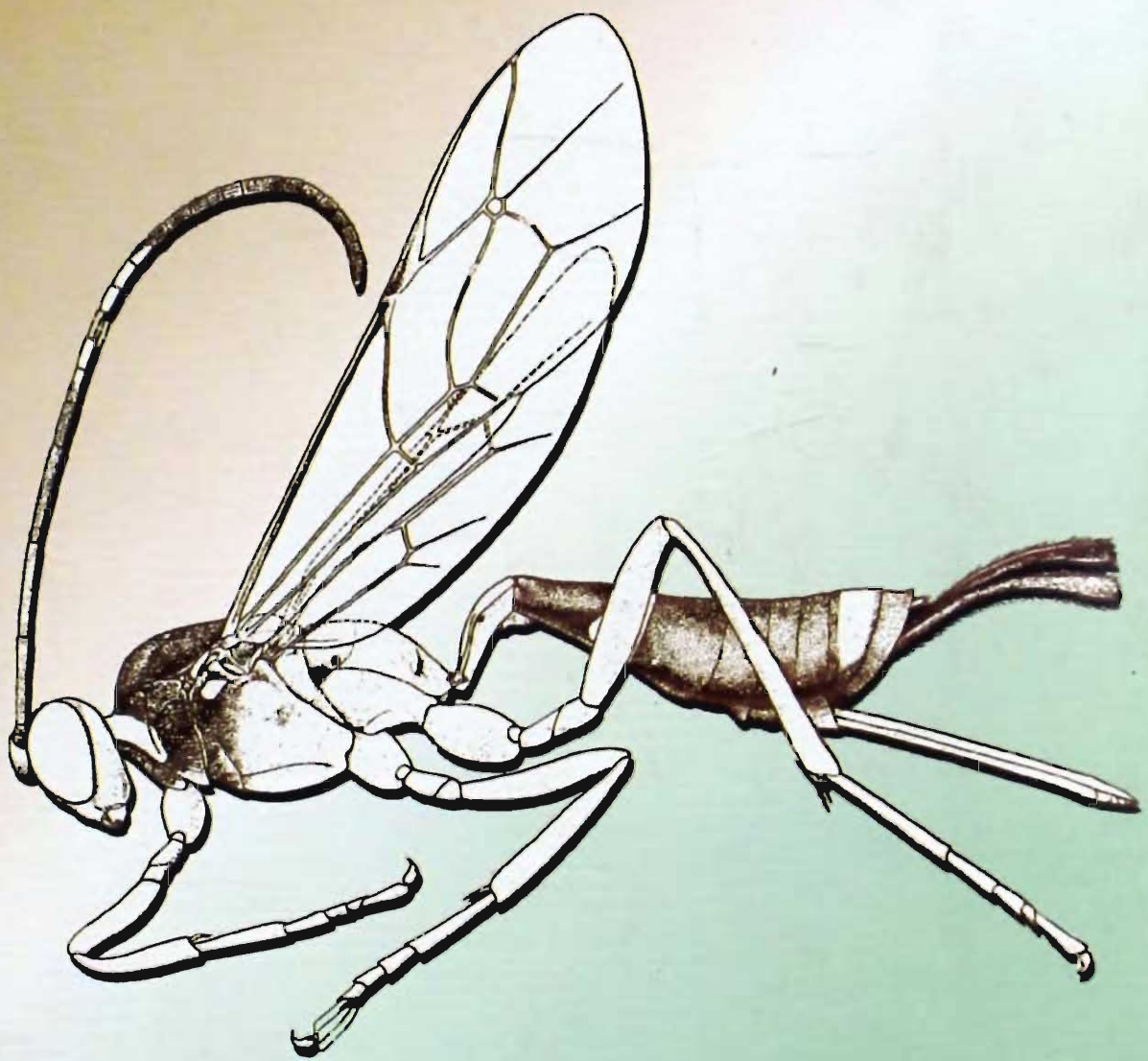
ICHNEUMONOLOGIA INDICA

(PART - 1)



JOSEPH K. JONATHAN

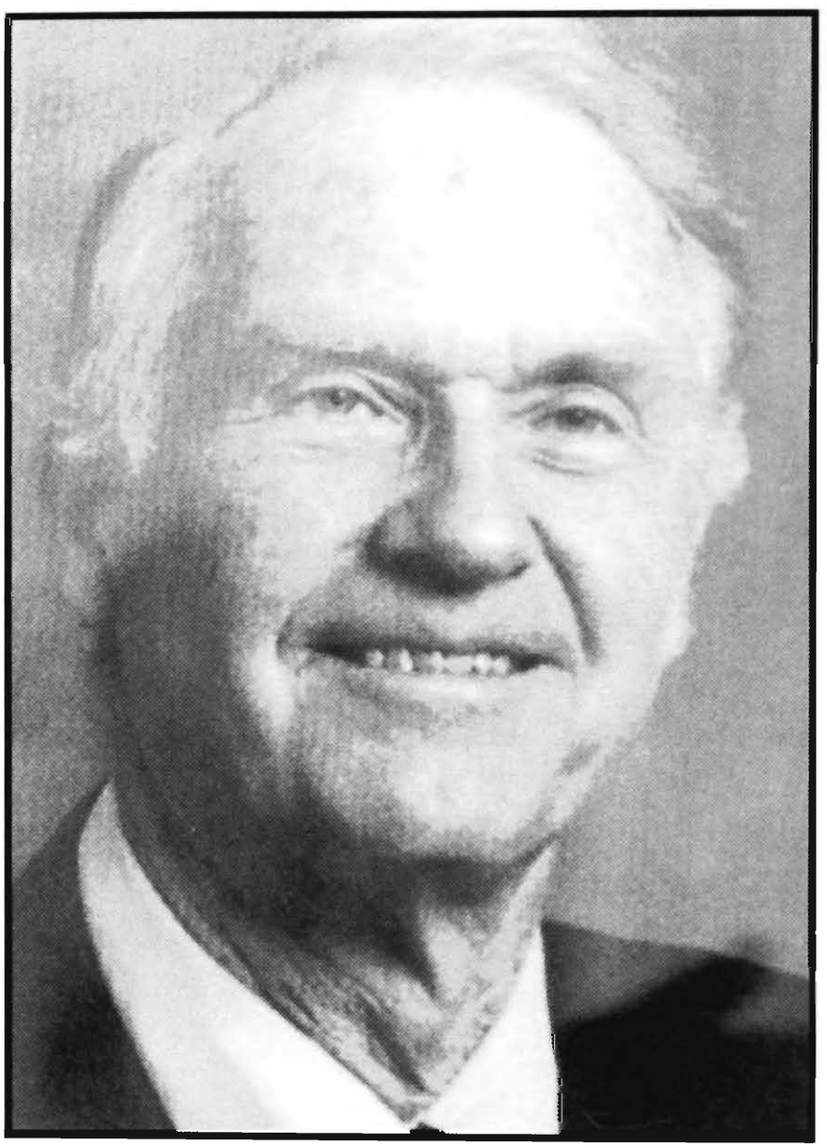
ZOOLOGICAL SURVEY OF INDIA

This manual is the Part-1 of the Ichneumonologia Indica Series, which deals with subfamily Mesosteninae of family Ichneumonidae (Hymenoptera : Parasitica). It is aimed tc provide a taxonomic guide to identify genera and species of this subfamily in India and adjacent countries. The member of this subfamily are parasitic on the larvae and pupae of other insects and some are parasitic on spiders or their eggs. By their parasitic habits they destroy a large number of insects injurious to agriculture and forestry. It is in this context, the taxornomic knowledge of these parasites and their hosts becomes all the more essential.

The present manual deals with 308 species and 18 subspecies under 68 genera. Of these, 2 subgenera and 23 species are described as new to science.

Therefore, this manual will help in identifications of these parasitic species, their distribution, hosts relationship and also their utilization in Biological Control Programme.

Dedicated to the Memory of



HENRY K. TOWNES

January 20, 1913—May 2, 1990

The outstanding contribution of Henry K. Townes to the studies of Ichneumonidae has been an incessant source of inspiration to me. It is hoped that his valuable work will be the guiding light to delve deeper to discover the importance of Ichneumonidae in biological control of insect pests.

ICHNEUMONOLOGIA INDICA

(PART-1)

An Identification Manual on Subfamily MESOSTENINAE (HYMENOPTERA : ICHNEUMONIDAE)

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Edited by the Director, Zoological Survey of India, Kolkata

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FOREWORD

This Manual on Subfamily Mesosteninae (Hymenoptera : Ichneumonidae) belongs to a group of Insects, whose members are parasitic on other group of insects injurious to agricultural crops, fruit orchards and forests.

This Manual is a consolidated account of the research work done by the present author in the last three decades and various scientists in the past. This manual provides a complete knowledge for the identification of super generic categories, their genera and species in India and adjacent countries.

The author has taken care to examine the types of most texa known, made extensive and intensive surveys of various parts of India, borrowed material from various institutions and museums in India and abroad.

This Manual provides detailed taxonomic accounts of various texa, identification keys to tribes, genera, species and subspecies. Distribution tables, illustrations of texa are provided for easy identification.

The present manual deals with 308 species and 18 subspecies under 68 genera of subfamily Mesosteninae. There are 2 subgenera and 23 species described as new to science.

The larvae of the members of this subfamily are ecto- or endoparasitoides of various phytophagous species of other insects, particularly Lepidoptera. Because of their parasitic habits these can be utilised in biological control processes and any increase in the knowledge of these natural enemies has a great potential economic value. It is well known that the exclusive use of chemicals in controlling insect pests often leads to the development of insecticide-resistance in pests, besides accumulation of harmful residues on the plants/crops, effecting directly or indirectly the environment and the consumers.

It is hoped, that this manual will greatly benefit scientists engaged in biological control programmes in identification of these economically important insects and their utilization in control of undue increase of noxious species.

May, 2006
Kolkata

J.R.B. Alfred
Director
Zoological Survey of India

PREFACE

The objective and need of this Manual is to consolidate the knowledge so far rendered through the works, of the author and various scientists in the past, in particular during the last three decades, on family Ichneumonidae, with special reference to subfamily Mesosteninae (Hymenoptra : Parasitica). The Manual is aimed to provide a taxonomic guide to identify all the higher categories, their genera and species in India and adjacent countries.

Our knowledge on Indian Ichneumonidae is extremely limited at the present. It is estimated that there are nearly 60,000 species in the world fauna, of which about 16,000 species occur in the Orient. In India this family is represented by about 1200 species and subspecies. The only reference work available is Morley's "Fauna of British India, Hynmenoptera Vol. 3 (Part I) Ichneumonidae" published in 1913. This has treated only a part of the family and completely left out large and important groups such as the Mesosteninae (= Cryptinae) and Ichneumoninae. Even this volume now become completely out-of-date due to more elaborate works of Cushman and Rohwer (1920), Gupta (1955-75), Gupta *et al.* (1966-1975), Perkins (1943), Townes (1944-70), Townes and Townes (1951, 1960, 1966) and Townes *et al.* (1961, 1965). Townes, Townes and Gupta (1961) catalogued the Indo-Australian species of Ichneumonidae. This was the first real attempt to straighten out the prevailing taxonomic confusion and synonymies etc. of the group. This work also provided comprehensive keys for the identification of the genera.

In the recent years, Gauld, 1976; Gauld & Mitchell, 1981; Gauld, 1987; Gauld & Gupta, 1983; Gupta & Maheshwary, 1977; Gupta & Tikar, 1976; Jonathan, 1969, 1974, 1975, 1980, 1982, 1987, 1993, 1994, 1995, 1997, 1999, 2000 & 2001; Jonathan & Gupta, 1973; Kamath & Gupta, 1972; Kaur & Jonathan, 1976, 1979; Morley, 1913 have published several research papers and monographs on the parasites of the family Ichneumonidae and their relationship with host species.

Ichneumonidae is one of the largest and important families of insects. The larvae of these insects develop as external or internal parasites in the larvae and pre-pupae of other insects, notably Lepidoptera. By their parasitic habits they destroy a large number of insects injurious to agriculture and forestry, and thus constitute one of the major factor for the prevention of undue increase of noxious species.

The exclusive use of chemicals in controlling insect-pests often leads to the development of insecticide-resistance in the pests, besides accumulation of harmful residues on the plants/crops, affecting directly or indirectly the environment and the consumers. The Integrated Pest Control Management Programme, therefore, incorporated methods of both chemicals as well as biological control. However, recently

the use of chemicals is on the way out and large dependency on organic control with particular reference to biological control is being advocated. It is in this context that the taxonomic knowledge of these parasites and their hosts becomes all the more essential.

Acknowledgement : I am indebted to Dr. J.R.B. Alfred, Director, Zoological Survey of India for providing necessary facilities to carry out the research work. I am grateful to Dr. David Wahl, Curator, American Entomological Museum, Gainesville, Florida and Prof. (Dr.) Massimo Olmi, Universita Degli Studi Della Tuscia, Dipartimento Di Protezione Delle Piante, 01100 Viterbo, Italia for generous supply of literature and valuable information to complete this work.

I am thankful to persons and authorities of various museums and institutions in India and abroad (as detailed in the text) for their help. I also thank Dr. B. G. Kundu for helping me in various ways and to Shri Rati Ram, Publication Production Officer, Z.S.I., for the task of printing this manual.

This publication would not have been possible without the encouragement and guidance of Dr. V. K. Gupta, Professor (Retired), Department of Entomology, University of Florida, who actually mooted this idea of publishing a consolidated account of subfamily Mesosteninae.

Last but not the least, I express my gratitude to the authorities of Ministry of Science & Technology, Government of India, New Delhi for the financial support, under its Utilization of Scientific Expertise of Retired Scientist Scheme.

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INTRODUCTION

The Ichneumonidae is one of the largest families of all animal groups. It includes more species than any other family with possible exception of the Curculionidae : Coleoptera. There are an estimated 60,000 species in the world fauna, of which about 8000 are believed to occur in India, where the great variety of climatic and other environments offer advantageous conditions for the life of these insects. These insects are parasitic on the larvae and pupae of the other insects, except for a few which are parasitic on spiders or their eggs. As they develop on other insects, they kill the host by feeding on the host's body fluids, then spin their own cocoons, pupate and emerge as adult ichneumonids. By their parasitic habits, they destroy a large number of agricultural and forest pests and thus constitutes one of the major forces for preventing the undue increase of noxious species. Under well balance conditions, a tendency for a potentially destructive insect to increase to dangerous limits permits an increase in its ichneumonids and other natural enemies and these is turn tend to effect a reduction of the pest. A little knowledge of them has been gained and with it some ability to apply biological control against insect pests. Because of the importance of natural enemies in biological control processes, any increase in our knowledge of them has potential practical value. A few species have been utilized for the biological control of pests, but a great majority of them have yet to be exploited for such control methods. Their non-utilization is apparently due to our inadequate knowledge of their taxonomy, biology, speciation and distribution. Due to lack of suitable manuals it is often not possible to identify the species correctly, thus hampering the progress of biological control programme.

The present manual is the Part 1 of the Ichneumonologia Indica Series. The Part 1 of this series will deal with the subfamily Mesosteninae. It is aimed to provide a taxonomic guide to identify all the higher categories, their genera and species of subfamily Mesosteninae in India and adjacent countries (Pakistan, Nepal, Bangladesh, Myanmar and Sri Lanka).

Three volumes will be required. As already stated the Part 1 will deal with subfamily Mesosteninae. The Part 2 will cover subfamilies Tryphoninae, Xoridinae, Banchinae and Ophioninae and Part 3 will cover rest of the subfamilies (excluding Ichneumoniae). These identification manuals will provide readily available information and a base to study smaller groups within a tribe or subtribe in finer details. These volumes are for those research workers who are ready to appreciate the diversity among the ichneumon flies and willing to undertake intensive and extensive effort to understand them, and prepare regional monographs or publish revisionary monographs or manuals on certain subfamilies, tribes or group of allied genera.

The objective of this work is to provide a consolidated account of subfamily Mesosteninae : family Ichneumonidae of India and adjacent countries. The present volume of Ichneumonologia Indica, Part I will also be provided with an introduction to Ichneumonidae, its general characters, a historical account, a key to all the subfamilies known from Indian and adjacent countries and a detailed account of morphological terms of taxonomic importance. The volume will deal exclusively with subfamily Mesosteninae, providing keys, descriptions and illustrations of genera and species.

SIZE OF THE ICHNEUMONIDAE

(Townes, 1969 : 3)

The Ichneumonids have been reported from the early Cretaceous and it might be possible that the family originated in the Jurassic. The geological age of birds and ichneumonids is about the same. The number of species in the Ichneumonidae is about seven times that in the birds. Approximately 8600 species of birds are classified as a separate class, with about 27 orders, 160 families, and 2,400 genera. The 60,000 species of Ichneumonidae are considered a single family of order Heymenoptera. There are 26 subfamilies and 1250 genera. There are an average 48 species per genus in the ichneumonids, and about 54 species per family is birds. An ichneumonid genus is thus often equivalent to a bird family, and an ichneumonid subfamily to a bird order.

The estimated number of species in various geographical regions can be added for a total of the world fauna as shown in tables below :

Table 1 : Number of described ichneumonids, Region-wise

Area	Catalogue authors and publication dates	Species listed	Corrections for synonyms	Estimated valid species
Nearctic	Townes & Townes, 1951; Walkley, 1958 & 1967	3,095	–6%	2,809
Neotropic	Townes & Townes, 1966	1,771	–3%	1,718
Indo-Australian	Townes, Townes & Gupta, 1961	2,579	–6%	2,424
Eastern Palaearctic	Townes, Momoi & Townes, 1965	2,474	–3%	2,400
Western Palaearctic	Schmiedeknecht, 1902-1927	4,470	–10%	4,023
Ethiopian	M. C. Townes, 1968	1,838	–12%	1,618
World totals (including duplications between areas)		**16,032**		**14,816**

(Source : Townes, 1969)

Table 2 : Estimated total number of ichneumonids, Region-wise

Area	Valid species reported (from Table 1)	Estimate of percent reported	Estimate of total species, including unreported
Nearctic	2,809	35%	8,026
Neotropic	1,718	10%	17,180
Indo-2,424 Australian	15%	16,160	
Eastern Palearctic	2,400	20%	12,000
Western Palearctic	4,023	70%	5,747
Ethiopian	1,618	15%	10,787
Total species, including duplications			**69,900**
Estimate of duplications between different areas (13.5%)			**9,436**
Total species probable in the world			**60,464**

(Source : Townes, 1969)

The ichneumonid species are widely distributed and tend to occur is more than one zoogeographical region, therefore, same percentage should be subtracted from the estimated world fauna.

HISTORICAL RESUME
(Higher classification)

The history of Ichneumonidae, its first definition, higher classification etc can be understood by the following account, as given by Townes (1969 : 7).

1. Gravenhorst (1829) : His classification was given is "Ichneumonologia europea" entitled "Conspectus generum et subgenerum" If we translate his terminology to present day terminology—Gravenhorst's "genera" will be called a subfamily and his "families or subgenera" will be called genera. He recognised 13 subfamilies containing 61 genera. The families were : 1. Ichneumon; 2. Tryphon; 3. Trogus; 4. Alomya; 5. Cryptus; 6. Pimpla; 7 Metopius; 8. Bassus; 9. Banchus; 10. Ophion; 11. Hellwigia; 12. Acoenites and 13. Xorides. The classification was mainly based on the abdomen : petiolate or subsessile, sessile, compressed or depressed.

2. Wesmael (1844) : He devided the Ichneumonids into 6 groups: "Ichneumones, Crypti, Pimplae, Banchi, and Ophiones"

3. Holmgren (1855) : He recognised 5 subfamilies : "Ichneumonides, Crypti, Ophionides, Tryphonides, and Pimplariae"

4. Thomson (1873-97) and Schmiedeknect (1902-1933) : Thomson enlarged Holmgren's classification as also Schniedeknect in his *Opuscula ichneumonologica.*

5. Foerster (1868) and Ashmead (1990) : Foerster subdivided the family into 36 groups which were later accorded family rank. Ashmead (1900) published a key to the genera of the family. Foerster's "families" were reduced by Ashmead to tribes and the tribes were grouped into 5 subfamilies of Holmgren. Foerster and Ashmead's work added more confusion and Ashmead, instead of making corrections added his own errors to those of Foerster.

6. Cushman and Rohwer (1920) : They published a new classification of the tribes of Ichneumonidae—"Pimplinae" They largely used the larval characters, and of the ovipositor tip. Cushman continued publishing additional papers, until 1947.

7 Roman (1903-1943) and Hellen (1914-1970) followed the classification of Thomson and Schmiedeknecht with some improvements.

8. Uchida (1924-1960) used Schmiedeknect's classification for species of Japan and nearby areas. Seyrig (1932-34) published Madagascan ichneumonids and posthumons paper on Gelinae in 1952. Heinrich contributed on Ichneumoninae of Sulawesi in 1934 and Madagascar in 1938.

9. H. K. & M. C. Townes (1933-1990) : Up until 1952 did research on Nearctic ichneumonids. By 1942, identifying ichneumonids by comparisons with types and a revised classification of described Nearctic Ichneumonids was published (1944-45). A taxonomic arrangement and catalogue of Indo-Australian Ichneumonidae was published in 1961, one on Palaearctic Ichneumonidae in 1965 and one on the Neotropic Ichneumonidae in 1966. A more extensive work on the genera and higher classification, form world-wide stand point was undertaken by Townes (1969-1971). They published–the genera of Ichneumonidae Part 1-4; a catalogue & reclassification of the Ethiopian Ichneumonidae (1973) and Ichneumon flies of America North of Mexico (1978).

MORPHOLOGICAL TERMS OF TAXONOMIC IMPORTANCE

The morphological terms used in keys and descriptions in this volumes are explained and illustrated. These terms are based on the works of Townes (1969), Kamath & Gupta (1972) and Jonathan & Gupta (1973). Some terms which are specific to certain genera are explained in generic description.

The terms used in the keys and the text are briefly described below and illustrated in figures 1 & 2.

Head

Clypeus : The area above the mouth opening, below the face, usually separated from the face by a shallow groove.

Face : The area between the eyes and from the lower margin of the antennal sockets to the clypeal groove. The width of the face at its narrowest point and height from clypeal foveae to the lower margin of the antennal sockets.

Frons : The area between the eys, extending from the lower margin of median ocellus to lower margin of antennal sockets.

Vertex : The top part of head, between the upper corners of the compound eyes.

Malar space : The space between the lower margin of the compound eye and base of mandible. The length is measured at its narrowest point.

Occiput : The top part of the hind aspect of the head, extending from the vertex to the accipital carina.

Occipital carina : A subcircular carina on the hind aspect of the head. This carina is interrupted below at mouth openning.

Hypostomal carina : One of the two carinae on the lower part of the hind aspect of head, running from the lower mandibular socket to the foramen magnum.

Ocellar triangle : The raised triangular area containing the three ocelli.

Orbit : An imaginary ring around each eye. The orbit can be referred to according to the part of head involved : frontal orbit (close to frons); facial orbit (to face) ; temporal and vertical orbit (to temple and vertex).

Thorax

Pronotum : It is a triangular plate extending laterally to the tegulae : This can be subdevided into three areas : i) *the pronotal callar,* which is more or less raised front margin of the pronotum, just behind head; ii) *the upper margins* of pronotum is the upper area of pronotum towards mesoscutum and iii) the area down towards the base of fore coxa is known as *lower margin.*

Epomia : A carina on the pronotal collar, obliquely extending to the upper margin.

Mesoscutum : It is a large broadly convex plate-like area, which has a pair of converging grooves, the *notauli* (singular *notaulus).*

Scutellum : A median, subtriangular, raised part of mesonotum behind mesoscutum.

Lateral carina of scutellum : A pair of carina extending on either side of scutellum from base to apex.

Metascutellum : The small median raised part of the metanotum, lying between the apex of the scutellum and the base of propodeum.

Mesopleurum : This term in ichneumonids means ordinarily only the mesepisternum, which comprises most of the mesopleurum.

Speculum : A weakly raised polished or less strongly sculptured area on the upper hind part of the mesepisternum (=mesopleurum).

Tegula : A convex scale lying over the base of the fore wing, on the front side.

Subtegular ridge : A transverse ridge near the upper edge of the mesopleurum, beneath the tegula and base of the fore wing.

Prepectal carina : A carina near the front of the mesothorax, crossing the mesosternum near the front, and extending upward on each side of the mesopleurum.

Prepectus : The part of mesopleurum and mesosternum in front of prepectal carina.

Sternaulus : A horizontal groove, considered a dividing line between mesopleurum and the mesosternum.

Postpectal carina : A transverse carina on the mesosternum, just in front of the middle coxae. The carina may be complete, may be interrupted in front of each of the middle coxae, or may be obsolescent with only a short trace on each side near the coxal socket and perhaps a remnant at the midline.

Mesopleural fovea : A pit or a short horizontal groove on the mesopleurum, at its mid height, just infront of the mesopleural suture and below the speculum.

Mesopleural suture : A vertical or somewhat oblique groove near the hind edge of the mesopleurum, reaching from the middle coxal socket to the base of the front wing.

Metapleurum : The metapleurum is in two distinct parts. The lower division is the larger and ordinarily is the only part referred to when the metaplerum is mentioned. This lower part is an oval or subtriangular area on the side of the thorax, between the middle and hind coxae and extending up to the propodeum. The upper division of metapleurum lies behind the upper half of the mesepimeron

and below and a little behind the base of the hind wing. It is separated from the propodeum by a furrow.

Juxtacoxal carina : It is an arched carina cutting off a lenticular area of the lower part of the metapleurum.

Propodeum : It is morphologically the first abdominal segment, but is topographically part of thorax. Two transverse carinae : apical carina and basal carina divide the propodeum into basal, median and apical regions. Propodeum is also longitudinally divided by two *lateral carinae* and a pair of *median* carinae.

Pleural carina : The carina between the propodeum and matapleurum.

Propodeal spiracle : Spiracular opening on either side at base of propodeum. The length and width are measured at the center of the surrounding rim.

Apophyses : One of the two teeth, horns, crests or tubercles on each side of the propodeum near its midlength, situated at the hind end of the second lateral area or sublaterally on the apical transverse carina.

Areola : The median area on the propodeum that is enclosed by carinae, usually pentagonal or haxagonal in shape.

Petiolar area of the propodeum : The median area of the propódeum just above the abdominal attachment.

Abdomen

In ichneumonids the first morphological segment has transferred to the thorax as the propodeum. Abdominal segments in ichneumonids are numbered from front to rear, with the first apparent segment (morphologically the second segment) termed the first segment.

First abdominal tergite : The first tergite typically has 3 pair of longitudinal carinae : (i) the *dorsomedian carinae* are a pair on the upper side, (ii) the *dorso-lateral carina* lies one on each side, at the level of the spiracle and (iii) the *ventro-lateral carina* is present on each side at the lower edge of the first tergite. The length of the first tergite is measured from the centre of the insertion area of the extensor tendons to the extreme apex on the mid-line and the width is measured at its widest point, which is nearly always close to the apex. The widened hind part of the first tergite behind the spiracles is the *postpetiole*. The part of the first segment of abdomen in front of spiracle, relatively slender is known as *petiole*.

Cercus : One of the two very small finger-like appendages at the apex of the last abdominal tergite.

FIG. 1

A. Front view of head of an Ichneumonid.

a. Vertex
b. Frons
c. Face
d. Malar space
e. Clypeus
f. Mandible
g. Epistomal suture
h. Antennal sockets
i. Median ocellus
j. Lateral ocellus
k. Eye
l. Semicircular carina
m. Antennal scrobe

B. Rear view of head of an Ichneumonid.

a. Vertex
b. Occiput
c. Foramen magnum
d. Temple
e. Occipital carina
f. Hypostomal carina

C. Side view of thorax of an Ichneumonid.

AREAS

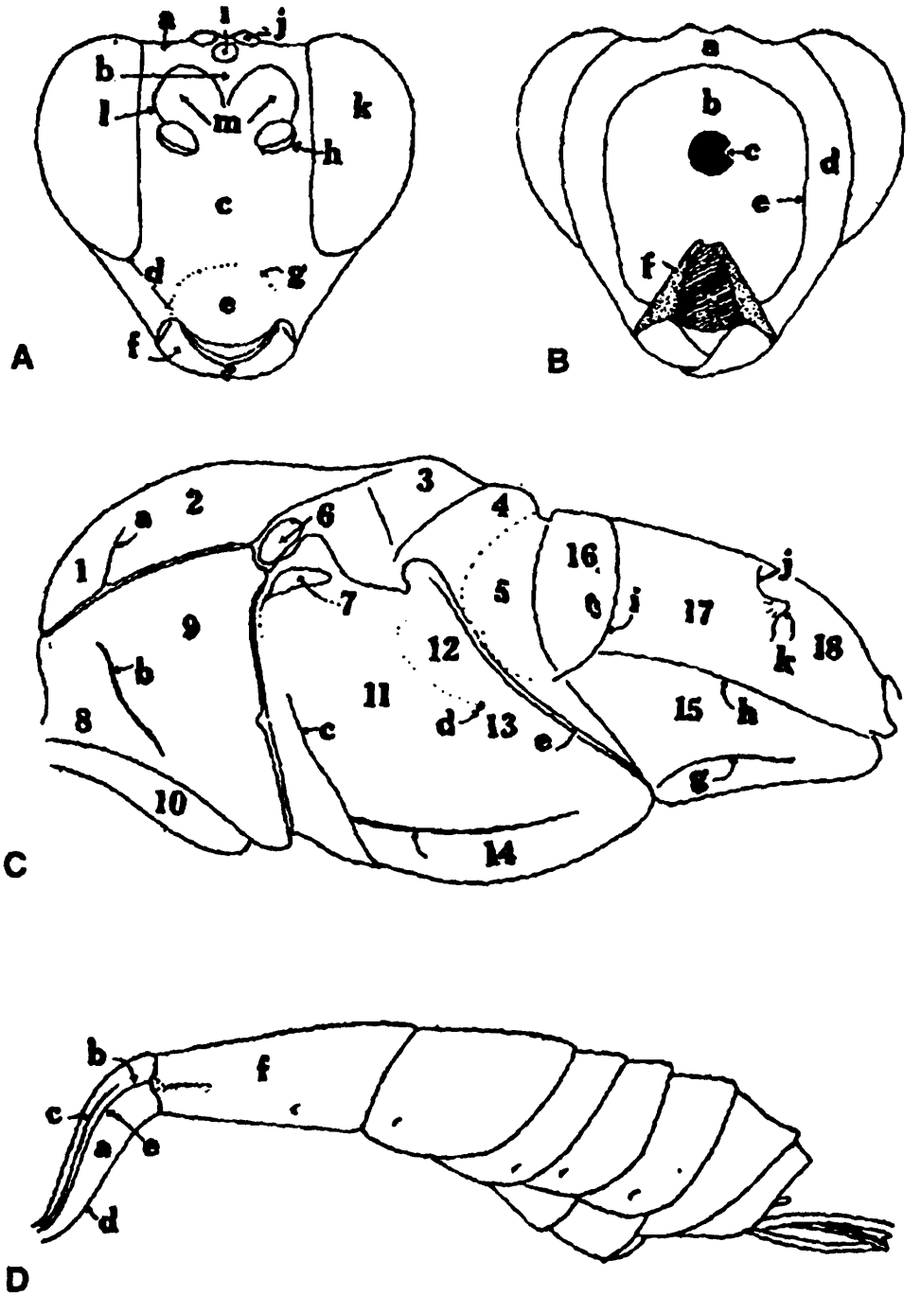
1. Median lobe of mesoscutum
2. Lateral lobe of mesoscutum
3. Scutellum
4. Metascutellum
5. Hind margin of metanotum
6. Tegula
7. Subtegular ridge
8. Pronotal collar
9. Upper margin of pronotum
10. Propleurum
11. Mesopleurum
12. Speculum
13. Mesepimeron
14. Mesosternum
15. Metapleurum
16. Basal area of propodeum
17. Middle area of propodeum
18. Apical area of propodeum

CARINE and GROOVES

a. Notaulus
b. Epomia
c. Prepectal carina
d. Mesopleural pit
e. Mesopleural suture
f. Sternaulus
g. Juxtacoxal carina
h. Pleural carina
i. Basal carina of propodeum
j. Apical carina of propodeum
k. Apophyses

D. Side view of abdomen.

a. First tergite
b. Dorso-lateral carina
c. Dorso-median carina
d. Ventro-lateral carina
e. Spiracle
f. Second tergite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B
C
D

FIG. 2

E. Fore and hind wings of an Ichneumonid.

VEINS

Fore wing	*Hind wing*
ab = Costa	ab = Costella
ed = Subcosta	cde = Subcostella
efg = Metacarpus	ef = Metacarpella
hijf = Radius	dgh = Radiella
klmn = Cubitus	jkl = Cubitella
opqv = Discoideus	mn = Discoidella
qrs = Subdiscoideus	kg = Intercubitella
co = Medius	ij = Mediella
tu = Submedius	op = Submediella
uv = Brachius	pq = Brachiella
beh = Stigma	rs = Axillus
do = Basal vein	jmp = Nervellus
ik = First intercubitus	
jm = Second intercubitus	
pk = Discocubitus	
lr = Second recurrent	
ou = Nervulus	
pqv = Postnervulus	

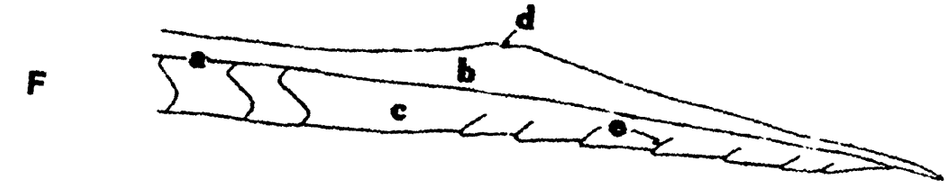
CELLS

Fore wing	*Hind wing*
1 = Radial cell	12 = Constellan cell
2 = Median cell	13 = Radiellan cell
3 = Discocubital cell	14 = Mediellan cell
4 = Areolet	15 = Cubitellan cell
5 = Third cubital cell	16 = Discoidellan cell
6 = Second discoidal cell	17 = Submediellan cell
7 = Third discoidal cell	18 = Brachiellan cell
8 = Submedian cell	19 = Anellan cell
9 = First brachial cell	20 = Postellan cell
10 = Second brachial cell	
11 = Anal cell	

E. Ovipositor of an Ichneumonid.
a. Shaft, b. Upper valve, c. Lower valve, d. Nodus, e. Teeth

G. Male genitalia of an Ichneumonid.
1. Aedeagus
spt = Spatha, pr = Paramere, erg = Ergot
2. Gonoforceps
gsq = Gonosquama, gst = Gonostipes, gc = Gonocardo
3. Volsella
gl = Gonolacinia, dv = Distivolseller apodeme, va = Ventral area of basivolsella, vstr = Basivolsella strut.

H. Ninth sternum or genital plate.
sp = Spiculum, ac = Anticosta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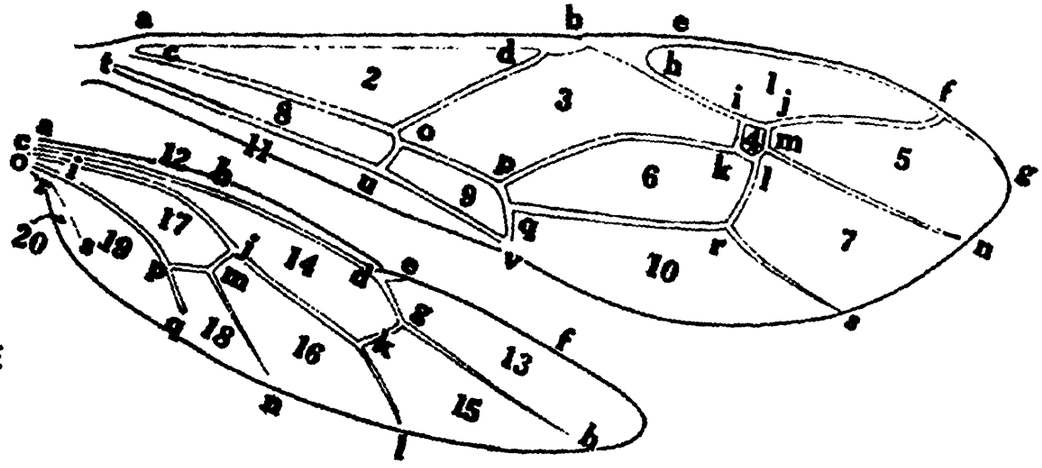
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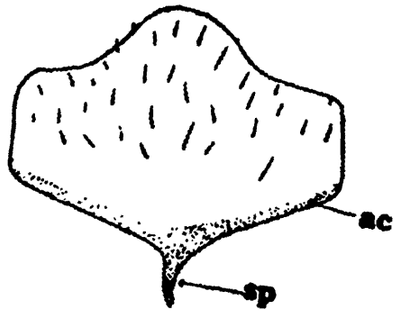
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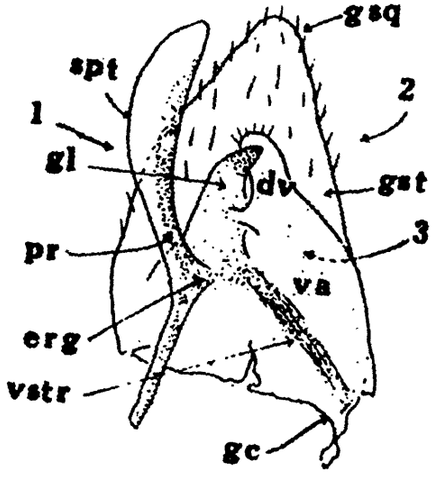
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Gastrocoelus : An impression on each side of the second abdominal tergite, near the base. The gastrocoelus includes the thyridium.

Glymma : A groove or pit in the side of the first tergite between its spiracle and base. The glymma is nearly always present when the first sternite is free from its tergite, and absent when the sternite is fused with its tergite.

Hamulus : A small, bristle like hook on the front edge of the hind wing that hook into a channel on the hind edge of the fore wing to join the two wings together.

Inclivous : The term applied to transverse wing vein. When the front end of vein nearer the wing base. If both ends are equal to wing base –the vein is *vertical* and when the front end is away from the wing base –the vein is *reclivous.*

Legs : In describing various aspects of leg, it is imagined as leg stretched out horizontally, at right angles to the body.

Pectinate : The tarsal claws that have a series of small teeth on the under side. Teeth may be of various shape, sparse or dense, comb-like. The tarsal claws are said to be "simple" when no pecten teeth can clearly be seen without a microscope slide mount.

Clasper : The lateral, out side piece of the male genitalia.

Ovipositor sheath : The two outside, covering parts of ovipositor. The length of the ovipositor sheath in relation to the length to the hind tibia or the fore wing, is used to indicate the length of the ovipositor itself. The length of the ovipositor sheath is the same as the length of the exerted part of the ovipositor.

Upper valve of the ovipositor : The dorsal half of the shaft of the ovipositor, composed of the two second valves fused together.

Lower valve of the ovipositor : The two lower valves of the ovipositor, one on each side, comprise the lower half of the ovipositor shaft. At the tip of the lower valve is nearly always a series of oblique *ridges* or *teeth.*

Nodus : A dorsal prominence on the tip of the ovipositor, a short distance before the apex.

Volsella : A part of the male genitalia between the clasper and penis, its lateral edge attached to the clasper. At the apex of the volsella is a lobe called *cuspis,* and attached to the mesal side near the apex a separate piece, the *digitus,* is articulated.

Wings veins and cells : as shown in figure 2.

Male genitalia : as shown in figure 2.

SYSTEMATIC ACCOUNT

Family ICHNEUMONIDAE

This family is easily distinguished by having two recurrent veins is fore wing (very rarely second recurrent absent); costal cell absent and hind wing with less than three basal cells. This family is close to Braconidae and Stephanidae, however, the second recurrent vein is always absent in these two families. In Ichneumonidae antenna is long, nearly always with more than 16 segments. In this character this family is close to Braconidae, Stephanidae, Pamphiliidae, Trigonalidae and Selerogibbidae, having more than 16 antennal segments. Abdomen petiolate or subpetiolate; ventral side of abdomen soft and membranous, with a median fold; last abdominal sternite of female devided longitudinally and ovipositor issuing from anterior to the tip of abdomen, and provided with a pair of narrow exserted sheaths as long as ovipositor. The larvae of ichneumonids, like many braconids spin a silken cocoon.

The Ichneumonidae can be distinguished from its related families by the following key :

1. Costal cell in fore wing absent 2

– Costal cell present, may be narrow 4

2. Ventral abdominal segments soft and membranous, with a median fold 3

– Ventral abdominal segments hard, heavily sclerotized. Scutellum armed with a sharp spiniform process ..... AGRIOTYPIDAE

3. Two recurrent veins, or if only one then the abdomen 3× as long as rest of body. Body length excluding ovipositor from a few millimeters to more than 40 mm in length ..... ICHNEUMONIDAE

– One recurrent vein or none. Abdomen not greatly elongated; propodeum not prolonged beyond hind coxae. Body mostly small, rarely over 12 mm in length ..... BRACONIDAE

4. Fore wing with 2 or 3 closed submarginal cells. Antennae with 18 or more segments. Head large, quadrate; mandibles with 4 teeth. Hind wing with 2 large closed cells. Brilliantly coloured species..... TRIGONALIDAE

– Fore wing with only 1 closed submarginal cell or none. Antennae setaceous, with 30 segments or more. Hind femora swollen and toothed before apex. Head tuberculate above ..... STEPHANIDAE

The world fauna of Ichneumonidae is classified in about 26 subfamilies. The

present volume deals with the fauna of India and adjacent countries. A key to Oriental subfamilies of the Ichneumonidae largely based on Townes (1969 : 53) is given below :

Key to the Oriental subfamilies of the Ichneumonidae

1. Clypeus and face forming a broad, rather weakly convex surface, the clypeus not separated by a distinct groove. Areolet rhombic, usually large. Posterior mesosternal carina not complete. Tarsal claws more or less pectinate. First tergite with a large glymma, its spiracle near or a little behind the middle. Second and following tergites nearly always polished. Male clasper ending in a long rod; female subgenital plate large, triangular in profile ..... 13. MESOCHORINAE

– Not agreeing entirely with the above. (Face and clypus usually narrower and with a more irregular surface, the clypus usually separated by a groove. Areolet various, sometimes absent, seldom rhombic, or sometimes the wings reduced or absent. Posterior mesosternal carina complete or incomplete. Tarsal claws pectinate or not. First tergite with or without a glymma, its spiracle varying in position: near base, near middle or near apex. Second and following tergites polished, mat, and/or punctate. Male clasper not ending in a long rod except in some species of *Nematopodius* and *Charops* and rarely in other genera. Female subgenital plate various, often inconspicuous in side view. 2

2. Spiracle of first abdominal tergite placed behind the midlength of the tergite. (Some genera are borderline in this character. These can be traced through either half of the couplet) 3

– Spiracle of first abdominal tergite placed near the midlength of the tergite or definitely in front of the midlength 16

3. Abdomen compressed, its third and fourth segments deeper than wide..... 4

– Abdomen depressed or cylindric, its third and fourth segments wider than deep 9

4. Second branchial cell with a long spurious vein that parallels its hind margin. First intercubital vein (or the intercubital vein that is present) joining cubital vein distad of second recurrent vein by a distance greater than half its length. Wings never reduced or absent. Epomia absent. Outer apical edge of front tibia without a spine or tooth. Medium to large sized species, usually pale brown in colour and with very large ocelli ..... 12. OPHIONINAE

– Second brachial cell without a spurious vein or with only a short one. First

intercubital vein joining cubital vein basad of, opposite, or less than half its length distad of second recurrent vein, or if rarely it joins cubitus more than half its length beyond second recurrent, then the epomia is present and long (or wings sometimes reduced or absent). Outer apical edge of front tibia often with a small spine or tooth 5

5. Propodeum without areas bounded by regular carinae, with at most a transverse basal carina, its sculpture usually coarse and reticulate. Occipital carina usually at outer hind margin of temple so that the head is nearly as wide at this carina as at the eyes. Areolet absent. Hind tarsus often swollen, especially in males 6

– Propodeum usually areolated or with other carinae than the basal transverse one, its sculpture usually fine, not coarsely reticulate. Occipital carina (when present) in its normal location, so that the head is much narrower at the carina than the eyes. Areolet present or absent. Hind tarsus usually not swollen 7

6. Epipleurum of third tergite separated by a longitudinal crease just beneath the spiracle; intercubitus joining cubitus beyond second recurrent vein by a distance greater than 0.6 its length. Middle tibia with one spur. Dorsal part of occipital carina well below the hind ocelli. Ovipositor sheath 3× as long as the apical depth of abdomen ..... 15. ANOMALONINAE

– Epipleurum of third tergite not separated by a crease; intercubitus joining cubitus basad, opposite, or sometimes distad of second recurrent vein by a distance greater than 0.6 its length. Middle tibia usually with two spurs, but sometime with one spur. Dorsal part of occipital carina usually close to the level of hind ocelli, but sometimes well below. Ovipositor sheath about 1–3.5× as long as apical depth of abdomen ..... 16. GRAVENHORSTINAE

7. Posterior transverse carina of mesosternum absent, or interrupted in front of each middle coxa, clypeus separated from face by a groove. (Maxillary palpus 4-segmented. Labial palpus 3-segmented. Clypeus with an apical fringe of long parallel bristles. Areolet absent) ..... 11. TARSILOCHINAE

– Posterior transverse carina of mesosternum complete, or rarely interruped infront of each middle coxa, in such cases the clypeus is confluent with face 8

8. Tibial spurs inserted in a common area with the tarsus, the apex of each tibia thus having a single membranous insertion area. Clypeus usually confluent with face. Face usually black ..... 9. PORIZONTINAE

Tibial spurs inserted in a separate area from that of the tarsus, the apex of

each tibia thus having two insertion areas separated by a sclerotized bridge. Clypeus separated from face by a groove. Face usually more or less pale .. .. 10. CREMASTINAE

9. Hind tibia with one spur. (Apex of clypeus with a large median tooth. Radius arising from near base of stigma) .... 2. TRYPHONINAE (genus *Sphinctus*)

– Hind tibia with two spurs 10

10. Ovipositor tip with a dorsal subapical notch and the tip of lower valve without distinct teeth. First sternite often not fused with its tergite .... 7 BANCHINAE (a few genera)

– Oviposite tip without a dorsal subapical notch, or with a weak notch and the lower valve tip bearing distinct teeth. First sternite fused with its tergite 11

11. Inner margins of eyes strongly convergent ventrad. Areolet pointed or stalked above. Second recurrent vein strongly inclivous. Fore wing 2.5 to 6.0 mm long ..... 18. HELICTINAE

Inner margins of eyes not convergent ventrad, or less strongly convergent. Areolet usually sessile above, sometimes absent (the wings sometimes reduced or absent) 12

12. Sternaulus short or absent, less than half as long as mesopleurum. Ovipositor not extending conspicuously beyond apex of abdomen, its sheath always rigid. Second intercubital vein present. Mandible with two teeth or sometimes only one. Clypeas usually broad and weakly convex, its apex usually rather broadly truncate or subtruncate, its apical margin not impressed .... 24. ICHNEUMONINAE

– Sternaulus usually present and usually at least half as long as mesopleurum. Ovipositor usually extending conspicuously beyond apex of abdomen, its sheath flexible except when very short. Second intercubital vein present or absent. Mandible with two teeth. Clypeus various, usually moderately strongly convex and its apical margin usually impressed 13

13. Dorsal end of prepectal carina below midheight of hind margin of pronotum and some distance from front edge of mesopleurum. Sternaulus 0.2 to 0.5× as long as mesopleurum ..... 4. LABENINAE

– Dorsal end of prepectal carina nearly always above midheight of hind margin of pronotum and at, or close to front edge of mesopleurum. Sternaulus usually at least half as long as mesopleurum 14

14. Second recurrent vein with two bullae or sometimes with one, nearly always sloping outward posteriorly so that posterodistal corner of second discoidal cell is somewhat longer and more pointed than anterodistal corner (in a few cases when second recurrent vein is vertical and with a single bulla the sternaulus reaches hind edge of mesopleurum a little above its lower hind corner, and/or the apical truncation of the scape is only moderately oblique, and/or the epipleurum of second tergite is turned mesad). Face of male rarely marked with white or yellow. Propodeum usually areolated, with longitudinal as well as transverse carinae ..... 21. PHYGADEUONTINAE

– Second recurrent vein with a single bulla, usually not sloping outward posteriorly and usually meeting subdiscoidal vein at a right angle. Sternaulus, when it reaches hind edge of mesopleurum, ending just below lower hind corner of mesopleurum. Apical truncation of scape strongly oblique. Face of male frequently marked with white or yellow 15

15. Dorsal rim of metanotum with a posterior sublateral, triangular projection, this projection opposite front end of sublateral longitudinal carina of propodeum (which is nearly always present). Propodeum with longitudinal carinae as well as transverse carinae, or in some females only transverse carinae present, but in these the basal transverse carina is weak or absent and the apical carina strong ..... 22. HEMIGASTERINAE

– Dorsal rim of metanotum without a posterior sublateral projection (though sometimes there is such a projection just below the dorsal rim). Propodeum without longitudinal carinae, if only one transverse carina is present on propodeum, it is the basal carina rather than the apical one ..... 23. MESOSTENINAE

16. Clypeus not separated from face by a groove, the face and clypeus either forming a smooth, strongly convex surface or with a large shield-shaped flat or concave area that is bounded by a carina 17

– Clypeus separated from face by a more or less distinct groove or if rarely the groove is absent than the face is rather flat 19

17. Scape subcylindric, 1.8 to 2.4× as long as wide. Upper edge of face without a projection over or between the antennal sockets ..... 19. ORTHOCENTRINAE

– Scape ovoid, 1.2 to 1.7× as long as wide 18

18. Upper edge of face without a projection over or between the antennal sockets. Tarsal claws pectinate at the apex ..... 8. CTENOPELMATINAE

– Upper edge of face with a projection over or between the antennal sockets

(except in one genus in which the tarsal claws are simple). Tarsal claws simple or pectinate. ..... 14. METOPIINAE

19. Upper tooth of mandible broad, more or less distinctly divided into an upper and lower point by a week notch or impression on its apical margin, the mandible thus tending to appear 3-toothed. First tergite rectangular, not distinctly narrowed basad. Front wing 3.5 to 9.0 mm long. Ovipositor not extending beyound apex of abdomen ..... 20. DIPLAZONTINAE

– Upper tooth of mandible not divided into two points, the mandible thus 2-toothed or 1-toothed, or if rarely the upper tooth is more or less divided (some Banchinae and Ctenopelmatinae), then the first tergite is narrowed basad 20

20. Abdomen attached rather high on propodeum, so that in lateral view the base of abdomen is well separated from bases of hind coxae. Epipleura of tergites 2–4 0.4 to 0.6× as wide as the abdomen ..... 4. LABENINAE

– Abdomen attached low on propodeum, its base between or just above bases of hind coxae. Epipleura of tergites 2–4 often less than 0.4× as wide as the abdomen 21

21. Female subgenital plate very large, folded on the middle line, triangular, usually elongated, with its point projecting beyond tip of abdomen. Front and middle tarsal claws either simple or with a subapical tooth, or rarely with an internal lobe. Ovipositor long, without a subapical dorsal notch ..... 17. ACAENITINAE

– Female subgenital plate small, sometimes triangular but not projecting conspicuously beyond apex of abdomen. Front and middle tarsal claws simple, pectinate, or with a large basal lobe, without a subapical tooth except in some Pimplinae (in such genera the prepectal carina is absent). Ovipositor short to long, sometimes with a subapical dorsal notch 22

22. Apical margin of front tibia producted on the outer edge into a small tooth. Ovipositor short, not distinctly surpassing tip of abdomen. Tarsal claws often pectinate, never with a lobe or tooth ..... 8. CTENOPELMATINAE

– Apical margin of front tibia rounded on outer edge, without a tooth 23

23. Apex of scutellum with a spine that is about as long as the scutellum. Sterna of abdominal segments 2–4 completely sclerotized. ..... 6. AGRIOTYPINAE

– Apex of scutellum without a long spine except in most species of *Banchus*. Sterna of abdominal segments 2–4 partly to entirely membranous 24

24. Upper valve of ovipositor with a subapical dorsal notch, not raised at the

notch. Lower valve of ovipositor tip smooth or with very small inconspicuous teeth or ridges at the apex..... 25

– Upper valve of ovipositor without a subapical dorsal notch, or with a weak subapical notch that surmounts a raised nodus. Lower valve of ovipositor tip usually with conspicuous teeth or ridges 26

25. Second recurrent vein with one bulla or rarely with two, the vein subvertical or inclivous. Tarsal claws usually pectinate. Submetapleural carina usually forming a strong lobe just behind middle coxa. Female subgenital plate in lateral view large and conspicuous. First sternite not fused with its tergite ..... 7 BANCHINAE (most genera)

– Second recurrent vein with two bullae or rarely with one, the vein inclivous. Tarsal claws simple. Submetapleural carina not forming a strong lobe behind middle coxa. Female subgenital plate in lateral view inconspicuous or not visible. First sternite often fused with its tergite .... 18. HELICTINAE (most genera)

26. Tarsal claws usually pectinate but sometimes simple, never with a large tooth. Clypeus often wide and with a marginal fringe of setae, without a median apical notch. First abdominal sternite nearly always free from its tergite. Eggs attached to host by a stalk or by a modification of a stalk.... ..... 2. TRYPHONINAE (except *Sphinctus)*

– Tarsal claws not pectinate, in the female often with a large basal lobe. Clypeus various, sometimes with a median apical notch. First abdominal sternite sometimes fused with its tergite. Eggs not attached by a stalk..... 27

27. First sternite more or less free from its tergite (and the first tergite with a glymma), and/or propodeum entirely without the basal transverse carina. Tarsal claws often with a tooth or basal lobe, especially in females .... 1. PIMPLINAE

– First sternite completely fused with its tergite (and the first tergite without a glymma), and propodeum with at least a trace of basal transverse carina. Tarsal claws simple. (Sternaulus indistinct, absent, or less than half as long as mesopleurum. Flagellum of male without tyloids. Propodeum with longitudinal carinae) ..... 5. XORIDINAE

Subfamily MESOSTENINAE

Fore wing 3–27mm long. Face of male frequently white or yellow, or marked with white or yellow. Scape strongly obliquely truncate. Clypeus weakly to moderately convex, its apical margin usually impressed, rarely with a median

tooth. Dorsal rim of metanotum without a small sublateral angular projection, but sometimes with such a projection below hind margin and often with a submedian pair of such projection on either side of metascutellum, or without tooth or tooth-like projections opposing similar projections on the basal rim of propodeum. Propodeum usually with two transverse carinae, basal carina usually stronger than the apical carina; when one transverse carina present, it is the basal carina; propodeum without longitudinal carinae except rarely in some genera (*Apsilops, Trachysphyrus* and sometimes *Isotima),* but the median basal area is usually defined. Epipleura of second tergite narrow and vestigial.

Key to the tribes of Mesosteninae

1. Mandible about 4.5× as long as its width at the middle, upper tooth much longer than the lower tooth, the lower tooth sometimes indistinct. Clypeus broadly truncate, without a median tooth or lobe. Tergite 1 slender..... .o..... IX. Tribe **Osprynchotini**

– Mandible 1.2 to 3.5× as long as its width in the middle, upper tooth not at all or a little longer than the lower tooth. Tergite 1 various 2

2. Wings shorter than thorax (females only). Apex of clypeus weakly convex. Ovipositor reaching far beyond apex of abdomen .... I. Tribe **Agrothereutini** (Some females of *Agrothereutes*)

– Wings of normal size, longer than thorax 3

3. Ovipositor reaching only to tip of abdomen. Female subgenital plate broad, rhomboidal, weakly convex. Second intercubital vein absent, not present even as a trace ..... XI. Tribe **Sphecophagini**

– Ovipositor nearly always reaching past tip of abdomen. Female subgenital plate not large and rhomboidal. Second intercubital vein usually present, at least as a trace 4

4. Postpectal carina complete, or if there is an interruption in front of each middle coxa these gaps are narrower than the width of middle basitarsus 5

– Postpectal carina incomplete, present only laterally or with a wide gap infront of each middle coxa 6

5. Transverse groove at base of propodeum broad and shallow. Pronotum with a strong tubercle or tooth at upper end of epomia. Lower end of occipital carina (genal carina) strongly sinuate, reaching base of mandible .... VII. Tribe **Vagenathini**

– Transverse groove at base of propodeum narrow. Pronotum without a tubercle or tooth at upper end of epomia, the epomia sometimes absent. Lower end of occipital carina (genal carina) not or only weakly sinuate, joining hypostomal carina. Lower tooth of mandible equal or little shorter to upper tooth. Nervulus a little basad of basal vein ..... I. Tribe **Agrothereutini**

6. Spiracle of first tergite at or close to the mid-length, not behind apical 0.4 of the tergite. Tip of lower valve of ovipositor with a dorsal lobe, that partly encloses tip of upper valve. Fourth segment of female fore tarsus not, or weakly, bilobed (seen from below). First tergite without median dorsal carinae. Lower tooth of mandible usually longer than upper tooth ..... X. Tribe **Gabuniini**

– Spiracle of first tergite at or behind apical 0.47 of the tergite, or other characters not entirely as above. Fourth segment of female fore tarsus usually deeply bilobed (seen from below). First tergite often with median dorsal carinae. Lower tooth of mandible not, or rarely longer than upper tooth ... 7

7. Upper valve of ovipositor tip with a series of teeth or transverse or oblique ridges, the ovipositor tip approximately cylindric. Mandible short, stout, strongly narrowed towards apex, the lower tooth distinctly shorter than upper tooth ..... III. Tribe **Baryceratini**

– Upper valve of ovipositor tip without a series of teeth or transverse or oblique ridges, except in a few cases in which the ovipositor tip is strongly compressed. Mandible not exactly as above 8

8. Apical 0.7 of mediella vein weakly to strongly arched. 9

– Apical 0.6 of mediella vein approximately straight. 16

9. Areolet medium-sized to large, always closed at apex, at least as high as the section of second recurrent vein above the bulla 10

– Areolet medium-sized to small or very small, often open at apex, not as heigh as the section of second recurrent vein above the bulla 11

10. Mesopleural impression that is just below speculum in the form of a pit, the pit distant from mesopleural suture by about twice the width of mesepimeron, often the pit connected with mesopleural suture by a weak groove. Clypeus without a median preapical tooth. Intercubiti parallel or subparalled ..... V Tribe **Goryphini** (*Friona, Buodias,* in part)

– Mesopleural impression that is just below speculum in the form of a short horizontal groove, the groove 1.0 to 2.0× as long as the width of mesepimeron, often the front end of the groove deepened into a pit 16

11. Hind rim of metapleurum without a small angular or tooth-like widening just laterad of each side of metascutellum, or sometimes with a very small, faint tooth or widening. Transverse furrow at base of propodeum very shallow to moderately deep. Median part of propodeal slope just below metascutellum usually with strong vertical wrinkles 12

– Hind rim of metanotum with a small angular or tooth-like widening just laterad of each side of metascutellum, except in a few genera having transverse furrow at base of propodeum deep and narrow. Median part of propodeal slope just below metascutellum usually smooth 14

12. Propodeum with both apical and basal carinae complete and strong; between the carinae with a median pair of longitudinal swellings. First sternite ending before mid-length of its tergite ..... VI. Tribe **Coesulini**

– Propodeum not as above. First sternite ending usually behind mid-length of its tergite 13

13. Areolet pentagonal or approximately so, about 0.8× as high as the second recurrent vein above the bulla. Second intercubitus strong. Median portion of postpectal carina absent. ..... II. Tribe **Ischnini** (in part)

– Areolet rectangular or somewhat trapezoidal, usually much wider than high, sometimes its outer side open, *or* rarely the areolet represented only by the very short first intercubitus which is approximately interstitial with second recurrent vein. (Petiole usually with a basal lateral tooth. Notaulus reaching past centre of mesoscutum. Propodeal apophyses, when present, in the form of crests or horizontal teeth) ..... VIII. Tribe **Ceratocryptini**

14. Areolet usually about 1.5× as wide as high, or areolet sometimes lacking and first intercubitus almost opposite second recurrent vein and almost obliterated by approximation of radius and cubitus. First tergite without median dorsal carinae or with traces of them in *Gotra*. Notaulus reaching to behind center of mesoscutum. Thyridium nearly always wider than long .....
..... IV Tribe **Mesostenini**

– Areolet less than 1.4× as wide as high. First tergite usually with at least a trace of the median dorsal carinae. Thyridium usually longer than wide in the genera that otherwise would agree with the above diagnosis of Mesostenini
..... 15

15. Front side of hind coxa with a basal short horizontal groove. Mesopleural impression that is just below speculum in the form of a pit, that may or may not be connected with mesopleural suture by a short horizontal groove. ....
..... II. Tribe **Ischnini** (in part)

– Front side of hind coxa without a basal short horizontal groove. Mesopleural impression that is just below speculum in the form of a pit, that may or may not be connected with mesopleural suture by a short horizontal groove..... ..... V Tribe **Goryphini**

16. Mesosternum with median section of postpectal carina present, moderately long, and straight. Sternaulus reaching about 0.6× the distance to middle coxa, weakly up curved or almost straight. .....I. Tribe **Agrothereutini**

– Mesosternum without the median section of postpectal carina, or if present it is short and V-shaped, or like a tubercle in the centre of the median longitudinal groove of mesosternum. Sternaulus usually reaching almost or quite to middle coxa, and sinuate ..... II. Tribe **Ischnini**

I. THE TRIBE AGROTHEREUTINI

Body moderately slender to stout. Face of male mostly black. Frons without horn or carina. Clypeus of moderate size, its apex truncate, or more or less convex, with or without a median tooth or lobe. Mandible short, teeth equal or the lower tooth a little shorter than the upper. Upper margin of pronoturn not swollen. Epomia present or absent. Notaulus short or long, or sometimes entirely absent. Sternaulus slanted upward, less then 0.5 the length of mesopleurum. Mesopleural fovea in the form of a short horizontal groove that joins mesopleural suture. Postpectal carina mostly interrupted in front of each middle coxa, except complete in *Amauromorpha* and in a few others. Propodeum moderately short to long, variously sculptured, its apical carina complete or with a median interruption, sublaterally forming weak to strong lateral crests, its spiracle circular or elliptic. Fourth tarsal segment of female more or less bilobed at apex. Ramulus present or absent. Areolet large to small and in *Amauromorpha* almost open at apex. Nervulus various. Mediella moderately to strongly arched. Nervellus intercepted usually below the middle but sometimes above. Axillus convergent towards anal margin of hind wing. First tergite with or without a subbasal lateral triangular tooth, tergite slender to rather stout; ventrolateral carina usually complete. Dorsolateral carina usually present, distinctly distad of spiracle and often absent or weak basad. Median dorsal carinae of first tergite usually strong, or sometimes the carinae absent; its spiracle usually well behind the middle, sometimes almost at the middle. Ovipositor sheath 0.35 to 3.8× as long as hind tibia; ovipositor compressed or subcylindric, its tip short to moderately long, usually with a nodus and distinct oblique ridges on lower valve. In *Amauromorpha* the lower valve has a dorsal lobe that encloses the upper valve.

The members of this tribe are parasitic on cocoons of lepidoptera and of Symphyta. Some parasitize spider egg masses, or even the aculeate Hymenoptera nests.

This tribe is known from Holarctic and Oriental regions and contains 11 genera. In Indian subregion this tribe is represented by four genera.

Key to the genera of tribe Agrothereutini

1. Apex of clypeus truncate, without a median tooth, the clypeus strongly impressed next to apex. Propodeum usually with a sublateral longitudinal carina or strong wrinkles between its two transverse carinae 2

– Apex of clypeus more or less convex, with or without a median tooth or lobe. Propodeum without a sublateral longitudinal carina or wrinkles 3

2. Second intercubitus lacking or very faint. First intercubitus opposite or distad of second recurrent vein. Base of first tergite without a lateral triangular tooth. Ramulus absent. Lower valve of ovipositor with a dorsal lobe that partly encloses the upper valve tip. Tip of upper valve weakly rippled along the dorsal edge. Oriental Region..... 1. ***Amauromorpha*** Ashmead

– Second intercubitus present. First intercubitus basad of second recurrent vein. Base of first tergite with a lateral triangular tooth. Ramulus present. Lower valve of ovipositor without a dorsal lobe. Tip of upper valve very rarely with weak serrations between nodus and apex, usually without serrations. Holarctic and Oriental regions ..... 2. ***Agrothereutes*** Foerster

3. Prepectal carina reaching dorsad to subtegular ridge. Nervulus opposite or basad to basal vein. Epomia usually weak or absent. Ovipositor tip gradually tapered from an indistinct nodus. Clypeus large. Holarctic Region..... ..... 3. ***Idiolispa*** Foerster

– Prepectal carina ending near middle of hind margin of pronotum. Nervulus opposite or distad of basal vein. Epomia usually strong. Ovipositor tip sagittate. Clypeus moderate size to small. Holarctic and Oriental regions.. .....4. ***Trychosis*** Foerster

1. Genus ***Amauromorpha*** Ashmead (Fig. 3 : a, b, c)

1905. *Amauromorpha* Ashmead, *Proc. U.S. Natl. Mus.*, **29** : 410. Type-species : (*Amauromorpha metathoracica Ashmead*) = *accepta metathoracica* Ashmead; monobasic.

1913. *Eripternimorpha* Viereck, *Proc. U.S. Natl. Mus.*, **44** : 645. Type-species : (*Eripternimorpha schoenobii* Viereek) = *accepta schoenobii* Viereck; original designation. Syn. by Cushman, 1919.

Taxonomy : Townes, Townes & Gupta, 1961 : 61. Townes, 1970 : 150.

Hosts : Lepidopterous stem borers, particularly paddy.

Distribution : Oriental Region.

This genus is easily distinguished by the absence of second intercubitus, and first intercubitus opposite or distad of second recurrent vein.

Body with dense hairs. Thorax subcylindric. Clypeus moderate size, weakly convex, apical margin weakly concave, without a median tooth. Mesoscutum moderately convex; notaulus moderately long, strong, surpassing center of mesoscutum. Epomia weak but long. Prepectal carina ending center of hind margin of pronotum. Postpectal carina almost complete, with a very narrow interuption in front of each middle coxa. Propodeum longish, both the transverse carinae complete or at center obsolescent, lateral crest absent, its spiracle elongate. Second intercubitus lacking or very faint; first itnercubitus opposite or distad of second recurrent vein. Ramulus absent. Nervulus a little basad of basal vein. Nervellus intercepted far above the middle. First tergite short and stout, with basal lateral tooth, its spiracle at middle, its dorsolateral and ventrolateral carinae complete, median dorsal crinae indistinct. Ovipositor sheath about 0.87× as long as hind tibia, its lower valve tip with a dorsal lobe that partly encloses upper valve tip, with coarse vertical ridges, and dorsal valve weakly rippled along dorsal edge.

This is a small genus of the Oriental Region. Only *A. tricolor* (Morley) and *A. accepta schoenobii* (Viereck) have been reported from India.

Key to the species of *Amauromorpha*

1. Body with decumbent silky pubescence. Frons with a median longitudinal carina extending from median ocellus downward to the level of antennal sockets, wings clear hyaline. India : Tamil Nadu; Karnataka. Taiwan. China. Malaysia ..... 1. *accepta schoenobii* (Viereck)

– Body without pubescence. Frons without a median longitudinal carina. Wings clouded. India : Bihar ..... 2. *tricolor* (Morley)

1. *Amauromorpha accepta schoenobii* (Viereck)

1913. *Eripternimorpha schoenobii* Viereck, *Proc. U.S. Natl. Mus.*, **44** : 646. Male, Female. des. Type : Female, Taiwan : Taipei (WASHINGTON). Host : *Scirpophaga incertulas.*

1913. *Eripternimorpha schoenobii* Shiraki, *Extra Rept. Taihoku Agri. Expt. Sta. Formosa,* **15** (109) : 141. Male, Female. des., fig., biol. Taiwan. Hosts : *Scirpophaga incertulas; Chilo suppressalis; Scirpophaga nivella; Chilo sacchariphagus; Sesamia inferens; Spodoptera exigua.*

1929. *Amauromorpha schoenobii* : Sonan, *Trans. Nat. Hist. Soc. Formosa,* **19** : 423. Male, Female. n. comb. Taiwan : Taipei; Fengshan (=Bozan); Alishan (=Arisan); Sunmoon Lake (= Jihyueh Lake). Host : *Scirpophaga excerptalis.*

1931. *Amauromorpha schoenobii* : Matsumura, 6000 Illustrations of Insects of Japan, p. 35. Female. des., fig. Taiwan.

1931. *Amauromorpha schoenobii* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 177. Female. Taiwan : Taipei. Host : *Scirpophaga nivella.*

1934. *Amauromorpha schoenobii* : Takano, *J. Formosan Sugar Planters' Assoc.*, **11** : 456. Hosts : *Chilo sacchariphagus; Scirpophaga nivella; Sesamia inferens.*

1944. *Amauromorpha schoenobii* : Sonan, *Bull. Govt. Agri. Res. Inst. Taiwan,* 222 : 13. Hosts : *Chilo sacchariphagus; Scirpophaga nivella; S. praelata.*

1957. *Amauromorpha metathoracica schoenobii* : Townes, *Proc. Ent. Soc. Washington,* **59** : 106. n. comb.

1961. *Amauromorpha accepta schoenobii* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 161. n. conb. Taiwan.

1964. *Amauromorpha accepta schoenobii* : Gupta, *Indian J. Ent.*, **26** : 109. Male, Female. India : Tamil Nadu : Coimbatore; Rudur; Hugary; Ananthpur; Vandivash. Host : *Scirpophaga incertulas.*

1966. *Amauromorpha accepta schoenobii* : Momoi, *Mushi,* **40** : 5. Male, Female. India : Karnataka : Mandakalli. Malaysia : Malaya : Penang. Sabah : Tuaran; Papir.

1968. *Amauromorpha accepta schoenobii* : Momoi, *Mushi,* **41** : 178. key, distr. Thailand.

1973. *Amauromorpha accepta schoenobii* : Chu & He, Utilization & Control of Animal, 1973 (5) : 5. key, fig. China : Zhejiang; Guangdong; Guangxi. Taiwan. Hosts : *Scirpophaga incertulas; Chilo suppressalis; Sesamia inferens.*

1978. *Amauromorpha accepta schoenobii* : Chu, He & Wu, Atlas of Natural Enemies of Economic Insects, p. 39. des., biol., host records. China : Zhejiang; Sichuan; Fujian; Guangdong; Guangxi; Guizhou. Taiwan.

1981. *Amauromorpha accepta schoenobii* : Chao, Annotated Checklist of Insects from Fujian Prov nce, p. 294, 640. host rec. China : Fujian : Fuzhou.

1984. *Amauromorpha accepta schoenobii* : He, *Acta Agri. Univ. Zhejiangensis,* **10** : 87. syn. biol., distr. and host records in China. [Specimens from China and Taiwan should be reexamined to check which subspecies occurs there]

1987. *Amauromorpha accepta schoenobii* : Gupta, *Mem Amer. Ent. Inst.*, **41** : 780.

The following account is based on a description given by Viereck (1913).

Female : Body covered with decumbent silky pubescence. Lateral ocelli close to anterior ocellus than to each other. Frons with a median longitudinal carina extending down from the median ocellus to the level of antennal sockets. Apical margin of clypeus slightly subemerginate. Mandible striate in basal half. Antenna 28-segmented. Prepectal carina not reaching base of subtegular ridge. Propodeum

without longitudinal carinae; apical and basal transverse carinae weak. First abdominal tergite subcylindrical at base (petiole); its dorso-lateral carina weak; dorso-median carinae distinctly wider at apex; spiracles nearly 3× as far from the base as from the lateral margin. Ovipositor sheath about as long as the first tergite.

Body black. Palpi dark brown. Mandible and scape black, except the mandibular teeth reddish. Flagellum and pedicel blackish-brown. Posterior margin of mesopleurum, middle coxae at base, petiole, all femora, hind coxae, metapleurum, propodeum, reddish; rest of legs blackish or black, except fore tibia yellowish beneath. Postpetiole reddish-yellow. Second tergite with a reddish band apically; third reddish except extreme apical edge blackish; apical half of eighth tergite whitish.

Male : Essentially similar to female, except as follows : Postpetiole parallel sided. Middle leg with fifth tarsal segment longer than its first tarsal segment. Second abdominal segment 3× as wide at apex as the first segment at apex. Spiracle about 5× as far from the base as from the lateral edge.

Black. Middle coxae mostly reddish; fore first tarsal segment yellowish. Postpetiole backish on basal half. Second segment yellowish apically; apices of third, fourth and fifth also yellowish; basal half of third largely black; apical half of seventh yellowish.

Length : Female 8.5 mm.

Distribution : India : Tamil Nadu (Coimbatore; Rudur; Huary; Ananthpur; Vandivash. Karnataka (Mandakalli). *Elsewhere* : Taiwan [Taipei; Fengshan (= Bozan); Alishan (= Arisan); Sunmoon Lake (= Jihyueh Lake)]. China (Zhejiang; Guangdong; Guangxi; Sichuan; Fujian; Guizhou; Fuzhou). Malaysia : Malaya (Penang); Sabah (Tuaran; Papar). Thailand.

Hosts : *Scirpophaga incertulus; Chilo suppressalis; S. nivella; C. sacchariphagus; Sesamia inferens; Spodoptera exigna; Scirpophaga excerptalis; S. praelata.*

2. ***Amauromorpha tricolor*** (Morley)

1913. *Perilissus tricolor* Morley, *Fauna of British India, Hymenoptera*, **3** : 316. Male, key, des. Type : Male, India : Bihar : Pusa (LONDON).

1961. *Amauromorpha tricolor* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 161. n. comb. Taiwan.

1987. *Amauromorpha tricolor* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 781.

The following account is based on a description given by Morley (1913).

Male : Head as broad as thorax; vertex strongly emarginate; frons densely and evenly punctate; malar space long. Mesoscutum little convex, notaulus not distinct; scutellum without lateral carinae, weakly convex, distinctly punctate. Abdomen fusiform, its first segment narrow. Wings slightly clouded; nervellus intercepted a little above the middle.

Black. The following are yellow : base of face and clypeus, pronotum, scutellum and metascutellum, apices of first tergite, a broad mark on eighth tergite. The following are red or reddish : mandible in the centre, apex of scape, propodeum, third and fourth abdominal segments entirely and second and fifth apically. Legs in general red, with fore coxae and trochanters yellow with black; tarsi, hind tibiae and trochanters, and coxae inside and apices of their femora, black.

Body length about 9 mm.

Distribution : India : Bihar (Pusa).

2. Genus ***Agrothereutes*** Foerster (Fig. 3 : d, e, f)

1850. *Agrothereutes* Foerster, *Arch. f. Naturgesch.*, **16** (1) : 71. Type-species : (*Pezomachus abbreviator* Gravenhorst) = *abbreviator* Fabricius; designated by Viereck, 1914.

1873. *Spilocryptus* Thomson, *Opuscula Entomologica*, **5** : 472, 501. Type-species : (*Spilocryptus zygaenarum* Thomson) = *fumipennis* Gravenhorst; designated by Viereck, 1914. Syn. by Townes, 1944.

1902. *Dayro* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **9** : 209. Type-species : *Dayro pilosus* Cameron; monobasic. Syn. by Townes, Townes & Gupta, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 142. Townes, 1970 : 151.

Host : Lepidopterous and sawfly cocoons.

Distribution : Holarctic and Oriental region.

This genus is easily distinguished by the presence of lateral triangular tooth at the base of first tergite. Remulus present. Areolet large and quadrate.

Clypeus of moderate size, strongly convex, its apical margin also convex. Mesoscutum convex, usually polished, sometimes mat, or with dense, moderate sized strong punctures. Notaulus sharp, reaching little beyond centre of mesoscutum. Epomia weak to strong. Prepectal carina reaching 0.5 to the base of subtegular ridge. Propodeal spiracles circular to elliptic. Basal transverse carina of propodeum complete or medially obsolescent. Apical crina represented in the form of oblique sublateral crests. Areolet large, quadrate, its sides almost or quite parallel. Ramulus short, present. Nervulus opposite or basad of basal vein.

Mediella strongly arched. Nervellus intercepted at its lower end. First tergite with strong basal lateral tooth; median longitudinal carinae strongly present; dorsolateral carina strong distad of spiracle, weak or absent basad; ventrolateral carina strong throughout, second tergite mat and with fine puncture, punctures sparse dense, seventh tergite always marked with white. Ovipositor sheath 1× as long as hind tibia; its tip more or less sagittate, its upper valve sometimes weakly serrate between nodus and apex.

This is a Holarctic genus, with nine species in North America and more in Eurasia. Two species are known from India.

Key to the species of *Agrothereutes*

1. Base of tegulae yellow. Legs in general reddish. Postpetiole reddish at apex, second and third tergites black with reddish apical band, last segment entirely black. Frons without a median longitudinal carina. Propodeum in the middle trans-rugose and strongly rugose at apex. India : Meghalaya ..... 1. *pilosus* (Cameron)

– Base of tegulae black. Legs in general black. Postpetiole black, at apex yellow, second and third tergites black with yellow apical bands, last segment largely white. Frons with a median longitudinal carina. Propodeum at base closely punctate, rest rugoso-punctate. India : Meghalaya ..... 2. *rufofemoratus* (Cameron)

1. *Agrothereutes pilosus* (Cameron)

1902. *Dayro pilosus* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **9** : 210. Male, des., Type : Male, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Agrothereutes pilosus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 143. n. comb. India.

1987. *Agrothereutes pilosus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 781.

Male : Body in general covered with thick blackish hair. Frons and vertex closely and strongly punctate. Vertex behind thickly covered with dense, short blackish hair. Face and base of clypeus closely and strongly punctate, covered with longish blackish hair; apex of clypeus smooth with long hair. Pronotum above closely and deeply punctate, scrobe and collar above strongly irregularly striated, extreme base minutely punctate. Mesoscutum closely punctate, notauli extended up to the middle. Scutellum with scattered punctures, its lateral carinae extended up to 0.5 its length, metascutellum smooth and shiny. Propodeum closely punctate at base behind basal transverse carina, rest coarsely rugose, towards apex strongly trans-rugose. Mesopleurum closely punctate, sternaulus wide,

crenulate, extending 0.5 the distance to middle coxa. Areolet almost square; cubital veins parallel; first recurrent vein received in the middle.

Black. The following are yellow : face, clypeus, mandible, except the teeth, a line in the middle of inner orbit; base of tegula, scutellum, metascutellum, lateral carinae of scutellum; propodeum at sides and above. Legs in general reddish; fore leg darker in shade, fore and middle coxae and trochanters black, their first and fifth tarsal segments also black. Wings iridescent with yellowish tinge. First tergite black at base, reddish at apex, second and third segments black, broadly reddish at apex, fourth narrowly black, fifth and sixth entirely black, abdomen at apex white.

Length : Male : 14 mm.

Distribution : India : Meghalaya (Khasi Hills).

2. ***Agrothereutes rufo-femoratus*** (Cameron)

1903. *Etha rufo-femoratus* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 28. Male, des., Type : Male, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Agrothereutes rufo-femoratus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 143. n. comb. India.

1987. *Agrothereutes rufo-femoratus* : Gupta, *Mem Amer. Ent. Inst.*, **41** : 781.

Male : Face and clypeus mat, finely and closely punctate. Vertex somewhat more coarsely punctate, with a median longitudinal carina. Pronotum strongly obliquely striate, upper part in middle coarsely aciculate. Mesoscutum closely punctate, thickly covered with pale hair, notauli deep and wide with cross striations. Scutellum subpolished, punctate, with lateral carinae extending up to the middle. Propodeum at base closely punctate, rest more coarsely rugoso-punctate. Mesopleurum coarsely rugose, sternaulus shallow and wide; mesosternum closely punctate. Areolet large, almost square.

Black. Antennae covered with short black hair; head with white hair. The following are yellow : A broad triangular mark on scutellum and metascutellum. Legs in general black, except apices of fore femur, tibia and tarsus yellow; those of middle legs dark yellow; hind femur reddish, except at extreme apex; second to fourth segments of hind tarsus, yellowish-white. First abdominal tergite with an oval transverse mark, apices of second and third segments narrowly yellowish; last abdominal segment largely white.

Length : Male, 9 mm.

Distribution : India : Meghalaya (Khasi Hills).

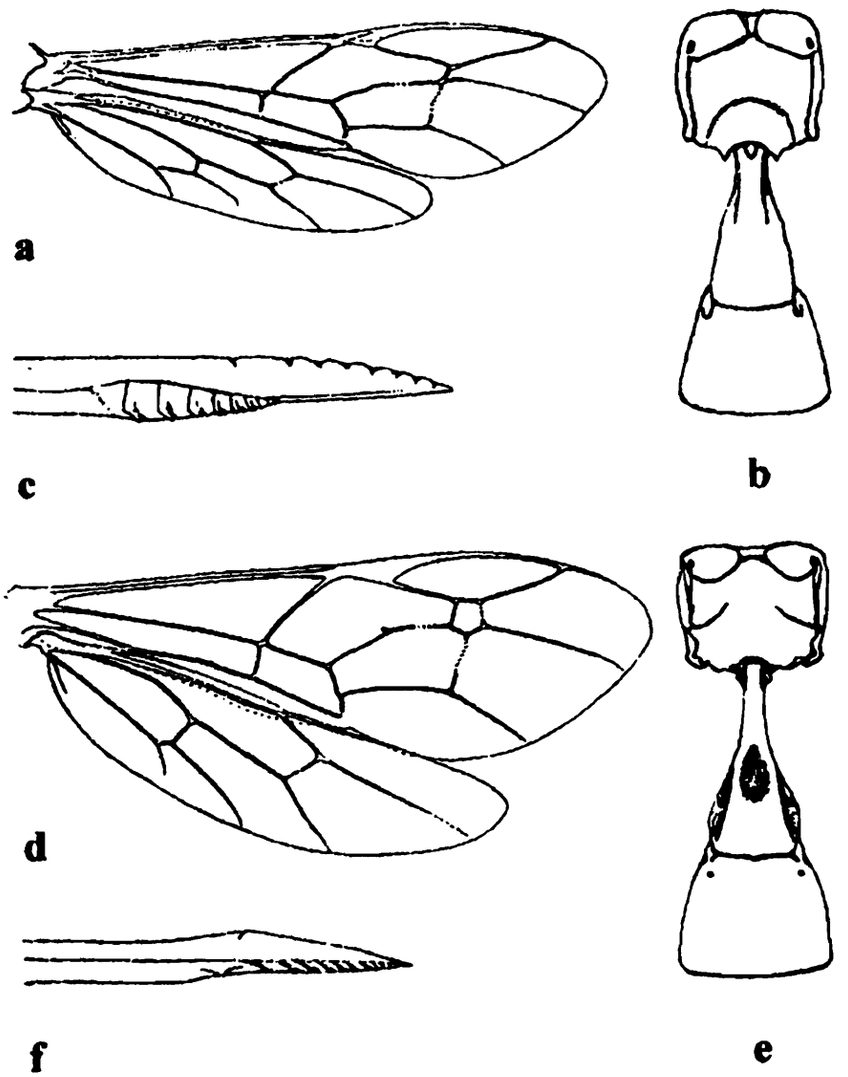

Fig. 3. *Amauromorpha* Ashmead : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. *Agrothereutes* Foerster : **d**, fore and hind wings showing venation; **e**, dorsal view of propodeum, first and second tergites; **f**, ovipositor tip. (Source : Townes, 1970).

3. Genus ***Idiolispa*** Foerster (Fig. 4 : a, b, c)

1869. *Idiolispa* Foerster, *Verh. Naturh Ver. Rheinlande*, **25** : 188. Type-species : *Bassus analis* Gravenhorst; designated by Viereck, 1914 from two species included by Tschek, 1870.

1873. *Liocryptus* Thomson, *Opuscula Entomologica*, **5** : 471, 489. Type-species : *Bassus analis* Gravenhorst; monobasic. Syn. by Dalla Torre, 1902.

1916. *Paracryptus* Szépligeti, *Ann. Mus. Natl. Hungarici*, **14** : 251. Type-species : *Paracryptus hungaricus* Szépligeti; monobasic. Syn. by Townes, Townes & Gupta, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 166. Townes, 1970 : 156.

Host : Spider egg masses.

Distribution : Holarctic and Oriental regions.

This genus is close to *Trychosis* Foerster in having mesoscutum weakly convex; notauli usually absent; thorax short and first abdominal segment long. However, it can be distinguished by having prepectal carina reaching dorsad to subtegular ridge; nervulus opposite or basad to basal vein; epomia weak or absent.

Clypeus large, convex and without a median tooth. Thorax stout and short. Mesoscutum short, weakly convex, its punctures moderately coarse, interspace equal to their own diameter. Notaulus weak or absent, not reaching centre of mesoscutum. Epomia weak or absent. Prepectal carina reaching dorsad to subtegular ridge. Propodeum in profile rather weakly convex, sloping, basal carina strong and complete, its apical carina also strong, forming weak to moderately strong, broad, sublateral crests, carina sometimes weak medially; spiracle elliptic. First abdominal segment long, about 0.5 to 0.6 as long as thorax; abdomen short. Areolet large, quadrate, its sides parallel; ramulus short or absent. Nervulus opposite or basad of basal vein. Mediella moderately arched; nervellus intercepted near its lower 0.3. First tergite gradually widened apically, its spiracle rather far behind the middle, tergite without basal lateral tooth; ventrolateral carina sharp, dorsolateral carina complete, median dorsal carinae absent or short and weak. Second tergite subpolished with moderately dense to sparse punctures. Tergite 7 with or without white mark. Ovipositor sheath about 0.4 as long as hind tibia, without a distinct nodus.

It is a small genus of Holarctic and Oriental regions. Only one species is known from Oriental Region.

1. ***Idiolispa analis*** (Gravenhorst)

1807. *Bassus analis* Gravenhorst, *Vergleichende Uebersicht des Linneischen und Einiger Neuern Zoologischen Systeme,* p. 266 [Female], des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, from Europe but without data (WROCLOW).

1890 *Idiolispa analis* : Schmiedeknecht, *Ent. Nachr.*, **16** : 117. n. comb.

1923. *Idiolispa analis* : Dutt, *Mem.* Dept. *Agri. India (Ent. Ser.),* **8** : 22. India : Meghalaya : Khasi Hills, 280-850m.

1961. *Idiolispa analis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 166. Europe. India.

1984. *Idiolispa analis analis* : Sawoniewicz, *Ann. Zool. Warszawa,* **37** : 325. syn. notes.

Remarks : Nothing is known about this species to the present author.

Distribution : India : Meghalaya (Khasi Hills). *Elsewhere* : Europe.

4. Genus ***Trychosis*** Foerster (Fig. 4 : d, e, f)

1869. *Trychosis* Foerster, *Verh. Naturh Ver. Rheinlande,* **25** : 187. Type-species : (*Cryptus titillator* Gravenhorst) = *mesocastana* Tschek; designated by Schmiedeknecht, 1890.

1906. *Phedrophadnus* Cameron, *J. Bombay Nat. Hist. Soc.,* **17** : 285. Syn. By Cushman, 1925. Type-species : *Cryptus similis* Cresson; original designation.

1913. *Orthocryptus* Viereck, *Proc. U.S. Natl. Mus.,* 44 : 567. Type-species : (*Cryptus monticola* Ashmead) = *sanderi Dalla Torre; original designation.* Syn. by Townes, 1944.

Taxonomy : Townes, Townes & Gupta, 1961 : 167. Townes, 1970 : 157.

Hosts : Spider egg masses.

Distribution : Holarctic and Oriental regions.

This genus is close to *Idiolispa* Foerster in having mesoscutum weakly convex; notauli usually absent; short thorax and long first abdominal segment. However, it can easily be distinguished by having prepectal carina short, nervulus opposite or distad of basal vein, epomia strong and ovipositor tip sagittate.

Clypeus of moderate size, moderately to strongly convex, apical margin without a median tooth. Thorax stout, usually short. Mesoscutum weakly convex, shiny, densely and coarsely punctate. Notaulus various : weak, absent, sharp, when present not reaching the centre of mesoscutum. Epomia usually strong. Prepectal carina reaching middle of hind margin of pronotum. Propodeum weakly convex, strongly sloping, its basal carina complete, apical carina complete or interrupted medially, forming lateral distinct crests; spiracle elliptic. First abdominal segment long, about 0.52–0.59× as long as thorax. Areolet subquadrate, sides parallel or weakly convergent. Ramulus short or absent, Nervulus opposite or distad of basal vein. Mediella moderately arched. Nervellus intercepted near below or above the middle. Second tergite finely, moderately sparsely punctate. Tergite 7 without a median white spot. Ovipositor sheath 0.65 as long as hind tibia, its tip sagittate, with a distinct nodus.

This is moderately a large genus of Holarctic and Oriental regions. In Oriental region only one species has been reported from Quetta in Pakistan.

1. ***Trychosis striata*** (Cameron)

1906. *Phaedrophadnus striatus* Cameron, *J. Bombay Nat. Hist. Soc.,* **17** : 286. Male, Female, des. Type : Female, Pakistan : Quetta (LONDON).

1914. *Idiolispa striata* : Morley, *Ann. Mag. Nat. Hist.,* (8)**14** : 410. n. Comb.

1961. *Trychosis striata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 167. n. comb, Pakistan.

1987. *Trychosis striata* (Cameron), *Mem. Amer. Ent. Inst.,* **41** : 783.

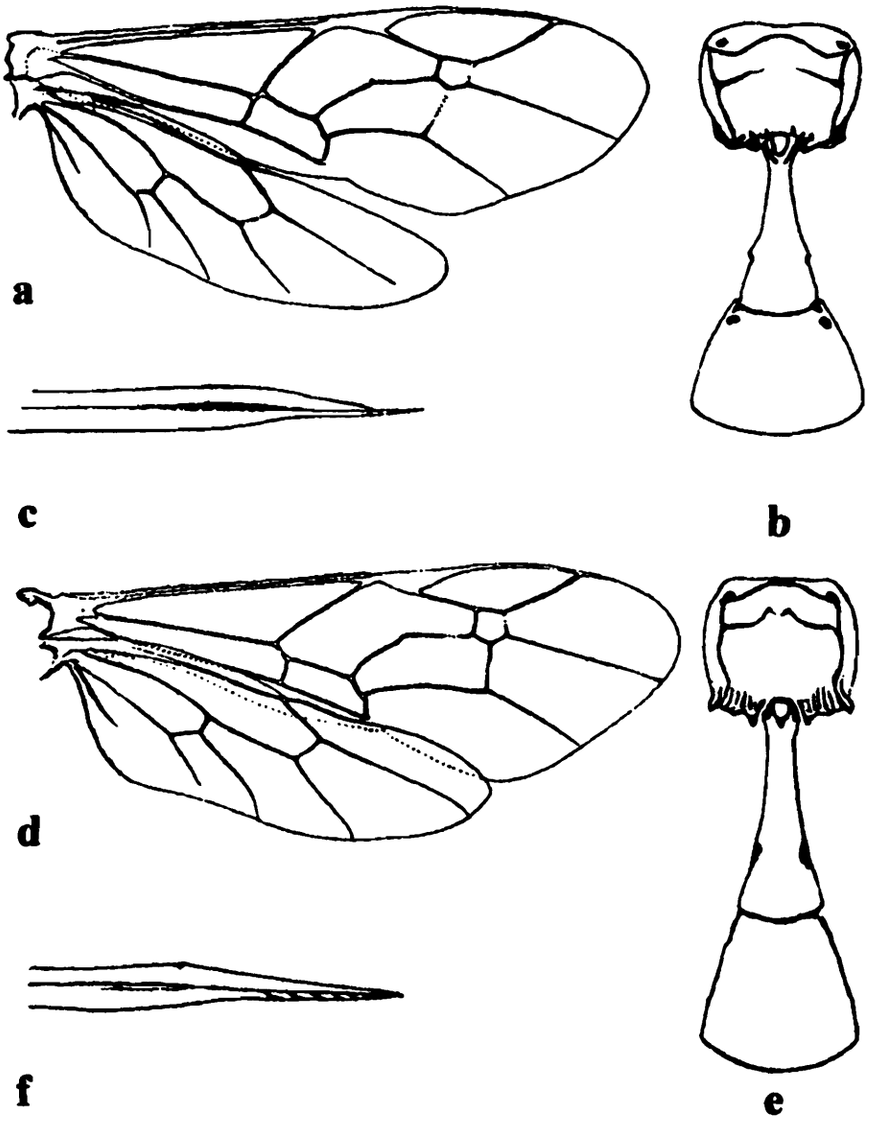

Fig. 4. *Idiolispa* Foerster : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. *Trychosis* Forester : **d**, fore and hind wings showing venation; **e**, dorsal view of propodeum, first and second tergites; **f**, ovipositor tip. (Source : Townes, 1970).

Female : Face and clypeus with close and strong punctures; malar space mat and coarsely aciculate. Temple smooth and shiny. Frons in middle strongly irregularly striato-reticulate. Temple short and acciput rounded. Pronotum above closely punctate, lower half striate. Mesoscutum closely punctate. Scutellum sparsely punctate. Mesopleurum strongly punctate. Propodeum impunctate in center, closely punctate at sides, area between apical and basal carinae strongly longitudinally striato-reticulate. Abdomen smooth and shiny.

Black. The following are red : First to fourth abdominal segments, fore and middle femora, tibiae and tarsi, hind femur and base of hind tibiae broadly. 10th and 11th antennal segments, white. Wings clear hyaline.

Male : Similar to female, except first abdominal segment narrow and elongate. Ramulus present or sometimes absent.

Colour as in female, except basal half of first segment black.

Length : Female, 7mm; fore wing 5 mm; ovipositor sheath 1.5. Male, 6.5 mm; fore wing 5 mm.

Distribution : Pakistan (Quetta).

II. THE TRIBE ISCHNINI

The members of this tribe are recognised by having body of moderate proportions to stout, or sometimes rather slender. Frons without horns, sometimes wth a pit behind each antennal socket. Mandible short to moderately long, its lower tooth usually slightly shorter, equal or sometimes longer than upper tooth. Temple moderately long to rather short. Occipital carina joining hypostomal carina above base of mandible. Upper margin of pronotum often somewhat widened. Epomia usually present and long, sometimes short, indistinct or absent. Notaulus usually long and sharp but not deeply impressed, sometimes short or absent. Sternaulus long, reaching usually to hind edge of mesopleurum, sinuate. Mesopleural fovea in the form of short horizontal groove that joins mesopleural suture. Postpectal carina not complete, its median section absent or short and weak or broadly V-shaped, sometimes represented by a median tubercle. Hind rim of metanotum usually with a small rounded or angular widening just laterad of each side of scutellum, the slope of metanotum below scutellum short, ending in a transverse groove that is shallow or deep. Propodeal spiracle round to elongate. Propodeum of moderate length, its apical carina complete, interruped medially, or absent, sometimes elevated sublaterally as a crest or tooth or the carina represented only by sublateral teeth. Base of hind coxa moderately deep to quite deep, often with a groove extending from its basal attachment, the groove horizontal oblique, or vertical, when horizontal always weak and short, when oblique or vertical, short and faint to long and sharp. Areolet medium sized to large, or in a few genera rather small, its sides convergent or sometimes parallel. Ramulus often present. Nervulus opposite basal vein or mesad or distad of basal vein by about 0.3 its length. Apical 0.6 of mediella weakly to strongly arched. Nervellus intercepted at or usually below middle. Brachiella present. Axillus convergent to anal margin of hind wing, parallel, or weakly to strongly divergent, in a few genera equidistant between anal margin and submediella. First tergite slender to rather stout, with or without a lateral subbasal tooth, its spiracle always behind the middle. Ventrolateral, dorsolateral, and median dorsal carinae of first tergite variously complete, incomplete, or absent. Thyridium circular to several times as wide as long. Ovipositor sheath usually 0.4 to 2.0 as long as hind tibia, sometimes between 2.0 as long as hind tibia and rarely as much as 8 times as long. Ovipositor tip usually with a nodus and with oblique ridges on lower valve. (Townes, 1970 : 158).

This tribe contains a total of 42 genera. In Oriental Region this tribe contains 18 genera. In Indian subregion this tribe is represented by 14 genera which are discussed below :

A key to the Oriental genera (modified of Townes, 1970 : 159) is given below :

Key to the Oriental genera of Ischnini

1. Base of first tergite with a lateral tooth that is sharp or at least from dorsal view it is angular or sharply rounded, the tooth more distinct in females than in males (*Glabridorsum* is variable in this character. It may be traced through either half of the couplet) 2

– Base of first tergite without a lateral tooth (but often with a narrow lateral flange at base, which in dorsal view has a gently rounded profile as in *Nippocryptus*) 6

2. Mesopleurum divided into upper and lower half by a moderately deep and broad transverse groove, groove with strong vertical ridges. Propodeum with a blunt apicolateral tooth between hind coxa and its apical carina. Notauli indistinct, confined to base only. Body metallic dark blue. Oriental Region. ..... 1. ***Neodontocryptus*** Uchida

– Not as above 3

3. Front side of areolet longer than outer side, the intercubiti subparallel. Median section of postpectal carina very short. Face with a median tubercle. Oriental Region ..... 2. ***Etha*** Cameron

– Front side of areolet shorter than outer side, intercubiti convergent. Face without median tubercle 4

4. Propodeal spiracle 2 to 3× as long as wide. Eastern Asia, India, China and Japan. ..... 3. ***Caenocryptoides*** Uchida

– Propodeal spiracle 1 to 1.5× as long as wide 5

5. Mesoscutum entirely mat and rather densely punctate. Worldwide ..... 4. ***Ischnus*** Gravenhorst

– Mesoscutum mostly or entirely polished and impunctate. Indo-Australian and Japan ..... 5. ***Glabridorsum*** Townes (in part)

6. Subapical 0.6 of mediella straight to weakly arched 7

– Subapical 0.6 of mediella moderately to strongly arched 12

7. Propodeal spiracle circular or short elliptic. Subapical 0.6 of mediella weakly arched. Hairs on second tergite of female rather dense 8

– Propodeal spiracle short elliptic to elongate. Subapical 0.6 of mediella straight or almost so. Hairs on second tergite of female rather dense to very sparse 9

8. Profile of clypeus subpyramidal, without median tooth. Ovipositor tip of moderate size to short, with distinct nodus. Holarctic and Oriental regions. ..... 8. ***Caenocryptus*** Thomson

– Profile of clypeus moderately convex, with a median tooth. Ovipositor tip elongate sagittate, without distinct nodus. Oriental and Palaearctic regions ..... 7. ***Nippocryptus*** Uchida

9. First tergite very long and slender, the sternite reaching at least half the distance between its spiracle and apex. Hairs on second tergite of female rather dense. Thyridium less than 0.6 as wide as long, or frequently absent. Palaearctic and Oriental regions. ..... 8. ***Myrmeleonostenus*** Uchida

– First tergite not so long and slender, the sternite seldom reaching to half the distance between its spiracle and apex. Hairs on second tergite of female moderately dense to very sparse. Thyridium usually more than 0.6 as wide as long 10

10. Frons with a pit dorso-laterad of each antennal socket (such a pit absent in other genera of Ischnini). Second recurrent vein simply arched. Basal carina of propodeum weak or absent. Holarctic and Oriental regions ..... 9. ***Buathra*** Cameron

– Frons without a pit dorso-laterad of each antennal socket. Second recurrent vein simple, arched or more or less distinctly sinuate. 11

11. Petiole of first abdominal segment with ventrolateral, and in female also dorso-lateral longitudinal carinae. Second recurrent vein usually weakly sinuate. Front side of areolet moderately wide to narrow. Hairs on second tergite of female rather sparse to very sparse. Holarctic, Afrotropical and Oriental regions. ..... 10. ***Itamoplex*** Fabricius

– Petiole of first abdominal segment terete, without longitudinal carinae. Second recurrent vein simply arched. Front side of areolet quite narrow. Hairs on second tergite of female rather sparse to very dense. Eastern Palaeartic and Oriental regions ..... 12 ***Hedycryptus*** Cameron

12. Spiracle of first tergite near or infront of the apical 0.47. Propodeal spiracle round. Second recurrent vein subvertical to strongly inclivous. Ovipositor tip somewhat compressed, its ridges subvertical 13

– Spiracle of first tergite behind the apical 0.45. Propodeal spiracle round to elongate. Second recurrent vein subvertical, reclivous, or weakly inclivous 14

13. Lower tooth of mandible distinctly longer than upper tooth. Center of apical margin of clypeus with a faint pair of tubercles. Oriental and eastern Palaearctic region ..... 12. ***Dihelus*** Townes

– Lower tooth of mandible of the same length as upper tooth. Center of apical margin of clypeus with a single tubercle or tooth. Palaearctic Region and India. ..... 13. ***Enclisis*** Townes

14. Mesoscutum mostly or entirely impunctate and polished. Apical carina present Indo-Australian Region and Japan ..... 5. ***Glabridorsum*** Townes (in part)

– Mesoscutum entirely punctate and usually also mat. Apical carina completely absent. Oriental Region and Japan ..... 14. ***Gyropyga*** Townes

1. Genus *Neodontocryptus* Uchida (Fig. 5 : a–e)

1932. *Odontocryptus* Uchida, *J. Fac. Agr. Hokkaido Imp. Univ.*, **33** : 187. Type-species : *Odontocryptus brillantus* Uchida; Original designation. Name preoccupied by Saussure, 1890, by Cameron, 1903 and by Szépligeti, 1916.

1940. *Neodontocryptus* Uchida, *Insecta Matsumurana,* **14** : 122. New name.

Taxonomy : Townes, 1970 : 204. Sexena, 1978 : 215 (in part).

Distribution : Oriental Region.

Body stout. Clypeus moderately large, about 2× as long as wide, moderately convex, its apex truncate; clypeal foveae deep. Malar space wide, as long as basal width of mandible (Fig. 5 : a). Mesoscutum polished with large, deep and scattered punctures, notauli deep and very short. Upper margin of pronotum in front of notauli strongly swollen like tubercles. Mesopleurum divided into upper and lower halves by a moderately deep and broad groove, groove with strong vertical ridges (Fig. 5 : b). Propodeal spiracle slit-like, about 4× as long as wide, basal carina of propodeum not defined. First tergite stout, with basal lateral tooth, dorso-median carinae weak or absent, ventro-lateral carinae opposite to spiracle, expended like a triangular tooth in male, in female not seen (Fig. 5 : c). Second tergite polished, strongly convex and broad, its punctures in both sexes rather large, deep and separated by 1–4× their diameter. Ovipositor sheath about 1.1× as long as hind tibia. Ovipositor weakly compressed, its tip long and without nodus (Fig. 5 : e). Wing venation as shown in figure 5d.

Length : Female and male about 12 mm.

Type-species : *Odontocryptus brillantus* Uchida, 1932.

This genus is known from Taiwan and South-eastern China. Townes (1970 : 204) and Gupta (1987 : 793), referred only one species, viz. *Odontocryptus brillantus* Uchida, 1932 from Taiwan and China. Sexena (1978) described a new species viz.

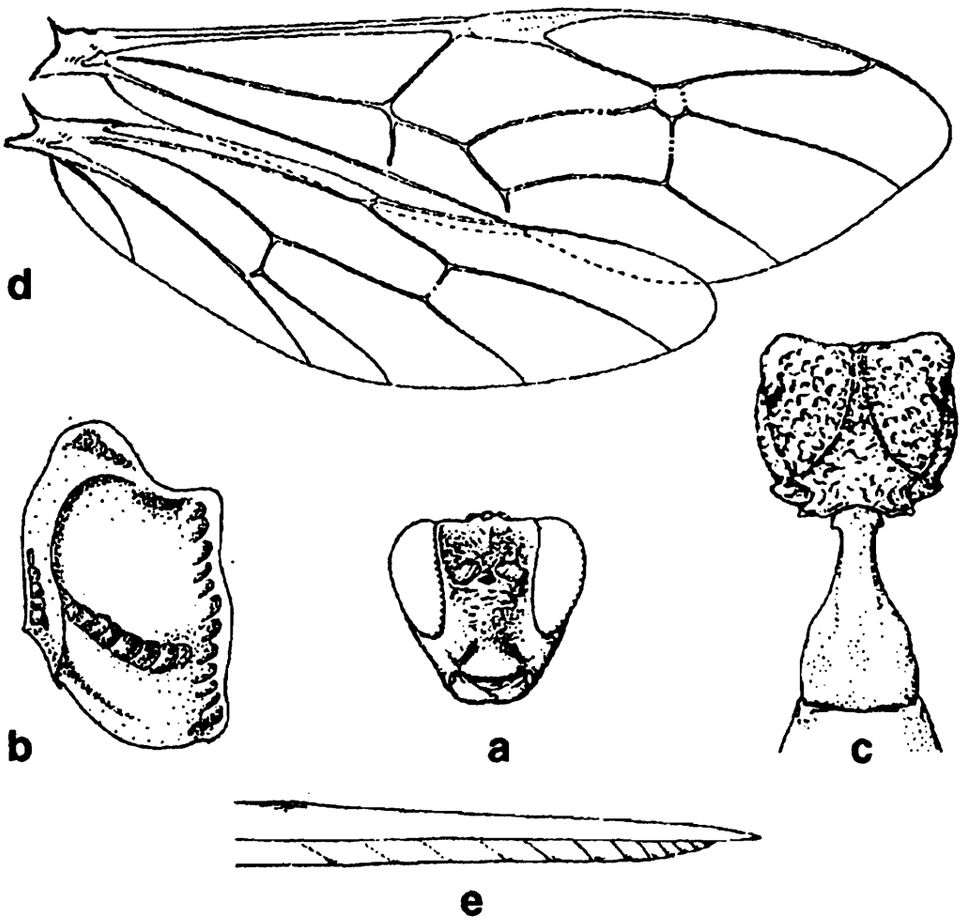

Fig. 5. *Neodontocryptus Uchida* [*N. brillantus* (Uchida)] : **a**, front view of head; **b**, mesopleurum; **c**, dorsal view of propodeum and first tergite; **d**, wing venation of fore and hind wings; **e**, ovipositor tip (Source : Townes, 1970).

Neodontocryptus hyalina Sexena from India, Nepal and Indonesia. On examination of the type of *N. hyalina* (Jonathan, 2000 : 113), it was found that this is similar to *Chlorocryptus coeruleus* Cameron.

1. ***Neodontocryptus brillantus*** (Uchida)

1932. *Odontocryptus brillantus* Uchida, *Jour. Faculty. Ags. Hokkaido Imp. Univ.*, **33** : 186. Female, des., fig. tyep : Female. Taiwan : Suisharyo (EBERSWALDE).

1940. *Neodontocryptus brillantus* : Uchida, *Insecta Matsumurana*, **14** : 122. China, Taiwan.

1970. *Neodontocryptus brillantus* (Uchida) : Townes, *Mem. Amer. Ent. Inst.*, **12** : 204. Taiwan, S.E. China.

1987. *Neodontocryptus brillantus* (Uchida) : Gupta, *Mem. Amer. ent. Inst.* **41** : 793.

2000. *Neodontocryptus brillantus* : Jonathan, *Rec. zool. Surv. India*, **98**(4) : 114. Male, des. India : Megalaya : Tura in Garo Hills.

This species is known by its female. Jonathan (2000) discovered the male of this species for the first time which is described below.

Male : Body polished, metallic blue in colour, wings hyaline dark brown. Face largely finely punctate, strongly rough and trans-rugose in the middle. Clypeus minutely and moderately closely punctate, besides these minute punctures, a few scattered large punctures also present. Malar space with minute and closely placed punctures. Frons moderately shallow, smooth and polished. Vertex and temple more or less smooth and polished, except for a few scattered small punctures. Mandible with minute close punctures, a few large punctures also present. Pronotum along the posterior margin with short strong ridges, its upper margin with large deep punctures, middle area with minute sparse punctures. Scutellum with small sized scattered punctures, its lateral carina not extending more than 0.3. Metascutellum in the form of two lateral tubercles. Upper lobes of mesopleurum largely smooth and shiny, except for a few large deep punctures near subtegular ridge, middle groove strongly striate, lower lobe with large deep and sparse punctures. Metapleurum with large deep punctures, juxtacoxal carina strong. Propodeum between apical carina and base with very large, deep, close to moderately spaced punctures, at sides appears to be reticulate, apicad of apical carina reticulo-wrinkled and with a median longitudinal carina, apophyses strong and tuberculate, below the apophyses additional pair of strong tubercles present. First tergite with moderately large, close to moderately spaced punctures, ventral longitudinal carina with a flange-like tooth below spiracle. Second and third tergites with small to moderate sized punctures, punctures close to dense at apex, sparse towards the base, second and third tergites large, shield-shaped, following tergites short and somewhat retracted, seventh tergite at apex with a fringe of thick bristles.

Female : Not seen. Body structure similar to male and as detailed under generic description.

Length : Male, about 13 mm. Fore wing 11 mm.

Distribution : India : Meghalaya (Tura in Garo Hills). *Elsewhere* : Taiwan. South-eastern China.

2. Genus ***Etha*** Cameron (Fig. 6 : a–d)

1903. *Etha* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 17. Type-species : ***Etha striatifrons***; desginated by Viereck, 1914.

Taxonomy : Townes, Townes & Gupta, 1961 : 67. Jonathan, 2000 : 1.

Distribution : Oriental Region.

Body slender. Face with a median tubercle (Fig. 6 : c). Clypeus of moderate size, strongly convex with apical 0.3 flattered, apical margin weakly convex without a

median tooth or irregularities. Malar space about 0.5× as long as basal width of mandible. Lower tooth of mandible little shorter than upper tooth. Mesoscutum polished or subpolished, with small to median sized punctures, punctures dense to rather sparse, usually also with some indistinct transverse wrinkles. Notaulus sharp, reaching beyond the middle of mesoscutum. Propodeal spiracle about 2.2 × as long as wide, propodeum with lateral crests or apophyses, apical carina not well defined. Front edge of hind coxa with a short horizontal groove arising from lower edge of its articulations. First tergite (Fig. 6 : b) with a lateral triangular tooth at base, without longitudinal carinae, second tergite mat with small dense punctures. Wing venation variable : such as the position of nurvulus and nervellus; and sometimes axillus vein weakly divergent from anal margin of hind wing (Fig. 6 : a). Ovipositor sheath about 0.7× as long as hind tibia (Fig. 6 : d) (Townes, 1970 : 166).

Length : Female, 13–16 mm; fore wing 12–13 mm; ovipositor sheath 3.75–4 mm.

Type-species : *Etha striatifrons* Cameron.

This genus can be readily recognized by having a strong to weak median tubercle on face. Clypeus without a median tooth; areolet about 0.5× as high as the length of second recurrent vein. First abdominal tergite long, terete, without longtudinal carinae and its base with lateral tooth. It shows affinities with *Ischnus* Gravenhorst, *Caenocryptoides* Uchida and other related genera of tribe Ischnini, in having a weak or strong lateral tooth or projection at the base of first tergite, and clypeus without a median tooth or irregularities.

Key to the species of *Etha*

1. Epomia strongly tuberculate near the shoulder. Facial tubercle narrow at base, high and pointed. Axillus diverging from the anal margin, its tip straight. (Mesopleurum strongly rugose; nervellus intercepted at its lower 0.4. Face back, facial tubercle yellow). Mayanmar. Java. Philippines ..... 1. *flavofaciata* Jonathan

– Epomia normal, not tuberculate. Facial tubercle broad at base, conical, weak to moderately strong. Axillus close to wing margin, its tip curved towards the anal margin 2

2. Head and thorax largely black, variously marked with yellow 3

– Head and thorax largely yellow to reddish-brown, with various markings 6

3. First abdominal tergite long, about 4× as long as wide at apex, its postpetiole 2–3× as long as wide at base. (Face yellow, clypeal groove and facial tubercle black. Nervulus opposite; nervellus intercepted slightly above the middle; mesopleurum weakly rugose). Myanmar. ..... 2. *longipetiolata* Jonathan

– First abdominal tergite about 3× (3–3.3×) as long as wide at apex and postpetiole about 2× as long as wide at base, except in *E. flavocoxata,* 2.6× and 1.5× respectively 4

4. Facial tubercle weak, not well developed, face medially uniformly weekly convex. Mesopleurum largely finely rugoso-wrinkled, at some places puncto-reticulate. (All coxae yellow; apices of all the abdominal tergites and apical half of propodeum, yellow. Wings yellowish hyaline) India : Karnataka; Maharashtra..... ..... 3. *flavocoxata* Jonathan

– Facial tubercle moderately high and conical. Mesopleurum without punctures, finely wrinkled or rugoso-wrinkled 5

5. Lateral carina of scutellum not marked; antennal scape, yellow. Face usually yellow, sometimes black along clypeal groove. Nervellus variable. India : Assam; Himachal Pradesh; Meghalaya; Sikkim; Uttaranchal; West Bengal..... ..... 4. *striatifrons* Cameron

– Lateral carina of scutellum yellow marked; antennal scape black. Face yellow with a median inverted 'Y' shaped black mark. Nervellus intercepted at the middle. India : Meghalaya; Uttaranchal. Myanmar..... 5. *flaviorbita* Jonathan

6. Mesopleurum finely rugoso-wrinkled. Propodeum between apical carina and apex striato-wrinkled, between apical and basal carinae finely striato-punctate. Mesoscutum, metascutellum and basal area of propodeum of same colour as of thorax (reddish-brown). Myanmar. ..... 6. *burmensis* Jonathan

– Mesopleurum finely rugose. Propodeum between basal carina and apex strongly coarsely trans-striate. Mesoscutum, metascutellum, and basal area of propodeum dark brown to blackish. India : Meghalaya .....7. *nigromaculata* Jonathan

1. ***Etha flavofaciata*** Jonathan (Fig. 6 : e, f)

2000. *Etha flavofaciata* Jonathan, *Rec. zool. Surv. India,* **98**(1) : 3. Male, Female, Key, des., fig. Type : Female, Philippines : Los Banos Leg. (A.E.I., Florida). Philippines : Los Banos Leg; Alcate Mt. Victoria Mindora; S. Luis Calapan, Mondoro; Mt. Maquilling, Elev. Myanmar : Mt. Victoria, 1000m; Maymyo, 500m, W. Java : Radjamandala, 350m (A.E.I., Florida & Z.S.I., Calcutta).

This is a distinct species by having epomia strongly tuberculate near the shoulder. Facial tubercle narrow at base, high and pointed. Axillus diverging from the anal margin, its tip straight. Face black and facial tubercle yellow.

Female : Face subpolished, indistinctly punctate in the middle, longitudinally striate at sides. Clypeus shiny, shallowly and sparsely punctate. Malar space granulose, 0.6× the basal width of mandible. Mandible shallowly punctate. Frons subpolished,

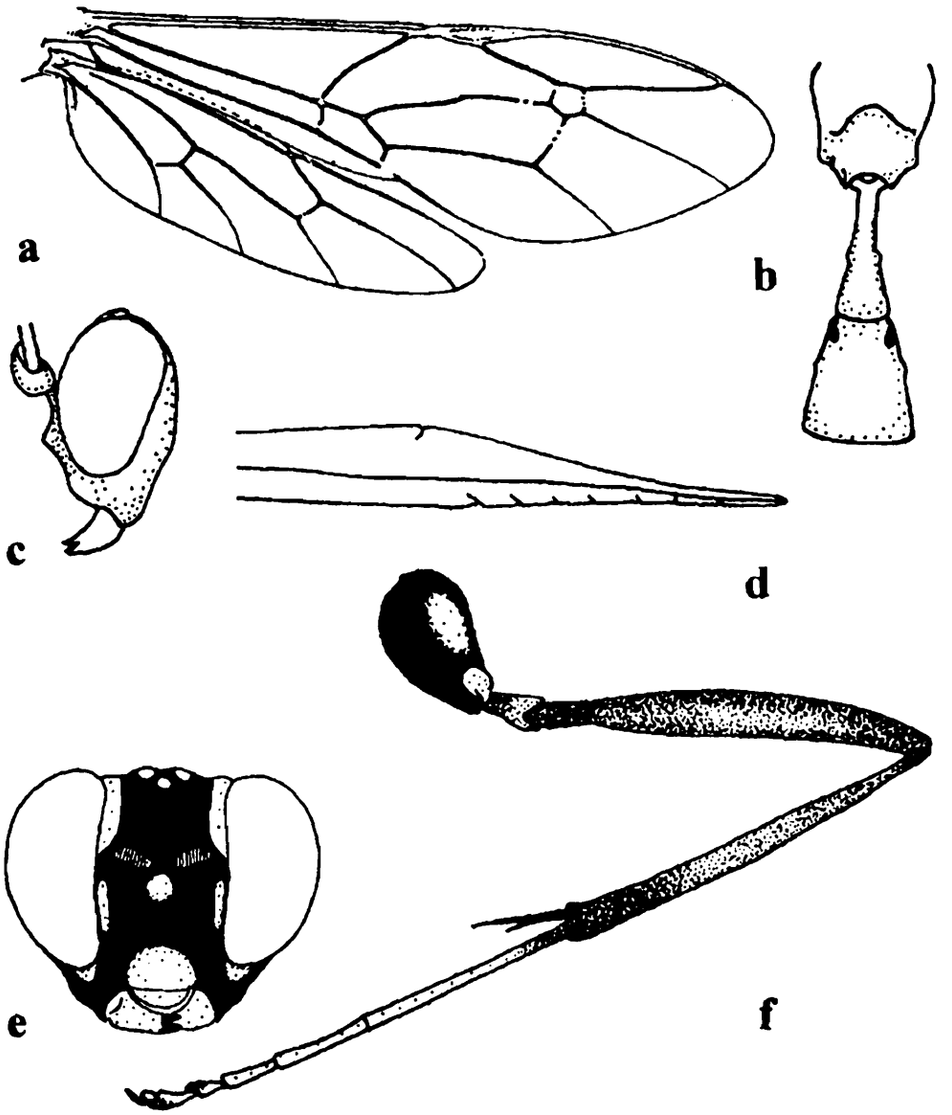

Fig. 6. *Etha* Cameron : **a**, fore and hind wings showing venation; **b**, head side view showing facial tubercle; **c**, dorsal view of first tergite; **d**, ovipositor tip. *Etha flavofaciata* Jonathan : colour pattern : **e**, front view of head; **f**, hind leg.

irregularly longitudinally striate in the antennal scrobes, sublaterally with fine punctures, along the eye margin smooth and shiny. Vertex shiny with sparse and minute punctures. Temple shiny, sparsely and minutely punctate. Pronotum subpolished, coarsely trans-stiate in the middle groove, finely obliquely striato-punctate above, lower margin closely punctate. Epomia strong reaching up to upper margin then turned mesad, forming a tubercle above. Mesoscutum along the margins of each lobe distinctly trans-striate, middle stripe of each lobe closely punctate, punctures running into striations. Scutellum shiny with moderately deep and coarse punctures; lateral carina extending to its basal 0.5. Metascutellum smooth and shiny. Mesopleurum subpolished, largely rugoso-wrinkled, speculum with deep and coarse punctures, area below sternaulus with moderately deep and close punctures, punctures near the sternaulus running into trans-striations, prepectal carina extending 0.75 the height

of mesopleurum. Metapleurum transversely rugoso-punctate, juxtacoxal carina not well defined. Propodeum between basal carina and apex coarsely trans-striate, basad of basal carina closely punctate, with fine circular striations. First tergite smooth and shiny with a few scattered shallow punctures, following tergites mat and subpolished. Ovipositor long, its sheath about 0.8× as long as hind tibia, its tip long and pointed. Nervulus basad of basal vein by its own width. Nervellus intercepted at its basal 0.4.

Black. Antenna with apical half of 4th segment to 12th segment above, pure white. The following are yellow : Oval mark on median tubercle on face, face narrowly along the eye margin, clypeus, malar space, mandible, frons along the eye margin (Fig. 6 : e), pronotal collar largely above, lateral tubercles on upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum, propodeum between apical carina and apex, this mark extending towards the base in the middle, first tergite broadly at base and apex, and apices of all the following tergiters. Fore and middle legs with their coxae and trochanters yellow, except the inner side of coxae sometimes with brown markings, rest of fore and middle legs brownish-yellow, with the apical segments of tarsi brown. Hind leg with coxa yellow except the apex irregularly black, first trochanteral segment brownish, second segment and femur almost black, tibia yellowish-brown, except its extreme base and apical 0.3 and spurs black; its tarsus white, except basal 0.2 of first and fourth, and fifth segment wholly brownish to black (Fig. 6 : f). Wings clear hyaline with a light yellow tinge.

Male : Essentially similar to female, except more polished and slender. Malar space 0.5× the basal width of mandible. Frons largely shiny with scattered shallow punctures in the middle and a few weak striae, rest at sides smooth and shiny. Vertex and temple shiny with a few punctures. Lateral carina of scutellum extending to its basal 0.3. Metapleurum strongly puncto-reticulate, first abdominal tergite mat and subpolished with a few punctures apico-laterally, following tergites mat and subpolished.

Black. The following are yellow : 7th–9th flagellar segments, face almost wholly (except two sublateral stripes and along the clypeal groove dark brown), vertex along the eye margin, clypeus wholly, base of mandible, pronotal collar above and minutely below, pronotal tubercle, tegula, scutellum, subtegular ridge, metascutellum, arrow-shaped mark at the apex of propodeum, base and apex of first tergite, and apices of 2–6 tergites narrowly and seventh tergite with a median elongated mark. Legs similar to female, but colour of coxae variable, fore and middle coxae almost black to black with yellow in front, hind coxa largely black with an elongated yellow mark above.

Length : Female, 13.5–16 mm; fore wing 12–13.5 mm; ovipositor sheath 4 mm. Male, 13 mm; fore wing 9.5 mm.

Distribution : Philippines (Los Banos Leg; Alcate Mt. Victoria Mindoro; S. Luis Calapan, Mandoro). Myanmar (Mt. Victoria, 1000m; Maymyo, 500m). W. Java (Radjamandala, 350m).

2. ***Etha longipetiolata*** Jonathan (Fig. 7 : a, b)

2000. *Etha longipetiolata* Jonathan, *Rec. zool. Surv. India,* **98**(1) : 5. Female, Key, des., fig. Type : Female, Myanmar : Mt. Victoria, 2200m (A.E.I., Florida). Myanmar : Mt. Victoria, 2200m (Z.S.I., Calcutta)

This species is recognised by having its first tergite about 4× as long as wide at apex, it postpetiole 2–3× as long as wide at base. Face yellow and clypeal groove and facial tubercle black.

Female : Median tubercle on face low (weak). Face subpolished largely rugulose, with fine aciculations in the middle. Clypeus dull, rugulose. Malar space granulose, 0.8× the basal width of mandible. Mandible rugulose. Frons rugose in the middle, longitudinally striate at sides, smooth and shiny along the eye margin. Vertex mat and subpolished. Temple rugulose, subpolished. Pronotum striato-wrinkled in the middle, above closely punctate, punctures running into fine striations, pronotal collar and extreme lower margin rugulose, epomia long reaching up to upper margin but not forming tubercle. Mesoscutum subpolished, finely and densely punctate, punctures with fine transverse aciculations. Scutellum subpolished, coarsely and shallowly punctate, towards the apex smooth and shiny lateral carina extending to its basal 0.5. Metascutellum smooth and shiny. Mesopleurum subpolished, largely finely trans-rugose to striate, area just above and below sternaulus finely and closely puncto-striate, speculum shiny with moderately deep punctures and striate along the anterior margin, prepectal carina extending 0.85 the height of mesopleurum. Metapleurum largely finely transversely rugoso-punctate, juxtacoxal carina not defined. Propodeum subpolished, strongly trans-striate between basal carian and apex, basad of basal carina with moderately deep and dense punctres, punctures running into striations, at some places appears to be reticulate. First tergite 4× as long as wide at apex, post-petiole about 2–3× as long as wide at base, smooth and shiny; following tergites dull. Nervulus opposite to basal vein, nervellus intercepted slightly above the middle. Ovipositor sheath about 0.9× as long as hind tibia.

Black. Apical 0.33 of 5th to 9th antennal segments above, white. The following are yellow : Face (except median tubercle above and along clypeal groove, black), clypeus (except the apical margin), mandible (except the teeth), frons along the eye margin, malar space and base of temple (Fig. 7 : a), pronotal collar, upper margin of pronotum, tegula, subtegular ridge, a small quadrangular mark in the middle of scutellum. Abdomen largely yellowish-brown, except first to third tergites dorsally dark brown. Legs in general yellowish-brown. Fore and middle coxae and trochanters yellow with brown markings; hind coxa largely black except apico-ventrally brownish, femur along its upper margin, tibia at its extreme base and apex dark brown; tarsus whitish, except basal 0.6 of first segment black (Fig. 7 : b). Wings clear hyaline.

Male : Not known.

Length : Female, 14 mm; fore wing 11 mm; ovipositor sheath 5 mm.

Distribution : Myanmar (Mt. Victoria, 2000m).

3. ***Etha flavocoxata*** Jonathan (Fig. 7 : c, d)

2000. *Etha flavocoxata* Jonathan, *Rec. zool. Surv. India,* **98**(1) : 6. Male, Key, des., fig. Type : Female, Karnataka : Gunji, 573m (Z.S.I., Calcutta). Maharastra : Mahabaleshwar, 1285m (Z.S.I, Calcutta).

This species is close to *Etha longipetiolata* Jonathan, but can be recognised by having first tergite short (3×) and postpetiole about 2× as long as wide at base.

Female : Face subpolished, closely and shallowly punctate, punctures running into striations, at sides rugulose. Clypeus largely smooth and subpolished, with a few scattered shallow punctures. Malar space granulose, 0.8× the basal width of mandible. Frons moderately strongly rugoso-punctate in the middle, at sides rugulose. Vertex subpolished weakly punctate. Temple sparsely and shallowly punctate, shiny. Pronotum

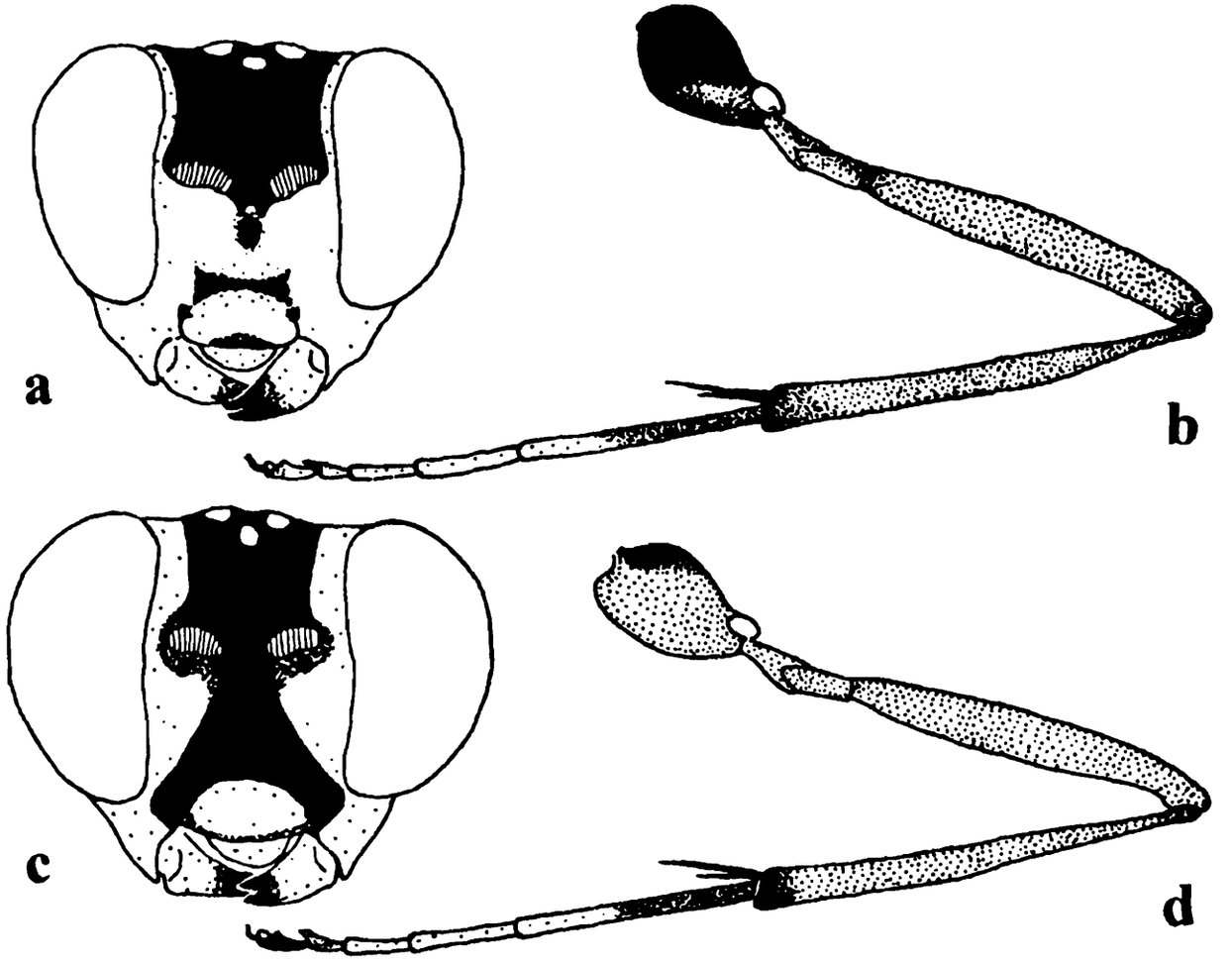

Fig. 7. *Etha longipetiolata* Jonathan : colour pattern : **a**, front view of head; **b**, hind leg. *Etha flavocoxata* Jonathan : colour pattern : **c**, front view of head; **d**, hind leg.

largely trans-wrinkled, above densely and deeply punctate, punctures running into fine striations, epomia long, reaching up to upper margin. Mesoscutum densely punctate; along the margins of each lobe striate. Scutellum subpolished, sparsely punctate, lateral carina extending at its basal 0.2. Metascutellum smooth and polished. Mesopleurum finely rugoso-wrinkled, at some places appears to be puncto-reticulate, below subtegular ridge finely striate, speculum deeply punctate, punctures running into striations; area above sternaulus near to prepectus with moderately deep and close punctures, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum puncto-reticulate, juxtacoxal carina absent. Propodeum between apical carina and apex coarsely striate, between apical and basal carinae at sides coarsely striate and finely wrinkled in the middle, basad of basal carina with moderately deep and dense punctures, punctures running into striations. First and second tergites granulose, dull with a few scattered indistinct punctures. Nervulus opposite to basal vein, nervellus intercepted slightly below the middle. Ovipositor sheath about 0.8× as long as hind tibia.

Black. 4th to 10th flagellar segments white above. The following are yellow : Face (except a broad triangular black mark in the middle), clypeus except along the margins, frons and vertex along the eye margin, mandible except the teeth, malar space, lower 0.5 of temple (Fig.7 : c), pronotal collar, upper margin of pronotum, tegula, subtegular ridge, lateral carina of scutellum faintly, scutellum except at the apex, base of hind wing, propodeum broadly at apex, apices of 1st to 5th tergites narrowly in the middle and broadly at sides, 6th and 8th tergites broadly at sides, 7th broadly in the middle and sides and all the sternites almost wholly. Legs in general reddish-yellow, except fore and middle tarsi brown. Hind coxa at base with a small mark and apex of tibia, black, hind tarsus white, except basal 0.5 of first and fourth faintly, and fifth segment wholly black (Fig. 7 : d). Wings clear hyaline.

Male : Essentially similar to female, except more polished slender and weakly sculptured. Face weakly rugoso-punctate. Clypeus largely smooth and shiny. Frons rugoso-wrinkled. Vertex and temple distinctly punctate. Pronotum coarsely wrinkled, upper margin punctate with running striations. Propodeum in the middle coarsely trans-striate, towards the apex irregularly wrinkled, basad of basal carina with circular striae and with punctures in between the striae. Abdomen mat and subpolished. Nervulus slightly apicad of basal vein and nervellus intercepted slightly above the middle.

Black. 13th to 22nd flagellar segments white. Black mark on face small. Apices of all tergites yellow. Hind leg with coxa broadly at base, apical 0.4 of tibia, basal 0.85 of first and apical 0.8 of fifth tarsal segment, black; rest of colour similar to female.

Length : Female, 11.5 mm; fore wing 8 mm; ovipositor sheath 3.5 mm. Male, 12.5 mm; fore wing 8.75 mm.

Distribution : India : Karnataka (Gunji, 573m). Maharashtra (Mahabaleshwar, 1285m).

4. ***Etha striatifrons*** Cameron (Fig. 8 : a–d)

1903. *Etha striatifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 18. Female, des. Type : Female, India : Khasi Hills in Meghalaya (formerly Assam) (OXFORD).

1970. *Etha striatifrons* : Uchida, *Treubia,* **18** : 57. key.

1987. *Etha striatifrons* : Gupta, *Mem. Amer. Ent. Inst.*, **41**(2) : 784.

2000. *Etha striatifrons* : Jonathan, *Rec. zool. Surv. India,* **98**(1) : 9. Female, Key, des. India : Assam : Rangapara : Charduar Forest. Himachal Pradesh : Dalhousie, 2132m, Manali 1828m. Meghalaya : Shillong Botanical Garden, 1429m, Cherrapunji, 1272m. Sikkim : Gangtok 1871m. Uttaranchal : Bhowali, Kumaon Hills, Dehra Dun in Garhwal Hills, Garjia and Jeolikote in Kumaon Hills, Chaubatia nr. Ranikhet, 1924m, Pawalgarh, Mohakampur, Haldwani, Mussoorie, 2100m. West Bengal : Darjeeling, Bot. Garden, 1840-2142m, Rangiroon near Darjeeling 1800m. Java : Tjibodas Godeh, 1400 m.

This species is close to *Etha flaviorbita* Jonathan in having nervulus distad of basal vein and facial tubercle moderately high and conical, but can be recognised by having lateral carina of scutellum black, face yellow. Nervellus consistantly intercepted at its upper 0.4.

Female : Face and clypeus subpolished. Face weakly rugose. Clypeus with moderately large and shallow punctures, interspaces about 0.5 their own diameter. Frons moderately strongly obliquely striate, with a few scattered punctures, and a median longitudinal carina extending from the base of median ocellus. Vertex mat and subpolished. Temple shiny, shallowly and closely punctate. Ma ar space granulose, 0.66× the basal width of mandible. Pronotum subpolished strongly trans-striate in the middle, striae below fine and irregular, upper margin thickly punctate, and with fine striations. Mesoscutum densely punctate, punctures running into transverse striation, at some places tending to be rugose. Scutellum shiny, with deep, sparse punctures, lateral carina extending at its basal 0.75. Metascutellum smooth and shiny. Mesopleurum subpolished, finely rugoso-wrinkled, wrinkles transverse, speculum with deep punctures and trans-striation. Prepectal carina extending 0.8 the height of mesopleurum. Metapleurum finely transversely rugoso-wirinkled, at some places above appears to be reticulo-punctate, juxtacoxal carina absent. Prepodeum between apophyses and apex coarsely trans-striate, above between the basal carinae and apophyses strongly trans-wrinkled, reticulate in the middle region, basad of basal carina densely punctate, punctures running into fine circular striations. First tergite mat and dull, with a few scattered shallow punctures; following tergites mat and subpolished. Ovipositor long, its sheath about 0.8× as long as hind tibia, tip long and pointed. Nervulus slightly apicad of basal vein, nervellus intercepted little above the middle.

Black. The following are yellow : Antenna with scape broadly in front, sixth to tenth flagellar segments above, face, clypeus, frons along the eye margin, temple at

the basal half, mandible except the tip (Fig. 8 : a, c), pronotal collar sometimes above, sometimes narrowly below also, upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum (soemtimes largely blackish), metapleurum sometimes just above the middle coxa, propodeum between apophyses and at apex, this mark many be extended backward in the middle, all the abdominal segments ventrally and laterally, apices of all the tergites narrowly (Fig. 8 : d). Legs with fore and middle coxae and trochanters light yellow, their femora, tibiae and tarsi deep yellow to light brownish-yellow. Hind leg largely brownish-yellow, except coxa, trochanter and femur above with a line of dark brown; hind tibia along the upper margin and broadly at apex, dark brown, tarsus whitish-yellow, its fifth segment brown; colour of legs in general and hind leg in perticular variable, sometimes becoming more darker. Wings clear hyaline, having yellowish tinge.

Variations : This species shows a high degree of variations in body structure and colour. The nervellus usually intercepted at the middle, but sometimes intercepted little below or above the middle. The face mostly yellow, but sometimes black in the middle and along the base of clypeus forming an inverted 'Y' shaped mark; middle lobe of mesoscutum at apex sometimes with an oval distinct or weak yellow mark; hind coxa reddish-brown with a black line above and apical abdominal segments becoming more reddish-brown.

Length : Female, 13 mm; fore wing 10.5 mm; ovipositor sheath 3.75.

Distribution : India : Assam (Rangapara : Charduar Forest). Himachal Pradesh (Dalhousie, 2132m; Manali 1828m). Meghalaya (Shillong Bot. Garden, 1429m in Khasi Hills; Cherrapunji, 1272m). Sikkim (Gangtok 1871m). Uttaranchal (Bhowali, 1700m; Garjia; Jeolikote, 1142m; Chaubatia nr. Ranikhet, 1924m; Pawalgarh, Mohakampur; Haldwani in Kumaon Hills and Mussoorie, 2100m & Dehra Dun in Garhwal Hills). West Bengal (Darjeeling, Bot. Garden, 1840-2142m; Rangiroon nr. Darjeeling 1800m). Java (Tjibodas Godeh, 1400m).

5. ***Etha flaviorbita*** Jonathan (Fig. 8 : e–f)

2000. *Etha flaviorbita* Jonathan, *Rec. zool. Surv. India,* **98**(1) : 11. Female, Male, key, des. fig. Type : Female, Uttaranchal : Jeolikote in Kumaon Hills (Z.S.I., Calcutta). India : Uttaranchal : Garjia, Dibri in Kumaon Hills. Meghalaya : Pynursla, 1257m in Jaintia Hills. Myanmar : Mt. Victoria.

This species is distinguished from its closely related species viz., *Etha striatifrons* Cameron, by having lateral carina of scutellum marked yellow, nervellus intercepted at the middle and face with a black inverted 'Y' shaped mark (Fig. 8 : e).

Female : Median tubercle on face moderately high, finely punctate, face subpolished, weakly rugoso-punctate, at sides granulose. Clypeus subpolished, sparsely and shallowly punctate. Mandible transversely rugoso-punctate. Malar space granulose

0.75× the basal width of mandible. Frons shiny, with a median longitudinal carina and on either side strong transverse ridges. Ocellar triangle densely punctate. Vertex subpolished, with coarse, close and shallow punctures. Temple shiny, indistinctly punctate. Pronotum subpolished, largely rough and trans-wrinkled, towards the upper margin distinctly punctate with obliquely running fine striations. Epomia strong reaching up to upper margin then turned mesad, forming weak lateral tubercles. Mesoscutum transversely rugoso-punctate, along the margins of each lobe distinctly striate. Scutellum shiny, sparsely and shallowly punctate, lateral carina more or less confined to its base, metascutellum smooth and shiny. Mesopleurum finely wrinkled, at some places wrinkles running transverse, speculum with moderately deep and close punctatures, area below sternaulus and just above it finely striato-punctate, prepectal carina extending 0.9 the height of mesopleurum. Metapleurum with moderately deep and large punctures, at some places appears to be reticulate, juxtacoxal carina not defined. Propodeum between apical carina and apex coarsely trans-striate, between the transverse carinae obliquely finely striato-wrinkled and with a few punctures, basad of basal carina with circular fine striations, and punctate in between the striae. First tergite largely smooth and shiny, with a few shallow punctures towards the apex, second tergite granulose, with dense, weak punctures, following tergites mat and subpolished. Nervulus distad of basal vein by 0.2–0.4 it length, nervellus intercepted at the middle. Ovipositor long, its sheath about 1.0× as long as hind tibia, tip long.

Black. 5th–10th flagellar segments white above. The following are yellow : Face and clypeus [except face usually in middle with an inverted 'Y' shaped mark (Fig. 8 : e) and clypeus along the margin, black], mandible except the teeth, malar space, basal half of temple, frons and temple along the eye margin, upper margin of pronotum, pronotal collar above, tegula, subtegular ridge, apical 0.5 of scutellum, lateral carina of scutellum, metascutellum, propodeum between apical carina and apex, first tergite at its basal 0.4 and narrowly at apex, apices and lateral margins of all the following tergites (Fig. 8 : f). Fore and middle legs in general brownish-yellow, except their coxae at extreme base blackish and their tarsi, brown. Hind leg with coxa, trochanter and femur reddish-brown, except coxa with a line above, trochanters broadly and femur with a narrow line above, black. Hind tibia brownish-yellow, with its exterme base and apex blackish, hind tarsus white, except its basal half of first segment, apical half of fourth and fifth segments wholly dark brown to blackish. Wings clear hyaline.

Male : Similar to female, except more slender and polished. Frons weakly striate. Mesoscutum densely punctate, running into rugosities, along the margins of each lobe trans-striate. Propodeum between basal carina and apex irregularly wrinkled, in between the wrinkles punctate; basad of basal carina and first tergite smooth and shiny, following tergites mat and subpolished, rest as in female.

Black. 16th to 25th flagellar segments dirty white. The following are yellow : Face and clypeus wholly, mandible, lower 0.6 of temple, frons and vertex along the eye margin, pronotum almost all along the margins, lateral carina of scutellum, basal 0.8 of scutellum, tegula, subtegular ridge, propodeum between apical carina and apex, apices of all the tergites and also first tergite at base, and fore and middle legs almost. Hind leg colour variable, its coxa almost black, except sometimes its apex yellow, trochanter and femur black or brownish with a broad black line above, tibia dark brown, lighter towards the base, tarsus white, except its first segment at base dark brown (most of the tarsi broken, except one tarsus with first and second segments). Wings clear hyaline.

Length : Female, 12.8 mm; fore wing 10 mm; ovipositor sheath 5 mm. Male, 10–12 mm; fore wing 8–10 mm.

Distribution : India : Meghalaya (Pynursla, 1257m in Jaintia Hills). Uttaranchal (Jeolikote, 1142 m; Garjia, Dibri Village in Kumaon Hills). *Elsewhere* : Myanmar (Mt. Victoria, 1000m).

6. ***Etha burmensis*** Jonathan (Fig. 8 : g)

2000. *Etha burmensis* Jonathan, *Rec. zool. Surv. India,* **98**(1) : 12. Male, Female, Key, des. fig. Type : Female, Myanmar : Mt. Popa, 600-1000m (A.E.I., Florida). Myanmar : Mt. Popa, 600-1000m (A.E.I., Florida & Z.S.I., Calcutta).

This species is close to *Etha nigromaculata* Jonathan in having head and thorax largely yellow to reddish-brown with various markings, but can be distinguished by its finely rugoso-wrinkled mesopleurum; propodeum between the transverse carinae striato-punctate. Mesoscutum, metascutellum and basal area of propodeum having same colour as that of thorax (reddish-brown).

Female : Face rugulose dull. Clypeus subpolished, sparsely and shallowly punctate. Malar space granulose, 0.6× the basal width of mandible. Frons subpolished, in the middle with circular and irregular striations, at sides sparsely and shallowly punctate, at sides mat and subpolished. Temple shiny, with indistinct punctures. Pronotum largely trans-rugose, extreme upper margin with moderately deep and close punctures, epomia strong, reaching up to upper margin, but not forming a tubercle. Mesoscutum finely rugoso-punctate, finely striate along the margin of each lobe. Scutellum shiny, sparsely and shallowly punctate, lateral carina extending 0.6 the length of scutellum. Metascutellum smooth and polished. Mesopleurum largely weakly trans-rugose, speculum densely punctate, striate along the anterior margin, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum with moderately deep and close punctures, towards metapleural fold rugoso-punctate, above near the pleural carina appears to be reticulate, juxtacoxal carina not defined. Propodeum between transverse carinae striato-punctate, between apical carina and apex striato-wrinkled,

basad of basal carina in the middle densely punctate, punctures running into striation, laterally in spiracular area finely trans-striate. First tergite dull, subapically granulose with sparse and shallow punctures. Second and third tergites granulose, following tergites mat and subpolished. Nervulus opposite to basal vein, nervellus intercepted at the middle. Ovipositor long, its sheath about 0.8× as long as hind tibia.

Black. Apical 0.3 of 4th to 11th segment of antennal flagellum whitish above. The following are yellow : Scape in front, face, clypeus, mandible, malar space, basal 0.5 of temple, frons along the eye margin, sometimes scutellum at apex, apices of second to fifth tergites narrowly and at sides broadly. Thorax largely reddish-brown (Fig. 8 : g). Fore and middle legs in general brownish-yellow, their coxae with a mark above and tarsi wholly dark brown. Hind leg with coxa yellowish-brown with a black broad and elongated mark above; trochanter, femur and tibia largely dark brown to blackish; tarsus white, except extreme base of its first and apex of fifth segment blackish. Wings clear hyaline, with yellowish tinge.

Male : Similar to female, except more slender and polished. Frons irregularly wrinkled. Vertex minutely punctate. Temple shiny, with indistinct sparse punctures. Mesoscutum largely densely punctate, striate along the margins of each lobe. Matapleurum reticulo-punctate. Propodeum largely moderately and strongly rugose, baso-laterally weakly rugose and punctate. First tergite subpolished and smooth, except for a few scattered punctures. Nervellus opposite or little apicad of basal vein, nervellus intercepted at or slightly above the middle.

Colour similar to female except 17th–25th antennal segments whitish; thorax largely reddish, with pronotum broadly in the middle, mesoscutum, metapleurum in the middle, propodeum largely, dark brown; sometimes hind coxa entirely dark brown to blackish.

Length : Female, 13 mm; fore wing 10 mm; ovipositor sheath 3.75 mm. Male, 9.5–13 mm; fore wing 7.5–9.5 mm.

Distribution : India : Myanmar (Mt. Popa, 600–1000m).

7. ***Etha nigromaculata*** Jonathan (Fig. 8 : h)

2000. *Etha nigromaculata* Jonathan, *Rec. zool. Surv. India,* **98**(1) : 15. Male, Female, key, des. fig. Type : Female, India : Meghalaya : Cherrapunji, 1272 in Khasi Hills (Z.S.I., Calcutta).

This species can be recognised from its allied species, viz., *Etha burmensis* Jonathan by having mesopleurum finely rugose. Propodeum largely trans-striate. Mesoscutum, metascutellum and basal area of propodeum dark brown to blackish.

Female : Face subpolished, ruguloso-punctate, rugae radiating from median tubercle, at sides granulose with sparse shallow punctures. Clypeus subpolished, sparsely and

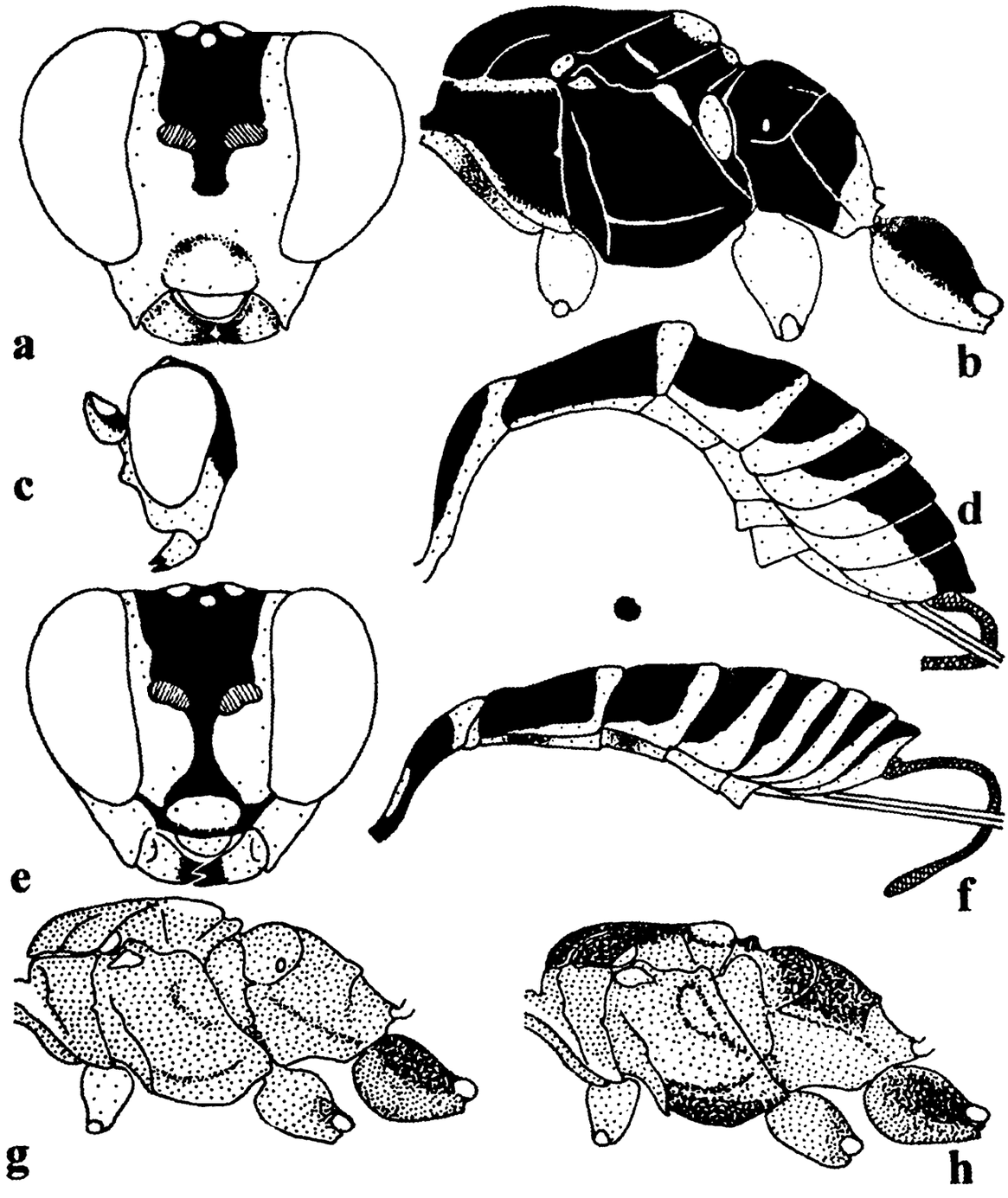

Fig. 8. *Etha striatifrons* Cameron : colour pattern : **a**, front view of head; **b**, side view of thorax; **c**, side of head; **d**, side view of abdomen. *Etha flaviorbita* Jonathan. colour pattern : **e**, front view of head; **f**, side view of abdomen. *Etha burmensis* Jonathan : **g**, side view of thorax showing colour pattern. *Etha nigromaculata* Jonathan : **h**, side view of thorax showing colour pattern.

shallowly punctate. Mandible subpolished, with sparse and shallow punctures. Malar space granulose, 0.6× the basal width of mandible. Frons shiny with desending strong ridges from median ocellus, towards the antennal sockets trans-striate, a few punctures present in between the striae, at sides sparsely punctate. Ocellar triangle deeply punctate. Vertex behind ocellar triangle closely punctate. Temple shiny, distinctly punctate. Pronotum subpolished, in the scrobe finely wrinkled, upper 0.5 with deep and close punctures, pronotal collar rugoso-punctate, epomia strong, reaching upper margin then turned mesad. Mesoscutum densely punctate, punctures at some places coalescent with wrinkles, along the margins of each lobe finely striate. Scutellum sparsely and shallowly punctate, punctures, coarse, lateral carina extending to its basal more than 0.5. Metascutellum smooth and polished. Mesopleurum finely rugose in the middle, above with a few close punctures, area just above sternaulus near prepectal carina and below sternaulus finely and closely punctate, speculum shiny with small deep and close punctures, and striate along the anterrior margin, prepectal carina extending 0.85 the height of mesopleurum. Metapleurum finely transversely rugoso-striate, with a few weak punctures above near pleural carina. Propodeum shiny, moderately strongly trans-striate between basal carina and apex, basad of basal carina deeply punctate. First tergite smooth and subpolished; second tergite granulose with sparse and shallow punctures, following tergites mat and subpolished. Nervulus slightly apicad of basal vein, nervellus intercepted near its 0.5. Ovipositor sheath about 0.8× as long as hind tibia.

Black. 5th to 10th flagellar segments white above. Scape, face, clypeus, mandible, malar space, lower 0.5 of temple, frons and vertex along the eye margin, yellow. Thorax reddish-brown, except pronotal collar, upper margin of pronotum, subtegular ridge, tegula, basal 0.7 of scutellum, yellow. Mesoscutum almost wholly, apical 0.3 of scutellum, metascutellum, mesosternal area below sternaulus, propodeum at base and subtaterally, black (Fig. 8 : h). Fore and middle legs brownish-yellow, their 5th tersal segments dark brown. Hind leg reddish-brown, except coxa with an elongate line above, trochanters largely, femur above, tibia at extreme base and apex, blackish; its tarsus white except first segment at base black (4th & 5th segments broken). Abdomen with first tergite at base, all the tergites narrowly at apex and abdomen leterally narrowly on second and third tergites and more broadly towards the apex, yellow. Wings clear hyaline.

Male : Similar to female except more slender and polished. Face densely and shallowly punctate. Clypeus largely smooth. Frons with a few wrinkles and striations. Vertex and temple shiny, sparsely and shallowly punctate. Pronotum trans-striate, upper area obliquely striato-punctate. Mesoscutum densely punctate, striate along the margins of each lobe. Scutellum sparsely punctate. Mesopleurum in the middle rugoso-punctate, striato-punctate above towards subtegular ridge and towards middle coxa, speculum shiny with deep coarse punctures, area below sternaulus destinctly

punctate. Metapleurum with moderately large, deep and dense punctures. Propodeum between basal carina and apex coarsely trans-striate, basad of basal carina with fine circular striations, in between the striae punctate. First tergite smooth and shiny with a few (6–10) scattered punctures, following tergites mat and subpolished.

Black. Antenna with 14–21 segments white. The following are yellow : Scape in front, face and clypeus wholly, frons and vertex along the eye margin, malar space, lower 0.5 of temple, pronotal collar above, upper shoulder of pronotum, lateral lobes of mesoscutum faintly, scutellum, lateral carina of scutellum, subtegular ridge, speculum, mesopleurum broadly in middle, mesosternum, propodeum apically, apices of all the abdominal tergites narrowly and faintly. Fore leg largely dark yellow, except its fifth tarsal segment at apex dark brown. Middle leg brownish-yellow, its tarsal segments infuscate. Hind coxa, trochanter, femur, tibia at extreme base and apical 0.35, basal 0.66 of first tarsal segment and fifth segment wholly black; rest of tibia yellow and rest of tarsus white. Wings yellowish hyaline.

Length : Female, 15.5 mm; fore wing 13 mm; ovipositor sheath 5 mm. Male, 12.25 mm; fore wing 9.5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1272m in Khasi Hills).

3. Genus ***Caenocryptoides*** Uchida (Fig. 9 : a–c)

1936. *Caenocryptoides* Uchida, *Insecta Matsumurana,* **11** : 4. Type-species : *Ischnojoppa tarsalis* Matsumura. Original designation.

Taxonomy : Townes, 1970 : 167. Jonathan, 1999 : 213.

Distribution : Japan and eastern Asia (Townes, 1970); and also India and China (Jonathan, 1999).

Body moderately slender to stout. Clypeus of moderate size, about 2.5× as wide as long, strongly convex with its apical 0.3 flattened, the apex broadly subtruncate, without a distinct tooth or irregularity. Malar space about 0.67× as long as the basal width of mandible. Lower tooth of mandible a little shorter than upper tooth. Mesoscutum mat, with small dense punctures; notaulus deep reaching more than 0.5 the length of mesoscutum. Propodeal spiracle about 2.5× as long as wide; apical carina of propodeum medially weak or indistinct, laterally forming weak crests. Hind coxa with or without a short, shallow subvertical groove on its antero-basal face below its artiulation. First tergite (Fig. 9 : b) broad, with a weak lateral tooth at base, its ventro-lateral carina complete; dorso-lateral carina distinct from spiracle to apex; median dorsal carinae present but weak on basal 0.5 of the tergite. Spiracle of first tergite near its apical 0.45; second tergite mat, with dense punctures. Ovipositor (Fig. 9 : c) sheath about 1.0× as long as hind tibia. Wing venation and ovipositor tip as in figure 9 : a, c. (Townes, 1970 : 167).

Length : Female, 8.5–13.5 mm. Fore wing 7.5–10.5 mm. Ovipositor 2.5–4.5 mm.

Type-species : *Ischnojoppa tarsalis* Matsumura.

Caenocryptoides is readily distinguished by having propodeal spiracle 2.5× as long as wide. Front side of areolet little shorter than outerside, intercubiti convergent. Spiracle of first tergite near its apical 0.45 and clypeus about 2.5× as wide as long. It shows affinities with *Etha* Cameron, *Ischnus* Gravenhorst and other related genera of the tribe Ischnini, in having a weak or strong lateral tooth or projection at the base of first tergite, and clypeus without a median tooth or irregularities.

Jonathan (1999 : 213) described four species from India, China and Japan. A key to all the species known under this genus and their detailed descriptions are given below to give a complete picture of this genus.

Key to the species of *Caenocryptoides*

1. Face strongly mat with minute weak and dense setiferous punctures. Hind femur black or red. Upper margin of pronotum entirely black. Propodeum apically black. Not all the tergites with apical bands 2

– Face largely subpolished with small to moderate sized, closely placed punctures. Hind femur yellow with apical about 0.3 black. Upper margin of pronotum with yellow markings. Propodeum apically marked with yellow. All the tergites with narrow apical bands 4

2. Pronotum in the scrobe rugose. Hind femur red. Face, frons, malar space and temple along the eye margin, and clypeus medially, yellow. First to seventh abdominal tergites narrowly at apex yellow. India : Himachal Pradesh; Uttaranchal ..... 1. *rugosus* Jonathan

– Pronotum in scrobe transversely striate or wrinkled. Hind femur black. Head wholly black. First to third and eighth abdominal tergites apically yellow 3

3. Pronotum in scrobe finely transversely wrinkled. Frons above rugoso-punctate. Speculum on mesopleurum subpolished with minute dense punctures. Scutellum with a small triangular mark at apex; metascutellum black. Japan .... 2. *tarsalis* (Matsumura)

– Pronotum transversely striate. Frons above strongly mat with dense punctures. Speculum on mesopleurum shiny with distinct evenly spaced punctures. Scutellum and metascutellum, yellow. China ..... 3. *maai* Jonathan

4. Largely black species. Head largely black. Upper margin of pronotum with two small yellow spots. Mesopleurum with a small oval yellow mark near the base of middle coxa. All coxae black; apical mark on propodeum faint and small.

Propodeum basad of basal carina with weak dense punctures. Japan .....
..... 4. *nigrifacies* Jonathan

– Largely yellow species. Head largely yellow, except frons and vertex in the middle, back of head and clypeus at apex and base, black. Upper margin of pronotum broadly yellow. Mesopleurum with a broad irregular yellow mark. All coxae extensively marked yellow. Propodeum with large marks at apex; basad of basal carina with deep dense punctures. India : Meghalaya .....
..... 5. *flavescens* Jonathan

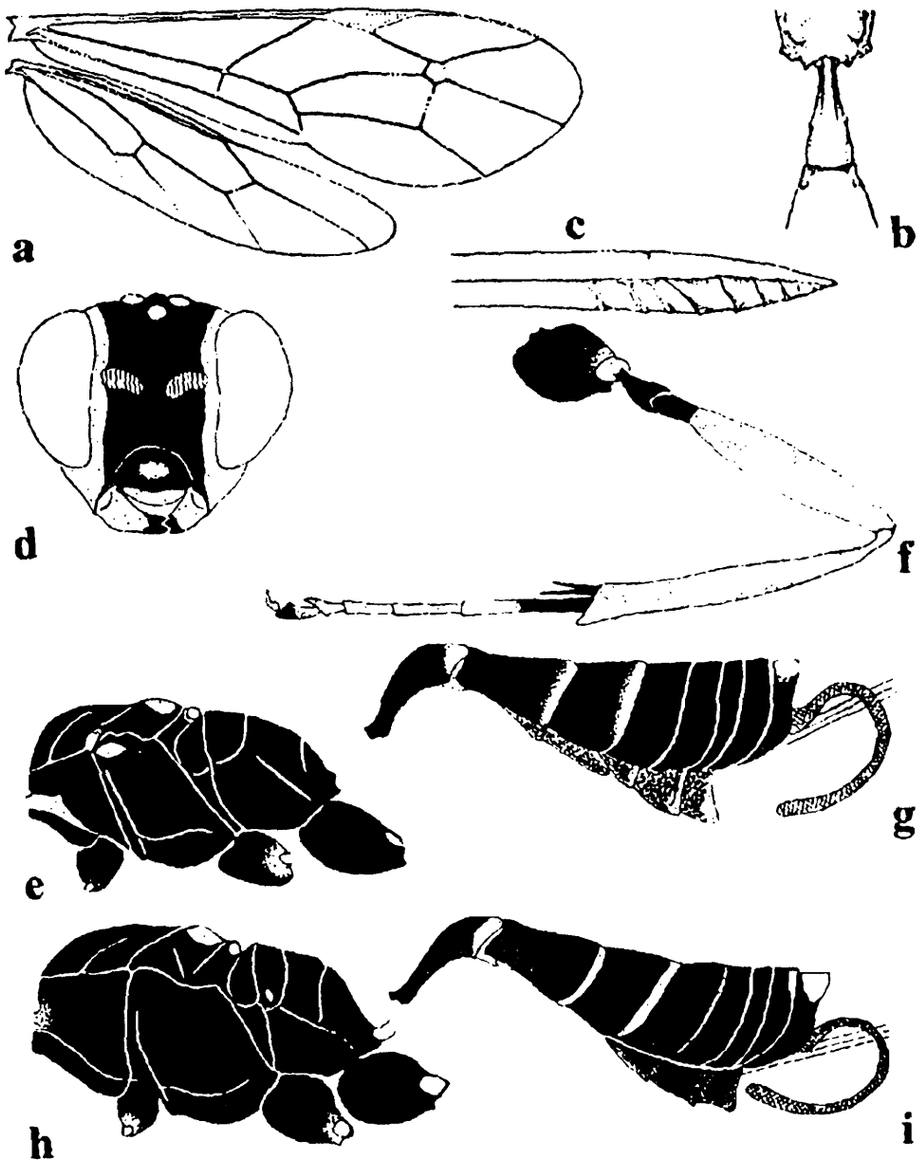

Fig. 9. *Caenocryptoides* Uchida (*C. tarsalis* Mat.) : **a**, wing venation of fore and hind wings; **b**, dorsal view of first tergite; **c**, ovipositor tip. *C. rugosus* Jonathan : colour pattern : **d**, head front view; **e**, thorax side view; **f**, hind leg. *C. tarsalis* (Matsumura) : colour pattern : **g**, abdomen side view. *C. maai* Jonathan : colour pattern : **h**, thorax side view; **i**, abdomen side view.

1. ***Caenocryptoides rugosus*** Jonathan (Fig. 9 : d–f)

1999. *Caenocryptoides rugosus* Jonathan, *Rec. zool. Surv. India,* **97**(3) : 215. Female, key, des., fig. Type : Female, India : Himachal Pradesh : Narkanda, 2572m in Shimla Hills (Z.S.I., Calcutta). India : Uttaranchal : Dwali, 2743m in Kumaon Hills (Z.S.I., Calcutta).

This is a distinct species having pronotum in scrobes rogose. Face, frons, malar space, temple along the eye margin, clypeus and first to seventh tergites apically, yellow. Hind femur red.

Female : Face strongly, in the middle with dense setiferous punctures. Clypeus at base rugulose with a few setiferous weak punctures, towards the apex smooth and shiny. Mandible at base granulose. Malar space granulose, 0.6× the basal width of mandible. Frons moderately strongly rugose in the middle, rugulose at sides, towards the antennal base somewhat trans-rugose, a strong median longitudinal carina present. Vertex and temple rugulose, with indistinct setiferous punctures. Pronotum, mesopleurum, metapleurum and propodeum uniformly rugose to strongly rugoso-wrinkled. Scutellum subpolished, with dense, shallow, small sized punctures, its lateral carina more or less confined to its base. Metascutellum subpolished, with fine close and weak punctures. First abdominal tergite granulose (mat) with sparse setiferous punctures; second tergite granulose with dense, moderately strong punctures, following tergites mat and subpolished.

Black. Apex of 5th to base of 10th flagellar segment above white. The following are yellow : Face, frons and temple along the eye margin, malar space, mandible except the teeth, small mark at the center of clypeus (Fig. 9 : d), pronotal collar above, subtegular ridge, tegula at base, triangular mark at the apex of scutellum, metascutellum (Fig. 9 : e), apices of 1–7 abdominal tergites narrowly. Legs with all the coxae and trochanters black, except coxae at their apices, yellow; all femora and tibia reddish-brown, except fore and middle femore and tibiae dorsally dark brown, and their tarsi also dark brown; hind tarsus whitish, except basal 0.6 of its first segment and apical 0.25 of fifth segment black (Fig. 9 : f). Wings clear hyaline.

Male : Unknown.

Length: Female, 8.5 mm; fore wing 7.2 mm; ovipositor sheath 2.5 mm.

Distribution : India : Himachal Pradesh (Narkanda, 2572m in Shimla Hills). Uttaranchal (Dwali, 2743m in Kumaon Hills).

2. ***Caenocryptoides tarsalis*** (Matsumura) (Fig. 9 : g)

1921. *Ischnojappa tarsalis* Matsumura, Thousand Insects of Japan supplement, **4** : 244. 'Female' = male, des., fig. Type , Japan : Kyoto (SAPPORO).

1930. *Ischnojappa tarsalis* Matsumura : Uchida, *Jour. Faculty Agr. Hokkaido Imp. Univ.,* **25** : 213. Male, Female. Japan : Sapporo & Garugawa both in Hokkain, Kyoto.

1965. *Caenocryptoides tarsalis* : Townes et al., *Mem. Amer. Ent. Inst.*, **5** : 174. Syn.

1999. *Caenocryptoides tarsalis* : Jonathan, *Rec. zool. Surv. India,* **97**(3) : 215. Male, Female, key, des. Japan : Yokokana.

This species is close to *Caenocryptoides maai* Jonathan, in having head and femur wholly black, first to third and eighth abdominal tergites apically yellow. It is recognized by having pronotum finely transversely wrinkled in the scrobes. Frons rugoso-punctate. Speculum on mesopleurum subpolished, with minute dense punctures. Scutellum with a small triangular mark at the apex.

Female : Face strongly mat with close setiferous punctures, dull. Clypeus subpolished, sparse to closely punctate. Frons moderately strongly rugoso-punctate, towards the antennal bases smooth and shiny. Vertex largely mat; minutely and closely punctate behind the ocellar triangle. Temple mat with sparse small punctures. Malar space granulose. Pronotum largely finely trans-wrinkled, upper margin with small coalescent punctures, punctures running into striations; pronotal collar rough with sparse indistinct punctures. Epomia strong but not reaching up to its upper margin. Mesoscutum with minute dense punctures, with short striae along notauli. Scutellum with fine, distinct, closely placed punctures, lateral carina extending at its basal 0.25. Metascutellum shiny, with minute sparse and shallow punctures. Mesopleurum moderately strongly rugoso-wrinkled, speculum above and mesosternum finely and closely punctate; prepectal carina extending 0.8 the height of mesopleurum. Metapleurum finely trans-rugoso-wrinkled. Juxtacoxal carina absent. Propodeum between basal carina and apex somewhat finely reticulo-punctate, basad of basal carina, specially near the spiracles densely punctate; basal carina complete, moderately arched, apical carina broadly interrupted in the middle, laterally forming weak crest. First tergite mat, with coarse and close punctures in the middle. Second tergite mat, with minute dense punctures, following tergites mat and subpolished.

Black. 6th to 9th flagellar segments above whitish. The following are yellow : scutellum with a small mark in the middle, apices of first to third tergites very narrowly and eight tergite broadly in the middle (Fig. 9 : g). Wings hyaline with yellowish-brown tinge.

Male : Essentially similar to female, except more slender. Face strongly mat with dense shallow punctures. Frons strongly mat and densely punctate. pronotum trans-striate in the scrobes, moderately closely punctate above, with obliquely running striations. Mesopleurum moderately strongly trans-rugoso-wrinkled; speculum and mesosternum with deep and moderately close punctures. Metapleurum moderately strongly reticulo-punctate. Propodeum between basal carina and apex reticulo-wrinkled, basad of basal carina with close to dense punctures. First tergite mat, its basal 0.75 sparsely and shallowly punctate. Second tergite mat with weak sparse punctures.

Black. The following are yellow : 15th to 20th flagellar segments, face, clypeus, malar space, mandibles, except the teeth, frons with two oval marks along the eye margin, temple with two large elongate-oval marks, scutellum with a median large mark, apices of all the abdominal tergites narrowly. Leg in general black, except fore and middle coxae and trochanters narrowly to broadly yellow. Hind tarsus from apical 0.2 of first to basal 0.5 of fifth segments whitish-yellow. Wings clear hyaline.

Length : Female, 10 mm; fore wing 8 mm; ovipositor sheath 3.5 mm. Male, 10.5–11.5 mm; fore wing 8–8.75 mm.

Distribution : Japan (Yokokana).

3. ***Caenocryptoides maai*** Jonathan (Fig. 9 : h, i)

1999. *Caenocryptoides maai* Jonathan, *Rec. zool. Surv. India,* **97**(3) : 219. Male, Female, key, des., fig. Type : Female, China : Shaowu Hsien, Fukien, 1200-1500m (A.E.I., Florida). China : Shaowu Hsien, Fukien, 1200-1500m (A.E.I., Florida & Z.S.I., Calcutta).

This species is close to *Caenocryptoides tarsalis* (Matsumura) by having head and femur black, and first to third and eighth tergites apically, yellow. This species is recognised by its transversely striate pronotum, frons mat with dense punctures. Scutellum and metascutellum, yellow.

Female : Face strongly mat, with undefined setiferous punctures. Clypeus mat, its basal 0.75 with sparse to close, moderate sized punctures, its apical 0.25 smooth. Frons strongly mat in the middle with dense, setiferous punctures, towards the antennal sockets smooth. Vertex mat, in the ocellar triangle closely punctate. Temple subpolished with moderate sized close punctures. Malar space granulose. Pronotum largely in the middle and below coarsely trans-striate, sparsely punctate in between the striae, its upper area finely puncto-wrinkled, pronotal collar rugulose with fine scattered punctures. Epomia short but strong. Scutellum mat and dull, closely punctate, its lateral carina extending at its basal 0.2. Metascutellum smooth and subpolished. Mesopleurum moderately strongly trans-rugose, speculum shiny, distinctly punctate, area below sternaulus with small, close and shallow punctures, punctures running into fine striations; prepectal carina extending 0.8 the height of mesopleurum. Metapleurum in the upper half moderately strongly wrinkled, in the lower half finely trans-wrinkled. Juxtacoxal carina defined. Propodeum between basal carina and apex wrinkled, basad of basal carina with small and very dense punctures, punctures running into rugosities. First tergites in its 0.66 with close punctures, its apical 0.3 mat; second and third tergites also mat, with very dense punctures; following tergites mat and subpolished.

Black. 5th to 9th flagellar segments white. The following are yellow : pronotal collar at its extreme upper corner, scutellum, metascutellum (Fig. 9 : h), apices of first to third and seventh tergites narrowly, eighth tergite broadly in middle (Fig. 9 : i),

and extreme apices of fore and middle coxae. Second to fourth hind tarsal segments dirty white. Legs in general black, except their femora and tibiae dark brown. Wings hyaline with light brownish tinge.

Male : Face minutely and densely punctate. Clypeus sparsely punctate. Frons mat, with minute and dense punctures. Vertex minutely and closely punctate. Temple sparsely punctate. Pronotal scrobes coarsely striate, upper margin with deep, close to sparse punctures, collar largely smooth and shiny, with a few minute punctures along the margin. Mesopleurum from the base of middle coxa to base of subtegular ridge strongly wrinkled; speculum, area above sternaulus anteriorly and mesosternum punctate, punctures deep, close to sparse. Metapleurum with strong, moderately large and close punctures. Propodeum between basal carina and apex strongly wrinkled, at some places appears to be reticulate, basad of basal carina with small to large but shallow punctures. First tergite in the middle with coarse shallow and sparse punctures, following tergites mat, except second and third tergites with weak setiferous punctures.

Black. 14th to 20th flagellar segments whitish. The following are yellow : face, clypeus, mandible except the teeth, malar space, temple along the eye margin, frons with two lateral longish-oval marks, scutellum, metascutellum, tegula, subtegular ridge, apices of all the abdominal tergites, fore and middle coxae and trochanters. Fore and middle femora and tibiae yellowish-brown, their tarsi dark brown. Hind leg largely black, except extreme apex of coxa, femur and tibia along the inner margin yellowish-brown, apical 0.25 of its first tarsal segment to basal 0.5 of fifth segment white. Wings hyaline with brownish tinge.

Variation : Males are variable in colour, having pronotal collar, mesosternum, a small oval mark above sternaulus, area near the base of hind wing, metapleurum above, propodeum almost wholly, first tergite, fore and middle legs largely, deep yellow to reddish-yellow. Hind tarsus white except basal 0.3 of first segment black.

Length : Female, 11–12.5 mm; fore wing 8.5–9.5 mm; ovipositor sheath about 3–4 mm. Male, 9–10 mm; fore wing 6.5–7.5 mm.

Distribution : China (Shaowu Hsien, Fukien).

4. ***Caenocryptoides nigrifacies*** Jonathan (Fig. 10 : a–d)

1999. *Caenocryptoides nigrifacies* Jonathan, *Rec. zool. Surv. India,* **97**(3) : 220. Female, key, des., fig. Type : Female, Japan : Yokohama, Kanagawaken (A.E.I., Florida).

This species is close to *Caenocryptus flavescens* Jonathan in having face largely subpolished and punctate. Hind femur in its basal 0.6, upper margin of pronotum, propodeum apically and all the abdominal tergiters narrowly at apex, yellow. It is readily distinguished by having head largely black, upper margin of pronotum with two small yellow marks, all coxae black and mesopleurum with a small yellow mark near the base of middle coxa.

Female : Face subpolished, mat, closely punctate above, sparsely towards the eye margin and clypeal groove. Clypeus sparsely punctate, towards the apex smooth. Malar space granulose. Frons and vertex mat, frons in front of ocellar triangle ruguloso-punctate, towards the antennal sockets largely smooth and subpolished. Vertex with close to sparse punctures. Temple shiny, with sparse and fine punctures. Scutellum shiny, minutely and sparsely punctate, its lateral carina extending at its basal about 0.25. Metascutellum almost smooth and polished. Pronotum in the middle moderately strongly wrinkled, its collar rough with sparse large punctures, upper margin of pronotum with dense deep punctures. Epomia short. Mesopleurum largely finely rugoso-wrinkled, speculum closely punctate, below sternaulus finely and closely punctate, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum densely punctate; juxtacoxal carina not present. Propodeum between basal carina and apex moderately strongly wrinkled, at some places appears to be reticulate, basad of basal carina weakly and densely punctate. First tergite in the middle with coarse and close punctures, towards the base and apex smooth. Second and third tergites mat, densely punctate, following tergites mat and subpolished.

Black. The following are yellow : 4th to 9th flagellar segments, a small mark near the lower margin of malar space, base of mandible (Fig. 10 : a), two small mark on upper margin of pronotum, scutellum broadly, anterior corner of tegula, subtegular ridge, an oval mark on mesopleurum near the base of middle coxa, apices of all the abdominal tergites narrowly (Fig. 10 : b, c). Legs in general black, all the femora and tibiae yellowish-brown and their tarsi dark brown, except apical 0.3 of hind femur and extreme apex and base of tibia, blackish. Hind tarsus yellowish-white, except basal 0.5 of first and fifth segments wholly blackish (Fig. 10 : d). Wings clear hyaline.

Male : Unknown.

Length : Female, 12 mm; fore wing 9 mm; ovipositor sheath 4.5 mm.

Distribution : Japan (Yokohama, Kanagawaken).

5. ***Caenocryptoides flavescens*** Jonathan (Fig. 10 : e–h)

1999. *Caenocryptoides flavescens* Jonathan, *Rec. zool. Surv. India,* **97**(3) : 221. Female, key, des., fig. Type : Female, India : Meghalaya : Cherrapunji, 1273m in Khasi Hills (Z.S.I., Calcutta).

This species is distinguished from other species by having its body largely marked with yellow.

Female : Face subpolished, in the middle with close and moderately deep punctures, near the eye margin mat and shallowly punctate. Clypeus subplished with close to sparse, small punctures, towards the apex smooth and shiny. Mandibles, except the teeth with close fine punctures. Frons in the middle moderately strongly rugoso-

punctate. Vertex mat with fine and close punctures. Temple subpolished, sparsely and finely punctate. Malar space granulose, 0.5× the basal width of mandible. Pronotum strongly wrinkled and carinate in the middle, its upper area and pronotal collar closely punctate. Epomia short but strong. Scutellum shiny, sparsely punctate, lateral

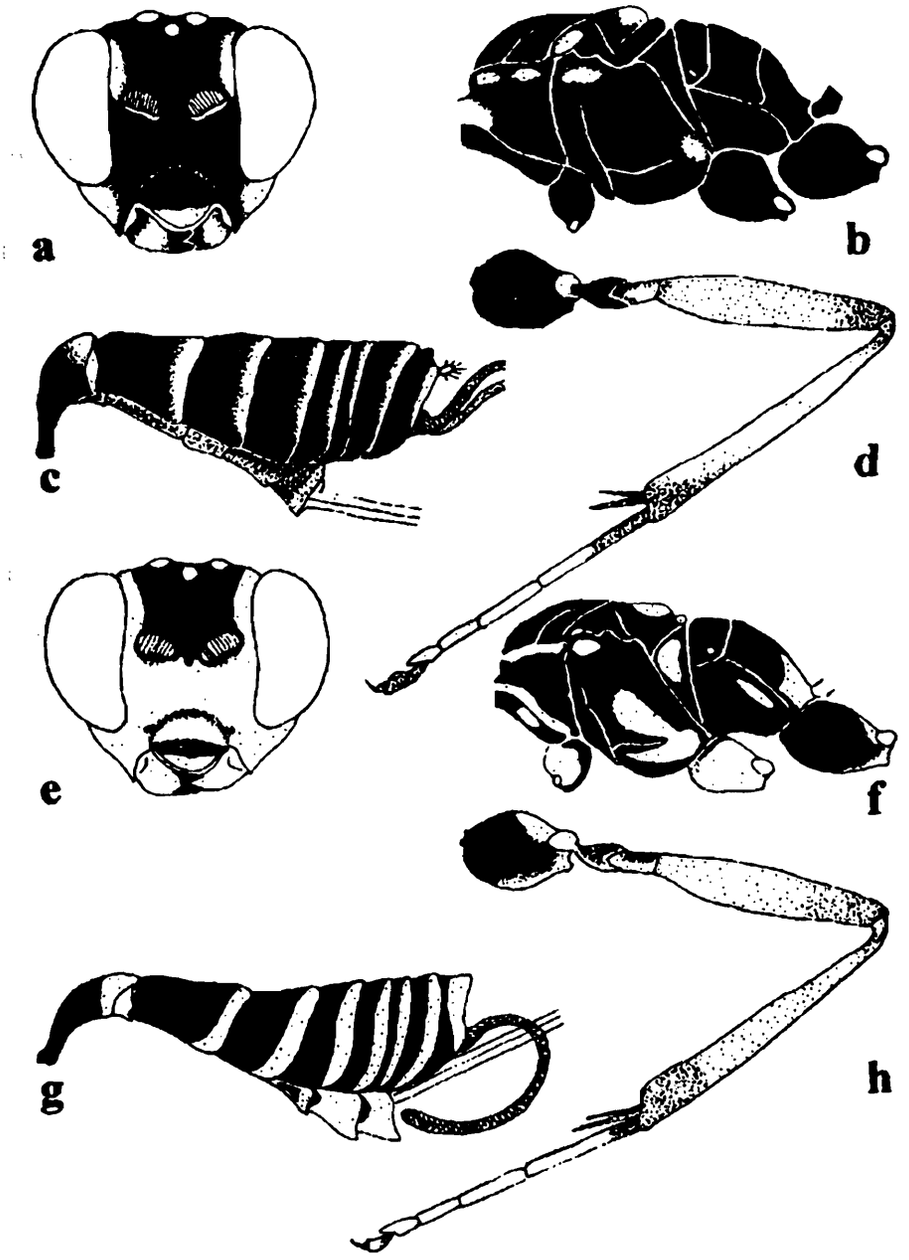

Fig. 10. *C. nigrifacies* Jonathan : Colour pattern : **a**, head front view; **b**, thorax side view; **c**, abdomen side view; **d**, hind leg. *C. flavescens* Jonathan : colour pattern : **e**, head front view; **f**, thorax side view; **g**, abdomen side view; **h**, hind leg.

carina extending to its basal 0.25. Metascutellum smooth and shiny. Mesopleurum finely rugoso-winkled in the middle, trans-wrinkled above near subtegular ridge, mesosternum and area above sternaulus with fine dense punctures, punctures running into fine aciculations, prepectal carina extending about 0.85 the height of mesopleurum, speculum shiny with small, deep and sparse punctures posteriorly. Metapleurum

finely trans-wrinkled, in the center appears to be finely reticulate, juxtacoxal carina not present. Propodeum between basal carina and apex finely wrinkled, in the center appears to be reticulate, basad of basal carina with moderate sized dense and deep punctures. First tergite mat and subpolished, except at the extreme base and apex with moderate sized deep puncturres. Following tergites mat, second and third tergites densely and finely punctate, fourth with setiferous punctures.

Black. 4th to 10th flagellar segments white above. The following are yellow : Face except for a small spot near antennal bases, clypeus except the clypeal groove and apical margin, mandible except the teeth, malar space, frons and vertex along the eye margin, temple broadly along the eye margin (Fig. 10 : e), an oval mark on propleurum, pronotal collar, upper margin of pronotum, tegula, scutellum, metascutellum, subtegular ridge, mesopleurum with a broad irregular mark, metanotum near the base of hind wing, metapleurum with a small spindle-shaped mark above, propodeum with a broad heart-shaped mark (Fig. 10 : f), and apices of all the abdominal tergites (Fig. 10 : g). All the coxae and trochanters yellow, except fore the middle coxae at the inner side and hind coxae broadly at sides and first trochanteral segment above, black, rest of legs in general brownish-yellow, except fore and middle femora and tibiae with a line dorsally and their tarsi almost wholly, apical 0.3 of hind femur, tibia at extreme base and apex and tarsus at extreme base, dark brown to black, (its fifth tarsal segment and claws broken), rest of tarsus white (Fig. 10 : h). Wings clear hyaline.

Male : Unknown.

Length : Female, 13.5 mm; fore wing 10.5 mm; ovipositor sheath 4.5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1273m in Khasi Hills).

4. Genus ***Ischnus*** Gravenhorst (Fig. 11 : a–c)

1829. *Ischnus* Gravenhorst, *Ichneumonologia europia,* **1** : 638. Type-species : (*Ichneumon porrectorius* Fabricius) = *inquisitorius* Mueller; designated by Westwood, 1840.

1878. *Habrocryptus* Thomson, *Opuscula entomologia,* **5** : 498. Syn. in Dalla Torre, 1902. Type-species : (*Ichneumon porrectorius* Fabricius) = *inquisitorius* Mueller; designated by Viereck, 1914.

1903 *Aglaocryptus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 31. Type-species : *Aglaocrypus curvimaculatus* Cameron; designated by Viereck, 1914. Syn. by Townes, Townes and Gupta, 1961.

1905 *Erythrocryptus* Cameron, *Invertebrata Pacifica,* **1** : 126. Type-species : (*Erythrocryptus rufus* Cameron) = *inquisitorius atriceps* Cresson. Monobasic. Syn. by Townes, Townes and Gupta, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 163. Townes, 1970 : 173. Gauld, 1984 : 161.

Hosts : Lepidopterous pupae.

Distribution : Worldwide.

This genus is characterised mainly by having base of first tergite with lateral tooth that is sharp or atleast from dorsal view it is angular. Front side of the areolet short, intercubiti convergent. Propodeal spiracle about 1–1.5× as long as wide. Clypeus strongly convex and mesoscutum mat and densely punctate.

Body slender to moderately stout. Clypeus strongly convex and often pyramidal in profile, its apical margin convex and without any distinct tooth. Malar space 0.6–0.8× the width of mandible at base. Mandible with almost equal teeth. Apical 0.3 of female flagellum enlarged, not flatterned below, tapered toward the tip. Mesoscutum largely mat and densely punctate, notauli extending beyond the middle. Propodeal spiracle roundish, apical carina usually present, sometimes weak or absent medially, laterally forming weak crest-like apophyses. First abdominal tergite moderately slender with a lateral weak or acute tooth, its spiracle near apical 0.4, its ventro-lateral carina complete, dorso-lateral carina weak, median-dorsal carinae, if present reaching to little behind spiracles. Second tergite largely mat and densely punctate. Ovipositor sheath about 0.7× as long as hind tibia, ovipositor slender, compressed, its tip narrowly sagittate. Wing venation as shown in figure.

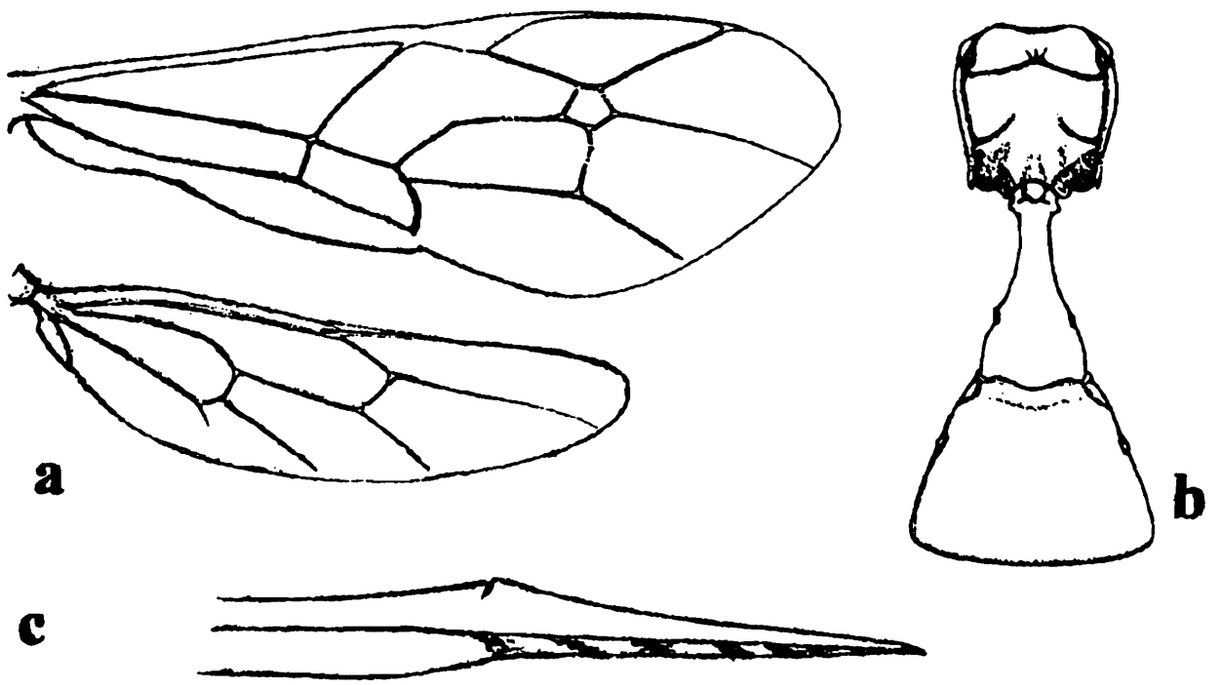

Fig. 11. *Ischnus* Gravenhorst : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

This is a moderately large genus of almost worldwide distribution, except Australian region. The genus include two species viz., *Aglaocryptus curvimaculatus* Cameron, 1903 and *A. striatifrons* Cameron, 1903 from Oriental Region. In addition, two new species are described here from India. These can be distinguished by the following key :

Key to the species of *Ischnus*

1. Face black with a median V-shaped yellow mark. Mesopleurum below sternaulus without any mark (black). Frons strongly wrinkled with a strong median carina. Second and third tergites strongly granulated, dull, without distinct punctures. Propodum with a bow-shaped mark. Ovipositor tip long, 9× as long as wide at nodus. India : Meghalaya ..... 1. *striatifrons* (Cameron)

– Face completely yellow, mesopleurum below sternaulus with or without a yellow mark. Frons rugose or striate, with or without median carina. Second and third tergites weakly granulated, with small to large, shallow to deep punctures. Propodeum with a broad to very broad trilobate mark. Ovipositor tip about 5–6× as long as wide at nodus 2

2. Mesopleurum below sternaulus black. Mesopleurum in the middle with broad irregular yellow mark. Nervellus intercepted at its lower 0.45. Postpetiole long, about 1.6× as long as wide at base. India : Meghalaya .... 2. *curvimaculatus* (Cameron)

– Mesopleurum below sternaulus in the middle with moderate sized spindle-shaped yellow mark (mark sometimes faint). Mesopleurum with speculum wholly, a mark infront of speculum and a mark near base of middle coxa, which may also joins mesosternal mark. Nervellus intercepted at its lower 0.2–0.4. Postpetiole short, about 1.1–1.2× as long as wide at base 3

3. Middle lobe of mesoscutum at base with two lateral marks. Frons with a median longitudinal carina and a few longitudinally running striae. Temple sparsely punctate. Malar space about 0.8× the basal width of mandible. India : Sikkim; Uttaranchal. Myanmar. ..... 3. *bimaculatus,* sp. nov.

– Middle lobe of mesoscutum without any mark at base. Frons without median longitudinal carina, striae not longitudinal but obliquely diverging outwardly. Temple smooth and shiny. Malar space about 0.6× the basal width of mandible. India : Maharashtra; Karnataka ..... 4. *emaculatus,* sp. nov.

1. ***Ischnus striatifrons*** (Cameron), n. comb. (Fig. 12 : a, b)

1903. *Aglaocryptus striatifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.,* **47**(14) : 33. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Ischnus striatifrons* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 163. Syn.

1970. *Nippocryptus striatifrons* : Townes, *Mem. Amer. Ent. Inst.*, **12** : 191. n. comb.

Readily distinguished by having a V-shaped yellow mark on face. Mesopleurum entirely black. Frons strongly wrinkled, with a strong median carina, second to third tergites strongly granulated. Propodeum with a bow-shaped mark and ovipositor tip about 9× as long as wide at nodus.

Female : Body largely subpolished. Face minutely and densely punctate, punctures tending to be shallow and indistinct toward the eye margin. Clypeus with minute and close punctures, towards the apex smooth and shiny. Malar space granulose, 0.55× the basal width of mandible. Frons moderately strongly obliquely wrinkled, towards the base of antennae trans-striate, median longitudinal carina extending down from median ocellus strong, area at sides with coarse, shallow and sparse punctures. Vertex in ocellar triangle punctate, behind mat. Temple wholly finely and closely punctate. Pronotal scrobe moderately strongly trans-wrinkled, pronotum above strongly punctate, pronotal collar closely and shallowly punctate, punctures close above, coarse and sparse towards the base of fore coxa, epomia short but strong. Scutellum distincly coarsely punctate, lateral carina extending at its basal 0.3. Metascutellum almost smooth and shiny, with 2-3 indistinct punctures. Mesopleurum largely strongly rugose, rugae tending to be transverse towards the base of middle coxa, area above sternaulus near prepectal carina and mesosternum minutely and densely punctate, speculum smooth and shiny, prepectal carina extending up to the base of subtegular ridge. Metapleurum finely transversely rugoso-wrinkled; juxtacoxal carina faintly indicated. Propodeum between basal carina and apex moderately strongly wrinkled, basad of basal carina with small dense punctures, at some places punctures running into fine striations, both the transverse carinae distinct, apical carina weak sublaterally, apophyses moderately strong. First tergite largely mat, with a few scattered shallow punctures, its apex smooth and shiny; second and third tergites strongly granulose, granulation due to very fine and dense setiferous punctures, following tergites smooth and subpolished. Nervulus slightly basad of basal vein. Nervellus intercepted at its basal 0.27. Ovipositor tip long, about 9× as long as wide at nodus.

Black. Antennal flagellar segments from apex of 4th to base of 11th segments above white. The following are yellow : Scape, face in the middle, clypeus except at the apex, mandible except the teeth, orbits all along the eye margin, pronotal collar, upper margin of pronotum, a round spot at the apex of middle lobe of mesoscutum, tegula, subtegular ridge, speculum, an elongate mark on mesopleurum above middle coxa, an oval mark in front of this mark, this mark narrowly joining with the former mark or distinctly separated, metapleurum with an elongated mark along the pleural carina, scutellum, metascutellum, propodeum with a bow-shaped mark (Fig. 12 : a), apices of all the abdominal tergites, fore and middle coxae and trochanter. Rest of fore and middle legs yellowish-brown, their tarsi dark brown; hind coxa, trochanter and

femur reddish, except with an oval yellow mark above coxa, tibia brownish-yellow, its apex dark brown, tarsus white except basal 0.3 of first and fifth segment wholly dark brown (Fig. 12 : b). Wings clear hyaline.

Male : Unknown.

Length : Female, 8.2–11 mm; fore wing 7.5–8.75 mm; ovipositor sheath 2.8–4 mm.

Distribution : India : Meghalaya.

Remarks : This species was transfered to genus *Nippocryptus* Uchida by Townes (1970 : 191), but on examination of the type specimen it was found that it belongs to genus *Ischnus* not to *Nippocryptus.*

2. ***Ischnus curvimaculatus*** (Cameron) (Fig. 12 : c, d)

1903. *Aglaocryptus curvimaculatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47(14)** : 31. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Ischnus curvimaculatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 163. Syn.

1970. *Ischnus curvimaculatus* : Townes, *Mem. Amer. Ent. Inst.*, **12**(2) : 173. Syn.

1987. *Ischnus curvimaculatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 786.

This species is distinguished by having nervellus intercepted at its lower 0.45. Pospetiole long and about 1.6× as long as wide at base. Frons without a median carina. Face, and a broad irregular mark on mesopleurum, yellow.

Female : Body largely subpolished. Face rugulose in the middle, granulose at sides. Clypeus largely smooth with a few scattered shallow punctures. Malar space granulose, 0.75× the basal width of mandible. Frons rugose in the middle, rugae somewhat radiating towards the eye margin, at sides sparsely and shallowly punctate; along to eye margin smooth. Vertex and temple smooth without distinct punctures, except for a few minute punctures in the ocellar triangle. Pronotumn in the middle somewhat trans-rugose, above rugoso-punctate, punctures not well defined; pronotal collar longitudinally striate with a few punctures in between the striae; epomia short, present only in the middle groove. Scutellum closely and shallowly punctate, punctures running into logitudinal striations; lateral carina extending at its basal 0.45. Matascutellum shallowly punctate. Mesopleurum weakly trans-rugose in the middle, below subtegular ridge trans-striate; speculum deeply punctate, shiny; area below sternaulus mat, with dense shallow punctures; prepectal carina extending more or less up to the base of subtegular ridge. Metapleurum finely trans-striate, except along the metapleural fold strongly striate, juxtacoxal carina absent. Propodeum between basal carina and apex strongly mat, at sides with dense shallow punctures, punctures running into striations; basal carina complete; apical carina weak, laterally forming weak lateral crests or absent laterally. First tergite largely smooth and shiny, its petiolar area with sparse shallow punctures. Second and third tergites weak to strongly

granulose with small dense shallow punctures, following tergites mat and subpolished. Nervulus basad of basal vein by 1.5× the width of the vein, nervellus intercepted at its lower 0.45.

Black. 6th–11th flagellar segments above white. The following are yellow : Scape in front, face (except in between the antennal sockets), clypeus, malar space, orbital mark all along the orbit; pronotal collar, upper margin of pronotum, an oval mark at the apex of middle lobe of mesoscutum, tegula, subtegular ridge, scutellum and metascutellum, mesopleurum with an elongated mark, base of hind wing, an oval mark on metapleurum, a broad trilobate mark at the apex of propodeum, (Fig. 12 : c) apices of first to sixth abdominal tergites, seventh and eighth tergites almost wholly, fore and middle coxae. Rest of fore and middle legs, yellowish-brown, tarsi tending to be more darker. Hind leg with coxa, trochanter and femur reddish, except coxa sometimes with an oval yellow mark above, tibia yellowish-brown, its extreme base and apex dark brown, tarsus white, except basal 0.6 of first segment and fifth segment wholly black (Fig. 12 : d). Wings clear hyaline.

Male : Not known.

Length : Female, 6.75–10 mm; fore wing 6–8 mm; ovipositor sheath 2–2.5 mm.

Distribution : India : Meghalaya.

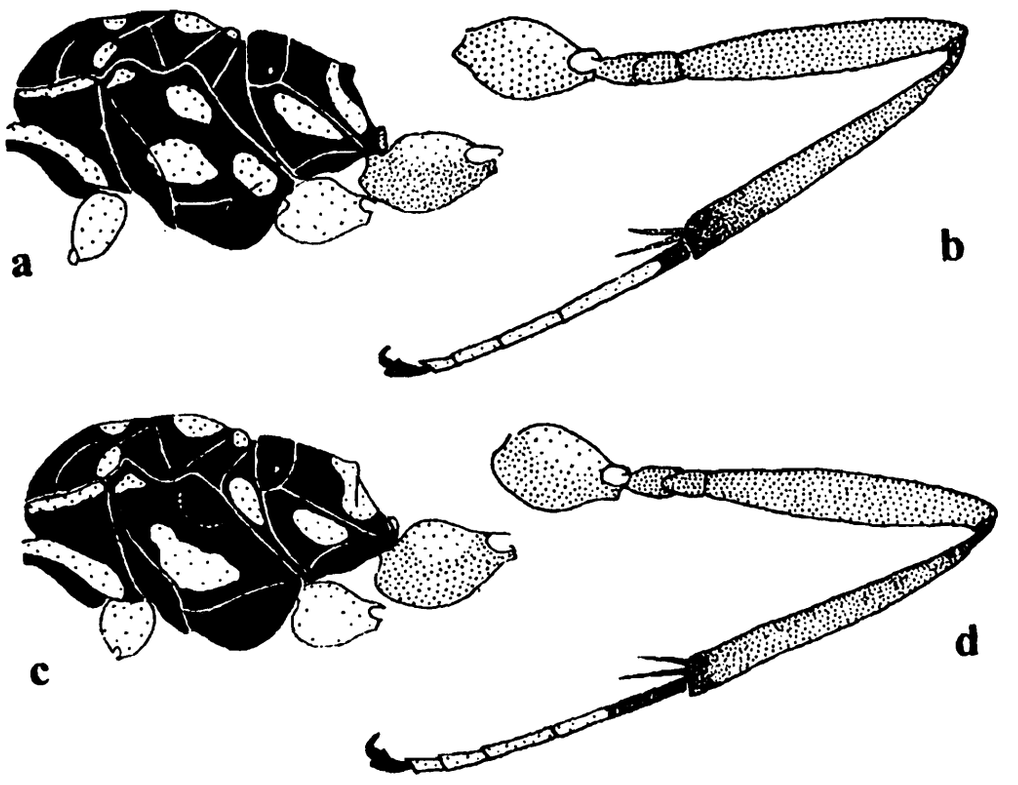

Fig. 12. Showing colour pattern. *Ischnus striatifrons* (Cameron) : **a**, side view of thorax; **b**, hind leg. *Ischnus curvimaculatus* (Cameron) : **c**, side view of thorax; **d**, hind leg.

3. ***Ischnus bimaculatus*** Jonathan, sp. nov. (Fig. 13 : a–c)

This species is close to *Ischnus emaculatus* by having postpetiole less than 1.3× as long as wide at base and mesopleurum below sternaulus with a spindle-shaped mark. It can be distinguished by having two lateral marks on mesoscutum; frons with median longitudinal carina, malar space about 0.8× the basal width of mandible.

Female : Body largely subpolished. Face and clypeus sparsely and shallowly punctate, punctures on face with longitudinally running rugosities; clypeus apically smooth and shiny, and medially strongly swollen. Malar space granulose, 0.8× the basal width of mandible. Mandible sparsely punctate at base. Frons in the middle with a median carina and a few longitudinal striations, at sides smooth. Vertex in the ocellar triangle with a few deep punctures, rest largely smooth. Temple largely shiny, with weak sparse punctures. Pronotal scrobe strongly striate, upper margin distinctly and pronotal collar weakly punctate, epomia short but strong. Scutellum with coarse shallow punctures, punctures running into rugosities, lateral carina extending at its basal 0.4. Matascutellum with coarse and shallow punctures. Mesopleurum in the middle moderately strongly rugoso-wrinkled, subtegular ridge shiny, with coarse and shallow punctures, area above middle coxa and mesosternum with moderately deep and close punctures, speculum polished, with indication of small and sparse punctures, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum rugoso-wrinkled, wrinkles strong and transverse toward metapleural fold; juxtacoxal carina not distinct. Propodeum between basal carina and apex finely wrinkled, towards the base at sides appears to be reticulate, basad of basal carina mat and densely punctate; apical carina not distinct except lateral crests. First tergite largely smooth and shiny except for a few large shallow scattered punctures near the spiracular region. Second and third tergites mat, with moderately large and dense punctures, punctures on third tergite weak; following tergites smooth and subpolished. Nervulus opposite or slightly basad of basal vein. Nervellus intercepted at its lower 0.4. Ovipositor tip about 5× as long as wide at nodus.

Black. Antennal flagellar segments 5th to 12th white above. The following are yellow : Scape in front, face, clypeus (except the apical margin), mandible (except the teeth), orbit broadly all along the eye margin, pronotal collar and upper margin of pronotum broadly, middle lobe of mesoscutum with an oval mark at apex and two linear small to large spots at base (Fig. 13 : b), scutellum and metascutellum wholly, tegula, subtegular ridge, speculum wholly, an oval mark in front of this mark and an elongated mark near the base of middle coxa, this mark extends on mesosternum below sternaulus and some times joining with the mark in front of it, metapleurum with a broad oval mark, propodeum with a trilobate mark (Fig. 13 : a), apices of all the abdominal tergites, fore and middle coxae and trochanters. Rest of fore and middle legs, reddish-yellow, their tarsi darker towards the apex. Hind coxa black with an irregular yellow mark, first trochanteral segment dark brown; second segment,

femur and tibia, reddish-yellow, except the extreme apex of femur and base and apex of tibia, blackish; tarsus white except basal 0.5 of first segment and fifth segment wholly, black (Fig. 13 : c). Wings clear hyaline.

Male : Not known.

Length : Female, 7.2–10 mm; fore wing 5.75–8 mm; ovipositor sheath 1.75–2.5 mm.

Holotype : Female, INDIA : Sikkim : Gangtok, 1571m, 11.v.1966, T. Chand, Coll. No. T 244 (Z.S.I., Calcutta). Paratypes 16 Females. INDIA : Sikkim : Gangtok, 1571m, 2 Femals, 12–17.v.1966 Colls. V.K. Gupta and M.K. Kamath, Colln. Nos. 177 & K 111. Himachal Pradesh : Manali, 1824m, 3 Females, 18–23.v.1970 & 1 Female, 4.vi.1970, Colls. M.K. Kamath, D. Ram and T. Chand, Colln. Nos. K. 213, 220 & 226. Khajjiar, 1 Female, 23.vii.1965. J.K. Jonathan, Colln. No. J46. Uttaranchal : Garjia, Dibri village, 4 Females, 11–13.iv.1968, D. Ram, Colln. Nos. 303 & 305. Dehradun, New Forest, 1 Females, 1.iv.1966, V.K. Gupta Colln. No. 151. Dhunia in Kumaon Hills, 1 Females, 12.iv.1965, J.K. Jonathan, Colln. No. J15 (Z.S.I., Calcutta). Myanmar : Mt. Popa, 600-1000m, 2 Females, xi.1937; 1 Female, x.1937, Coll. G. Heinrich (A.E.I., Florida).

Distribution : India : Sikkim; Himachal Pradesh; Uttaranchal. *Elsewhere* : Myanmar.

4. ***Ischnus emaculatus*** Jonathan, sp. nov. (Fig. 13 : d–f)

This species is close to *Ischnus bimaculatus,* but can be recognised by having middle lobe of mesoscutum entirely black; frons without a median logitudinal carina, striae on frons obliquely outwardly diverging, Temple smooth and shiny and malar space 0.6× the basal width of mandible.

Female : Body largely subpolished. Face finely rugoso-punctate in the middle, punctures small and shallow, area at sides mat, sparsely and shallowly punctate. Clypeus sparsely and shallowly punctate. Malar space granulose, 0.6× the basal width of mandible. Frons shiny, with fine sparse diverging striae in the middle, at sides largely shiny with a few scattered punctures. Vertex at the ocellar triangle with a few deep punctures, behind minutely and sparsely punctate. Temple smooth and shiny. Pronotal scrobe with short transverse striations, pronotum above largely closely punctate with finely running striations, pronotal collar shallowly punctate. Epomia short but strong. Scutellum coarsely and closely punctate, its lateral carina extending at its basal 0.33. Matascutellum largely smooth and shiny. Mesopleurum in the middle finely trans-rugose, in between the rugae punctate, mesosternum and area above the base of middle coxa with moderately deep and close punctures, speculum smooth and shiny, prepectal carina extending almost up to the base of subtegular ridge. Metapleurum densely punctate, surface appears to be rugoso-punctate, juxtacoxal carina not defined. Propodeum in the middle and apicad of apical carina finely rugose,

basad of basal carina and between the transverse carinae at sides mat and densely punctate. First tergite sparsely punctate, second and third tergites, mat with large dense and deep punctures, third tergite largely mat with sparse and shallow punctures, following tergites smooth and subpolished. Nervellus intercepted at its basal 0.3.

Black. 6th to 10th flagellar segments white above. The following are yellow : Scape in front, face, clypeus (except clypeal grove and apical 0.25 of clypeus), base of mandible, orbital mark all along the eye margin (Fig. 13 : d), pronotal collar, upper margin of pronotum, an oval mark at the apex of middle lobe of mesoscutum, tegula, subtegular ridge, speculum, a spindle-shaped mark in front of speculum, a elongated hammer-shaped mark near the base of middle coxa on mesopleurum, this mark sometimes

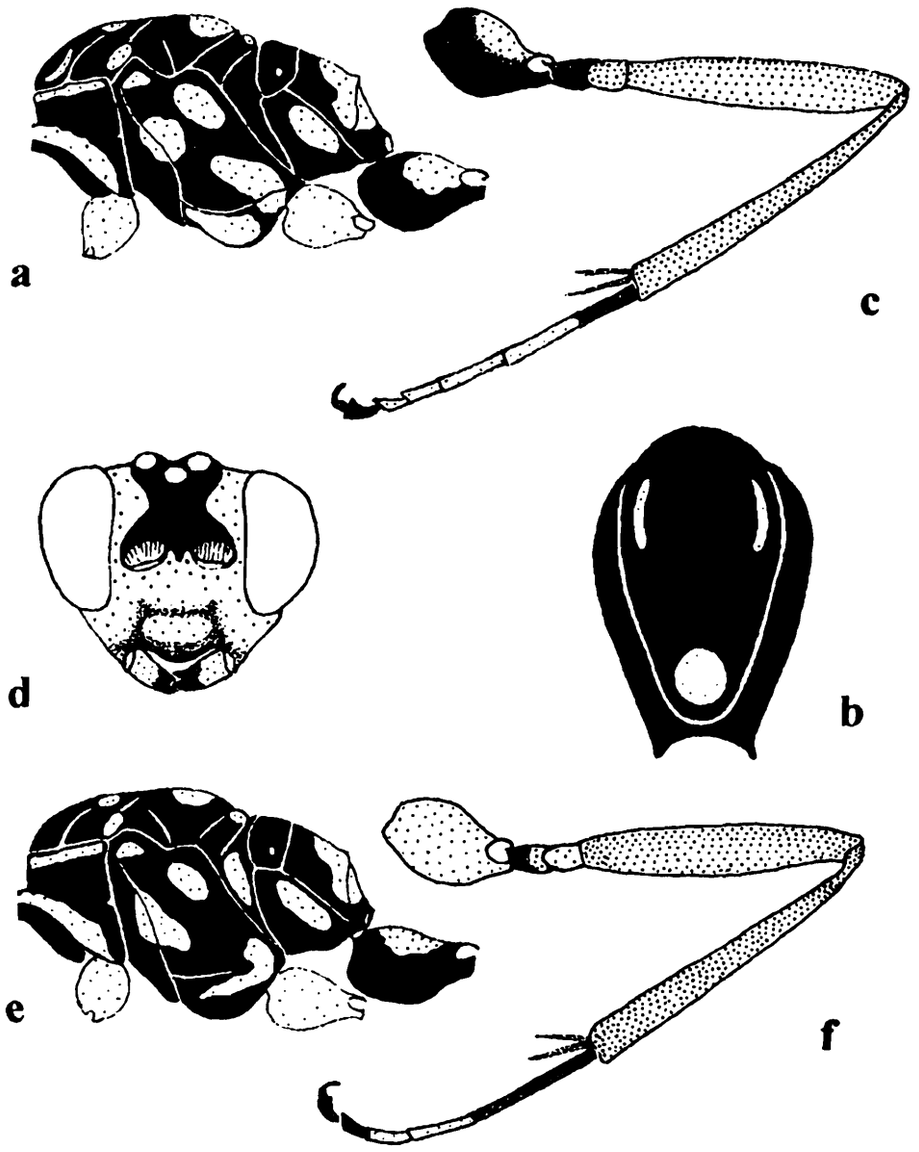

Fig. 13. Showing colour pattern. *Ischnus bimaculatus,* sp.nov. : **a,** thorax side view; **b,** dorsal view of mesoscutum; **c,** hind leg. *Ischnus emaculatus,* sp.nov. : **d,** front view of head; **e,** thorax side view; **f,** hind leg.

broken into two, base of hind wing, scutellum, metascutellum, metapleurum with a broad oval mark (Fig. 13 : e), propodeum with a trilobate moderately broad mark, apices of all the tergites, fore and middle coxae and trochanters. Rest of fore and middle legs reddish-yellow, except the apical tarsal segments dark brown. Hind coxa black with a irregular yellow mark and trochanters yellow, except a blackish mark at base, femur and tibia reddish-yellow, its first, fourth and fifth tarsal segments blackish, second and third white, sometimes with a brownish band on second and third tarsal segments (Fig. 13 : f). Wings clear hyaline.

Male : Similar to female, except more slender, polished, weakly sculptured. Second to fourth hind tarsal segments also white.

Length : Female, 8–10.5 mm; fore wing 6.5–8 mm; ovipositor sheath 2.25–2.8 mm. Male, 8.5 mm; fore wing 6.5 mm.

Holotype : Female, and *allotype* Male, INDIA : Maharashtra : Panhala Fort, 857m, 18.xi.1965, D.T. Tikar, Colln. No. T 115 (Z.S.I., Calcutta). *Paratypes* 5 Females, 1 Male, INDIA : Maharashtra : Panhala Fort, 857m. 3 Females, 1 Male, 18.xi.1965, J.K. Jonathan, No. J99 & D.T. Tikar, No. T 113 & T 115. Mahabaleshwar, 1285m, 1 Female, 13.xi.1965, M.K. Kamath, No. K 43. Karnataka : Gunji, 571 m, 1 Female, 22.xi.1965, J.K. Jonathan, No. J 100 (Z.S.I., Calcutta).

Distribution : India : Maharashtra; Karnataka.

5. Genus ***Glabridorsum*** Townes (Fig. 14 : a–c)

1970 *Glabridorsum* Townes, *Mem. Amer. Ent. Inst.*, **12** : 174. Type-species : *Gambrus stokesii* Cameron; original designation.

Taxonomy : Gauld, 1984a : 156.

Hosts : Species of Tortricidae and Xylorycidae.

Distribution : Indo-Australian region and Japan.

This genus can readily be distinguished by having mesoscutum polished and more or less impunctate and hairless. Clypeus rather small and strongly convex, without a median tooth.

Body slender. Thorax sometimes strongly convex in front. Clypeus 1.8× as long as wide, strongly convex and without apical median tooth, its apical margin arched or truncate. Malar space about 0.8–1.0× as long as the basal width of mandible. Mandible with its lower tooth equal to or slightly shorter than the upper tooth. Head behind the ocellar triangle flat. Mesoscutum polished, the front 0.15 to 0.33 of its length with fine setiferous punctures, rest polished, impunctate and hairless. Notauli sharp but not deep, reaching beyond the center of mesoscutum. Propodeal spiracles round,

apical carina of propodeum strongly sinuate, medially week or absent, laterally forming crest-like apophyses. Base of hind coxa moderately deep, with a very short vertical groove descending from its attachment on antro-basal face. Base of first tergite usually with a lateral tooth, its spiracle near its apical 0.43, ventro-lateral and dorso-lateral carinae complete but rather weak, and median-dorsal carinae present or absent, if present not extending beyond spiracle; second tergite weakly to moderately mat, its setiferous punctures usually weak and quite sparse, sometimes stronger and dense. Wing venation as in figure 14 : a, b except nervellus intercepted at its lower 0.25 to 0.4 and brachiella often short or absent. Ovipositor sheath about 0.7× as long as hind tibia. Ovipositor moderately stout, somewhat compressed, its tip segittate (Fig. 14 : c).

Length : Female, 4.75–8.5 mm; fore wing 4–6.5 mm; ovipositor sheath 1–2.5 mm.

Type-species : *Gambrus stokesii* Cameron.

Glabridorsum Townes is close to *Ischnus* Gravenhorst in having first tergite moderately slender, its spiracle near apical 0.25; clypeus strongly transversely convex and propodeal spiracle less than 1.5 times as long as wide. However, it is distinguished by having mesoscutum mostly and entirely polished, impunctate and hairless.

Townes (1970 : 174) and Gupta (1987 : 787) referred only one species viz., *Glabridorsum stokesii* Cameron from Australia. Jonathan (2000 : 159) added eight species from India and Nepal.

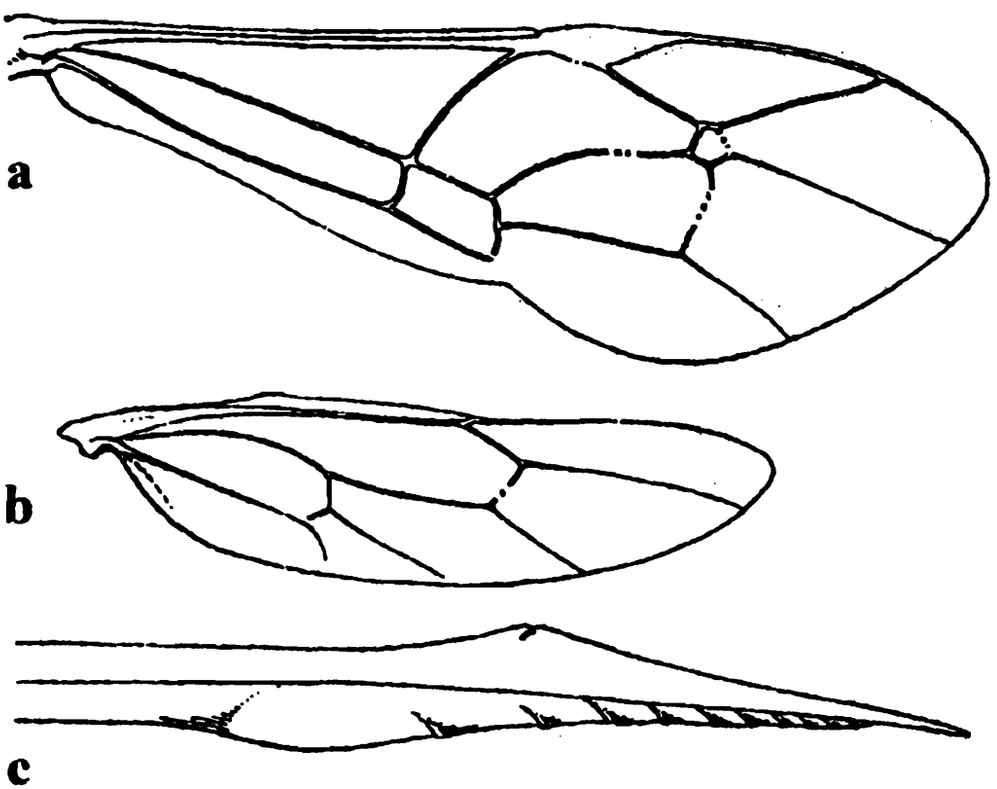

Fig. 14. *Glabridorsum* Townes : **a, b,** fore & hind wings showing venation; **c,** ovipositor tip. (Source : Townes, 1970).

Key to the species of *Glabridorsum*

1. First abdominal tergite with a lateral tooth at its base 2

– First abdominal tergite without a lateral tooth at its base 3

2. First abdominal tergite with a few scattered punctures, second and third tergites densely punctate, following tergite mat and subpolished. Nervellus intercepted at its lower 0.4. Face not black along clypeal groove. India : Uttaranchal; Jharkhand; Chattisgarh; Meghalaya ..... 1. *varibalteatum* Jonathan

– All abdominal tergites impunctate and subpolished. Nervellus intercepted at its 0.25. Face along clypeal groove black. India : Himachal Pradesh .... 2. *punctatum* Jonathan

3. Body with its posterior part of mesopleurum, metascutellum, metapleurum, propodeum, first tergite and legs in general, red. Third and fourth abdominal tergites totally black and without apical bands. India : Tamil Nadu .... 3. *glabrosum* Jonathan

– Body largely with black and yellow marks, and without red markings 4

4. Mesopleurum finely sparsely punctate 5

– Mesopleurum trans-striate or rugoso-striato-punctate 6

5. Upper margin of pronotum infront of notaulus strongly swollen like a tubercle; abdominal tergites smooth and shiny. Face black along clypeal groove, all abdominal bands narrowed in the middle. Nepal ..... 4. *nepalensis* Jonathan

– Upper margin of pronotum infront of notaulus not swollen; abdominal tergites mat and subpolished. Face not black along clypeal groove, abdominal bands on second and third tergites not narrowed in the middle. India : West Bengal; Meghalaya; Uttaranchal ..... 5. *similis* Jonathan

6. First and second tergites mat with sparse and shallow punctures. Mesopleurum marked yellow at subtegular ridge and also two oval marks, one below subtegular ridge and one near base of middle coxa. India : Himachal Pradesh; Uttaranchal ..... 6. *orbitalis* Jonathan

– First, second and following abdominal tergies mat and subpolished, without any punctation. Mesopleurum at subtegular ridge and a broad oblong mark in middle, and some times a small mark at speculum 7

7. Speculum black. Metapleurum with moderately large punctures, tending to be rugoso-punctate. India : Himachal Pradesh; J. & K. .....7. *semilunatum* Jonathan

– Speculum with a small yellow mark. Metapleurum trans-striato-punctate. India : West Bengal; Himachal Pradesh; Uttaranchal ..... 8. *simulatum* Jonathan

1. ***Glabridorsum varibalteatum*** Jonathan (Fig. 15 : a, b)

2000. *Globridorsum varibalteatum* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 161. Male, Female, key, des., fig. Type : Female, India : Uttaranchal : Garjia, 610m (Z.S.I., Calcutta). India : Uttaranchal : Garjia 610m; Jeolikote, 2660m. India : Uttaranchal : Garjia, Vill. Dibri 610m; Jharkhand : Ranchi, Namkum, Kunti, Ambero-Bero. Chattisgarh : Raigarh, 500m, Ratanpur in Bilaspur dist. Meghalaya : Jowai in Jaintia Hills (Z.S.I., Calcutta).

This species is close to *G. punctatum* Jonathan in having lateral tooth at the base of first abdominal tergite. It is also close to *G. simulatum* Jonathan in having similar markings on mesopleurum. However, it can be distinguished by having face not black along clypeal groove, first abdominal tergite with a few scattered punctures, second and third tergites densely punctate and nervellus intercepted at its lower 0.4 (Fig.).

Female : Body largely shiny. Clypeus smooth with a few scattered weak punctures. Face in the middle finely trans-striate, sparsely and shallowly punctatre at sides. Malar space granulose, 0.6× the basal width of mandible. Mandbile smooth, with a few weak punctures in the middle. Frons smooth and polished, median longitudinal groove not well defined. Vertex and temple smooth and polished. Pronotal scrobe all along strongly striate, its margin subpolished with sparse, moderately large and shallow punctures, pronotal collar more or less smooth, extreme upper margin of pronotum (when viewed from dorsal side) moderately strongly swollen, epomia short. Scutellum with a few sparse shallow punctures, its lateral carina confined to its base. Metascutellum smooth. Mesopleurum in the middle with coarse shallow punctures; area just below subtegular ridge anteriorly along speculum and near to prepectal carina closely to sparsely striate; speculum smooth and shiny. Mesosternum finely and closely punctate, mesopleural groove with short strong ridges, prepectal carina extending up to the base of subtegular ridge. Metapleurum with coarse shallow and close punctures, towards the juxtacoxal carina strongly wrinkled. Propodeum between basal carina and apex moderately strongly rugoso-wrinkled; basad of basal carina with irregular or distinct punctures, and short striae along the basal carina, spiracles round and small, both the transverse carinae present, apophyses low crest-like. First tergite with distinct basal lateral tooth, tergite mat with a few scattered shallow punctures, second and third tergites densely punctate, following tergites mat and subpolished, areolet pentagonal, moderate sized, about 0.6× as high as the portion of second recurrent vein above bulla. Nervulus opposite to basal vein. Nervellus intercepted at its lower 0.4 (Fig. 15 : a).

Black. 7th to 16th (sometimes 6th–18th) antennal flagellar segments distinctly white. The following are brownish : Flagellum with scape, pedicel, first and second segments brownish in front. The following are yellow : Face, clypeus, except some times at sides, mandibles except the teeth, orbital mark all along the eye (Fig. 15 : a), upper margin of pronotum, pronotal collar, a roundish mark at the apex of middle lobe of mesoscutum, metascutellum, tegula, subtegular ridge, speculum, a broad

elongate-oval mark in the middle of mesopleurum, metanotum near the base of hind wing, metapleurum broadly in the middle, an inverted horse-shoe-shaped mark on propodeum, all the tergites with apical bands. Legs in general reddish-brown, except fore and middle coxae and trochanters yellow and their apical tarsal segments light to dark brown. Hind coxa with an oval yellow mark above, and sometimes a brown mark at the apex of tibia, basal 0.25–0.75 of first tarsal segment, apical 0.5 to fourth and fifth segment wholly dark brown, Wings clear hyaline. First tergite at base and ventrally reddish-brown.

Male : Similar to female, except more polished, slender and weakly sculptured. Face and clypeus with a few indistinct punctures, rest of head smooth and shiny. Pronotum with a few short striae in the scrobes and along the posterior margin. Mesopleurum finely and closely punctate with fine trans-striations above.

Colour pattern also similar to female except as follows; 9th to 17th flagellar segments white, mesosternum also yellow, this mark joining with the broad oval mark on mesopleurum. Metapleurum almost wholly yellow. Mark on propodeum extensive. Apical 0.75 of first tergite yellow. Hind leg with coxa broadly yellow, except apically above black. Mark on trochanteral segments, apex of femur, apical 0.3 of tibia, base of first tarsal segment and 5th segment wholly, black.

Length : Female, 5–8.5 mm; fore wing 4–6.5 mm; ovipositor sheath 1.3–3.5 mm. Male, 6.5 mm; fore wing 5 mm.

Distribution : India : Uttaranchal, formerly Uttar Pradesh (Garjia 610m, Dibri Vill.; Jeolikote, 2660m in Kumaon Hills). Jharkhand, formerly Bihar (Ranchi, Namkum, Kunti, Amberobero). Chattisgarh, formerly Madhya Pradesh (Raigarh, Ratanpur in Bilaspur dist.). Meghalaya (Jowai in Jaintia Hills).

2. ***Glabridorsum punctatum*** Jonathan (Fig. 15 : c, d)

2000. *Globridorsum punctatum* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 163. Female, key, des., fig. Type : Female, India : Himachal Pradesh : Ahla, 2286m (Z.S.I., Calcutta). India : Himachal Pradesh : Dalhousie, 2133m; Manali, 1828m (Z.S.I., Calcutta).

This species is close to *G. varibalteatum* Jonathan in having lateral tooth at the base of first abdominal tergite and almost similar colour pattern. However, it can be distinguished by having all the abdominal tergites impunctate and polished and nervellus intercepted at its lower 0.25 (Fig. 15 : c). Face along clypeal groove, black.

Female : Body largely subpolished to shiny. Face finely and closely punctate. Clypeus sparsely punctate. Frons and vertex shiny with fine scattered punctures. Temple shiny with indistinct scattered punctures. Malar space granulose, 0.66× the basal width of mandible. Mandible distinctly punctate. Pronotum in the middle and in the scrobes coarsely and closely striate, its upper margin coarsely and shallowly

punctate, pronotal collar weakly punctate, epomia short, upper margin of pronotum not swollen. Scutellum with moderately large and sparse punctures, lateral carina confined to its base. Metascutellum with moderately close punctures. Mesopleurum and mesosternum coarsely and closely punctate, mesopleurum in the upper half with transverse striations, striae strong below subtegular ridge and along the speculum, speculum smooth and shiny. Metapleurum coarsely and closely punctate, wrinkled towards metapleural fold, juxtacoxal carina present. Propodeum between basal carina and apex moderately strongly wrinkled, basad of basal carina punctate, both the transverse carinae strongly present, apical carina sinuate, laterally forming weak crests-like apophyses, all the tergites mat and subpolished, first to third tergites with scattered setiferous punctures. Nervulus opposite to basal vein. Nervellus intercepted at its basal 0.25 (Fig. 15 : c).

Black. 6th to 12th flagellar segments white. Clypeus apically in the middle, face along the clypeal groove and sometimes also two longitudinal line, dark brown to black (Fig. 15 : d). Mark on speculum small, hind coxa red or reddish-brown, with an oval yellowish mark above and a dark brown area just below oval yellow mark; mark on propodeum also narrow like a sinuate band, rest of the colour similar to *G. simulatum* and *G. varibalteatum.*

Male : Not known

Length : Female, 6–8.5 mm; fore wing 4.75–6.5 mm; ovipositor sheath 1.5–2 mm.

Distribution : India : Himachal Pradesh (Ahla, 2286m; Dalhousie, 2133m and Manali, 1828m).

3. ***Glabridorsum glabrosum*** Jonathan (Fig. 15 : e)

2000. *Globridorsum glabrosum* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 165. Female, key, des., fig. Type : Female, India : Tamil Nadu : Kodikanal, 1958m (Z.S.I., Calcutta).

This species is readly distinguished by having largely smooth and polished body; posterior half of mesopleurum, metascutellum, metapleurum, first tergite and legs in general, red (Fig. 15 : e); third and fourth abdominal tergites totally black and without usual apical bands.

Female : Body largely shiny. Face, clypeus, frons and vertex smooth and polished, without any sculpture. Malar space 0.8× the basal width of mandibles. Pronotal groove and its posterior margin with a few striations, rest smooth and shiny; epomia moderately long. Scutellum and metascutellum smooth and shiny. Mesopleurum in the middle finely striate, along prepectal carina near sternaulus striato-punctate, speculum smooth and polished, prepectal carina extending (1.0) almost up to the base of subtegular ridge. Propodeum between basal carina and apex moderately strongly rugose, basad of basal carina mat and subpolished; its spiracle round and small, both

the carinae present except apical carina broadly interrupted in the middle and laterally forming distinct crest-like apophyses. First tergite without distinct basal lateral tooth, tergite largely smooth and shiny, second and third tergites mat and subpolished, following tergites smooth and shiny. Areolet in fore wing moderately large, pentagonal, about as high as the portion of second recurrent vein above bulla; nervulus opposite to basal vein, nervellus intercepted at its basal 0.4.

Black. 8th to 11th antennal segments white above. The following are whitish-yellow : orbit all along the eye margin, clypeus except its apical margin, extreme base of mandible, pronotal collar in its lower half, upper margin of pronotum, an oval mark on middle lobe of mesoscutum, scutellum, tegula, mesopleurum with its subtegular ridge, an oblong longish mark in middle, fore coxa wholly, its first trochanteral segment, an irregular mark on middle coxa above, apices of second and fifth to eighth abdominal tergites, and second to fourth hind tarsal segments. The following are red : posterior half of mesopleurum, metascutellum, metapleurum, propodeum, first tergite, middle and hind coxae (Fig. 15 : e). Legs in general red, except as stated above and their tibiae and tarsi reddish-brown and hind first and fifth tarsal segments, dark brown.

Male : Unknown.

Length : Female, 6.5 mm; fore wing 5.5 mm; ovipositor sheath 1.5 mm.

Distribution : India : Tamil Nadu (Kodaikanal, 1958m).

4. ***Glabridorsum nepalensis*** Jonathan (Fig. 15 : f–h)

2000. *Globridorsum nepalensis* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 166. Female, key, des., fig. Type : Female, Nepal : Phulchowki, 2400m (Z.S.I., Calcutta).

This species is close to *G. similis* Jonathan, but can be recognised by having upper margin of pronotum infront of notaulus strongly swollen like a tubercle, abdominal tergites smooth and shiny. Face black along clypeal groove, all abdominal apical bands narrowed in the middle.

Female : Clypeus with weak, fine scattered punctures. Face along the clypeal groove with fine and closely placed punctures. Malar space mat, 1.0× the basal width of mandible. Pronotum almost smooth and polished, epomia short, upper margin of pronotum in front of notaulus strongly swollen like a tubercle. Mesopleurum with fine and sparse punctures, speculum smooth, area infront of specullum with a few short weak ridges, prepectal carina extending up to the base of subtegular ridge, notauli moderately deep and not interrupted by short ridges. Scutellum and metascutellum smooth and shiny, lateral carina of scutellum confined to its base. Metapleurum below juxtacoxal carina closely punctate, above juxtacoxal carina with scattered shallow punctures. Propodeum largely smooth, except for a few punctures between apical and basal carinae and area near spiracles, basal carina sinuate, apophyses weak crest-

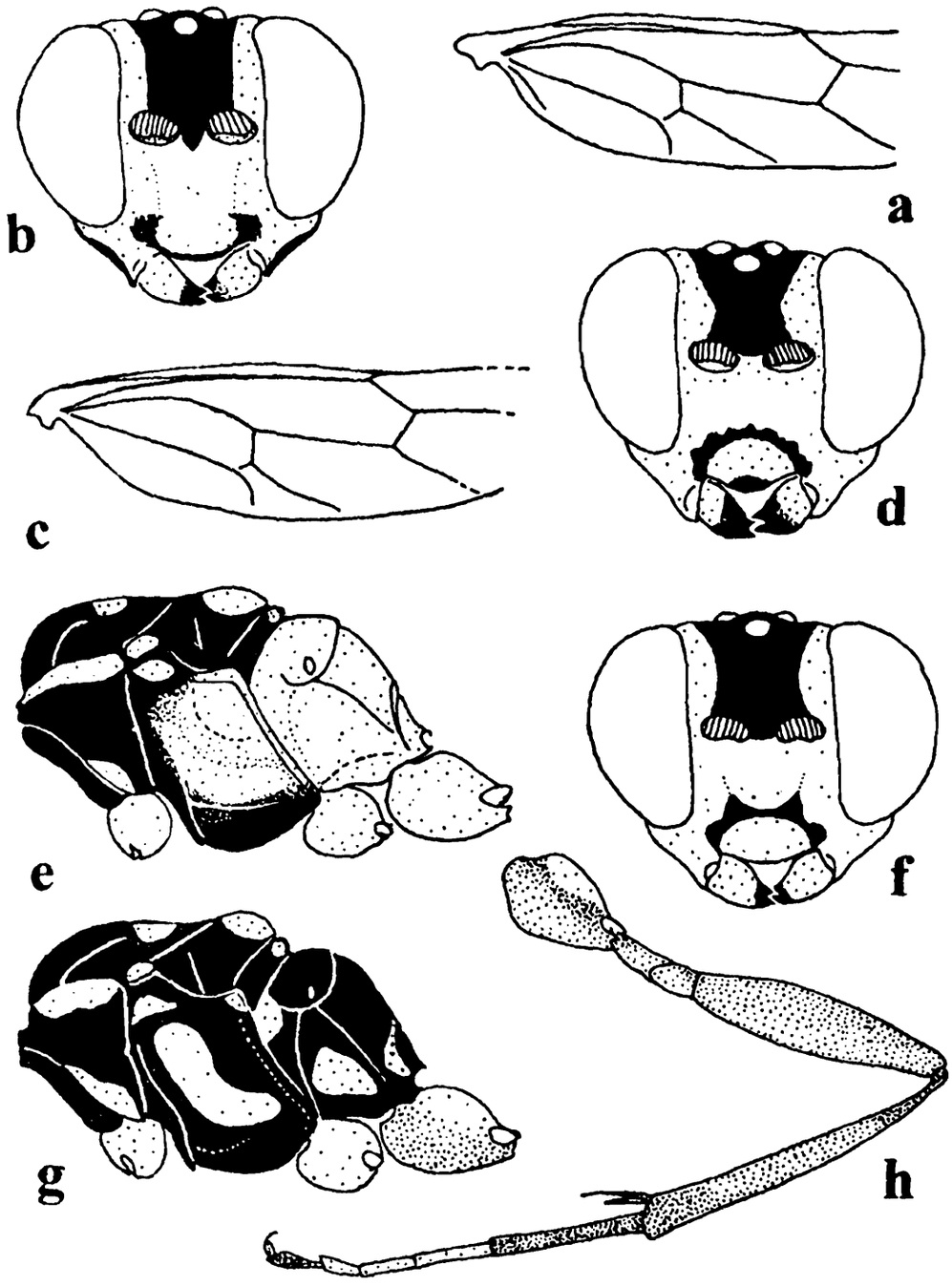

Fig. 15. *Glabridorsum varibalteatum* Jonathan : **a**, hind wing showing venation; **b**, front view of head showing colour pattern. *Glabridorsum punctatum* Jonathan : **c**, hind wing showing venation; **d**, front view of head showing colour pattern. *Glabridorsum glabrosum* Jonathan : colour pattern : **e**, side view of thorax. *Glabridorsum nepalensis* Jonathan : colour pattern : **f**, front view of head; **g**, side view of thorax; **h**, hind leg.

like, spiracle small round. First tergite without basal lateral tooth, tergite short and thick, smooth and shiny, without distinct punctures; following tergites smooth and shiny. Nervulus opposite to basal vein, nervellus intercepted at its lower 0.33.

Black. 8th to 12th flagellar segments white, scape in front brown. The following are yellow : Face, clypeus and orbits broadly along the eye margin, except face along the clypeal groove (Fig. 15 : f), pronotal collar, upper margin of pronotum, an oval mark on the middle lobe of mesoscutum, tegula, subtegular ridge, elongate-oval mark on mesopleurum, scutellum, metascutellum, near base of hind wing, metapleurum broadly, a ring shaped mark on propodeum (Fig. 15 : g), apices of all the tergites, band narrow in the middle, broad at sides; fore and middle coxae and their first trochanteral segment. Legs in general brownish-yellow. Hind coxa with an oval yellow mark above, its first trochanteral segment, apex of tibia, first and fifth tarsal segments, dark brown, its second to fourth tarsal segments white (Fig. 15 : h). Wings clear hyaline.

Male : Unknown.

Length : Female, 4.75 mm; fore wing 4.25 mm; ovipositor sheath 1 mm.

Distribution : Nepal (Phulchowki, 2400 m).

5. ***Glabridorsum similis*** Jonathan

2000. *Globridorsum similis* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 167. Female, key, des. Type : Female, India : West Bengal : Rangiroon, 1758m in Darjeeling Hills (Z.S.I., Calcutta). India : Meghalaya : Cherrapunji, 1272m in Khasi Hills; Uttaranchal : Mussoorie (Z.S.I., Calcutta).

Essentially similar to *G. nepalensis* Jonathan in sculpture and colour, except as follows :

Female : Face and clypeus minutely and sparsely punctate. Pronotum above not strongly swollen like a tubercle. Mesopleurum sparsely and minutely punctate anteriorly. Metapleurum and area basad of basal carina of propodeum densely and shallowly punctate. Abdominal tergites mat and subpolished.

Black. Face without black mark along the clypeal groove. Apical band on second and third tergites not narrowed in the middle.

Male : Not known.

Length : Female, 6 mm; fore wing 5 mm; ovipositor sheath 1.5 mm.

Distribution : India : West Bengal (Rangiroon, 1758m in Darjeeling Hills). Meghalaya (Cherrapunji, 1272m in Khasi Hills). Uttaranchal (Mussoorie).

6. ***Glabridorsum orbitalis*** Jonathan (Fig. 16 : a, b)

2000. *Glabridorsum orbitalis* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 167. Female, key, des., fig. Type : Female, India : Himachal Pradesh : Narkanda, 2571m in Shimla Hills (Z.S.I., Calcutta). India : Himachal Pradesh : Narkanda, 2571m in Shimla Hills; Dhenkund, 274m nr. Dalhousie; Chini Banglow, 1457m nr. Shimla; Kalatop, 2488m nr. Dalhousie. Uttaranchal : Dwali, 2743m in Kumaon Hills (Z.S.I., Calcutta).

This species is close to *G. semilunatum* Jonathan and *G. simulatum* Jonathan in having mesopleurum trans-rugoso-striate. However, it can be easily distinguished by having first and second tergites mat with sparse and shallow punctures, mesopleurum with two yellow oval marks.

Female : Body largely subpolished to shiny. Face and clypeus with small, sparse and shallow punctures, except face above with a few trans-striations and apical 0.3 of clypeus smooth and shiny. Mandible with fine and sparse punctures. Malar space granulose, 1.0× as long as basal width of mandible. Frons smooth and polished, with a shallow median vertical groove. Vertex smooth and shiny. Temple shiny sparsely and shallowly punctate. Pronotum largely trans-striate, its upper margin shiny, sparsely and shallowly punctate, pronotal collar with indistinct punctures, and weak fine aciculations, epomia short, upper margin of pronotum opposite to notaulus moderately strongly swollen. Scutellum sparsely and shallowly punctate, lateral carinae extending at its basal 0.25. Metascutellum smooth and subpolished. Mesopleurum below subtegular ridge trans-striate, further below rugoso-striato-punctate, mesosternum shiny with small and sparse punctures, speculum smooth and polished, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum finely trans-striate, juxtacoxal carina present. Propodeum between basal carina and apex largely finely obliquely wrinkled, towards the apex tending to be rugose, basad of basal carina with undefined sparse punctures, near spiracles rough, both the transverse carinae moderately strong and complete, apophyses crest-like. First tergite mat and subpolished with a few scattered shallow punctures, at base without lateral tooth. Second tergite mat with sparse and shallow setiferous punctures, following tergites mat and subpolished. Nervulus in fore wing opposite to basal vein, nervellus intercepted at its lower 0.4.

Black. 8th and 9th antennal flagellar segments distinctly white. The following are yellow : Face with a small to large squarish mark in the middle, clypeus except along the margin, base of mandible, face, frons, vertex, temple and malar space broadly, orbit all along the eye margin, upper margin of pronotum, pronotal collar below, middle lobe of mesoscutum at base, scutellum, metascutellum, subtegular ridge, an oval mark in front of speculum and another above the base of middle coxa on mesopleurum, a broad mark at the base of hind wing, a roundish mark at the base of metapleurum, a bow-shaped mark (all along the apical carina) on propodeum (Fig. 16 : a), apices of all the tergites, fore and middle coxae (except at base, black) and an

oval mark on hind coxa. All the trochanters largely black, except fore trochanter narrowly yellow (Fig. 16 : b); rest of all the legs reddish, except fore and middle tarsi tending to be darker (brown), apex of hind tibia, first and fifth segments of its tarsus wholly blackish; its 2–4 segments pure white. Wings clear hyaline.

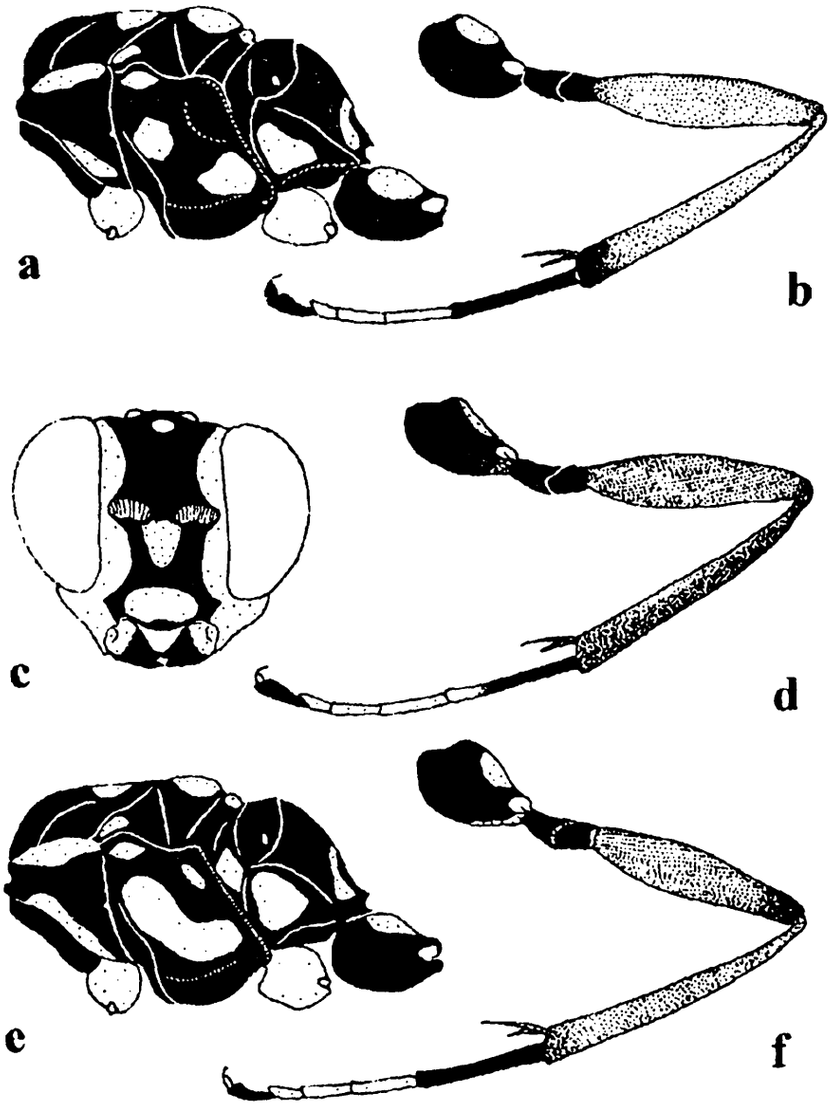

Fig. 16. Colour pattern : *Glabridorsum orbitalis* Jonathan : **a**, side view of thorax; **b**, hind leg. *Glabridorsum semilunatum* Jonathan : **c**, front view of head; **d**, hind leg. *Glabridorsum simulatum* Jonathan : **e**, side view of thorax; **f**, hind leg.

Male : Not known.

Length : Female, 8 mm; fore wing 7 mm; ovipositor sheath 2 mm.

Distribution : India : Himachal Pradesh (Narkanda, 2571m; Chini Bunglow, 1457m in Shimla Hills; Kalatop, 2488m, Dhenkand 2743m and Ahla, 2286m nr. Dalhousie). Uttaranchal (Dwali, 2743m in Kumaon Hills).

7. ***Glabridorsum semilunatum*** Jonathan (Fig. 16 : c, d)

2000. *Globridorsum semilunatum* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 169. Male, Female, key, des., Fig. Type : Female, India : Himachal Pradesh : Kalatop, 3438m; Rahla, 2743m nr. Manali (Z.S.I., Calcutta). India : Himachal Pradesh : Dalhousie, 2132m. Jammu & Kashmir : Gulmarg, 2430m (Z.S.I., Calcutta).

This species is close to *G. simulatum* Jonathan in having abdominal tergites without punctations and mesopleurum with broad oblong mark in the middle. However, it can be recognised by having its metapleurum with moderately large punctures, area tending to be rugoso-punctate.

Female : Face in the middle punctate, punctures shallow, their interspaces more than their own diameter, at sides mat and subpolished. Clypeus largely smooth and subpolished, except for a few scattered shallow punctures. Frons, vertex and temple smooth and shiny. Malar space granulose, 1.0× the basal width of mandible. Mandibles coarsely punctate. Pronotum with 7–8 strong transverse striations in the scrobes, its upper margin and collar smooth and shiny, epomia short and weak, upper margin normal. Scutellum and metascutellum smooth and shiny lateral carina more or less conifined to its base. Mesopleurum moderately strongly transversely rugoso-punctate, area below subtegular ridge and infront of speculum smooth, mesosternum closely punctate, prepectal carina extending more or less up to the base of subtegular ridge. Metapleurum with moderately large punctures, punctures towards the metapleural carina dense, tending to be rugoso-punctate, juxtacoxal carina present. Propodeum between basal carina and apex finaly wrinkled, basad of basal carina sparsely punctate, both the transverse carinae strong and sinuate, apophyses like weak lateral crests. First tergite without distinct lateral tooth, all the tergites mat and subpolished. Nervulus more or less opposite to basal vein, nervellus intercepted at its lower 0.33.

Black. 7th to 11th flagellar segments white. The following are yellow : Clypeus, except along the margin, face with an elongate triangular mark, base of mandibles, orbital mark encircling the eye (Fig. 16 : c), pronotal collar, upper margin of pronotum, an oval mark on the middle lobe of mesoscutum, scutellum, tegula, subtegular ridge, and elongate curved mark on mesopleurum, a mark near the base of hind wing, a large triangular mark on metapleurum, a broad semilunar mark on propodeum, apices of all the tergites, fore and middle coxae. Legs in general reddish-brown; except first fore and middle trochanteral segments yellow with small to broad black marks. Fore and middle tarsi clouded with dark brown; hind coxa and trochanter black, except coxa above with an oval mark and narrowly at apex yellow, its tibia broadly at apex and along the upper margin, basal 0.7 of first tarsal segment and fifth segment wholly dark brown to black, rest of hind tarsus, white (Fig. 16 : d). Wing clear hyaline.

Male : Essentially similar to female except as follows : Body more slender. Pronotum

largely smooth and shiny, without distinct striations. Mesopleurum largely finely transversely striato-punctate. Metapleurum finely trans-rugoso-punctate. Propodeum with more strong and oblique wrinkles.

Black : 10th to 16th flagellar segments white. Scape in front yellow. Fore and middle first trochanternal segments without black marks; rest of the colour as in female.

Length : Female, 8 mm; fore wing 7.2 mm; ovipositor sheath 1.75 mm. Male, 7.2 mm; fore wing 6.5 mm.

Distribution : India : Himachal Pradesh (Kalatop, 3438m; Dalhousie, 2132m; Rahla 2743m nr. Manali). Jammu & Kashmir (Gulmarg, 2430m).

8. ***Glabridorsum simulatum*** Jonathan (Fig. 16 : e, f)

2000. *Globridorsum simulatum* Jonathan, *Rec. zool. Surv.* India, **98**(2) : 170. Male, Female, key, des., fig. Type : Female, India : West Bengal : Darjeeling Botanical Garden, 1943m (Z.S.I., Calcutta). India : West Bengal : Darjeeling Botanical Garden, 1943m. Uttaranchal : Phata, 1430m; Bhyundar, 2286m and Harsil in Garhwal Hills. Himachal Pradesh : Khajjiar, 1800m nr. Chamba (Z.S.I., Calcutta).

This species shows affinities with *G. semilunatum* Jonathan and *G. punctatum* Jonathan. It can be distinguished by the absence of lateral tooth at the base of first tergite, metapleurum trans-striato-punctate and speculum on mesopleurum with a small yellow mark (Fig. 16 : e).

Female : Body largely shiny. Face and clypeus smooth, except for a few scattered setiferous punctures. Frons, vertex and temple smooth and polished. Malar space granulose, 1.0× the basal width of mandible. Pronotum almost smooth and shiny, without distinct striae in the scrobes and without punctures on collar and upper margin; its upper margin not swollen. Mesopleurum transversely rugoso-punctate, striate below subtegular ridge and along speculum, speculum smooth, mesosternum shallowly punctate, prepectal carina extending up to the base of subtegular ridge. Scutellum and metascutellum smooth. Metapleurum transversely striato-punctate, juxtacoxal carina present. Propodeum between basal and apical carinae weakly obliquely wrinkled, apicad of apical carina with weak sparse punctures and rugosities; basad of basal carina minutely and sparsely punctate, both the carinae moderately strong, apical carina strongly sinuate, laterally forming weak crest-like apophyses. First tergite without basal lateral tooth, tergite smooth; following tergites mat and subpolished. Nervellus intercepted at its lower 0.33.

Colour similar to *G. punctatum,* except hind coxa black, with an oval mark above and extreme apex below, yellow (Fig. 16 : f).

Male : Essentially similar to female, except more slender and polished. Face and

clypeus somewhat closely and shallowly punctate. Mesopleurum and mesosternum minutely and sparsely punctate, finely striate along the speculum. Metapleurum with moderate sized close punctures.

Colour similar to female except 10th to 13th flagellar segments and scape in front, yellow. Hind leg with coxa above and apically broadly, yellow, its first trochanteral segment black; second segment, femur and tibia reddish-brown, except for a mark on second trochanteral segment, femur at apex, tibia at apex and along the upper margin, black; first and fifth tarsal segments, black, and second to fourth segments white.

Length : Female, 6.5 mm; fore wing 5 mm; ovipositor sheath 1.5 mm. Male, 6 mm; fore wing 4.5 mm.

Distribution : India : West Bengal (Darjeeling Botanical Garden, 1943). Uttaranchal (Phata, 1430m; Bhyundar, 2286m and Harsil, 2550m in Garhwal Hills). Himachal Pradesh (Khajjiar, 1800m).

6. Genus ***Caenocryptus*** Thomson (Fig. 17 : a–c)

1873. *Caenocryptus* Thomson, *Opuscula entomologica,* **5** : 494. Type-species : *Cryptus rufiventris* Gravenhorst; designated by Viereck, 1914.

1952. *Habrocryptoides* Uchida, *Insecta Matsumurana,* **18** :19. Type-species : *Habrocryptoides shikokuensis* Uchida; Original designation. Syn. by Townes, 1957.

1954. *Pseudischnus* Walkley, *J. Washington Acad. Sci.* **44** : 219. Type-species : *Ischnus oregonensis* Cushman; Original designation. Syn. under *Habrocryptoides* by Townes & Townes, 1962.

Taxonomy : Townes, 1970 : 189.

Hosts : Cocoons of sawflies and various Lepidoptera.

Distribution : Holarctic and Oriental regions.

Body of moderate proportions. Clypeus small, about 2.2× as wide as long, strongly convex, subpyramidal in profile, its apex convex or truncate without a median tooth or irregularity. Malar space about 0.9× as long as basal width of mandible. Mandible of moderate length, its lower tooth slightly shorter than upper. Apical 0.3 of female flagellum not or only slightly thickened, not flattened below, weakly tapered towards the tip. Mesoscutum mat and subpolished with fine and close punctures. Notaulus sharp, reaching to behind centre of mesoscutum. Propodeal (Fig. 17 : c) spiracle round or short elliptic; propodeum narrow and convex, its apical carina forming weak sublateral crest, often weak and rarely absent in the middle. Base of hind coxa deep, without a groove, its lower basal corner sometimes polished and hairless. Wing as shown in figure 17 : a, b. First tergite without a lateral tooth at the base, its spiracle near apical 0.34; dorso-lateral and ventro-lateral carinae distinct, usually complete

but weak, its median dorsal carinae moderately strong, reaching to behind spiracle. Second tergite mat, with fine punctures. Ovipositor sheath about 0.6 to 1.8× as long as hind tibia. Ovipositor moderately stout, somewhat compressed its tip of moderately long to short with a distinct nodus. (Townes, 1970 : 189).

Caenocryptus is rather a distinct genus easily distinguished by the absence of lateral tooth at the base of first tergite; subapical 0.6 of mediella vein weakly arched; propodeal spiracle rounded or short elliptic; clypeus without median tooth and ovipositor tip short with distinct nodus.

Host : Known host includes cocoons of sawflies and various Lepidoptera.

Jonathan (1999 : 1) recorded this genus from India, Myanmar and Taiwan for the first time.

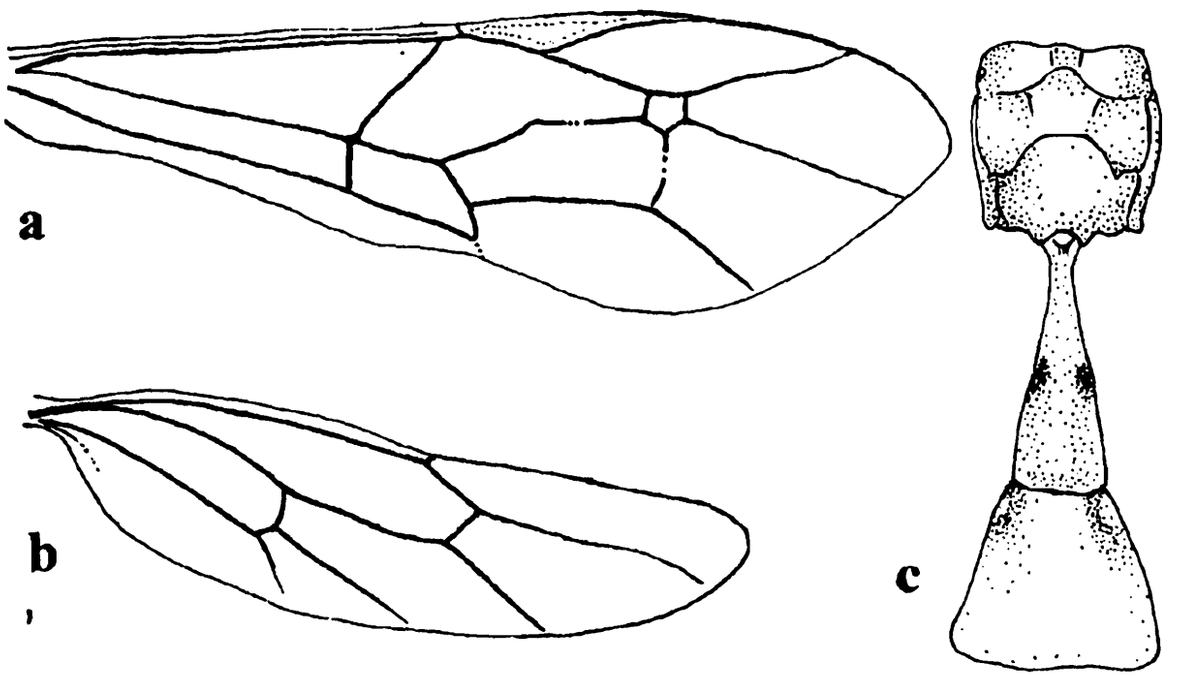

Fig. 17. *Coenocryptus* Thomson : **a**, **b**, fore and hind wings showing venation; **c**, dorsal view of propodeum and first tergite.

Key to the species of *Caenocryptus*

1. Antennal flagellum black and without a whitish band. Legs also back, except hind femur red. Frons strongly mat and with very minute dense and weak punctures. India : Himachal Pradesh; Jammu & Kashmir .... 1. *rugosus* Jonathan

– Antennal flagellum with a white band. Legs almost entirely black or variously marked with yellow or red. Frons mat and rugose 2

2. Ovipositor tip short, upper valve heavy, evenly arched between apex and nodus, not flattended. Speculum on mesopleurum with small deep and dense punctures. (Pronotum trans-rugose. Scutellum mat, minutely and densely punctate. Mesopleurum, metapleurum and propodeum rugoso-wrinkled). India : Himachal Pradesh ..... 2. *reticulatus* Jonathan

– Ovipositor tip long, both the valves equally strong, upper valve flattened at apex. Speculum on mesopleurum rugose 3

3. Pronotum largely moderately strongly transversely rugoso-striate. Mesopleurum and metapleurum strongly rugoso-wrinkled. Punctures on scutellum not dense and not running into striations. Hind tarsus with apical 0.2 of first and second to fourth segments wholly whitish. India : Himachal Pradesh. Taiwan .... 3. *striatus* Jonathan

– Pronotum strongly mat, weakly rugose in scrobes. Mesopleurum and metapleurum weakly rugose. Punctures on scutellum strong and dense, running into fine striations. Hind tarsus largely reddish-yellow. Myanmar .... 4. *burmensis* Jonathan

1. ***Caenocryptus rugosus*** Jonathan (Fig. 18 : a, b)

1999. *Caenocryptus rugosus* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 4. Male, Female, key, des., fig. Type : Female, India : Himachal Pradesh : Ahla, 2286m (Z.S.I., Calcutta). India : Himachal Pradesh : Dalhousie, 2132m, Ahla, 2286m, Khadrala, 2771m; Pabar Range Bashahr. Jammu & Kashmir : Gulmarg, 2500m (Z.S.I., Calcutta & 1 Female in A.E.I., Florida).

This is a distinct species having antennal flagellum black. Legs also black, except the hind femur. Frons strongly mat and with very minute dense weak punctures.

Female : Face moderately strongly granulated, except for a median oval area near antennal bases smooth and shiny. Clypeus subpolished, its basal 0.6 sparsely punctate, apical 0.4 smooth and shiny with a few scattered punctures. Malar space granulose. Mandible ruguloso-punctate. Frons and vertex strongly mat, with minute dense weak punctures. Temple subpolished, with small close to moderately spaced punctures. Pronotum largely rugoso-wrinkled, its upper 0.25 strongly granulated, pronotal collar and lower corner subpolished and sparsely and shallowly punctate. Epomia short, but moderately strong. Mesopleurum subpolished and rugose, lower half of speculum shiny with a few coarse punctures, area anteriorly above sternaulus and mesosternum strongly granulose, dull; prepectal carina extending 0.8 the height of mesopleurum, subtegular ridge shiny, minutely punctate. Scutellum and metascutellum dull, granuloso-punctate, lateral carina of scutellum more or less confined to its base. Metapleurum mat, finely rugose, juxtacoxal carina of scutellum more or less confined to its base. Metapleurum mat, finely rugose, juxtacoxal carina absent. Propodeum

between basal carina and apex mat, moderately strongly rugoso-wrinkled, basad of basal carina strongly granulose. First tergite strongly mat, postpetiole with a few setiferous punctures. Ovipositor sheath about 0.9× as long as hind tibia.

Black. Apical antennal segments with reddish hue. The following are yellow : Face with a small median mark, orbital mark on face, frons, vertex and also temple (Fig. 18 : a) (this orbital mark sometimes not continuous, interrupted near malar space and above at temple), upper margin of pronotum and collar narrowly, sometimes these are very faint and indistinct, scutellum with or without an oval mark, subtegular ridge with or without a mark. Legs in general blackish-brown to black. Fore and middle femora reddish-brown apico-basally. Hind leg (Fig. 18 : b) with femur red, tarsus colour variable, its apical half of second to fourth segments whitish, sometimes totally dark brown or blackish. Wings clear hyaline.

Male : Essentially similar to female, except more slender and weakly sculptured, body largely subpolished. Face and clypeus minutely and densely punctate. Temple minutely and sparsely punctate. Metapleurum finely wrinkled. First to third abdominal tergites mat, with minute sparse punctures. Nervulus in fore wing slightly basad of basal vein.

Colour similar to female. The following are yellow : face and clypeus wholly, vertex and temple along the eye margin, scape of antennae in front, oval mark on scutellum, pronotal collar and upper margin of pronotum, subtegular ridge, tegula, fore and middle coxae and their first trochanteral segment. Legs reddish or reddish-brown; hind coxa and trochanter black, femur red, tibia brown, tarsus brownish at base, rest whitish.

Length : Female, 7–10 mm; fore wing 5.5–7.2 mm; ovipositor sheath 2–2.5 mm. Male, 7 mm; fore wing 5.5 mm.

Distribution : India : Himachal Pradesh (Ahla, 2286m; Dalhousie, 2132m; Khadrala, 2771m and Bashahr in Pabar Range). Jammu & Kashmir (Gulmarg, 2500m).

2. ***Caenocryptus reticulatus*** Jonathan (Fig. 18 : c–e)

1999. *Caenocryptus reticulatus* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 6. Female, key, des., fig. Type : Female, India : Himachal Pradesh : Dalhousie, 2132m (Z.S.I., Calcutta).

This species is distinguished from *Caenocryptus striatus* Jonathan and *Caenocryptus burmensis* Jonathan by having ovipositor tip short, upper valve heavy, evenly arched between apex and nodus (Fig. 18 : e), apex not flattened. Speculum and mesopleurum with deep and dense punctures.

Female : Face mat, with minute, dense punctures at sides running into fine rugosities, along the eye margins mat and dull. Clypeus subpolished, with minute,

rather sparse punctures, at apex smooth and shiny. Malar space granulose, with minute, dense punctures. Frons mat and weakly rugose. Vertex mat, minutely and closely punctate, dull. Temple mat with minute, closely placed punctures, punctures running into fine striations. Pronotum subpolished, trans-rugose, above finely striate,

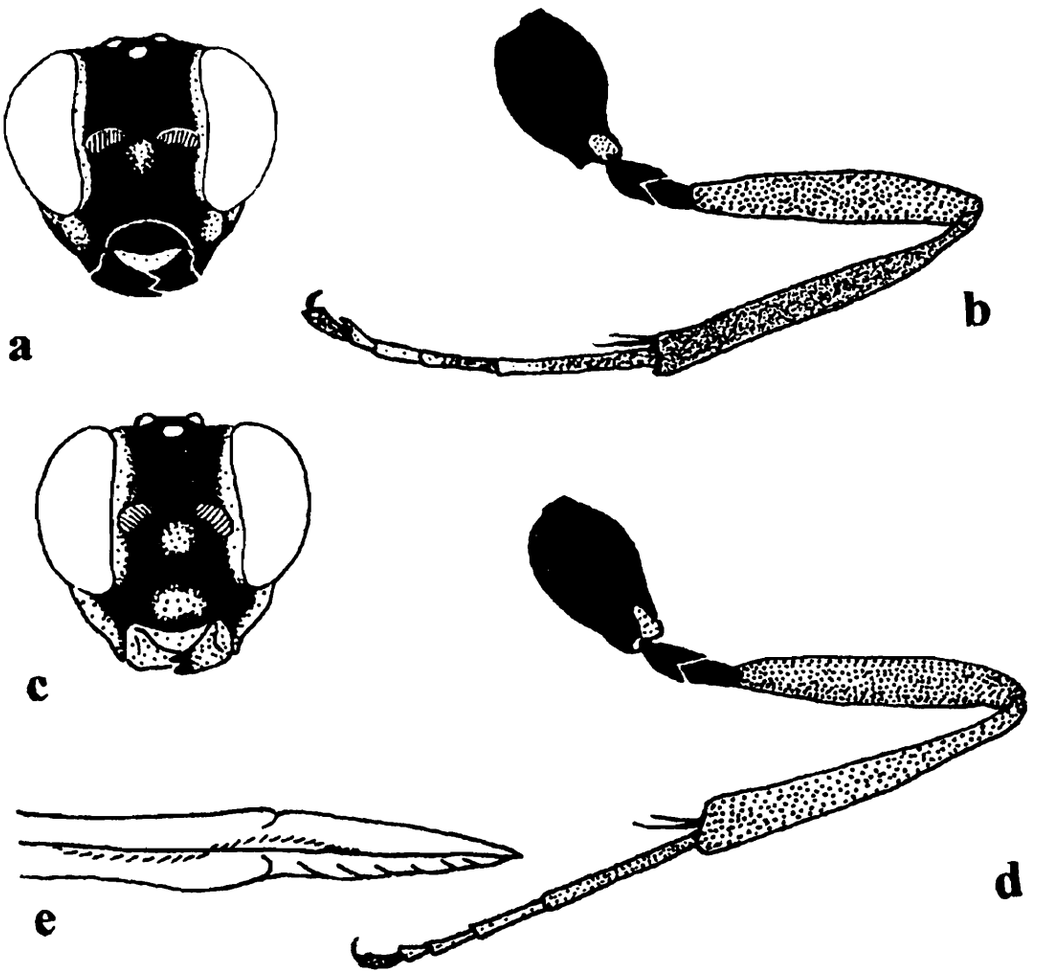

Fig. 18. *Coenocryptus rugosus* Jonathan : colour pattern : **a**, front view of head; **b**, hind leg. *Coenocryptus reticulatus* Jonathan : colour pattern : **c**, front view of head; **d**, hind leg; **e**, ovipositor tip.

pronotal collar and below minutely punctate, with fine striations in between the striae, epomia moderately strong and long. Scutellum mat and subpolished, minutely and densely punctate, with fine longitudinally running striations, lateral carina extending about 0.3 its length. Metascutellum subpolished, with closely placed small punctures. Mesopleurum subpolished, moderately strongly rugoso-wrinkled, below subtegular ridge ruguloso-punctate, subtegular ridge minutely punctate, speculum shiny with large deep punctures. Mesosternum minutely and densely puncto-rugulose, prepectal carina extending 0.9 the height of mesopleurum. Metapleurum subpolished, rugoso-wrinkled, juxtacoxal carina weakly present. Propodeum between basal carina and apex strongly rugoso-wrinkled, at some places tending to be reticulate, basad of

basal carina with small sized, dense punctures, punctures forming rugosities, apical carina strong in the middle. First tergite mat, with fine, dense punctures, second to fourth tergites mat with fine dense punctures, following tergites mat and subpolished. Ovipositor sheath about 0.8× as long as hind tibia. Ovipositor tip as shown in figure 18 : e.

Black. 6th to 9th antennal segments white above. The following are yellow : a mark on scape in front, face with a small round mark above, clypeus faintly, face and frons (Fig. 18 : c) along the eye margin, malar space, temple along the eye margin, pronotal collar and upper margin of pronotum narrowly, subtegular ridge and scutellum in the middle. Legs in general reddish-brown, except their coxae and trochanter black, and hind tarsus with second to fourth segments whitish (Fig. 18 : d). Wings clear hyaline.

Male : Not known.

Length : Female, 10 mm; fore wing 8 mm; ovipositor sheath 2.5 mm.

Distribution : India : Himachal Pradesh (Dalhousie, 2132 m).

3. ***Caenocryptus striatus*** Jonathan (Fig. 19 : a–c)

1999. *Caenocryptus striatus* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 8. Male, Female, key, des., fig. Type : Female, India : Himachal Pradesh : Ahla, 2286m nr. Dalhousie (Z.S.I., Calcutta). India : Himachal Pradesh : Kalatop, 2438m; Khajjiar, 2438m; Dalhousie, 2132m; Ahla, 2286m; Nichar, 2500m. Taiwan : Sunmoon Lake (Z.S.I., Calcutta and A.E.I., Florida).

This species is close to *Caenocryptus burmensis* Jonathan in having ovipositor tip long, both the valves of ovipositor equally strong and upper valve flattened at the apex. Speculum including mesopleurum rugose. It can be distinguished by having pronotum strongly transversely rugoso-striate. Meso- and metapleurum strongly rugoso-wrinkled. Punctures on scutellum neither dense nor running into striations. Hind tarsus at its apical 0.2 of first and second to fourth segments wholly, whitish.

Female : Face subpolished, moderately strongly granulated. Clypeus subpolished, mat, sparsely and shallowly punctate, its apex smooth. Malar space granulose. Mandible shallowly punctate. Frons strongly granulose to weakly rugose, near the antennal sockets smooth and shiny. Vertex and temple mat, with fine setiferous punctures. Pronotum in the scrobe moderately strongly transversely rugoso-striate, pronotal collar and upper half of pronotum strongly granulose to weakly rugose, epomia short but strong. Scutellum and metascutellum subpolished with fine, weak and dense punctures, lateral carina of scutellum extending to its basal 0.2. Mesopleurum almost wholly moderately strongly rugose, mesosterum rugulose, subtegular ridge subpolished minutely punctate, prepectal carina extending 0.9× the height of mesopleurum.

Metapleurum mat, rugose, juxtacoxal carina absent. Propodeum between basal carina and apex mat and finely rugoso-wrinkled, basad of basal carina strongly granulated, apical carina complete, transverse in the middle. First tergite mat and subpolished, with a few scattered shallow setiferous punctures. Second tergite mat with fine dense punctures, punctures towards the apex not well defined; following tergites mat and subpolished. Ovipositor sheath about 0.9× as long as hind tibia.

Black. 6th to 9th flagellar segments white above. The following are yellow : face with a T-shaped mark above (Fig. 19 : a), basal half of clypeus, mandible fainly at base, orbit all along the eye margin, pronotal collar, upper margin of pronotum, scutellum with a small oval mark in the middle, subtegular ridge. First to third abdominal tergites (Fig. 19 : b) more or less blackish except second and third tergites apically and following tergites wholly reddish-brown; all the coxae and trochanters dark brown to black, fore and middle femora and tibiae reddish-brown, their tarsus dark brown. Hind femur reddish, tibia blackish, tarsus with basal 0.8 of first segment and fifth segment wholly black, the rest of tarsus whitish (Fig. 19 : c). Wings clear hyaline.

Male : Similar to female, except more slender and subpolished. Face subpolished, minutely and densely reguloso-punctate. Clypeus subpolished with shallow close punctures. Frons mat, densely and minutely punctate. Vertex mat, shallowly punctate. Temple shiny with shallow close punctures. Pronotum rugoso-punctate. Mesopleurum mat, weakly rugose, speculum and area below subtegular ridge rugoso-punctate. Mesosternum densely punctate. Metapleurum somewhat rugoso-punctate. Propodeum moderately strongly wrinkled, basad of basal carina granulose. First tergite mat and subpolished with scattered indistinct punctures; following tergites largely mat and dull.

Black. Antennal flagellum entirely blackish. The following are yellow : scape in front, face and clypeus wholly, mandible, except the teeth, frons along the eye margin, temple, malar space broadly, pronotal collar, upper margin of pronotum, scutellum with a small mark, tegula, subtegular ridge, an oval mark above sternaulus, mesosternum almost wholly, fore and middle coxae and first trochanteral segment (hind legs broken). Legs in general yellowish-brown. First abdominal segment black; following segments, blackish-brown.

Length : Female, 7.2–9 mm; fore wing 6.5–7.5 mm; ovipositor sheath 2.25–2.8 mm. Male, 7.5 mm; fore wing 6 mm.

Distribution : India : Himachal Pradesh (Ahla, 2286m nr. Dalhousie; Dalhousie, 2132m; Kalatop, 2438m; Khajjiar, 2438m; Nichar, 2500m). *Elsewhere* : Taiwan (Sunmoon Lake).

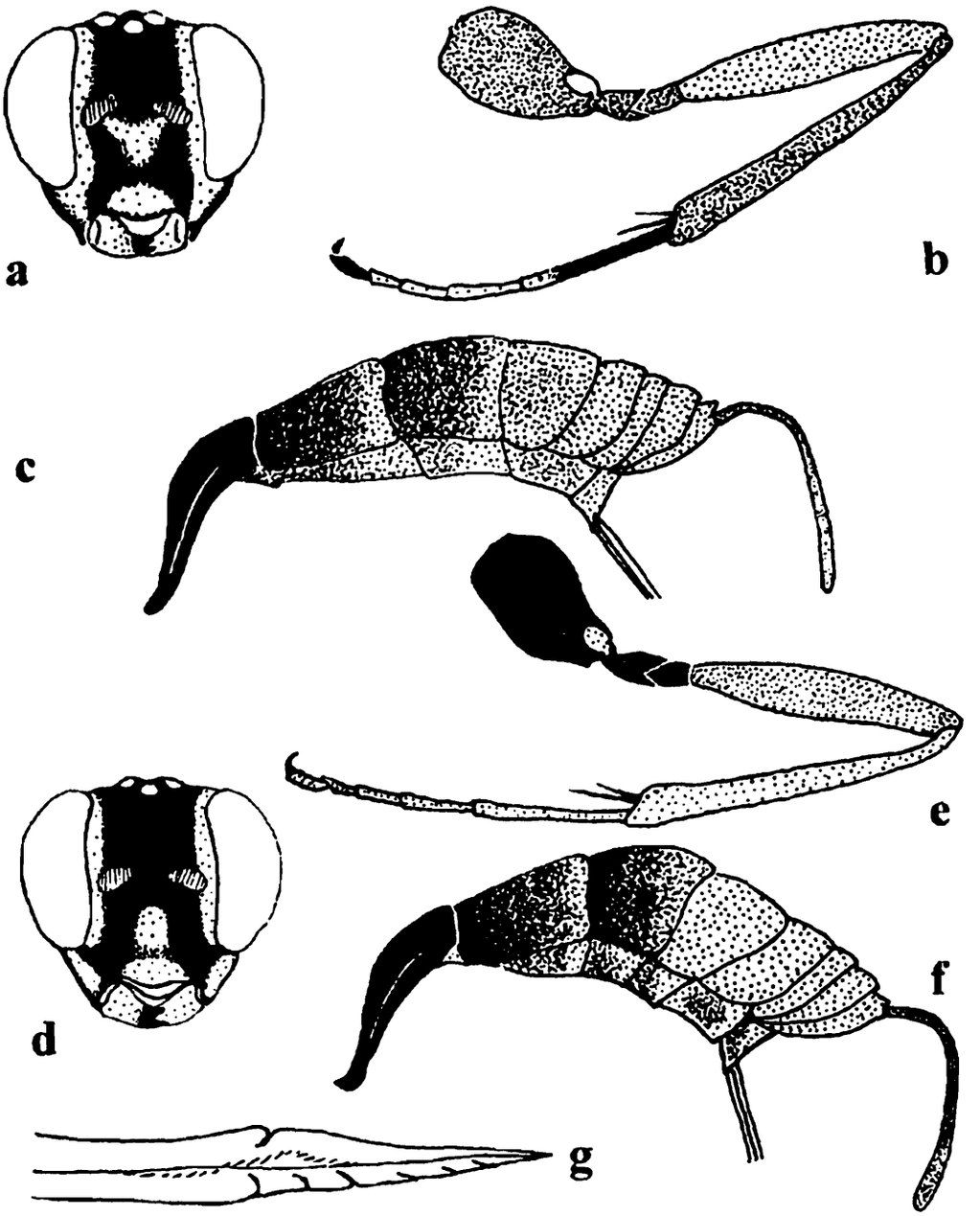

Fig. 19. *Coenocryptus striatus* Jonathan : colour pattern : **a**, front view of head; **b**, hind leg; **c**, side view of abdomen. *Coenocryptus burmensis* Jonathan : colour pattern : **d**, front view of head; **e**, hind leg; **f**, side view of abdomen; **g**, ovipositor tip.

4. ***Caenocryptus burmensis*** Jonathan (Fig. 19 : d–g)

1999. *Caenocryptus burmensis* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 11. Female, key, des., fig. Type : Female, Myanmar : Mt. Victoria, 2800m (A.E.I., Florida). Myanmar : Mt. Victoria, 2800m (A.E.I., Florida and Z.S.I., Calcutta).

This species is distinguished from *Caenocryptus striatus* Jonathan by having pronotum strongly mat, mesopleurum and metapleurum weakly rugose. Punctures on secutellum strong and dense, running into striations. Hind tarsus reddish-yellow.

Female : Face moderately strongly granulated, weakly raised in the middle. Clypeus subpolished sparsely and shallowly punctate. Malar space granulose. Mandible with minute weak punctures. Frons strongly rugose, with a median wide shallow longitudinal groove. Vertex mat with fine dense punctures. Temple subpolished, with minute closely placed punctures. Pronotum as a whole granulated, in the scrobes and above weakly rugose, upper margin strongly granulated with sparse shallow setiferous punctures. Scutellum granulated with fine dense punctures, punctures running into fine striations, its lateral carina more or less confined to its base. Metascutellum with minute dense punctures. Mesopleurum largely mat, and weakly rugose, subtegular ridge subpolished, minutely and closely punctate, prepectal carina extending more or less up to the base of subtegular ridge. Metapleurum rogoso-wrinkled, juxtacoxal carina not well defined. Propodeum between basal carina and apex moderately wrinkled, basad of basal carina mat with minute dense punctures. First tergite mat and subpolished; second and third tergites mat, with very minute and dense punctures. Following tergites mat subpolished. Ovipositor sheath about 0.8× as long as hind tibia. Ovipositor tip as shown in figure 19 : g.

Black. Apex of sixth segment to the base of tenth segment of antennal flagellum white above. The following are yellow : clypeus broadly, mandible, face sometimes faintly, malar space, eye orbit wholly (Fig. 19 : d), pronotal collar, upper margin of pronotum, scutellum with an oval mark in the center and subtegular ridge. First to third tergites black (Fig. 19 : f), following tergites reddish-brown. Legs in general reddish-brown, except fore and middle coxae dark brown and ususlly with yellow markings. Hind coxa and trochanter largely black, its tarsus reddish-yellow (Fig. 19 : e). Wings clear with yellowish tinge.

Male : Not known.

Length : Female, 11.5 mm; fore wing 8.25 mm; ovipositor sheath 2.25 mm.

Distribution : Myanmar (Mt. Victoria).

7. Genus ***Nippocryptus*** Uchida (Fig. 20 : a–c)

1836. *Nippocryptus* Uchida, *Insecta Matsumurana,* **11** : 3. Type-species : ***Hemiteles suzukii*** Matsumura (= *vittatorius* Jurine). Original designation.

Taxonomy : Townes, 1970 : 190.

Distribution : Palaearctic and Oriental regions.

Body moderately stout. Clypeus small, about 2.2× as wide as long, moderately convex, apical 0.35 flattened or slightly concave, with a median tooth, lobe or obtuse angulation. Malar space 0.5 to 1.1× as long as basal width of mandible; mandible with equal teeth or lower tooth slightly shorter. Mesoscutum polished or weakly mat, closely punctate. Notaulus moderately strong, ending behind the center of mesoscutum.

Propodeal spiracle subcircular to 2.0× as long as wide, apical carina (Fig. 20 : c) with sublateral crest-like apophyses. Base of hind coxa with a short, shallow, oblique groove below its attachment. Wing venation in figure 20 : a, b, the ramulus sometimes vestigial or absent. First tergite moderately stout, at base without lateral tooth, its spiracles near apical 0.42; median dorsal carinae distinct in female, indistinct in male, ending between base and middle, dorso-lateral carinae moderately strong to obsolescent, ventro-lateral carinae distinct. Second tergite mat with small punctures, hairs short and rather dense. Ovipositor sheath 0.8 to 1.5× as long as hind tibia, ovipositor weakly compressed, its tip elongate-sagittate with a distinct nodus.

Length : Female, 7.2–12.8 mm; fore wing 6–9.5 mm; ovipositor sheath 2.5–3.75 mm.

Type-species : *Hemiteles suzukii* Matsumura.

Nippocryptus Uchida is close to *Caenocryptus* Thomson by the absence of lateral tooth at the base of First tergite; subapical 0.6 of mediella vein weakly arched; propodeal spiracle rounded or short illiptic. However, it is easly distinguished from *Caenocryptus* by having clypeus moderately convex (not subpyramidal) in profile; ovipositor tip elongate-sagittate and apical margin of clypeus with a median short tooth, lobe, or abtuse angulation.

A key to all the known species under this genus is given below. *Nippocryptus striatifrons* (Cameron) has been treated under *Ischnus* Gravenhorst.

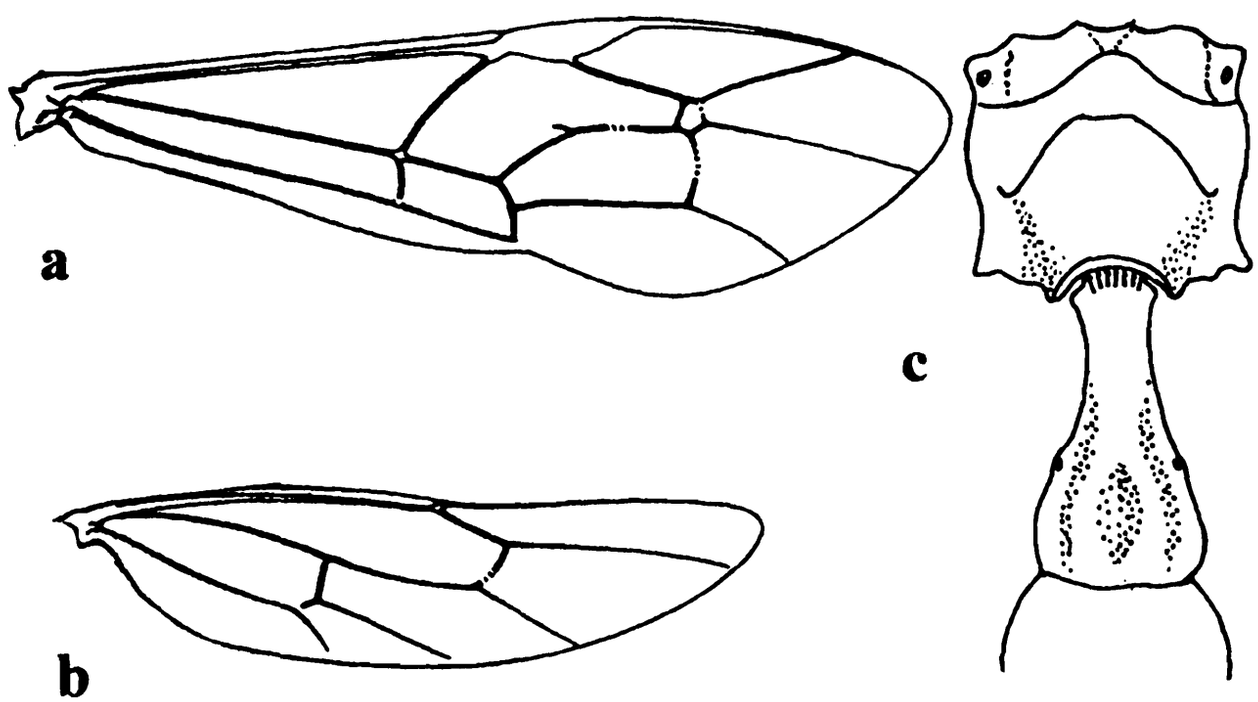

Fig. 20. *Nippocryptus* Uchida : **a**, **b**, fore and hind wings showing venation; **c**, dorsal view of propodeum and first tergite.

Key to the species of *Nippocryptus*

1. Body almost entirely black (except second to fourth hind tarsal segments, whitish). Fore wing with a broad dark brown transverse band. Japan and Europe ..... 1. *vittatorious* Jurine

– Body black and variously marked with yellow. Fore wing without a dark brown transverse band, except in *N. himalayensis* Jonathan with a light transverse band 2

2. Frons medially strongly rugose or wrinkled. Clypeus yellow. Abdominal tergites black with narrow to moderately broad apical bands (number of bands varies). Antennal flagellum with a whitish band 3

– Frons medially strongly mat, with setiferous punctures or rugulose. Clypecus black; abdominal tergites largely black or reddish without distinct bands. Antennal flagellum with or without a band 4

3. Frons with a median longitudinal carina. Basal carina of propodeum moderately arched. Mesopleurum with an elongate mark just above sternaulus, speculum, lateral lobes of mesoscutum near the base of fore wing with small longish, and median lobe with a large oval mark; metascutellum, propodeum along apical carina, an elongate mark on metapleurum above, yellow; first tergite at base black. Hind tibia without a basal band. Ovipositor tip long. India : Meghalaya; West Bengal ..... 2 *misippus* (Cameron)

– Frons without a median longitudinal carina. Basal carina of propodeum acutely bent. Mesopleurum, metapleurum and propodeum black. First tergite at base broadly, yellow. Hind tibia with a basal yellow band. Ovipositor tip short. India : Himachal Pradesh ..... 3. *himalayensis* Jonathan

4. Propodeal spiracle oval. Speculum on mesopleurum smooth and polished. Basal carina of propodeum strongly arched in the middle. Scutellum shiny, sparsely, minutely and weakly punctate. Antennal flagellum with a whitish band. Metascutellum and scutellum yellow. Metapleurum with an oval mark at the base. Hind tarsus reddish. India : Himachal Pradesh ..... 4. *rufofemoratus* Jonathan

– Propodeal spiracle circular. Speculum on mesopleurum densely punctate. Basal carina of propodeum weakly arched in the middle. Scutellum mat minutely and densely punctate. Metascutellum and metapleurum, black. Hind tarsus largely whitish. Antennal flagellum without a band. India : Himachal Pradesh; Uttaranchal ..... 5. *granulosus* Jonathan

1. ***Nippocryptus vittatorius*** Jurine (Fig. 21 : a)

1807. *Ichneumon vittatorius* Jurine, *Nouvelle methode de classer les hymenopteres et les dipteres*, p. 107. Female. Type : Female, Europe (GENEVA).

1912. *Hemiteles suzukii* Matsumura, *Thousand insects of Japan*, suppl., 4 : 313. Female, des., fig. Type : Female, Japan, Kyoto (SAPPORO).

1936. *Nippocryptus suzukii* Uchida, *Insecta Matsumurana*, **11** : 3. Male, Female, des. of Male, figs. Japan.

1999. *Nippocryptus suzukii* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 17. des.

This is a distinct species having body almost black, except second to fourth hind tarsal segments whitish. Fore wing with a broad dark brown transverse band (Fig. 21 : a).

Female : Face largely mat, with shallow setiferous punctures, median raised area weakly rugose. Clypeus subpolished, with coarse shallow punctures, towards the apex smooth. Mandible shallowly punctate with striations in between the punctures. Malar space granulose, 1.0× the basal width of mandible. Frons mat, dull, weakly rugoso-punctate. Vertex mat, with setiferous punctures. Temple with small, weak and closely placed punctures. Pronotum subpolished, in the middle striato-wrinkled, its collar and upper area with small, dense punctures, punctures forming fine rugosities, epomia long and strong. Mesoscutum mat, densely punctate. Scutellum mat and subpolished with moderate sized, not so close punctures, lateral carina extending at its basal 0.3. Metascutellum smooth and shiny. Mesopleurum moderately strongly rugoso-wrinkled, its central area infront of speculum with coarse closely placed punctures, the punctures running into striations; speculum smooth and shiny except its posterior area punctate, subtegular ridge finely punctate. Mesosternum with small closely placed punctures, prepectal carina extending 0.8× the height of mesopleurum. Metapleurum finely wrinkled, along the pleural carina closely punctate. Propodeum as a whole finely rugoso-wrinkled, apical carina strong, arched, laterally forming crest-like apophyses. First tergite mat and dull, post-petiole laterally near the spiracles with small and dense punctures. Ramulus in the fore wing present. Nervulus slightly basad of basal vein, inclivous. Nervellus intercepted at its lower 0.25.

Black. 5th–7th flagellar segments white above; temple with a narrow yellow line along the eye margin, hind tarsus with second to fourth segments whitish; fore wing clear hyaline with a broad dark brown band in the subapical region (Fig. 21 : a).

Male : Not available for study.

Length : Female, 11.5 mm; fore wing 8 mm; ovipositor sheath 3.75 mm.

Distribution : Japan. In literature Europe.

2. ***Nippocryptus misippus*** (Cameron) (Fig. 21 : b–f)

1904. *Mesostenus misippus* Cameron, *Trans. Ent. Soc. London,* 1904 : 114. Female, des. Type : Female, India Khasi Hills, Meghalaya (formerly Assam) (OXFORD).

1907. *Ischnus misippus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 163.

1970. *Nippocryptus misippus* : Townes, *Mem. Amer. Ent. Inst.,* **12** : 191.

1999. *Nippocryptus misippus* Jonathan, *Rec. zool. Surv. India,* **97**(2) : 18. Male, Female, key, des. India : Meghalaya : Cherrapunji, 1273m. West Bengal : Rangiroon, 1790m nr. Darjeeling.

This species is close to *N. himalayensis* Jonathan in having frons medially strongly rugose or wrinkled, clypeus yellow, abdominal tergites with narrow to broad apical bands. This species is recognized by having a median longitudinal carina on frons. Mesopleurum with an elongated mark, speculum, lateral lobes of mesoscutum with longish marks and its median lobe with an oval mark, yellow. First tergite black at base, and hind tibia without a basal band.

Female : Face subpolished, with small, sparse punctures, punctures at sides weak. clypeus subpolished, sparsely and shallowly punctate. Mandible weakly striato-punctate. Malar space granulose, 0.75× the basal width of mandible. Frons subpolished, moderately strongly transversely rugose in the middle, near the median ocellus rugoso-punctate, at sides mat and shallowly punctate, median longitudinal carina weakly present. Vertex mat with close setiferous punctures. Temple shiny, with small closely placed punctures. Pronotum subpolished, largely trans-wrinkled, its upper margin with moderate sized deep and close punctures, punctures running into striations. Pronotal collar minutely and sparsely punctate. Scutellum with small, close and shallow punctures, lateral carina exending at its basal 0.2. Metascutellum shiny with minute scattered punctures. Mesopleurum largely rugose, speculum smooth and shiny except posteriorly punctate, mesosternum with small dense punctures, prepectal carina extending almost up to the base of subtegular ridge, subtegular ridge minutely punctate. Metapleurum moderately strongly rugoso-wrinkled, juxtacoxal carina not defined. Propodeum between basal carina and apex moderately strongly wrinkled, basad of basal carina reticulo-punctate, apical carina strongly arched, carina in the middle transverse, basal carina moderately arched (Fig. 21 : e). First abdominal tergite mat, postpetiole laterally with small setiferous punctures. Ramulus absent, nervulus basad of basal vein, vertical. Nervellus intercepted at its lower 0.25. Ovipositor tip long (Fig. 21 : f).

Black. Apex of 5th to 11th flagellar segments white above. The following are yellow : Scape in front, face with a triangular mark above, clypeus, except at the apex, orbital mark all along the eye margin (Fig. 21 : b), pronotal collar, upper margin of pronotum, an oval mark at the apex of middle lobe of mesoscutum, a small mark

each on lateral lobes near to tegula, scutellum, metascutellum, subtegular ridge, speculum, an elongate transverse mark along the sternaulus, a narrow elongate mark on metapleurum above, apical carina of propodeum (Fig. 21 : c), apices of all the abdominal tergites. Legs in general reddish-brown, except fore and middle coxae and trochanters yellow with black markings, their tarsi brown. Hind coxa (Fig. 21 : d) black with an oval mark above and an oval mark apico-ventrally, yellow; first trochanteral segment black, tarsus white except its basal 0.4 of first segment and fifth segment wholly dark brown. Wings clear hyaline.

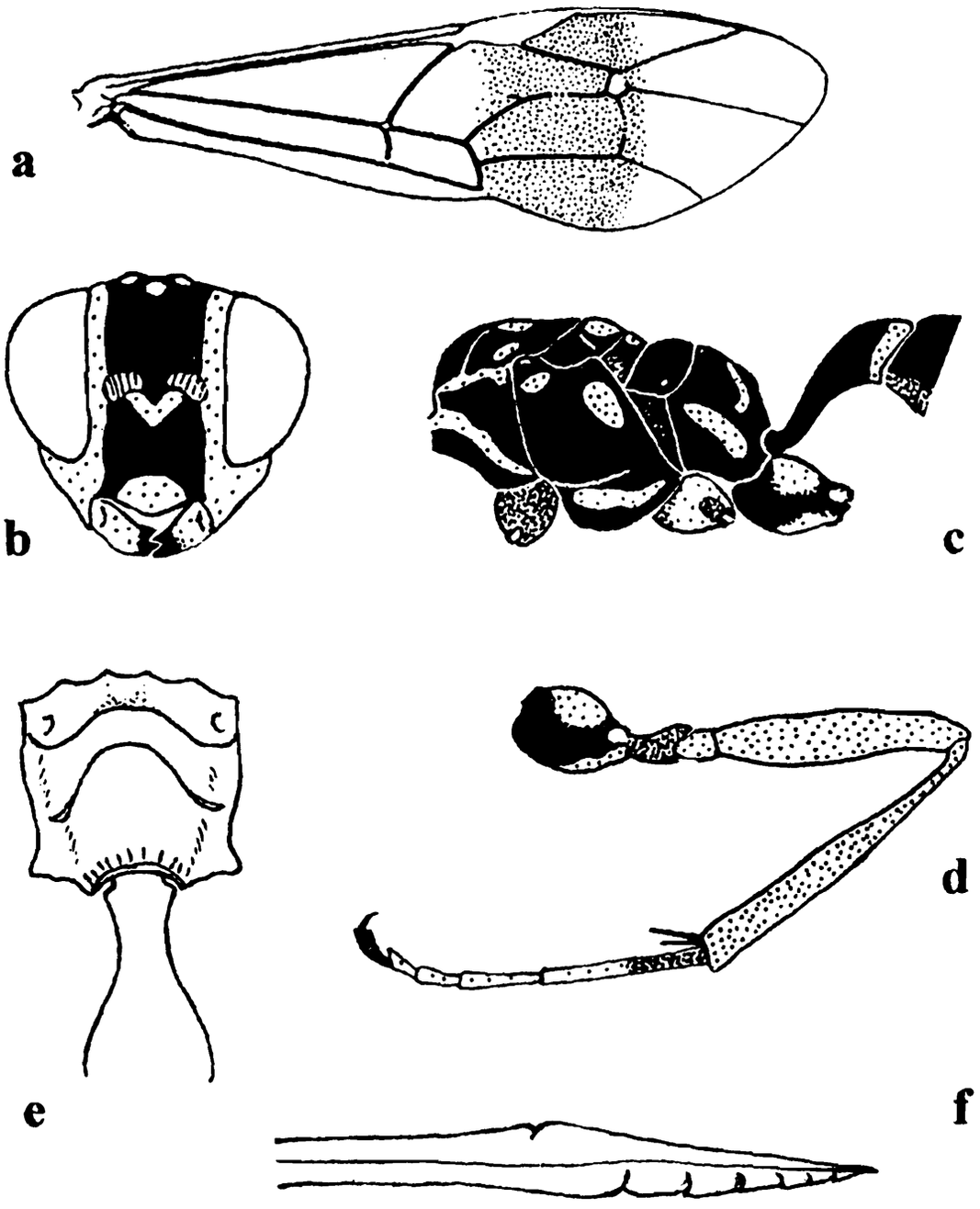

Fig. 21. *Nippocryptus vittatorius* Jurine : **a**, fore wing showing dark brown band. *Nippocryptus misippus* (Cameron) : colour pattern : **b**, front view of head; **c**, side view of thorax; **d**, hind leg; **e**, dorsal view of propodeum and first tergite; **f**, ovipositor tip.

Male : Essentially similar to female in colour and body structure, except body slender and polished. Face densely and shallowly punctate. Frons finely rugoso-wrinkle with a few scattered punctures. Vertex mat and subpolished. Temple shiny, minutely and sparsely punctate. Pronotum striate in the middle, its upper and lower regions with moderate sized punctures. Mesopleurum rugoso-punctate in the middle, striato-punctate above. Mesosternum closely punctate, speculum smooth and shiny except for a few punctures above. Metapleurum weakly rugose. Propodeum between apical carina and apex largely rugoso-wrinkled, basad of basal carina mat with shallow close punctures, apical carina represented by knob-like apophyses. First tergite largely smooth. Ramulus present as a small stump; rest as in the female.

Black. Antennal flagellum entirely black. The following are yellow : Scape in front, face, clypeus, malar space, mandible except the teeth, temple, frons and vertex along the eye margin, pronotum except the middle stripe, middle lobe of mesoscutum with an oval mark, lateral lobes with a small mark each, scutellum, metascutellum faintly, tegula, subtegular ridge, speculum, mesopleurum with a broad extensive irregular mark, metapleurum above, propodeal apophyses and median protion of apical carina, apices of all the tergites, fore and middle coxae and trochanters, yellow, their femora and tibiae yellowish-brown, tarsi dark brown. Hind coxa black with an oval mark above and below, yellow; trochanters black, femur and tibia brown, femur above and tibia at apex dark brown or blackish, tarsus white, except its first segment and claws blackish. Wings clear hyaline.

Length : Female, 10 mm; fore wing 9 mm; ovipositor sheath 3.5 mm. Male, 9.5 mm; fore wing 7 mm.,

Distribution : India : Meghalaya (Cherrapunji, 1273m). West Bengal (Rangiroon, 1790m in Darjeeling Hills).

3. ***Nippocryptus himalayensis*** Jonathan (Fig. 22 : a–e)

1999. *Nippocryptus himalayensis* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 21. Male, Female, key, des. fig. Type : Female, India : Himachal Pradesh : Manali, 1828m (Z.S.I., Calcutta). India : Himachal Pradesh : Manali, 1828m (Z.S.I., Calcutta).

This species is close to *N. misippus* (Cameron), but can be distinguished by having first tergite broadly, yellow. Hind tibia with a basal yellow band. Frons without a median longitudinal carina and basal carina of propodeum acutely bent in the middle.

Female : Face subpolished, minutely punctate. Clypeus subpolished its basal half with small, sparse punctures. Mandible with minute sparse punctures. Malar space granulose, 0.75× the basal width of mandible. Frons shallow, moderately strongly wrinkled in the middle, at sides closely puncto-rugose; ocellar triangle with small sized punctures. Vertex mat with fine setiferous punctures. Temple subpolished, with small closely placed punctures. Pronotum largely finely wrinkled, wrinkles in the

scrobe coarse, extreme upper margin rugulose, epomia moderately long and strong. Scutellum mat and subpolished, with small closely placed punctures, its lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum subpolished, moderately strongly rugose, area below subtegular ridge, area above sternaulus in front and mesosternum with small sized moderately deep and closely placed punctures, speculum posteriorly with deep punctures, anteriorly smooth and shiny, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum moderately strongly rugose, juxtacoxal carina present. Propodeum (Fig. 22 : d) between basal carina and apex rugoso-wrinkled, basad of basal carina rugoso-punctate, basal carina in the middle acutely bent, apical carina evenly arched, laterally forming moderately strong apophyses. First abdominal tergite strongly mat, at base smooth, postpetiole in the middle with sparse setiferous punctures, at sides small sized dense punctures. Ramulus in the fore wing present. Nervulus basad of basal vein, slightly inclivous. nervellus intercepted at its lower 0.2. Ovipositor tip as in figure 22 : e.

Black. Apex of 4th to 9th flagellar segment white above. The following are yellow : Face in the middle, clypeus, orbital mark all along the eye margin (Fig. 22 : a), pronotal collar, upper margin of pronotum, tegula, scutellum, subtegular ridge (Fig. 22 : b), first tergite broadly at base and apices of first to seventh tergites narrowly (except sometimes bands on 4th-7th tergites not defined). Fore and middle coxae and trochanters yellow, with blackish markings. Hind coxa entirely black, its trochanter largely blackish-brown. All the femora reddish, tibiae reddish-brown, clouded with brown, hind tibia with a basal yellow band. Fore and middle tarsi brown to dark brown. Hind tarsus whitish, except basal 0.5 of its first segment and fifth segment wholly blackish-brown (Fig. 22 : c). Wings clear hyaline, except for a light brown transverse band in the middle.

Male : Body polished and slender. Face minutely and densely punctate. Clypeus with small and weak punctures, at apex smooth and shiny. Frons with moderate sized and closely placed punctures, punctures running into oblique striations, near antennal scrobes smooth and shiny; near eye margin mat, with a few weak punctures. Pronotum largely rugoso-wrinkled, punctate above, collar with sparse punctures. Scutellum and metascutellum shallowly punctate. Mesopleurum and mesosternum with moderate sized, deep and closely placed punctures, area below subtegular ridge rugoso-punctate, speculum in the middle smooth and polished. Metapleurum finely rugoso-punctate. Propodeum rugoso-wrinkled, basad of basal carina weakly punctate. First abdominal tergite smooth, postpetiole mat and shallowly punctate; rest as in female.

Black. The following are yellow : Scape, face, clypeus, mandible except the teeth, frons, vertex and temple along the eye margin, pronotal collar, upper margin of pronotum, tegula, scutellum, subtegular ridge, a mark near the base of hind wing, two lateral marks on propodeum, marks united in front by a narrow line, basal half of first tergite, apices of first to seventh tergites narrowly. Fore leg yellow except for

a narrow line above on femur and tibia, and tarsus almost wholly, brown. Middle leg with coxa, trochanter and inner side of femur yellow; femur on the outer side yellowish-brown, tibia brownish-yellow with a basal yellow band. Hind leg with coxa and trochanter black, except coxa narrowly at apex and its second trochanteral segment largely yellow, femur chocolate-brown, its apical 0.4 blackish, tibia dark brown with a basal yellow band; tarsus white, except basal 0.25 of its first segment and claws blackish. Wings clear hyaline.

Length : Female, 10–12.8 mm; fore wing 8–9.5 mm; ovipositor sheath 3.25–3.75 mm. Male, 10 mm; fore wing 6 mm.,

Distribution : India : Himachal Pradesh (Manali, 1828m).

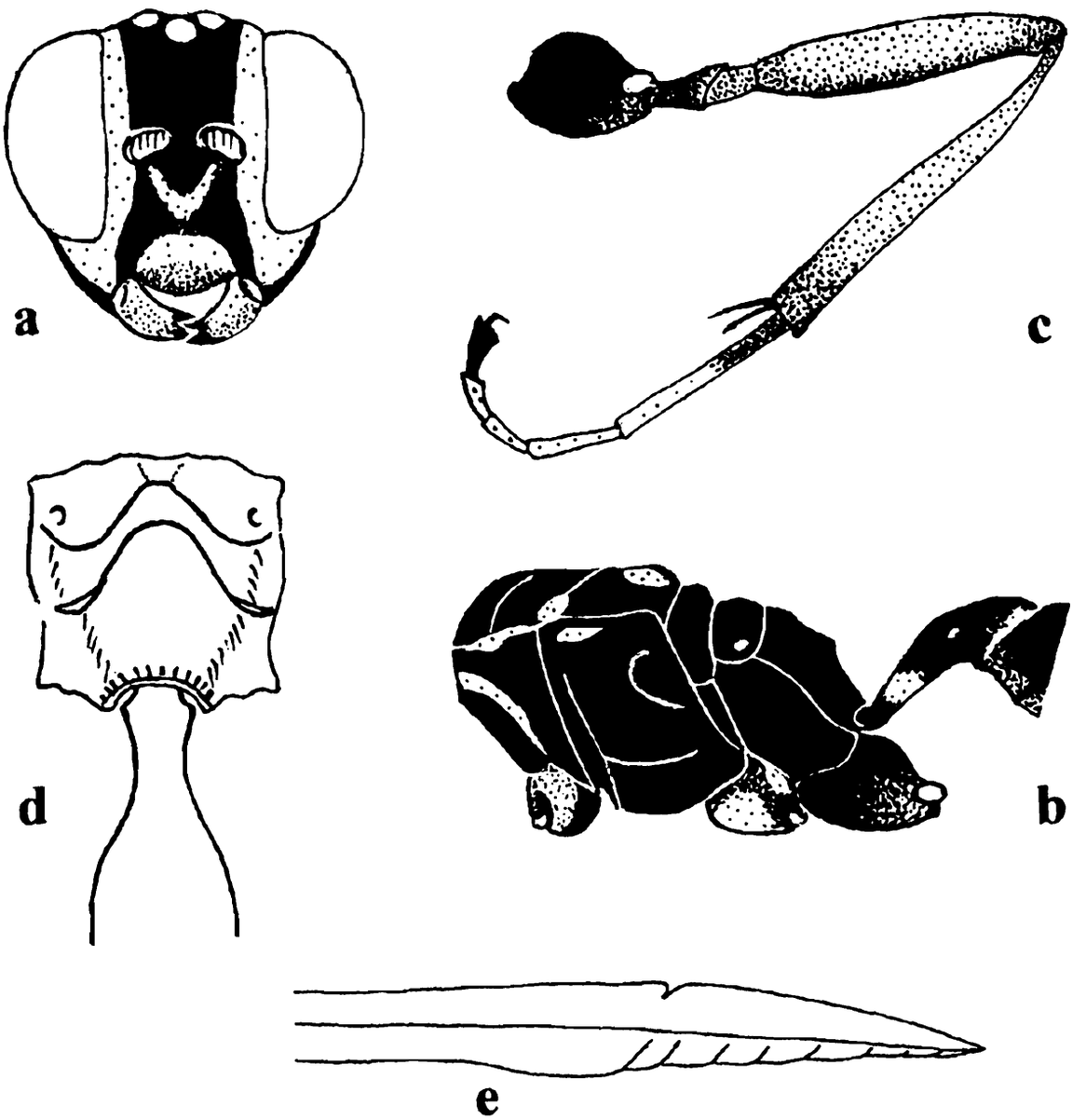

Fig. 22. *Nippocryptus himalayensis* Jonathan : colour pattern : **a**, front view of head; **b**, side view of thorax; **c**, hind leg; **d**, dorsal view of propodeum and first tergite; **e**, ovipositor tip.

4. ***Nippocryptus rufofemoratus*** Jonathan (Fig. 23 : a–c)

1999. *Nippocryptus rufofemoratus* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 24. Female, key, des. fig. Type : Female, India : Himachal Pradesh : Kulu (Z.S.I., Calcutta).

This species is close to *N. granulosus* Jonathan by having body strongly mat (granulated) and abdomen largely reddish. This species can be recognised by having propodeal spiracle oval, speculum smooth, antennal flagellum with a white band, matascutellum yellow, metapleurum with an oval mark and hind tarsus and abdomen reddish.

Female : Face subpolished, strongly granulated, with fine shallow dense punctures. Clypeus shiny with moderate sized, deep and sparse punctures. Malar space granulose, 1.0× as long as basal with of mandible. Mandible shiny, striato-punctate. Frons strongly mat and rugulose, with fine shallow punctures at sides, antennal scrobes shiny with a few trans-striations, median longitudinal groove wide and shallow without carina. Vertex mat with minute, dense, shallow punctures. Temple shiny, minutely and sparsely punctate. Scutellum shiny with minute moderately spaced punctures, lateral carina confined to its base. Metascutellum shiny, minutely punctate. Mesopleurum subpolished, with small dense coalescent punctures, appear to be rugoso-punctate; speculum smooth and polished, subtegular ridge minutely and sparsely punctate, prepectal carina extending about 0.8× the height of mesopleurum. Metapleurum strongly rugoso-wrinkled, with coarse deep punctures above, juxtacoxal carina absent. Propodeum between basal carina and apex subpolished, mat and finely wrinkled, area between transverse carinae at sides with coarse moderately deep punctures, basad of basal carina coarsely punctate, apical carina broadly obsolete in the middle, laterally forming strong apophyses, basal carina strongly arched in the middle, propodeal spiracle oval; first to third tergites granulose with fine dense setiferous punctures. Ovipositor sheath long about 1.6× as long as hind tibia.

Black. 5th to 9th flagellar segments white above. The following are yellow : Face with a mark above, orbits (Fig. 23 : a) all along the eye margin, pronotal collar, upper margin of pronotum, a mark at the apex of middle lobe of mesoscutum, a large oval mark on scutellum, metascutellum, subtegular ridge, a small oval mark at the basal upper corner of metapleurum. Basal 0.66 of first tergite (Fig. 23 : b) black, its apical 0.33 and following all the tergites deep red. Legs (Fig. 23 : c) in general reddish, except all the coxae and trochanters black, and coxae broadly marked with yellow. Wings clear hyaline with yellowish hue.

Male : Not known.

Length : Female, 9.75 mm; fore wing 7.2 mm; ovipositor sheath 3.75 mm.

Distribution : India : Himachal Pradesh (Kulu).

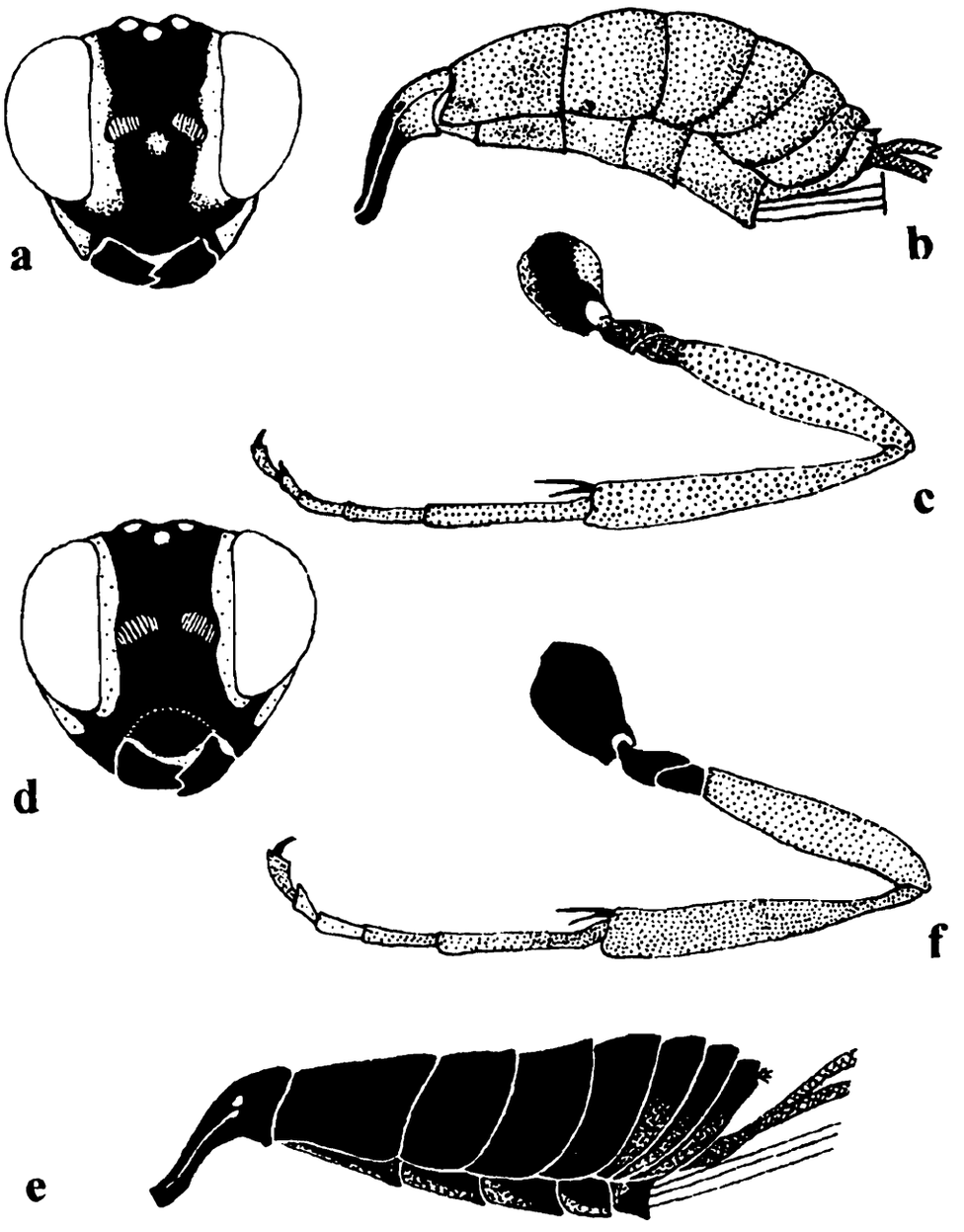

Fig. 23. *Nippocryptus rufofemoratus* Jonathan : colour pattern : **a**, front view of head; **b**, side view of abdomen; **c**, hind leg. *Nippocryptus granulosus* : colour pattern : **d**, front view of head; **e**, side view of abdomen; **f**, hind leg.

5. ***Nippocryptus granulosus*** Jonathan (Fig. 23 : d–f)

1999. *Nippocryptus granulosus* Jonathan, *Rec. zool. Surv. India*, **97**(2) : 26. Female, key, des. fig. Type : Female, India : Himachal Pradesh : Manali, 1828m (Z.S.I., Calcutta). India : Himachal Pradesh : Manali; Uttaranchal : Nainital in Kumaon Hills (Z.S.I., Calcutta & A.E.I., Florida).

This species is allied to *N. rufofemoratus* Jonathan, but can be recognised by having propodeal spiracle circular, antennal flagellum without a band, hind tarsus whitish and metascutellum and metapleurum entirely, black.

Female : Body largely dull and strongly granulated. Face minutely and densely punctate, at sides granulate. Clypeus subpolished, with small sized close punctures, apical 0.2 smooth and shiny. Frons in antennal scorbes coarsely trans-striate, above strongly granulated with fine, dense, setiferous punctures, and also with fine median longitudinal carina. Vertex largely granulated, behind with dense, shallow, small punctures. Temple subpolished, with minute sparse, indistinct punctures. Mandibles rough with coarse punctures. Malar space granulose, 0.8× the basal width of mandible. Pronotum largely rugoso-wrinkled, in the middle tending to be trans-wrinkled, above finely closely trans-rugose with weak scattered punctures in between the regulae, epomia moderately strong and long, collar finely rugose. Mesoscutum mat and subpolished, with minute close punctures. Scutellum mat with minute, close punctures, its lateral carina extending to its basal 0.33. Metascutellum with minute, weak and sparse punctures. Mesopleurum largely moderately strongly rugose, at some places finely striato-rugose, sternaulus with short ridges, below sternaulus minutely and sparsely punctate with fine transverse regulae, speculum densely punctate, prepectal carina extending almost up to the base of subtegular ridge, subtegular ridge carinated, subpolished, sparsely and minutely punctate. Metapleurum moderately strongly rugose, in large size specimens transversely rugose, juxtacoxal carina not well defined. Propopodeum between basal carina and apex wrinkled, basad of basal carina very finely wrinkled with shallow punctures, spiracle circular, both the transverse carinae strong, bent upward and straight in the middle. First to third tergites mat with fine and dense punctures, following tergites mat. Fore wing with areolet pentagonal, about 1.0× as high as the protion of second recurrent vein above bulla. Nervellus intercepted at its 0.26, remulus in fore wing absent. Ovipositor sheath about 1.0× as long as hind tibia.

Black. Apical antennal segments with reddish-brown hue. The following are yellow or dirty yellow : Face, frons and vertex behind narrowly, temple below along the eye margin (Fig. 23 : d), upper margin of pronotum narrowly, upper corner of pronotal collar (sometimes collar wholly), a small oval mark on scutellum (sometimes mark absent), subtegular ridge. Apex of abdomen (ventrally) reddish-brown (Fig. 23 : e). Legs in general reddish-brown, except all the coxae and trochanters, fore femur broadly on outer side, tibia with a line above black; all the tibiae and fore and middle tarsi brown, hind tarsus whitish, except its first segment largely and fifth segment apically reddish-brown (Fig. 23 : f). Wings clear hyaline (colour variable).

Male : Not known.

Length : Female, 7.2–9.5 mm; fore wing 6–8 mm; ovipositor sheath 2.25–3 mm.

Distribution : India : Himachal Pradesh (Manali, 1828m). Uttaranchal (Nainital in Kumaon Hills).

8. Genus ***Myrmeleonostenus*** Uchida (Fig. 24 : a–c)

1936. *Myrmeleonostenus* Uchida, *Insecta Matsumurana,* **10** : 116. **Type-species** : *Myrmeleonostenus babai* Uchida; Original designation.

Taxonomy : Townes, 1970 : 196. Gauld, 1984 : 167. Jonathan, 2000 : 19.

Hosts : Myrmeleontidae.

Distribution : Japan, Southern Europe and Indo-Papuan area.

Body of moderate proportions, with stout thorax and first tergite moderately long and slender. Clypeus moderately small, about 2.4× as wide as long, subpyramidal at centre, its apex convex or subtruncate, without a median tooth. Malar space about 1.0× as long as basal width of mandible. Mandibles short and wide, its lower tooth a little shorter than upper tooth. Mesoscutum polished with small dense and deep punctures; notauli reaching up to the center of mesoscutum. Propodeal spiracle usually long and slit-like, atleast 2× as long as wide, apical carina of propodeum complete, moderately strong, sublaterally forming weak crests. Hind coxa without a groove at

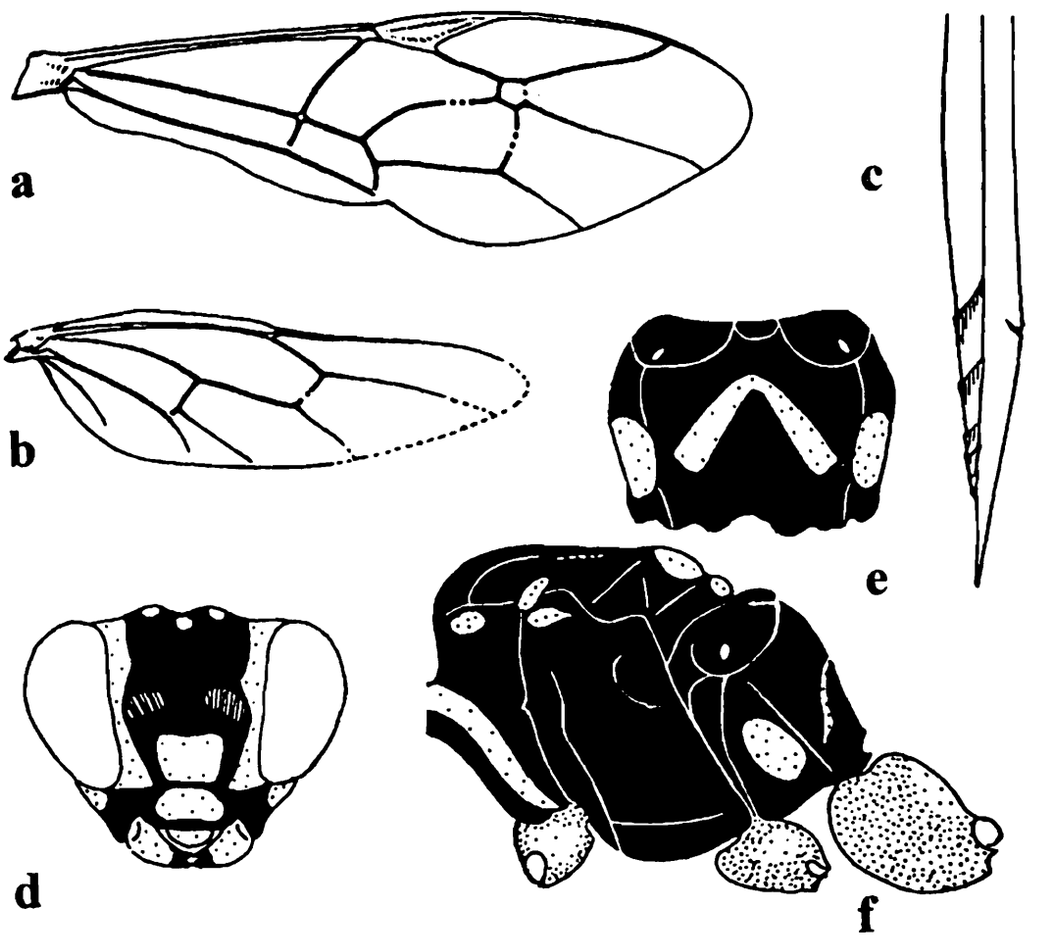

Fig. 24. *Myrmeleonostenus* Uchida : **a, b,** fore and hind wings showing venation; **c,** ovipositor tip. *Myrmeleonostenus longipetiolatus* Jonathan : colour pattern : **d,** front view of head; **e,** dorsal view of propodeum; **f,** side view of thorax.

base on its basal or outer side. First tergite usually long and slender, sometimes short and stout, with or without a tooth at base, with 3 pairs of longitudinal carinae, these may be obsolete or obsolescent on postpetiole. First sternite opposite to spiracle or extending more than 0.5 the distance between spiracle and apex. Second tergite mat to polished, its punctures small or fine, rather dense. Wing venation as in figure 24 : a, b. Ovipositor (Fig. 24 : c) sheath about 1.0× as long as hind tibia, ovipositor weakly compressed.

Length : Female, 6.5–11 mm; fore wing 4.5–8.5 mm; ovipositor sheath 3.5–4.5 mm.

Type-species : *Myrmeleonostenus babai* Uchida.

This genus is known to occur in Indo-papuan and southern part of Palaearctic region. Townes (1970:196) referred to this genus 3 species viz., *Myrmeleonostenus babai* Uchida and *M. secundus* Momoi from Japan, and *Cryptus italicus* Gravenhorst from Europe and Siberia.

Jonathan (2000 : 19) recorded this genus for the first time from India and described three new species from India (Bihar, Himachal Pradesh, Jammu & Kashmir, Maharashtra and Uttar Pradesh).

The Indian species can be distinguished by the following key :

Key to the species of *Myrmeleonostenus*

1. First tergite about 3.5× as long as wide at apex. Postpetiole 2× as long as wide at base. First tergite without lateral tooth at base. First sternite extending 0.5 the distance between spiracle and apex. (Two small elongate mark on mesoscutum, yellow; mesopleurum wholly black. Propodeum with an inverted V-shaped mark. First tergite and legs in general, red) India : Uttaranchal; Himachal Pradesh; Assam; Karnataka; Jharkhand; Maharashtra ..... 1. *longipetiolatus* Jonathan

– First tergite about 2.5× as long as wide at apex. Postpetiole 1.6× as long as wide at base. First tergite with or without a weak lateral tooth or angulation at base. First sternite extending less than 0.4 the distance between spiracle and apex.....2

2. Face sublaterally rugoso-punctate. Malar space about 1× the basal width of mandible. First tergite laterally smooth and shiny, except for a few weak punctures. Nervulus distad of basal vein. Face entirely yellow. Mesopleurum, metapleurum, propodeum and first segment largely red. India : Uttaranchal .....2. *flavomaculatus* Jonathan

– Face uniformly densely punctate. Malar space 0.75× the basal with of mandible. First tergite laterally with transverse ridges at base. Nervulus opposite to basal vein. Face black, marked with yellow. Mesoscutum with a median oval yellow

mark. Mesopleurum, metapleurum, propodeum and first tergite largely, black. India : Jammu & Kashmir; Himachal Pradesh; Uttaranchal .....
.....3. *nigrimaculatus* Jonathan

1. ***Myrmeleonostenus longipetiolatus*** Jonathan (Fig. 24 : d–f)

2000. *Myrmeleonostenus longipetioletus* Jonathan, *Rec. zool. Surv. India*, **98**(1) : 20. Male, Female, key, des. fig. Type : Female, India : Uttaranchal : Garjia, 610m; Herbertpur and Dehra Dun (Z.S.I., Calcutta). India : Uttaranchal : Garjia, 610m. Assam : Rangapara, Sonajuli Tea Estate. Himachal Pradesh : Dharmshala, 1700m. Karnataka : Anmod, 600m. Jharkhand : Ranchi, Namkum. Maharashtra : Nechal, Satara dist. in Western Ghats.

This is a distinct species having first tergite about 3.5× as long as wide at base, postpetiole 2× as long as wide at base, without lateral tooth at base. Mesopleurum wholly black and legs in general red.

Female : Face mat, with small dense punctures in the middle, at sides punctures weak and not well defined. Clypeus subpolished with closely placed punctures at its basal half, apical half smooth and shiny, except for a few scattered punctures. Mandible with minute dense punctures. Malar space granulose about 0.75× the basal width of mandible. Frons subpolished, in the middle with small dense punctures, punctures running into rugosities, at sides along the eye margin largely smooth, a short shallow median groove present extending from the median ocellus. Vertex and temple subpolished with moderate sized and deep punctures, interspaces more than their own diameter, punctures in ocellar triangle dense. Pronotum in the groove and below strongly trans-striate, its upper margin strongly and deeply punctate, pronotal collar with minute, sparse and weak punctures, epomia short, but strong. Scutellum shiny, with coarse shallow and moderately spaced punctures; lateral carina extending at its basal 0.2. Metascutellum smooth and polished. Mesopleurum largely ruguloso-wrinkled, area between subtegular ridge to speculum with deep, moderately large coalescent punctures, punctures running into striations. Mesosternum and area above sternaulus with small dense punctures, prepectal carina extending 0.7 the height of mesopleurum. Metapleurum rugoso-wrinkled, jutacoxal carina present. Propodeum apicad of apical carina moderately strongly wrinkled, between apical and basal carinae with strong oblique ridges, basad of basal carina with small, deep and dense punctures. First tergite about 3.5× as long as wide at apex, tergite largely smooth and subpolished, except distinctly punctate at apex, tergite without lateral tooth, postpetiole about 2.0× as long as wide at base, sternum extending about 0.5 the distance between spiracle and base, second tergite mat, with fine dense punctures, following tergites mat and subpolished. Fore wing with nervulus opposite to basal vein and strongly reclivous; areolet large, about as high as wide, nervellus in hind wing intercepted at its lower 0.2, axillus vein straight, parallel to wing margin.

Black. 5th–10th flagellar segments white above. The following are yellow : Face with an oval mark in the middle, orbital stripe all along the eye margin on face and frons (Fig. 24 : d), clypeus except the apical region, temple along the eye margin, pronotal collar, an oval mark at the upper margin, two small elongated mark in the middle of mesoscutum, scutellum, metapleurum, an inverted V-shaped mark on propodeum (Fig. 24 : e, f), apices of all the abdominal tergites. First tergite and legs in general red, except all the coxae with yellow marks, apex and base of hind tibia, middle and hind tarsus almost wholly brown to dark brown. Wings clear hyaline.

Male : Essentially similar to female, except more slender and finely sculptured. Face, clypeus and frons with small, close to dense punctures, punctures on frons running into striations. Vertex and temple weakly punctate. Mesopleurum striato-wrinkled in the middle. Metascutellum shallowly punctate. Second tergite mat and dull with fine setiferous punctures.

Black. Antennae without band. Face and clypeus wholly, frons and temple along the eye margin, yellow; rest of markings on thorax similar to female, except that the mark on metapleurum and propodeum much broad. First tergite black, fore and middle coxae and trochanters entirely yellow; all femora reddish; all tibiae and fore tarsus, yellowish-brown, except hind tibia broadly at apex and narrowly at base, dark brown; hind tarsus wholly and apical segment of fore and middle tarsus brown; abdominal tergites with usual apical yellow bands.

Length : Female, 6.5–10 mm; fore wing 4.5–7.5 mm; ovipositor sheath 3.5–4 mm. Male, 8 mm; fore wing 6 mm.

Distribution : India : Uttaranchal (Garjia, 610m; Harbertpur; Dehra Dun, New Forest). Himachal Pradesh (Dharmshala, 1700m). Assam (Rangapara, Sonajuli Tea Estate). Karnataka (Anmod, 600m). Jharkhand (Namkum nr. Ranchi). Maharashtra (Nechal, Satara dist. in Western Ghats).

2. ***Myrmeleonostenus flavomaculatus*** Jonathan (Fig. 25 : a–c)

2000. *Myrmeleonostenus flavomaculatus* Jonathan, *Rec. zool. Surv. India*, **98**(1) : 23. Female, key, des. fig. Type : Female, India : Uttaranchal : Barkot, 1143m (Z.S.I., Calcutta).

This species is close to *M. nigrimaculatus* Jonathan by having first abdominal tergite about 2.5× as long as wide at apex and first sternite extending less than 0.4× the distance between spiracle and apex. It is readily distinguished by having face rugoso-punctate, face enitrely yellow; mesopleurum, metapleurum, propodeum and first abdominal segment largely, red.

Female : Face subpolished, with small sized, dense, shallow punctures. Clypeus subpolished, its basal half with small, close to sparse shallow punctures, at apex smooth and shiny. Malar space granulose, about 1.0× the basal width of mandible.

Base of mandible with indistinct punctures. Frons subpolished, having moderate sized, deep and closely placed punctures, punctures in the middle dense and running into wrinkles, median longitudinal groove short and shallow. Vertex and temple with moderate sized and closely spaced punctures. Pronotum subpolished, scrobe with strong trans-wrinkles, pronotum above with moderately large, deep and dense punctures, punctures running into wrinkles, pronotal collar weakly striato-punctate, epomia short and not defined due to wrinkles. Scutellum subpolished, coarsely and shallowly punctate, punctures close at apex, sparse at base, lateral carina extending about 0.5 its lengths. Metascutellum with a few shallow punctures. Mesopleurum along the oblique line drawn from the subtegular ridge to middle coxa finely rugose, subtegular ridge, and area below the ridge, specular area above sternaulus in front and sternum with small punctures, punctures dense and forming fine wrinkles, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum rugose, juxtacoxal carina not defined. Propodeum subpolished, between basal carina and apex finely wrinkled, basad of basal carina with small deep punctures, punctures at sides near spiracles dense, basal carina sublaterally obsolescent. First tergite about 2.5× as long as wide at apex, at base with triangular lateral tooth, tergite shiny its postpetiolar area with closely spaced punctures, postpetiole about 1.6× as long as wide at base, sternite extending less then 0.4 the distance between spiracle and apex. Second and third tergites mat with small and close punctures, fourth tergite mat with setiferous punctures, following mat and sub polished. Fore wing with nervulus little apicad of basal vein, vertical. Nervellus intercepted at its lower 0.25, axillus parallel, its tip curved towards the margin.

Black. 2nd-13th flagellar segments white above. The following are yellow : Scape, face, clypeus, mandible except the teeth, malar space, frons, vertex, temple along the eye margin (Fig. 25 : a, b, c), pronotal collar and upper margin of pronotum broadly, two elongated lines on mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, mesopleurum with a broad mark above sternaulus in front, a small mark just near the base of middle coxa, propodeum with two hemispherical marks sublaterally, apices of all the abdominal tergites. Mesopleurum above including speculum, metapleurum largely, propodeum between apical carina and base laterally and first tergite, red (Fig. 25 : c). Legs in general also red. Fore and middle coxae and trochanters yellow, except first segment of trochanters with a brown line above; hind tibia yellowish-brown, darker at apex and base, hind tarsus white except its fifth segment. Wings clear hyaline with brownish tinge.

Male : Not known.

Length : Female, 8 mm; fore wing 6.5 mm; ovipositor sheath 2.8 mm.

Distribution : India : Uttaranchal (Barkot, 1143m).

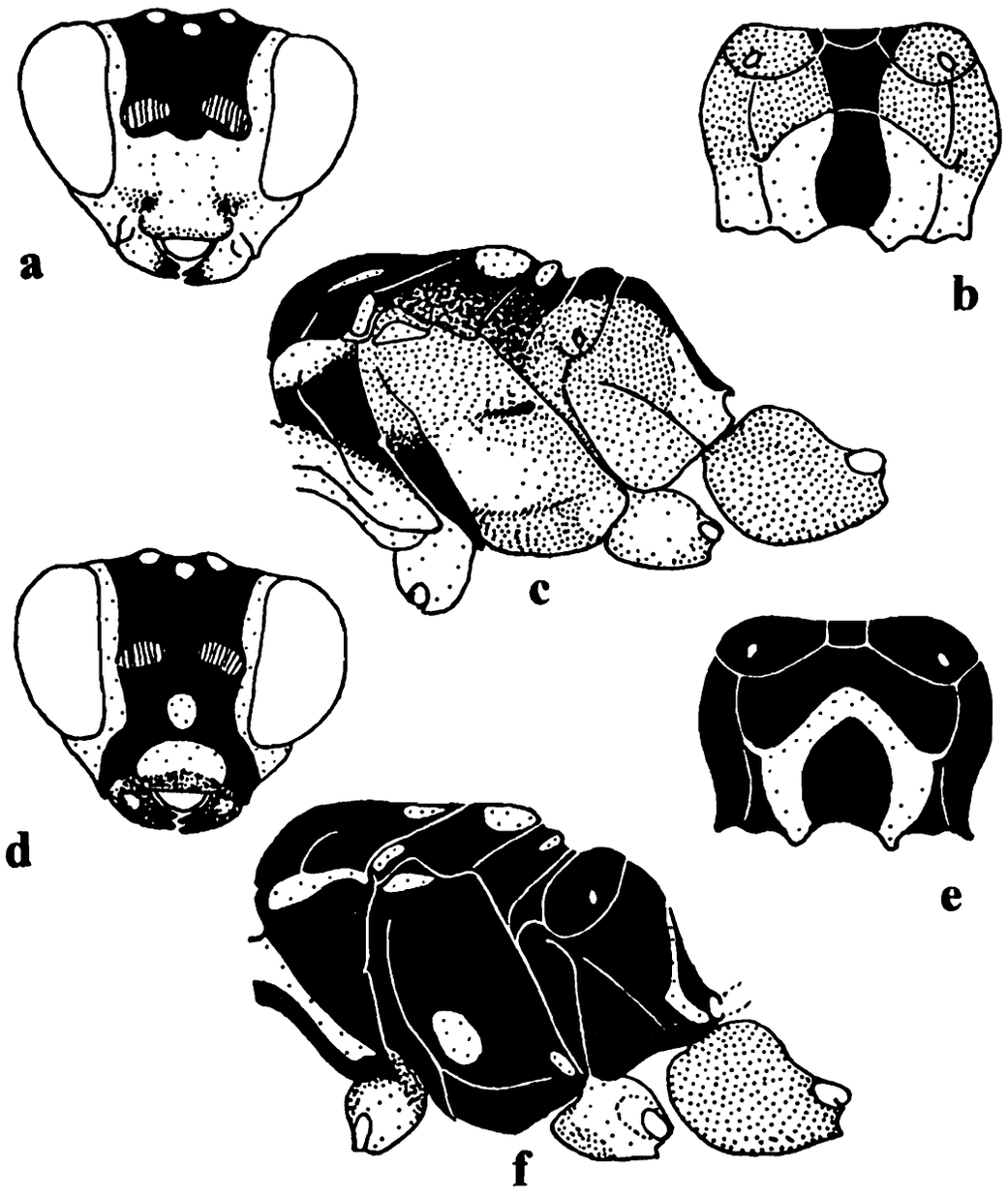

Fig. 25. *Myrmeleonostenus flavomaculatus* Jonathan : colour pattern : **a**, front view of head; **b**, dorsal view of propodeum; **c**, side view of thorax. *Myrmeleonostenus nigrimaculatus* Jonathan : colour pattern : **d**, front view of head; **e**, dorsal view of propodeum; **f**, side view of thorax.

3. ***Myrmeleonostenus nigrimaculatus*** Jonathan (Fig. 25 : d–f)

2000. *Myrmeleonostenus nigrimaculatus* Jonathan, *Rec. zool. Surv. India*, **98**(1) : 25. Male, Female, key, des. fig. Type : Female, India : Uttaranchal : Bhyundar, 2286m in Garhwal Hills (Z.S.I., Calcutta). India : Uttaranchal : Bhyundar, 2286m in Garhwal Hills. Himachal Pradesh : Manali, 1828m; Kasol, 1829m; Dalhousie, 2132m; Ahla, 2286m; Kulu. Jammu & Kashmir : Pahalgam, 2070m (Z.S.I., Calcutta). United Prov. (A.E.I., Florida).

This species is close to *M. flavomaculatus* Jonathan by having first tergite about 2.5× as long as wide at apex, postpetiole about 1.5× as long as wide at base and first sternite extending less than 0.4 the distance between spiracle and apex.

This species is distinguished by having face densely punctate, malar space 0.75× the basal width of mandible; first tergite laterally with transverse ridges and base of tergite with or without basal lateral angulation or weak tooth.

Female : Face with small sized punctures, punctures in the middle closely placed, rugoso-punctate sublaterally, along the eye margin mat with sparse, shallow punctures. Clypeus subpolished, with small and sparsely placed punctures. Mandible sparsely and shallowly punctate, malar space granulose, about 0.75× the basal width of mandible. Frons with moderate sized closely placed punctures, punctures in the middle dense and running into wrinkles, median groove not defined. Vertex and temple with moderately sized, deep and close punctures. Pronotum in its lower 0.6 strongly trans-wrinkled, its upper 0.4 densely punctate, epomia short but strong. Scutellum subpolished, coarsely and shallowly punctate, lateral carina more or less confined to its base. Metascutellum shiny with a few weak punctures. Mesopleurum moderately strongly rugose, speculum rugoso-punctate, mesosternum and area above sternaulus with small dense punctures, subtegular ridge and area just below it finely punctate, Metapleurum rugoso-wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex reticulo-wrinkled, basad of basal carina with moderately large, deep, closely placed punctures. First tergite about 2.5× as long as wide at apex, postpetiole about 1.5× as long as wide at base, tergite smooth and shiny at base, its postpetiolar area mat and densely punctate, punctures tending to be sparse towards the base, pleural area with strong transverse ridges, base of the tergite with or without weak tooth or angulation. Second tergite mat and subpolished with minute dense punctures, third tergite mat and with setiferous punctures, following tergites mat and subpolished. Fore wing with nervulus vertical, opposite to basal vein; nervellus intercepted at its lower 0.28, axillus vein parallel and its tip curved towards the margin.

Black. Apex of 3rd to 10th flagellar segments white above. The following are yellow : a circular mark in the middle of face, clypeus, except apicomedially, mandible at base, face, frons and temple all along the eye margin (Fig. 25 : d), pronotal collar, upper margin of pronotum, an oval mark at the center of mesoscutum, scutellum, metascutellum subtegular ridge, a large mark at the apex and a small mark at the base of sternaulus, propodeum with a 'ring-shaped' mark (Fig. 25 : e, f), apices of all the abdominal tergites, fore and middle coxae with irregular markings. Legs in general red, except hind tarsus white with its first segment at base, fourth and fifth segment largely reddish. Wings clear hyaline.

Male : Essentially similar to female, except 11th to 17th flagellar segments above white. Fore and middle coxae and trochanters yellow with black markings. Hind coxa and trochanter black.

Length : Female, 8–11 mm; fore wing 6–9 mm; ovipositor sheath 3.5–4.5 mm. Male, 8.5 mm; fore wing 6.5 mm.

Distribution : India : Uttaranchal (Bhyundar, 2286m in Garhwal Hills). Himachal Pradesh (Manali, 1828m; Kasol, 1929m; Dalhousie, 2132m; Ahla, 2286m; Kulu). Jammu & Kashmir (Pahalgam, 2070m).

9. Genus ***Buathra*** Cameron (Fig. 26 : a–d)

This genus is mainly distinguished by the absence of lateral tooth at the base of first abdominal tergite. Frons with a pit-like depression dorso-laterad to antennal sockets. This pit is formed due to the presence of a vertical ridge behind each antennal socket (such a pit-like depression is absent is other genera of Ischnini), and second recurrent vein simply arched.

Body of moderate proportions to rather slender. Face without any tubercle. Frons usually strongly depressed with a pit-like depression derso-laterad of each antennal socket. Clypeus about 2.3× as wide as long, weakly to strongly convex, its apical margin without a median tooth. Malar space 0.8 to 1.2× as long as basal width of mandible. Mandible of moderate length, its lower tooth little shorter or about 3× longer than the upper tooth. Mesoscutum polished, with small to medium sized punctures, sparse to dense, sometimes mesoscutum trans-striate or rugose along the edges and notauli; notaulus moderately deep, extending behind center of mesocutum. Propodeal spiracle elliptic to slit-like. Propodeum moderately long, its basal carina usually incomplete, weak or absent, sometimes moderately strong and complete; apical carina moderately strong and complete, sometimes obsolecent at the center, laterally forming very weak crest-like apophyses. Wing venation as in figure 26 : c; second recurrent vein simply arched, usually rather short; areolet pentagonal, intercubiti moderately to strongly convergent infront; axillus vein in hind wing various. First abdominal tergite moderately strong, without lateral tooth or flange at base, its spriracle between its apical 0.33 to 0.45; its postpetiole as long as wide at base or longer than wide at base; ventro-lateral carina of first tergite distinct and complete, dorso-lateral and dorso-median carinae, in female weak and blunt, is male absent or almost absent. Second tergite mat, with fine setiferous punctures. Fore and middle legs sometimes with their tarsal segments apically expended in females. Ovipositor long, its sheath about 1.25× as long as hind tibia, tip with distict nodus, upper valve between nodus and tip straight, weakly convex or concave; lower value with sparse teeth.

Buathra Cameron and *Meringopus* Foerster are very close to each other in sharing several characters. Townes (1970 : 192, 201) and Van Rossem (1969 : 165) defined and distinguished these two genera on the basis of the position of axillus in hind wing, presence and absence of pit-like depression on frons and absence of lateral tooth or flange at the base of first abdominal tergite.

The present author examined the type-species of *Meringopus* (viz., *Cryptus titillator* Linnaeus) and found that there is no frontal pit-like depression in female, as well as in male. Therefore, *Meringopus* should be restricted to species without frontal pit and to the species zoogeographically distributed in the Holarctic region only. All the species with frontal pit should be treated under *Buathra*. *Buathra* is a widely distributed genus of Holarctic and Oriental regions.

Townes (1970 : 192) recognised following species under *Buathra* Cameron from Oriental Region : *Buathra rufiventris* Cameron; *Hedycryptus filicornis* Cameron; *Bathycrisis striaticollis* Cameron; *Cryptus binghami*; *Cryptus excavatus* and *Cryptus himalayensis* Cameron.

The other species from Oriental Region referrable to this genus are, *Etha dentata* Cameron; *Cryptus nigellus* Tosquinet and *Cryptus violaceotinctus* Cameron. Townes (1971 : 239) transfered *Hedycryptus filicornis* Cameron to *Hedycryptus*. *Cryptus luculantus* Cameron (as placed under *Trachysphyrus* by Townes, Townes & Gupta, 1961 : 165); *Cryptus insidiator* Smith and *Cryptus (Cryptus) pilosus* Szépligeti [placed under *Meringopus* Foerster by Vam Rossem (1969 : 192, 193) and Gupta (1987 : 789)] form new combinations with *Buathra* as a result of present study.

The genus *Buathra* is now divisible into three subgenera viz., *Buathra* Cameron, 1903; *Mandibulathra* subgenus nov. and *Meringothra* subgenus nov. A key to subgenera is as follows :

Key to the subgenera of *Buathra*

1. Lower tooth of mandible about 3× as long as upper tooth. Basal carina of propodeum moderately strong and complete. Postpetiole longer than wide at base (1.5×); its spiracle near its apical 0.45. India. Myanmar ..... 2. Subgenus ***Mandibulathra***, nov.

– Lower tooth of mandible equal or little shorter than the upper tooth. Basal carina of propodeum usually incomplete, weak or absent. Postpetiole as long as wide at base (1.0×); its spiracle near its apical 0.33 2

2. Axillus vein (Fig. 27 : c, d) weakly or strongly diverging from anal margin of hind wing, and its tip not coming close to anal margin, rather slanted away from the margin. Axillus strongly pigmented. Oriental and eastern Palaearctic regions ..... 3. Subgenus ***Meringothra***, nov.

– Axillus vein (Fig. 27 : a, b) paralled to anal margin, or close to the margin; its tip uniformly and progressively curved toward the anal margin. Axillus weakly pigmented. Holarctic and Oriental regions. ..... 1. Subgenus ***Buathra*** s. str.

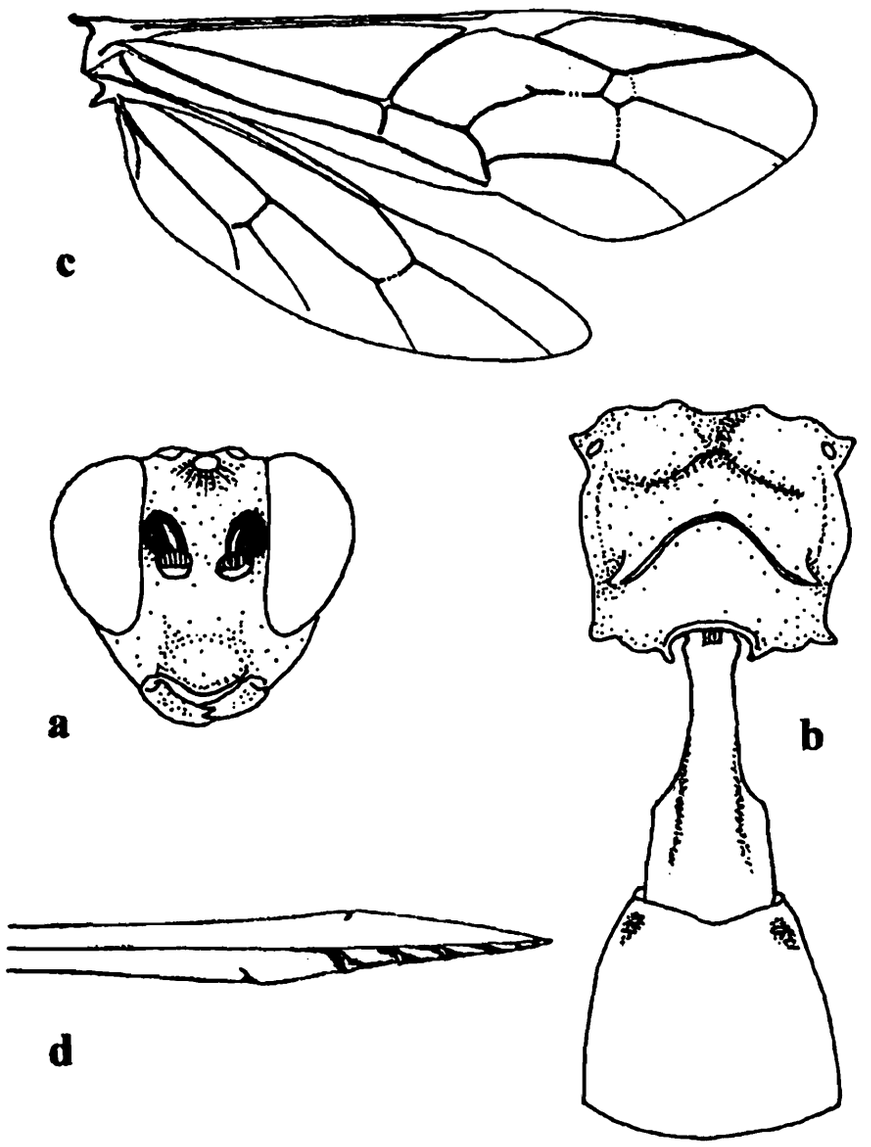

Fig. 26. *Buathra* (*Buathra*) Cameron : *B.(B.) excavata* Cameron : **a**, front view of head showing frontal pits; **b**, dorsla view of propodeum, first & second tergites; **c**, fore & hind wings showing venation; **d**, ovipositor tip.

1. Subgenus ***Buathra*** Cameron (Fig. 26 : a–d)

1903. *Buathra* Cameron, *Tran. Ent. Soc. London*, 1903 : 233. Type-species : *Buathra rufiventris* Cameron; monobasic.

1905. *Bathycrisis* Cameron, *Spolia Zeylanica*, **3** : 96. Syn. by Townes, Townes & Gupta, 1961. Type-species : (*Bathycrisis striaticollis* Cameron) = *excavata* Cameron; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 163-164 (as a synonym of *Trachyshyrus)*. Townes, 1970 : 192 (also included *Hedycryptus* as a synonym). Townes, 1971 : 239 (removed *Hedycryptus* from the synonymy). *Bathycrisis* and *Buathra* were together synonymised under *Trachysphyrus* by Townes, Townes & Gupta, 1961.

Distribution : Holarctic and Oriental regions.

Mandibular teeth subequal, its lower tooth little shorter than the upper tooth. Basal carina of propodeum usually weak or largely absent. Postpetiole as long as wide as at spiracles; spiracles at its apical 0.33. Axillus vein parallel to anal margin or running close to the margin, its tip uniformly and progressively curved towards the anal margin. Axillus weakly pigmented.

This subgenus is widely distributed in Holarctic and Oriental regions. The species referrable to this subgenus from Oriental Region are as follows : *Cryptus excavatus* Cameron; *Bathycrisis striaticollis* Cameron; *Cryptus binghami* Cameron; *Buathra rufiventris* Cameron; and *Cryptus violaceotinctus* Cameron. In addition 6 new species are described here as new from India and Myanmar. The species from India and adjacent countries can be distinguished by the following key.

Key to the species of *Buathra (Buathra)*

1. Abdomen entirely black. 2

– Abdomen not entirely black; may be black, red or brown 5

2. Eye along its margin (orbit) yellow 3

– Eye along its margin black 4

3. Pronotum, subtegular ridge and tegula, yellow. Legs with coxae and trochanters black; femora and tibiae reddish-brown. India : Himachal Pradesh; West Bengal. Sri Lanka ..... 1. *excavata* (Cameron)

– All above black, except all femora red. India : Himachal Pradesh .... 2. *narkandensis*, sp. nov.

4. All tarsi red. Wings clear hyaline. Apical 0.25 of fore and middle femora red. Prepectal carina extending 0.55 the height of mesopleurum. India : Himachal Pradesh ..... 3. *nigripilosa,* sp. nov.

– All tarsi dark brown. Wings clouded with dark brown. Whole of fore and middle femora bright reddish-orange. Prepectal carina extending 0.75 the height of mesopleurum. India : Himachal Pradesh. .....4. *rufifemorata,* sp. nov.

5. Abdomen with apex of 1st to 8th tergites, red. Face, clypeus, pronotum and scutellum, black 6

– Abdomen with 1st or 1–3 tergites, black, rest brown or reddish-brown. Face, clypeus, pronotal collar, upper margin of pronotum and scutellum, yellow 7

6. Face densely and clypeus sparsely and shallowly punctate. Mesoscutum strongly reticulo-punctate, punctures running into longitudinal striations in the center of the middle lobe. Basal transverse carina of propodeum strongly arched in the

middle, laterally not defined. India : Meghalaya; Uttaranchal; Himachal Pradesh. ..... 5. *rufiventris* Cameron

– Face largely granulose with undefined shallow punctures. Clypeus smooth and shiny with a few scattered punctures. Mesoscutum coarsely punctate. Basal transverse carina of propodeum obscured. India : Himachal Pradesh. .... 6. *similis,* sp. nov.

7. Abdominal segments 1–3 black; 4–8 dark brown. Malar space 0.8× the basal width of mandible. Face densely punctate. Pronotum largely trans-striato-wrinkled. India : Meghalaya. Myanmar. ..... 7. *heinrichi*, sp. nov.

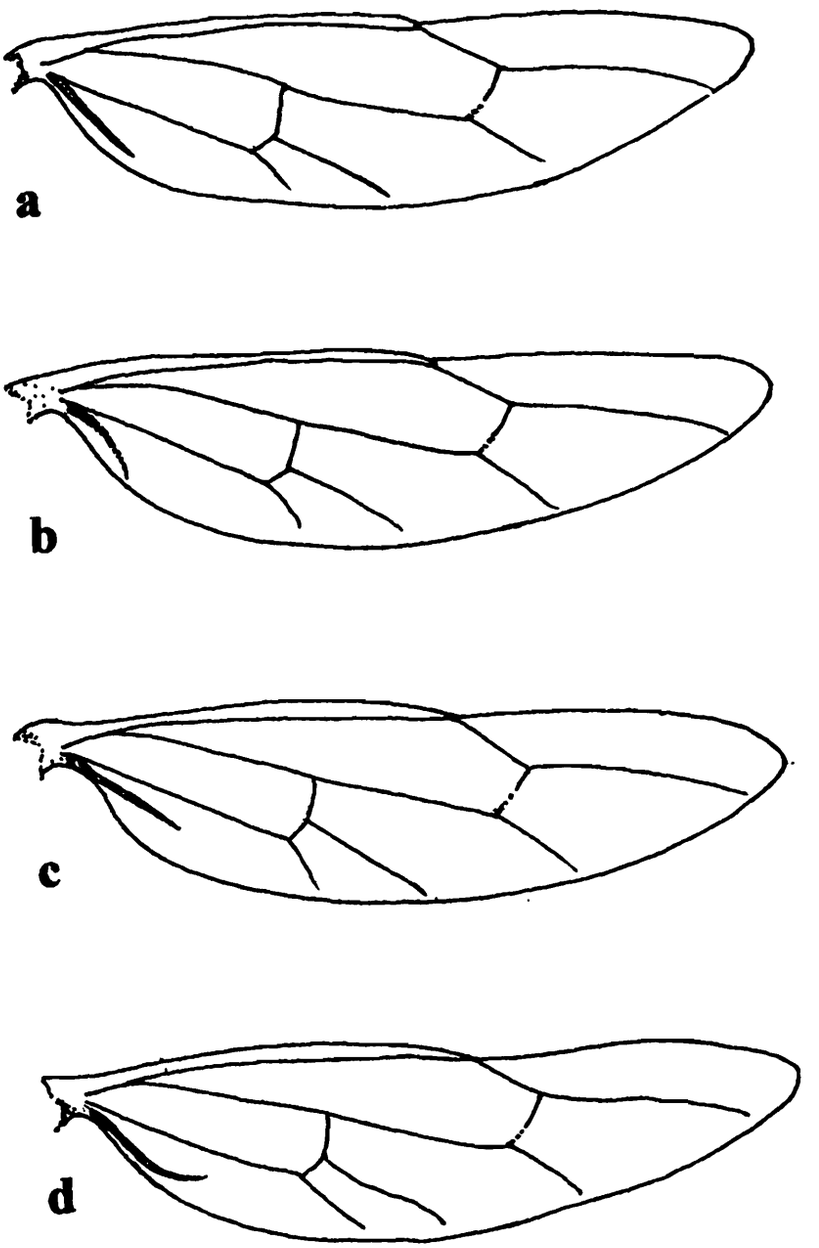

Fig. 27. Showing position of axillus vein in hind wing : **a**, & **b**, *Buathra (Buathra)*; **c**, & **d**, *Buathra (Meringothra)*.

– First abdominal tergite black; tergites 2–8 reddish-brown. Malar space 1× the basal width of mandible. Face rugulose. Pronotum strongly rugoso-punctate. India : Uttaranchal; Uttar Pradesh. ..... 8. *kumaonensis,* **sp. nov.**

Note : *Buathra (Buathra) violaceotincta* (Cameron) is based on a male type, therefore could not be included in the key to the species.

1. *Buathra (Buathra) excavata* (Cameron) (Fig. 26 : a-d)

1905. *Cryptus excavatus* Cameron, *Entomologist,* **38** : 84. Female. des. Type : Female. India : Himachal Pradesh : Simla (LONDON).

1905. *Bathycrisis striaticollis* Cameron, *Spolia Zeylanica,* **3** : 97. Male. des. Type : Male, Sri Lanka : Trincomalee (LONDON). **New Synonymy.**

1907. *Cryptus binghami* Cameron, *Ann & Mag. Nat. Hist.,* (7) 19 : 181. Male. Female. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, India : West Bengal : Darjeeling, 1425m (LONDON). **New synonymy.**

1961. *Trachysphyrus binghami* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 164. Lectotype design. n. comb. India.

1961. *Trachysphyrus excavatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 164. n. comb. India.

1961. *Trachysphysus excavatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 164. n. comb. India.

1961. *Trachysphysus striaticollis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 166. n. comb. India.

1970. *Buathra binghami* : Townes, *Mem. Amer. Ent. Inst.,* **12** : 193. n. comb.

1970. *Buathra excavatus* : Townes, *Mem. Amer. Ent. Isnt.* **12** : 193. n. comb.

1970. *Buathra striaticollis* : Townes, *Mem. Amer. Ent. Inst.,* **12** : 193. n. comb.

1987. *Buathra excavata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 790.

Female : Antennae long and filiform. Head and thorax covered with dense silvery hairs. Face strongly raised in middle, strongly and closely punctate. Clypeus with sparse and coarse punctures, apically impressed, apical margin turncate. Malar space granulose, 1.15× the basal width of mandible. Frons strongly depressed, subpolished, coarsely trans-striate just behind the antennal sockets, strongly and irregularly wrinkled above. Vertex behind ocellar triangle finely rugose. Temple subpolished, with moderately large close punctures. Pronotum subpolished rugoso-wrinkled with a few punctures at extreme upper margins. Mesoscutum rugoso-wrinkled with transversely running striations. Scutellum subpolished with sparse deep punctures, its lateral carina more or less confined to its base. Metascutellum largely smooth and

shiny with a few scattered shallow punctures. Mesopleurum largely strongly rugoso-wrinkled, with deep punctures above and on prepectus, prepectal carina extending 0.85 the height of mesopleurum. Metapleurum and propodeum strongly reticulo-wrinkled, apical carina strong, bow-shaped, laterally froming moderately strong conical apophyses, basal carina weak, at sides not well defined (absent), spiracle large slit-like. First abdominal tergite smooth and shiny, following tergites mat and subpolished. Postpetiole about at long as wide at base. Areolet large, pentagonal, nervellus intercepted at its basal 0.3. Ovipositor tip long and pointed with distinct nodus, its sheath about 0.85× as long as hind tibia.

Black. The following are yellow are dirty yellow: eyes all along the eye margin except above, pronotum with a small mark at the upper end of epomia, subtegular ridge and tegula. Legs with all coxae and trichanters black, their femora and tibae reddish-brown and tarsi dark brown. Fore and middle femora with a broad black line below, apices of hind femora and tibae dark brown; and hind 2-4 tarsal segments whitish-yellow. Wings clear hyaline, with a yellowish hue.

Male : Essentially similar to female except more slender and polished. Antennae thick and tapering towards the apex. Face shallowly and closely punctate. Clypeus sparsely punctate. Upper margin of pronotum finely and deeply punctate, rest of pronotum rugoso-wrinkled. Mesopleurum densely rugoso-punctate. Metapleurum densely and strongly punctate, appears to be reticulate. Propodeum with both the transverse carinae equally strong. First abdominal tergite long slender and smooth; following tergites mat and subpolished.

Black. The following are yellow : Face with a square-shaped mark in the center, clypeus largely, face broadly, and frons and vertex narrowly along the eye margin, temple also narrowly along outer orbit except above, pronotum above, subtegular ridge. Tegula blackish-brown. Legs similar to female in colour pattern. Wings clear hyaline.

Length : Female, 9.5–13 mm; fore wing 8–11 mm; ovipositor sheath 4.5–5.5 mm. Male, 6–13 mm; fore wings 4.5–9.5 mm.

Distibution : India : Himachal Pradesh (Narkanda, 2600 m; Dhenkund, 2743 m nr. Dalhousie; Ahla, 2286m nr Dalhousie; Kalatop, 2483 m nr. Dalhousie; Manali, 1828m and Rohtang Pass, 3950m; Chini Banglow, 2460m in Shimla Hills. Jammu & Kashmir (Gulmarg, 2430m and Killanmarg, 3000m). Sikkim (Gangtok, 1570 m). Uttaranchal (Mussoorie, 2100 m and Bhyundar, 2285 m). West Bengal (Darjeeling, 1900m and Lelong, 1765 m). *Elsewhere* : Sri Lanka (Trincomalee).

2. ***Buathra (Buathra) narkandensis*** Jonathan, sp. nov.

Female : Face finely and closely punctate, weakly raised in the middle, subpolished. Clypeus moderately convex, largely smooth and shiny, with a few minute punctures

in the basal area, apical margin impressed. Malar space granulose, 1.5× the basal width of mandible. Frons moderately strongly obliquely rugose, antennal scrobes in the middle with strong trans-striations, area laterad to median ocellus weakly rugose. Vertex dull, strongly granulose. Temple shiny, sparsely and finely punctate. Pronotum subpolished, moderately strongly trans-rugose, rugae weak at the extreme upper margin. Epomia straight, strong. Mesoscutum subpolished, closely and shallowly punctate. Scutellum roundly convex, shiny with scattered minute punctures, lateral carina of scutellum more or less confined to its base. Metascutellum smooth and shiny. Mesopleurum, metapleurum and propodeum largely moderately strongly rugose, except prepectus closely punctate, speculum smooth in the middle. Juxtacoxal carina not well defined. Basal transverse carina of propodeum complete and strong, apical carina strong and arched, laterally forming strong lateral crest. First tergite mat and subpolished, and 2.5× as long as wide at apex, postpetiole about 1.1× as long as wide at spiracles, following tergites mat and subpolished. Areolet pentagonal, narrowed in front, nervulus slightly basad of basal vein, nervellus intercepted at its lower 0.25. Ovipositor sheath 0.8× as long as hind tibia.

Black. Flagellum without a band; face, frons, vertex above and temple narrowly along the eye margin, yellow. Legs black except all the femora bright red. Wings hyaline, light fuscous.

Male : Similar to female, except more slender and weekly sculptured.

Length : Female, 9 mm; fore wing 6.5 mm; ovipositor sheath 3 mm. Male 8.5 mm; fore wing 6 mm.

Holotype : Female and allotype Male, INDIA : Himachal Pradesh : Narkanda in Shimla Hills, 2730 m, 6.x.1966, D. Ram, No. 237 (Z.S.I., Calcutta). *Paratype* 4 Females and 1 Male. Same data as holotype, 3 Females, 5–6.x.1966, V.K. Gupta & D.T. Tikar, Coll.Nos 235 & T273*. 1 Female, 7.x.1962, V.K. Gupta, No. 34; 1 Male, 9.x.1966, V.K. Gupta, No. 248 (Z.S.I., Calcutta) and (*) marked specimen donated to A.E.I, Florida).

Distribution : India : Himachal Pradesh.

3. ***Buathra (Buathra) nigripilosa*** Jonathan, sp. nov.

This species is extremely similar to *Buathra (B.) excavata* (Cameron) in colour and other morphological characters, but differs as follows.

Female : Head and thorax covered with fine black hairs. Antennae moderately long and filiform. Face and clypeus densely and coarsely punctate, except apical 0.5 of clypeus smooth and shiny. Mandible densely strongly punctate, punctures running into striations. Malar space granulose, 1.5× the basal width of mandible. Frons largely reticulo-wrinkled, area behind antennal sockets trans-striate. Vertex and temple moderately strongly wrinkled, tending to be reticulate behind the ocellar triangle. Pronotum and mesopleurum largely strongly wrinkled, surface shiny; epomia strong

and long, extending up to upper margin than turned mesad, prepectal carina extending 0.55× the height of mesopleurum. Mesoscutum puncto-wrinkled, punctures in the middle of each lobe sparse and longish. Scutellum and metascutellum subpolished with deep coarse punctures, lateral carina of scutellum extending to its basal 0.25. Metapleurum strongly reticulate, juxtacoxal carina not well defined. Propodeum largely reticulo-wrinkled, apical carina complete, bow-shaped, straight in the middle, basal carina strongly arched in the middle, laterally not well defined, apical carina laterally forming moderately strong apophyses. First tergite 2.3× as long as wide at apex, postpetiole about (1.0×) as long as wide at spiracles, tergite subpolished, granulose along the mid-line, dorso-median carinae short, joining with dorso-lateral carinae behind the spiracle. Following tergites largely dull and granulose. Areolet pentegonal. Nervulus basad of basal vein, nervellus intercepted at its lower 0.2. Ovipositor long, its tip blunt, with distinct nodus and series of teeth. Ovipositor sheath 1.0× as long as hind tibia.

Body black without any mark, covered with black longish hair. Legs largely red, except all the coxae, trochanters, basal 0.75 of fore and middle femora, and extreme apices of middle and hind tibia, black. Wings clear hyaline.

Male : Not known.

Length : Female, 11 mm; fore wing 9 mm; ovipositor sheath 4 mm.

Holotype Female, INDIA : Himachal Pradesh : Dalhousie, 213 m, 27.iv. 1971. T. Chand, coll. no. DH 11 (Z.S.I., Calcutta).

Distribution : India : Himachal Pradesh.

4. ***Buathra (Buathra) rufifemorata*** Jonathan, sp. nov.

This species is close to *Buathra (Buathra) nigripilosa*, sp.nov. in having black erect hairs on head and thorax. It also comes very close to *B. (B.) excavata* (Cameron), but differs in having wings more dark, different sculpture of scutellum, abdomen etc and femora reddish-orange.

Female : Body in general polished. Head and thorax covered with moderately long, erect black hairs. Face coarsely and densely punctate, punctures running into radiating striations. Clypeus in its basal 0.6 with deep, sparse punctures, rest (0.4) smooth and shiny. Mandible longitudinally striate, with punctures in between the striae. Malar space granulose, about 0.8× the basal width of mandible. Frons moderately strongly reticulo-wrinkled, behind the antennal sockets trans-striate. Vertex puncto-wrinkled. Temple striato-punctate. Pronotum and mesopleurum moderately strongly rugose, epomia extending up to upper margins than turned mesad, prepectal carina extending 0.75 the height of mesoplaurum. Mesoscutum coarsely, sparsely punctate, punctures in the middle of middle lobe running into fine striations. Scutellum and metascutellum

finely punctate, shiny, lateral carina confined to its base. Metapleurum and propodeum largely reticulate, apical carina of propodeum very strong, bow-shaped, laterally forming moderately high apophyses, basal carina present in the middle only, like an inverted "V" First abdominal tergite smooth and shiny, about 2.2× as long wide at apex, postpetiole about 1.0× as long as wide at spiracles, following tergites smooth and shiny. Areolet large pentagonal, nervulus basad of basal vein; nervellus intercepted at its lower 0.2. Ovipositor moderately long its tip long and pointed its lower valve with a few teeth, ovipositor sheath 1.0× as long as hind tibia.

Body in general black, except all the femora and tibiae bright reddish-orange. all tarsi brown. Wings hyaline, clouded with dark brown.

Male : Not known.

Length : Female, 12 mm; fore wing 9 mm; ovipositor sheath 4 mm.

Holotype Female, INDIA : Himachal Pradesh : Dhankund, 2743m, near Dalhousie, 25.ix.1971, A.K. Gulati, No. JD. 167. *Paratype* 1 Female, INDIA : Himachal Pradesh : Kalatop, 2488m near Dalhousie, 28.ix.1971, Sukh Dev, No. JD 182 (Z.S.I., Calcutta).

Distribution : India : Himachal Pradesh.

5. ***Buathra (Buathra) rufiventris*** Cameron (Fig. 28 : a)

1903. *Buathra rufiventris* Cameron, *Trans. Ent. Soc. London*, **1903** : 234. Male. des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD).

1914. *Cryptus rufiventris* : Morley, *Entomologist,* **47** : 25. n. comb.

1937. *Buathra rufiventris* : Heinrich, *Ann. & Mag. Nat. Hist.,* (10) **20** : 261. Male. syn. notes. "Cryptine."

1961. *Trachysphyrus rufiventris* : Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.,* **1** : 166. n. comb. India.

1970. *Buathra rufiventris* : Townes, *Mem. Amer. Ent. Inst.,* **12** : 193. new status.

1987. *Buathra rufiventris* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 790.

Female : Head and thorax covered with fine silvery hair. Antennae long filiform. Face densely and clypeus sparsely and shallowly punctate. Malar space granulose, 1.0× basal width of mandible. Frons moderately strongly rugoso-punctate, punctures at sides more distinct, antennal depression smooth and shiny. Vertex densely punctate, appears to be rugoso-punctate. Temple subpolished, with moderately deep punctures, interspaces about 1.0× the diameter of a punctures. Pronotum largely rugoso-winkled, rugosities at its upper margin and pronotal collar fine. Eponia strong, reaching upper margin then turned mesad. Mesoscutum modereately strongly reticulo-punctate,

punctures on the middle lobe in the center running into longitudinal striations. Scutellum subpolished coarsely punctate, interspaces about their own diameter, punctures fine and close towards the apex, lateral carina of scutellum more or less confined to its base. Metascutellum subpolished with fine punctures. Mesopleurum moderately strongly rugoso-wrinkled, rugosities more stronger towards the mesopleural suture, speculum shiny, with a few coarse punctures above, prepectal carina extending 0.85× the height of mesopleurum, mesosternal area coarsely and closely punctate. Metapleurum and propodeum strongly reticulo-wrinkled; apical carina strong, bow-shaped; laterally forming low lateral crests, basal carina strongly arched in the middle, laterally not well defined. First tergite 2.25× as long as wide at apex, postpetiole about as long as wide at base, dorso-median carinae high near the spiracles. Following tergites largely mat and dull. Areolet pentagonal, large, nervulus opposite to basal vein, nervellus intercepted at its lower 0.25. Ovipositor long, its tip blunt with distinct nodus, ovipositor sheath 1.0× as long as hind tibia.

Black. The following are yellow : Eyes all along the margin except above, clypeus, mandible except the tip and at base, tegula along the outer margin, subtegular ridge, second to fourth hind tarsal segments. First abdominal tergite (Fig. 28 : a) apically and all the following tergites, all the legs in general, bright red, except their coxae and trochanters largely black.

Male : Similar to female except more slender, weakly sculptured.

Length : Female, 16 mm; fore wing 12 mm; ovipositor sheath 5 mm. Male, 14 mm; fore wing 10 mm.

Distribution : India : Meghalaya (Khasi Hills). Uttaranchal (Chakrata, Mundali; Mussoorie, 2005m). Himachal Pradesh : (Dalhousie, 2132 m; Ahla, 2283m nr. Dalhousie; Manali, 1828 m).

6. ***Buathra (Buathra) similis*** Jonathan, sp. nov.

Extremely similar and sympatric to *Buatha (Buathra) rufiventris* Cameron, but can be distinguished by the sculpture of face, mesoscutum, propodeum and shape of ovipositor.

Female : Face largely granulose, with dense, not well defined shallow punctures all over. Clypeus largely shiny with a few scattered fine punctures. Mesoscutum shiny, closely and coarsely punctate. Basal carina of propodeum obscured. Ovipositor very narrow near nodus and tepering towards the tip, its tip pointed, nodus with a deep notch, lower valve with many distinct teeth. Rest of the body structure and colour similar to *Buathra (Buathra) rufiventris* Cameron.

Male : Not known.

Length : Female, 11 mm; fore wing 8.5 mm; ovipositor sheath 4.5 mm.

Holotype : Female, INDIA : Himachal Pradesh : Khajjiar 1828 m, 18.v.1971, M.K. Kamath, No. DH. 51. *Paratype* 1 Female, INDIA : Himachal Pradesh : Pangi, 2867m, 14.vi.1972, V.K. Gupta, No. 394 (Z.S.I., Calcutta).

Distribution : India : Himachal Pradesh.

7. ***Buathra (Buathra) heinrichi*** Jonathan, sp. nov. (Fig. 28 : b)

This species is easily distinguished by having 1–3 abdominal segments black and 4–8 segments dark brown. Face densely punctate. Malar space 0.8× the basal width of mandible and pronotum largely trans-striato-wrinkled.

Female : Head largely subpolished. Face strongly raised in the middle, minutely and densely punctate, along the eye margin smooth, with a few scattered shallow punctures. Clypeus moderately convex, sparsely and shallowly punctate, apical margin impressed and evenly arched. Frons above obliquely striate, smooth and shiny towards the antennal sockets. Vertex densely granuloso-punctate, punctures with fine running striations. Temple with fine and evenly spaced punctures, interspaces about 2× their own diameter. Malar space granuloso-punctate, 0.8× the basal width of mandible. Mandible sparsely and shallowly punctate, teeth equal. Pronotum largely transversely striato-wrinkled, its upper margin densely punctate, epomia strong, reaching to upper margin then turned mesad. Mesoscutum densely punctate with transversely running fine striations, notauli deep and long. Scutellum convex sparsely punctate, lateral carina extending to its basal 0.2. Metascutellum smooth and shiny. Mesopleurum subpolished, rugose, with a few puntures in between the rugae, speculum shiny with coarse, deep and close punctures, prepectal carina extending 0.85 the height of mesopleurum, subtegular ridge smooth, longish. Metapleurum strongly rugose, juxtacoxal carina not well defined. Propodeum rugoso-wrinkled, tending to be reticulate in the middle and above, both the transverse carinae strongly arched, apical carina laterally forming moderately strong crest-like apophyses, spiracles large, slit-like. First tergite largely smooth and subpolished with a few sparse, shallow punctures, both the longitudinal carinae not well defined, tergite about 2.5× as long as wide at apex, postpetiole 1.1× as long as wide at the spiracles; following tergites mat and subpolished. Fore wing with areolet pentagonal, intercubiti convergent, nervulus basad of basal vein, nervellus intercepted at its lower 0.3. Ovipositor long, its tip blunt, with distinct nodus, lower valve with series of distinct teeth. Ovipositor sheath about 0.6× as long as hind tibia.

Black. The following are yellow : Face in the middle, clypeus largely (sometimes mark on face and clypeus confluent), orbital mark encircling the whole orbit, mandible (except the teeth), pronotum along the upper margin, pronotal collar above, tegula, subtegular ridge, small faint mark in the middle of scutellum. Abdomen (Fig. 28 : b)

largely dark brown, except first segment black, second and third tergites broadly blackish. Legs in general brown, except fore coxa and trochanter, yellow. A black mark above on fore coxa; middle and hind coxae black; middle trochanter yellow with a black line above; hind tarsus wholly brownish-yellow. Wings clear hyaline.

Male : Essentially similar to female except more slender and weakly sculptured. Face weakly raised in the middle, sparsely and shallowly punctate. Vertex shiny, sparsely punctate. Pronotum weakly rugose, sparsely punctate above. Mesoscutum finely punctate, middle lobe with trans-striations. Mesopleurum finely rugose. Metapleurum and propodeum largely-reticulate, abdomen mat and subpolished.

Black. Yellow markings on head more extensive than female. Scape broadly yellow in front; rest similar to female.

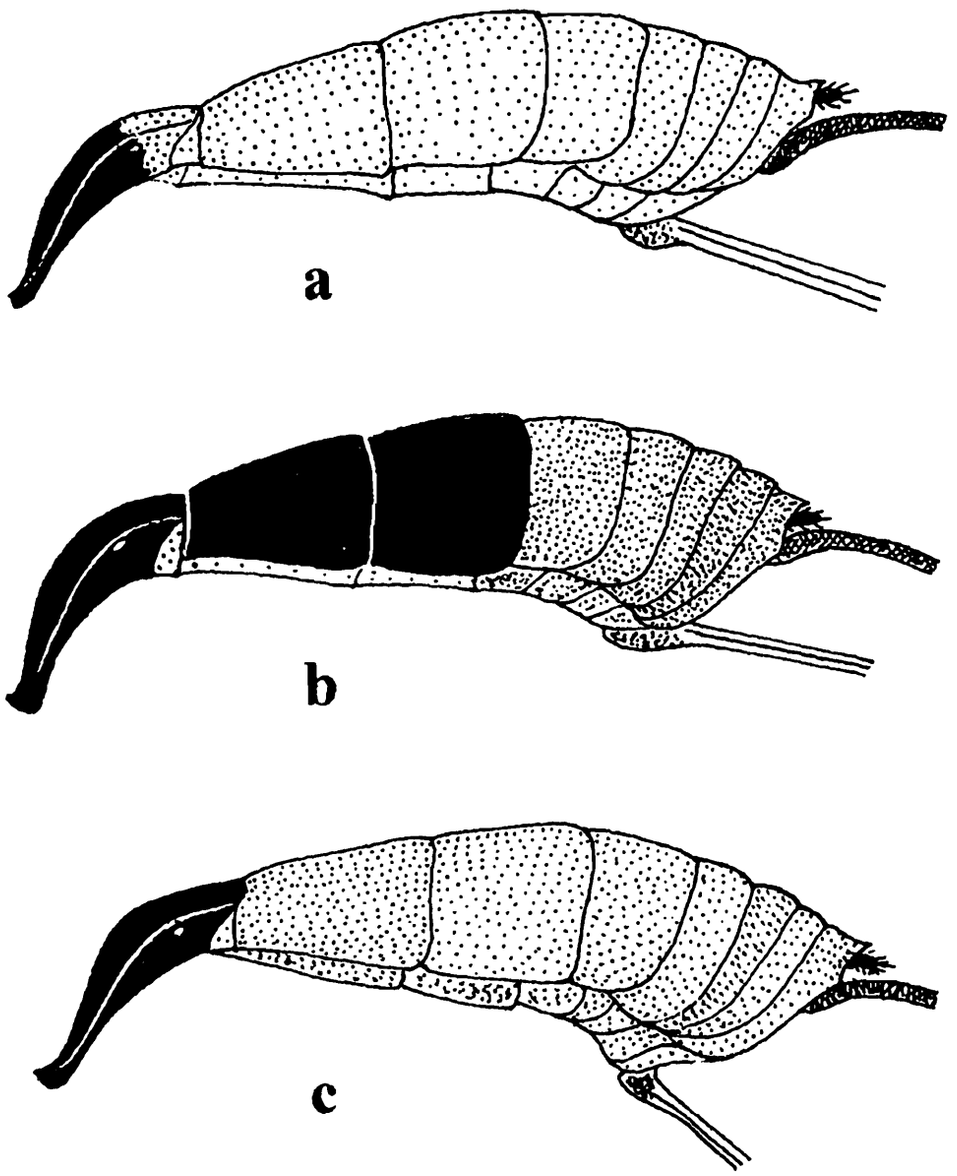

Fig. 28. Colour pattern of abdomen : **a**, *Buathra (B.) rufiventris* Cameron; **b**, *B.(B.) heinrichi*, sp. nov.; **c**, *B.(B.) kumaonensis*, sp. nov.

Length : Female 13–18 mm; fore wing 10.5–13 mm; ovipositor sheath 6–8 mm. Male, 13 mm; fore wing 10.5 mm.

Holotype Female, MYANMAR : Mt. Victoria, 1400m 1938, Gerd Heinrich. *Allotype* Male, MYANMAR : Mt. Victoria, 2800 m, 29.iv.1938, Gerd Heinrich. *Paratypes* 6 Females, 2 Males. MYANMAR : Mt. Victoria, 1400m, 2 Females, 1938, Gerd Heinrich; 4 Females, 29.iv.1938, Gerd Heinrich. INDIA : Meghalaya : Cherrapunji in Khasi Hills, 2 Males, 4–7.iv.1966, M. K. Kamath, Nos. 76, 77 (Z.S.I., Calcutta and A.E.I., Florida).

Distribution : India : Meghalaya. *Elsewhere* : Myanmar : Mt Victoria.

8. ***Buathra (Buathra) kumaonensis*** Jonathan, sp. nov. (Fig. 28 : c)

This species is recognised by having first abdominal tergite black and 2–8 tergites reddish-brown. Malar space about 1× the basal width of mandible. Face rugulose. Pronotum strongly rugoso-punctate.

Female : Head largely subpolished. Face and clypeus largely rugulose. Frons finely rugose, area near the pit smooth and shiny. Vertex behind ocellar triangle finely closely punctate, at side sparsely punctate. Temple sparsely punctate, interspaces about 1.5× their diameter. Malar space granulose, 1.0× the basal width of mandible. Pronotum strongly rugoso-wrinkled, its upper margin with moderately deep punctures, epomia short, present in the scrobe. Mesoscutum closely punctate, interspaces less than their diameter, punctures at some places running into striations. Mesopleurum and metapleurum strongly rugoso-wrinkled, speculum on mesopleurum with a few deep punctures, prepectal carina extending 0.7× the height of mesopleurum, juxtacoxal carina on metapleurum not well defined. Scutellum and metascutellum subpolished, closely and shallowly punctate, lateral carina of scutellum confined to its base. Propodeum wrinkled, reticulate towards the base, apical carina bow-shaped, straight in the middle; basal carina arched in the middle, absent at sides. First tergite smooth and shiny about 2.2× as long as wide at apex, postpetiole as long as wide at the spiracles. Following tergites mat and subpolished. Areolet large pentagonal, narrowed in front, nervulus opposite to basal vein, nervellus intercepted at its lower 0.2. Ovipositor tip blunt, nodus distinct, lower valve with a few teeth.

Black. Antennae with 4–9 segments white above. Scape in front yellowish-brown. The following are yellow : frons, vertex and temple along the eye margin, face and clypeus with an elongate mark, malar space, pronotum narrowly along the upper margin, collar with two marks, subtegular ridge, tegula, basal 0.6 of scutellum. First tergite black, following tergites reddish-brown, second and thrid tergites tending to be darker (Fig. 28 : c). Legs in general yellowish-brown. Fore and middle legs with their coxae and trochanters blackish-brown, its tarsus largely yellowish. Wings clear hyaline.

Male : Similar to female, except more slender and weakly sculptured.

Length : Female, 10.5 mm; fore wing 8.5 mm; Ovipositor sheath 2.5 mm. Male, 10mm; fore wing 8mm.

Holotype Female and *Allotype* Male, INDIA : Uttaranchal : Sat tal, 1500m, in Kumaon Hills, 6.v.1963, V.K. Gupta, No. 43. *Paratypes* 3 Females, 5 Males. INDIA : Uttaranchal : Nainital, 1856m, Male, 1 Female, 4.v.1965 and 5.v.1963, V. K. Gupta, Nos. 52, 42. Chaubatia nr. Ranikhet, 10.v.1963, V.K. Gupta, Nos. 45, 46. Mussoorie, 2500 m, 1 Female, 24.v.1962, V.K. Gupta. Phata, 1600m, in Garhwal Hills, 1 Male*, 13.v.1967, M. K. Kamath, No. 180. Uttar Pradesh : Muktesar, 1 Female, 1 Male, 5–18.iii.1934, S.K. Sen (Z.S.I., Calcutta and (*) marked in A.E.I., Florida).

Distribution : India : Uttaranchal and Uttar Pradesh.

9. ***Buathra (Buathra) violaceotincta*** (Cameron), n. comb.

1906. *Cryptus violaceotinctus* Cameron, *J. Bombay Nat. Hist. Soc.*, **17** : 284. Male. key, des. Type : Male, Pakistan : Quetta (London).

1961. *Trachysphyrus violaceotinctus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 166. n. comb. Pakistan.

1987. *Buathra violaceotinctus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 791. Jonathan proposed n. comb.

This species is based on a male type. A brief description is given below :

Male : Face closely and strongly punctate, thickly covered with long white pubescence. Clypeus smooth and shiny with a few scattered punctures in the middle, its apical margin impressed. Frons with a median groove, strongly obliquely striate, at sides smooth. Pronotum closely rugose, striate is the scrobe. Mesoscutum with irregular punctures, notauli deep, short, apical area finely and closely striate, at sides smooth. Mesopleurum rugoso-punctate above, in the middle closely obliquely reticulo-striate, near sternaulus irregularly aciculate. Propodeum rugosely reticulo-punctate, reticulation more distinct between the transverse carinae, both the transverse carinae strong and complete. Areolet large pentagonal, nervulus slightly basad or almost interstitial to basal vein.

Black : Clypeus with a large yellow mark at the apex. All femera; fore and middle tibiae and abdomen except first segment (Black) red. Wings clear hyaline with violaceous iridescence. Body 15 mm long.

Body length : 15 mm.

Female : Not known.

Distribution : Pakistan (Quetta).

2. Subgenus ***Mandibulathra*** Jonathan, nov. (Fig. 29 : a, b)

Lower tooth of mandible long, about 3x as long as upper tooth. Basal carina of propodeum moderately strong and complete. Postpetiole longer than wide at base (1.5×); its spiracles near its apical 0.45. Axillus in hind wing similar to as in subgenus *Buathra*.

Fore and middle tarsal segments not expanded apically. Frons with usual frontal pit-like depression dorso-laterad to each antennal sockets.

This subgenus at present is known from India and Myanmar. *Cryptus albimandibularis* Uchida from Palaearctic Region also belongs to this subgenus, and included in the key and the text.

Key to the species of *Mandibulathra*

1. Abdomen largely black, without bands. Legs mostly black, except all tibiae partly light to dark brown. Mesopleurum strongly rugose and speculum smooth and shiny. China. Taiwan. Korea ..... 1. *albimandibularis* Uchida

– Abdomen with 2–8 tergites or atleast 1-3 tergites with narrow apical bands. Legs various; all femora and tibiae reddish or dark brown. Mesopleurum strongly rugoso- wrinkled or rugoso-striate; speculum polished with a few scattered punctures. 2

2. Face largely smooth. Lateral carina of scutellum extending 0.2× its length. Propodeum strongly rugoso-wrinkled, reticulate towards apex. Clypeus and mesoscutum entirely black. Mesopleurum, metapleurum and propodeum also entirely black. All femora and tibiae reddish. India : Himachal Pradesh .... 2. *indica,* sp.nov.

– Face rugoso-punctate. Lateral carina of scutellum extending 0.5× its length. Propodeum finely wrinkled. Clypeus and middle lobe of mesoscutum at apex with an oval mark, yellow. Mesopleurum, metapleurum and propodeum variously marked, yellow. All femora and tibiae dark brown. Myanmar : Kambati .... 3. *burmensis,* sp. nov.

1. ***Buathra (Mandibulathra) albimandibularis*** Uchida (Fig. 29 : a–e)

1955. *Cryptus albimandibularis* Uchida, *Jour. Faculty Agr. Hokkaido Univ.* **50** : 113. Male, Female. des. Type : Female, Korea : Mt. So-yo (= Shoyozan) (SAPPORO). China : Tiehling (= Tetsureci) in Manchuria. Korea : Mt. Ko-dae (= Takadaisan).

1965. *Trachysphyrus albimandibularis* : Townes, Momoi and Townes, *Mem. Amer. Ent. Inst,* **5** : 178. n. comb.

This species is mainly recognised by having body largely black. Ovipositor tip long and pointed, its upper valve between nodus and tip up-curved.

Female : Face subpolished, weakly raised, granulose. Clypeus shiny, sparsely punctate at base, smooth towards apex, its apical margin impressed. Malar space granulose, 0.85× the basal width of mandible. Frons weakly rugose with a few deep punctures near the median ocellus. Vertex dull and mat. Temple subpolished minutely densely punctate. Pronotum strongly rugose, trans-rugose in the scrobe, densely punctate at the upper margin and collar, epomia strong but short. Mesoscutum subpolished, granulose. Scutellum subpolished minutely and densely punctate, lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum subpolished,

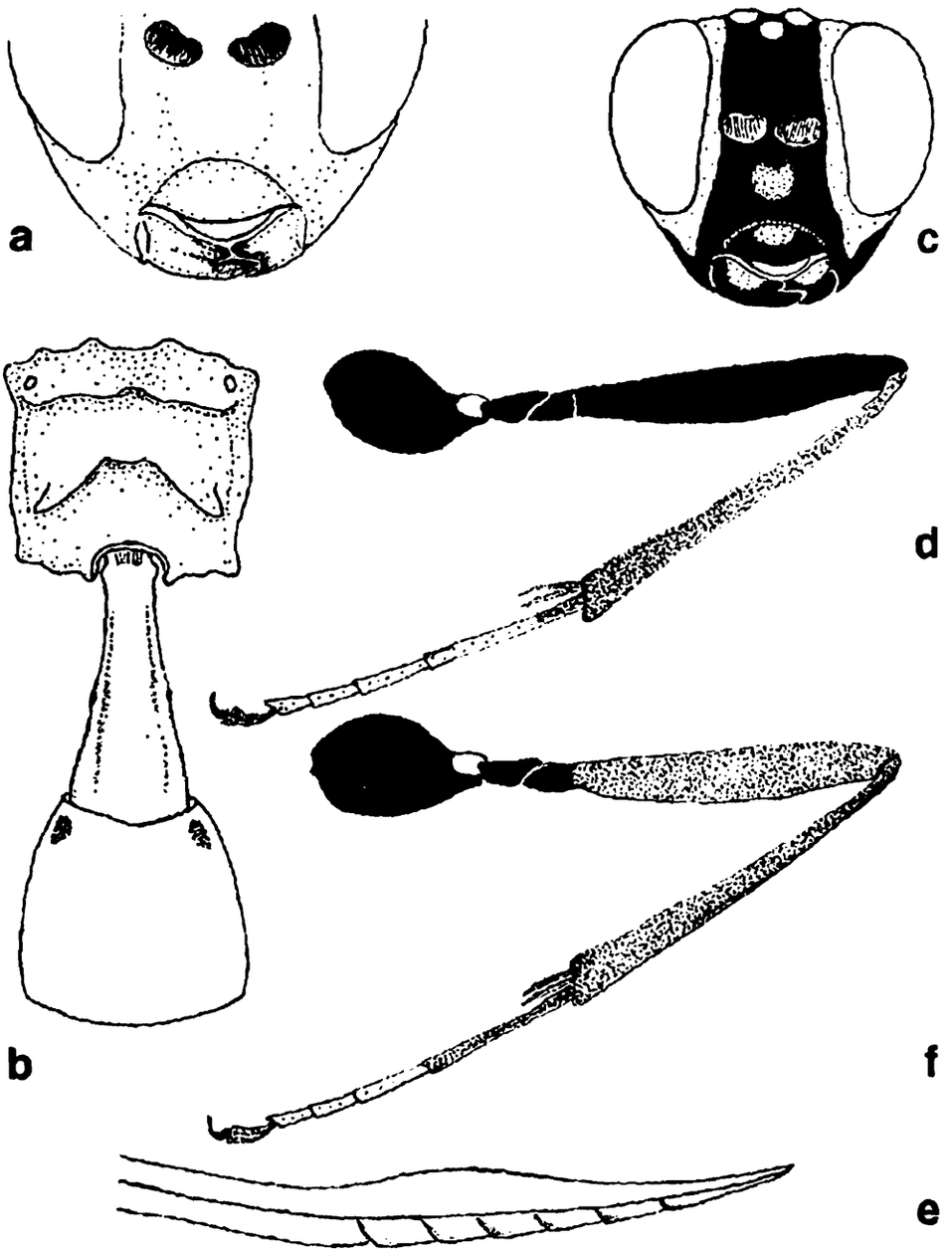

Fig. 29. *Buathra* (*Mandibulathra*) *albimandibularis* Uchida : **a**, front view of head showing shape of teeth; **b**, dorsal view of propodeum, first & second tergites; **c**, front view of head and **d**, hind leg showing colour pattern; **e**, ovipositor tip. *B (M.) indica*, sp. nov. : **f**, hind leg showing colour pattern.

moderately strongly rugose, speculum almost smooth and polished, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum strongly rugose, juxtacoxal carina not well defined. Propodeum strongly rugoso-wrinkled, tending to be reticulate, spiracle long, both the transverse carinae strong, complete, apophyses also strong. First tergite about 3× as long as wide at apex, tergite mat and subpolished, post-petiole longer than wide, following tergites mat and subpolished. Areolet pentagonal nervulus basad of basal vein, nervellus intercepted at its lower 0.25. Ovipositor sheath about 1× as long as hind tibia, tip long and pointed, slightly up-curved, lower valve with strong ridges (Fig. 29 : e).

Black. Antennal flagellum from 5–10 segments white above. The following are yellow : Face (Fig. 29 : c) with an irregular oval mark in middle; face, frons and temple along the eye margin, mandible along upper edge, clypens with a small mark above, upper margin of pronotum, extreme upper and lower corner of collar, apex of middle lobe of mesoscutum and scutellum, tegula along margins, subtegular ridge, a mark on speculum, apical carina of propodeum. All abdominal tergites and legs in general black or blackish, except middle tibia brownish; hind tibia dark brown apically and light brown towards base; hind tarsal segment 1–4 dirty white, its first segment at base and whole of fifth segment dark brown (Fig. 29 : d).

Male : Not available for study.

Length : Female, 9.5–16.0 mm; fore wing 7–14.5 mm; ovipositor sheath 4–6.5 mm.

Distribution : China (Shaowu Hsien; Fukien; Tiehling (= Tetsurei in Manchuria). Korea [Mt. So-Yo (= Shoyozan); Mt. Ko-Dae (= Takadaisan)]. Taiwan (Sunmoon Lake).

2. ***Buathra (Mandibulathra) indica*** Jonathan, sp. nov. (Fig. 29 : f)

This species can easily be distinguished by having all femora and tibiae reddish. Mesoscutum, mesopleurum, metapleurum and propodeum entirely black.

Female : Face largely smooth and subpolished, weakly raised in the middle, covered with a tuft of fine hairs. Clypeus largely smooth, with a few scattered shallow punctures, moderately convex at base, flat towards the apex, apical margin impressed, covered with a tuft of fine hairs. Malar space granulose, 0.85× the basal width of mandible. Frons moderately strongly rugose, in the middle below the median ocellus with a row of strong transverse ridges, at sides largely smooth and subpolished. Vertex dull, with fine dense shallow punctures, punctures towards occiput not well defined. Temple below strongly rugoso-puncate, above shallowly punctate. Pronotum subpolished strongly rugoso-wrinkled, its upper margin densely punctate with irregular striations, epomia strong, reaching upper margin of pronotum. Mesoscutum densely punctate, punctures small, interspaces mat, transversely rugose along the notauli and margins. Scutellum subpolished, closely punctate, lateral carina of scutellum confined to its basal 0.2. Metascutellum smooth and shiny. Mesopleurum subpolished strongly rugoso-wrinkled, except speculum smooth and polished with a few shallow punctures above;

prepectal carina extending 0.8× the height of mesopleurum. Metapleurum strongly transversely rugoso-wrinkled, juxtacoxal carina not well defined among the wrinkles. Propodeum strongly rugoso-wrinkled, tending to be reticulate towards the apex, spiracles long, basal carina complete, strong, its apical carina present in the middle, bow-shaped, apophyses moderately strong conical. First tergite about 3× as long as wide at apex, postpetiole about 1.5× as long as wide at spiracles, tergite mat and subpolished; second tergite dull and granulose, following tergites mat and dull. Areolet pentagonal, narrow in front, nervulus basad of basal vein, nervellus intercepted at its lower 0.25. Ovipositor sheath about 1× as long as hind tibia. Ovipositor tip upcurved.

Black. Antennal flagellum with apex of fourth to eighth segments white above. The following are yellow : face, frons, vertex and temple along the eye margin, extreme upper margin of pronotum, a spot on upper margin of pronotal collar, an oval mark on scutellum, apices of first to third tergites narrowly. All coxae and trochanters, black. All femora, tibiae and tarsi, reddish, except fore femur at base and ventrally blackish. Hind tarsus brownish with second to fourth segments whitish. Wings clear hyaline, veins dark brown (Fig. 29 : f).

Male : Very much similar to female, except more slender and weakly sculptured. Frons in antennal scrobes smooth and shiny. Vertex and temple largely smooth and shiny. Mesopleurum rugose in the middle, distincly punctate near and below sternaulus. First tergite long and slender, following tergites mat and subpolished. Wing venation similar to female.

Black. Flagellum without a band. The following are yellow : Face with a squarish mark in the middle, clypeus except near the apex, mandible except the tip, oribital mark along the eye, upper margin of pronotum, pronotal collar with two elongate marks, subtegular ridge, tegula at outer margin, speculum, subtegular ridge, metapleurum with a small mark towards the base of hind coxa, apices of first to third tergites. Fore and middle legs with coxae and trochanters, yellow, except coxae broadly at base and trochanters narrowly above, black; their femora, tibiae and tarsi reddish-yellow. Hind coxa and trochanter black; its femur and tibia reddish-brown, except their apices, blackish; hind tarsus largely white.

Length : Female, 11–15 mm; fore wing 8–11 mm; ovipositor sheath 3.5–5 mm. Male, 11.5–15 mm; fore wing 8–10 mm.

Holotype Female, INDIA : Himachal Pradesh : Dalhousie 2132 m, in N.W. Himalaya, viii-x. 1964, V. K. Gupta. *Allotype* Male, same data as holotype, 8.vii.1965, D.T. Tikar, No. T.62. *Paratypes* 12 Females, 4 Males. INDIA. Locality same as holotype, 2 Females, viii-ix.1964, V.K. Gapta, No. 64; 1 Male, 1 Female, 8.vii.1965, D. T. Tikar, No. T 62; 2 Males*, 12.v.1971, M. K. Kamath, No. DH41; Kalatop nr. Dalhousie, 2438m, 1 Female, 5.viii.1965 and 1 Female, 31.viii.1971, Girish Chandra, No. JD. 86; Ahla nr. Dalhousie, 2286 m; 2 Females*, 30.v. and 27.vi.1971, M.K. Kamath, Nos. DH 63 & 117; 2 Females, 16.viii.1965, M. K. Kamath. Upper Bakrota, nr. Dalhousie, 2438m,

1 Female, 1 Male, 21.v. & 29.vii. 1971, M. K. Kamath & M. L. Gupta. Nos. DH 56 & M 137; Dhenkund, 2743 m, nr. Dalhousie, 1 Female, 18.vii–3.viii. 1971, Malaise Trap No. III. Kalagarh, 1 Female, 4.vii. 1964, CIBC colln., ex. pupa of *Porthetria* sp. (Z.S.I., Calcutta). [1 Male, 1 Female (marked *) in A.E.I., Florida].

Distribution : India : Himachal Pradesh.

Host : *Porthetria* sp.

3. ***Buathra (Mandibulathra) burmensis*** Jonathan, sp. nov.

This species is distinguished by having all femora and tibiae dark brown. Mesoscutum with an oval mark. Mesopleurum, metapleurum and propodeum variously marked with yellow.

Female : Face subpolished, ruguloso-punctate in the middle, mat at sides, Clypeus subpolished, sparsely and shallowly punctate at sides. Malar space granulose, 0.8× the basal width of mandible. Frons rugose in the middle, at sides largely mat and subpalished with weak punctures, antennal scrobes smooth and shiny. Vertex dull, moderately strongly granulose. Temple subpolished, minutely punctate. Pronotum largely trans-wrinkled, its upper shoulder area closely punctate, punctures running into striations. Epomia strong, ending before the upper margin. Mesoscutum densely punctate, forming a fine reticulation. Scutellum subpolished, flat, with sparse and shallow punctures, its lateral carina extending to its basal 0.5. Metascutellum smooth and shiny. Mesopleurum subpolished, rugoso-striate in the middle, rugoso-punctate around sternaulus and below subtegular ridge. Speculum largely polished with a few shallow puncture above, prepectal carina extending 0.9 the height of mesopleurum. Metapleurum and propodeum finely wrinkled, juxtacoxal carina of metapleurum obscured. Apical carina of propodeum weakly arched, weak in the middle, laterally forming weak conical crests, basal carina complete. First abdominal tergite long, dull and mat, about 3× as long as wide at apex, postpetiole about 1.5× as long as wide at spiracles, dorso-median and dorso-lateral carinae present; following tergites mat and subpolished. Areolet pentagonal, moderately large, about 2× as high as the portion of second recurrent vein above bulla, nervulus basad of basal vein, nervellus intercepted at its lower 0.3. Ovipositor moderately long, its tip beyond the nodus moderately narrow and pointed, lower valve with six teeth, ovipositor sheath 1.0× as long as hind tibia.

Black. Antennal segments from fourth to ninth above, whitish-yellow. The yellow are : orbital mark along the eye margin, clypeus and mandible (except at the apex), pronotal collar, upper margin of pronotum, subtegular ridge, an oval mark at the apex of middle lobe and two tiny spots laterally on lateral lobes of mesoscutum, scutellum broadly, speculum on mesopleurum, an elongated mark on metapleurum along pleural carina, a small squarish mark in the centre of propodeum, apices of

second to eight abdominal tergites narrowly. Legs in general dark brown, except fore and middle coxae black marked with yellow; hind coxa and its trochanters largely black. Hind tarsus whitish with its first segments at base and fifth segment brownish. Wings clear hyaline.

Male : Not known.

Length : Female, 10.5 mm; fore wing 8mm; ovipositor sheath 3.5 mm.

Holotype Female, N.E. MYANMAR : Kambaiti, 2000m, 13.v.1934, Malaise (STOCKHOLM).

Distribution : Myanmar.

3. Subgenus ***Meringothra*** Jonathan, nov.

Mandibular teeth subequal. Basal carina of propodeum usually incomplete, weak or absent. Postpetiole as long as wide at base, its spiracle near its apical 0.33. Axillus vein weakly or strongly diverging from anal margin of hind wing, and its tip not coming close to anal margin, rather slanted away from the margin. Axillus strongly pigmented.

This subgenus is known from Oriental and eastern Palaearctic regions. This subgenus includes : *Cryptus luculantus* Cameron; *Cryptus insidiator* Smith, *Cryptus pilosus* Szépligeti and *Cryptus (Cryptus) piliceps suspicabilis* Kokujev. In addition, two species are described here as new from India.

Key to the species of *Buathra (Meringothra)*

1. Tarsal segments 2, 3 and 4 of fore and middle legs apically expanded (in female only). All femora with ventral lamelliform expansion in females and in males only hind femur expanded 2

– Tarsal segments 2, 3 and 4 of fore and middle legs not expanded. All femora normal, not expanded 3

2. Nervulus distinctly apicad of basal vein. All tergites black. India : Uttaranchal. ..... 1. *nigriterga*, sp. nov.

– Nervulus almost opposite to basal vein. 1–2 abdominal tergites bright red. India : Kashmir ..... 2. *rufiterga*, sp. nov.

3. Prepectal carina extending 0.75 the height of mesopleurum. Mesopleurum reticulo-wrinkled. Propodeum reticulate. Wings brownish-yellow. Legs with all coxae and trochanters black, rest of legs reddish-brown. Abdomen entirely black with bluish iridescence. India : Himachal Pradesh; West Bengal .... 3. *luculanta* (Cameron)

– Prepectal carina extending 0.66 the height of mesopleurum. Mesopleurum moderately to strongly rugoso-wrinkled. Propodeum rugoso-wrinkled to finely wrinked. Wings dark fuscous. Abdomen black or red, with or without bluish iridescence. Only femora bright red, rest of all legs black 4

4. All femora bright red. 1–3 abdominal tergites red with bluish iridescense. Pronotum densely punctate. Malar space 1.3× the basal with of mandible. India : Kashmir. Russia ..... 4. *insidiator* (Smith)

– Only hind femur bright red. Abdomen entirely black with bluish iridescence. Pronotum trans-rugose. Malar space 1.5× the basal width of mandible. India : Uttaranchal. China. Russia ..... 5. *suspicabilis* (Kokujev)

1. ***Buathra (Meringothra) nigriterga*** Jonathan, sp. nov. (Fig. 30 : a–c)

This species is easily distinguished by having 2–4 tarsal segment of fore and middle legs apically expanded and femora with ventral lamalliform expansion (in female) and hind femur in males. All tergites black.

Female : Body largely subpolished. Face densely punctate in the middle, punctures coalescent and running into striations, at sides sparsely punctate. Clypeus with coarse sparse punctures. Malar space granulose, about 1.5× as long as the basal width of mandible. Frons moderately strongly obliquely rugoso–wrinkled, at sides somewhat rugoso-punctate. Vertex dull, mat with scattered coarse irregular punctures. Temple shiny, sparsely punctate. Pronotum finely rugoso-wrinkled, its upper 0.25 closely punctate, epomia short. Mesoscutum shiny, closely to sparsely punctate. Scutellum with coarse punctures, its lateral carina confined to its base. Metascutellum smooth and shiny with a few punctures. Mesopleurum and metapleurum moderately strongly rugoso-wrinkled; speculum shiny with a few coarse punctures along the margin; prepectal carina extending 0.66 the height of mesopleurum, juxtacoxal carina not well defined. Propodeum finely wrinkled, apical carina strong, strongly arched, straight in the middle, laterally forming moderately strong crest-like apophyses; basal carina present in the middle like short weak crest; spiracle slit-like. First abdominal tergite about 2.25× as long as wide at apex. Postpetiole about 1.0× as long as wide at spiracles; median dorsal carinae distinct between apex and spiracle. All the abdominal tergites smooth and shiny. Areolet (Fig. 30 : a) large pentagonal; nervulus apicad of basal vein; nervellus intercepted at its lower 0.25. Fore and middle 2, 3 and 4 tarsal segments (Fig. 30 : b) apically expended and with long bristles; all femora (Fig. 30 : c) with ventral lamelliform expansion. Ovipositor long its tip pointed, upcurved with distinct nodus; lower value with 10–11 ridged teeth. Ovipositor sheath 1.4× as long as hind tibia.

Body largely black. Face, frons and temple very narrowly along the eye margins, yellow. All femora, tibiae and tarsi bright red. Wings clear hyaline with fuscous hue.

Male : Essentially similar to female, except more slendar and weakly sculptured. Face largely ruguloso-punctate. Fore and middle tarsi normal, its joints not apically expanded. Hind femur expanded ventrally, fore and middle femora normal.

Body colour similar to female, except legs with coxae, trochanters, tarsi, and tibiae apically black or dark brownish-black. Wings hyaline with light fuscous hue.

Length : Female, 15.5 mm; fore wing 11.0 mm; Ovipositor sheath 7mm. Male, 12.5 mm; fore wing 9.5 mm.

Holotype Female, INDIA : Uttaranchal : Bharon Ghati, 2820 m, 19.vi.1977, M. Rathore, Coll. No. R52 (Z.S.I., Calcutta). *Allotype* Male, INDIA : Kashmir : Drass, 3900m in Ladakh, 12.vi.1973 Girish Chandra, No. G. 35 (Z.S.I., Calcutta).

Distribution : India : Uttaranchal. Jammu & Kashmir.

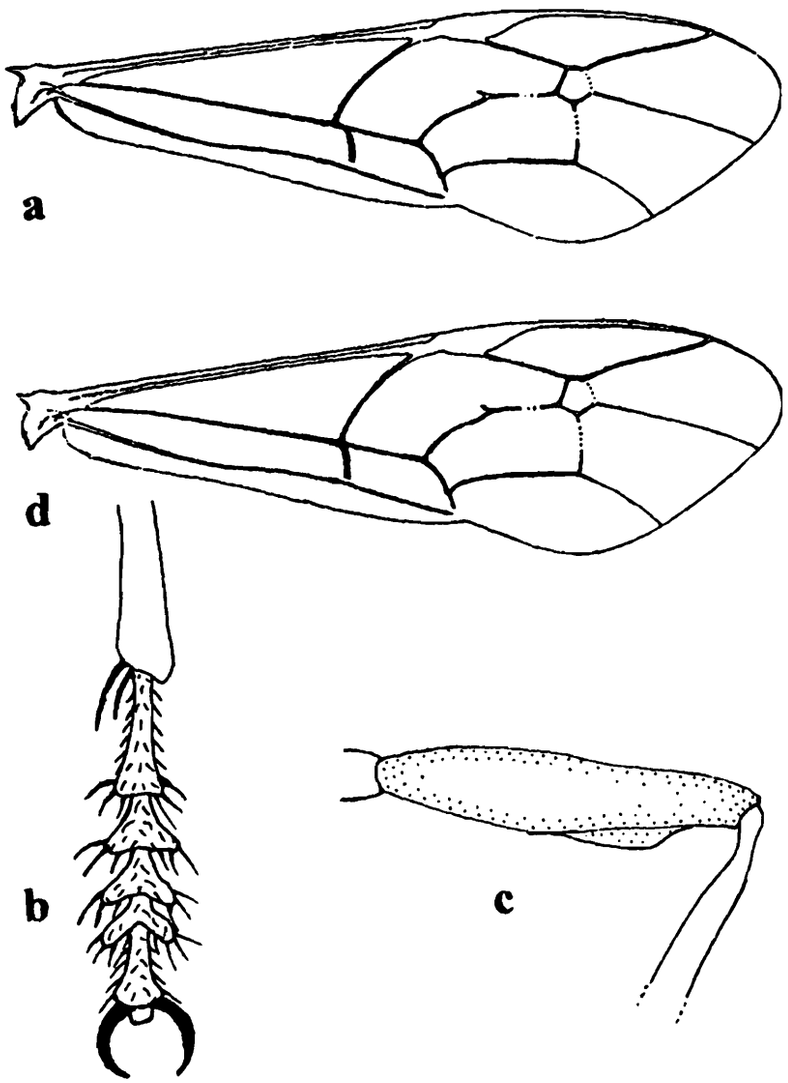

Fig. 30. *Buathra (Meringothra) nigriterga.*, sp.nov. : **a**, fore wing showing venation; **b**, tarsus of middle leg; **c**, hind femur showing ventral expansion (in female). *B.(M) rufiterga*, sp.nov. : **d**, fore wing showing venation.

2. ***Buathra (Meringothra) rufiterga*** Jonathan, sp. nov. (Fig. 30 : d)

This species is very close to *B. (M.) nigriterga*, sp. nov, but can be distinguished by having 1–2 abdominal tergites bright red and nervulus almost opposite to basal vein.

Female : Body subpolished. Face raised in middle with two depressed longitudinal shallow grooves, surface granulose with dense punctures in middle and sparse punctures at sides. Clypeus shiny sparsely punctate, apex impressed, smooth. Malar space granulose, with sparse shallow punctures, about 1.4× as long as basal width of mandible. Frons strongly depressed, moderately strongly puncto-wrinkled in the middle area, towards the eye margin finely puncto-wrinkled. Vertex with sparse to dense moderately large punctures; in the ocellar triangle area reticulo-punctate. Temple polished with coarse sparse punctures. Pronotum moderately strongly reticulo-punctate, pronotal collar with fine striations, epomia short and strong. Mesoscutum shiny, with coarse shallow punctures, punctures on lateral lobes somewhat sparse. Scutellum shiny, moderately strongly punctate, its lateral carina confined to its base. Metascutellum punctate with longitudinal ridges. Mesopleurum and metapleurum largely strongly wrinkled, area below subtegular ridge finely reticulo-wrinkled; area below sternaulus, and above sternaulus near prepectal carina strongly punctate, speculum shiny, with small sparse punctures posteriorly, prepectal carina extending 0.75 the height of mesopleurum; juxtacoxal carina not present. Propodeum finely wrinkled, apical carina bow-shaped complete, laterally forming moderately strong crest-like apophyses, basal carina not well defined among the wrinkles, spiracle slit-like. First abdominal tergite about 2.5× as long as wide at apex, all the three pairs of longitudinal carinae distinct, postpetiole 0.9× as long as wide at base, tergite smooth and shiny, except near spiracles with a few scattered punctures, following tergites smooth and shiny. Areolet (Fig. 30 : d) large pentagonal, nervulus little apicad of basal vein, nervellus intercepted at its lower 0.35. Fore and middle tarsal segment apically expanded and with long bristles; all femora ventrally with lamelliform expansion. Ovipositor long, tip long pointed somewhat upcurved, lower valve with 10–11 ridged teeth; nodus distinct; ovipositor sheath about 1.5× as long as hind tibia.

Body largely black, except face, frons and temple narrowly along eye margin yellow. All femora, tibiae, tarsi, first and second abdominal tergites, bright red. Wings clear hyaline, with brownish-yellow hue.

Male : Essentially similar to female, except slender and weakly sculptured. Face uniformly densely punctate on granulose surface. Clypeus shiny, sparsely punctate, apically smooth, apical margin broadly truncate. Malar space granulose, about 1.25× as long as basal width of mandible. Vertex and temple densely punctate. Head covered with dense white silvery hairs. Mesoscutum with uniformly placed dense and moderately deep punctures. Scutellum and metascutellum shiny with small sparse

punctures, lateral carina confined to its base. Pronotum, mesopleurum, metapleurum with similar sculpture as in female. Propodeum wrinkled, tending to be reticulate, apical carina bow-shaped, laterally forming conical apophyses, basal carina weak. Fore and middle tarsal segments normal, not expanded apically. Legs with only hind femora expanded ventrally, fore and middle femora normal. Abdomen almost smooth and shiny.

Black. Face (somewhat broadly), frons and temple narrowly along eye margin, clypeus medially, mandible (except teeth), yellow. All femora, tibiae, tarsi, 2–4 abdominal tergites, bright red. Wings clear hyaline with brownish-yellow hue.

Length : Female, 17 mm; fore wing 14 mm; ovipositor sheath 9 mm. Male, 15mm; fore wing 12 mm.

Holotype Female, INDIA : Kashmir : Darass, 3900m, in Ladakh, 12.vi.1973, V.K. Khanna, No. 449 (Z.S.I., Calcutta). *Allotype* Male, same data as holotype, Coll. Girish Chandra, No. G. 35 (Z.S.I., Calcutta)

Distribution : India : Kashmir (Darass in Ladakh).

3. ***Buathra (Meringothra) luculanta*** (Cameron), n. comb.

1905. *Cryptus luculantus* Cameron, *Entomologist,* **38** : 85. Female. des. Type : Female, India : Himachal Pradesh (LONDON).

1907. *Cryptus luculantus* : Cameron, *Ann. Mag. Nat. Hist.,* **19** : 182. key. India : West Bengal : Darjeeling, 2000 m.

1914. *Cryptus luculantus* : Morley, *Entomologist,* **47** : 25. syn. (in part).

1961. *Trachysphyrus luculantus* : Townes. Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 165. n. comb., syn. India.

This species is distinguished by having legs with all coxae and trochanters black and rest of legs reddish-brown. Abdomen entirely black with bluish iridescence.

Female : Head and thorax subpolished, covered with moderately long and thick white hair. Face with coarse close punctures, punctures shallow and sparse at sides. Clypeus at its basal 0.6 coarsely punctate, apical 0.4 smooth and shiny. Malar space granulose, with a few scattered shallow punctures, 1.15× the basal width of mandible. Frons strongly depressed, reticulo-punctate, at sides coarsely punctate, just behind antennal sockets smooth and shiny. Vertex moderately strongly densely punctate. Temple coarsely above and sparsely punctate below. Pronotum strongly rugoso-wrinkled, with dense coarse punctures above, epomia strong reaching up to upper margin. Mesoscutum densely and coarsely punctate, punctures in the middle lobe running into longitudinal striations. Scutellum and metascutellum with deep close punctures, lateral carina more or less confined to its base. Mesopleurum reticulo-

wrinkled, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum and propodeum strongly reticulate, juxtacoxal carina not defined. Apical carina of propodeum strong and complete, laterally forming moderately strong crests, apical carina straight or U-shaped in the middle (variable) basal carina weak, strongly turned forward in the middle, laterally weak or absent. First abdominal tergite smooth and shiny with a few scattered punctures, about 2.0× as long as wide at apex; postpetiole about 0.8× as long as wide at spiracles, dorso-median carinae not defined, dorso-lateral carinae weakly present between base and spiracle; following tergites mat and dull. Areolet pentagonal about 2× as high as the portion of second recurrent vein above bulla, nervulus slightly basad of basal vein, nervellus intercepted at its lower 0.2. Ovipositor long, its tip pointed, sheath 1.0× as long as hind tibia, lower valve with 8–9 teeth.

Black. The following are yellow : Face, frons and temple very narrowly along the eye margin, clypeus with a faint mark in the middle. Legs with all coxae and trochanters black, rest reddish-brown, except hind tarsus with 2–4 segments reddish-yellow. Abdomen black with bluish hue.

Male : Essentially similar to female. Antennae somewhat thick, gradually tapering towards the tip. Clypeus broad, its apical margin impressed. First abdominal tergite slender, sparsely punctate at apex; following tergites mat and subpolished.

Black. Face, frons and temple along eye margin yellow. Fore and middle legs black, except fore femur yellow above on inner side. Hind leg black, except femur red and 3-4 tarsal segments dirty white. Abdomen with 1–3 and base of 4th tergite, red.

Length : Female, 14–16 mm; fore wing 13–14 mm; ovipositor sheath 6 mm. Male, 15 mm; fore wing 13 mm.

Distribution : India : Himachal Pradesh (Ahla, 2286 m; Kalatop, 2438m in Dalhousie Hills; Theog, 2142m; Narkanda, 2570 m in Shimla Hills; Manali, 1878 m; Pangi, 2867 m). Kashmir (Pahalgam, 2060 m; Gulmarg, 2430 m; Srinagar; Darass, 3900 m in Ladakh). Uttaranchal (Jangla, 2700 m; Harbil, 2550 m and Srinagar).

4. ***Buathra (Meringothra) insidiator*** (Smith)

1878. *Cryptus insidiator* Smith, Hymenoptera. *In* India : Scientific Results of the second Yarkand Mission : Based on the Collection and Notes of the late F. Stoliczka, Part 9 : 21. Female. des. type : Female : Kashmir : Sind Valley (Z.S.I., Calcutta).

1885. *Cryptus insidiator* : Waterhouse, Aid to the identification of Insects, **2** (25) : pl. 162. Fig. of type.

1906. *Cryptus nursei* Cameron, *J. Bombay Nat. Hist. Soc.*, **17** : 285. Female, key, des. Lectotype (labelled by Gupta, 1967) : Female, India : Kashmir, 2285–2570m (LONDON). Syn. by Morley, 1914.

1906. *Cryptus nursei* : Cameron, *J. Bombay Nat. Hist. Soc.* **17** : 292. India : Kashmir, 2285–2570m.

1914. *Cryptus insidiator* : Morely, *Entomologist,* **47** : 25. syn.

1916. *Cryptus (Cryptus) pilosus* Szepligeti, *Ann. Mus. Natl. Hungarici,* **14** : 244. Female, Russia : Turkestan : Alai Mts. (BUDAPEST). **New synonymy.**

1935. *Cryptus pilosus* ? Roman, *In* Visser & Visser-Hooft : Wissenschaftliche Ergebnisse der Niederlandischen Expeditionen in den Karakoram. *Zoologie,* p. 248. Male. des. India : Ladakh Kashmir : Khardung-Tal, 4000–45000m.

1961. *Trachysphyrus insidiator* : Townes, Townes & Gupta, *Mem. Amer. Inst.,* **1** : 165. n. comb. India.

1961. *Trachysphyrus pilosus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 165. n. comb. India. Russia

1969. *Meringopus insidiator* : Van Rossem, *Tijdschr. v. Ent.,* **112** : 192. n. comb., syn. notes.

1969. *Meringopus pilosus* : Van Rossem, *Tijdschr. v. Ent.,* **12** : 193. Male, Female. n. comb., key, des. India : Ladakh Kashmir : Khargung Valley, 4000–4500 m. Russia : Alai Mountains.

1987. *Meringopus insidiator* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 789.

1987. *Meringopus pilosus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 789.

This species is distinguished by having long silvery hairs on body. All femora bright red. 1–3 abdominal tergites red. Abdomen with bluish iridescence.

Female : Head largely covered with silvery moderately long hairs, hairs on clypeus blackish; head subpolished with moderately deep punctures. Punctures on face close, interspaces less than 0.5 their own diameter, surface granulose. Punctures on clypeus coarse, apical margin impressed with a few punctures. Malar space granuloso-punctate, 1.3× the basal width of mandible. Frons strongly depressed, moderately strongly rugoso-striato-punctate, with a short median carina. Vertex behind the ocellar triangle coarsely punctate, at side punctures with running striations. Temple shiny and sparsely punctate. Pronotum largely densely punctate, punctures running into striations, epomia short. Mesoscutam subpolished with coarse, close to sparse punctures, short striae present along the notauli in front. Scutellum with moderately deep punctures, its lateral carina extending about 0.4 its length. Metascutellum subpolished, with a few deep punctures. Mesopleurum strongly rugoso-wrinkled in the middle with large puncture below subtegular ridge, speculum, prepectus and area below and above sternaulus, prepectal carina extending 0.66 the height of mesopleurum. Metapleurum wrinkled, tending to be reticulate, juxtacoxal carina not well defined. Propodeum largely rugoso-wrinkled, at some places tending to be reticulate, between the transverse carinae obliquely striate, apical carina complete, laterally forming moderately strong

apophyses; basal carina weak, spiracle long slit-like. First abdominal tergite about 2× as long as wide at apex, postpetiole wider than long, tergite smooth and shiny. Ovipositor long about 1.4× as long as hind tibia, tip long with distinct nodus, lower valve with a series of teeth.

Body largely black; except face, frons and temple very narrowly along the eye margin, yellow. All femora, 1–3 abdominal segments, sometimes 4th also basally, red. Apical 0.5 of 4th to 8th segments (black) with a bluish iridescence. Wings dark fuscous hyaline.

Male : Extremely similar to female in sculpture, except as follows : pronotum rugoso-punctate, at some places tending to be reticulate. Mesoscutum strongly punctate, punctures running into striations. Mesopleurum rugoso-reticulate in the middle. Metapleurum strongly rugose. Basal carina of propodeum moderately strong.

Colour almost similar to female, except hind tarsal segment 3–4 white. Wings clear hyaline.

Length : Female, 14–17 mm; fore wing 10–12 mm; ovipositor sheath 7–8 mm. Male, 13–17 mm; fore wing 10–11 mm.

Distribution : India : Kashmir (Khillanmarg, 3000m; Sind valley; Ladakh : Khardung Tal, 4000-4500m). *Elsewhere :* Russia (Alai Mountains).

5. ***Buathra (Meringothra) suspicabilis*** Kukujev, n. comb.

1905. *Cryptus (Cryptus) piliceps* var. *suspicabilis* Kukujev, *Russk. Ent.* Obozr. (Rev. Russe d' Ent.), **5** : 210. Female. des. Type : Female, "Pamir" (LENINGRAD).

1905. *Cryptus (Cryptus) piliceps* var. *dubitabilis* Kukujev, *Russk. Ent.* Obozr. (Rev. Russe d'Ent.), **5** : 210. Female. des. Lectotype : Female (labeled by Townes, 1964), Russia : Alai Mountains (LENINGRAD). China : Burkhan Buddha Mts., 4000-4300m. Syn. by Townes, Momoi & Townes, 1965.

1965. *Trachysphyrus suspicabilis* : Townes, Momoi & Townes, *Mem. Amer. Ent. Inst.*, **5** : 184. syn.

1969. *Meringopus suspicabilis* : Van Rossem, *Tijdschr. v. Ent.*, **112** : 184. n. comb.

This species is distinguished by having body almost black. except hind femur red and abdomen with bluish iridescence. Wings fuscous hyaline.

Female : Body largely subpolished. Head and thorax covered with long yellowish-white hair. Face in middle, clypeus largely moderately convex; face closely and clypeus sparsely punctate, punctures on face at some places running into striations, apical margin of clypeus somewhat truncate, Malar space granulose, 1.4× the basal width of mandible. Frons subpolished, depressed, obliquely rugoso-striate, at sides with a few shallow punctures. Vertex with close to sparse punctures. Temple shiny, moderately

strongly punctate, interspace about 1–2× their own diameters. Pronotum trans-rugose, its upper shoulder and collar coarsely punctate, punctures at collar coalescent and running into striations, epomia strong, but not reaching the upper margin. Mesoscutum coarsely and sparsely punctate. Scutellum and metascutellum with a few scattered shallow punctures, lateral carina confined to its base. Meso- and metapleurum strongly rugoso-wrinkled, mesopleurum below subtegular ridge tending to be reticulate, prepectal carina extending 0.66 the height of mesopleurum, speculum smooth, with a few scattered shallow punctures; juxtacoxal carina not well defined. Propodeum finely wrinkled, apical carina strongly arched, complete, laterally forming moderately strong apophyses, basal carina laterally absent, spiracle large and longish. First abdominal tergite 1.75× as long as wide at apex, postpetiole about 0.8× as long as wide at base; following tergites mat and subpolished. Ovipositor long, its tip long and slightly upcurved. Ovipositor sheath 1.2× as long as hind tibia. Areolet large, pentagoual, 4× as high as the portion of second recurrent vein above bulla. Nervulus apposite to basal vein. Nervellus intercepted at its lower 0.2.

Body largely black, except face, frons and temple very narrowly along the eye margin yellow. Hind femur bright-red. Abdomen with blue iridescence. Wings fuscous hyaline.

Male : Essentially similar to female. Face densely punctate. Clypeus shiny, sparsely punctate. Frons below median ocellus obliquely striate, at sides, moderately strongly closely punctate. Temple and vertex strongly punctate, puncture on vertex coalesent. Pronotum wrinkled in scrobe, its upper shoulder and collar densely punctate. Mesoscutum strongly punctate, interspaces shiny. Scutellum and metascutellum strongly and closely punctate. Mesopleurum largely reticulo-wrinkled, speculum strongly punctate. Metapleurum and propodeum strongly reticulo-wrinkled; apical and basal carinae complete. Abdomen shiny, its first tergite with a few punctures.

Black : Antennae without any band. Face, frons and temple along the eye margin very narrowly, yellow. Hind femur red. Abdomen with bluish iridescence. Wings light fuscous hyaline.

Length : Female, 15–18 mm; fore wing 12–13 mm; ovipositor sheath 5–6 mm; Male, 12–15 mm; fore wing 10–11 mm.

Distribution : India : Uttranchal (Gangotri, 3000 m; Bhojwasa, 3000 m). Himachal Pradesh (Chatru, 3150 m). *Elsewhere :* Tibet (Rongbuk, 4285m). Russia (Alai Mountains). China (Burkhan Buddha Mts. 4000–4300 m). 'Pamir'

10. Genus ***Itamoplex*** Foerster (Fig. 31 : a–c)

1804. *Cryptus* Fabricius, *Systema Piezatorum,* p. 70. Type-species : *Cryptus viduatorius* Fabricius; designated by Curtis, 1837. Name preoccupied by Jurine, 1901.

1869. *Itamoplex* Foerster, *Verh. Naturh. Ver. Rheinlande*, **25** : 188. Type-species : (*Cryptus americanus* Cresson) = *albitarsis* Cresson; designated by Viereck, 1914.

1903. *Plesicryptus* Cameron, *Ztschr. System. Dipt.*, **3** : 299. Type-species : *Plesiocryptus carinifrons* Cameron. Monobasic. Syn. by Townes *et al.*, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 163 (as a syn. of *Trachysphyrus).* Van Rossem, 1969 : 299 (as *Cryptus*). Townes, 1970 : 193 (separate genus).

Host : A variety of lepidopterous larvae.

Distribution : Holaractic, Afrotropical and Oriental regions.

Body moderataly slender. Clypeus medium sized, about 2.2 as wide as long, moderately convex, without a median tooth or irregularity. Malar space 0.7 to 1.8× as long as basal width of mandible; lower tooth of mandible a little shorter than the upper. Mesoscutum polished, with medium sized to small, moderately close to dense or crowded punctures, sometimes rugulose close to notauli, notauli weak reaching a little behind center of mesoscutum. Basal carina of propodeum usually distinct, apical carina complete, with weak to moderately strong lateral crests. Propodeal spiracle about 2.4× as long as wide. Base of hind coxa deep, without a distinct groove but with a short shallow, almost horizontal impression at its attachment. Wings (Fig. 31 : a, b)

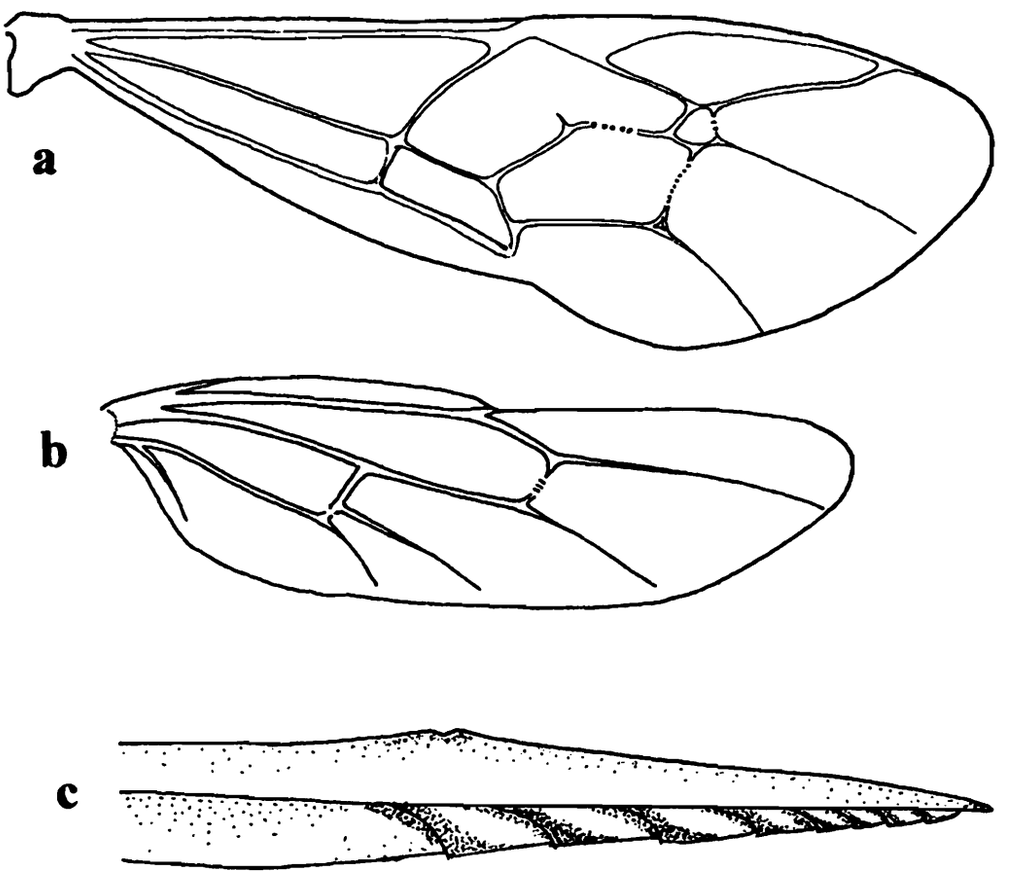

Fig. 31. *Itamoplex* Foerster : **a, b,** fore & hind wings showing venation; **c,** ovipositor tip.

with intercubiti strongly convergent and second recurrent vein nearly always weakly sinuate. First abdominal tergite without lateral tooth at base, its spiracle near apical 0.35, ventrolateral carina of first tergite distinct and complete; in males dorsolateral and dorsomedian carinae absent or indistinct; in female dorsolateral carina usually week and dorsomedian carina usually strong, reaching up to the base of postpetiole; second tergite mat with fine setiferous, punctures dense in male, quite sparse in female. Ovipositor sheath 1.1 to 2.2× as long as hind tibia, ovipositor weakly compressed, its tip usually elongate (Fig. 31 : c).

Length : Female, 6–14 mm; fore wing 6–9 mm; ovipositor sheath 1.5–3.5 mm.

Type-species : *Cryptus viduatorius* Fabricius.

Itamoplex Foerster is close to *Bauthra* Cameron and *Hedycryptus* Cameron in having first tergite not so long and slender, its sternite seldom reaching half the distance between spiracle and apex; thyridium usually more than 0.6 as wide as long. However, it is distinguished by the absence of a pit dorso-laterad to each antennal sockets on frons; petiole of first targite with ventro-lateral and dorso-lateral carinae and second recurrent vein usually sinuate.

This genus is known from Holarctic, African and Oriental regions. It contains small to medium sized species measuring 6–14 mm in length. Townes (1970 : 193) referred to this genus only one species viz., *Itamplex carinifrons* (Cameron) from Oriental region (India and Pakistan) and Jonathan (2000 : 173) added five new species from India.

Key to the species of *Itamoplex*

1. Frons strongly depressed, laterally along the eye margin strongly raised like a ridge. Propodeal spiracle elongate-oval, about 2× as long as wide. Abdomen dull, mat-granulated. Antennal flagellum without a whitish band. India : Himachal Pradesh; Uttaranchal; Jammu & Kashmir ..... 1. *carinifrons* (Cameron)

– Frons neither strongly depressed nor raised along the eye margin propodeal spiracle oval, about 1.5× as long as wide. Abdomen subpolished or shiny with setiferous or minute punctures. Antennal flagellum with whitish or yellowish band 2

2. Abdomen largely black. Wings infumate 3

– Abdomen largely red. Wings yellowish 4

3. Ovipositor tip lanceolate, with a distinct nodus, both the valves uniformly tapering towards a pointed apex. Scutellum shiny with sparse indistinct punctures. Basal carina of propodeum complete, juxtacoxal carina almost absent. India : Jammu & Kashmir ..... 2. *lanceolatum* Jonathan

– Ovipositor tip not lanceolate, without a distinct nodus, upper value heavy, gradually arched towards the tip, lower valve sharply narrowed towards the apex. Scutellum subpolished with distinct, dense punctures. Basal carina of propodeum sublaterally weak to absent. Juxacoxal carina strongly present. India : West Bengal ..... 3. *longiterebratum* Jonathan

4. All coxae and trachanters, red (legs almost red). Orbital mark encircling the whole of orbit. Upper margin of pronotum, tegula, apophyses, scutellum with two marks, metascutellum and speculum on mesopleurum, yellow. India..... ..... 4. *indicum* Jonathan

– All coxae and trochanters, black. Orbital mark not completely encircling the whole orbit. Upper margin of pronotum, tegula, apophyses, metascutellum and speculum, black. Scutellum with a single oval mark at the apex, yellow..... 5

5. Nervulus opposite to basal vein. Postpetiole wider than long, about 0.8× as long as wide at base. Antennal scrobes moderately deep with fine transverse striations, frons above weakly rugose. Antennal flagellum with 5th–9th segments white above. India : Jammu & Kashmir..... 5. *kashmirensis* Jonathan

– Nervulus distinctly basad of basal vein. Postpetiole longer than wide, about 1.3× as long as wide at base. Antennal scrobe not deep, strongly trans-rugose, frons above strongly wrinkled. Antennal flagellum with 5th & 6th segments only white. India : Himachal Pradesh; Uttaranchal..... 6. *himalayensis* Jonathan

1. ***Itamoplex carinifrons*** (Cameron) (Fig. 32 : a–c)

1903. *Plesiocryptus carinifrons* Cameron, *Zstchr. System. Hymen. Dipt.*, **3** : Female, des. Type : Female, India : Shimla (LONDON).

1923. *Plesiocryptus carinifrons* Cameron, Dutt, *Mem. Dept. Agr. India (Ent)*, **8** : 22. Pakistan : Murree, 2142m.

1961. *Trachysphyrus carinifrons* (Cameron) : Townes *et al.*, *Mem. Amer. Ent. Inst.*, **1** : 164. Syn.

2000. *Itamoplex carinifrons* : Jonathan, *Rec. zool. Surv. India*, **98**(2) : 175. Female, key, des. fig. India : Jammu & Kashmir : Khillanmarg, 3000m. Himachal Pradesh : Khadral, 2800m; Naldera in Shimla Hills, Nichar, 2500m; Ahla, 2286m; Dalhousie, 2132m; Kalatop, 2438m; Narkanda, 2700m; Rahla, 2743m. Uttaranchal : Harsil, 2550m; Bharon Ghatti, 2820m; Mussoorie, 2100m; Chaubatia 1900m nr. Ranikhet; Bhyundar 2200m in Garhwal.

This is a distinct species and can be recognised from rest of the species by having frons strongly depressed, along the eye margin strongly raised like a ridge. Propodeal spiracles elongate-oval, about 2× as long as wide. Antennal flagellum without a band.

Female : Face subpolished, molderately convex in the middle, with obliquely running rugae, with sparse fine punctures. Clypeus shiny, minutely and sparsely punctate. Malar space granulose, 0.9× the basal width of mandible. Mandible rugoso-punctate. Frons subpolished, strongly depressed, at sides strongly raised like a ridge (Fig. 32 : a), scrobe moderately trans-striate, above obliquely striate with sparse small punctures. Vertex mat and subpolished, with small sized dense punctures. Temple subpolished, with coarse, dense punctures. Pronotum subpolished, largely with strong wrinkles, above finely striate with fine punctures in between the striae, pronotal collar with small dense punctures, epomia strong and moderately long. Mesoscutum mat and subpolished with moderate sized, close to dense punctures. Scutellum shiny, with small, moderately deep punctures with a few fine longitudinal striations, lateral carinae extending at its basal 0.25. Metascutellum shiny, sparsely and minutely punctate; mesopleurum largely rugose, area below subtegular ridge longitudinally striato-punctate, speculum with coarse closely placed puncture; prepectus, area above sternaulus and mesosternum with mediam sized, close to sparse punctures, prepectral carina extending 0.75× the height of mesopleurum. Metapleurum rugoso-wrinkled, juxtacoxal carina short. Propodeum between apical carina and apex finely and between the apical and basal carinae moderately strongly rugoso-wrinkled, basad of basal carina somewhat reticulo-punctate, apical carina transverse in the middle, basal carina laterally indistinct. First abdominal tergite largely granulose (mat), subpolished, near the spiracles rugose; following tergites mat and subpolished with fine dense setiferous punctures, punctures on apical tergites not define. Ovipositor sheath about 1.3× as long as hind tibia.

Black. The following are yellow : Orbit along the eye marign, a line on malar space (Fig. 32 : b), pronotal collar narrowly above, a small mark at the upper end of epomia, subtegular ridge faintly. All the coxae and trochanters, black; all femora red; fore and middle tibiae reddish-brown, their tarsi brown to dark brown; hind tibia and tarsus dark brown-blackish, except tibia at base narowly reddish-brown (Fig. 32 : c). Wings clear hyaline.

Male : Not known.

Length : Female, 6.75–12.5 mm; fore wing 6.75–9.5 mm; ovipositor sheath about 2.8–4.5 mm.

Distribution : India : Jammu & Kashmir (Khillanmarg, 3000m). Himachal Pradesh (Khadral, 2800m; Naldera in Shimla Hills; Nichar, 2500m; Ahla, 2286m; Dalhousie, 2132m; Kalatop, 2438m; Narkanda, 2700m; Rahla, 2743m). Uttaranchal (Harsil, 2550m; Bharon Ghatti, 2820m; Mussoorie, 2100m; Chaubatia, 1900m nr. Ranikhet; Bhyundar, 2200 m).

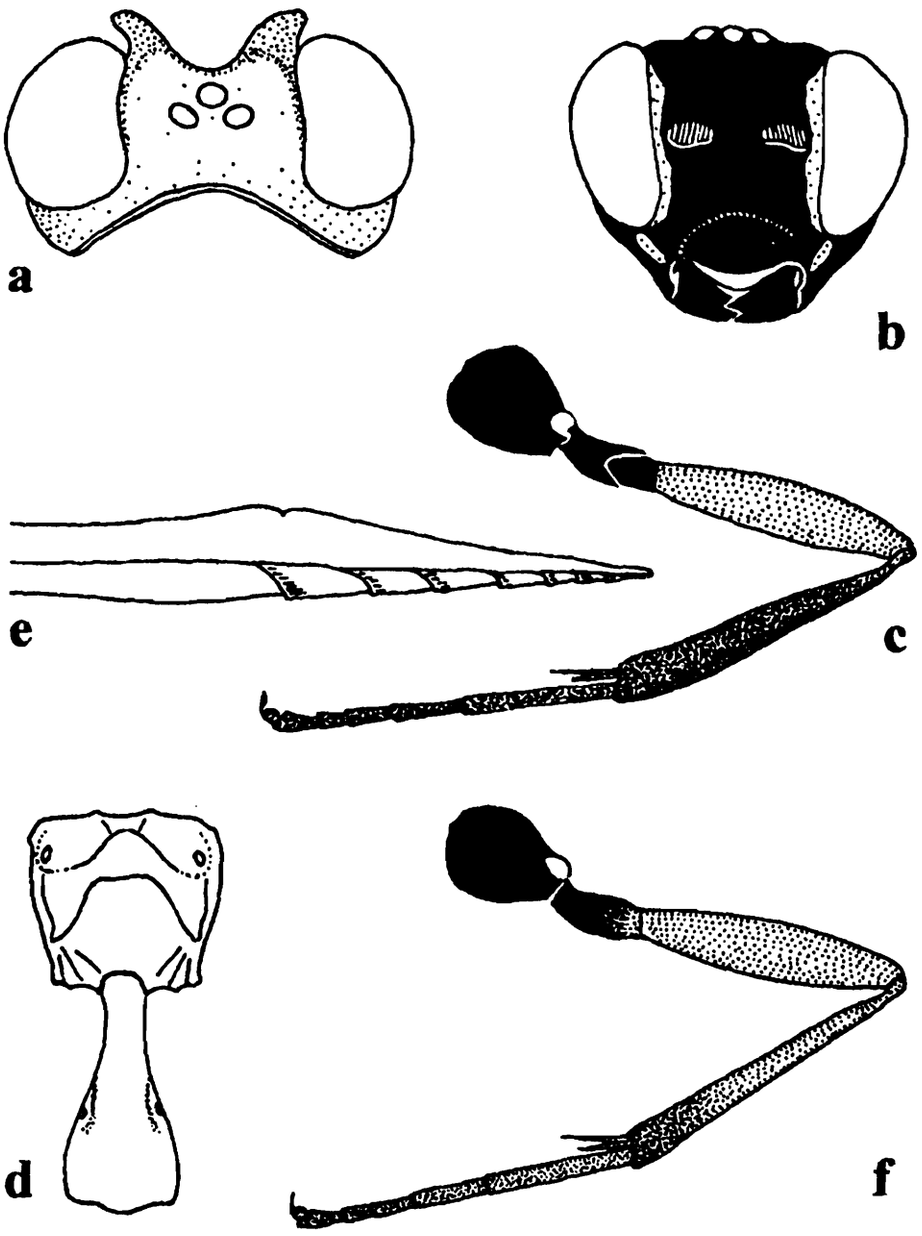

Fig. 32. *Itamoplex carinifrons* (Cameron) : **a**, dorsal view of head showing raised margins of frons; colour pattern : **b**, front view of head; **c**, hind leg. *Itamoplex lanceolatum* Jonathan : **d**, dorsal view of propodeum & first tergite; **e**, ovipositor tip; **f**, hind leg showing colour pattern.

2. ***Itamoplex lanceolatum*** Jonathan (Fig. 32 : d–f)

2000. *Itamoplex lanceolatum* Jonathan, *Rec. zool. Surv. India*, 98(2) : 177. Female, key, des. fig. Type : Female, India : Jammu & Kashmir : Gulmarg, 2429m (Z.S.I., Calcutta). India : Jammu & Kashmir : Gulmarg, 2429 m; Khillanmarg, 2000m (Z.S.I., Calcutta).

This species is close to *I. longiterebratum* Jonathan by sharing characters of abdomen (black) and wings (infumate), but can be distinguished by having ovipositor tip lanceolate, with a distinct nodus. Scutellum shiny with sparse indistinct punctures. Basal carina of propodeum complete and justacoxal carina almost absent.

Female : Face subpolished, minutely punctate, punctures close in the middle, dense at sides. Clypeus shiny, sparsely punctate, smooth at apex. Malar space granulose, 1.0× the basal width of mandible. Mandible subpolished, with close and shallow punctures. Frons mat and subpolished, rugoso-punctate, rugae behind the antennal sockets transverse. Vertex mat and subpolished, ocellar triangle sparsely punctate. Temple shiny, with small, closely placed, distinct punctures. Pronotum subpolished, in the scrobe trans-rugose, sometimes rugae not transverse, weak with small punctures in between the rugae. Pronotum above, collar and lower corner with minute dense punctures, punctures running into fine striations, epomia short. Mesoscutum shiny, small sized, moderately deep, close to little sparse punctures. Scutellum smooth and shiny, with sparse, weak punctures, its lateral carina extending at its basal 0.5. Metascutellum smooth and shiny, except, for a few minute indistinct punctures. Mesopleurum shiny, in the middle finely rugoso-wrinkled, subtegular ridge, area below the ridge, prepectus, area above sternaulus in front and mesosternum with close to dense, small to minute punctures, sometime punctures running into striations, mesopleurum in some specimens largely rugoso-punctate, punctures with transversely running striations, and mesopleurum in the centre largely rugose, speculum in the centre smooth and shiny, perpectal carina extending 0.75× the height of mesopleurum. Metapleurum subpolished, moderately strongly wrinkled, juxtacoxal carina not defined. Propodeum between apical carina and apex finely wrinkled, between apical and basal carinae with strong oblique ridges or striations, basad of basal carina finely wrinkled, basal carina weak at sides (Fig. 32 : d). First abdominal tergite largely smooth and shiny, postpetiole weakly mat, near the spiracles sparsely punctate. Second and third tergites with minute dense punctures, following tergites smooth and shiny. Ovipositor sheath about 1.2× as long as hind tibia; ovipositor tip as shown in figure 32 : e.

Black. 5th to 7th (sometimes 5th–9th) flagellar segments white. The following are yellow : orbits all along the eye margin narrowly, except interrupted at vertex and near malar space, a line on malar area. Legs in general red or reddish-brown, except all the coxae and all the first trochanteral segments, black; all the tarsi and also apex of hind tibia, dark brown (Fig. 30 : f). Wings brownish, hyaline and iridescent.

Male : Not known.

Length : Female, 6–9 mm; fore wing 4–6 mm; ovipositor sheath 2.5–4 mm.

Distribution : India : Jammu & Kashmir (Gulmarg, 2429m; Khillanmarg, 3000m).

3. ***Itamoplex longiterebratum*** Jonathan (Fig. 33 : a)

2000. *Itamoplex longiterebratum* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 177. Female, key, des. fig. Type : Female, India : West Bengal : Darjeeling, 1980m (Z.S.I., Calcutta). India : West Bengal : Ghoom, 2206m; Darjeeling, 1980m (Z.S.I., Calcutta).

This species is close to *I. lanceolatum* Jonathan but can be recognised by its ovipositor tip not lanceolate, without a distinct nodus, upper valve heavy, lower valve sharply narrowed towards the apex (Fig. 3 : a), scutellum distinctly punctate. Juxtacoxal carina strong.

Female : Head and throax subpolished, abdomen shiny. Face convex in the middle, uniformly minutely and densely punctate, near eye margin mat with weak closely placed punctures. Clypeus somewhat sparsely punctate, at apex smooth. Malar space granuloso-punctate, dull, 0.75× the basal width of mandible. Mandible striato-punctate. Frons below median ocellus finely wrinkled, further below wrinkled with small sized punctures, at sides mat, closely punctate, frontal scrobes with a few trans-striations. Vertex with small dense punctures, punctures at some places coalescent. Temple with moderate sized punctures, punctures closely placed above, sparse towards the base of mandible. Pronotum largely with moderate sized, dense punctures, punctures running into striations or at some places forming rugosities, in the middle with coarse transverse wrinkles, epomia short. Mesoscutum with small, dense punctures, forming fine reticulations. Scutellum distinctly punctate, punctures moderate size and close, its lateral carina more or less confined to its base. Metascutellum minutely and sparsely punctate. Mesopleurum largely with small sized, dense punctures, punctures running into striations and at some places forming fine reticulations, in the middle finely wrinkled. Mesosternum and area above sternaulus in front minutely and densely punctate, speculum in front smooth, prepectal carina extending 0.66× the height of mesopleurum. Metapleurum somewhat finely rugoso-reticulate, juxacoxal carina present but incomplete. Propodeum between basal carina and apex reticulo-wrinkled, basad of basal carina with medium sized, dense punctures, punctures forming rugosities, basal carina weak in the middle, apical carina interrupted sublaterally. First tergite with a few scattered minute punctures. The following tergites smooth, except second with minute, dense setiferous punctures. Ovipositor sheath about 1.8× as long as hind tibia. ovipositor tip as shown in figure 33 : a.

Black. Apex of 5th to base of 9th flagellar segment white above. Orbits all along the eye margin narrowly except below, subtegular ridge faintly, yellow. Legs in general red, except all the coxae and trochanters, black; hind tarsus with second to third segments white, its first segment reddish-brown and fifth segment dark brown. Wings hyaline with yellowish hue.

Male : Not known.

Length : Female, 11 mm; fore wing 7.5 mm; ovipositor sheath 5.5 mm.

Distribution : India : West Bengal (Darjeeling, 1800m; Ghoom 2206m).

4. ***Itamoplex indicum*** Jonathan (Fig. 33 : b)

2000. *Itamoplex indicum* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 180. Female, key, des. fig. Type : Female, India : No further data (Z.S.I., Calcutta).

This species is close to *I. kashmirensis* Jonathan and *I. himalayensis* Jonathan in having abdomen largely red and wings yellowish, but can be distinguished by having all coxae and trochanters, red; orbital mark encircling the whole orbit, scutellum with two lateral linear marks, metapleurum and speculum, yellow.

Female : Face subpolished, minutely punctate, with a weak median tubercle; clypeus smooth and shiny. Malar space granulose, 1.0× the basal width of mandible. Frons moderately depressed, scrobe shiny with trans-striations in the middle, below median ocellus obliquely rugoso-striate. Vertex mat and subpolished. Temple shiny, minutely punctate. Pronotum rugoso-punctate, pronotal collar densely punctate, epomia strong, reaching upper margin. Mesoscutum subpolished, minutely punctate. Scutellum shiny, sparsely punctate, lateral carina more or less confined to its base. Metascutellum subpolished, smooth. Mesopleurum subpolished, with small, distinct dense punctures, punctures at some places running into fine striations, speculum smooth and shiny, prepectal carina extending 0.9 the height of mesopleurum. Metapleurum moderately strongly rugose, juxta coxal carina absent. Propodeum rugoso-wrinkled, apophyses moderately strong. First abdominal tergite mat, near the spiracle rugose, following tergites mat and subpolished. Ovipositor sheath about 1.2× as long as hind tibia.

Black. The following are yellow : orbital mark along the eye margin, a line on malar space, clypeus at base, pronotal collar, upper margin of pronotum, tegula, subtegular ridge, an elongate mark on speculum, two lateral marks on scutellum, metascutellum wholly and apophyses (Fig. 33 : b). Abdomen wholly red. All the legs in general reddish-brown, except hind tarsus dark brown.

Male : Unknown.

Length : Female, 8.5 mm; fore wing 6 mm; ovipositor sheath about 3 mm.

Distribution : India : Loc. not known. Probably Kashmir.

5. ***Itamoplex kashmirensis*** Jonathan (Fig. 33 : c–e)

2000. *Itamoplex kashmirensis* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 180. Female, key, des. fig. Type : Female, India : Jammu & Kashmir : Gulmarg, 2429m (Z.S.I., Calcutta). India : J & K : Gulmarg, 2429m (Z.S.I., Calcutta).

This and the following species are readily recognised by having legs largely black, orbital mark not encircling the whole orbit. This species can be distinguished by having nervellus opposite to basal vein (Fig. 33 : c), postpetiole 0.8× as long as wide at base (Fig. 33 : d) and antennal flagellum with a white band on 5th to 9th segments.

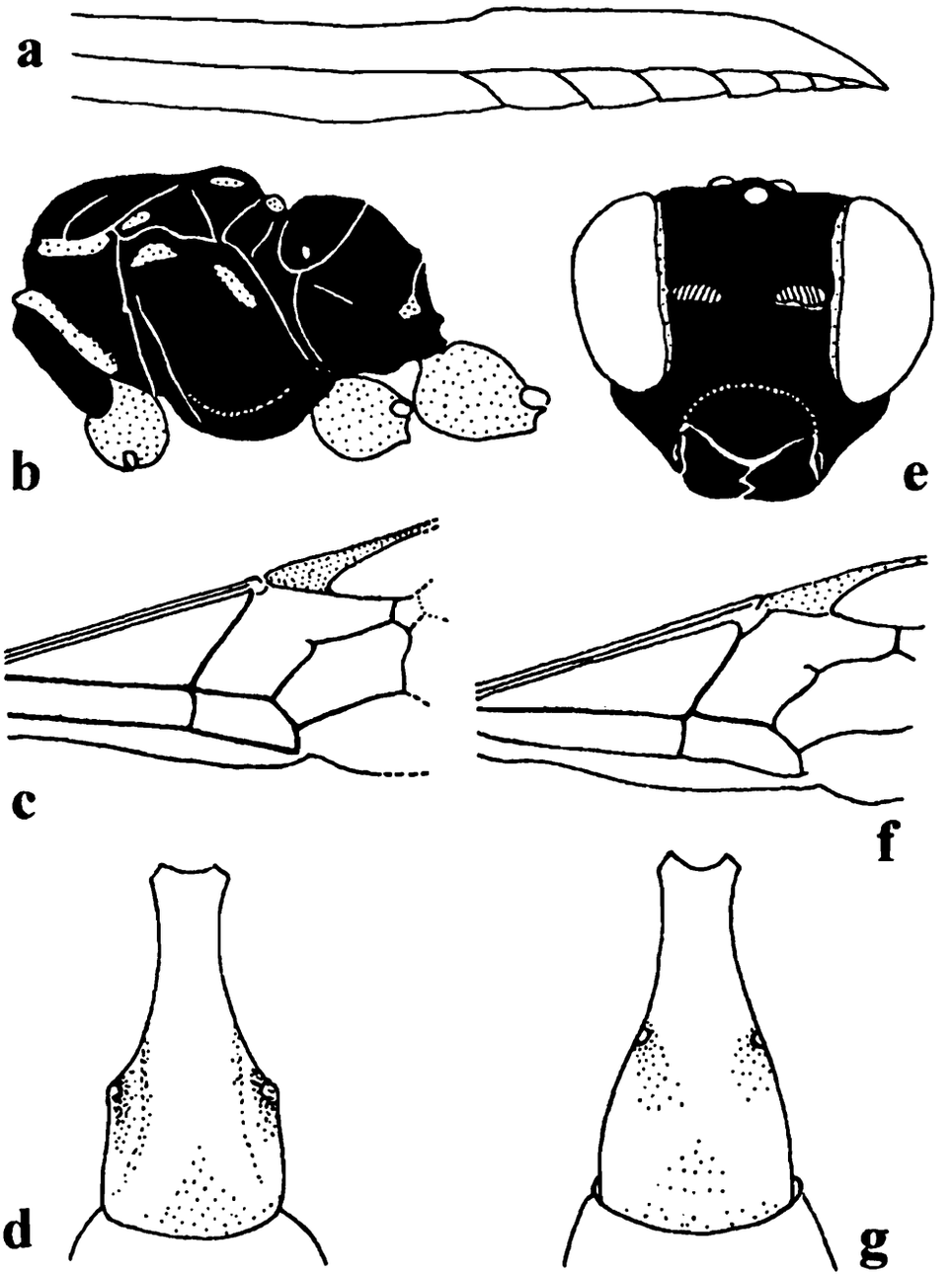

Fig.33. *Itamoplex longiterebratum* Jonathan : **a**, ovipositor tip. *Itamoplex indicum* : colour pattern : **b**, side view of thorax. *Itamoplex kashmirensis* Jonathan : **c**, fore wing; **d**, dorsal view of first tergite; **e**, front view of head showing colour pattern. *Itamoplex himalayensis* Jonathan : **f**, fore wing; **g**, dorsal view of first tergite.

Female : Body subpolished. Face in the middle weakly raised, at sides flat, with small punctures, punctures in the middle with interspaces as wide as their own diameter, punctures at sides close and shallow, surface mat. Clypeus with moderately large and deep punctures, punctures towards the apex sparse. Malar space granulose, 1.2× the basal width of mandible. Mandible somewhat rugoso-punctate. Frons with antennal scrobes deep, in the scrobes finely trans-striate, above rogoso-punctate, at side mat with sparse shallow punctures. Vertex strongly mat, with close shallow punctures, punctures in the ocellar triangle moderately large and deep. Temple with

moderate sized deep punctures, interspaces 1.0× or more than their diameter. Mesoscutum with medium sized, close to little sparse punctures. Scutellum shiny, minutely and sparsely punctate, lateral carina extending to its basal 0.33. Metascutellum with small, closely placed punctures. Mesopleurum largely rugoso-wrinkled, area below subtegular ridge, along the anterior and posterior margins striato-punctate; subtegular ridge, speculum, area above sternaulus near prepectal carina and mesosternum with medium sized evenly spaced punctures, interspaces 1.0× or little more than their diameter, prepectal carina extending about 0.7× the height of mesopleurum. Metapleurum reticulo-wrinkled, juxtacoxal carina not well defined. Propodeum largely moderately strongly reticulo-wrinkled, basal carina laterally weak. First tergite largely smooth and subpolished, except for a few scattered shallow punctures and area near spiracles rugoso-punctate, second and third tergites mat, with fine dense setiferous punctures, following tergites mat and subpolished. Ovipositor sheath about 0.7× as long as hind tibia.

Black. 5th to 9th flagellar segments white above. Face, frons temple narrowly along the eye margin (Fig. 33 : e), scutellum with a small mark, yelllow. Abdomen reddish, except first abdominal segment at base blackish. Legs in general reddish to reddish-brown, except all the coxae and trochanters black, and their tarsi brownish.

Male : Unknown.

Length : Female, 8.5 mm; fore wing 6 mm; ovipositor sheath 2 mm.

Distribution : India : Jammu & Kashmir (Gulmarg, 2429m).

6. ***Itamoplex himalayensis*** Jonathan (Fig. 33 : f, g)

2000. *Itamoplex himalayensis* Jonathan, *Rec. zool. Surv. India*, **98**(2) : 181. Female, key, des. fig. Type : Female, India : Uttaranchal : Dehra Dun (Z.S.I., Calcutta). India : Himachal Pradesh : Rahla, 2743m (Z.S.I., Calcutta).

This species can be distinguished from *I. kashmirensis* Jonathan by having nervulus distinctly basad of basal vein (Fig. 33 : f). Postpetiole longer than wide, about 1.3× as long as wide at base (Fig. 33 : g) and antennal flagellum with a white band on 5th to 6th segment.

Female : Body largely subpolished. Face medially convex, with small sized dense punctures, punctures running into striations. Clypeus with intermixed small and moderately large punctures, punctures towards the apex sparse. Malar space granulose, 1.2× the width of mandible. Mandible strongly striato-punctate. Frons in the middle below median ocellus wrinkled, at sides with coarse closely placed punctures, behind antennal sockets coarsely trans-striate or striate. Vertex in ocellar triangle densely, behind the triangle and at sides with small sized close punctures, punctures sparse near the eye margin. Temple with moderately deep, small sized punctures, interspace

more than their own diameter. Pronotum in the scrobe moderately strongly rugose, above with coarse, deep and dense punctures, forming rugosites; pronotal collar and lower margin with small sized moderately deep, close to sparse punctures; epomia short but strong. Mesoscutum with moderate sized close punctures, punctures at some places running into striations. Scutellum shiny with sparse small sized punctures, lateral carina more or less confined to its base. Metascutellum smooth, with a few minute punctures. Mesopleurum broadly in the middle rugoso-wrinkled, speculum with coarse deep punctures and a few striations; prepectus, area above sternaulus anteriorly, mesosternum, area around subtegular ridge finely punctate, interspace 1.5–2.0× their own diameter; prepectal carina extending 0.6–0.7× the height of mesopleurum. Metapleurum largely rugoso-wrinkled, at some places forming reticulate pattern, juxtacoxal carina absent. Propodeum between basal carina and apex moderately strongly wrinkled, basad to basal carina finely reticulo-wrinkled with a few punctures at extreme base, both the transverse carinae strong and complete, apophyses strong. First abdominal tergite largely smooth and subpolished, except postpetiole with small scattered punctures and near the spiracles rugoso-punctate. Second tergite mat with fine dense setiferous punctures; following tergites mat and subpolished. Ovipositor sheath about 1.1× as long as hind tibia.

Black. 5th and 6th flagellar segments white above. The following are yellow : orbit narrowly all along the eye margin, except above, malar space, tegula sometimes, subtegular ridge, extreme upper margin of pronotal collar and a small mark on scutellum. Abdomen red, except basal 0.6 of first segment black, sometimes black colour extended on second tergite. Legs in general reddish, except all the coxae and trochanters black, all the tarsi brown or dark brown, hind tibia reddish-brown. Wings clear hyaline.

Male : Unknown.

Length : Female, 9.5 mm; fore wing 7.5 mm; ovipositor sheath 4 mm.

Distribution : India : Himachal Pradesh (Rahla, 2743). Uttaranchal (Dehra Dun).

11. Genus ***Hedycryptus*** Cameron (Fig. 34 : a–c)

1903. *Hedycryptus* Cameron, *Ztschr. System. Hymn. Diptra,* **3** : 298. Type-species : (*Hedycryptus filicornis* Cameron) = *orientalis* Cameron; Monobasic.

1970. *Apachia* Townes, *Mem. Amer. Ent. Inst.,* **12** : 195. Syn. by Townes, 1971 : 239. Type-species : *Cryptus tenuiabdominalis* Uchida; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 163–164 (as a syn. of *Trachysphyrus).* Townes, 1970 : 192 (as a syn. of *Buathra).* Townes, 1971 : 239 (separate genus with *Apachia* as its synonym).

Distribution : Eastern Palaearctic and Oriental regions.

Body slender. Clypeus of moderate size, about 2.3× as wide as long, strongly convex, its apex weakly convex, without a median tooth or lobe. Malar space about 1.0× as long as basal width of mandible. Mandible of moderate length, its lower tooth a little shorter than upper tooth. Apical 0.3 of female flagellum not enlarged, not flattened below, not or only faintly tapered to apex, the tip blunt. Mesoscutum mat, with small, very dense punctures. Notaulus moderately strong, reaching behind center of mesoscutum. Propodeal spiracle about 3.5× as long as wide. Apical carina of propodeum forming strong sublateral crests, carina usually distinct between the crests, laterad often absent. Hind coxae deep, with a short, faint, horizontal groove just below its attachment. Venation as figured, the areolet rather small, with strongly convergent sides, the second intercubitus simply arched. First tergite slender, without a lateral tooth at base, its spiracle near apical 0.31. Ventrolateral carina of first tergite lacking though ventrolateral margin of tergite often indicated by smoother sculpture. Dorso-lateral and median-dorsal carinae absent or blunt, when present often reaching the apex of postpetiole. Second tergite mat, its setiferous punctures fine, rather dense in male, sparse to rather dense in female. Ovipositor sheath about 1.0 as long as hind tibia. Ovipositor rather slender, weakly compressed, its tip elongate-sagittate.

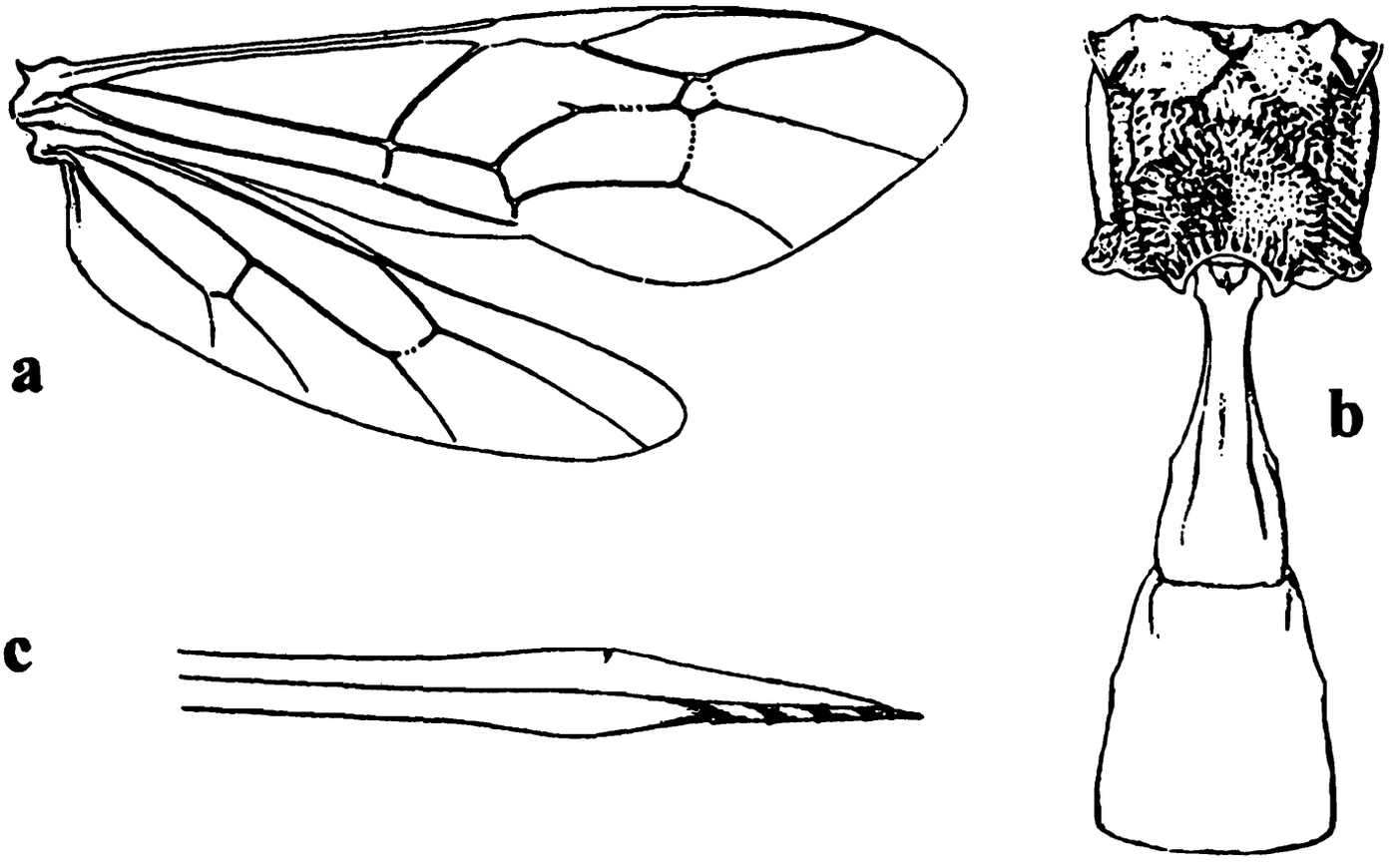

Fig. 34. *Hedycryptus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first tergite and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

The genus *Hedycryptus* Cameron is known from eastern Palaearctic and Oriental regions. Townes *et al.* (1961) placed *Hedycryptus* Cameron as junior synonym under *Trachysphyrus* Haliday, 1836 and referred 20 species under *Trachysphyrus*. *Hedycryptus* Cameron was known by a single species, viz., *H. filicornis* Cameron (1903), which was also included under *Trachysphyrus* Haliday, 1836.

Townes (1970 : 181, 192, 193, 195, 201) revised and reorganized the genus *Trachysphyrus* and divided the genus into *Buathra* Cameron, 1903; *Itamoplex* Fabricius, 1804; *Maringopus* Foerster, 1866 and *Anacis* Porter, 1967. Townes (1970 : 195) erected a new genus *Apachia* and referred *Cryptus tenuiabdominalis* Uchida, 1930 as its type species. Townes (1970 : 181-183) restricted *Trachysphyrus* to species occurring only in South America south of the equator. Inclusion of Holarctic species in *Trachysphyrus*, he thought to be an error induced by superficial resemblance (Townes, 1970 : 182). Townes (1970; 192) placed *Hedycryptus* as junior synonym of *Buathra*. Townes (1971 : 239) separated *Hedycryptus* as a distinct genus with *Apachia* as its synonym.

Townes (1971 : 239) synonymised *Apachia* Townes with *Hedycryptus* Cameron, and referred three species, viz., *H. filicornis* Cameron, 1903; *Cryptus tenuiabdominalis* Uchida, 1930 and *Cryptus rufopetiolatus* Cameron, 1904 to this genus.

Townes *et al.* (1961) referred 20 species to *Trachysphyrus*, of these, 1 species is under *Itamoplex*; 8 under *Buathra*, 3 species under *Hedycryptus* and 1 under *Anacis*. Of the remaining 7 species; 2 species are junior synonyms under *Buathra* and 5 species are junior synonyms under *Hedycryptus*. The new synonymies as referred by Gupta (1978 : 791-793) based on the findings of the present author are ratified in the present manual.

Five new species are described here from Java, Sulawesi, Philippines and China. A key to all the species from Oriental Region is given below :

Key to the Oriental species of *Hedycryptus*

1. Head, thorax and abdomen almost black (sometimes head along the inner eye orbit and pronotal collar, yellow); wings yellowish or dark fuscous 2

– Body variously marked with black, yellow and red; wings yellowish 6

2. Fore and middle legs entirely black 3

– Fore and middle legs not entirely black (variously marked) 5

3. Face entirely black; postpetiole as wide as long at base. Malar space about 1× as long as the basal width of mandible. China. Japan .....
..... 1. *tenuiabdominalis* (Uchida)

– Face along the eye margin yellow; postpetiole longer (1.3–1.5×) than its width at base. Malar space narrow (0.6–0.8×) 4

4. Face normal, without distinct median tubercle; propodeal spiracle slit-like, about 4× as long as wide; mesopleurum strongly rugoso-wrinkled; postpetiole about 1.5× as long as wide at base; malar space about 0.8× the basal width of mandible. Indonesia : Java, Sulawesi. ..... 2. *javensis*, sp. nov.

– Face with distinct median tubercle; propodeal spiracle longish-oval, about 3.3× as long as wide; mesopleurum finely trans-rugose; postpetiole abut 1.2× as long as wide at base; malar space 0.6× the basal width of mandible. Sulawesi ..... 3. *sulawesensis*, sp. nov.

5. Antennal flagellum broadly yellowish. Middle and hind tibia and tarsus entirely yellow. First abdominal tergite without median, lateral and ventral longitudinal carinae; petiole round in cross section, tergite smooth and shiny. Apical carina of propodeum reduced, represented by two lateral apophyses and a median tubercle. Philippines. ..... 4. *flavotarsatus*, sp. nov.

– Antennal flagellum not broadly yellowish. Middle and hind tibia largely brown. First abdominal tergite with median, lateral and ventral longitudinal carinae, tergite strongly granulated, subpolished; petiole rectangular in cross-section. Apical carina of propodeum moderately strong and more or less complete. China ..... 5. *chinensis*, sp. nov.

6. Abdomen reddish or red, except its first or basal two segments, black. India : Assam; Himachal Pradesh; Meghalaya; Sikkim; Uttaranchal. Pakistan. Taiwan ..... 6. *orientalis* (Cameron)

– Abdomen largely black, its first segment some times red, and following tergites some times with yellow apical bands 7

7. Head largely red. Abdomen black, Legs in general with a shade of reddish-yellow or reddish-brown, except all coxae, hind trochanters and femora, black. Philippines ..... 7. *philippinus*, sp. nov.

– Head largely black. Abdomen with first segment red or black and following tergites black with yellow apical bands; legs in general red. India : Bihar; Meghalaya; Uttaranchal. Myanmar. Java. Taiwan. ..... 8. *rufopetiolatus* (Cameron)

1. ***Hedycryptus tenuiabdominalis*** (Uchida) (Fig. 35 : e)

1930. *Cryptus tenuiabdominalis* Uchida, *Jour. Faculty Agr. Hokkaido Imp. Univ.*, **25** : 307. Female, Male, des., fig. Type : Female, Male. Japan : Hokkaido; Honshu; Shikoku; Kyushu (SAPPORO).

1903. *Cryptus tenuiabdominalis* : Uchida, *Insecta Matsumurana,* **14** : 118. Female. China : Kuling.

1961. *Trachysphyrus tenuiabdominalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **12** : 166. n. comb. China, Japan.

1970. *Apachia tenuiabdominalis* : Townes, *Mem. Amer. Ent. Inst.,* **12** : 196. n. comb. Fig.

1971. *Hedycryptus tenuiabdominalis* : Townes, *Mem. Amer. Ent. Inst.* : **17** : 240. Syn.

1987. *Hedycryptus tenuiabdominalis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 793. Syn.

This is a distinct species having head, thorax, abdomen, fore and middle legs almost entirely, black. Postpetiole as wide as long at base and malar space about 1× as long as the basal width of mandible.

Female : Face subpolished, weakly raised in the middle, general surface granulose with minute close punctures and fine striations. Clypeus subpolished moderately raised in the middle, with moderately coarse and deep punctures. Frons with antennal scrobes deep, largely smooth and shiny, below ocellar triangle obliquely rogoso-punctate, a medium groove extending from median ocellus to the level of antennal sockets. Vertex with indistinct punctures, mat. Temple weakly swollen towards the base of mandible, swollen area distinctly punctate, temple above shallowly and sparsely punctate. Malar space granuloso-punctate, 1.0× the basal width of mandible. Pronotum subpolished, in the scrobes and along the posterior margin strongly rugose, collar also weakly rugose with its lower margin with fine irregular striations. Upper margin of pronotum strongly granulated. Epomia strong, reaching up to upper margin. Mesoscutum dull with minute and dense punctures, appear to be granulated in low magnification. Notauli deep and long, with short cross ridges. Scutellum largely rugoso-wrinkled, at apex punctate, its lateral carina confined to its basal 0.3. Metascutellum subpolished, with deep coarse punctures. Mesopleurum and metapleurum strongly rugoso-wrinkled, mesopleurum near and below sternaulus densely punctate, punctures running in to striations, prepectal carina extending 0.75× the height of mesopleurum, speculum subpolished with deep coarse punctures. Metapleurum at some places appears to be reticulate, juxtacoxal carina strong. Propodeum largely rugoso-reticulate, apical carina complete, strongly arched, straight in the middle, apophyses long and conical, basal carina present in the middle like an inverted 'V', laterally not defined, spiracle long slit-like. First tergite long about 2.5× as long as wide at apex, dorso-median and dorso-lateral carinae or angulations present at the postpetiolar region, postpetiole little longer than wide at base, tergite dorsally subpolished, granulate with a few scattered shallow punctures. Following tergites mat and subpolished. Ovipositor long, 1.1× as long as hind tibia, its tip lanceolate with distinct nodus.

Black. Antennal flagellum from third to eight segments above white. Frons narrowly along the eye margin, second segment of hind tarsus apically, third and fourth wholly, white or whitish-yellow (Fig. 35 : e). Fore and middle tibiae blackish-brown. Wings dark fuscous, hyaline.

Male : Essentially similar to female, body slender and weakly sculptured. Face densely and shallowly punctate. Clypeus sparsely punctate. Frons rugoso-punctate. Vertex subpolished, indistinctly punctate. Temple sparsely punctate. Pronotum largely punctate, with coarse strong striae in the middle groove. Mesoscutum closely and shallowly punctate. Scutellum with shallow coarse punctures. Mesopleurum rogoso-striate in the middle region, specular area above and below sternaulus with coarse deep punctures. Metapleurum rogoso-punctate, juxtacoxal carina present. Propodeum largely rogoso-winkled between basal carina and apex. Basad of basal carina subpolished with moderately deep and close punctures, both the transverse carinae strongly present; abdomen mat and dull.

Black. The following are yellow: Scape in front, face, clypeus (except the extreme apex), mandible (except the teeth), frons and temple along the eye margin (except temple above), tegula, subtegular ridge, an oval mark on scutellum, pronotal collar with a thin line below. Legs in general black, except fore coxa and trochanter, middle coxa broadly in front and its trochanter, yellow; rest of fore and middle legs yellowish-brown, with femora darker above. Hind leg with a light mark on second trochanteral segment, tarsus at base yellowish-brown, hind tarsus white except basal half of its first segment black. Wings clear hyaline.

Length : Female, 9–14 mm; fore wing 7–11 mm; ovipositor sheath 4–5 mm. Male, 9.5–13 mm; fore wing 6.5–9.5 mm.

Distribution : China (Kuling). Japan (Onuma; Saunkyo; Jozanki; Honshu; Shikoku; Ryushu; Loc. in Hokkaido).

2. ***Hedycryptus javensis*** Jonathan, sp. nov. (Fig. 35 : f)

This species is close to *H. tenuiabdominalis* Uchida and *H. sulawesensis,* sp. nov. in having fore and middle legs entirely, black. This species can be recognized by the absence of median tubercle on face. Propodeal spiracles slit-like, about 4× as long as wide. Mesopleurum strongly rugoso-wrinkled; postpetiole 1.5× as long as wide at base and malar space 0.8× the basal width of mandible.

Female : Face subpolished, granuloso-punctate, with finely running aciculations. Clypeus subpolished, basal half minutely and densely punctate, apical half largely smooth and shiny, with a few scattered punctures. Malar space rough, 0.8× the basal width of mandible. Frons subpolished, antennal scrobe shiny with weak indication of sparse transverse striations, above largely rugoso-wrinkled. Vertex and temple with dense and shallow punctures, surface appears to be granulose. Pronotum moderately strong trans-striate, at upper margin closely punctate with fine trans-striations reaching up to upper margin. Mesoscutum dull, weakly rugoso-punctate, punctures not well defined, short striae present along the notauli, notauli long and narrow. Scutellum closely punctate, with fine longitudinally running striations, lateral carina

extending to its more than 0.5. Metascutellum with a few punctures and longitudinal striae at sides. Mesopleurum moderately strongly rugoso-wrinkled, speculum and sternal area striato-punctate, prepectal carina extending almost up to the base of subtegular ridge. Metapleurum rugose, with strong transverse ridges on metapleural fold. Propodeum with moderately strong wrinkles between basal carina and apex, basad of basal carina rugose, basal carina strong and complete, arched in the middle; apical carina variable, evenly arched to straight in the middle, sublaterally weak or absent, apophyses high, strong and conical. First abdominal tergite long, about 3× as long as wide at apex, postpetiole 1.5× as long as wide at base, spiracles protruding, dorsal carina weak. Following tergites dull and granulose. Ovipositor long, about 1.3× as long as hind tibia, tip long and pointed, lower valve with weak teeth. Fore wing with nurvulus interstitial to little basad of basal vein.

Black. Antennal flagellum usually with a whitish band above on fourth to basal half of sixth segment, sometimes this band absent. Face, frons and temple narrowly along the eye margin, pronotal collar and subtegular ridge faintly, yellow. Hind tarsus (Fig. 35 : f) white except basal 0.66 black. Wings hyaline with yellowish hue.

Male : Similar to female, except more slender and weakly sculptured. Face granuloso-punctate, without aciculations. Clypeus sparsely punctate. Frons at antennal scrobes smooth and shiny, above rugoso-wrinkled. Vertex and temple shiny, with indication of weak minute sparse punctures. Mesoscutum densely punctate. Scutellum with moderately strong coalescent punctures, punctures running into striations. Metapleurum in basal half striate, closely punctate above. First tergite smooth and shiny, following tergites mat and subpolished. Fore wing with nervulus basad of basal vein.

Black. Antennal flagellum without any band. Scape in front, face in the middle and along the eye margin, frons and temple along the eye margin, malar space, mandible (except the teeth), pronotal collar narrowly, subtegular ridge, pale yellow. Hind tarsus white, except basal 0.33 of its first segment black. Fore and middle tibiae and tarsi lighter in shade. Wings hyaline with yellowish hue.

Length : Female, 10–15 mm; fore wing 8–12 mm; ovipositor sheath 3.5–5.0 mm. Male, 7.2–11 mm; fore wing 5.7–7.5 mm.

Holotype : Female, INDONESIA : Java : Mt. Gedeh, Tjibodas, 1600 m, 20.iii.1932, Coll. M.A. Lieftinck. *Allotype* Male, INDONESIA : Java : Mt. Telamojo, Kedoe, 1200 m, 29.x.1939, Coll. M.A. Lieftinck. *Paratypes* 17 Females, 2 Males. JAVA : Mt. Gedeh, Tjibodas, 1600m, 1 Female, 28.iii.1932, Coll. M.A. Lieftinck; Mt. Telamojo, Kedoe, 1200 m, 1 Male, 29.x.1939, Coll. M.A. Lieftinck. Lebak, 1 Female, 28.vi.1937, Coll. M.A. Lieftinck. Idjen, 1850m, 5 Female, Ongop-ongop, Dammerman. Tjibodas, 1400m, 7 Female, 27-29.vii.1930, Coll. M.A. Lieftinck; 30.v.1937, 1 Female, Coll. M.A. Lieftinck; 8.iv.1953, 1 Female, Coll. Amsari. Mt. Gedeh, Panggerango, 1 Male*, 15.vii.1951, Coll.

H.M.R. Wegner and 1 Female*, vii.1932, Coll. M.A. Lieftinck. Sulawesi : 1600m, 1 Female, vi.1936, Coll. G. Lampobasang [all in A.E.I., Florida and (*) marked in Z.S.I., Calcutta].

Distribution : Indonesia : Java; Sulawesi.

3. ***Hedycryptus sulawesensis*** Jonathan, sp. nov. (Fig. 35 : g)

This species is essentially similar to *H. javensis,* sp. nov. in most of its characters, except as follows :

Female : Clypeus shiny with minute sparse punctures in the basal half. Face with a distinct median tubercle. Malar space 0.6× the basal width of mandible. Frons above obliquely rugoso-punctate. Vertex and temple with distinct punctures. Notauli short, not extending more than 0.5 the length of mesoscutum. Scutellum punctate, without strong longitudinal striations. Mesopleurum finely trans-rugose, speculum and sternal area striato-punctate. Propodeum basad of basal carina rugulose, striato-wrinkled between apical carina and apex, between transverse carinae distinctly longitudinally striate; spiracles longish-oval, about 3.3× as long as wide. First abdominal tergite smooth and shiny, about 3× as long as wide at apex, postpetiole 1.2× as long as wide at base.

Colouration similar to *H. javensis*, except without any mark on frons and temple along the eye margin. First hind tarsal segment (Fig. 35 : g) almost wholly black. Wings with yellowish-brown hue.

Length : Female 11 mm; fore wing 9 mm; ovipositor sheath 4 mm.

Holotype : Female, INDONESIA : S. Sulawesi (Celebes) : coll. Bua Kraeng. no other data (Z.S.I., Calcutta).

Distribution : Indonesia : Sulawesi.

4. ***Hedycryptus flavotarsatus*** Jonathan, sp. nov. (Fig. 35 : a, h)

This species is close to *H. chinensis,* sp. nov., but can be distinguished by having antennal flagellum broadly yellowish; middle and hind tibiae and tarsi entirely, yellow. First abdominal tergite without longitudinal carinae; petiole round in cross section. Apical carina of propodeum reduced, represented by one median and two lateral tubercles.

Female : Face and clypeus moderately raised in the middle, face subpolished, granulose with close punctures. Clypeus shiny, sparsely punctate, towards the apex smooth. Frons subpolished, antennal scrobes shallow with transverse ridges, frons above obliquely striate with coarse punctures in between the striae. Vertex with indistinct punctures. Temple subpolished weakly and closely punctate. Malar space

granulose, 0.65× the basal width of mandible. Pronotum subpolished, largely coarsely trans-rugose, above coarsely and closely punctate with fine striations, lower corner also finely striato-punctate. Epomia strong reaching up to upper margin. Mesoscutum dull, densely and shallowly punctate, surface in low magnification appears to be granulated. Notauli long and deep with cross ridges. Scutellum convex, deeply and densely punctate, lateral carina extending at its basal 0.25. Metascutellum largely smooth and shiny with a few weak punctures. Mesopleurum subpolished, moderately strongly rugose, rugae transverse along the prepectal carina, and oblique below the subtegular ridge, speculum below with moderately deep punctures, area below subtegular ridge with a few punctures; prepectal carina extending 0.85 the height of mesopleurum. Metapleurum subpolished, rugoso-wrinkled, juxtacoxal carina obscure. Propodeum between basal carina and apex strongly and basad of basal carina weakly reticulo-wrinkled, apical carina absent, except in the middle present as a small tubercle, lateral apophyses moderately high, conical and blunt, basal carina strong, spiracles long slit-like. First abdominal tergite 3× as long as wide at apex. Postpetiole 1.28× as long as wide at base, following tergites mat and subpolished. Ovipositor long, about 1.2× as long as hind tibia, tip long and pointed, lower valve with weak teeth.

Black. The following are yellow: Second to sixteenth flagellar segments (sometime variable), face (Fig. 35 : a) in the center and along the eye margin, clypeus in the center (rest of face and clypeus, reddish-brown), frons and temple along the eye margin, pronotal collar above, subtegular ridge. Fore and middle coxae and trochanters blackish-brown. Fore leg with femur brownish-yellow, its tibia and tarsus deep yellow. Middle leg with femur blackish-brown, colour lighter towards the apex, its tibia and tarsus deep yellow. Hind leg black, except tibia and tarsus (Fig. 35 : h) including tibial spur deep yellow. Wings clear hyaline with yellowish hue.

Male : Slender and weakly sculptured. Face, clypeus, frons, temple and pronotum largely smooth and shiny. Mesoscutum, scutellum, mesopleurum, metapleurum shiny with indistinct to weak, sparse punctures. Propodeum weakly rugoso-punctate. Abdomen smooth and shiny.

Black. Tenth to eighteenth flagellar segments, scape in front, whole of face and clypeus, mandible largely in the middle, propleurum, pronotal collar, tegula, subtegular ridge, fore coxa, fore and middle trochanters, yellow. Rest of fore and middle legs, brownish-yellow. Hind tibia, tarsus including spurs, deep yellow, except tibia with a small patch of light brown at apex. Wings clear hyaline.

Length : Female, 10.5–13 mm; fore wing 8.75–10 mm; ovipositor sheath 5.5 mm. Male, 6 mm; fore wing 4.5 mm.

Holotype : Female, PHILIPPINES : Negros Oriental, Mt. Canlaon, 1080m, 6.v.1953, Colls. H.M. & D. Townes. *Allotype* Male, data same as holotype, 1400 m, 1.v.1953 (A.E.I., Florida). *Paratype* 1 Female, data same as allotype (Z.S.I., Calcutta).

Distribution : Philippines (Negros).

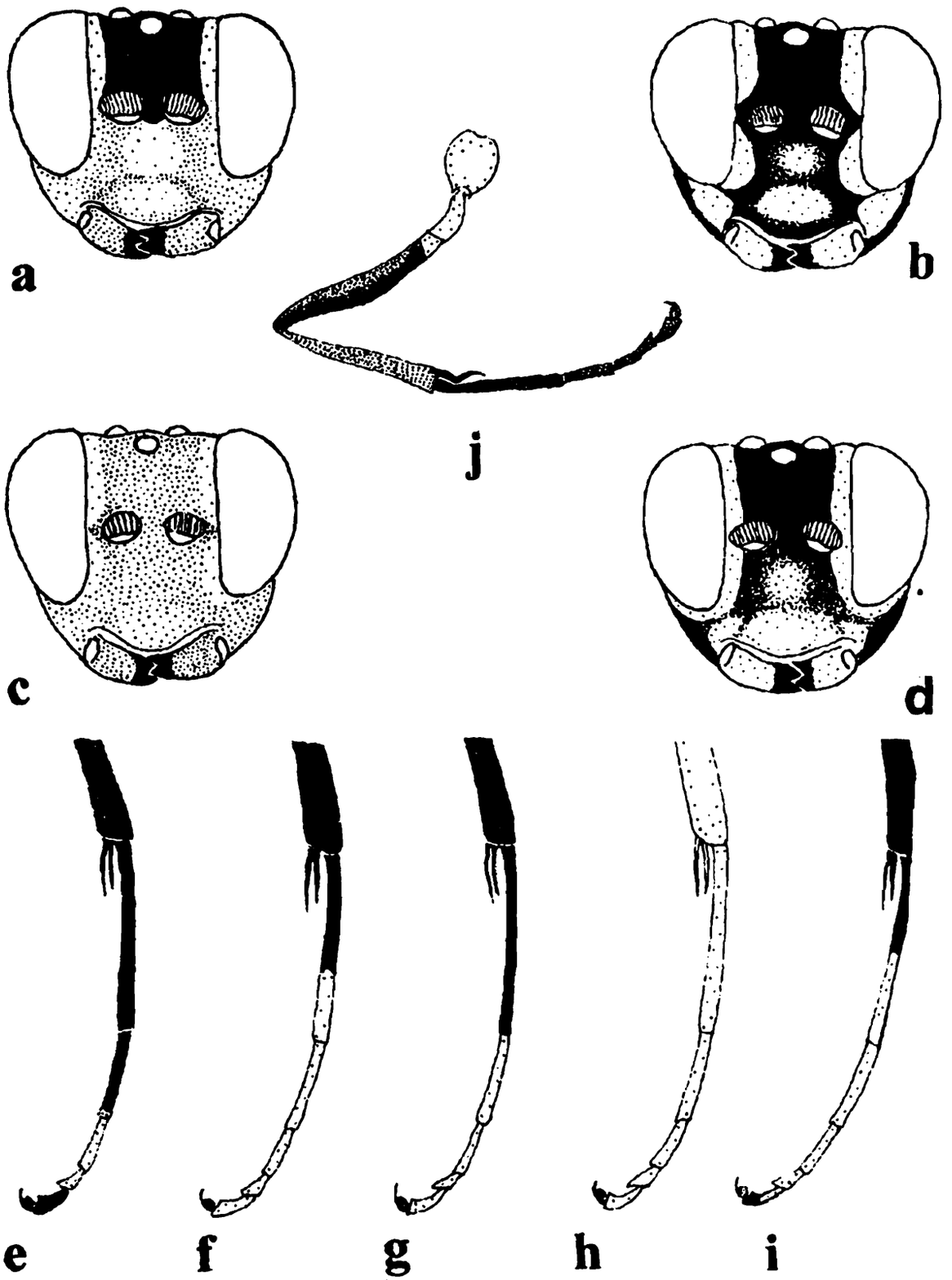

Fig. 35. Showing colour pattern. *Hedycryptus flavotarsatus* : **a**, front view of head; **h**, hind tarsus. *Hedycryptus chinensis* : **b**, front view of head; **i**, hind tarsus. *Hedycryptus philippinus* : **c**, front view of head. *Hedycryptus rufopetiolatus* (Cameron) : **d**, front of head. *Hedycryptus tenuiabdominalis* (Uchida) : **e**, hind tarsus. *Hedycryptus javensis* : **f**, hind tarsus. *Hedycryptus sulawesensis* : **g**, hind tarsus. *Hedycryptus orientalis* (Cameron) : **j**, fore leg.

5. ***Hedycryptus chinensis*** Jonathan, sp. nov. (Fig. 35 : b, i)

This species can be recognized by having antennal flagellum not broadly yellowish; middle and hind tibiae largely brown. First abdominal tergite with median, lateral and ventral longitudinal carinae, tergite strongly granulated, subpolished, petiole rectangular in cross-section. Apical carina of propodeum moderately strong and more and less complete.

Female : Face with a moderately high median tubercle, subpolished, largely rugulose with indication of weak punctures. Clypeus moderately convex, subpolished with shallow coarse punctures in the basal half, apical half smooth. Frons with antennal scrobes largely smooth and shiny, sublaterally obliquely rugoso-wrinkled, along the eye margin smooth. Vertex and temple above granulose, about 0.8× the basal width of mandible. Pronotum subpolished, trans-rugose, upper and lower margin closely punctate. Epomia short but strong. Mesoscutum densely punctate, notauli deep with short ridges in the groove. Scutellum with moderately strong and dense punctures, punctures running into longitudinal striations, lateral carina extending to its basal 0.25. Metascutellum with deep and dense punctures. Mesopleurum subpolished, largely rugose, with undefined small punctures between the rugae. Prepectal carina extending almost up to the base of subtegular ridge. Metapleurum rugose, juxtacoxal carina obscured. Propodeum strongly winkled, at some places appears to be reticulate, basad of basal carina weakly rugose, basal carina complete and strong, apical carina present in the middle in the form of a short ridge; apophyses high, conical and blunt at apex, spiracle long slit-like. Nervulus basad of basal vein, nervellus intercepted at its lower 0.2. First abdominal tergite long, about 3× as long as wide at apex, largely mat and subpolished, postpetiole slightly longer than wide at base. Second and third tergites strongly granulated, following tergites dull and mat. Ovipositor long, about 1.13× as long as hind tibia, its tip lanceolate and pointed, lower valve with weak teeth.

Black. Apical half of third to seventh segments of antennal flagellum above, white. The following are yellow or dirty yellow: Median tubercle on face, and also broadly along the eye margin, clypeus at base, malar space, mandible (except the teeth), frons and temple (Fig. 35 : b) along the eye margin, pronotal collar, its upper margin narrowly, tegula, subtegular ridge, scutellum faintly at base. Fore and middle legs dark brown, except their coxae largely black. Hind leg largely black, except tibia brownish subbasally, apical half of first tarsal segment to basal half of fifth segment whitish-yellow (Fig. 35 : i). Abdomen towards the apex tending to be blackish-brown. Wings clear hyaline with yellowish tinge.

Male : Similar to female except more polished and slender. Face densely and shallowly punctate. Clypeus sparsely punctate. Frons obliquely rugoso-punctate. Vertex minutely punctate. Temple with fine weak punctures. Pronotum striato-punctate. Mesoscutum with dense and deep punctures. Pronotum striato-punctate. Mesoscutum

with dense and deep punctures. Scutellum coarsely and closely punctate. Metascutellum with deep punctures. Mesopleurum densely punctate with transversely running fine striations. Metapleurum finely wrinkled in the middle, appears to be reticulate above, juxtacoxal carina present. Propodeum between basal carina and apex reticulate, towards the apex wrinkled, basad of basal carina closely and shallowly punctate. Abdomen largely mat and subpolished.

Black. The following are yellow or dirty yellow: Face and clypeus wholly, whole of orbit, mandible, scape in front, pronotal collar, upper margin of pronotum, scutellum broadly, tegula, subtegular ridge, fore and middle coxae and trochanters. Rest of fore and middle legs yellowish-brown, their fifth tarsal segments dark brown. Hind leg black except second trochanteral segment above, femur at base, tibia broadly at base, yellowish-brown, its tarsus whitish with basal half of first and claw dark brown to blackish. Wings clear hyaline with yellowish tinge.

Length : Female, 10.5–15 mm; fore wing 8–11.5 mm; ovipositor sheath 3.5–5.3 mm. Male, 10 mm; fore wing 8 mm.

Holotype : Female, CHINA : Shaowu Hsien, 1200-1500m, 21-30.ix.1943, Coll. T.C. Maa. *Allotype* Male, same data as holotype, 6-9.vi.1943. *Paratypes* 3 Females. Same locality and collector as holotype, 1 Female*, 1-7.vii.1945; 2 Females, 21-27.iv.1945. (all in A.E.I., Florida) and (* marked in Z.S.I., Calcutta).

Distribution : China.

6. ***Hedycryptus orientalis*** (Cameron) (Fig. 35 : j)

1897. *Cryptus orientalis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **41** (4) : 16. Female. des. Type : Female, India : Uttar Pradesh : Mussoorie (OXFORD).

1903. *Hedycryptus filicornis* Cameron, *Ztschr. System. Hymen. Dipt.*, **3** : 299. Female, des, Type : Female, India : Sikkim (LONDON). **New Synonymy.**

1904. *Cryptus himalayensis* Cameron, *Trans. Ent. London,* 1904 : 106. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD). Syn. with *filicornis* by Morley, 1914.

1904. *Cryptus bibulus* Cameron, *Trans. Ent. London,* 1904 : 106. Male, des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD). **New Synonymy.**

1905. *Distantella pilosella* Cameron, *J. Bombay Nat. Hist. Soc.,* **19** : 729. [Male], des. Type : Male, India: Himachal Pradesh: Shimla (LONDON). **New Synonymy.**

1931. *Cryptus kankoensis* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 169. Female, key, des., fig., Type : Female, Taiwan: Kangokou; Jenho; Fenchifu; Wukuglun (SAPPORO). Syn. by Townes, 1971: 239 under *filicornis.*

1983. *Hedycryptus orientalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 791.

This is a distinct species having abdomen reddish or red, except its first or basal two segments black. Wings yellowish.

Female : Face and clypeus moderately convex in the middle. Face dull, largely rugulose, median convex area mat and subpolished. Clypeus dull, shallowly punctate, its apical 0.3 smooth and impressed. Frons in the scrobes smooth and polished, above rugose with irregular oblique striations. Vertex, temple and malar space subpolished and granulose. Malar space 0.9× the basal width of mandible. Pronotum subpolished rugose, usually trans-striate in the lower half, epomia short but strong. Mesoscutum with dense punctures, and fine striations, distinct short striae present along the notauli. Scutellum subpolished with moderate size punctures and longitudinal striations, lateral carina extending about 0.4 of its length. Metascutellum shiny, with coarse and close punctures. Mesopleurum and metapleurum subpolished, strongly rugose, somewhat rugoso-wrinkled in middle, juxtacoxal carina on metapleurum not well defined among the rugosities. Prepectal carina extending about 0.75 the height of mesopleurum. Propodeum with moderately strong apical and basal carinae, apophyses long and conical, apical carina sometimes interrupted sublaterally, propodeum as a whole strongly rugose, area apicad of apical carina tending to be trans-rugose, area basad of basal carina finely rugose, spiracle long and slit-like. First tergite mat and subpolished, about 3× as long as wide at apex, postpetiole about 1.2× as long as wide at base, spiracles close to each other than to apex; following tergites mat and subpolished. Ovipositor long, about 1× as long as hind tibia, its tip long and moderately pointed with a distinct nodus.

Black. Antennal flagellum from the apex of 3rd to the base of 8th segment white above. Scape and pedicel in front yellowish-brown. The following are yellow or dirty yellow : median tubercle on face, clypeus broadly at base, eyes all along the orbit; sometimes face, clypeus, along eye margins, malar space wholly (as in *himalayensis* and *filicornis)*, pronotal collar, upper margin of pronotum, tegula, subtegular ridge. Legs in general yellowish-brown, except fore and middle coxae and trochanters yellow with broad marks at base, dark brown. Fore and middle femora (Fig. 35 : j) with narrow line above and tarsi largely, dark brown; hind coxa and trochanter black, femur reddish, tibia reddish-brown, tibia at apex dark brown; tarsus white with basal 0.5 of first and fifth segment wholly black. Abdomen with first segment black, rest reddish, except second segment almost wholly and third baso-medially dark brown to blackish. Wings clear hyaline.

Male : Similar to female, except more slender and weakly sculptured. Face and clypeus subpolished, surface granulose with shallow, not well defined punctures. Vertex and temple smooth and shiny. Pronotum trans-striate. Mesoscutum densely punctate, punctures coalescent and running into irregular striations. Mesopleurum densely, moderately deeply punctate, punctures distinctly running into fine trans-striations. Metapleurum with dense coarse punctures, appears to be reticulate. Propodeum puncto-raticulate, towards the apex reticulo-wrinkled. Abdomen mat and subpolished.

Black. Antennal flagellum with a white band. The following are yellow: Scape in front, face, clypeus, malar space, eyes all along the orbit, pronotal collar, upper margin of pronotum, tegula, subtegular ridge, scutellum largely, fore and middle coxae and trochanters. Hind tarsus white, except its first segment at its basal 0.3 black; rest of legs and abdomen similar to female.

Length : Female, 8–13 mm; fore wing 6.5–11 mm; ovipositor sheath 3–4 mm. Male, 7–12 mm; fore wing 5.5–8.5 mm.

Distribution : India : Assam (Kobo). Himachal Pradesh (Shimla). Meghalaya (Khasi Hills). Sikkim and Uttranchal (Mussoorie, Dehra Dun). *Elsewhere* : Pakistan (Murree). Taiwan (Kangokou; Jenho; Fenchifu; Wukuglum; Chiasien; Kuandouchi; Sunmoon Lake; Taichun; Talin; Fengshan).

7. ***Hedycryptus philippinus*** Jonathan, sp. nov. (Fig. 35 : c)

This species can be recognized by having head largely red; abdomen black; legs in general reddish-yellow or reddish-brown and all coxae, hind trochanters and femora, black.

Female : Face subpolished, median tubercle granulose with scattered shallow punctures, at sides granulose. Clypeus shiny with a few scattered punctures. Frons in antennal scrobes smooth and shiny, above obliquely rugoso-striate. Vertex and temple smooth and shiny. Malar space strongly granulated, 0.9× the basal width of mandible. Pronotum subpolished, largely transversely striato-punctate, striae fine and puncture more prominent at the upper region, epomia short. Mesoscutum subpolished, finely rugose, rugae running into fine striations, notauli long and fine, striate along the groove. Scutellum with moderately strong, dense coalescent punctures, punctures running into longitudinal striations. Metascutellum smooth with a few coarse shallow punctures. Mesopleurum subpolished, transversely striate, striae fine, speculum above reticulo-punctate, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum moderately strongly transversely rugoso-wrinkled, juxtacoxal carina obscured. Propodeum subpolished, largely rugoso-wrinkled, tending to be reticulate at some places, specially near spiracle, apical carina absent, except present in the center like a tubercle, apophyses moderately strong, high and conical; basal carina strong complete and arched in the middle. First tergite 3× as long as wide at apex, postpetiole 1.5× as long as wide at base, tergite smooth and shiny; following tergites mat and subpolished. Ovipositor long, about 1.4× as long as hind tibia, Ovipositor tip long and pointed, with distinct nodus, lower valve with weak teeth. Nervulus interstitial, second recurrent close to first intercubitus.

Black. Antenna reddish, apical half of flagellum dark brown. Head (Fig. 35 : c) reddish-brown, except along the orbit yellow, this orbital mark interrupted below near the base of mandible. The following are yellow: Pronotal collar, upper margin of

pronotum, subtegular ridge, small spot near the base of tegula. Fore leg with coxa black, trochanter dark brown, femur, tibia and tarsus reddish-brown. Middle and hind coxae and trochanters and hind femur, black; their tibiae and tarsi brownish-yellow, middle femur blackish-brown, lighter towards the apex. Wings clear hyaline, with yellowish tinge.

Male : Essentially similar to female except more slender and polished. Face closely and shallowly punctate. Frons largely smooth and shiny with oblique striations below median ocellus. Temple minutely punctate. Pronotum with weak striations and punctures. Mesopleurum densely punctate with fine transversely running striations. Scutellum with deep close punctures. Mesopleurum finely transversely striato-punctate. Metapleurum rugoso-punctate, with transversely running striations, juxtacoxal carina present. Propodeum largely reticulo-wrinkled. First tergite smooth and shiny, following mat and subpolished.

Black. Antennal flagellum reddish, except apical segments brownish. Head reddish with face and clypeus wholly, frons and temple along the eye margin, pronotal collar, upper margin of pronotum, tegula largely and subtegular ridge, yellow. Fore leg with coxa and trochanter yellow, except coxa in front and largely at back reddish-brown, rest of fore leg deep yellow. Middle leg with coxa black, first trochanteral segment yellow, second trochanteral segment and femur with brownish hue, rest of middle leg deep yellow. Hind coxa, trochanter and femur black, tibia, tibial spur and tarsus deep yellow. Wings clear hyaline, with yellowish hue.

Length : Female, 10.5 mm; fore wing 9 mm; ovipositor sheath 4 mm. Male, 6.75–12 mm; fore wing 5–9.5 mm.

Holotype : Female, PHILIPPINES : Luzon : Mt. S. Thomas, near Baguio, 1900 m, 23.xi.1952, Coll. Townes family. *Allotype* Male, locality same as holotype, 28.xi.1953, Colls. H., M. & D. Townes. *Paratypes* 2 Females, 9 Males. PHILIPPINES : Luzon: Mt. S. Thomas, near Baguio, 1900 m, 3 Males, 4.iv.1952, Colls. H., M. & D. Townes; 1 Male, 23.xi.1952, Colls. Townes family. Mt. Data, 3300 m, 1 Male, 31.xii.1952, Colls. H., M. & D. Townes; 4 Males, 1 Female, 1.i.1953, Colls. Townes family (all above in A.E.I., Florida; except 1 male and 1 female Paratype in Z.S.I., Calcutta). Mt. Prov., Abatan, Buguias, 60 Km. south of Bontoe, 1800-2000 m, 1 Female, 27.v.1964, coll. H.M. Terrevillas (Z.S.I., Calcutta).

Distribution : Philippines: Luzon and Mt. Data.

8. ***Hedycryptus rufopetiolatus*** (Cameron) (Fig. 35 : d)

1906. *Cryptus rufopetiolatus* Cameron, *Trans. Ent. Soc., London,* 1904 : 105. Female. key, des., fig. Type: India: Khasi Hills (Meghalaya) (OXFORD).

1931. *Cryptus horishanus* Uchida, *Jour. Faculty Agr. Hokkaido Imp. Univ.,* **30** : 170. Female.

key. des., fig. Type : Female, Taiwan : Horisha; Yakanron (Sapporo Museum). **New Synonymy.**

1961. *Trachysphyrus rufopetiolatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Ins.*, **1** : 166. syn.

1961. *Trachysphyrus horishanus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Ins.*, **1** : 165, syn.

1970. *Apachia rufopetiolata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Ins.*, **12** : 196. n. comb.

1971. *Hedycryptus rufopetiolatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Ins.*, **17** : 240. n. comb.

1987. *Hedycryptus rufopetiolatus* : Gupta, *Mem. Amer. Ent. Ins.*, **41** : 493.

This specie is readily recognized by having head black; first abdominal tergite usually red (sometimes black), following tergite black with yellow apical bands; legs in general red.

Female : Face and clypeus moderately convex in the middle. Face subpolished, closely and finely punctate, covered with white hairs. Clypeus subpolished, its apical half smooth, extreme apex impressed, basal half minutely and closely punctate, covered with fine white hairs. Frons with antennal scrobes depressed, smooth and shiny, above obliquely rugoso-striate, along the eye margin sparsely and shallowly punctate. Vertex subpolished granulated. Temple subpolished, minutely and sparsely punctate. Malar space granulose, 0.75× the basal width of mandible. Pronotum subpolished, strongly trans-striate, its upper and lower areas closely punctate, punctures at extreme upper margin running into striations, epomia strong and long. Mesoscutum densely rugoso-punctate, at some places forming fine reticulations. Scutellum subpolished, shallowly punctate with longitudinally running striations, lateral carina extending at its basal 0.7. Metascutellum largely smooth and shiny, except for a few undefined punctures. Mesopleurum and metapleurum closely wrinkled, speculum on mesopleurum with a few punctures, prepectus and mesosternum finely and closely punctate, punctures at some places running into striations, prepectal carina extending 0.8× the height of mesopleurum, juxtacoxal carina not well defined. Propodeum between basal carina and apex strongly reticulo-wrinkled, basad of basal carina finely and closely wrinkled, tending to be reticulate, basal carina strong, inverted V-shaped in the middle, apical carina interrupted submedially, laterally forming strong moderately high apophyses. Mesopleurum, metapleurum and propodeum covered with fine white hairs. First tergite moderately long, about 3× as long as wide at apex, postpetiole about 1.2× as long as wide at base, tergite subpolished, granulose, smooth at base and apex, dorso-median, dorso-lateral and ventro-lateral carinae distinct in the apical half, weak in the basal half. Second tergite granulose, following tergites mat and subpolished. Ovipositor long, about 1.3× as long as hind tibia, its tip long and pointed with a distinct nodus.

Black. Antennal flagellum with fourth to seventh segments above, white. The following are yellow: Scape in front reddish-brown, face (Fig. 35 : d) with an oval mark in the center, clypeus broadly, eyes all along the oribit, malar space, mandible except the tip, pronotal collar, upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum, apophyses, middle portion of apical carina, apices of all the abdominal tergites. First abdominal segment and all the legs in general red, except tibiae and tarsi reddish-brown, fifth tarsal segment of fore and middle legs dark brown. Hind tarsus blackish-brown, its third and fourth segments white. Wings clear hyaline.

Variations : Fore wing with nervulus interstitial or little basad of basal vein, apical carina of propodeum sometime complete. Facial mark large and joining orbital mark, first tergite sometime dark brown to totally black; apical carina of propodeum completely yellow.

Male : Essentially similar to female. Face and clypeus minutely and closely punctate. Frons obliquely striato-punctate. Vertex mat. Temple and mandible distinctly punctate. Scutellum with coarse shallow punctures. First tergite largely smooth and shiny with scattered shallow punctures, following tergites mat and subpolished, rest as in female.

Black. Antennal flagellum without a white band. The yellow are : face wholly, clypeus except at apical margin, whole of oribit, mandible, pronotal collar, upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum, an elongated mark along the pleural carina on metapleurum, bow-shaped mark on propodeum, apices of all the abdominal tergites, a small oval mark above on fore and hind coxae. Legs in general red, except apical segments of fore and middle tarsi, apical 0.3 of hind tibia, its first trochanteral segment and apical 0.8 of fifth segment, blackish. First abdominal tergite colour as variable as in female.

Length : Female, 8–14.5 mm; fore wing 6–9 mm; ovipositor sheath 2.8–4 mm. Male 7.5–12 mm; fore wing 5.5–7.5 mm.

Distribution : India : Jharkhand (Ranchi : Ambero-Bero). Meghalaya (Khasi Hills). Uttaranchal (Herbertpur). *Elsewhere* : Taiwan (Puli; Wukunglun; Horisha; Sunmoon Lake; Taichan). Java (Mt. Gede; Ditalahab Mts. : Djampang Tengh). Myanmar (Mt. Victoria).

12. Genus ***Dihelus*** Townes (Fig. 36 : a–c)

1970. *Dihelus* Townes, *Mem. Amer. Ent. Inst.*, **12** : 170. Type-species : *Dihelus rufipleuris* Townes. Original designation.

Taxonomy : Gupta & Gupta, 1979 : 557.

Hosts : Aculeate Hymenoptera nesting in stems.

Distribution : Oriental Region and Japan.

Small to moderate sized insects; clypeus large, weakly convex, its apical margin slightly concave in the centre and with a pair of very weak tubercles (Fig.). Mandible with its lower tooth distinctly longer than the upper. Malar space 0.4–0.8× the basal width of mandible. Frons flat, smooth or rugose. Vertex usually smooth and shiny. Mesoscutum smooth and shiny or very finely and densely punctate. Notauli deep and sharp, reaching more than 0.6× its length; prepectal carina almost reaching the subtegular ridge. Propodeal spiracles small circular to oval, basal transverse carina always present, apical transverse carina present or absent, or interrupted in the submedial region; basad of basal carina usually punctate or smooth; apicad of basal carina weakly to strongly rogoso-punctate. Nervulus basad or opposite to basal vein, nervellus intercepted at or a little below the middle. Areolet small, pentagonal, as high as wide, its first intercubitus longer than the second; second intercubital vein faint; second recurrent vein subvertical, bent near the bulla; mediella of hind wing uniformly arched; axillus vein parallel to the margin of the hind wing. Fore tibia moderately swollen. First abdominal tergite narrow, without lateral teeth at base, its spiracle near its midlength, median dorsal carinae absent, but a longitudinal median depression is present; dorsolateral and ventrolatral carinae present; first sternite ending behind the midlength; second tergite with fine dense punctures. Ovipositor sheath longer than the hind tibia; ovipositor compressed, the lower valve not enclosing the upper; teeth on lower valve subvertical.

This genus is close to *Enclisis* Townes in having spiracle of first abdominal tergite only slightly behind the middle; ovipositor tip compressed, its ridges subvertical. However, it can be readily distinguished by having lower tooth of mandible distinctly longer than upper tooth; apical margin of clypeus in middle with a faint pair of tubercles.

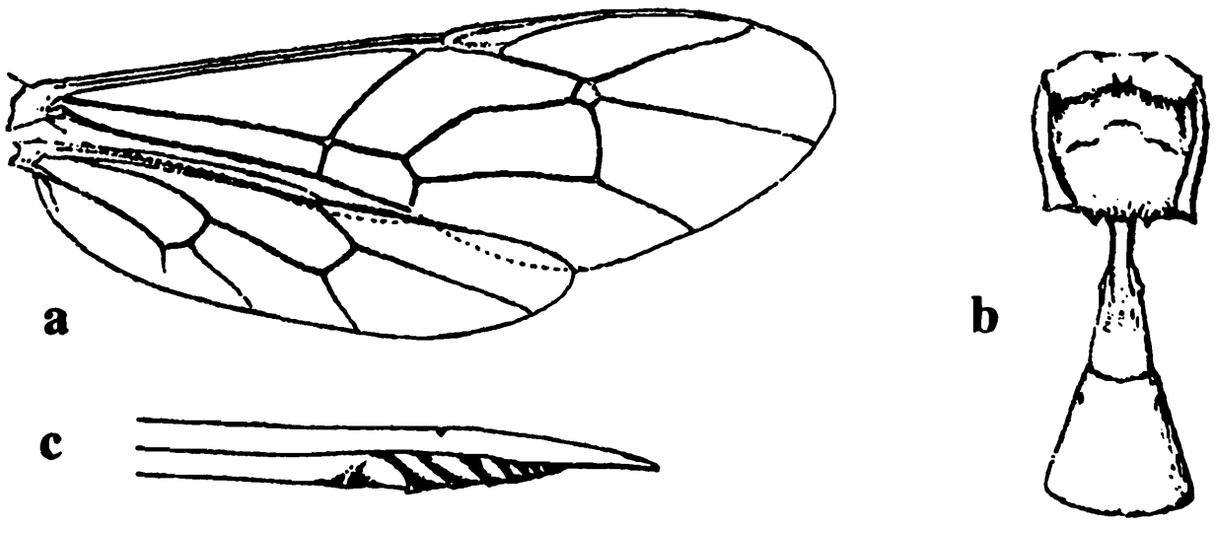

Fig. 36. *Dihelus* Townes : **a**, fore and hind wings showing venation; **b**, dorsol view of propodeum, first & second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Gupta & Gupta (1979 : 557) revised this genus and reported seven species from Oriental region and two species from Palaearctic region (Japan). India and adjacent countries are represented by six species. The following account of this genus is largely based on the studies on the genus *Dihelus* by Gupta and Gupta (1979 : 557-574).

Key to the species of *Dihelus*

1. Male : Propodeum largely smooth and shiny; its apical transverse carina present. Body largely yellow, with ocellar region, mesoscutum, base of propodeum and abdominal tergites basally, black. India : Karnataka. Indonesia ..... 1. *fulvus* Gupta & Gupta

– Female : Propodeum weakly to strongly rugose 2

2. Frons smooth and shiny. Propodeum weakly ruguloso-punctate between transverse carinae; basally smooth 3

– Frons rugoso-punctate; propodeum strongly rugoso-punctate to rugoso-striate between transverse carinae; basally punctate 4

3. Apical transverse carina of propodeum complete. Propodeum wholly orange. Mesosternum with oval red spots. Face black except inner orbits. Frons black. First abdominal tergite orange at base. India : Uttaranchal ..... 2. *kumaonensis* Gupta & Gupta

– Apical transverse carina of propodeum incomplete. Propodeum basally black. Mesosternum black. Face in the middle and along the orbit yellow. Frons also along the eye margin yellow. All abdominal tergites black with yellowish-brown apical bands. India : Uttaranchal ..... 3. *granulosus* Gupta & Gupta

4. Apical transverse carina of propodeum broken submedially. Propodeum strongly rugulose laterally. Mesosternum black. Metapleurum black with whitish-yellow spots. Propodeum black basally and yellow apically. Face yellow with two inverted V-shaped black marks. Abdomen black with faint brownish bands apically. Myanmar ..... 4. *burmensis* Gupta & Gupta

– Apical transverse carina of propodeum complete; propodeum rugoso-punctate. Mesosternum black or yellowish-ornage. Metapleurum and propodeum mostly yellowish-orange. Face black or spotted. Abdomen black with prominent white apical bands 5

5. Metapleurum rugose. Face black. Propodeum wholly orange. Mesosternum black. First abdominal tergite orange (apex white). India : Punjab; Uttar Pradesh; Maharashtra; Karnataka. Myanmar ..... 5. *orientalis* Gupta & Gupta

– Metapleurum transversely striate medially. Face spotted. Propodeum basally black to orange. First abdominal tergite basally black. Mesosternum reddish-orange. Myanmar ..... 6. *flavosternum* Gupta & Gupta

1. ***Dihelus fulvus*** Gupta & Gupta (Fig. 37 : a–d)

1979. *Dihelus fulvus* Gupta & Gupta, *Oriental Ins.*, **12** : 563 (1978). Male, Key, des., fig. Type : Male, India : Karnataka : Mercara, 1220m (GUPTA). Indonesia : Java : Ongop-Ongop : Idjen, 1850m.

1987. *Dihelus fulvus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 785.

Male : Body largely smooth and polished. Face and clypeus with a few scattered punctures. Malar space 0.5× the basal width of mandible. Interocellar distance 0.75× the ocello-ocular distance. Mesoscutum smooth without any punctation. Scutellum arched. Mesopleurum with weak transverse striations in the middle. Prepectal carina not reaching subtegular ridge. Metapleurum and propodeum smooth. Propodeum somewhat dull in the middle, both transverse carinae complete. Nervulus opposite the basal vein. Nervellus intercepted slightly below the middle; abdominal tergites mat.

Yellow. Antenna dark brown; frons and vertex medially, mesoscutum wholly, basal area of propodeum and an elongate mark on prepectus black. All the abdominal tergites basally black, except first tergite orange in colour. Legs yellow with marks on trochanters, hind femur apically, apical half of hind tibia and hind tarsus wholly, blackish-brown. Wings hyaline, stigma and wing veins brown.

Female : Not known.

Length : Male, 10 mm; fore wing 5 mm.

Distribution : India : Karnataka (Mercara, 1220m). *Elsewhere* : Indonesia (Java : Ongop-Ongop : Idjen, 1850m).

2. ***Dihelus kumaonensis*** Gupta & Gupta (Fig. 37 : e, f)

1979. *Dihelus kumaonensis* Gupta & Gupta, *Oriental Ins.*, **12** : 565 (1978). Female, key, des., fig. Type : Female, India : Uttaranchal : Garjia in Kumaon Hills (GUPTA).

1987. *Dihelus kumaonensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 785.

This species is distinguished by having propodeum weakly ruguloso-punctate, with apical carina complete. Propodeum and metapleurum wholly orange and the face and frons black with yellow orbital lateral marks.

Female : Face weakly convex, finely and closely punctate. Clypeus sparsely punctate. Malar space 0.4× the basal width of mandible. Frons and vertex smooth and polished; interocellar distince 0.5× the ocello-ocular distance. Mesoscutum shiny with fine punctures. Pronotum smooth and polished. Mesopleurum punctate, tending to be striate in the middle and also along the prepectal carina; prepectal carina reaching up to the subtegular ridge. Metapleurum with a few transverse striae. Propodeum

with both basal and apical transverse carinae present and complete (Fig. 37 : e), submedian part of apical carina somewhat weaker; propodeum basally smooth, apically and medially weakly ruguloso-punctate, spiracle circular. Nervulus opposite the basal vein. Nervellus intercepted at the middle. First abdominal tergite smooth granulose apico-laterally; second and third tergites finely, densely punctate; the following tergites weakly punctate. Ovipositor long, slightly shorter than the length of abdomen.

Black, marked with yellowish-orange spots. Face, frons and vertex centrally and mesoscutum black. The following are yellow : orbital ring, pronotal collar, a mark on the upper margin of pronotum, a mark on the centre of mesoscutum, tegula, subtegular ridge, base of wings, scutellum, metascutellum, apical bands on first to fourth abdominal tergites and last tergite wholly (Fig. 37 : f). Mesopleurum (except prepectus), mesosternum, metapleurum, propodeum, and first abdominal tergite except apex, largely orange (37 : e). Fore coxa largely yellow, fore leg otherwise orange. Middle and hind legs largely orange; middle tarsus and hind tibia and tarsus infuscate.

Male : Not known.

Length : Female, 9 mm; fore wing 5 mm; ovipositor sheath 4.5 mm.

Distribution : India : Uttaranchal (Garjia in Kumaon Hills).

3. ***Dihelus granulosus*** Gupta & Gupta (Fig. 37 : g, h)

1979. *Dihelus granulosa* Gupta & Gupta, *Oriental Ins.*, **12** : 567 (1978). Female, key, des., fig. Type : Female, India : Uttaranchal : Kumaon Hills : Ranikhet, 1830m (GUPTA).

1987. *Dihelus granulosa* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 785.

Body largely granulose. Frons smooth and shiny. Propodeum weakly ruguloso-punctate with apical transverse carina incomplete. Face in middle and along eye margin, yellow. All abdominal tergites black with yellowish-brown narrow apical bands.

Female : Body largely granulose. Face flat; clypeus impressed and smooth. Malar space 0.5× the basal width of mandible. Frons and vertex smooth; interocellar distance 0.5× the ocello-ocular distance. Mesoscutum, scutellum and metascutellum with indistinct minute punctures; prepectal carina reaching the base of subtegular ridge; mesopleurum medially transversely striate. Mesosternum with minute punctures. Metapleurum punctate. Propodeum rugulose in basal half and striate in apical half, apical propodeal carina incomplete submedially. Nervulus opposite the basal vein. Nervellus intercepted in the middle. First abdominal tergite granulose; second and third tergites finely and densely punctate, tending to be granulose; second and third tergites finely and densely punctate, tending to be granulose towards apex; the following tergites mat and subpolished. Ovipositor shorter than the length of abdomen.

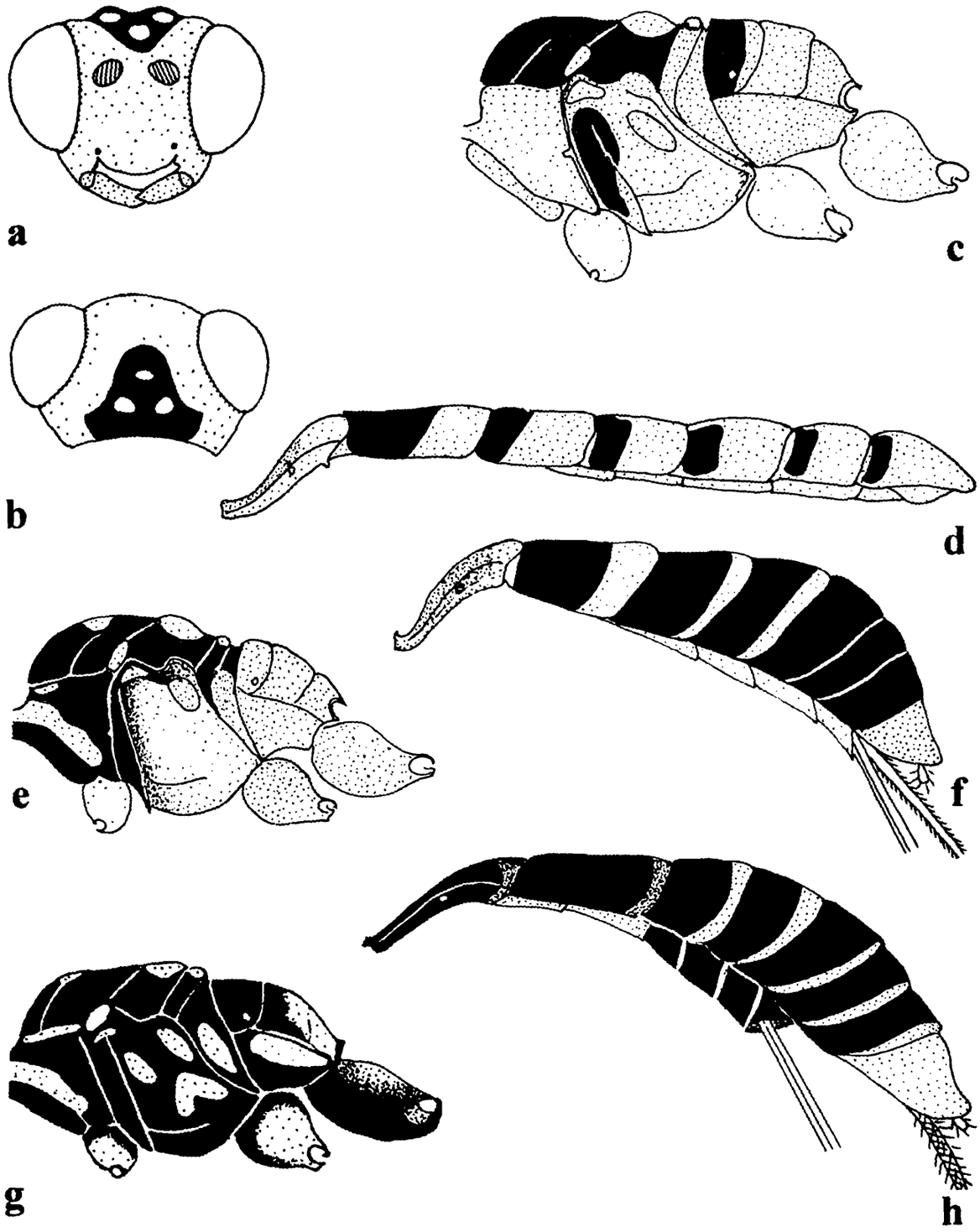

Fig. 37. Colour pattern : *Dihelus fulvus* : **a**, front view of head; **b**, dorsal view of head; **c**, side view of thorax; **d**, side view of abdomen. *D. kumaonensis* : **e**, side view of thorax; **f**, side view of abdomen. *D. granulosus* : **g**, side view of thorax; **h**, side view of thorax. (Source : Gupta & Gupta, 1978 : 557).

Black. The following are yellow : Orbital ring, centre of the face with a V-shaped mark as in *flavosternum*; clypeus, temple, pronotal collar, upper margin of pronotum, a mark in the centre of mesoscutum, tegula, scutellum, metascutellum, base of wings, speculum, a mark in the middle of mesopleurum, an inverted V-shaped mark at the base of mesopleurum and on elongate oval spot on metapleurum, propodeum in apical 0.75, and apices of all abdominal tergites, last tergite being wholly (Fig. 37 : g, h). Fore and middle coxae yellow with small black spots; hind coxa largely black; all trochanters brownish; legs otherwise reddish-orange; middle tarsus brownish and tarsus yellow; hind tibia apically brownish. Wings hyaline, stigma and veins as usual brown.

Male : Not known.

Length : Female, 12 mm; fore wing 6 mm. ovipositor sheath 3.5 mm.

Distribution : India : Uttaranchal (Ranikhet, 1830m in Kumaon Hills).

4. ***Dihelus burmensis*** Gupta & Gupta (Fig. 38 : a, b)

1979. *Dihelus burmensis* Gupta & Gupta, *Oriental Ins.*, **12** : 574 (1978). Female, Key, des., fig. Type : Female, Myanmar : Mt. Victoria, 1400m (GAINESVILLE)

1987. *Dihelus burmensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 785.

This species is mainly recognised by having apical transverse carina of propodeum interrupted medially. Abdomen black with faint blackish-brown bands apically.

Female : Face finely closely punctate, in the middle rugoso-punctate. Clypeus truncate, sparsely punctate. Malar space 0.6× the basal width of mandible. Temple sparsely and shallowly punctate. Frons in the middle rugoso-punctate. Vertex smooth and shiny; interocellar distance 0.6× the ocello-ocular distinace; pronotum smooth and shiny, striate along mesopleurum and anteriorly. Mesoscutum smooth, shiny and weakly granulose. Mesopleurum striato-punctate, striae more prominent towards prepectal carina and speculum, transversely striate medially, punctate basally below the speculum; prepectal carina extending 0.8× the height of mesopleurum. Metaplerum transversely striato-punctate; apical transverse carina of propodeum present, but interrupted submedially, propodeum punctate basolaterally, smooth basomedially and otherwise strongly rugoso-striate. Nervulus opposite the basal vein; nevellus intercepted in the middle. First abdominal tergite mat; second and third tergites, finely, densely and deeply punctate; the following tergites mat and subpolished.

Black. Face with two inverted V-shaped black marks continuous above fronto-clypeal groove; frons, mesosternum, propodeum basally, black. The following are yellow : temple, orbital ring except malar space, pronotal collar, upper margin of pronotum, a quadrate spot in the centre of mesoscutum, scutellum, tegula, subtegular ridge,

metascutellum, a spot in the centre of mesopleurum, a mark on speculum, large irregular spot on lower part of mesopleurum, an oval large spot at the base of hind wing. Propodeum except basally yellowish-brown (Fig. 38 : a, b). Legs including coxae, orange. Wings hyaline, veins and stigma brown.

Male : Not known.

Length : Female, 16 mm; fore wing 10 mm; ovipositor sheath 4.5 mm.

Distribution : Myanmar (Mt. Victoria, 1400m).

5. ***Dihelus orientalis*** Gupta & Gupta (Fig. 38 : c–e)

1979. *Dihelus orientalis* Gupta & Gupta, *Oriental Ins.*, **12** : 573 (1978). Female, key, des., fig. Type : Female, India : Uttaranchal : Herbertpur (GUPTA). India : Uttaranchal : Kumaon Hills : Garjia, 600m; Dibri Village. Himachal Pradesh : Palampur, 1220m. Tamil Nadu : Kodai Hills, 1500m. Maharashtra : Panhala Fort, 915m. Myanmar : Kambaiti, 2000m.

1987. *Dihelus orientalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 785.

This species is recognised by having frons rugoso-punctate, propodeum medially striate; metapleurum rugose. Apical transverse carina of propodeum complete. Face black. Propodeum and metapleurum wholly orange. Mesosternum black and first abdominal tergite almost orange.

Female : Face finely and closely punctate. Clypeus impressed, sparsely punctate. Malar space granulose, 0.6× the basal width of mandible. Frons rugulose towards ocelli and punctate on sides, interocellar distance 0.5× the ocello-ocular distance. Vertex and temple smooth, finely granulose. Pronotum striate, punctate anteriorly. Prepectal carina of mesopleurum reaching the tegula. Mesopleurum striate along the prepectal carina and speculum, obliquely striate medially, punctate towards the base of speculum. Mesoscutum, finely and sparsely punctate. Scutellum arched, smooth and shiny. Metapleurum rugose. Apical transverse carina of propodeum complete, basal transverse carina also complete; propodeum basally punctate, apically and medially rugoso-striate. Nervulus opposite the basal vein; nervellus intercepted above the middle. First abdominal tergite smooth and polished, second and third tergites with fine close and deep punctures; the following tergites mat.

Black. Face and frons along the eye; antenna medially, pronotal collar, upper margin of pronotum, a mark in the middle of mesoscutum, tegula, mesopleurum medially and at base and speculum (Fig. 38 : c, d), yellow. First abdominal tergite orange with its apex yellow; second to fourth abdominal tergites with yellowish apical bands. Last tergite wholly, metapleurum, propodeum and base of wing, orange (Fig. 38 : e). Legs wholly orange, with middle tarsus, marks on hind trochanters and apices of hind femur and tibia blackish; hind tarsus yellowish in basal 0.75 and blackish apically. Wings hyaline, stigma and veins brown.

Male : Not known.

Length : Female, 10 mm; fore wing 6 mm; ovipositor sheath 3.5 mm.

Distribution : India : Uttaranchal (Garjia, 600m and Dibri Village in Kumaon Hills). Himachal Pradesh (Palampur, 1220m). Tamil Nadu (Kodai Hills, 1500m). Maharashtra (Panhala Fort, 915m). *Elsewhere* : Myanmar (Kambaiti, 2000m).

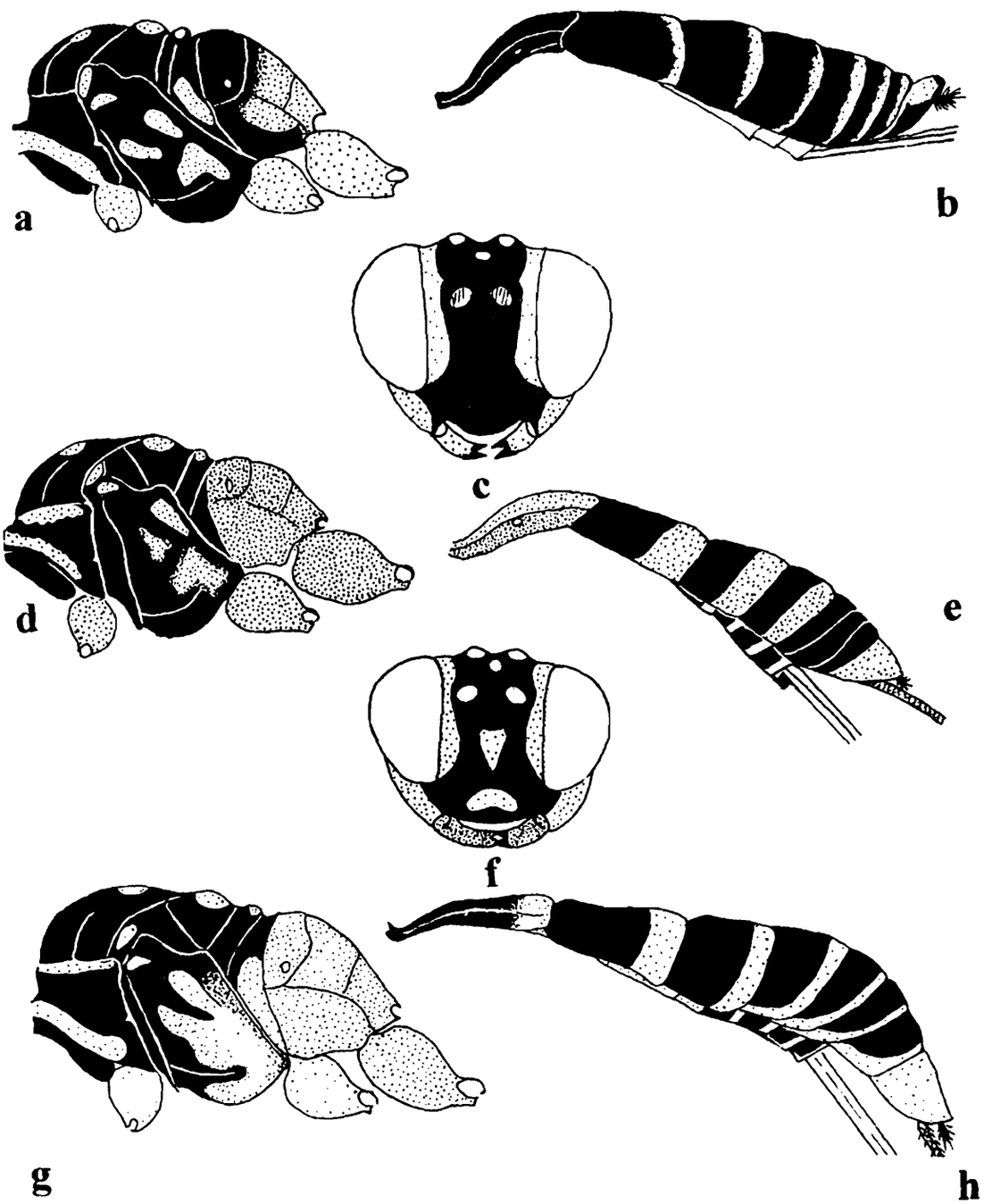

Fig. 38. Colour pattern : *Dihelus burmensis* : **a**, side view of thorax; **b**, side view of abdomen. *D. orientalis* : **c**, front view of head; **d**, side view of thorax; **e**, side view of abdomen. *D. flavosternum* : **f**, front view of head; **g**, side view of thorax; **h**, side view of abdomen. (Source : Gupta & Gupta, 1978 : 557).

6. ***Dihelus flavosternum*** Gupta & Gupta (Fig. 38 : f–h)

1979. *Dihelus flavosternum* Gupta & Gupta, *Oriental Ins.*, **12** : 574 (1978). Female, key, des., fig. Type : Female, Myanmar : Kambaiti, 2000m (STOCKHOLM). Malaysia : Panang : Fraser's Hills, 1280m.

1987. *Dihelus flavosternum* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 785.

This species is distinguished by having matapleurum transversely striato-punctate; frons and propodeum rugoso-punctate. Face with a V-shaped yellow mark; mesopleurum largely yellow in the lower half; mesosternum reddish-orange and first abdominal tergite basally black.

Female : Face punctate, punctures separated from each other by their own diameters. Clypeus sparsely punctate. Malar space 0.6× the basal width of mandible. Frons rugose and punctate on sides; interocellar distance 0.6× the ocello-ocular distance. Vertex and temple smooth. Pronotum with a few striae along the groove and towards prepectal carina, rest sparsely punctate. Prepectal carina 0.8× the height of mesopleurum; mesopleurum striate, basally punctate. Mesoscutum and scutellum smooth and polished. Metapleurum transversely striato-punctate. Apical transverse carina of propodeum complete but weak submedially. Propodeum basally punctate; apically and medially rugose. Nervulus opposite of basal vein, nervellus intercepted in middle. First abdominal tergite smooth; second and third tergites finely closely and deeply punctate; the following tergites mat.

Black. The following are yellow : Face, frons and vertex along the orbit; antenna medially, a V-shaped spot in the middle of face (Fig. 38 : f), clypeus, labrum, temple, pronotal collar, upper margin of pronotum, a spot in the centre of mesoscutum, tegula, subtegular ridge, speculum, scutellum, mesopleurum in lower half, base of wing, all abdominal tergites apically, last tergite wholly (Fig. 38 : g, h), fore and middle coxae, and hind tarsus. Mesosternum, propodeum, hind coxa and rest of legs orange. Propodeum basally black, rest yellow to orange. Wings hyaline, veins and stigma brown.

Male : Not known.

Length : Female, 12 mm; fore wing 7 mm; ovipositor sheath 4.5 mm.

Distribution : Myanmar (Kambaiti, 2000m). Malaysia (Panang, Fraser's Hills, 2180m).

13. Genus ***Enclisis*** Townes (Fig. 39 : a–c)

1970. *Enclisis* Townes, *Mem. Amer. Ent. Inst.*, **12** : 169. Type-species : *Cryptus macilentus* Gravenhorst. Original designation.

Taxonomy : Jonathan, 1999 : 223.

Distribution : Palaearctic Region and India.

Body moderately slender. Clypeus of moderate size, about 2.3× as wide as long, moderately convex, its apex with a weak median tooth or blunt angulation (Fig. 39 : b). Malar space about 0.7 to 1.0× as long as basal width of mandible. Mandible short with equal teeth. Mesoscutum polished, its punctures small and fine. Notaulus moderately strong, reaching slightly beyond the center of mesoscutum. Propodeal spiracle circular. Propodeum a little elongate, its apical transverse carina complete, forming weak sublateral crest. Base of hind coxa deep, with a weak basal impression on outer side below its attachment but without a distinct groove. Venation as shown in figure 39 : a; areolet small to large and pentagonal, the second recurrent vein distinctly inclivous. First tergite without a lateral projection at base, the spiracle only slightly behind the middle, its ventrolateral carina sharp and complete, dorsolateral carina sharp to rather blunt (complete or almost so), and median dorsal carinae distinct on petiole, becoming indistinct near centre of postpetiole. Second tergite mat with fine, dense weak punctures. Ovipositor sheath about 0.9 to 1.4 times as long as hind tibia. Ovipositor compressed, its tip heavy, upper value evenly arched with a distinct nodus, lower valve with 8–10 teeth (Fig.) (Townes, 1970 : 169).

Length : Female, 7.5–8 mm; fore wing 6–6.5 mm; ovipositor sheath 2.5–2.8 mm.

Type-species : *Cryptus macilentus* Gravenhorst.

This genus is close to *Dihelus* Townes in having spiracle of first tergite only slightly behind the middle; ovipositor tip compressed, its ridges subvertical. However, it can be easily distinguished by having hind end of sternaulus curved weakly downward towards base of middle coxa.

The Indian species can be identified by the following key :

Key to the species of *Enclisis*

1. Body largely black; seventh to nineth flagellar segments, face with small lateral spots, clypeus with a median spot and pronotal collar above, whitish. Legs with fore and middle coxae and trochanters, dark reddish-brown. Hind coxa and trochanter, black. Body mat, dull, densely punctate, puncture running into striations or wrinkles. Areolet in fore wing large, wider than high, second recurrent vein close to first intercubitus. India : Himachal Pradesh ..... 1. *nigricoxis* Jonathan

– Body extensively marked with white, yellow, brown and red. Fifth to nineth flagellar segments white above. Legs with all the coxae and trochanters, red. Body subpolished, largely rugoso-punctate. Areolet in fore wing small, higher than wide, second recurrent vein close to second intercubitus. India : Himachal Pradesh ..... 2. *ruficoxis* Jonathan

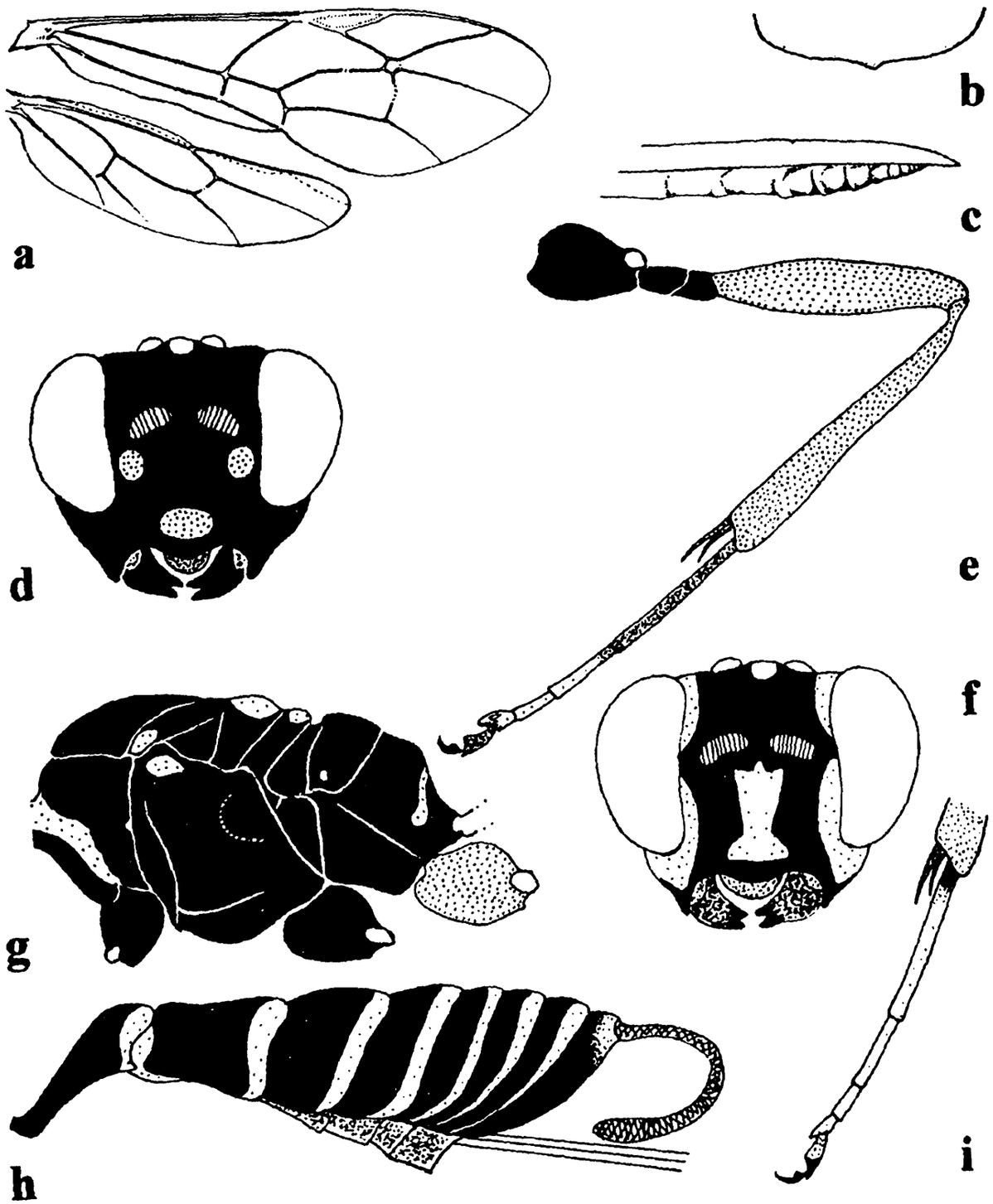

Fig. 39. *Enclisis* Townes : **a**, wing venation of fore and hind wings; **b**, clypeus showing median tooth; **c**, ovipositor tip. *E. nigricoxis* Jonathan : colour pattern : **d**, head front view; **e**, hind leg. *E. ruficoxis* Jonathan : colour pattern : **f**, head front view; **g**, thorax side view; **h**, abdomen side view; **i**, hind tarsus.

1. ***Enclisis nigricoxis*** Jonathan (Fig. 39 : d, e)

1999. *Enclisis nigricoxis* Jonathan, *Rec. zool. Surv. India,* **97**(3) : 224. Female, key, des., fig. Type : Female, India : Himachal Pradesh : Rahla, 2743m in N.W. Himalaya (Z.S.I., Calcutta).

This species can be recognized by having largely black body, especially all the coxae and trochanters black. Body densely punctate, punctures running into striations. Areolet moderately large, wider than high; second recurrent vein close to first intercubitus.

Female : Body largely mat and subpolished. Face with fine dense punctures, punctures running into fine striations or wrinkles. Clypeus subpolished with sparse moderate sized punctures. Malar space strongly granulose, 0.75× the basal width of mandible. Mandible except the teeth moderately strongly rugoso-punctate. Frons and vertex strongly mat and densely punctate, punctures forming wrinkles, area just behind antennal sockets smooth and shiny. Temple subpolished, with moderately large closely placed punctures. Pronotum and mesoscutum strongly mat, finely wrinkled with weak indistinct punctures, epomia very short. Scutellum shiny, with sparse small sized punctures, its lateral carina more or less confined to its base. Metascutullum smooth and shiny. Mesopleurum densely punctate, punctures fine and running into fine wrinkles, below sternaulus subpolished, with fine dense punctures, speculum largely smooth or polished except above with coarse deep close punctures, prepectal carina extending 0.7× the height of mesopleurum. Metapleurum moderately strongly puncto-wrinkled, juxtacoxal carina weak. Propodeum subpolished, mat, between basal carina and apex finely wrinkled, basad of basal carina granulose with coarse, sparse and shallow punctures; spiracles small, oval. First abdominal tergite subpolished, with sparse, shallow moderate sized punctures, tergites subapically with longitudinally depressed area, basally smooth. Second, third and also fourth tergites mat with dense, fine punctures; following tergites mat and subpolished. Fore wing with areolet moderately large, penatagonal, about 1.5× as high as the portion of second recurrent vein above bulla. Nervellus intercepted at its basal 0.4. Ovipositor sheath about 1.1× as long as hind tibia.

Black. Antennae with 7th to 9th segments white above. Face with two small lateral spots and clypeus with median basal spot, white (Fig. 39 : d). Head black, except face and temple with reddish hue. Thorax black, except pronotal collar behind neck whitish. Abdomen dark reddish-brown, fore and middle coxae and trochanters dark reddish-brown, their femora and tibiae yellowish-brown and tarsus brown to blackish-brown. Hind coxa and trochanter black, femur and tibia reddish, except tibia clouded with dark brown, tarsus dark brown except for a white band on second to fourth tarsal segments (Fig. 39 : e). Wings clear hyaline.

Male : Unknown.

Length : Female, 7.5 mm; fore wing 6.0 mm; ovipositor sheath 2.5 mm.

Distribution : India : Himachal Pradesh (Rahla, 2743m in N.W. Himalaya).

2. ***Enclisis ruficoxis*** Jonathan (Fig. 39 : f–i)

1999. *Enclisis ruficoxis* Jonathan, *Rec. zool. Surv. India,* **97**(3) : 226. Female, Key, des., fig. Type : Female, India : Himachal Pradesh : Narkanda, 2700m in Shimla Hills (Z.S.I., Calcutta).

This species is characterized by having coxae and trochanters red. Body largely rugoso-punctate. Areolet small, higher than wide, second recurrent vein close to second intercubitus.

Female : Body largely subpolished. Face with dense, shallow moderate size punctures, punctures tending to be sparse and indistinct towards the eye margin. Clypeus with sparse, small and weak punctures, apically smooth and shiny. Mandibles except the teeth longitudinally striate with punctures in between the striae. Malar space granulose, 0.7× the basal width of mandible. Frons above with dense and moderately deep small punctures, punctures running into fine rugosities, towards the antennal sockets smooth and shiny, along the eye margin largely smooth except for a few minute shallow punctures. Vertex minutely and closely punctate. Temple minutely and sparsely punctate, shiny. Pronotum in the middle coarsely wrinkled, upper margin with dense, moderate sized punctures, pronotal collar shiny, weakly and finely striato-punctate, epomia short. Scutellum with sparse, shallow and fine punctures, lateral carina more or less confined to its base. Metascutellum shiny, with a few indistinct punctures. Mesopleurum largely rugoso-wrinkled, mesopleurum above and near speculum with large, deep and close punctures, below sternaulus and prepectus with dense, small sized punctures, at some places punctures running into rugosities. Prepectral carina extending almost up to the base of subtegular ridge; speculum smooth and polished; subtegular ridge shiny, indistinctly punctate. Metapleurum finely rugoso-punctate, juxtacoxal carina not well defined. Propodeum between basal carina and apex finely wrinkled, at some places appears to be reticulo-punctate, basad of basal carina finely reticulo-punctate, basal carina with a median longitudinal fairly broad ridge. First tergite medially ruguloso-punctate, towards base and apex rugulose with a few shallow punctures, extreme apex and base subpolished, with sparse to close, shallow punctures. Second and third tergites mat with dense fine shallow punctures, following tergites mat and subpolished. Fore wing with areolet oblong, sides strongly convergent, about 1.0× as high as the portion of second recurrent vein above bulla. Second recurrent close to second intercuitus. Nervellus in hind wing intercepted at its basal 0.35. Ovipositor sheath about 1.1× as long as hind tibia.

Black. Antennae with 5th to 9th segments above white; scape in front yellowish-brown. The following are yellow : Face with a triangular mark in the middle and along the eye margin, clypeus, frons and vertex along the eye margin, temple and malar space with a continuous mark along eye margin (Fig. 39 : f), pronotal collar, scutellum, metascutellum, tegula, subtegular ridge, bow-shaped mark on propodeum (Fig. 39 : g), apices of all the abdominal tergites (Fig. 39 : h). Legs in general deep red, their femora, tibiae and tarsi tending to be reddish-brown, except hind tarsus

whitish (Fig. 30 : i) with the extreme base of first segment and extreme apex of fifth segment blackish. Wings clear hyaline.

Male : Unknown.

Length : Female, 8 mm; fore wing 6.5 mm; ovipositor sheath 2.8 mm.

Distribution : India : Himachal Pradesh (Narkanda, 2700m in Shimla Hills).

14. Genus *Gyropyga* Townes (Fig. 40 : a–c)

1970 *Gyropyga* Townes, *Mem. Amer. Ent. Inst.*, **12** : 175. Type-species : *Gyropyga nigra*; original designation.

Distribution : Oriental Region and Japan.

Body 10–11.5 mm long, slender. Clypeus moderately large, about 2.2× as wide as long, weakly convex, its apex forming a very wide obtuse angle, median point of the angle weakly projecting. Malar space about 0.4× as long as the basal width of mandible. Mandible with equal teeth or lower tooth slightly shorter. Apical 0.3 of female flagellum slightly enlarged, tapered towards the tip. Mesoscutum shiny, with medium sized punctures, interspaces about 1.7× their own diameter, notaulus deep, reaching past center of mesoscutum. Propodeal (Fig. 40 : b) spiracle about 2.4× as long as wide, propodeum moderately long and evenly convex, its apical carina lacking or represented by a pair of small weak crests. Hind coxa with a short subvertical groove descending from its attachment. Wing venation as shown in the figure 40 : a. First tergite short, at base with lateral ridge but without triangular projections, its spiracle near its apical 0.43, longitudinal carina represented by weak, low longitudinal ridges; second

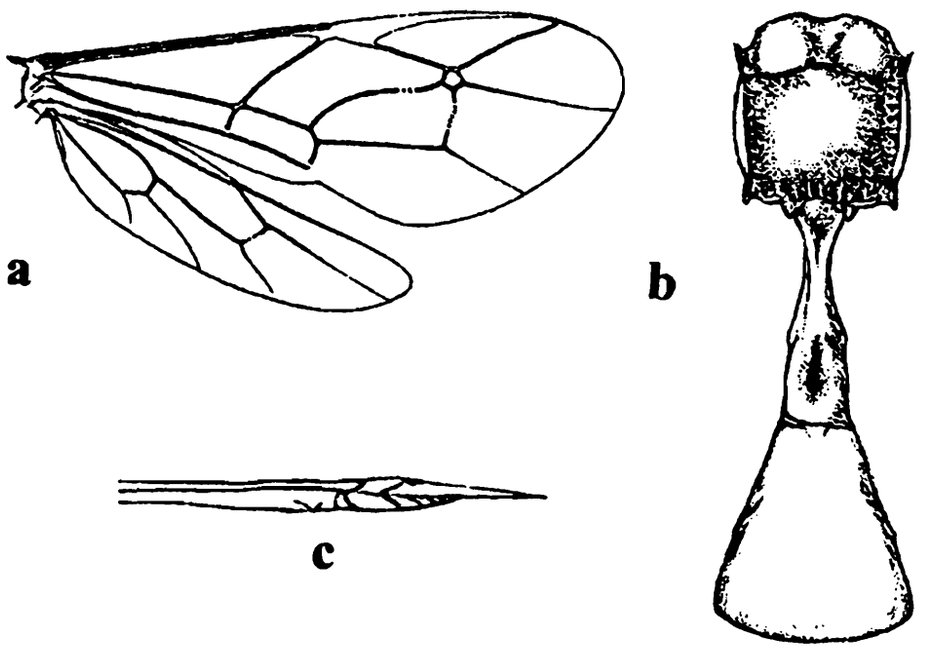

Fig. 40. *Gyropyga* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first & second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

tergite mat with weak, small dense to sparse punctures. Ovipositor sheath about 1.15× as long as hind tibia. Ovipositor moderately compressed, its tip as figured.

Townes (1970) described two species viz., *G. nigra* Townes from Japan and *G. leucops* Townes from Myanmar and India. These species can be recognized by the following key as given by Townes (1970). Detailed description of *G. nigra* is not included in the text.

Key to the species of *Gyropyga*

1. Mesopleurum and metapleurum reticulately wrinkled and with less distinct punctation. Face mostly or entirely white. India and Myanmar..... *leucops* Townes

– Mesopleurum and metapleurum with distinct punctures and a little wrinkling. Face entirely black. Japan ..... *nigra* Townes

1. *Gyropyga leucops* Townes

1970. *Gyropyga leucops* Townes, *Mem. Amer. Ent. Inst.* **12** : 176. Female, key, des. Type : Female : Myanmar : Maymyo, 300m (GAINESVILLE). India : Uttaranchal : Jeolikote, 1150m in Kumaon Hills.

Female : Face mat, rugulose in the middle. Clypeus shiny, with sparse and shallow punctures. Frons shiny, with a few oblique wrinkles below median ocellus, further down with a few minute punctures, rest smooth. Vertex and temple largely smooth and shiny, with scattered minute punctures. Pronotum largely moderately strongly rugoso-wrinkled; pronotal collar with weak punctures. Mesopleurum shiny, wrinkled; mesosternum with small distinct punctures. Metapleurum reticulo-wrinkled. Propodeum between basal carina and apex moderately strongly reticulo-wrinkled, basad of basal carina polished, with sparse undefined shallow punctures, apical carina almost absent. First tergite smooth and subplished, its postpetiole mat and with a shallow depressed area. Second tergite mat with close shallow setiferous punctures, following tergites largely mat and subpolished.

Black. 6th to 12th flagellar segments white. The following are yellow : Face, clypeus, mandible faintly, frons along the eye margin, pronotal collar, hind corner of pronotum, tegula, subtegular ridge, scutellum, matascutellum, first and second tergites broadly at base and narrowly at apex, and apices of all the following tergites narrowly, yellow. Legs in general light brownish-yellow, except fore and middle coxae and their first trochanteral segment yellow, and their tarsi brown. Hind coxa black, except its apex and trochanters yellowish, tibia dark brown, tarsus whitish except the extreme base of its first segment and fifth segment wholly, dark brown. Wings clear hyaline.

Male : Not known.

Length : Female, 10 mm; fore wing 8 mm; ovipositor sheath 3.75 mm.

Distribution : India : Uttaranchal (Jeolikote, 1150m and Bhowali, 1700m in Kumaon Hills).

III. THE TRIBE BARYCERATINI

Body slender to stout. Frons various : normal, or with a compressed horn or sometimes with a longitudinal carina. Clypeus small, weakly convex to pyramidal in shape, its apex truncate or weakly convex, often with a weak median pair of tubercles or points. Mandible short and stout, its upper tooth large and longer than lower tooth. Occipital carina joining oral carina some distance above base of mandible. Upper margin of pronotum normal or sometimes swollen. Epomia long and strong, rarely absent. Notaulus present or absent. Mesopleural fovea close to mesopleural suture, a moderate distance, or far from the suture, usually connected with the suture by a groove, that varies from shallow to deep. Median part of postpectal carina absent, represented by a tubercle, or when present, it is short to long and usually straight. Propodeum short to moderately long, its basal and apical transverse carinae variously present; propodeal spiracle circular to elongate. Base of hind coxa deep. Fore tibia not swollen. Fourth tarsal segment bilobed at apex in female. Ramulus absent or vestigial. Areolet very small to large, pentagonal, square, rectangular, or sometimes trapezoidal with front side the widest. Nervulus opposite, straight. Nervellus intercepted below middle or near middle. Brachiella present. Axillus rather near to anal margin, its tip convergent toward or weakly divergent from anal margin. First tergite stout to slender, its spiracle far behind the middle, with or without a lateral tooth at base, its longitudinal carina variously present or absent, strong or weak. Ovipositor cylindric, its tip without a distinct nodus, with strong transverse or oblique ridges on both upper and lower valves; ovipositor sheath 0.6 to 1.0× as long as hind tibia.

This tribe is widely distributed except western Palaearctic Region, and is respresented by 12 genera. They are parasites of coccoons of Eucleidae. In India 3 genera have been reported. They can be distinguished by the following key.

Key to the genera of Baryceratini

1. Upper margin of pronotum strongly swollen. Notaulus represented by a rugulose stripe, that reaches past the center of mesoscutum. Mediella moderately strongly arched. Oriental Region ..... 1. ***Buysmania*** Cheesman

– Upper margin of pronotum not strongly swollen. Notauli absent. Mediella weakly arched to almost straight 2

2. Body not metallic in colour. First tergite long and slender, with weak lateral teeth at base. Clypeus pyramidal in profile. India..... 2. ***Jonathania*** Gupta

– Body metallic blue, purple or greenish in colour. First tergite stout, with strong lateral teeth at base, Clypeus not pyramidal in profit. Oriental and Eastern Palaearctic regions ..... 3. ***Chlorocryptus*** Cameron

1. Genus ***Buysmania*** Cheesman (Fig. 41 : a–c)

1941. *Buysmania* Cheesman, *Ann. & Mag. Nat. Hist.*, (11) 7 : 25. Type-species : (*Buysmania reticulata* Cheesman) = *Oxymora oxymora* Tosquinet; Original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 140. Townes, 1970 : 210.

Distribution : Oriental Region.

Body stout. Frons without any horn or carinae. Mesoscutum broad and weakly convex. Notaulus represented by a rugulose stripe that reaches past center of mesoscutum. Epomia weak or absent. Upper margin of pronotum strongly swollen, not paralled by a groove. Mesopleural fovea moderately distant from mesopleural suture by a very shallow groove. Sternaulus sinuate, reaching hind edge of mesopleurum. Median part of postpectal carina rather long. Propodeum short, its basal carina complete and apical carina represented by a pair of very low crests. Propodeal spiracle 3× as long as wide. The tip of axillus converging towards anal margin. First tergite stout with strong lateral tooth a base, ventrolateral carina strong and complete, dorsolateral carina distinct from base to spiracle, and median-dorsal carinae distinct from base of the tergite to the centre of postpetiole. Thyridium about 4× as wide as long. Ovipositor sheath about 0.8× as long as hind tibia.

This is a small genus represented by three species in the Oriental Region. A single subspecies known from India is discussed below :

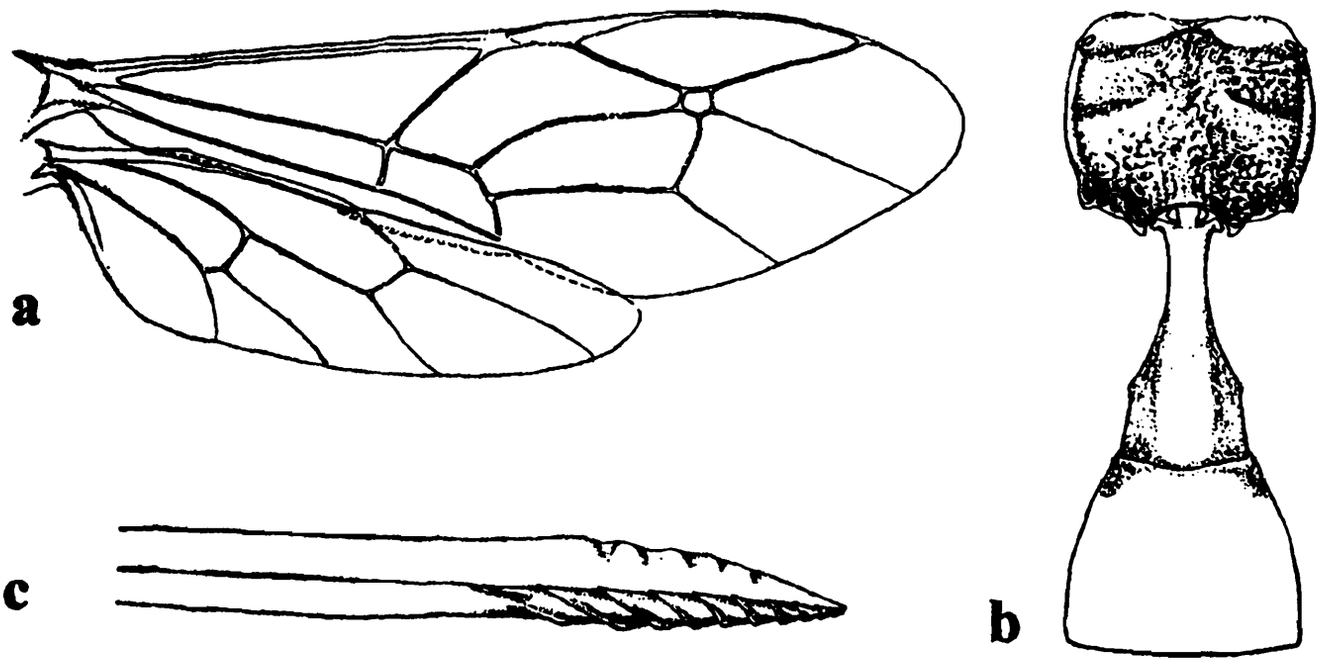

Fig. 41. *Buysmania* Cheesman : **a**, fore and hind wings showing venation; **b**, dorsla view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

1. ***Buysmania oxymora annulitarsis*** (Cameron)

1907. *Cratocryptus annulitarsis* Cameron, *Ann. & Mag. Nat. Hist*, (7)**20** : 24. Female, key, dis. Type : Female, India : Sikkim (LONDON).

1941. *Goryphus oxymorus* : Betrem, *Treubia* **18** : 85. Male, Female, key, syn., des. (in part).

1961. *Buysmania oxymora annulitarsis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 140. n. comb. India.

1987. *Buysmania oxymora annulitarsis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 794. syn.

Female : Face rugoso-punctate, tending to be reticulate in the center. Clypeus sparsely but strongly punctate. Frons largely strongly striate, longitudinally striate above, trans-striate below. Mesoscutum with dense fine punctures, striate along the notauli. Scutellar depression wide and deep. Pronotum largely strongly striated. Meso- and metapleurum closely rugosely reticulate. First and the last abdominal tergites smooth, rest of the tergites closely punctate. Areolet with second recurrent vein received just beyond the middle.

Black. 7–13 antennal segments white. The following are yellow : Face along the eye margin and a squarish mark in the center touching the clypeal mark, clypeus, frons along the eye margin up to the top of eye, eye along the outer orbit from middle to the malar space, mark broad below, narrowed above, mandible broadly at base, a broad line in the middle of pronotum, lower edge of propleurae, subtegular ridge, tegula, scutellar keels, scutellum, propodeum on the apical slope, apices of abdominal tergites, bands on 1–3 tergites broad and narrowed on rest. Legs in general reddish. Fore and middle coxae and trochanters yellow; hind coxa black, except broadly on inner side and apically above, yellow; femora narrowly at apex and base and tibia at apex black. Hind leg darker in shade, tarsus blackish, its 2nd and 3rd segments white. Wings clear hyaline, stigma and veins black.

Male : Essentially similar to female (Betrem, 1941 : 85).

Length : Female and male, 10 mm; ovipositor 2 mm.

Distribution : India : Sikkim.

2. Genus ***Jonathania*** Gupta (Fig. 42 : a–c)

1971. *Rupa* Jonathan, *Oriental Ins.*, **5** : 149. Name preocc in Coleoptera by Jedkicks, 1935. Type-species : *Rupa multimaculata* Jonathan; original designation.

1987. *Jonathania* Gupta, *Mem. Amer. Ent. Inst.*, **41** : 796. New name for *Rupa* Jonathan.

Distribution : India.

This genus is mainly distinguished by having short and tapered mandible, its lower tooth shorter than the upper; posterior mesosternal carina absent and represented only medially by a small median tubercle. Notauli absent. Propodeum carinated and first tergite long and slender.

Body stout; head moderately large, wider than long. Clypeus moderately convex, weakly pyramidal in profile, apical margin impressed, truncate, laterally dilated, without median irregularity. Frons without a median horn or raised carina. Mandible of moderate size, teeth blunt, upper tooth slightly longer than the lower. Flagellar segments slightly dilated in the middle. Epomia strong but not reaching the extreme upper margin of pronotum. Notauli obscure. Prepectal carina extending 0.75 the height of mesopleurum; sternaulus extending up to the hind margin of mesopleurum, deep anteriorly; mesopleural pit deep, connected with mesopleural suture by an equally deep groove; posterior mesosternal carina absent, represented by a small tubercle in the middle; juxtacoxal carina distinct. Propodeum short, basal carina strong and complete, apical carina complete but weak in the middle, strongly arched in the middle, laterally represented by very low crests; propodeal spiracle abut 4× as long as wide. Areolet moderately large, pentagonal, more than 1.0 as high as the portion of second recurrent vein above bulla, sides converging forward, second recurrent vein received in the middle, nervulus opposite basal vein, mediella slightly arched, nervellus intercepted below the middle, axillus vein convergent towards anal margin. First tergite long and slender, base of tergite with a rather weak lateral triangular tooth, median dorsal carinae absent, dorso-lateral carina indistinct, weakly present basally, ventro-lateral carina distinct; spiracle of first tergite far behind the middle, postpetiole longer than wide with a shallow concavity in middle. Ovipositor sheath about 0.8× as long as hind tibia. Ovipositor about 0.75× as long as abdomen.

Type-species : *Rupa multimaculata* Jonathan.

Jonathania Gupta seems close to *Chlorocryptus* Cameron and *Coccygodes* Saussure, by the notauli almost absent. It, however, differs from *Chlorocryptus,* in not being metallic blue in colour, first tergite long and slender and clypeus somewhat pyramidal in profile. It is distinct from *Coccygodes* by having the propodeum carinated and propodeal spiracle about 4× as long as wide.

Jonathania also approaches *Calaminus* Townes and *Ceratomansa* Cushman, by the nature of the long sternaulus, but is distinct from *Calaminus* by the absence of notauli, linear propodeal spiracle (about 4× as long as wide) and the first tergite having distinct median dorsal carinae. It differs from *Ceratomansa* by having no horn-like structure on frons and the areolet receiving second recurrent vein at the middle (Townes, 1970 : 206-208).

This genus is known only by a single species from India, which is detailed below :

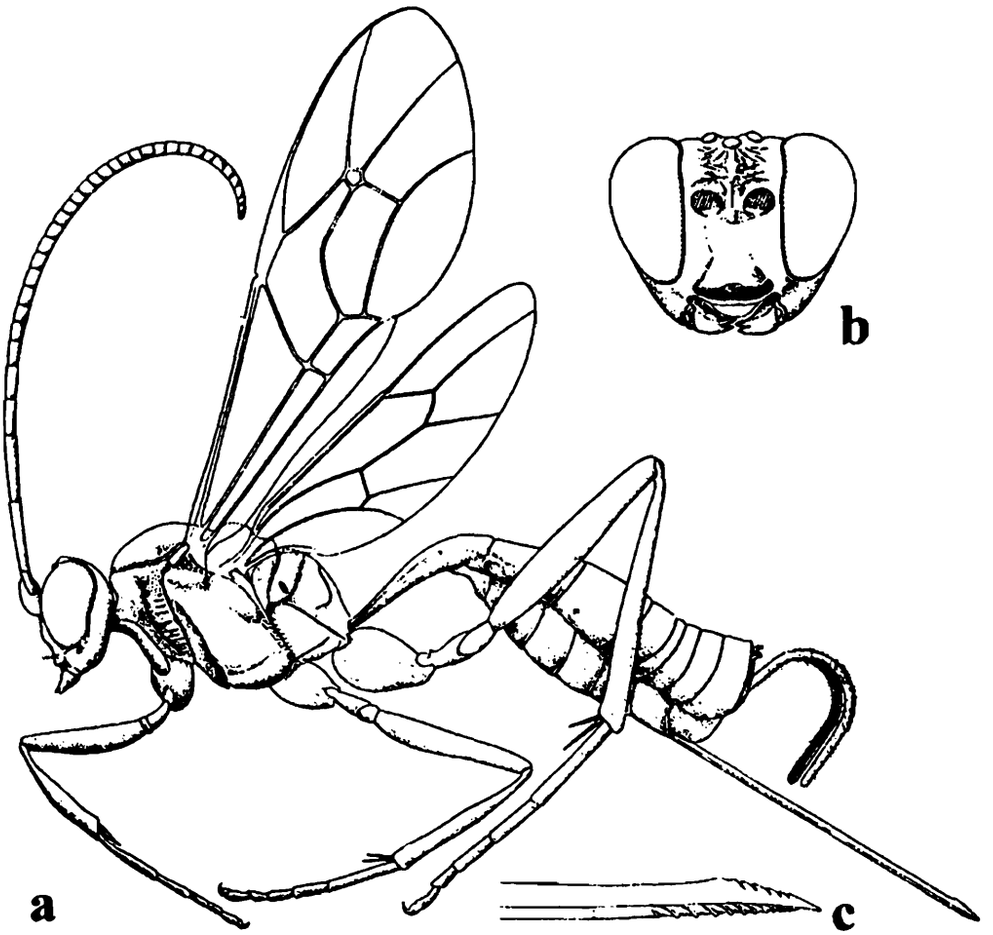

Fig. 42. *Jonathania* Gupta : **a**, side view of whole body; **b**, front view of head; **c**, ovipositor tip.

1. ***Jonathania multimaculata*** (Jonathan) (Fig. 42 : a–c)

1971. *Rupa multimaculata* Jonathan, *Oriental Ins.*, **5** : 151. Female, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Shillong Botanical Garden, 1465m (GUPTA). India : Meghalaya : Khasi Hills : Cherrapunji 1235m.

1987. *Jonathania multimaculata* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 796.

Female : Face punctate, punctures of moderate size and coalescent in the middle, at sides punctures sparse and shallow. Clypeus sparsely and shallowly punctate. Malar space granulose, 1.1× the basal width of mandible. Frons in the middle transverse to obliquely striate, along the eye margins and behind antennal sockets smooth and shiny; area behind ocellar triangle distinctly punctate. Temple sparsely punctate, tending to be smooth and shiny below. Pronotum striate in the middle, upper margin and pronotal collar punctate. Mesoscutum densely, strongly punctate. Scutellum subpolished, sparsely punctate, scutellum oval in shape, prescutellar foveae deep, lateral carina of scutellum confined to its base. Mesopleurum closely and deeply punctate, punctures smaller than those of mesoscutum; near prepectal carina and below subtegular ridge aciculated.

Metapleurum trans-rugose. Propodeum between basal carina and apex reticulate, basad of basal carina deeply and densely punctate. First tergite shiny, postpetiole apico-laterally, second and third tergites with moderately spaced punctures, the following tergites mat and subpolished.

Black. 6 to 13 flagellar segments yellowish-white above. The following are yellow : scape below, face, clypeus, except the clypeus at apex, mandible, frons along the eye margin, lower half of temple, upper margin of pronotum, pronotal collar, a spot in the centre of mesoscutum, subtegular ridge, tegula, an elongate mark in the middle of mesopleurum, an oval mark on metapleurum above, scutellum, metascutellum, inverted V-shaped mark on propodeum, and apices of all the abdominal tergites. Fore and middle legs with apices of their coxae and trochanteral segments, yellow, femora and tibiae brownish-yellow, tarsi dark brown; hind coxa with a yellow mark above and below, trochanter black, femur yellowish-brown, its apical 0.25 black, tibia yellowish-brown, except broadly at apex and narrowly at base black, tarsus yellowish-white, except its fifth segment at apex blackish.

Male : Not known.

Length : Female 12 mm; fore wing 10 mm; ovipositor sheath 3.5 mm.

Distribution : India : Meghalaya (Shillong, Botanical Gardens, 1465 m; Cherrapunji, 1235 m).

3. Genus ***Chlorocryptus*** Cameron (Fig. 43 : a–d)

1903. *Chlorocryptus* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 34. Type-species : *Chlorocryptus melallicus* Cameron; designated by Viereck, 1914.

1936. *Cochlidionostenus* Uchida, 1936, *Insecta Matsumurana,* **10** : 115. Syn. by Townes, 1961. Type-species : *Cryptaulax coreanus* Szépligeti; Original designation.

1940. *Cryptaulaxoides* Uchida, *Insecta Matsumurana,* **14** : 21. Syn. of *Cochlidionostenus* by Townes, 1957. Type-species : *Cryptus purpuratus* Smith; Original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 141. Townes, 1970 : 214.

Distribution : Oriental & Eastern Palaearctic regions.

This genus can easily be distinguished by its stout body of a dark metallic blue, purple or greenish colour.

Frons without a horn or carinae. Mesoscutum weakly convex. Notaulus absent. Epomia long and strong. Upper margin of pronotum not swollen. Mesopleural fovea close to mesopleural suture, connected by a shallow impression. Sternaulus 0.65 as long as mesopleurum. Median section of postpectal carina represented by

a tubercle. Propodeum short, its basal carina absent or incomplete; apical carina present or absent, sublaterally often forming weak crest; propodeal spiracle about 2.5× as long as wide. Areolet small, quadrangular, the second intercubitus present but weak; nervulus a little distad of basal vein. Mediella almost straight; nervellus intercepted near its lower 0.3. Tip of axillus converging towards anal margin. First tergite stout, with lateral flange like tooth at base; its ventrolateral carina complete, dorsolateral carina distinct, and median dorsal carinae indistinct or absent. Thyridium about 3× as wide as long. Ovipositor sheath about as long as hind tibia.

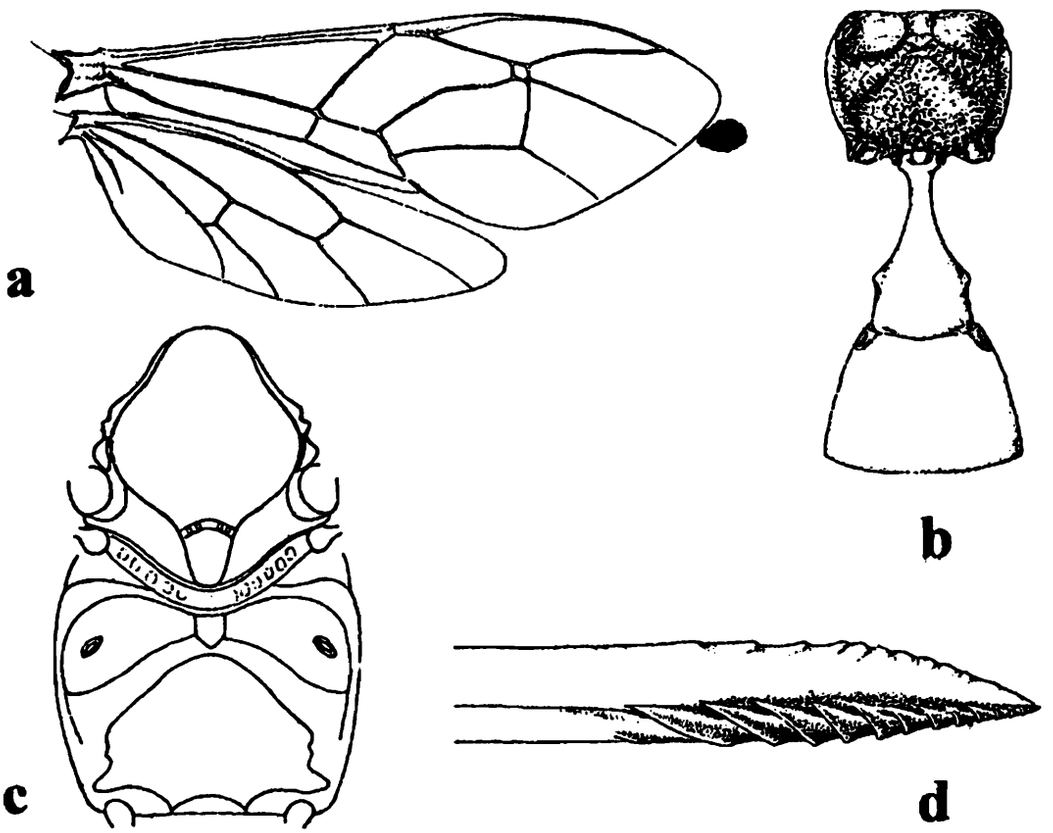

Fig. 43. *Chlorocryptus coeruleus* Cameron : **a**, fore and hind wings; **b**, dorsal view of propodeum, first and second tergites; **c**, dorsal view of thorax; **d**, ovipositor tip. (Source : Townes, 1970 & Saxena, 1978).

This is a small genus of Oriental and eastern Palaearctic regions. In Oriental region four species have been reported. In India two species have been recognised. Indian species can be distinguished by the following key :

Key to the species of *Chlorocryptus*

1. Large size species, about 18 mm long. Face covered with dense white hairs. Scutellum sparsely punctate. Propodeum closely reticulo-wrinkled.

Metanotum without projecting keels. India : Meghalaya; Sikkim. China.... ..... 1. *coeruleus* Cameron

– Small size species, about 12 mm long. Face not covered with dense white hairs. Scutellum smooth, with a few scattered punctures. Propodeum trans-striate. Metanotum with projecting keels. India : Meghalaya..... ..... 2. *metallicus* Cameron

1. *Chlorocryptus coeruleus* Cameron (Fig. 43 : a–d)

1903. *Chlorocryptus coeruleus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 36. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1907. *Chlorocryptus reticulatus* Cameron, *Tijdschr. v. Ent.*, **50** : 84. Male, India : Sikkim (LONDON). Syn. by Townes, Townes & Gupta, 1961.

1916. *Cryptaulax cyaneus* Szepligeti, *Ann. Mus. Natl. Hungarici,* **14** : 286. Male, Female. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Male, India : Sikkim (BUDAPEST). China Tschifu-Tschintau, Shanghai. Syn. by Townes, Townes & Gupta, 1961.

1978. *Neodontocryptus hyalina* Sexena, *Oriental Ins.*, **12** : 216. Male, Female, key, des. fig. Type : Female, India : Maharashtra : Bombay. Tamil Nadu : Anamalai Hills : Kalampraj, 1050m. Uttaranchal : Garjia, 610m; Dehra Dun : New Forest. Nepal : Balaju, 1500m. Indonesia : Java : Djampang Tengah; Tondano. Synonymised by Jonathan, 2000.

1987. *Chlorocryptus coeruleus* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 797.

2000. *Chlorocryptus coeruleus* : Jonathan, State Fauna Series 4 : Fauna of Meghalaya, Part 7 : 550. key, syn.

Female : Face moderately strongly rugose, hairy. Clypeus rugoso-punctate, its apical margin somewhat truncate. Malar space mat, about 0.8× as long as the basal width of mandible. Lower tooth of mandible little shorter than the upper. Frons with a median longitudinal crest, at sides trans-striate. Vertex puncto-wrinkled. Temple mat and subpolished. Pronotum with fine punctures, in scrobe trans-striate. Mesoscutum short, trans-striate along the notauli, punctate in the anterior region. Scutellum sparsely punctate, punctures large and deep. Scutellum with its lateral carina confined to its base. Metascutellum largely smooth. Mesopleurum in the middle largely obliquely striate, prepectal area densely punctate. Metapleurum and propodeum reticulo-wrinkled; both the transverse carinae present, apophyses crest-like. Areolet medium sized; nervulus distad of basal vein by about 0.4 its length. First abdominal tergite punctate, remaining tergites densely punctate. Ovipositor weakly compressed with distinct nodus and oblique teeth on lower valve, its sheath about 0.5× as long as fore wing and about 1.0× as long as hind tibia.

Metallic blue. The following are black : all tibiae, tarsi, claws of middle and hind legs. Fore legs black with reddish hue. Face black with greenish hue.

Male : Similar to female in all respect except as follows : Vertex sparsely punctate. Mesoscutum without median longitudinal ridge. Apical carina of propodeum without distinct lateral crests. First tergite (petiole) with a few coarse punctures.

Colour also essentially similar to female, except mandible reddish-black, palpi reddish-brown and face with bluish-green hue.

Length : Female, 12–17.5 mm; fore wing 10–12.5 mm; ovipositor sheath 3.5–6 mm. Male, 10.5–13.5 mm; fore wing 8–10.5 mm.

Distribution : India : Meghalaya (Khasi Hills). Sikkim. Maharashtra (Bombay). Manipur (Kanchipur, 793m). Tamil Nadu (Kalampraj, 1050m in Anamalai Hills). Uttaranchal (New Forest nr. Dehra Dun; Garjia, 610m). *Elsewhere* : Indonesia (Djampang Tengah, Forsten Tondano). China (Tschifu-Tschintau; Shanghai; Fujian). Nepal (Balajee).

2. *Chlorocryptus metallicus* Cameron

1903. *Chlorocryptus metallicus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 35. Female, des. Type : Female, India ; Meghalaya : Khasi Hills (OXFORD).

1961. *Chlorocryptus metallicus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1**.: 142.

1987. *Chlorocryptus metallicus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 798.

Very little is known about this species to the present author. However, it can be distinguished by its body size of about 12mm. Face not covered with dense white hair. Scutellum smooth, with a few scattered punctures. Propodeum transstriate. Metanotum with projecting keels.

Distribution : India : Meghalaya (Khasi Hills).

IV. THE TRIBE MESOSTENINI

The members of this tribe are recognised by having body stout to slender. Clypeus moderately to strongly convex, its apical margin never with a median tooth, sometimes with a weak pair of tubercles. Frons often with a median horn or a vertical crest, or sometimes with a median pair of horns. Mandibe with equal teeth or lower tooth shorter than the upper tooth. Occipital carina joining hypostomal carina above base of mandible, very rarely occipital carina absent. Pronotam at its upper margin weakly to strongly swollen. Epomia various. Mesoscutum with sharp, deep and long notaulus. Sternaulus distinct, reaching to middle coxa or atleast 0.5 the distance to middle

coxa, usually sinuate. Mesopleural pit far away from mesopleural suture, sometimes joined with the suture by a weak groove. Postpectal carina present or absent. Hind margin of metanotal rim with a small projection just laterad of each side of metascutellum, the slope from basal margin of metanotums to transverse groove at base of propodeum short to long, without strong vertical wrinkles. Both the transverse carinae of propodeum complete, apical carina with sublateral crests or apophyses, or sometimes lacking. Ramulus absent. Areolet small or very small, about 1.5× as wide as high or sometimes lacking and first intercubitus almost apposite second recurrent vein and almost obliterated by meeting of radius and cubitus. Nervulus various. Mediella weakly to strongly arched. Nervellus intercepted between a little above the middle and its lower hind end. Tip of axillus converging towards anal margin. First tergite stout to slender, its spiracle behind the middle, usually with a lateral tooth a base, 3 pairs of longitudinal carinae various, usually absent. Ovipositor sheath 0.3 to 6× as long as hind tibia. Ovipositor with nodus, lower valve with oblique teeth, without dorsal lobe. Upper valve with a notch at nodus, without transverse or oblique ridges.

This is a moderately large tribe containing fourteen genera is world fauna, nine genera are reported from Oriental Region. Of these, only 3 genera are from India and adjacent countries.

Key to the genera of Tribe Mesostenini

1. Apex of first sternite behind spiracle of first tergite. Apical margin of clypeus broadly truncate or weakly arched. Postpetiole longer than wide at base. Wordwide ..... 3. ***Mesostenus*** Gravenhorst

_ Apex of first sternite opposite or infront of spiracle of first tergite. Apical margin of clypeus evenly arched. Postpetiole as long as wide at base 2

2. Apical margin of clypeus with a median tooth. Sternaulus sinuate, extending up to the base of middle coxa. Areolet in fore wing very small, almost obliterated. Indian subregion ..... 2. ***Anupama*** Jonathan

– Apical margin of clypeus without a median tooth. Sternaulus short, not extending up to (0.5) the base of middle coxa. Areolet small, not obliterated. Indo-Australian Region ..... 1. ***Gotra*** Cameron

1. Genus ***Gotra*** Cameron

1902. *Gotra* Cameron, *Ann. & Mag. Nat. Hist.*, (7)**9** : 206. Types-species : *Gotra longicornis* Cameron; monobasic.

1932. *Stenaraeoides* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 181. Syn. by Uchida, 1940. Types-species : *Mesostenus octocinctus* Ashmead; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 177. Townes, 1970 : 218. Gauld, 1984 : 158. (*Palmerella* considered a synonym in 1961 was separated in 1970 and placed under the tribe Ischnina. *Ivondrites* Seyrig from Madagascar was doutbfully synonymized here by Townes, 1970).

Host : Coccons of Totricidae and Anthelidae.

Distribution : Indo-Australion Region.

This genus is recognised by having stout body. Clypeus small, strongly convex, its apical margin without median tooth. Frons with median vertical carina, without distinct horn, but sometimes vertical carina transform into an compressed horn. Malar space 0.5× as long as basal width of mandible. Mandibular teeth equal. Pronotum at upper margin swollen. Epomia long, extending to upper margin then turned mesad. Notaulus long and distinctly impressed. Propodeum (Fig. 44 : b) with both transverse carinae present; apical carina laterally forming crest-like tubercles. Areolet about 3× as wide as high, its second recurrent distad of the center and second intercubitus present. Nervulus various, opposite to basad of basal vein (Fig. 44 : a). First abdominal tergite at base with a strong triangular tooth. Apex of first sternite basad of spiracle. Ovipositor sheath about 0.3–0.7× as long as hind tibia.

This is a very large genus of Indo-Australian region. Gupta (1987 : 798) reported 37 species from Oriental Region. 9 species have been found in India and adjacent countries. This genus requires complete revision. Several undescribed species are available is various museums.

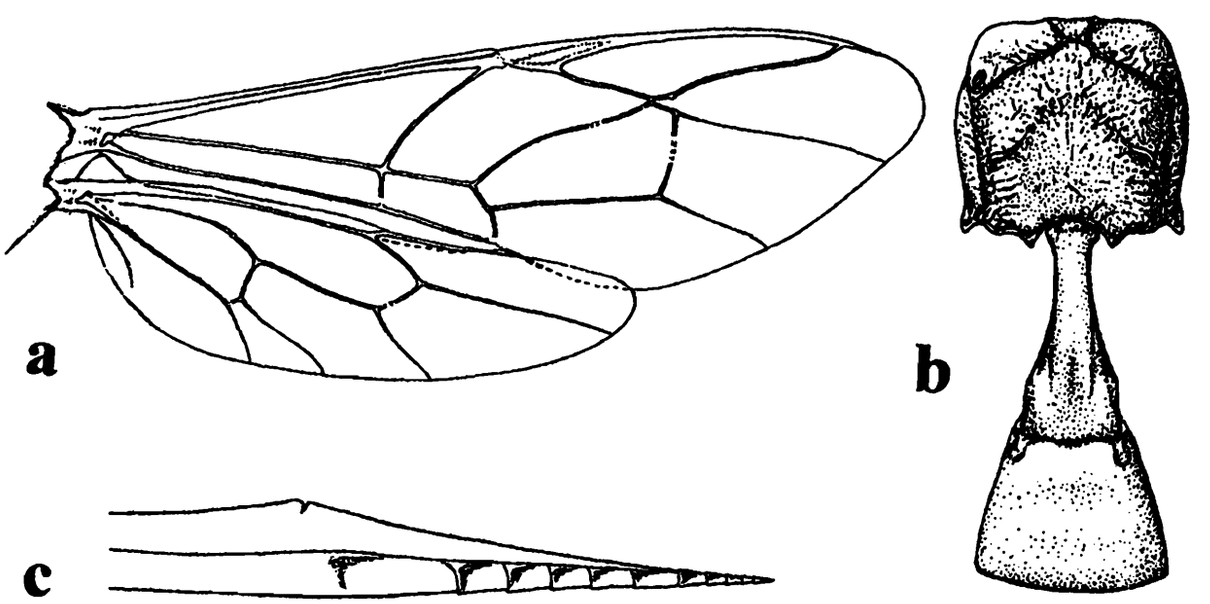

Fig. 44. *Gotra* Cameron : **a**, fore and hind wings; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

1. *Gotra acutilineata* (Cameron)

1905. *Skeatia acutilineata* Cameron, *Spolia Zeylanica,* **3** : 113. Female. des., fig. Type : Female, Sri Lanka : Kandy (LONDON).

1940. *Gotra marginata* : Uchida, *Insecta Matsumurana,* **14** : 120. syn. (in part).

1961. *Gotra acutilineata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 178. n. comb. Sri Lanka.

1987. *Gotra acutilineata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 799.

Female : Frons irregularly rugoso-punctate, with a median carina. Face distinctly punctate. Clypeus sparsely punctate above, smooth below. Thorax largely closely and strongly punctate. Metapleurum more strongly punctate than the rest. Propodeum strongly reticulate towards apex, closely reticulate in the center. First abdominal tergite sparsely and rest of the tergites closely and uniformly punctate.

Black. Antenna with a white band on the middle joints. The following are yellow : face, clypeus, mandible at base, palpi, eye all along margin, pronotum at base, broadly in scrobe, tegula, mesoscutum on middle lobe at base, lateral carina of scutellum, scutellum, propodeum with a trilobate mark, apical slope including apophyses, mark extending on metapleurum, mesopleurum with a large oblique mark, mesosternum, metapleurum along the groove, apices of all the abdominal tergites. Legs in general red; coxae and trochanters yellow; hind coxa broadly at apex and base, femur narrowly at apex, tibia narrowly at base and broadly at apex and apical tarsal segments, black; hind tibia largely blackish. Wings hyaline.

Male : Not known.

Length : Female, 12 mm; ovipositor sheeth 3–3.5 mm.

Distribution : Sri Lanka (Kandy).

2. *Gotra carinifrons* Cameron

1903. *Gotra carinifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.* **47**(14) : 10. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1923. *Gotra carinifrons* : Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 23. India : Tamil Nadu. Shevaroy Hills, 1140m.

1961. *Gotra carinifrons* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 178. India.

1987. *Gotra carinifrons* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 800.

Distribution : India : Andhra Pradesh. Assam. Bihar. Maharashtra. Meghalaya (Khasi Hills). Punjab. Tamil Nadu. Uttaranchal. Uttar Pradesh and West Bengal.

3. *Gotra cyclosiae* (Cameron)

1905. *Skeatia cyclosiae* Cameron, *Spolia Zeylanica,* **3** : 114. Female. key, des. Type : **Female,** Sri Lanka : Kandy (LONDON). Host : *Cyclosia panthona.*

1905. *Skeatia panthonae* Cameron, *Spolia Zeylanica,* **4** : 115. Male. Key, des. Type : **Male, Sri** Lanka : Kandy (LONDON). Host : *Cyclosia panthona.* Syn. by Gupta, 1970.

1923. *Skeatia cyclosiae* : Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 24. India : **Maharashtra** : Nagpur.

1941. *"Skeatia" cyclosiae* : Cheesman, *Ann. & Mag. Nat. Hist.,* (11) **7** : 28. Syn. notes.

1961. *Gotra cyclosiae* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 178. **n. comb.** India. Sri Lanka.

1961. *Gotra panthonae* : Townes, Townes & Gupta, *Mem. Amar. Ent. Inst.,* **1** : 181. **n. comb.**

1970. *Gotra cyclosiae* : Gupta, Ichneumon Hunting in India, P. 90 syn. India : **Localities in** Assam; Jharkhand; Maharashtra; Madhya Pradesh.

1987. *Gotra cyclosiae* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 800.

Female : Frons with a distinct carina, rugoso-striate. Face and base of clypeus punctate. Mesoscutum closely finely rugoso-punctate. Pronotum strongly obliquely above and more strongly longitudinally striate below. Scutellum smooth. Propodeum closely rugoso-reticulate, smooth at base. Mesopleurum and metapleurum closely punctate. First abdominal tergite at base and center aciculate, postpetiole at side closely puncto-striate, following segment densely punctate.

Black. Antenna with a broad white band on the middle joints. The following are yellow : face, clypeus, mandible at base, palpi, eye all along the margin, malar space, pronotum above, pronotal collar, mesoscutum with an oval mark at the base of middle lobe, lateral carinae of scutellum, scutellum, propodeum with roundish mark, including apophyses, at apex, a large mark on mesopleurum, sharply constricted in the middle, mesosternum, a large mark in the centre of metapleurum, apices of the abdominal segments. Legs in general deep yellow, coxae and trochanters, yellow. Hind coxa at base and outer side, under side of trochanters, apex of hind femur, base of tibia narrowly, apex broadly, black; hind tarsus white. Wings clear hyaline.

Male : Essentially similar to female in sculpture and colour, except more slender and colour more yellow.

Length : Female, 12 mm; ovipositor sheath 2–2.5 mm. Male, 11 mm.

Distribution : India : Maharashtra (Nagpur). Assam. Jharkhand. Madhya Pradesh. *Elsewhere* : Sri Lanka (Kandy).

Host : *Cyclosia panthona*

4. *Gotra erythropus* (Cameron)

1905. *Fenenias erythropus* Cameron, *Spolia Zeylanica,* **3** : 112. Female. key, des. Fig. Type : Female, Sri Lanka. Peradeniya (LONDON).

1914. *Mesostenoideus erythropus* Morley, *Rec. Indian Mus.,* **8** : 327. Female. India : Assam : Dibrugarh.

1961. *Gotra erythropus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 179 India, Sri Lanka.

1987. *Gotra erythropus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 801.

Female : Face and upper part of clypeus distinctly punctate. Vertex punctate in the center. Mesoscutum distinctly punctate. Scutellum finely and sparsely punctate. Pronotum punctate above and below, scrobe striate. Mesopleurum closely punctate, coarsely, irregularley, longitudinally striate at base above, irregularly, closely reticulate in the middle. Propodeum irregularly reticulate in center, at sides more finely reticulate; apical slope depressed, closely transversely striate to reticulate; apical transverse carina not defined in the center; basal carina almost absent. First abdominal segment largely smooth and shiny, except for a few puncture at apex; second wholly and third segment in basal 0.5 closely and distinctly punctate; following segments mat and subpolished. Areolet very small; nervulus basad of basal vein, nervellus intercepted below the middle.

Black. The following are yellow : inner orbit from top to the bottom, lower 0.66 of outer orbit, mandible at base, palpi, pronotum narrowly above, and at base below, an oval mark at the apex of middle lobe of mesoscutum, apex of scutellum, lateral carina of scutellum, propodeum with 3 linear marks, marks united at base, apophyses, a pyriform mark on mesopleurum below, base of hind wing, apices all the abdominal tergites, bands on apical tergites interrupted. Legs in general red; hind tarsus yellowish. Wings hyaline.

Male : Not Known.

Length : Female, 8 mm; ovipositor sheath 3.5 mm.

Distribution : India : Assam (Dibrugarh). *Elsewhere :* Sri Lanka (Peradeniya).

5. *Gotra hapaliae* (Rao)

1935. *Mesostenus* sp. Beeson & Chatterjee, *Indian Forest Rec. (N.S.) Ent.,* **1** : 163, biol. India : Uttaranchal : Dehra Dun. Host : *Pyrausta machaeralis.*

1953. *Mesostenus hapaliae* Rao, *Indian Forest Rec. (N.S.) Ent.,* **8** : 214 Female. des. fig. Type : Female, India : Tamil Nadu : Begur, Wynaad (DEHRADUN). Host *Pyrausta machaeralis.*

1961. *Gotra ? hapaliae* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 179. n. Comb. India.

1964. *Gotra hapaliae* : Gupta, *Pacific Ins.*, **6** : 233. notes on type.

1970. *Gotra hapaliae* : Rao, *Marathwada Univ. J. Sci.*, **9** : 93. Female. India : Maharashtra : Kuldabad, Marathwada.

1987. *Gotra hapaliae* : Gupta, *Mem. Amer. Ent. Inst.* **41** : 801.

Female : Body largely subpolished. Face densely and shallowly punctate. Clypeus sparsely and shallowly punctate. Malar space granulose, about 0.8× the basal width of mandible. Frons with a median carina extending down from the median ocellus, area around ocellar triangle ociculo-punctate, at sides smooth with a few scattered punctures. Vertex and Temple above and behind smooth and shiny. Pronotum in scrobe trans-striate, collar striato-punctate, upper shoulder weakly swollen, shallowly and sparsely punctate, epomia strong, reaching up to upper margin. Mesoscutum moderately strongly and densely punctate. Scutellum and metascutellum smooth and shiny, its lateral carina confined to its base. Mesopleurum largely moderately strongly punctate, tending to be striato-punctate below subtegular ridge, near speculum and also near the base of middle coxa, prepectal carina extending up to the base of subtegular ridge, sternaulus extending up to the base of middle coxa. Metapleurum strongly reticulate, juxtacoxal carina complete. Propodeum between basal carina and apex moderately strongly reticulate, basad of basal carina obliquely striate, apical carina obsolete, basal carina complete, spiracle longish. First abdominal tergite largely rugoso-punctate, its extreme apex granulose with a few scattered punctures. Second and third tergites densely punctate, following tergites mat and subpolished.

Black. 5–11 antennal segments white. The following are yellow : Head largely (except frons and vertex in middle and temple above, black), pronotal collar, shoulder, middle lobe of mesoscutum at base, scutellum, lateral carinae of scutellum, metascutellum, tegula, subtegular ridge an oval mark below subtegular ridge, an oval mark near base of middle coxa, mesosternum, base of hind wing, propodeum with two elongate mark on either side, apices of all the abdominal tergites, except band on 4–8 narrow or interrupted in the middle, fore coxae and trochanters. Rest of fore and middle legs dark yellow, tending to be brownish towards apical tarsal segments. Hind coxa, trochanter and femur reddish-orange, coxa with an oval yellow mark above, tibia reddish-brown, tarsus brownish-yellow, its 5th segment dark brown. Wings clear hyaline.

Male : Not Known.

Length : Female, 13 mm; fore wing 8 mm; ovipositor sheath 5.5 mm.

Distribution : India : Uttaranchal (Dehra Dun). Tamil Nadu (Begur, Wynaad). Maharashtra (Kuldabad, Marathwada). Jharkhand (Ranchi). Orissa (Khurda Road).

Host : Pyrausta machaeralis.

6. *Gotra latispina* (Cameron)

1907. *Mesostenoideus latispina* Cameron, *Tijdschr. v. Ent.*, **50** : 87. Female. des., Type : Female, India : Sikkim (LONDON).

1961. *Gotra latispina* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 179. n. comb. India.

1987. *Gotra latispina* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 802.

Female : Face strongly and closely, and clypeus sparsely punctate. Frons with a strong mediam longitudinal carina, trans-striate in the middle, striae above running into reticulation. Pronotum largely smooth in the scrobe, upper margin obliquely, lower area longitudinally striate. Mesoscutum closely rugoso-punctate. Scutellum smooth. Propodeum at base smooth, reticulate towards apex, rest obliquely striate. Mesopleurum largely reticulo-striate. Basal and apical abdominal segments smooth, middle segments closely punctate.

Black. Antenna with a white band on the middle joints. The following are yellow : face, clypeus, labrum, mandible, palpi, orbits, pronotum at base, pronotal collar, tegula, oval mark on middle lobe of mesoscutum, lateral carina of scutellum, scutellum, metascutellum, propodeum at sides and apex, apophyses, a broad mark on mesopleurum, a small oval mark on the apex, an oval mark at the base of hind wing, longish mark on metapleurum, mesosternum, apices of abdominal segments. Fore and middle legs light yellow, their femora dark yellow, 5th tarsal segment black. Hind coxa black, broadly yellow at base and above, basal joint of trochanter, apex of femur, apex of tibia and 5th tarsal segment, black. Hind femur reddish-yellow. Wings clear hyaline.

Male : Not Known.

Length : Female, 11 mm; ovipositor sheath 3.5 mm.

Distribution : India : Sikkim.

7. *Gotra longicornis* Cameron

1902. *Gotra longicornis* Cameron, *Ann. & Mag. Nat. Hist.*, (7)**9** : 206. Male. des. Type : Male, India : Maghalaya : Khasi Hills (OXFORD).

1904. *Gotra fulvipes* : Cameron, *Trans. Ent. Soc. London,* 1904 : 104. Female. des. Type : Females, India : Meghalaya : Khasi Hills (OXFORD). Syn. by Townes, Townes & Gupta, 1961.

1905. *Skeatia javanica* Cameron, *Tijdschr. v. Ent.*, **48** : 35. Male. des. Type : Male, Indonesia : Java : Pasuruan (AMSTERDAM). Syn. by Townes, Townes & Gupta. 1961.

1908. *Fenenias diversus* Szépligeti, *Notes Leyden Mus.*, **29** : 239. Male. key, des. Type : Male, Indonesia : Java : Semarang (BUDAPEST). Syn. by Townes, Townes & Gupta, 1961.

1908. *Mesostenus (Gotra) longicornis* : Schmiedeknecht, *Genera Insectorum*, **75** : 55. n. comb.

1912. "Ichneumonidae sp." Dutta, *Mem. Dept. Agri. India.* (Ent. Ser.), **4** : 195. biol. Host : *Pseudagenia clypeata.*

1916. *Stenaraeus diversus* : Szépligeti, *Ann. Mus. Natl. Hungrici,* **14** : 322, 325. n. comb., key. "Borneo."

1919. *Gotra longicornis* : Dutt, *Bull. Agri. Res. Inst. Pusa, India,* **89** : 5, 8. India. Host : *Pseudogenia clypeata; P. blanda.*

1923. *Gotra longicornis* : Dutta, *Mem. Dept. Agri. India (Ent. Ser.),* **8** : 23. India : Bihar : Pusa. Host : *Pseudagenia clypeata; P. blanda.*

1961. *Gotra longicornis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 179. syn. Borneo.

1987. *Gotra longicornis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 802.

Female : Face and clypeus shiny, strongly punctate, and sparsely covered with white hair. Frons with a deep furrow down, strongly trans-striate. Vertex on lower part reticulo-striate, behind punctate. Mesoscutum coarsely and closely punctate. Scutellum smooth. Propodeum largely strongly irregularly reticulate, reticulation more distinct towards apex. First abdominal segment at base smooth and shiny, postpetiole laterally with some large, sparse punctures, second segment with close rather strong punctures.

Black. 7th to 12th antennal joints white. the following are yellow : face, clypeus, mandibles except teeth, palpi, eye all along the orbit, pronotal collar, middle lobe of mesoscutum with an oval mark, lateral carina of scutellum, scutellum, propodeum broadly at apex, including apophyses, mesopleurum below, apex of mesopleurum, apices of all the abdominal segments. Fore and middle coxae and trochanters yellow and rest of the legs dark yellow. Hind coxa white, broadly marked reddish. Hind femur and tibia red, extreme base of femur, apex broadly, base of tibia narrowly and apex broadly, black, tarsus yellowish. Wings clear hyaline.

Male : Essentially similar to female in sculpture and colour, except more slender and polished, covered with short white hair. Antennae with 10 middle joints white. Body largely closely and moderately strongly punctate.

Length : Female, 12 mm; ovipositor sheath 2 mm. Male, 10 mm.

Distribution : India : Meghalaya (Khasi Hills). Bihar (Pusa). *Elsewhere* : Indonesia : Java (Pasuruan; Semarang); Kalimantan.

Host : *Pseudagenis clypeata; P. blanda.*

8. *Gotra marginata* (Brullé)

1846. *Mesostenus marginatus* Brullé, *In* Lepeletier : Histoire Naturelle des Insectes. Hyménoptères, **4** : 224. Female, des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, India : Bengal (PARIS). Philippines.

1897. *Mesostenus himalayensis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **41**(4) : 18 Male. des. Type : Male, India : "Himalayas" (LONDON). Syn. by Townes, Townes & Gupta, 1961.

1904. *Mesostenoideus marginatus* : Ashmead, *J. N. Y. Ent. Soc.*, **12** : 17. n. comb.

1904. *Mesostenoideus octozonatus* Ashmead, *Proc. U. S. Natl. Mus.*, **28** : 143. Female. des. Type : Female, Philippines : Luzon : Manila (WASHINGTON). Syn. by Townes, Townes & Gupta, 1961.

1904. *Mesostenus clarinervis* Cameron, *Trans. Ent. Soc. London,* 1904 : 115. Female. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, India : Meghalaya : Khasi Hills (OXFORD). Syn. by Townes, Townes & Gupta, 1961.

1905. *Fenenis albomaculatus* : Cameron, *Spolia Zeylanica,* **3** : 113. misdet. of *Fenenias albomaculatus.* key.

1907. *Fenenias albomaculatus* : Cameron, *Tijdschr. v. Ent.,* **50** : 91. misdet. of *Fenenias albomaculatus.* India : Sikkim.

1907. *Mesostenoides clarinervis* : Cameron, *Ann. & Mag. Nat. Hist.,* (7)**20** : 23. n. comb.

1914. *Mesostenoideus albomaculatus* : Morley, *Rec. Indian Mus.,* **80** : 327. Female. syn. India : Assam : Dibrugarh.

1916. *Stenaraeus rufipes* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 325. [Female]. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, Taiwan ; Puli (=Horisha) (BUDAPEST). Taiwan : Sunmoon Lake (= Jihyueh Lake). Syn. by Townes, Townes & Gupta, 1961.

1923. *Mesostenoides (!) clarinervis* : Dutt, *Mem. Dept. Argi. India* (Ent. Ser.), **8** : 23. India : West Bengal : Buxa Duar. Bihar : Chapra; Pusa.

1923. *Mesostenoides (!) marginatus* : Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 24. India : Bihar : Pusa.

1930. *Mesostenus rufipes* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.,* **25** : 318 key.

1930. *Mesostenus octocinctus* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **25** : 319. Male, Female, syn. (in part).

1931. *Mesostenus rufipes* : Matsumura, *6000 Illustrations of Insects of Japan,* p. 56. Male. des., fig. Taiwan.

1931. *Mesostenus (Stenaraeus) octocinctus* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 180. syn. (in part).

1931. *Mesostenus (Stenaraeus) rufipes* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 180. Male, Female. key, fig. Taiwan : Lienhuachih (= Rengechi); Jenho (=Ranrun); Neinpenpu (=Naihonpo).

1932. *Stenaraeoides rufipes* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 182. Male, Female. n. comb. Taiwan : Talin (= Taihorin); Chiasien (= Kosempo). (in part).

1936. *Gotra marginata* : Cheesman, *Nova Guinea*, **17** : 365. n. comb.

1940. *Gotra marginata* : Uchida, *Insecta Matsumurana*, **14** : 120. Female. syn. (in part). Hong Kong.

1940. *Mesostenoideus clavinervis* (!) : Pruthi, *Sci Rept. Imp. Agri. Res. Inst. New Delhi*, 1938-39 : 122. Host : *Scirpophaga* sp.

1961. *Gotra marginata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 180. lectotype design. syn. India. Hong Kong. Taiwan. Philippines.

1964. *Gotra marginatus* : Baltazar, *Pacific Ins.*, **6** : 40. Female. fig. Philippines.

1970. *Gotra marginata* : Gupta, Ichneumon Hunting in India, p. 91. distr. India : Assam; Bihar; Delhi; Kerala; Maharashtra; Tamil Nadu. Rajasthan; Sikkim; Uttar Pradesh; West Bengal.

1984. *Gotra marginata* : He, *Acta Agri. Univ. Zhejiangensis*, **10** : 89. China : Localities in Guangxi and Yunnan. Host : *Mythimna separata.*

1987. *Gotra marginata* : Gupta, *Mem. Amer. Ent. Inst.* **41** : 803.

Female : Body largely subpolished. Face densely and moderately deeply punctate. Clypeus at base densely and rest sparsely and shallowly punctate. Malar space granulose about 10× the basal width of mandible. Frons shiny, shallow, with a median longitudinal carina, area around ocellar triangle radiating rugoso-punctate. Vertex and temple smooth and shiny. Pronotum largely trans-striate, its upper margin and collar largely smooth, epomia long reaching upper margin then turned mesad, its upper margin distinctly swollen. Mesoscutum densely punctate, and middle of each lobe tending to be reticulate. Scutellum and metascutellum smooth and shiny; lateral carina of scutellum confined to its base. Mesopleurum largely sparsely to densely punctate, striate below subtegular ridge and along speculum; speculum smooth and shiny, subtegular ridge shiny with a few scattered punctures, below sternaulus minutely and sparsely punctate, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum strongly trans-rugoso-punctate, juxtacoxal carina not well defined among the strong rugae. Propodeum largely strongly rugoso-reticulate, reticulation basad of basal carina fine, basal carina complete, apical carina not well defined, apophyses moderately strong and conical, spiracle longish-oval. First abdominal tergite sparsely to closely punctate, extreme apex smooth and shiny, second and third tergites with dense setiferous punctures, following tergites mat and subpotished. Ovipositor lip long, upper valve convex, lower valve with 8–10 teeth.

Black. 5–9 antennal segments white above. The following are yellow : Face, clypeus wholly, frons, vertex and temple along the eye margin (except near clypeal foveae), mandible (except teeth), pronotal collar, upper margin of pronotum, and an oval mark on middle lobe of mesoscutum, a triangular mark at the apex of scutellum, lateral carinae of scutelum, metascutellum, tegula, subtegular ridge, a large oval mark infront and one below speculum, a semilunar mark just below sternaulus, base of hind wing, a large oval mark on metapleurum, three characteristic mark on propodeum, apices of all the abdominal tergites, bands on 4–8 tergites narrow and interrupted in the middle. Legs largely yellowish-brown to reddish-brown, except fore coxa, base of middle coxa, and an oval mark above on hind coxa, yellow. 4 and 5 tarsal segments of fore and middle legs and whole of hind tarsus blackish-brown. Wings clear hyaline.

Male : Essentially similar to female in sculpture and colour, except more sender and polished.

Black. 9–11 antennal segments white above. Abdominal bands not interrupted on 4–8 tergites. Legs in general reddish-orange. Fore coxa and tarsus yellow, except 5th tarsal segment brownish. Middle coxa at base above yellow, apical tarsal segment black. Hind coxa at base yellow, its first tarsal segment, base and apex of femur narrowly, base and apex of tibia broadly and first, 0.5 of second and whole of 5th tarsal segment, black.

Length : Female, 8–12 mm, fore wing 7–9 mm; ovipositor sheath 2 mm. Male, 7–9 mm; fore wing 5–8.5 mm.

Distribution : India : Assam (Dibrugarh). Bihar (Chapra; Pusa). Delhi. Jharkhand (Ranchi). Kerala. Karnataka. Maharashtra. Rajasthan. Sikkim (Lachen). Tamil Nadu. Uttaranchal. Uttar Pradesh. West Bengal (Darjeeling; Kalimpong; Rangpoo; Rangiroon; Takda; Singla; Buxa Duar). *Elsewhere :* Hong Kong. China. Taiwan [Lieuhuachih (= Rengechi); Jeuho (= Ranrun); Neinpenhu (= Naihonpo); Talin (= Taihorin); Chiasien (= Kosempo); Puli (= Horisha); Sunmoon Lake (= Jihyuch Lake)]. Philippines (Manina).

Host : Scirpophaga sp.

9. *Gotra serendiva* (Fernando)

1956. *Goryphus serendiva* Fernando, *Ann. & Mag. Nat. Hist.*, (12)**9** : 878. Female des., fig. Type : Female, Sri Lanka : Sigiriya (FERNANDO).

1961. *Gotra serendiva* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 182. n. comb. Sri Lanka.

1987. *Gotra serendiva* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 805.

Distribution : Sri Lanka (Sigiriya).

Remarks : Very little is known about this species from Sri Lanka. No specimen or description of this species was available to the author.

2. Genus *Anupama* Jonathan (Fig. 45 : a–c)

1982. *Anupama* Jonathan, *Oriental Ins.*, **15** : 281 (1981). Type-species : ***Anupama himalayensis*** Jonathan; original designation.

Distribution : Indian subcontinent.

Body of moderate proportions. Clypeus (Fig. 45 : a) oval, weakly convex, its apical margin evenly arched, with a median tooth-like projection. Mandible with equal teeth. Frons with a median longitudinal carina. Occipital carina joining hypostomal carina before the base of mandible. Epomia short, extending short distance to upper margin. Mesoscutum with fully developed notauli. Prepectal carina extending 0.85× the height of mesopleurum, sternaulus sinuate, extending up to the base of middle coxa; mesopleural pit moderately deep, joining mesopleural suture by a groove; juxtacoxal carina weak; pleural carina present. Both the apical and basal transverse carinae of propodeum present; spiracle longish-oval about 1.5× as long as wide. First abdominal

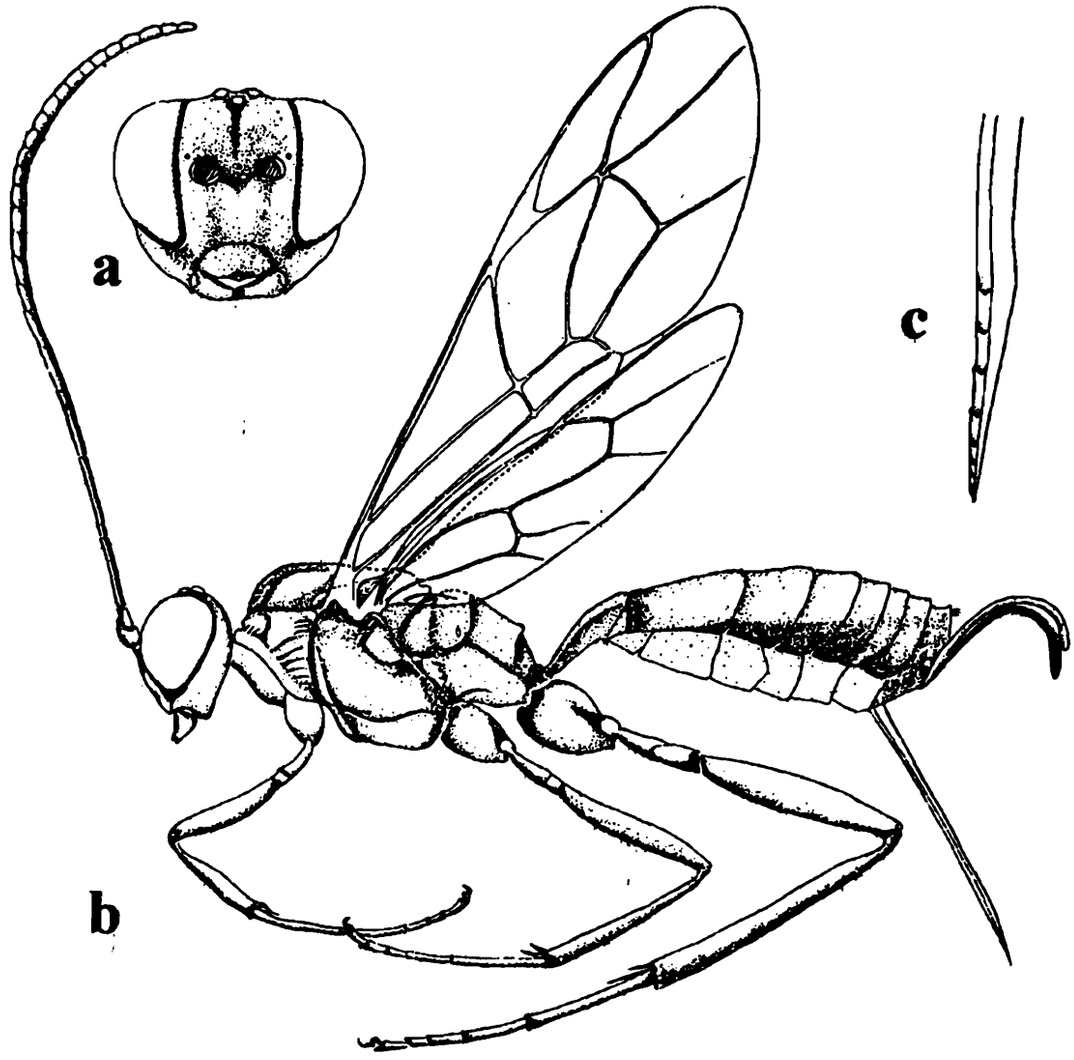

Fig. 45. *Anupama* Jonathan : **a**, front view of head; **b**, side view of whole body; **c**, ovipositor tip.

tergite short and stout, about 2.3× as long as wide at apex; postpetiole about as long as wide at base; petiole narrow subbasally, round in cross-section; dorso-median carinae almost indistinct, dorso-lateral carina present only between the spiracle and apex, ventro-lateral carinae absent; tergite at base with lateral tooth like projection. Areolet (Fig. 45 : b) in fore wing very small, almost obliterated, second intercubitus absent, nervulus slightly basad of basal vein, nervellus intercepted at its lower 0.4; axillus vein converging towards the margin; brachiella long. Ovipositor sheath 0.66× as long as hind tibia, its tip long and pointed, lower valve with weak teeth (Fig. 45 : c).

This genus is easily distinguished by having a median tooth at the apical margin of clypeus. Areolet very small, almost obliterated. Sternaulus sinuate, extending up to middle coxa.

This is a monotypic genus, so far known from India, Nepal and Myanmar,

1. ***Anupama himalayensis*** Jonathan

1982. *Anupama himalayensis* Jonathan, *Oriental Ins.*, **15** : 283 (1981). Male. Female. des., fig. Type : Female, India : Sikkim : Gangtok, 1650m. (GUPTA). India : West Bengal : Darjeeling Hills : Rangiroon, 2000m. Nepal : Kathmandu Valley : Godavari, 1500m. Myanmar : Mt. Victoria, 2600m.

1987. *Anupama himalayensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 806.

Female : Face weakly rugoso-punctate, rugulose at sides. Clypeus with scattered shallow punctures. Malar space 0.75× basal width of mandible. Frons with a few wrinkles towards the base of antennal sockets. Vertex polished. Temple shiny, sparsely punctate. Pronotal scrobe coarsely striate, rest largely smooth. Mesoscutum punctate. Scutellum and metascutellum smooth and shiny. Mesopleurum moderately strongly rugoso-punctate in the middle, coarsely punctate above and with deep punctures below sternaulus; speculum smooth and shiny. Metapleurum moderately strongly rugoso-punctate. Propodeum between basal carina and apex reticulo-wrinkled basad of basal carina coarsely punctate, smooth and shiny at the exteme base, both the transverse carinae strong, evenly arched. First abdominal tergite largely smooth and subpolished, following tergites mat and subpolished.

Black. 6–11 flagellar segments yellowish-white above. The following are yellow : clypeus, face (except two sublateral longitudinal black stripes extending from the base of antennal sockets to clypeal foveae), whole of orbit, temple broadly below, pronotal collar, upper margin of pronotum, an oval spot at the apex of middle lobe of mesoscutum, tegula at base, subtegular ridge, an elongated mark on mesopleurum, base of hind wing, scutellum (except at base), lateral carina of scutellum, metascutellum, an oblong mark on metapleurum, an inverted horse-shoe-shaped mark on propodeum, apices of all the abdominal tergites. Fore leg with coxa and trochanter yellow, its femur, tibia and tarsus yellowish-brown, 5th tarsal segment dark brown.

Middle leg with coxa yellow, rest of middle leg yellowish-brown, and 5th tarsal segment dark brown. Hind coxa black with an oval yellow mark above and dark brown mark below, trochanter and femur reddish-brown, tibia yellowish-brown, tarsus whitish-yellow, except extreme apex of femur, apex and base of tibia and whole of 5th tarsal segment, dark brown. Wings clear hyaline.

Fig. 46. *Anupama himalayensis* Jonathan : Showing colour pattern : **a**, side view of whole body; **b**, front view of head; **c**, hind leg.

Male : Similar to female except as follows : body slender, polished and weakly sculptured. Cleypeus and frons smooth. Face weakly punctate. Pronotum with a few striations; epomia short, but distinct. Mesopleurum sparsely and metapleurum coarsely punctate. Propodeum largely wrinkled. Abdomen smooth and shiny.

Black. Face and clypeus wholly yellow. Hind coxa black, above and below broadly yellow; its femur reddish-brown; tibia yellowish-brown. Hind trochanter wholly, extreme apex of femur, tibia narrowly at base and broadly at apex, first and 5th tarsal segments almost wholly, black.

Rest of body colour similar to female.

Length : Female, 6–9 mm; fore wing 5.5–6.5 mm; ovipositor sheath 1.5–2 mm. Male, 6.5 mm; fore wing 6 mm.

Distribution : India : Sikkim (Gangtok, 1650 m). West Bengal (Rangiroon, 200 m nr. Darjeeling). *Elsewhere* : Myanmar (Mt. Victoria, 2600 m). Nepal (Godavari, 1500 m).

3. Genus ***Mesostenus*** Gravenhorst

1829. *Mesostenus* Gravenhorst, *Ichneumonologia Europaea*, **2** : 750. Type-species : *Mesostenus transfuga* Gravenhorst; designated by Westwood, 1840.

1896. *Stenaraeus* Thomson, *Opuscula Entomologica*, **21** : 2380. Type-species : *Mesostenus transfuga* Gravenhorst; design. by Viereck, 1914. Syn. in Dalla Torre, 1902.

1902. *Umlima* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **9** : 208. Type-species : *Umlima penetralis* Cameron; monobasic. Syn. by Schmiedecknecht, 1908.

1919. *Derocentrus* Cushman, *Proc. Ent. Soc.* Washington, **21** : 113. Type-species : (*Coleocentrus texanus* Ashmead) = *longicaudis* Cresson; original designation. Syn. by Townes & Townes, 1962.

Taxonomy : Townes, Townes & Gupta, 1961 : 183. Townes, 1970 : 223. Gauld, 1984 : 166.

Distribution : Worldwide. Gauld records undescribed males from Australia.

Host : Pupae of Lepidoptera. No host records for Oriental species.

This genus is mainly distinguished from other genera of Indian subregion by having apex of first sternite behind the spiracle of first tergite and postpetiole longer than wide at base.

Body slender. Frons without any horn, often with a median longitudinal crest-like carina. Clypeus short, its apical margin impressed, broadly truncate, without median tooth or irregularity. Malar space 0.7× as long as basal width of mandible. Pronotum above moderately swollen. Epomia strong, reaching swollen area. Apical carina of propodeum complete or interrupted medially, laterally forming weak sublateral crests.

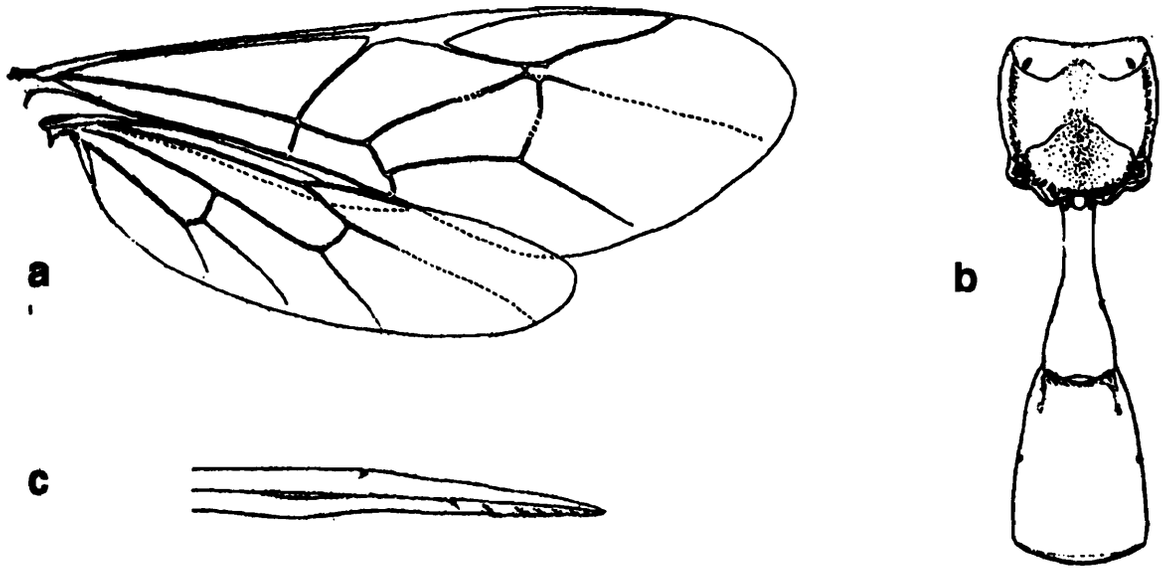

Fig. 47. *Mesostenus* Gravenhorst : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Areolet about 1.6× as wide as high, receiving second recurrent vein distad of center. Second intercubitus present. Nervulus apposite basal vein or basad of basal vein by as much as 0.4 its length. First abdominal segment, long slender with basal lateral tooth. Ovipositor sheath various, 0.9 to 6× as long as hind tibia.

This moderate sized genus, has a worldwide distribution. Four species were reported from Oriental Region. One species each is known from India and Pakistan.

Key to the species of *Mesostenus*

1. Face strongly punctate and covered with thick white hair. Propodeum between apical and basal carinae rugoso-punctate, tending to be reticulate. Antennae with its apical segments brown. Hind tarsus white, except its 1st and 5th segments wholly and 2nd segment at base black. Pakistan. ..... 2. *tricarinatus* Cameron

– Face rugose in center and trans-striate at sides. Propodeum between apical and basal carinae trans-striate, punctate at sides. Antennae with its 8–13 segments white. Hind tarsus white, its basal 0.66 of 1st and whole of 5th segment black. India : Meghalaya ..... 1. *penetralis* (Cameron)

1. *Mesostenus penetralis* (Cameron)

1902. *Umlima penetralis* Cameron, *Ann. & Mag. Nat. Hist.* (7) **9** : 208. Female. des. Type : Female, India : Meghalaya : Khase Hills (OXFORD).

1904. *Umlima flexilis* Cameron, *Trans. Ent. Soc.* London, 1904 : 107. Male. des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD). Syn by Townes, Townes & Gupta, 1961.

1908. *Mesostenus penetralis* : Schmiedeknecht, *Genera Insectorum,* **75** : 56. n. comb.

1961. *Mesostenus penetralis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 183. Syn. India.

1987. *Mesostenus penetralis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 811.

Female : Antenna as long as body, scape shiny, sparsely covered with short white hair. Frons and vertex smooth and shiny, frons with a semicircular depression infront of median ocellus, and a median longitudinal carina. Face strongly convex in the center, rugose, trans-striate at sides. Clypeus smooth, sparsely covered with short white hair. Mandible at base with a few punctures. Mesoscutum shiny, thickly covered with brownish hair, punctures close but not strong, notauli extending up to the center. Scutellum shiny, hairy, sparsely punctate. Metascutellum smooth and shiny, lateral carina of scutellum long and strong. Pronotum above coarsely punctate, below strongly longitudinally striate. Mesopleurum rugose, longitudinally striate in the middle. Metapleurum coarsely punctate, covered with thick long, soft, white hair. Propodeum at base smooth, between transverse carinae trans-striate, punctate at

side. Areolet slightly longer than broad, recurrent vein received at its apical 0.25. Abdominal segments largely mat and subpolished.

Black. 8th to 13th antennal segments white. Clypeus and palpi white. Thorax entirely black except subtegular ridge white. Lateral carina of scutellum marked yellow. Legs with all the coxae black; fore and middle trochanters white, hind trochanters, black; fore leg pale, middle leg dark yellow; hind femur reddish, tibia dark yellow, narrowly at base and more broadly at apex black; hind tarsus white, its basal 0.66 of 1st segment and whole of 5th segment black. Apices of abdominal tergite with apical whitish-yellow to dark yellow band; band on 2nd broad, 8th almost wholly and 7th narrow. Wings clear hyaline, stigma and veins dark brown.

Male : Face closely and finely rugoso-punctate. Clypeus roundly convex, apex rounded, both covered with thick long white hair. Frons and vertex smooth. Mesoscutum thickly covered with pale short pubescence, in the middle strongly punctate. Pronotum in scrobe strongly striate, propleurae punctate. Mesopleurum longitudinally striate, pleural furrow wide, deep and long. Mesosternum closely punctate, its furrow deep and wide. Propodeum at base finely punctate, between the transverse carinae trans-striate, apical slope much strongly trans-striate. Abdominal petiole smooth and shiny, depressed at apex, remaining segments mat and thickly covered with pale pubescence.

Black. The following are yellow : Clypeus, mandible except the teeth, palpi, lateral carinae of scutellum, 2nd tergite in apical half. Legs in general yellowish, apex of fore and middle tarsi above, the coxae, except at apex, black; hind leg reddish, coxa, trochanters, apex of femur narrowly, base of tibia. somewhat more broadly, apical 0.33 of the 5th segment, black, rest white. Antenna with a white band beyond the middle, flagellum thickly covered with longish pubescence.

Length : Female, 9–10 mm; ovipositor 4 mm. Male, 10 mm.

Distribution : India : Meghalaya (Khasi Hills).

2. *Mesostenus tricarinatus* Cameron

1906. *Mesostenus tricarinatus* Cameron, *J. Bombay Nat. Hist. Soc.*, **17** : 286. Female. des. Type : Female, Pakistan : Quetta (LONDON).

1961. *Mesostenus tricarinatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 183. Pakistan.

1987. *Mesostenus tricarinatus* : Gupta, *Mem, Amer. Ent. Inst.*, **41** : 811.

Female : Face and clypeus strongly punctate and thickly covered with white pubescence. Frons closely rugoso-punctate, intermixed with fine longitudinal striae, with a median longitudinal carina. Vertex closely punctate around ocellar triangle, at

sides shiny with sparse fine punctures. Pronotum, mesoscutum, mesopleurum and mesosternum closely and strongly punctate, covered with white hair. Scutellum shiny, sparsely punctate. Propodeum with strong apical and basal carinae; apical carina strongly arched in the middle, at base medially strongly punctate, at side smooth and shiny; area between apical and basal carinae rugoso-punctate, tending to be reticulate, the apical slope strongly trans-striate. Metapleurum closely rugoso-punctate. Abdomen smooth, its petiole long and slender. Areolet narrow, twice longer than wide, recurrent vein received at the apex.

Black. Antenna with apical segments brownish below. The following are yellow: Face broadly at sides, clypeus except the apex, mandible except teeth, inner orbits narrowly, narrow line in the center of outer orbit, lateral carinae of scutellum, its sides broadly, tegula largely and subtegular ridge. Abdomen except the base of the petiole, red. Legs in general red. Fore and middle coxae and trochanters whitish-yellow; hind coxa, trochanters, apical 0.33 of tibia, tarsus with first segment wholly second at base and fifth segment wholly, black; rest of hind tarsus, white. Wings clear hyaline, stigma and veins black.

Male : Not known.

Length : Female, 8 mm.

Distibution : Pakistan (Quetta)

V. THE TRIBE GORYPHINI

Body stout to slender. Clypeus small to large, its apical margin evenly arched or truncate, weakly to strongly convex, at center sometimes with a weak median lobe, pair of weak tubercles or a median tooth. Frons with or without a median horn or tooth, sometimes with a semicircular carina behind each antennal socket or flanges above each antennal socket. Mandible short or moderately long, teeth equal, sometimes lower tooth or upper tooth shorter than the other. Occipital carina joining hypostomal carina above base of mandible or at or almost at base of mandible. Pronotal shoulder often swollen. Notaulus weakly to strongly impressed, reaching to center or a little beyond of mesoscutum. Epomia long and strong, sometimes weak or absent. Sternaulus usually extending up to base of middle coxa, straight, weakly curved or its apical 0.5 weakly sinuate. Mesopleural pit is some distance in front of mesopleural suture, the pit often connected with mesopleural suture by a shallow impression or groove. Median part of postpectal carina present, long and straight. Hind margin of metanotum with a small triangular or crescentic lobe just either side of metascutellum. Propodeum short to long, basal carina complete, apical carina complete, interrupted, sometimes absent, sublateraly with crest or tooth-like apophyses. Propodeal spiracle circular,

elliptic or elongated. Ramulus absent. Areolet small, square, pentagonal, higher than wide or wider than high, intercubiti convergent foward, sometimes parallel, and sometimes second intercubitus absent. Nervulus opposite basal vein, sometimes basad or little distad. Mediella arched. Nervellus intercepted usually below the middle or at the middle or above the middle. Brachiella present or absent. Axillus converging towards anal margin. First tergite usually with a basal lateral tooth, its spiracle always behind the middle, all the sets of longitudinal carinae present and complete (in females), but sometimes weak, incomplete or absent in varying degree. Ovipositor sheath about 0.6 to 1.0× as long as hind tibia. Ovipositor stout, slender, its tip narrow sagittate, with a distinct nodus and lower valve with teeth, rarely the lower valve with a weak dorsal lobe.

This tribe is represented by about 40 genera. In India and adjacent countries 19 genera have been reported. These can be distinguished by the following key :

Key to the genera of tribe Goryphini

1. First abdominal segment without longitudinal carinae or ridges, its spiracle near the apical 0.47 Propodeum about 1.2× as long as wide, the portion behind basal carina polished or subpolished and usually covered with regular transverse wrinkles. Apical carina of propodeum absent or blunt and very close to apex. Arolet about 1.4× as wide as high. Oriental Region .... 6. ***Friona*** Cameron

– First abdominal segment either with longitudinal carinae or ridges and/or its spiracles behind the apical 0.45. Propodeum usually less than 1.0 as long as wide, the portion behind basal carina usually mat and/or punctate, if wrinkled, the wrinkles irregular. Areolet usually less than 1.4× as wide as high 2

2. Epomia weak or absent, when present divergent abruptly from swollen front margin of pronotal collar, this swelling continued dorsad up to epomia. Scutellum often with lateral carina on its basal 0.4 to 0.7 3

– Epomia weak to strong, divergent gradually from swollen front margin of pronotal collar, the submarginal swelling absent or weaker dorsad of its juncture with epomia. Scutellum without lateral carina, or with lateral carina on its basal 0.35 or less 5

3. Nervellus intercepted near its upper 0.37, strongly reclivous. Oriental and Ethiopian regions ..... 5. ***Menaforia*** Seyrig

– Nervellus intercepted at or below its center, subvertical or weakly reclivous. 4

4. Clypeus elliptic and evenly convex. Apical propodeal carina inverted V-shaped, with the median angle somewhat rounded and with very weak sublateral crests. Upper valve of ovipositor heavy and in profile weakly convex between nodus and apex, teeth on lower valve weak. Afro-tropical, Indo-Australian regions and Japan. ..... 1. ***Necolio*** Cheesman

– Clypeus not elliptic and not evenly convex. Apical propodeal carina more transverse, usually with stronger sublateral crests. Ovipositor not as above. 5

5. Ventro-lateral part of abdominal petiole rounded, without a longitudinal angulation or carina separating its lateral face from ventral face. India... ..... 3. ***Neobuodias*** Rao & Nikam

– Ventrolateral part of abdominal petiole with a longitudinal angulation or carina separating its lateral face from its ventral face 6

6. Median section of posterior mesosternal carina short and high, 0.3 to 0.5 as high as its basal width. Ovipositor tip long and slender. Upper valve with down curve, sometimes straight to concave between nodus and apex. Areolet moderately small, transversely oblong. Indo-Australian region .... 4. ***Takastenus*** Uchida

– Median section of posterior mesosternal carina wide but not so high, about 0.1 to 0.2 as high as its basal width. Ovipositor tip stouter but short. Upper valve straight or convex between nodus and tip. Afrotropical and Indo-Australian regions ..... 2. ***Allophatnus*** Cameron

7. Frons with a median horn; scutellum without lateral carina. Areolet small, about 0.8 to 1.0 as wide as high Holarctic, Neotropical and Indo-Australian regions. ..... 7. ***Listrognathus*** Tschek

– Frons without a median horn 8

8. Frons with a semicircular carina above each antennal socket that encloses a shallow basin. Brachiella vein present or absent 9

– Frons without a semicircular carina above each antennal socket 12

9. Epomia long, strong and reaching upper margin of pronotum, then turned mesad, where it ends in a weak elevation (view from top). Nervulus basad of basal vein, sloping towards the base. Brachiella present, reaching more that 0.5 the distance to wing margin. Afrotropical and Oriental regions .. .. 11. ***Fotsiforia*** Seyrig

– Epomia short, weak to strong or sometimes obscured, not reaching upper margin of pronotum and not ending in an elevation. Nervulus various, brachiella absent or in the form of a small stump, if present, extending less than 0.5 the distance to wing margin (except in *Indostenus,* but here nervellus is intercepted at its upper 0.3) 10

10. Epomia and sternaulus obscured (absent) or almost indistinct. Prepectal carina short, extending as much as 0.5 the height of mesopleurum. First abdominal tergite short and stout, about 2× as long as wide at apex. Postpetiole as long as or a little longer than wide at base. Nervulus distinctly apicad of basal vein. Nervellus intercepted at its upper 0.36. Brachiella entirely absent. Ovipositor long, compressed, tip slightly up curved. Afrotropical and Indo-Australian regions. ..... 12. ***Gambroides*** Betrem

– Epomia and sternaulus distinctly present. Prepectal carina long, extending as much as 0.95 or up to the base of subtegular ridge. First abdominal tergite short to long, stout to slender, about 2 or 3× as long as wide at apex, postpetiole longer than wide or wider than long. Nervulus and nervellus conditions various. Brachiella present or absent. Ovipositor moderately short to long, tip straight or sometimes curved 11

11. First abdominal segment short and thick in shape, about 2 to 2.5× as long as wide at apex. Petiole short, quadrate, its spiracle close to the apex than to each other. Thorax short and robust. Abdomen depressed. Ovipositor tip short to long, less pointed, tip never curved. Oriental Region .... 13. ***Isotima*** Foerster

– First abdominal segment long and slender in shape, about 3× as long as wide at apex. Petiole long usually tubular, its spiracles close to each other than to the apex. Thorax long and slender. Abdomen largely spindle-shaped. Ovipositor tip long and pointed and usually straight and sometimes curved. Oriental Region. ..... 14. ***Formostenus*** Uchida

12. Brachiella almost or entirely absent. Apical carina of propodeum present in the middle. Oriental and Neotropical regions..... 17 ***Baltazaria*** Townes

– Brachiella present reaching atleast half the distance to wing margin. Apical carina of propodeum often lacking at the midline. 13

13. Lower tooth of mandible 0.2 to 0.6× as long upper tooth, the mandible narrow at apex. Epomia usually reaching to near upper margin of pronotum and there turned mesad. Ovipositor slender, tip long tapered. Indo-Australian region ..... 16. ***Euchalinus*** Townes

– Lower tooth of mandible at least two-thirds as long as upper tooth, the mandible moderately wide at apex. 14

14. Petiole of first tergite with a longitudinal angulation or carina separating its lateral from its ventral surface. Sternaulus reaching to middle coxa. Ovipositor tip short to moderately long, its teeth distinct. 15

– Petiole of first tergite rounded ventrolaterally, without a longitudinal angulation or carina separating its lateral from its ventral surface. Sternaulus often not reaching to middle coxa. Ovipositor tip very long, teeth very weak and indistinct 17

15. Apex of clypeus broadly truncate, with a small subapical median tooth. Spiracle of first abdominal tergite at mid-length or a little behind. Ovipositor strongly compressed laterally. Oriental Region .....
..... 10. ***Perjiva*** Jonathan & Gupta

– Apex of clypeus not truncate, without a subapical tooth. Spiracle of first abdominal tergite always behind the mid-length. Ovipositor not so strongly compressed 16

16. First abdominal tergite less than 2× as long as wide at apex and postpetiole much wider at base (width = distance between spiracle) than long (length = distance between spiracle and apex on mid-line). Ovipositor tip usually short and blunt, and not so pointed. Propodeal apophyses generally crest-like. Old world tropics ..... 8. ***Goryphus*** Holmgren

– First abdominal tergite 2× or more as long as wide at apex, and postpetiole as wide or less wider than long at base. Ovipositor tip usually long and pointed. Propodeal apophyses largely long and poined, rarely crest-like Indo-Papuan area ..... 9. ***Skeatia*** Cameron

17 Sternaulus reaching to middle coxa. Propodeum of female with strong, tooth-like apophyses. Ovipositor tip about 8× as long as deep. Indo-Papuan area.
..... 15. ***Melcha*** Cameron

– Sternaulus reaching 0.4 to 0.6 the distance to middle coxa. Propodeum of female with weak sublateral crests. Ovipositor tip about 6× as long as deep.

18. Occipital carina weakly sinuate, joining hypostomal carina above base of mandible. Clypeus weakly convex, without apical median tooth. Mandible with its lower tooth little shorter than upper tooth. Oriental Region. .....
..... 18. ***Colaulus*** Townes

– Occipetal carina strongly sinuate or curved, joining hypostomal carina at base of mandible. Clypeus with a median apical tooth. Mandible with equal teeth. India ..... 19. ***Pseudotricapus*** Jonathan

1. Genus ***Necolio*** Cheesman (Fig. 48 : a–c)

1936. *Necolio* Cheesman, *Nova Guinea*, **17** : 373. Type-species : *Necolio jugosus* Cheesman; originl designation.

1952. *Afrocryptus* Seyrig, *Mem. Acad. Malgache*, **19** (39) : 162. Type-species : *Afrocryptus imperialis* Seyrig; original designation. Syn. by Townes, 1970.

Taxonomy : Townes, Townes & Gupta, 1961 : 168. Townes, 1970 : 241. Gauld, 1984a : 170.

Distribution : Afrotropical and Indo-Australian regions and Japan.

This genus is easily distinguished by the absence of median apical tooth on clypeus; nervellus intercepted at or below the middle; basal transverse carina of propodium complete and first abdominal tergite with a basal lateral tooth.

Frons with a median vertical carina or a median vertical groove. Clypeus apically convex, without a median tooth, sometimes with a slight median apical elevation. Lower end of occipital carina not sinuate and ending some distance away from the base of mandible. Both the teeth of mandible almost equal in length. Lower part of pronatal collar margined behind by a carina that is some distance from front edge. Epomia absent or rather weak. Sternaulus short but strong. Lateral carina of scutellum extending up to a maximum of 0.7 the length of scutellum. Apical carina of propodeum complete or sometimes interrupted in the middle with weak lateral crests, basal transverse carina distinct. Propodeal spriracles 2.5 to 4.0× as long as wide. Areolet about 0.5 as high as the portion of second recurrent vein in front of bulla, and as wide as high. Nervellus intercepted near its lower 0.28. Brachiella reaching almost to wing margin. First abdominal segment with a lateral triangular tooth at base, its ventro-lateral carina absent, dorsolateral carina present or absent, dorso-median carinae present or absent, spiracle behind the middle. Ovipositor sheath about 1.05× as long as hind tibia. Dorsal value of ovipositor tip deep, its dorsal profile not angulate at nodus but evenly arched to apex; lower value of ovipositor tip with ridges only near apex. (Townes, 1970 : 241).

This genus is distributed in Japan, the Indo-Australian and Ethiopian regions. In Indian subregion this genus is represented by three species. *Necolio rugifrons* (Cameron) from Sikkim is known by its type male. *N. indicus* (Rao) from Tamil Nadu and *N. testaceipes* (Cameron) from Meghalaya are known by their type females only. By the descriptions given by the authors of these species, it appears that the male type of *rugifrons* belongs to *testaceipes.*

A key to the species is given below, however, *rugifrons* is distinguished only by the characters of male.

Key to the species of *Necolio*

1. Face, clypeus, a line on upper inner orbits and broad line on lower outer orbits; propodeum at base, a squarish mark in the center behind the apophyses, its apical slope and base of hind wing, yellow (Male only). India : Sikkim. ..... 1. *rugifrons* (Cameron)

– Colour various 2

2. Antennal flagellum with 8–12 segments white. Inner orbits narrowly and outer orbits somewhat broadly on the lower side, yellow. Legs in general light yellow and apices of abdominal tergites obscurely yellow. (Female only). India : Meghalaya ..... 2. *testaceipes* (Cameron)

– Antennal flagellum with 6–11 segments white. Inner and outer orbits not marked yellow, rather face with a yellowish mark in the middle. Legs in general orange (ferrugineous) and apices of first, second and third abdominal tergites with whitish-yellow bands and apex of abdomen also whitish-yellow. (Female only). India : Tamil Nadu ..... 3 *indicus* (Rao)

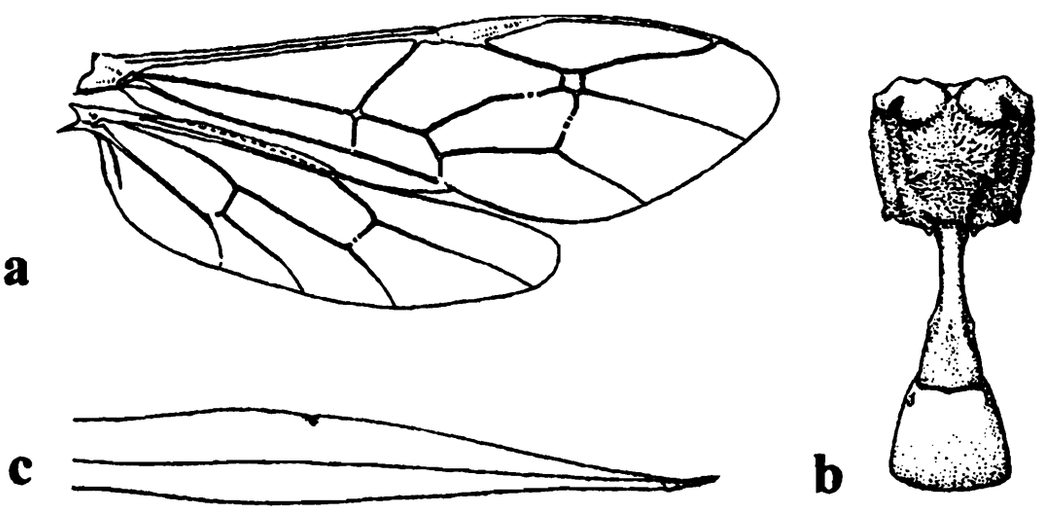

Fig. 48. *Necolio* Cheesman : **a**, fore and hind wings showing venation; **b**, propodeum, first and second tergite in dorsal view; **c**, ovipositor tip. (Source : Townes, 1970).

1. *Necolio rugifrons* (Cameron)

1907. *Buodias rugifrons* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **19** : 180. Male. des. Type : Male, India : Sikkim (LONDON).

1961. *Necolio rugifrons* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 168. n. comb. India.

1987. *Necolio rugifrons* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 812.

Male : Face closely and strongly punctate; clypeus smooth. Frons finely rugosely reticulate with a median longitudinal carina extending down from median ocellus; frons below with trans-striations. Vertex closely punctate. Mesoscutum distinctly punctate. Scutullum smooth. Base of propodeum with scattered punctures, rest longitudinally reticulate, intermixed with scattered punctures, lateral crest weak. Areolet in fore wing almost equal sided. Nervellus intercepted at the middle.

Black. The following are yellowish-white : Face, clypeus, basal half of mandible, palpi, inner orbit and outer orbits on the lower half, a line on the base of propleurae extending broadly on to the pronotum, a line on the side of pronotum, a spot on the middle lobe of mesoscutum, scutellum, base of propopodeum, a squarish mark in the center behind the apophyses, apical slope of propodeum, base of hind wing, apical three fourths of metapleurum, apices of second abdominal tergite, yellow. Fore and middle legs pale yellow, femora dark yellow. Hind legs reddish-yellow, their trochanters, apical half of femora and tibiae in middle blackish; tarsi whitish, narrowly black at the base. Antennal flagellum with a white band. Wings hyaline.

Length : Male, 10 mm.

Distribution : India : Sikkim.

2. *Necolio testaceipes* (Cameron)

1903. *Etha testaceipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 24. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Necolio testaceipes* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 168. n. comb. India.

1987. *Necolio testaceipes* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 813.

Female : Face closely punctate, broadly convex in the middle, surface covered with short sparse white pubescence. Clypeus roundly convex, smooth. Mesoscutum subpolished granulose, notauli long and distinct. Scutellum smooth and shiny. Pronotum striate in the scrobe, upper margin strongly aciculated, below smooth. Mesopleurum granulose, coarsely aciculated, sternaulus wide and striated. Metapleurum closely rugoso-punctate, punctures running into striations. Propodeum closely rugoso-punctate, both the transverse carinae, present, central and apical part thickly covered with short white pubescence, apophyses crest-like. First abdominal tergite smooth and shiny, apically depressed in the middle, following tergites mat and subpolished. Areolet squarish, nervulus slightly basad of basal vein.

Black. 8–12 antennal segments white. Clypeus separated from face by a black line. Mandible and palpi yellow. Inner orbits narrowly and outer orbits below

broadly yellow. Scutellum, metascutellum, pronotum and tegula also yellow. Legs is general light yellow; anterior coxae and trochanters yellow; middle coxa brownish; hind coxae broadly black in the middle; hind femur with a blackish line above, tarsus whitish. Apices of all abdominal tergites obscurely yellow.

Body length : 12 mm.

Distribution : India : Meghalaya (Khasi Hills).

3. ***Necolio indicus*** (Rao) (Fig. 49 : a–d)

1953. *Phaedraspis indica* Rao, *Indian Forest Rec. (N.S.) Ent.*, **8** : 221. Female. des., fig. Type : Female, India : Tamil Nadu : Wynaad (DEHRA DUN).

1961. *Phaedraspis* ? *indica* : Townes, Townes & Gupta, *Mem, Amer. Ent. Inst.*, **1** : 144. India.

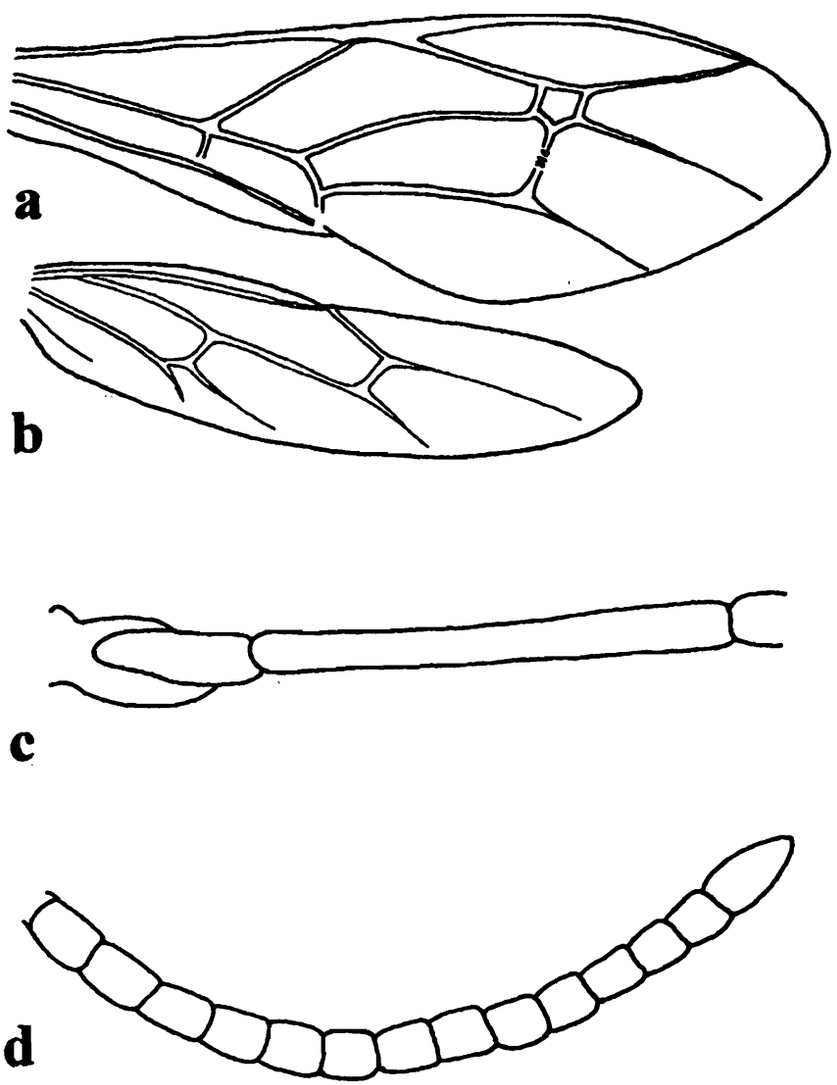

Fig. 49. *Necolio indicus* (Rao) : **a**, **b**, fore and hind wings; **c**, scape, pedical and 1st flagellar segment; **d**, apical antennal segments. (Source : Rao, 1953).

1964. *Necolio indicus* : Gupta, *Pacific Ins.*, **6** : 233. n. comb. notes on type.

1987. *Necolio indicus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 812.

Female : Head transverse, nearly rectangular, occiput finely pubescent, shiny. Frons subpolished, striato-punctate. Face flat, subpolished somewhat longitudinally striate. Clypeus separated from face by a groove, convex, finely pubescent. Mandible with equal teeth. Malar space short. Temple broad. Mesoscutum with deep distinct notauli, finely pubescent, sparsely minutely and shallowly punctate. Scutellum convex, coarsely shallowly and sparsely punctate; metascutellum shiny. Propodeum with lateral crest-like apophyses, coarsely strongly punctate. Mesopleurum rugose. Metapleurum rugoso-reticulate. Wings slightly smoky, fore wing nearly thrice as long as broad. Abdomen long, depressed up to the middle and apically compressed; second tergite finely punctate, following tergites indistinctly punctate. Ovipositor long.

Black. 6–11 antennal segments white, terminal segment and pedicel blackish-brown. Face brownish-black with a yellowish mark in the middle. Clypeus whitish; mandible pale white at base, teeth brownish-black. Palpi yellowish-brown. Scutellum light brown; metascutellum white in the middle, black at sides. Tegula yellowish-brown. Propodeum with whitish blunt tooth-like apophyses and whitish-yellow spots anteriorly. Legs in general reddish-orange; fore leg yellowish; hind coxa, trochanter and femur orange; hind tibia blackish-brown, darker at ends; apical tarsal segments dark brown. Wings smoky. Abdomen with apices of 1–3 tergites yellowish-white and extreme apex of abdomen with a yellowish-white mark.

Body length : 13 mm.

Distribution : India : Tamil Nadu (Wynaad).

2. Genus ***Allophatnus*** Cameron (Fig. 50 : a–c)

1905. *Allophatnus* Cameron, *Rec. Albany Mus.*, **1** : 233. Type-species : *Allophatnus fulvipes* Cameron; monobasic.

1906. *Phaedraspis* Cameron, *Entomologist*, **39** : 196. Syn. by Townes, 1971 : 239. Type-species : (*Phaedraspis rufobalteata* Cameron) = *fulvitergus* Tosquinet; monobasic.

1907. *Stictocryptus* Cameron, *Ztschr. system. Hymen. Dipt.*, **7** : 462. Syn. by Townes, Townes & Gupta 1961. Type-species : (*Stictocryptus testaceus* Cameron) = *fulvitergus* Tosquinet; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 143 (as *Phaedraspis*). Townes, 1970 : 242; 1971 : 239. Gauld, 1984 : 147.

Distribution : Afro-tropical and Indo-Australian regions.

Host : Lepidopterous borers in Graminae.

This genus is easily distinguished by having basal transverse carina of propodeum complete; first abdominal tergite with a lateral triangular tooth or flange at base; lower end of occipital carina ending some distance above the base of mandible and clypeus without a median tooth.

Frons with a median vertical carina which may be interrupted medially. Clypeal profile flattened or somewhat impressed near apex. Occipital carina below not sinuate or weakly sinuate. Mandibular teeth equal. Epomia absent. Lateral carina of scutellum reaching 0.3 to 0.8 the distance to apex. Basal carina of propodeum complete; apical carina also complete with distinct sublateral crests. Propodeal spiracle about 2.0× as long as wide. Areolet in fore wing about 1.25× as wide as high, about as high as the portion by second recurrent vein above the bulla; mediella moderately arched; nervellus intercepted near its lower 0.45; brachiella reaching almost to wing margin. Submedian and brachial cells of fore wings with as many hairs on lower side as on upper side. First tergite with a lateral tooth at base. Ovipositor sheath about 1× as long as hind tibia, its ovipositor tip with a distinct nodus.

This genus is represented by two species viz., *A. fulvitergus* (Tosquinet) based on male and female and *A. abdominalis* (Szepligeti) based on a male. A key to species could not be provided here because of lack of study material of both the species.

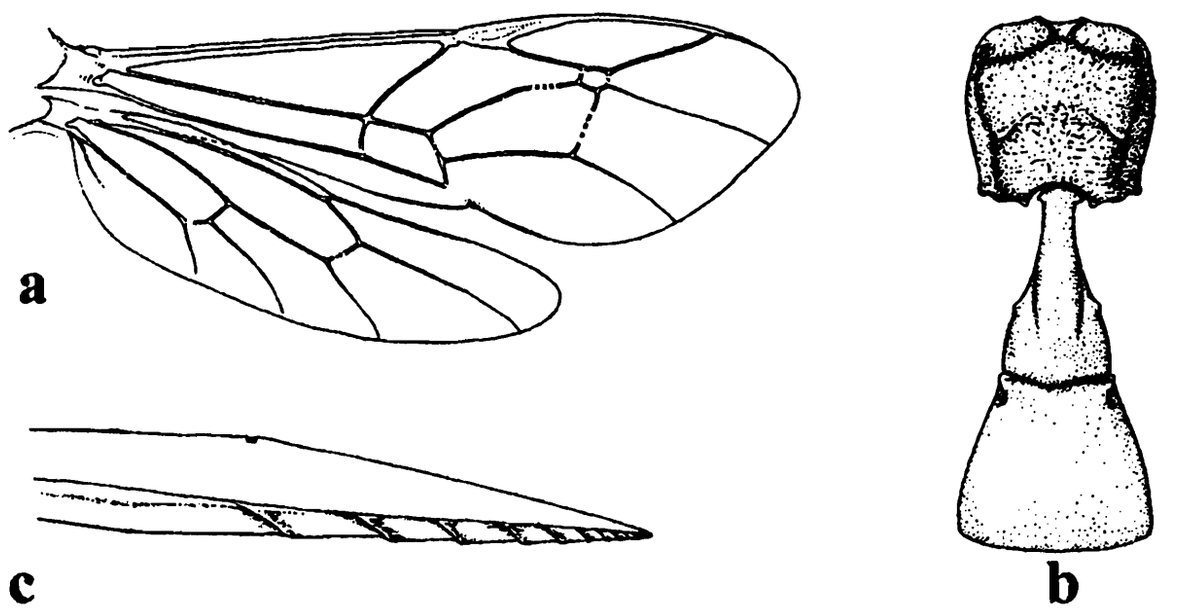

Fig. 50. *Allophatnus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

1. ***Allophatnus fulvitergus*** (Tosquinet) (Fig. 51 : a, b)

1903. *Cryptus fulvitergus* Tosquinet, *Mem. Soc. Ent. Belgique,* **10** : 199. Male des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Male, Indonesia : Sumatra : Pangherang–Pissang (GENOA).

1903. *Cryptus lenocinans* Tosquinet, *Mem. Soc. Ent. Belgique,* **10** : 204. Female des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, Indonesia : Sumatra : Pangherang–Pissang (GENOA) Syn. by Townes, Townes & Gupta, 1961.

1906. *Phaedraspis rufobalteata* Cameron, *Entomologist,* **39** : 197. Female des. Type : Female, Indonesia : Sumatra : Bindji; Deli (LONDON). Syn. by Townes, Townes & Gupta, 1961.

1907. *Stictocryptus testaceus* : Cameron, *Ztschr. System. Hymen. Dipt.,* **7** : 462. Male des. Type : Male, India : Maharashtra : Deesa (LONDON). Syn. by Townes, Townes & Gupta, 1961.

1908. *Cryptus lenocinans* : Szépligeti, *Notes Leyden Mus.,* **29** : 241. Female. Indonesia : Java : Semarang.

1923. *Stictocryptus testaceus* : Dutta, *Men. Dept. Agri. India (Ent.* Ser), **8** : 25. India : Bihar : Chhapra. Tamil Nadu : Coimbatore.

1931. *Mesostenus (Mesostenus) takanoi* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.,* **30** : 185. Male, Female, key des., fig. Lectotype (designated by Townes, Townes & Gupta, 1961). Female, Taiwan : Hsinhua (= Sinhwa) (SAPPORO). Syn. by Uchida, 1958 with *testaceus.*

1932. *Goryphus takanoi* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.,* **33** : 172. Male, Female, n. comb. Taiwan : Kangkou (= Kankau); Fengshan; Tainan; Anping; Tinshungchi (= Chosokei).

1956. *Stictocryptus testaceus* : Uchia, *Insecta Matsumurana,* **19** : 90. Male. Syn. Ryukyus : Amami Oshima : Koniya.

1961. *Phaedrospis fulvitergus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 143. Lectotype design, syn. India. Java. Ryukyus. Sumatra.

1970. *Phedraspis fulvitergus* : Momoi, *Pacific Ins.,* **12** : 355. distr. Ryukyus.

1971. *Allophatnus fulvitergus* : Townes, *Mem. Amer. Ent. Inst.,* **17** : 239. n. com.

1987. *Allophatnus fulvitergus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 814.

Female : Face and clypeus closely and strongly punctate. Frons in the middle somewhat strongly trans-striate, its sides and vertex almost smooth. Pro- and mesothorax closely and strongly punctate. Mesoscutum covered with thich yellowish pubescence. Scutellum closely punctate. Metascutellum smooth. Meso- and Metapleurum closely punctate, tending to be striate. Abdomen with 2nd and 3rd segment closely punctate.

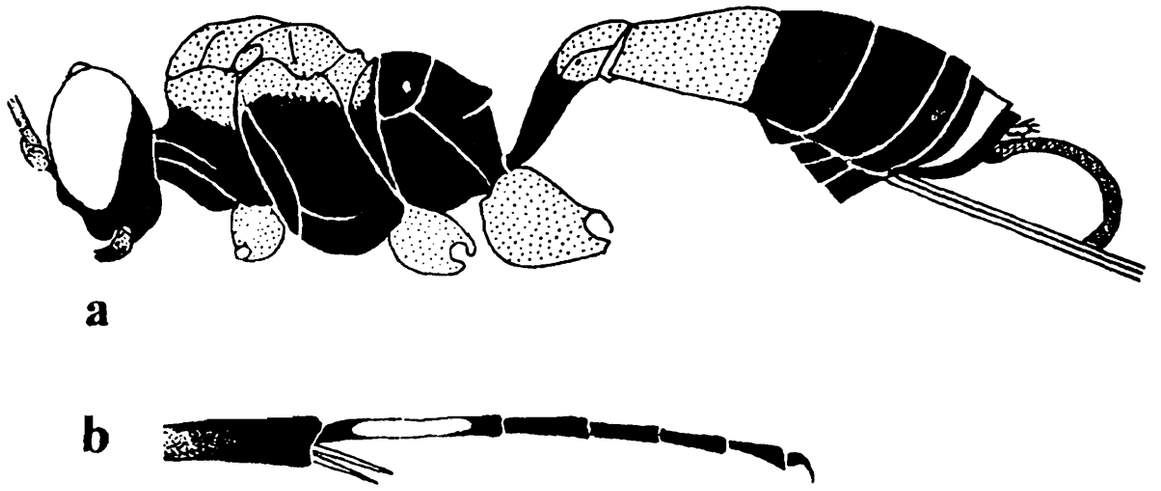

Fig. 51. *Allophatnus fulvitergus* (Tosquenet) : Colour pattern : **a**, Body side view, female; **b**, hind tarsus, male.

Black. Head wholly black, except frons along eye margin with or without yellow marks. Mesoscutum (Fig. 51 : a), scutellum, upper edge of mesopleurum narrowly, labrum and mandible, apical half of post petiole, 2nd tergite wholly and 3rd segment ventrally, and legs, red; hind tarsus black. 7th tergite above white. Antenna a with five middle joints white. Wings clear hyaline, stigma and nerves black.

Male : Face and clypeus closely punctate. Face, clypeus, mandible covered with white pubescence. Frons in middle trans-striate, rest of frons and vertex closely punctate. Thorax in general strongly and closely punctate. Propodeum more closely and strongly punctate. Postpetiole strongly and closely punctate. Abdomenal segments finely punctate.

Reddish-yellow (orange). Scutellum at apex and base of petiole deep yellow. Head black. Face at sides, frons along the eye margin, outer orbits, clypeus, mandible except teeth, palpi, whitish-yellow. Mesopleurum except narrowly at base, and above broadly below tegula, mesosternum, metapleurum at base and narrowly above, abdominal tergites 4th, 5th, 6th and base of 7th, black; the rest of 7th tergite white. Legs largely reddish-yellow. Middle and hind coxae broadly at base, apical half of hind tibiae and tarsus black (Fig. 51 : b); except its first joint largely white. Antennal segments black, densely covered with short pubescence.

Length : Female, 8–12 mm; ovipositor sheath about 2–3.5 mm. Male, 11 mm.

Distribution : India : Bihar (Chapra). Maharashtra (Deesa). Tamil Nadu (Coimbatore). *Elsewhere* : Indonesia : Sumatra (Pangherang-Pissang; Bindji; Deli); Java (Semerang). Taiwan : Hsinhua (= Sinhwa); Kangkou (= Kankau); Fingshan; Tainan; Anping; Tinshungchi (= Chosokei). Ryukyus (Amami Oshima : Koniya).

2. ***Allophatnus abdominalis*** (Szépligeti)

1916. *Neomesostenus abdominalis* Szépligeti, *Ann. Mus. Nate. Hungarici,* **14** : 294. Male. key, des. Type : Male, India : Maharashtra : Bombay (BUDAPEST).

1961. *Phaedraspis* ? *abdominalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 143. n. comb. India.

1987. *Allophatnus abdominalis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 813.

Very little is known about this species. This species is known by its male type from Bombay in Maharashtra state.

Distribution : India : Maharashtra (Bombay).

3. Genus ***Neobuodias*** Rao & Nikam (Fig. 52 : a–f)

1984. *Neobuodias* Rao & Nikam, *Entomon,* **8** : 179. (1983). Type-species : *Neobuodias indicus* Rao & Nikam; original designation.

Distribution : India.

This genus is easily distinguished by having areolet 0.6× as high as the portion of second recurrent vein above bulla; upper valve of the ovipositor tip straight; frons with a median vertical carina.

Frons with a median vertical carina. Clypeus without any median tooth. Epomia on pronotum strong, apically divergent. Sternaulus reaching middle coxa. Basal transverse carina of propodeum complete, apical carina also complete, orched in the middle, propodeal spiracles longish-oval. Areolet in fore wing 0.6× as high as the portion of second recurrent vein above bulla; mediella weakly convex. First abdominal tergite with basal lateral teeth. Ovipositor long, slender, nodus distinct, upper valve of ovipositor tip straight.

This is a small genus, known by its Type-species from India.

1. ***Neobuodias indicus*** Rao & Nikam (Fig. 52 : a–f)

1984. *Neobuodias indicus* Rao & Nikam, *Entomon,* **8** : 179. (1983). Female. des., fig. Type : female, India : Maharashtra : Aurangabad : Himayatbagh (NIKAM).

1987. *Neobuodias indicus* : Gupta, *Mem. Amer. Ent. Inst.,* 41 : 814. Syn.

Female : Face with short, fine pubescence, closely punctate. Clypeus with fine, sparse punctures, meadially convex, 2× broad than long. Mandible striato-punctate. Frons rugoso-striate. Malar space granulose, 2× as long as the basal width of mandible. Vertex finely punctate. Occipital carina almost touching the base of mandible. Pronotum reticulo-punctate. Mesoscutum with deep strong

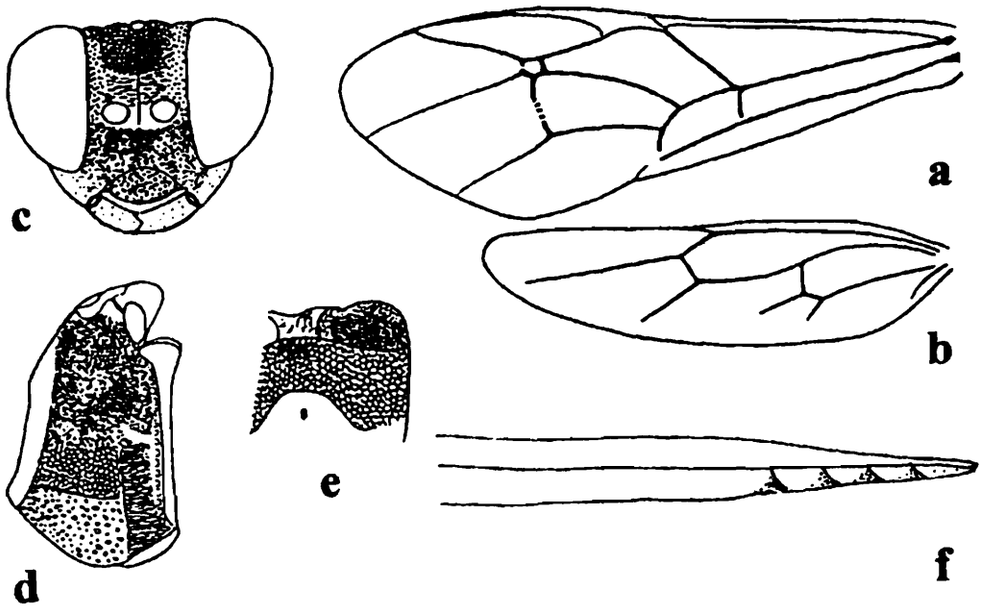

Fig. 52. *Neobuodias indicus* Rao : **a, b,** Fore and hind wings; **c,** head front view; **d,** mesopleurum; **e,** propodeum dorsal view (Part); **f,** ovipositor tip (Source : Rao & Nikam, 1984).

notauli, with sparse deep punctures. Scutellum sparsely punctate. Mesopleurum moderately strongly punctate, with a striate area above the base of middle coxa, prepectal carina extending 0.5 the height of mesopleurum. Metapleurum reticulate. Propodeum largely punctate at base, rest moderately strongly rugose. Abdomen depressed, first tergite longer than second tergite, abdomen largely closely punctate. Ovipositor long, its sheath about 2× as long as its hind tibia.

Dark brown. Face, frons, inter-ocellar space and vertex, blackish. Antenna apically and basally blackish-brown, with a whitish band; abdomen at apex blackish.

Male : Not Known.

Length : Female, 12.5 mm.

Distribution : India : Maharashtra (Aurangabad).

4. Genus ***Takastenus*** Uchida (Fig. 53 : a–c)

1931. *Takastenus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 188. Type-species : *Takastenus longidentatus* Uchida; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 171. Townes, 1970 : 247 (as a syn. of *Buodias).* Gauld, 1984 : 176. Townes (1970, 1973) Synonymized this and three African genera under *Buodias*. Gupta, 1969 : 24 (considered *Buodias* as a distinct genus).

Distribution : Indo-Australian Region.

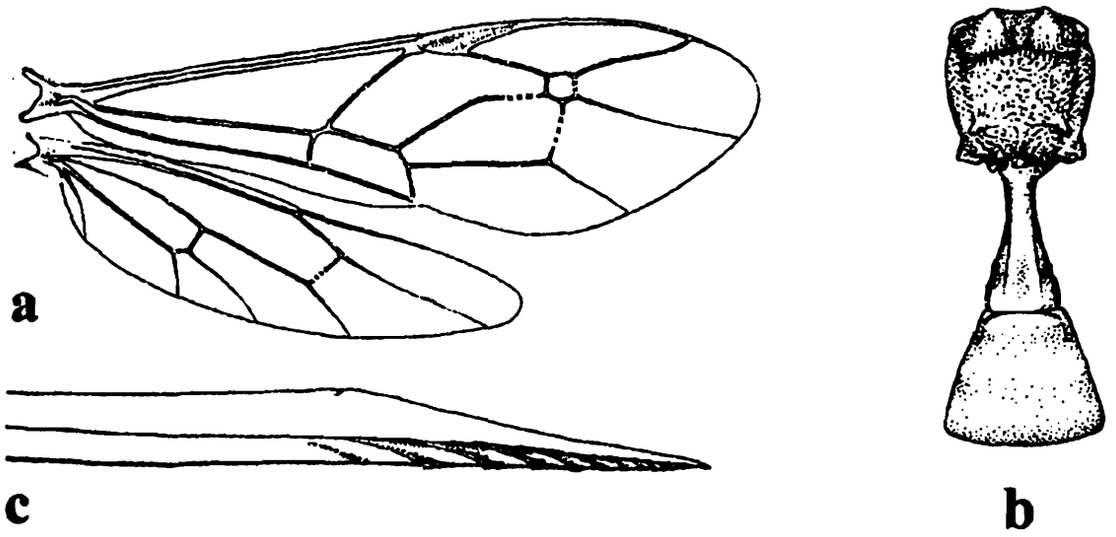

Fig. 53. *Takastenus* Uchida : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

This genus is mainly recognised by the following characters: Frons usually with a median vertical groove or a vertical carina. This carina sometimes elevated or crested. Clypeus with a median tooth. Mandibular teeth almost equal in length. Epomia present, weak or strong. Lateral carina of scutellum present or absent. Apical carina of propodeum present laterally as sharp and long apophyses, between the apophyses weak or absent. Areolet squarish or a little wider than high. Nervulus basad of basal vein, vertical. Mediella moderately arched. Nervellus intercepted near its lower 0.25-0.33. Brachiella reaching the wing margin. First tergite with a lateral tooth at base. Ventro-lateral part of abdominal petiole with a longitudinal angulation or carina separating its lateral face from its ventral face. Tergite with dorso-median and dorso-lateral carinae; spiracle at its apical 0.3–0.4. Ovipositor sheath about 0.7 to 1.0× as long as hind tibia; its tip moderately long, with a distinct nodus, upper valve with down curve, sometimes straight to concave, lower valve with distinct teeth.

This moderately large genus is represented by two species from India and Sri Lanka.

Key to the species of *Takastenus*

1. Female 2

– Male 3

2. Temple and whole of pronotal collar yellow. Metascutellum black. Propodeum with two elongate mark on apical slope including apophyses. Basad of basal carina of propodeum between the longitudinal carinae with a median yellow mark. All abdominal tergites, including 5–6 with yellow apical band. India : Karnataka. Sri Lanka ..... 1. *bituberculatus* (Cameron)

– Temple black. Pronotal colar above just behind neck, yellow. Metascutellum yellow. Propodeum with only the apophyses yellow. Based of basal carina entirely black. Abdomen with 5–6 tergites is almost entirely black. India : Bihar; Jharkhand; Maharashtra ..... 2. *octobalteatus* (Cameron)

3. Mesoscutum with an oval mark at the apex of middle lobe. Hind tarsus wholly yellow ..... 1. *bituberculatus* (Cameron)

– Mesoscutum black, without any mark. Hind tarsus with a white band .... 2. *octobalteatus* (Cameron)

1. ***Takastenus bituberculatus*** (Cameron) (Fig. 54 : a–c)

1905. *Friona bituberculatus* Cameron, *Spolia Zeylanica,* **3** : 111. Male. key, des. Type : Male, Sri Lanka : Kandy (LONDON).

1905 *Buodias rufipes* Cameron, *Spolia Zeylanica,* **3** : 106. Female. Name preoce. by Cameron, July 1905. des. fig. Type : Female, Sri Lanka : Kandy (LONDON). **New synonymy.**

1961. *Takastenus bituberculatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 171. n. Comb. Sri Lanka.

1961. *Takastenus deflexus* : Townes, Townes & Gupta, *Mem. Amer. Ent.,* **1** : 171. new name proposed for *Buodias rufipes* Cameron. Sri Lanka.

1987. *Takasfenus bituberculatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 816.

1987. *Takastenus deflexus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 816.

This species is mainly recognised by having propodeum with two elongate mark on apical slope including apophyses. Temple and whole of pronotal collar and apices of all the abdominal tergites, yellow. Basad of basal carina between longitudinal carinae on propodeum yellow.

Female : Face rugoso-punctate, rugae vertical. Clypeus subpolished, sparsely and shallowly punctate. Malar space granulose, about 0.5× the basal width of mandible. Mandible striato-punctate. Frons with a strong median carina, area between median ocellus and antennal sockets with diverging coarse striae, at sides smooth and subpolished. Vertex and temple smooth and shiny. Pronotum subpolished, scrobe and along posterior margin with strong coarse striations, its upper margin with weak circular striations and weak punctures, epomia moderately strong. Mesoscutum subpolished with fine sparse not so distinct punctures. Scutellum and metascutellum shiny without distinct punctures, lateral carina of scutellum extending 0.4 its length. Mesopleurum from the base of subtegular ridge to its middle trans-striate, from middle to sternaulus regoso-punctate, speculum and area near base of middle coxa distinctly punctate,

sternaulus sinuate, extending up to the base of middle coxa, prepectal carina 0.8× the hight of mesopleurum. Metapleurum moderately strongly trans-rugose near pleural carina rugoso-punctate, juxtacoxal carina not well defined. Propodeum between basal carina and apex moderately strongly reticulo-wrinkled, basad of basal carina dull, shallowly punctate, basal carina complete, apical carina absent, represented by strongly high conical tubercle-like apophyses, spiracle longish. First abdominal tergite smooth and shiny, second tergite with dense setiferous punctures, following tergites mat and subpolished. Ovipositor sheath about 1.0× as long as hind tibia, its tip down-cure (as in *Buodias*) (Fig. 54 : c).

Black : 4–9 flagellar segments white. The following are yellow : Face, frons, vertex and temple along the orbit (except at malar space), face (Fig. 54 : b) also in the middle with a small mark, clypeus centrally, pronotal collar, mesoscutum at the base of middle lobe and continue along the notauli, scutellum, lateral carina of scutellum, tegula, subtegular ridge, area near the base of hind wing, propodeum basad of basal carina between the longitudinal carinae, two elongate mark including apophyses on apical slope (Fig. 54 : a), base and apex of first abdominal tergite and apices of all tergites. Legs in general dark yellow, except fore leg with fifth tarsal segment and whole of middle tarsus dark brown; hind leg with reddish hue, its first and second tarsal segments yellow, remaining dark brown. Wings clear hyaline with yellowish hue.

Male : Essentially similar to female in sculpture and color. Face and clypeus closely and shallowly punctate. Frons with a few short oblique striae in the middle, including median longitudinal carina. Pronotum with a few short striae in scrobe, rest smooth and shiny. Mesoscutum shiny with sparse, minute, indistinct punctures. Scutellum smooth and shiny, lateral carina at its basal 0.2. Mesopleurum above striate below striato-punctate, speculum smooth and shiny. Metapleurum and propodeum as in female. Wing venation similar to female. First abdominal tergite smooth and shiny and following tergites mat and subpolished.

Colour pattern almost similar to female, except as follows : Face wholly, mesoscutum with only central oval mark, yellow. Metascutellum also faintly yellow. Propodeum with a mark which is broader towards apex and narrow towards base. Abdomen and wings similar to female. Legs in general reddish-yellow, tarsi tending to be darker and hind tarsus wholly yellow.

Length : Female & Male, 13–15 mm; fore wing 10 mm; ovipositor sheath 5 mm.

Distribution : India : Karnataka (Bhagmandla, 800m.). *Elsewhere* : Sri Lanka (Kandy).

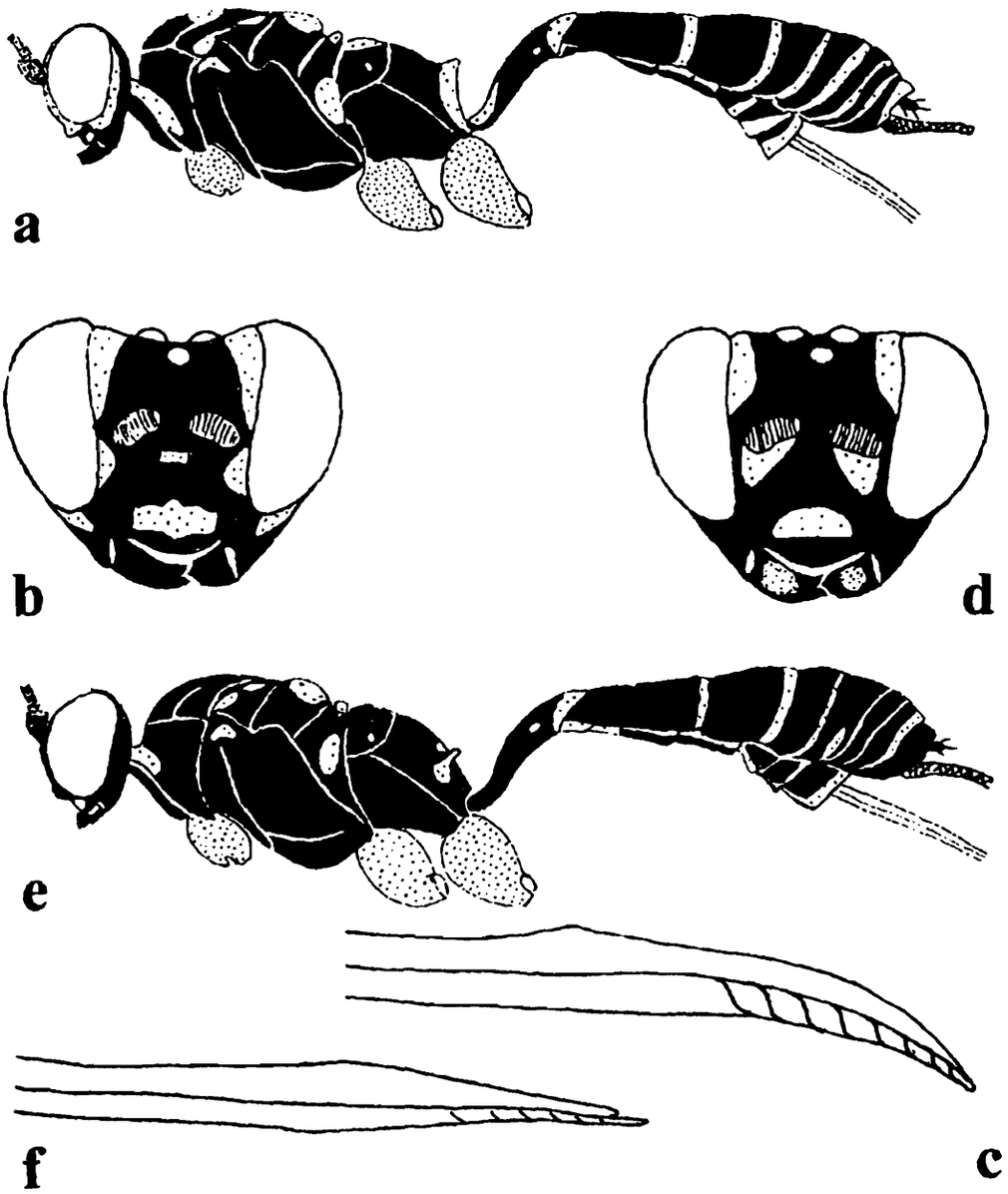

Fig. 54. Showing colour pattern. *Takastenus bituberculatus* (Cameron) : **a**, body side view; **b**, head front view; **c**, ovipositor tip. *Takastenus octobalteatus* (Cameron) : **d**, head front view; **e**, body side view; **f**, ovipositor tip.

2. ***Takastenus octobalteatus*** (Cameron), n. Comb. (Fig. 54 : d–f)

1907. *Friona octobalteata* Cameron, *J. Bombay Nat. Hist. Soc.*, **17** : 594. Male. des. Type : Male, India : Maharashtra : Deesa (LONDON).

1923. *Friona octobalteata* : Dutta, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 23. India : Bihar : Chapra; Pusa.

1961. *Friona octobalteata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 169. India.

1987. *Friona octobalteata* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 820.

This species is distinguished from *T bituberculatus* (Cameron) by having 5–6 abdominal tergites entirely black; propodeum with only the apophyses, yellow; and other characters as given in the key.

Female : Face in the middle rugoso-punctate, at side rugulose. Clypeus subpolished, sparesely shallowly punctate. Malar space granulose, 0.6× the basal width of mandible. Frons strongly wrinkled in the middle, with a median carina, at sides smooth and subpolished. Vertex and temple mat and subpolished. Pronotum strongly transversely wrinkled, towards the upper margin puncto-wrinkled, eponia strong. Mesoscutum smooth and shiny, with a few shallow scattered punctures. Scuttellum and metascutellum smooth and shiny, with a few indistinct punctures. Lateral carina of scutellum extending 0.5× the length of scutellum. Mesopleurum trans-wrinkled, speculum with shallow, sparse punctures, sternaulus sinuate; prepectal carina extending 0.75 the height of mesopleurum. Metapleurum strongly trans-wrinkled, juxtacoxal carina not present. Propodeum between basal carina and apex strongly reticulo-wrinkled; apical carina absent, apophyses high cone-shaped and pointed; spiracle longish-oval. First abdominal tergite mat and subpolished, second tergite with minute dense punctures, following tergites strongly granulose. Nervulus basad of basal vein by 0.6 its length. Nervellus intercepted at its lower 0.25. Ovipositor sheath about 1.0× as long as length of hind tibia, tip with nodus and indistinct teeth (Fig. 54 : f).

Black. 5–10 antennal segments white. The following are yellow : Face along the eye margin with triangular marks, clypeus in basal 0.5, mandibles except teeth, frons along the eye margin (Fig. 54 : d), pronotal collar above, scutellum, lateral carina of scutellum, metascutellum, area near to the base of hind wing, tegula, subtegular ridge, apophyses, a small dot-like mark between the apophyses, apices of first to fourth and seventh tergites of abdomen, except the band on fourth tergite becoming narrow and interrupted in the middle (Fig. 54 : e). Fore and middle legs in general light brownish-yellow, their apical tarsal segments dark brown. Hind leg with coxa, trochanter and femur brownish-yellow, tibia and tarsus brown, apical tarsal segment tending to be darker. Wings clear hyaline with light brownish hue.

Male : Essentially similar to female in sculpture and colour pattern, except as follows. Body much polished and slender, face rugoso-punctate. Clypeus with coarse shallow, sparse punctures. Frons striate, striae radiating from median ocellus. Pronotum smooth and polished with a few strong striae in the scrobe. Mesoscutum subpolished with sparse indistinct punctures. Scutellum and metascutellum shiny, with a few scattered punctures. Mesopleurum striato-punctate, speculum smooth, impunctate. Metapleurum finely wrinkled. Propodeum between basal carina and apex moderately strongly wrinkled, basad of basal

carina with moderately deep sparse punctures, spiracle small oval, apophyses short-blunt. First abdominal tergite smooth and shiny, following tergites mat and subpolished.

Colour as of female, except the facial marks extensive almost touching each other in the middle. Propodeal mark broader towards apex. First abdominal tergite also yellow at base, all the tergites with yellow apical bands. Fore leg deep yellow with reddish hue, its coxa blackish at base. Middle and hind leg reddish-yellow, except middle tarsus dark brown, and hind tarsus (variable) apical 0.25 of first segment to base of fourth white, sometimes third and fourth wholly dark brown. Wings clear hyaline with brownish hue

length : Female, 13.5 mm; fore wing 9.5 mm; Ovipositor sheath 5 mm. Male, 8.9 mm; fore wing 6.5 mm.

Distribution : India : Bihar (Chapra; Pusa). Jharkhand (Ranchi, Namkum). Maharashtra (Deesa).

5. Genus ***Menaforia*** Seyrig (Fig. 55 : a–c)

1952. *Menaforia* Seyrig, *Mem. Acad. Malgache,* **19** (39) : 205. Type species : *Menaforia rufa* Seyrig; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 160. Townes, 1970 : 248. Gupta & Saxena, 1979 : 231.

Distribution : Afrotropical and Oriental regions.

This genus can be distinguished by having lateral tooth or flange at the base of first abdominal tergite; basal transverse carina of propodeum complete; lower

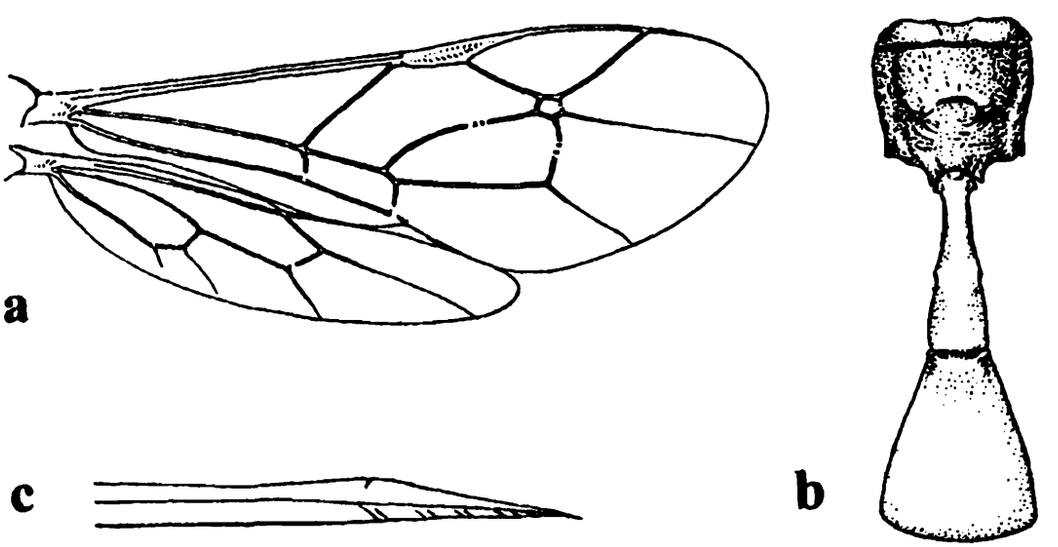

Fig. 55. *Menaforia* Seyrig : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

end of occipital carina ending away from the base of mandible; clypeus without a median point or tooth and nervellus intercepted near its upper 0.37 and strongly reclivous.

Frons smooth, sometimes with a weak median vertical carina. Clypeus moderately to strongly convex without a median tooth. Occipital carina faintly sinuate. Lower tooth of mandible a little shorter than upper tooth. Epomia absent. Pronotum with a swelling near front end of notaulus. Lateral carina of scutellum present or absent. Propodeum rather long, its basal carina complete and apical carina complete or almost complete, with low sublateral crests. Areolet 0.6 to 1.0× as high as the portion of second recurrent vein above the bulla, pentagonal or quadrangular, second intercubitus present. Mediella very strongly arched. Nervellus strongly reclivous, intercepted above the middle. Brachiella often short or absent. First tergite with a lateral tooth at base, its median-dorsal and ventrolateral carinae absent but dorsolateral carina often present, its spiracle behind middle or at middle. Ovipositor sheath about 0.38 as long as hind tibia. Ovipositor rather short, with a distinct nodus.

This is a moderate sized genus, widely distributed in Afrotropical and Oriental regions. Only one species is reported from India.

1. ***Menaforia indica*** Gupta & Saxena (Fig. 56 : a, b)

1975. *Menaforia indica* Gupta & Saxena, *Oriental Ins.*, **13** : 240. Make, Female. Key, des., fig. Type : Female, India : Jharkhand : Ranchi Dist : Namkum (GUPTA). India : Andhra Pradesh : Nagaram; Pakhal. Assam : Rangapara : Sonajuli Tea Estate. Delhi : University ridge. Chattisgarh : Baragarh; Bilaspur; Raigarh; Ratanpur. Maharashtra : Deolali; Ghoti. Orissa : Puri Dist : Gop ; Nimpara ; Pipli; Sakhi Gopal; Delang. Uttar Pradesh : Agra. Uttaranchal : Dehra Dun : New Forest. West Bengal : Bankura; Bishnupur; Murshidabad; Nadia : Shyampur; Sibpur; Howrah; Sundarban ; Suryaberia. Tamil Nadu : Karikal.

1979. *Menaforia nigrominiata* Gupta & Saxena, *Oriental Ins.*, **13** : 237. Female, key, des. Type : Female, India : Jharkhand : Ranchi Dist. : Namkum (GUPTA). Syn. by Gupta 1987.

1987. *Menaforia indica* : Gupta, *Mem. Amer. Ent. Ins.*, **41** : 817.

This species is mainly distinguished by having whole of thorax and sometimes also propodeum and neck yellowish-brown to reddish-brown. Abdomen closely punctate. Mesoscutum granulose and propodeum rugulose with a few striations apically. Nervulus opposite to basal vein. Wing brownish at apex.

Female : Face granulose to rugulose. Mandible with equal teeth. Malar space 0.5 to 0.8× as long as the basal width of mandible, finely granulose. Vertex finely granulose, at some places smooth and shiny. Temple wide, ruguloso-punctate.

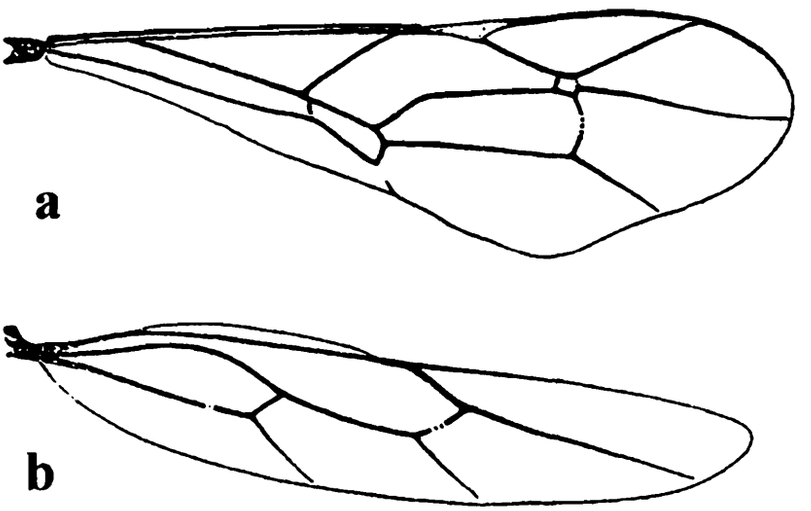

Fig. 56. *Menaforia indica* Gupta & Saxena : **a**, **b**, fore and hind wings showing venation.

Pronotum rugulose. Mesoscutum finely granulose. Scutellum finely punctate; meso- and metapleurum ruguloso-punctate. Propodeum rugulose with a few striations at upper end, both the transverse carinae present, apical carina arched and weak in the middle, spiracle oval. Wings hyaline, smoky at the tip. Areolet pentagonal, nervulus opposite or a little distad of basal vein; petiole long and narrow, postpetiole granulose; second and third tergites closely punctate, rest of the tergites finely punctate to granulose. Ovipositor sheath 0.2× as long as hind tibia.

Yellowish-brown. The following are yellow : face, frontal orbits, mandibles, temple, sides of throax, fore and middle coxae. Dark-brown are : frons, vertex, antennae, pronotum, mesoscutum, scutellum, propodeum, hind legs wholly, rest of fore and middle legs. Stigma and tarsi brownish-black.

Male : Similar to female, except the body punctures fine and weak, flagellum 38-segmented; propodeum basad of basal carina not smooth but coarsely punctate. Apical transverse carina of propodeum present and distinct.

In colour essentially similar to female, except some specimens have terminal abdominal segments black.

Variation : This is a variable species, showing variation is sculpture and colour pattern. Colour varies from yellowish-brown to dark reddish-brown.

Length : Female, 6.6–8.0 mm; fore wing 4.7–5.3 mm; ovipositor sheath 0.9–1.4 mm. Male, 6.5–8.0 mm; fore wing 4.5–5.5 mm.

Distribution : India : Andhra Pradesh (Nagaram; Pakhal). Assam (Rangapara : Sunajuli Tea Estate). Delhi (University ridge). Chattisgarh (Baragarh; Bilaspur; Raigarh; Ratanpur). Maharashtra (Deolali, Ghoti). Orissa (Puri dist. : Gop;

Nimpara; Pipli; Sakhi Gopal; Delang). Jharkhand (Ranchi Dist : Namkum). Uttar Pradesh (Agra). Uttaranchal (Dehra Dun). West Bengal (Bankura; Bishnupur; Murshidabad; Nadia : Shyampur; Sibpur; Howrah; Sundarban; Suryaberia. Tamil Nadu (Karikal).

6. Genus ***Friona*** Cameron (Fig. 57 : a–c)

1902. *Friona* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, **37** : 61. Type-species : *Friona striolata* Cameron; monobasic.

1902. *Lactolus* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, **37** : 62. Type-species : *Lactolus albomaculatus* Cameron; designated by Viereck, 1914.

Taxonomy : Townes, Townes & Gupta, 1961 : 168. Townes, 1970 : 248.

Distribution : Oriental Region.

This genus is easily recognised by having clypeus strongly convex its apical margin without median apical tooth or tubercle. Frons with longitudinally running irregular wrinkles, and also sometime with median vertical carina. Lower tooth of mandible (about 0.5) shorter than the upper tooth. Pronotal collar bordered behind by a carina. Epomia moderately strong to very strong; gradually approaching the other carina. Propodeum about 1.2× as long as wide, its basal carina complete; apical carina absent, or if present, blunt and very close to hind end of propodeum, carina often with blunt sublateral crests; spiracle of propodeum about 2× as long as wide. Propodeum behind basal carina polished, usually with long transverse wrinkles. Areolet in fore wing moderately large, about 1.4× as wide as high; second intercubitus reclivous. Nervellus

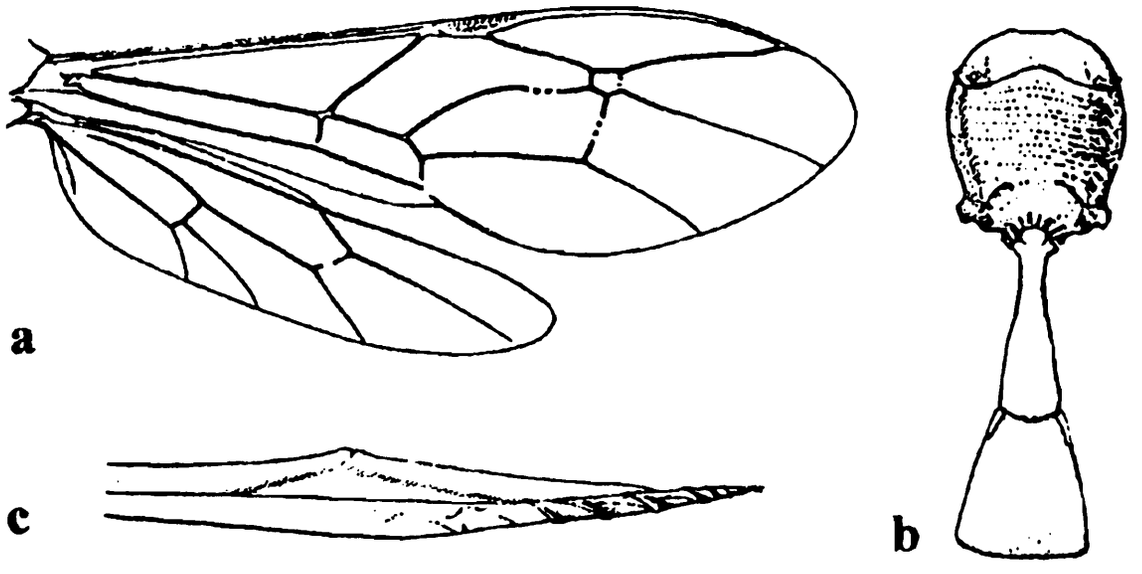

Fig. 57. *Friona* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergite; **c**, ovipositor tip. (Source : Townes 1970).

intercepted near its lower 0.3–0.33. Mediella weakly to moderately arched. Brachiella reaching almost to wing margin. First abdominal tergite without longitudinal carinae, tergite with a lateral tooth at base, spiracle near its apical 0.47. Ovipositor sheath about 0.8 to 1.5× as long as hind tibia, tip with a distinct nodus and distinct teeth.

This is a moderately large genus, occuring in Oriental Region. Gupta (1987 : 818) reported 29 species. Eight species from India and adjacent countries are discussed in the text. Of these, *F. lineatipes* Cameron has been synonymised with *F. frontella* Cameron. *F. octobalteata* Cameron transfered to genus *Takastenus* Uchida and *F. rufescens* Morely to *Formostenus* Uchida. In addition six new species are described here from India.

Key to the species of *Friona*

1. Propodeum subpolished, with a characteristic inverted 'Y' or 'T' shaped mark 2

– Propodeum shiny, with a characteristic trilobate heart-shaped mark 7

2. Mesopleurum in addition to a mark on subtegular ridge, having 1 or 2 small to median sized mark above the base of middle coxa 3

– Mesopleurum black, except for the yellow subtegular ridge 5

3. Mesoscutum black, without any marking. Lateral carina of scutellum not marked yellow. 8th abdominal tergite black. Hind tarsus brownish-yellow, except apex of its 4th and whole of 5th segment dark brown. India : Bihar. Sri Lanka ..... 1. *rufipes* Cameron

– Mesoscutum variously marked with yellow. Lateral carina of scutellum marked yellow. 8th abdominal tergite with a yellow band. Hind tarsus with atleast 2–4 segments white. 4

4. Mesoscutum with two marks on lateral lobe (1 semicircular mark infront and 1 along the notauli). Mesopleurum with a mark just above sternaulus close to the base of middle coxa. Apical band on 6th tergite broadly interrupted in middle, and bands on 7th and 8th tergites interrupted at two places. India : Karnataka ..... 2. *kamathi,* sp.nov.

– Mesoscutum with two marks on middle lobe along the notauli. Mosopleurum near the base of middle coxa with 2 marks one above the sternaulus and one below the sternaulus. Apical bands on 6th and 7th targites interrupted at two places and band on 8th tergite complete and not interrupted. India : Jharkhand; Uttaranchal ..... 3. *rahuli,* sp. nov.

5. First abdominal tergite at base (and also at apex), yellow. Pronotal shoulder strongly swollen. Clypeus with two yellow dots. Nervellus intercepted at its lower 0.4. India : Karnataka. ..... 4. *bhagmandlensis,* sp. nov.

– First abdomininal tergite at base black. Pronotal shoulder normal, not swollen. Clypeus either entirely yellow or black. Nervellus intercepted at its lower 0.25–0.3 6

6. Face and clypeus almost wholly yellow. Apical bands on 4–8 tergites narrow in the middle, but not interrupted. India : Assam; Meghalaya; Uttaranchal; West Bengal ..... 5. *frontella* Cameron

– Face black with two longish marks near antennal sockets and two longish marks along the eye margin. Clypeus entirely black. Apical bands on tergites 5–6 narrow and sometimes interrupted in middle. India : Bihar; Jharkhand; Maharashtra; Uttranchal; Assam. Myanmar ..... 6. *didymata* Morley

7. Face more or less yellow. Subtegular ridge on mesopleurum, and mesoscutum variously marked with yellow. First tergite black. All tergites with complete or incomplete yellow apical bands 8

– Face black or with two small yellow dots below antennal sockets. Mesoscutum without any yellow mark. Subtegular ridge on mesopleurum also black. First tergite reddish or reddish-brown, without apical band. Not all tergites with apical bands 9

8. Apical bands on 5th and 6th tergites interrupted in middle. Middle lobe of mesoscutum with two thin yellow lines along notauli. Extreme upper margin of pronotum near curved part of epomia yellow. First tergite at base black, not yellow. India : Karnataka. Indonesia : Java ..... 7. *fensus* (Tosquinet)

– Apical bands on 5th and 6th tergites not interrupted; bands on all tergites complete. Lateral lobes of mesoscutum with two semicircular yellow marks in front. Upper margin of pronotum black. First tergite with a longish yellow mark at base. India : Karnataka ..... 8. *similis,* sp. nov.

9. Face black (rather head wholly black). Tergite 6 with yellow apical band; tergites 4–5 black. Metapleurum with a longish yellow mark near the base of middle coxa. India : Karnataka ..... 9. *nigrifacies,* sp. nov.

– Face with two dot-like yellow marks near base of antennal sockets. Tergites 4–6 totally black. Metapleurum black at base and reddish-yellow toward apex. India : Karnataka ..... 10. *nigriterga,* sp. nov.

Note : *Friona curvicarinata* Cameron, a species based on a male specimen from Meghalaya could not be included in the key.

1. ***Friona rufipes*** Cameron (Fig. 58 : a, b)

1905. *Friona rufipes* Cameron, *Spolia Zeylanica,* **3** : 110. Female. key, des., fig. Type : Female, Srilanka : Kandy (LONDON)

1923. *Friona rufipes* : Dutt, *Mem. Dept. Agri. India (Ent. Ser.),* **8** : 23. India : Bihar : Chapra; Pusa.

1961. *Friona rufipes* : Townes. Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 171. India. Sri Lanka.

1987. *Friona rufipes* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 822.

This species is mainly recognised by having inverted Y-shaped mark on propodeum. Mesopleurum with two medium sized mark near the base of middle coxa. Mesoscutum and 8th tergite entirely black.

Female : Body is general subpolished. Face in the middle somewhat rugoso-punctate. Clypeus convex transversely, in the middle raised, at apex impressed, in the middle shallowly punctate. Malar space 0.25× the basal width of mandible. Frons strongly shallow, with a median vertical carina, along the median carina with coarse wrinkles and along the eye margin smooth and subpolished. Vertex and temple smooth and shiny. Pronotum largely coarsely trans-striate, its upper margin sparsely punctate. Mesoscutum shiny with a few scattered shallow punctures. Scutellum dull, with a few shallow punctures, its lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum moderately strongly trans-striate; speculum smooth and polished; sternaulus sinuate reaching midcoxa; prepectal carina extending 0.8 the height of mesopleurum. Metapleurum strongly trans-striate, towards the base strongly wrinkled, juxtacoxal carina not distinct. Propodeum between basal carina and apex coarsely trans-striate, basad of basal carina as usual smooth and shiny, spiracle longish, apical carina represented by lateral crest-like apophyses, basal carina complete. Fore wing with nervulus basad of basal vein by 0.4 its length. Nervellus intercepted at its lower 0.25. Ovipositor long, its sheath about 0.55 as long as hind tibia, with distinct nodus and teeth.

Black. 5–10 antennal flagellum segments white. The following are yellow : Face (Fig. 58 : a) except the median triangular black mark, clypeus except apical longish mark which is broad in the middle, mandible except at the base and its teeth, frons along the eye margin and temple behind the eye, malar space, upper margin of pronotum, pronotal collar just behind the neck, tegula, subtegular ridge, scutellum, metascutellum, mesopleurum (Fig. 58 : b) with two spots near the base of middle coxa, one above the sternaulus and another below the sternaulus, a mark near the base of hind wing, propodeum with an inverted Y-shaped mark and apices of all the abdominal tergites with narrow apical bands except the bands on 5th and 6th tergites interrupted in the middle and band on 8th entirely absent. Legs with fore and middle

coxae reddish-yellow, with brownish oval marks above, rest of fore and middle legs yellow, except apical tarsal segments fuscous. Hind leg with coxa reddish-brown, with a blacks mark above and a yellow mark at base, rest of hind leg brownish-yellow, except trochanteral segments, femur at apex, tibia at base, and apex of 4th and whole of 5th tarsal segments dark blackish-brown. Wings hyaline with yellowish hue.

Male : Not known.

Length : Female, 13–16 mm; fore wing 9–11 mm; Ovipositor sheath 4–5 mm.

Distribution : India : Bihar (Chapra; Pusa). *Elsewhere* : Sri Lanka (Kandy).

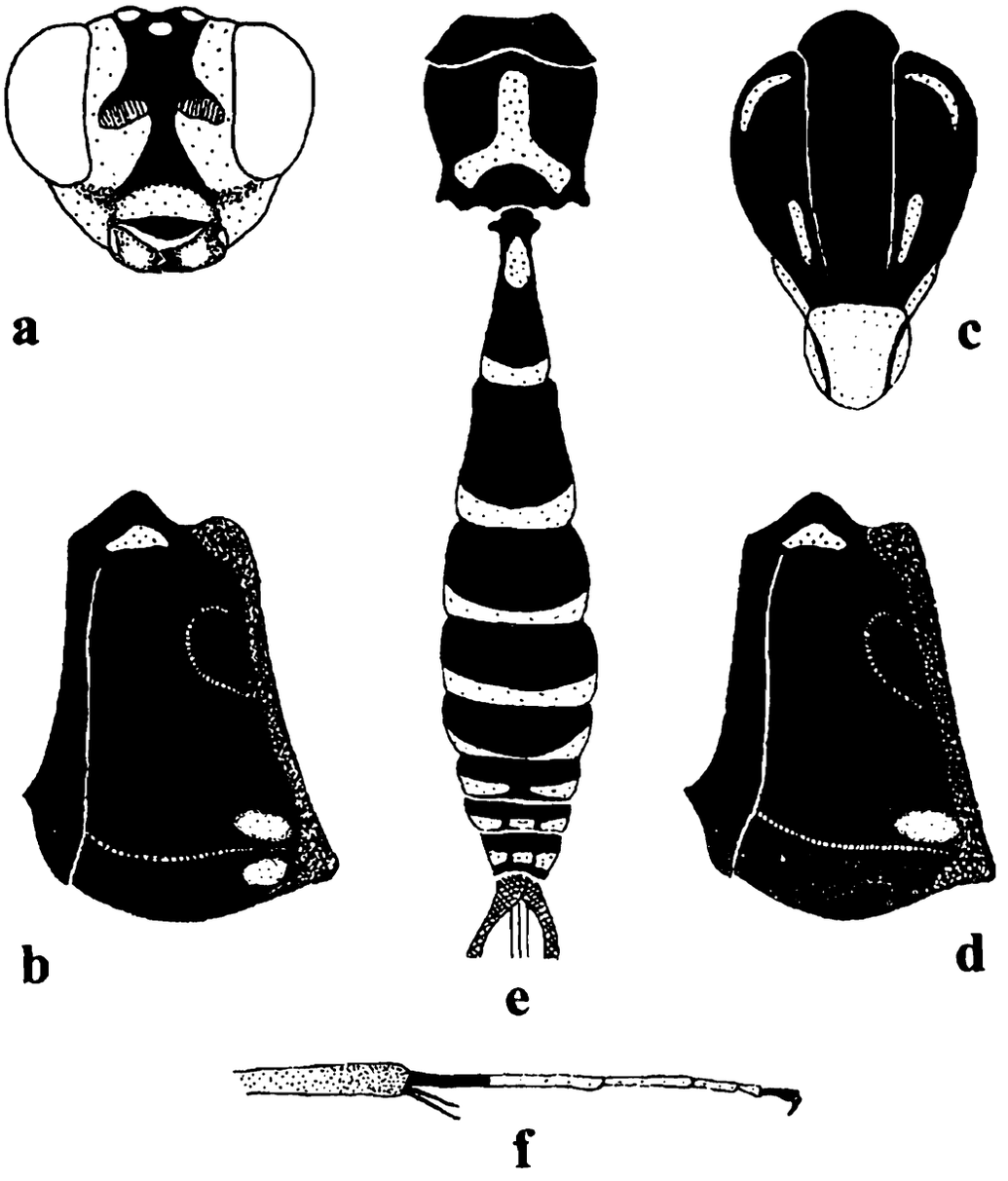

Fig. 58. Showing colour pattern. *Friona rufipes* Cameron : **a**, front view of head; **b**, mesopleurum. *Friona kamathi*, sp. nov. : **c**, dorsal view of mesoscutum and scutellum; **d**, mesopleurum; **e**, dorsal view of propodeum and abdomen; **f**, hind tarsus.

2. ***Friona kamathi*** Jonathan, sp. nov. (Fig. 58 : c–f)

This species is close to *F. rufipes* Cameron in having similar colour pattern of head, pronotum, metapleurum and propodeum.

Female : Face moderately strongly wrinkled. Clypeus shiny, densely punctate at base, sparsely and shallowly punctate towards apex. Malar space granulose, 0.4× the basal width of mandible. Frons strongly wrinkled, wrinkles radiating from the base of median ocellus and also with a median longitudinal carina. Vertex and temple with sparse, minute weak punctures. Pronotum largely trans-striate, upper shoulder densely punctate, epomia strong. Mesoscutum sparsely minutely punctate, subpolished. Scutellum shiny with a few scattered punctures, its lateral carina extending 0.4× its length. Metascutellum smooth and shiny. Mesopleurum closely trans-wrinkled, towards base tending to be reticulate, juxtacoxal carina not well defined. Propodeum shiny, between basal carina and apex trans-striate, apophyses moderately high crest-like, basad of basal carina smooth and shiny with a few scattered punctures, spiracle longish and nervellus intercepted at its lower 0.33. First abdominal tergite largely smooth and subpolished, second and third granulose with setiferous punctures. Ovipositor tip lenseolate, 0.8× as long as hind tibia.

Black. 5–9 antennal flagellum segments white. The following are yellow : Face and clypeus almost, except for a median inverted Y-shaped black mark, mandible, except the teeth, malar space, frons and vertex along the eye margin, pronotal collar and upper shoulder narrowly, lateral lobes of mesoscutum (Fig. 58 : c) with thin semicircular marks in front and thin lines along the notauli towards base, tegula, subtegular ridge, mesopleurum (Fig. 58 : d) with a triangular faint mark near the base of middle coxa, scutellum, lateral carina of scutellum, metascutellum, area at the base of hind wing, metapleurum with an elongated mark along pleural carina, propodeum (Fig. 58 : e) with usual inverted Y-shaped mark, base of first tergite, apices of all the abdominal tergites, except band on 6th broadly interrupted in center, bands on 7th and 8th sublaterally interrupted (Fig. 58 : e). Legs in general dark yellow with brownish hue, except apical segments of fore and middle tarsi brown; hind tarsus (Fig. 58 : f) white, except basal 0.4 of its first and fifth segment wholly brown to dark brown. Wings clear hyaline.

Male : Not known.

Length : Female, 11 mm; fore wing 8–5 mm; ovipositor sheath 3.5 mm.

Holotype Female, INDIA : Karnataka : Mercara, 1150m, 19.xii.1965, M. K. Kamath, No. K 64 (Z.S.I., Calcutta).

Distribution : India : Karnataka.

3. ***Friona rahuli*** Jonathan, sp. nov. (Fig. 59 : a–c)

This species is close to *F. rufipes* Cameron and *F. kamathi*, sp. nov., but can be differentiated by the characters given below :

Female : Face largely rugoso-punctate. Clypeus largely with a few scattered, shallow punctures, towards the apex smooth and shiny. Malar space granulose, 0.4× the basal width of mandible. Frons shiny, with a median longitudinal strong carina, and a few strong oblique striae extending from the base of median ocullus, at sides smooth and shiny. Vertex and temple smooth and shiny. Pronotum coarsely strongly trans-striate in the scrobe, its upper shoulder and area behind neck closely, shallowly punctate, epomia short. Mesoscutum shiny with sparse minute punctures. Scutellum sparsely and shallowly punctate, its lateral carina extending 0.33 its length. Metascutellum smooth and shiny Mesopleurum largely trans-striato-wrinkled, specutum shiny with a few scattered minute punctures, prepectal carina extending 0.8× the height of mesopleurum. Metapleurum moderately strongly trans-wrinkled, juxtacoxal carina not well defined. Propodeum between basal and apical carinae with sparse and coarse striations, apical carina also somewhat complete, laterally forming crest-like apophyses, basad of basal carina shiny with a few scattered minute punctures, spiracle longish. Nervellus intercepted at its lower 0.33. First abdominal tergite smooth and shiny, with a few minute punctures near spiracle, following tergites granulose, subpolished. Ovipositor long, its tip typical of genus, ovipositor sheath about 1.5× as long as hind tibia.

Black. Apical 0.3 of 5th antennal segment to 9th segment white above. The following are yellow : Face, clypeus (except apical margin narrowly at side and somewhat broadly in middle), mandible (except teeth), malar space, temple, frons and vertex along the eye margin (Fig. 59 : a), pronotal collar (Fig. 59 : b), this mark sometimes extensive and interrupted in middle, upper shoulder, this mark more extensive and joining pronotal collar mark above, middle lobe of mesoscutum along notauli, these marks sometimes very extensive, tegula, subtegular ridge, mesopleurum with two triangular marks near the base of middle coxa, one above the sternaulus and one below the sternaulus, scutellum, lateral carina of scutellum, metascutellum, metapleurum along the pleural carina, area near the base of hind wing, propodeum (Fig. 59 : c) with an inverted Y-shaped mark, apices of all the abdominal tergites, except sometimes base of first tergite also, and bands on 6th and 7th interrupted at two places sublaterally (Fig. 59 : c). Legs in general yellow to dark yellow, their fore and middle tarsi apically, middle tibia also in apical 0.25, dark brown. Hind leg with coxa reddish-brown with an oval yellow mark above, extreme apex of tibia, dark brown; colour of hind tarsus variable, dark brown, except 2–4 or 3–4 segments white. Wings clear hyaline.

Male : Not known.

Length : Female, 14–16 mm; fore wing 10–11 mm; ovipositor sheath 7–8 mm.

Holotype Female, INDIA : Uttaranchal : Pantnagar, 21.ii.1965, J. K. Jonathan, No. J22 (Z.S.I., Calcutta). *Paratypes* 2 Females. INDIA : Jharkhand : Ranchi, Namkum, 1 Female, 11.iv.1957, V. K. Gupta and 1 Female, G.E.L. Mission, Ranchi, 14.iv.1958. C. Tirky (Z.S.I., Calcutta).

Distribution : India : Uttaranchal and Jharkhand.

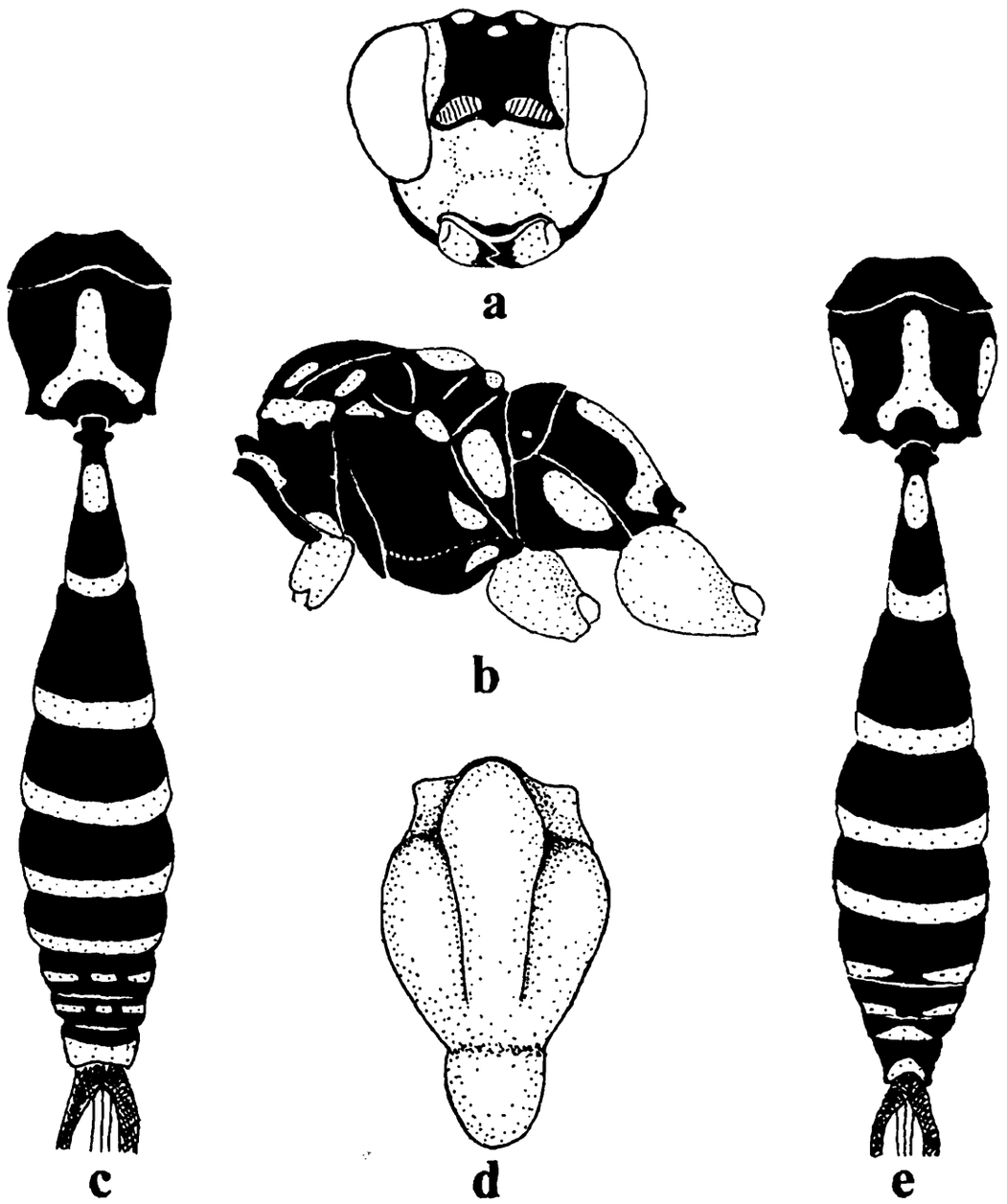

Fig. 59. Showing colour pattern. *Friona rahuli* sp. nov. : **a**, front view of head; **b**, side view of thorax; **c**, dorsla view of propodeum and abdomen. *Friona bhagmandlensis* sp. nov. : **d**, dorsal view of thorax showing swollen shoulder; **e**, dorsal view of propodeum and abdomen.

4. ***Friona bhagmandlensis*** Jonathan, sp. nov. (Fig. 59 : d)

This species is very close to *Friona didymata* Morley in its sculpture and colour pattern.

Female : Face weakly puncto-wrinkled, Clypeus rugulose. Frons with a few oblique striae below median ocellus, at sides smooth. Pronotum coarsely trans-striate, upper margin strongly swollen (Fig. 59 : d), shiny and sparsely punctate. Mesoscutum smooth and shiny. Scutelllum and metascutellum also smooth and shiny. Mesopleurum uniformly trans-striate, speculum impunctate, prepectal carina extending 0.8× the height of mesopleurum. Metapleurum trans-rugose, juxtacoxal carina absent. Propodeum sparsely trans-striate, its spiracle longish-oval, basad of basal carina smooth and shiny, apophyses blunt. First to third abdominal tergites granulose, following tergites mat and subpolished. Nervellus intercepted at its lower 0.4.

Black. 5th to 10th antennal segments white. The following are yellow: Face with two dots, dots sometimes absent, clypeus with two large dots, mandible, frons and vertex along eye margin, upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum area at the base of hind wing, an elongate mark along pleural carina on metapleurum, propodeum with an inverted Y-shaped mark, apex and base of first abdominal tegite, apices of all the other tergites, except band on 5th and 6th tergites broadly interrupted in the middle. Legs in general brownish-yellow, except fore coxa and its trochanter yellow, apical segments of fore tarsus and whole of middle tarsus brown. Hind tarsus dark brown, except apical 0.4 of its first and whole of 2nd and 3rd white. Wings clear hyaline with brownish hue.

Male : Not known.

Length : Female, 11.5 mm; fore wing 8 mm; ovipositor sheath 3 mm.

Holotype Female, INDIA : Karnataka : Bhagmandla, 800 m, 15.xii.1965. M. K. Kamath, No. K 60 (Z.S.I., Calcutta). *Paratype* 1 Female, same data as holotype (Z.S.I., Calcutta).

Distribution : India : Karnataka.

5. ***Friona frontella*** Cameron (Fig. 60 : a, b)

1904. *Friona frontella* Cameron, *Trans. Ent. Soc. London,* 1904 : 108. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1904. *Friona varipes* Cameron, *Trans. Ent. Soc. London,* 1904 : 107. Male. des. Type : Male India : Meghalaya : Khasi Hills (OXFORD). Syn. by Townes, Townes & Gupta, 1961.

1907. *Friona lineatipes* Cameron, *Ann. & Mag. Nat. Hist.,* (7) **20** : 23, Female. des. Type : Female. India : West Bengal : Darjeeling, 2000m (LONDON). **New Synonymy.**

1914. *Friona variipes* (!) : Morley, *Rec. Indian Mus.*, **8** : 328. Female. India : Assam : Kobo, 400ft.

1961. *Friona frontella* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 169. Syn. India.

1961. *Friona lineatipes* : Townes, Townes & Gupta, *Mem. Amer. Ent Inst.*, **1** : 169. India.

1987. *Friona frontella* : Gupta, *Mem. Amer. Ent. Inst.*, **4** : 819.

1987. *Friona lineatipes* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 819.

This species is close to *Friona bhagmandlensis*, sp. nov., but can be distinguished by having face and clypeus entirely yellow, apical bands on 4–8 tergites narrow in the middle. Pronotal shoulder normal, not swollen. First tergite not marked basally.

Female : Body in general subpolished. Face, clypeus and mandible with dense, moderately deep punctures, face in the center appears to be rugoso-punctate. Malar space 0.5× the basal width of mandible. Frons strongly wrinkled, close to eye margin granulose. Vertex and temple smooth and subpolished, except temple with a few punctures towards the base of mandible. Pronotum strongly trans-striate in the scrobe, its upper margin and behind the neck coarsely punctate. Mesoscutum smooth and shiny, covered with moderately long white pubescence. Scutellum with sparse, small shallow punctures, lateral carina extending 0.15 its length. Metascutellum smooth and shiny. Mesopleurum strongly trans-striate above near subtegular ridge, trans-striato-wrinkled broadly in the middle, below sternaulus distinctly punctate, sternaulus sinuately reaching the base of middle coxa, speculum with small sparse punctures, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum largely moderately strongly rugoso-wrinkled, along the pleural carina with dense punctures, juxtacoxal carina incomplete. Propodeum between basal carina and apex strongly trans-striate, basad of basal carina shiny with minute scattered punctures, both the carinae complete, apophyses crest-like, spiracle longish. Areolet large, nervulus basad of basal vein by 0.3 its length. Nervellus intercepted at its lower 0.25. Abdomen with first tergite smooth and shiny in basal half, apically minutely sparsely punctate, following tergites dull granulose. Ovipositor long its sheath about 1.0× as long as hind tibia, with distinct nodus and teeth.

Black. 5–10 antennal segments white. The following are yellow : Face, clypeus, mandibles almost wholly; frons and vertex along the eye margin, malar space, temple in continuation of malar space mark (except mandibular teeth, apical margin of clypeus narrowly at sides and broadly is middle, clypeal groove and a longish mark between the antennal sockets, black) (Fig. 60 : a), pronotal collar behind neck, upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum, area at the base of hind wing, an elongate mark on metapleurum along the pleural carina, propodeum with an inverted T-shaped mark, apices of all abdominal tergites, bands on 4–8 narrow in the middle, broad at sides, fore and middle legs in general, except

their tarsi yellowish-brown. Hind leg with coxa black with an oval yellow mark above, and blackish-brown below; trochanter, femur and tibia brownish-yellow, except first segment of trochanter black, apices of femur and tibia blackish-brown; hind tarsus white, except its first segment in basal 0.3 and whole of fifth segment blackish (Fig. 60 : b). Wings clear hyaline with yellowish hue.

Male : Essentially similar to female in body sculpture and colour pattern, except as follows : Face densely rugoso-punctate, rugae vertical and diverging towards eye margin. Clypeus and mandible smooth and subpolished with a few scattered punctures. Malar space 0.4× the basal width of mandible. Apical transverse carina not defined. Abdomen granulose.

Black. 9–15 flagellar segments white. Mesopleurum with two faint yellow marks near the base of middle coxa. Hind tarsus white, except basal 0.3 of first and extreme apex of fifth segment black. Rest of colour as of female.

Length : Female & Male, 14 mm; fore wing 10mm; ovipositor sheath 4.5 mm.

Distribution : India : Meghalaya (Khasi Hills). Assam (Kobo). Uttaranchal (Dehra Dun, New Forest area). West Bengal (enroute to Testa-Kalimpong).

6. ***Friona didymata*** Morley (Fig. 60 : c, d)

1914. *Friona didymata* Morley, *Rec. Indian Mus.,* **8** : 328. Male, Female. des. Types : Male, Female. India : Uttaranchal : Dehra Dun (LONDON). India : Uttaranchal : Bhowali in Kumaon Hills. Assam : Dibrugarh. Bihar : Monghyr. West Bengal : Calcutta. Kerala. Myanmar : Tenasserim : Mergui.

1961. *Friona didymata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 168. Myanmar. India.

1987. *Friona didymata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 818.

This species is close to *Friona frontella* Cameron. It is distinguished by having four longish mark on face. Clypeus entirely black. Apical band on tergites 5–6 narrow, or sometimes interrupted in middle.

Female : Face rugoso-punctate. Clypeus shiny, minutely and sparsely punctate. Malar space granulose, 0.5× the basal width of mandible. Frons shiny, strongly striate, striae radiating from the base of median ocellus. Vertex and temple polished, with a few minute scattered punctures. Pronotum with collar smooth, scrobe with coarse trans-striations, upper margin with sparse, distinct punctures. Mesoscutum largely shiny, minutely and sparsely punctate, in the center near the base of middle lobe rugose. Scutellum shiny, with minute sparse punctures, its lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum trans-striate to trans-wrinkled, speculum shiny with a few punctures along the margin, area near the base

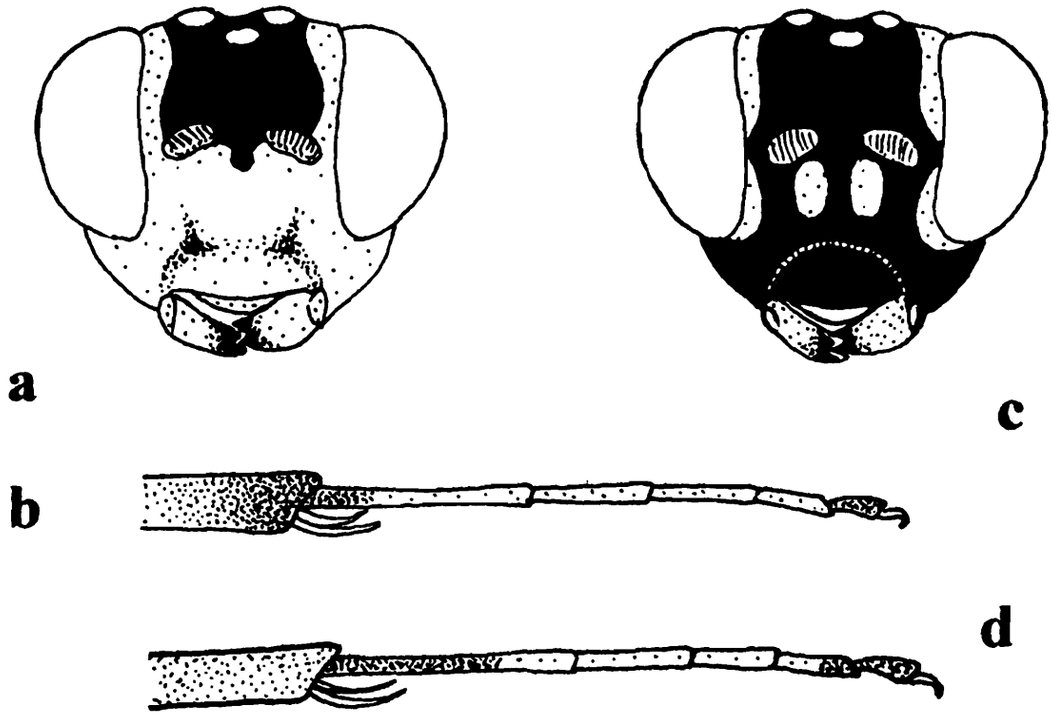

Fig. 60. Showing colour pattern. *Friona frontella* Cameron : **a**, front view of head; **b**, hind tarsus. *Friona didymata* Morely : **c**, front view of head; **d**, hind tarsus.

of middle coxa with fine obliquely running striae with punctures, prepectal carina extending 0.7 the height of mesopleurum, sternaulus sinuate, near to the base of middle coxa not distinct among the striae. Metapleurum moderately strongly rugoso-wrinkled, juxtacoxal carina present, short. Propodeum between basal carina and apex trans-striate, basad of basal carina shiny with a few scattered punctures, apical carina not defined among the striae, apophyses weak crest-like, spiracle longish. Fore wing with nervulus basad of basal vein by 0.6 its length. Nervellus intercepted at its lower 0.3. Abdomen largely granulose. Ovipositor long, its sheath about as long as hind tibia, tip with distinct nodus and few teeth.

Black. 6–11 antennal segments white. The following are yellow : Face with small longish marks near antennal sockets and two elongate marks along its eye margin (Fig. 60 : c), mandible except the teeth, frons and vertex along the eye margin, pronotal collar just behind the neck, upper margin of pronotum, scutellum, metascutellum, tegula, subtegular ridge, area near the base of hind wing, metapleurum with a small longish mark, propodeum with a somewhat Y-shaped mark, apices of all the abdominal tergites. Legs in general yellow to yellowish-brown, except fore and middle coxae and their apical tarsal segments brownish, hind coxa reddish-brown with an oval yellow mark above, hind tarsus blackish-brown, except apical 0.2 of first segment, second and third wholly and basal 0.5 of fourth whitish (Fig. 60 : d). Wings clear hyaline.

Colour somewhat variable. Fifth and sixth apical band on abdomen broadly interrupted is middle. Hind tarsus dark brown with its second and third segments sometimes more or less white.

Male : Essentially similar to female is sculpture and colour.

Length : Male and Female, 11–13 mm; fore wing 8–10 mm; ovipositor sheath 4–5 mm.

Distribution : India : Bihar (Monghyr). Jharkhand (Ranchi). Maharashtra (Matheran, 1000 m; Mahabaleshwar, 1500 m). Uttaranchal (Dehra Dun, Pant Nagar, Bhowali). Assam (Dibrugarh). *Elsewhere :* Myanmar : Tenasserim (Mergui).

7. ***Friona fensus*** (Tosquinet) (Fig. 61 : a–d)

1903. *Cryptus fensus* Tosquinet, *Mem. Soc. Ent. Belgique,* **10** : 197. Male. des. Type : Male, Indonesia : Java : Sukabumi, 570m (BRUSSELS).

1910. *Gombrus fensus* : Szépligeti, *Notes Leyden Mus.,* **32** : 97. Male. n. comb., key.

1910. *Gambrus persimilis* Szépligeti, *Notes Leyden Mus.,* **32** : 99. Male, Female. key, des. Type : Male, Indonesia : Java : Jakarta. (BUDAPEST). Syn. by Townes, Townes & Gupta, 1961.

1916. *Mesostenus persimilis* : Szépligeti, *Ann. Mus. Natl. Hungrici,* **14** : 329. n. comb., key.

1941. *Cryptus* sensus (!) : Betrem, *Treubia,* **18** : 61. key.

1961. *Friona fensus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 169. n. comb., syn. Java.

1987. *Friona fensus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 819.

This species is easily distinguished by having characteristic trilobate heart-shaped mark on propodeum. First abdominal tergite at base black; apical bands on tergite 5–6 interrupted in middle. Middle lobe of mesoscutum with two lines along notauli. Propodeum in males usually with very fine striations and surface shiny.

Female : Face moderately strongly rugose. Clypeus rugose with coarse sparse punctures. Malar space granulose, 0.3× the basal width of mandible. Frons strongly wrinkled in the scrobe, at sides mat with coarse shallow punctures. Temple and vertex mat and subpolished. Pronotum in the lower half trans-striate, upper have rugoso-punctate, epomia reaching up to upper margin. Mesoscutum, scutellum and metascutellum smooth and subpolished, lateral carina of scutellum extending to its basal 0.25. Mesopleurum almost wholly finely trans-striate, area below sternaulus minutely punctate, sternaulus extending 0.6 the distance to middle coxa; prepectal carina extending 0.75 the height of mesopleurum. Metapleurum moderately strongly wrinkled, juxta coxal carina not well defined. Propodeum between basal carina and apex finely trans-striate, basad of basal carina shiny with sparse shallow punctures,

basal carina complete, apical carina not defined among the striae. Spiracle longish (2.5×). First and second abdominal tergites strongly granulose, following mat and subpolished. Nervellus intercepted at its lower 0.4. Ovipositor sheath about 0.8× as long as hind tibia.

Black. Antennal flagellum from apical 0.2 of 4th to 9th segments white. The following are yellow : Face (Fig. 61 : a) broadly along the eye margins, clypeus with two dot-like marks, frons along the eye margin and temple along the eye margin behind, malar space, pronotal collar, upper margin narrowly behind neck, middle lobe of mesoscutum with two lines along notauli, tegula, subtegular ridge, scutellum, metascutellum, area near the base of hind wing, apical slope of propodeum with a trilobate mark (Fig. 61 : b, c), apices of all the abdominal tergites, except apical band on 5th and 6th narrow (or appears to be broadly interrupted) in the middle (Fig. 61 : d). Legs in general deep yellow, their coxae reddish-yellow, fore and middle apical tarsal segments dark brown. Hind tarsus dark brown with apical 0.25 of 1st to 3rd segment white. Wings clear hyaline.

Male : Similar to female, except weakly sculptured and slender. Mesoscutum smooth and subpolished. Mesopleurum moderately strongly uniformly trans-striate, speculum subpolished with a few indistinct punctures, prepectal carina extending 0.6 the height

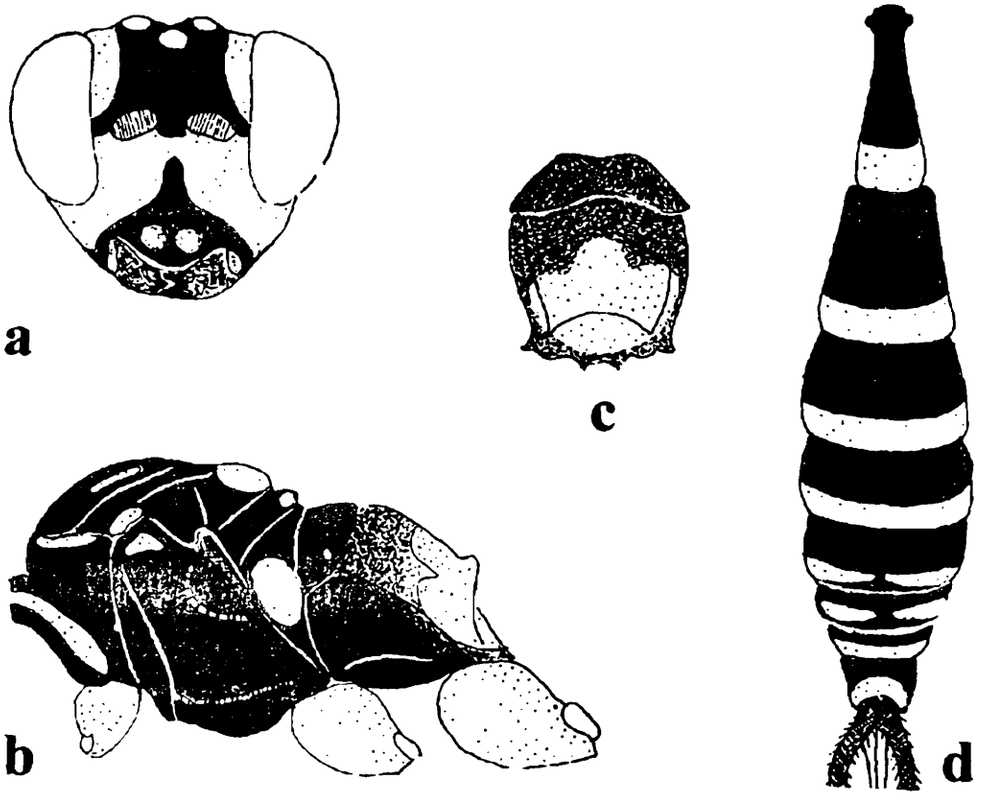

Fig. 61. Showing colour pattern. *Friona fensus* (Tosquinet) : **a**, front view of head; **b**, side view of thorax; **c**, dorsal view of propodeum; **d**, dorsal view of abdomen.

of mesopleurum. Metapleurum trans-rugoso-punctate. Propodeum shiny, with weak trans-striations. Abdomen mat and subpolished. Nervellus intercepted at its basal 0.4.

Black. 6–11 antennal segments white. Facial mark very extensive. Mesoscutum without any mark at the base of its middle lobe; rest of colour similar to female.

Length : Female, 12 mm; fore wing 9 mm; ovipositor sheath 3–5 mm. Male, 12 mm; fore wing 8 mm.

Distribution : India : Karnataka (Bhagmandla, 800m; Mercara, 1150 m). *Elsewhere :* Indonesia : Java (Jakarta; Sukabumi, 570m).

8. ***Friona similis*** Jonathan, sp. nov. (Fig. 62 : a, b)

This species is very much similar to *Friona fensus* Morley. However, it can be distinguished by the following characters.

Female : Pronotum finely trans-striate and pronotal shoulder minutely punctate, epomia strong and reaching upper margin. Mesopleurum trans-striate in upper half, its lower half trans-rugose, speculum smooth and shiny. Metapleurum rugoso-wrinkled.

Colour also very similar to *F. fensus* Morley. Face almost, clypeus with two dots (Fig. 62 : a), frons and vertex along eye margin; lateral lobes of mesoscutums with semilunar marks in front, pronotal collar above, scutellum, metascutellum, tegula, minute spots on subtegular ridge, area near base of hind wing, propodeum with usual trilobate mark, first tergite at base and all the tergites with apical bands, yellow (Fig. 62 : b). Legs in general yellow, except apical segments of fore tarsus and almost whole of middle and hind tarsus dark brown. Hind coxa, its second trochanteral segment and femur reddish-brown. Wings yellowish hyaline.

Male : Not known.

Length : Female, 10 mm; fore wing 8mm; ovipositor sheath 3 mm.

Holotype : Female, INDIA : Uttaranchal : Garjia, 10.iv. 1965. Coll. D. T. Tikar, Coll. No. T 10 (Z.S.I., Calcutta).

Distribution : India : Uttaranchal.

9. ***Friona nigrifacies*** Jonathan, sp. nov. (Fig. 62 : c)

This species is mainly recognised by having trilobate mark (fensus-type) on propodeum. Head, mesoscutum and tergites 4–5 entirely, black.

Female : Face wholly finely wrinkled. Clypeus shiny, sparsely punctate. Malar space granulose, about 0.5× the basal with of mandible. Frons with strong oblique

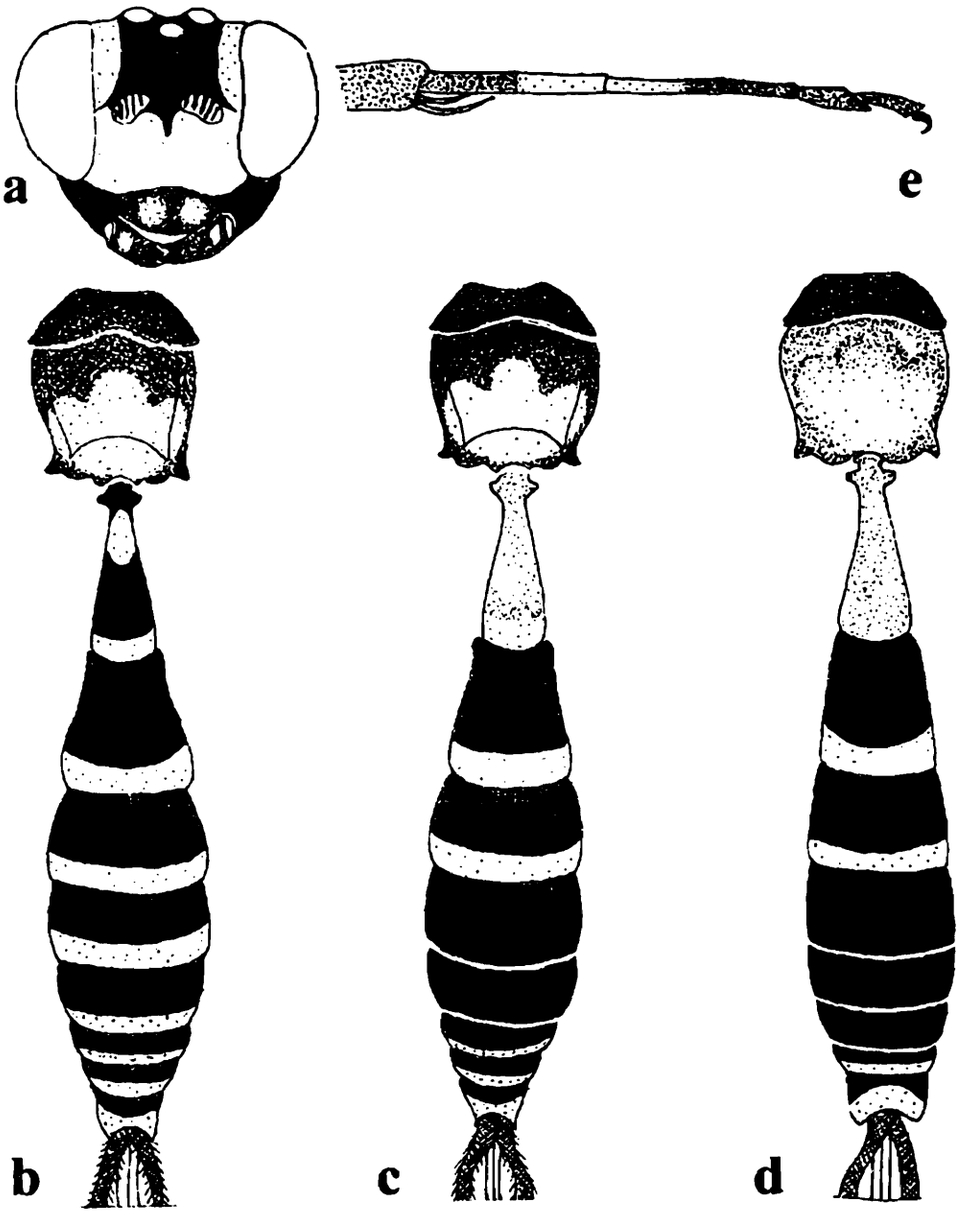

Fig. 62. Showing colour pattern. *Friona similis*, sp. nov. : **a**, front view of head; **b**, dorsal view of propodeum and abdomen. *Friona nigrifacies*, sp. nov. : **c**, dorsal view of propodeum and abdomen. *Friona nigriterga*, sp. nov. : **d**, dorsal view of propodeum and abdomen; **e**, hind tarsus.

wrinkles in the middle, along the eye margins ruguloso-punctate. Temple and vertex smooth and shiny. Pronotum finely trans-striate in the lower half, upper half shiny, sparsely, minutely punctate; epomia strong, reaching upper margin. Mesoscutum largely smooth and shiny. Scutellum and metascutellum polished, lateral carina of scutellum extending its basal 0.4. Mesopleurum from the base of subtegular ridge to sternaulus uniformly trans-striate, below sternaulus shiny with minute indistinct, sparse punctures, prepectal carina extending 0.55 the height of mesopleurum, speculum shiny, with a few minute punctures. Metapleurum finely trans-striate, juxtacoxal carina not distinct among the striations. Propodeum between basal carina and apex

finely and sparsely trans-striate, basad of basal carina largely smooth and shiny with a few scattered punctures, spiracle oval. Nervellus intercepted at its lower 0.33. First abdominal tergite smooth, second and third at base strongly granulose with setiferous punctures, following tergites mat and subpolished. Ovipositor tip typical of the genus, sheath about as long as hind tibia.

Black. Antennal flagellum from extreme apex of 5th to 10th segments white above; scape pedicel and 1st to 3rd segment on the under side brownish. Head totally black. The following are yellow : Pronotal collar just behind the neck, tegula, scutellum, metascutellum, area near the base of hind wing, metapleurum narrowly near the base of hind coxa, propodeum (Fig. 62 : c) with a trilobate (fensus-type) mark, apices of 1st to 3rd and 6th to 8th tergites, fore and middle trochanters. Legs is general reddish-brown, their all the tarsi, middle and hind tibia broadly at base and apex, dark brown. First abdominal segment reddish. Wings clear hyaline, with brownish hue.

Male : Not known.

Length : Female, 8 mm; fore wing 5.5 mm; ovipositor sheath 2 mm.

Holotype Female, INDIA : Karnataka : Mudigere, 650 m, 1-xii. 1965, Coll. J. K. Jonathan, No. J 106 (Z.S.I., Calcutta).

Distribution : India : Karnataka.

10. ***Friona nigriterga*** Jonathan, sp. nov. (Fig. 62 : d)

This species is close to *Friona nigrifacies*, sp. nov. in having similar sculpture and body colour, except as follows :

Female : Frons with a median longitudinal carina and a few oblique striae, rest smooth and subpolished. Lower half of pronotum with a few trans-striae, upper half smooth and subpolished with a few scattered punctures. Lateral carina of scutellum confined to its base. Metapleurum dull, with a few fine oblique striations towards the base, juxtacoxal carina absent. Propodeum between basal carina and apex shiny with weak sparse trans-striations. First and second abdominal tergites granulose, second tergite with setiferous punctures at base, following tergites mat and subpolished. Ovipositor sheath about 0.8× as long as hind tibia.

Black : Extreme apex of 4th to 11th flagellar segment white above. Face with dot-like marks near the base of each antennal sockets, frons and vertex along the eye margin, pronotal collar above just behind the neck, tegula, scutellum, metascutellum, base of hind wing, yellow. Metapleureum at base black, towards the apex reddish-yellow. Propodeum (Fig. 62 : d) with a trilobate mark, almost occupying the area between basal carina and apex, yellow, tending to be reddish towards the base. First tergite reddish-brown, without apical band; 4–6 tergites totally black without apical

bands, rest of the tergites with yellow apical bands. Legs in general yellow to dark yellow. All tarsi dark brown towards apices, Hind tarsus with apical 0.3 of 1st and basal 0.6 of 2nd segment, white. Wings clear hyaline.

Male : Not known.

Length : Female, 7.5 mm; forewing 5.5 mm; Ovipositor sheath 2 mm.

Holotype Female, INDIA : Karnataka : Gunji, 570m, 22.xi.1965, M. K. Kamath, No. K47 (Z.S.I., Calcutta).

Distribution : India : Karnataka.

11. ***Friona curvicarinata*** Cameron

1904. *Friona curvicarinata* Cameron, *Trans. Ent. Soc. London,* 1904 : 109. Male. des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Friona curvicarinata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 168. n. comb. Sarawak.

1987. *Friona curvicarinata* : Gupta, *Mem. Amer. Ent.* Inst., **41** : 818.

The following account is based on a description given by Cameron (1904 : 109).

Male : Antennae filliform. Face is general rugoso-punctate, trans-striate in the middle, thickly covered with short white hair. Vertex smooth. Frons infront of median ocellus with converging striations. Mesoscutum smooth, thickly covered with long dark brown hair. Scutellum with sparse dark brown hair. Pronotum finely striate in the scrobe. Mesopleurum finely striate between subtegular ridge to beyond the middle. Metapleurum strongly, closely obliquely striate, thickly covered with white hair. Propodeum smooth at base and rest finely trans-striate. Abdomen smooth and subpolished.

Black. Antennae with a white band shortly beyond the middle. The following are yellow : Face, clypeus, labrum, palpi, mandible, vertex along the eye margin. Propodeum with an inverted T-shaped yellow mark, base of hind wing, apices of all the abdominal tergites. Fore and middle legs is general yellow or dark yellow, except middle tarsus blackish. Hind leg with coxa yellow, broadly black at apex; trochanter black; femur dull yellow, with black line above; tibia black, except from base to shortly beyond the middle dull fulvous (yellow); tarsi white except base of first and fifth segments blackish. Wings clear hyaline.

Female : Not known

Length : Male, 13 mm; fore wing 10 mm.

Distribution : India : Meghalaya. *Elsewhere :* Sarawak.

7. Genus ***Listrognathus*** Tschek

This is a distinct genus readily distinguished by its single, sharp, conical median frontal horn; somewhat pyramidal clypeus; small squarish areolet; distinct tuberculate apophyses on propodeum and strongly punctate 2nd and 3rd abdominal tergites.

Fore wings 4.5–13.5 mm long. Body moderately stout. Frons with sharp, conical median horn. Clypeus somewhat pyramidal, its apical margin evenly convex or subtruncate, without any median point or tooth. Mesoscutum weakly convex, notauli short to long. Epomia very strong, ending on an angulate projection on upper margin of pronotum. Prepectal carina present. Propodeum strongly convex, its basal carina sharp and complete, apical carina variable in structure; propodeal spiracle short, elliptic to linear to elongate. Areolet small, quadrangular, squarish; ramulus absent; nervulus basad of vasal vein; medialla weakly arched; nervellus intercepted near its lower end. First abdominal segment stout, its spiracle far behind the middle, postpetiole strongly expended, with a strong subbasal lateral tooth; 2nd tergite with strong coarse punctures that are moderately dense to coalescent. Ovipositor sheath about 0.3 as long as fore wing, its tip various.

The following account is largely based on a revision of this genus by Gupta & Kamath (1967 : 373) and Kamath (1967 : 81).

This genus is represented by two subgenera in Indian subregion.

Key to subgenera of *Listrognathus*

1. Lower lateral edge of 1st abdominal tergite simple. Apical transverse carina of propodeum weak or interrupted medially, forming strong sublateral crests. Mandibular teeth equal or unequal in shape. Lower lateral edge of pronotal collar with or without a tooth-like prominence. Holarctic, Indo-Australian and Neotropical regions. ..... 1. ***Listrognathus*** Tschek

– Lower lateral edge of 1st abdominal tergite with 1 or 2 strong teeth near its middle. Apical carina of propodeum absent, propodeal apophyses strong, tuberculate. Lower lateral edge of pronotal collar with a prominent tooth-like projection. Indo-Australian ..... 2. ***Stivadens*** Townes

1. Subgenus ***Listrognathus (Listrognathus)*** Tschek (Fig. 63 : a–c)

1870. *Listrognathus* Tschek, *Verh. Zool. Bot. Gesell. Wien.*, **20** : 153. Type-species : *(Listrognathus cornutus* Tschek) = *pubescens* Fonscolombe; monobasic.

1900. *Mesostenoideus* Ashmead, *Proc. U. S. Natl. Mus.*, **23** : 45. Type-species : *Mesostenus albomaculatus* Cresson; original designatin. Syn. by Roman, 1910.

1903. *Suvalta* Cameron, *Ztschr. System. Hymen. Dipt.*, **3** : 301. Type-species: *Suvalta rugifrons* Cameron; designated by Viereck, 1914. Syn. by Gupta & Kamath, 1967.

Taxonomy : Townes, Townes & Gupta, 1961 : 176, 439. Townes & Townes, 1962 : 408, 413. Townes 1970 : 261. Gupta & Kamath, 1967 : 373. Chiu et al., 1984 : 18. Gauld, 1984 : 163 (Suvalta considered separate and a senior synonym of *Stivadens*).

Distribution : Holarctic, Neotropical and Indo-Australian regions. Gauld reported an undescribed species from Australia.

This subgenus is mainly distinguished by the characters given in the key to subgenera and also having clypeus sharply elevated medially. Mandibular teeth equal or upper tooth broader than the lower tooth. Lower end of accipital carina sharply angled or recurved and meeting hypostomal carina at a right angle, to weakly curved and joining hypostomal carina at an acute angle; sometimes occipital carina interrupted near hypostomal carina; hypostomal carina conspicuously raised or normal. Lower margin of pronotal collar with or without a tooth-like projection near its lower end; pronotal shoulder obtuse or acute. Apical transverse carina of propodeum weak or absent medially, forming strong sublateral crests; propodeal spiracle short elliptic to linear to elongate. Lower lateral edge of 1st abdominal tergite simple, without tooth; thyridium wider (1.3–2.5×) than its distance from base of 2nd tergite. Ovipositor compressed or subcylindric, its tip various.

The species of this subgenus show considerable variation in the nature of the occipital and hypostomal carinae, pronotal shoulders, mandibular teeth and tooth-like projection on pronotal collar.

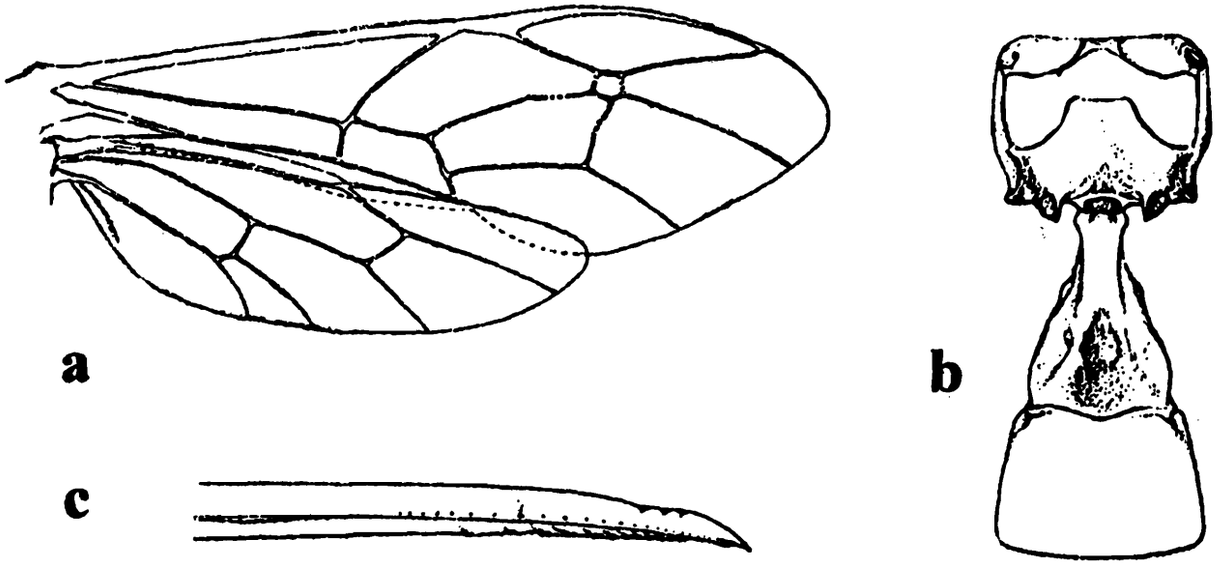

Fig. 63. *Listrognathus* (*Listrognathus*) Tschek : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first & second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Key to the species and subspecies of subgenus *Listrognathus*

1. Frons largely smooth and polished. 2

– Frons largely strongly striated 5

2. Scutellum at base yellow and at apex largely black. Oculo-ocellar area with fine punctures and irregular longitudinal rugae. India : Meghalaya; Maharashtra ..... 2. *laevifrons* (Cameron)

– Scutellum largely yellow. Oculo-ocellar area smooth to mat 3

3. Mesoscutum with a pair of yellow stripes in the middle. Lateral carina of scutellum also marked yellow. India : Himachal Pradesh; Uttaranchal; Jharkhand; Sikkim; Maharashtra; Tamil Nadu; Karnataka; Kerala ..... 1. *spinifrons* (Cameron)

– Mesoscutum without any yellow stripes in the middle, in *heinrichi* a rhomboidal mark at the apex of middle lobe. Lateral carina of scutellum also not marked yellow (Black) 4

4. Hind leg with apical 0.3–0.4 of femur and apical 0.25–0.3 of tibia, black; hind tarsus with its 1st segment basally black, rest yellow. Mandibular teeth equal in size. Pronotal scrobe strongly striate. India : Meghalaya. Myanmar ..... 3. *pallidinerva* (Cameron)

– Hind leg with apical 0.3 and extreme base of femur and apical 0.25 and extreme base of tibia, black; hind tarsus wholly, yellow. Mandibular teeth unequal. Pronotal scrobe densely and shallowly punctate. Myanmar ..... 4. *heinrichi* Kamath

5. Mandibular teeth equal in shape (Fig. 65 : b); lower lateral margin of pronotal collar without a tooth-like prominence (Fig. 65 : a). 6

– Mandibular teeth unequal in shape (Fig. 66 : b); lower margin of pronotal collar with a tooth-like projection (Fig. 66 : a) 8

6. Lower end of occipital carina moderately incurved and meeting hypostomal carina at about at right angle, not further from base of mandible than basal width of mandible. Postpetiole raised basally. India : Meghalaya ..... 5. *rugifrons* (Cameron)

– Lower end of occipital carina sharply angled and recurved, meeting hypostomal carina at a right angle or more or less interrupted at hypostomal carina; lower end of occipital carina far removed from base of mandible. Postpetiole evenly curved 7

7. Apical carina of propodeum complete in middle (Fig. 65 : e), sometimes weak. Frontal horn medium sized, 0.5 as long as scape (Fig. 65 : c). Hind tarsus with 1st and 5th segments black, 2nd segment to basal 0.5 of 4th segment yellow to brownish (Fig. 65 : f). India : Himachal Pradesh; Jharkhand; Uttaranchal; Uttar Pradesh; Maharashtra. Indonesia..... ..... 6. *rufipes* (Cameron)

– Apical carina of propodeum interrupted in middle (Fig. 65 : i), sometimes faintly present. Frontal horn small to very small, 0.2 to 0.3 as long as scape (Fig. 65 : g). Hind tarsus wholly brownish-black (Fig. 65 : j). India : Jharkhand ..... 7. *confracta* Gupta & Kamath

8. Vertex polished and smooth behind. Occipital carina interrupted above (Fig. 66 : c). Abdominal tergites 1–4 with complete yellow apical bands (Fig. 66 : d). Ovipositor tip laterally compressed and finely pointed at apex (Fig. 66 : e)..... 8. *acuminata* Gupta & Kamath.....9

– Vertex coarsely punctate, medially obliquely striated behind. Occipital carina complete above (Figs. 66 : f, h). Abdominal tergites with or without yellow apical bands. Ovipositor tip flattened or depressed dorsally and gradually tapered 10

9. Hind leg with coxa light to dark brown, with an elongate yellow mark above; trochanteral segments brownish-yellow; apical 0.1 of femur, basal 0.1 and apical 0.25 of tibia, brownish-black; tarsus brownish-black except 2nd and 3rd segments light yellow. India : Jharkhand; Tamil Nadu; Kerala. ....8a. *acuminata acuminata* Gupta & Kamath

– Hind leg with coxa black, with a broad oblique yellow mark above; 1st trochanteral segment black, 2nd segment dark yellow; apical 0.25 of femur, basal 0.1 and apical 0.3 of tibia, black; tarsus yellowish-white, except basal 0.4 of first and whole of fifth segment, black. Myanmar .... 8b. *acuminata burmensis* Kamath

10. Frons with oblique or almost parallel striations between horn and median ocellus. Metascutellum with a broad yellow spot. Abdominal segments with apical yellow band, band broadly interrupted in middle. Ovipositor tip seen from above, flattened, tapering gradually, without a median carina (Fig. 66 : g). India : Meghalaya. Myanmar ..... 9. *assamensis* Gupta & Kamath

– Frons with transverse as well as oblique striations between horn and median ocellus. Metascutellum black. Abdominal segments wholly black, sometimes with faint, narrow yellow apical bands (Fig. 66 : i). Ovipositor tip as seen from above depressed and broadly rounded at apex with a distinct median carina (Fig. 66 : j). India : Meghalaya..... 10. *nigriabdominalis* Gupta & Kamath

1. ***Listrognathus (Listrognathus) spinifrons*** (Cameron) (Fig. 64 : a–d).

1905. *Suvalta spinifrons* Cameron, *Ztschr. System. Hymen. Dipt.*, **5** : 143. Female, des. Type: Female, India: "Sikkim Himalayas" (LONDON).

1923. *Suvalta rugifrons:* Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 24. (in part). [Specimens reported from Nagpur belongs here].

1961. *Listrognathus (Suvalta) spinifrons :* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 177. n. comb. India.

1967. *Listrognathus (Listrognathus) spinifrons*: Gupta and Kamath, *Pacific Ins.*, **9** : 387. Male, Female. n. comb. key, des., fig. India: Maharashtra: Satpura Hills: Chikalda, 1100 m.; Devlali; Matheran, 900 m.; Panhala Fort. Jharkhand: Ranchi Dist.: Namkum; Ambera Bero. Uttaranchal : Kumaon Hills: Mohan. Himachal Pradesh: Dalhousie Hills: Khajjiar, 1925 m. Tamil Nadu: Coimbatore, 425 m.; Singara, 1050 m.; Yercaud, 1400 m. Kerala: Walayar Forest, 300 m. Karnataka : Bangalore. Maharashtra : Nagpur (Det. *Suvalta rugifrons* in IARI).

1987. *Listrognathus (Listrognathus) spinifrons* : Gupta, *Mem, Amer, Ent. Inst.*, **41** : 826.

This species is easily distinguished by having mesoscutum with a pair of yellow stripes in the middle; lateral carina of scutellum also marked yellow.

Female : Face rugose in the middle, shallowly punctate at sides. Clypeus sparsely punctate. Inner orbits smooth and shiny, with a few scattered punctures along eye margin. Mandibular teeth unequal in shape. Occipital carina weakly curved towards hypostomal carina and meeting at an acute angle (Fig. 64 : a). Frons smooth and polished, with a median small to moderate sized horn, sometimes with an accessory horn. Vertex smooth to mat. Temple fairly punctate. Malar space rugulose, Pronotum coarsely and shallowly punctate, trans-striate in middle. Pronotal shoulders acute, pronotal collar with a tooth on its lower margin and with a flange anteriorly; epomia strong. Mesoscutum rugoso-punctate, notauli reaching half its length. Scutellum with coarse shallow punctures at sides, medially with a smooth area; metascutellum smooth and shiny. Propodeum (Fig. 64 : b) strongly reticulo-punctate, apical transverse carina broadly interrupted in middle. Prepectus rugoso-punctate, mesopleurum sparsely punctate in the middle, rest of mesopleurum striate. Metapleurum strongly rugoso-punctate, tending to be reticulate. Postpetiole evenly curved, sparsely punctate at base; 2nd and 3rd tergite densely punctate; punctures sparse towards apex, following tergites smooth. Ovipositor (Fig. 64 : d) compressed with a notch at nodus.

Black. Antenna brownish-black, its 8–12 segments yellow dorsally. The following are yellow : an elongate stripe on pronotal collar, pronotal shoulders broadly; a pair of median stripes on mesoscutum; scutellum wholly, sometimes its extreme apex black; its lateral carinae; apico-lateral slopes including apophyses;

tegula; subtegular ridge; a mark in middle of mesopleurum; base of hind wing. Fore and middle legs brownish-yellow, their fifth tarsal segments brownish-black; hind leg broadly yellow, its coxa with an irregular black or brown mark at base; its first trochanteral segment with a black mark above, femur at extreme apex, extreme base and apical 0.25 of tibia, first and fifth tarsal segments wholly, black. Wings hyaline. Abdominal tergites (Fig. 64 : c) with broad yellow apical bands, bands interrupted in middle.

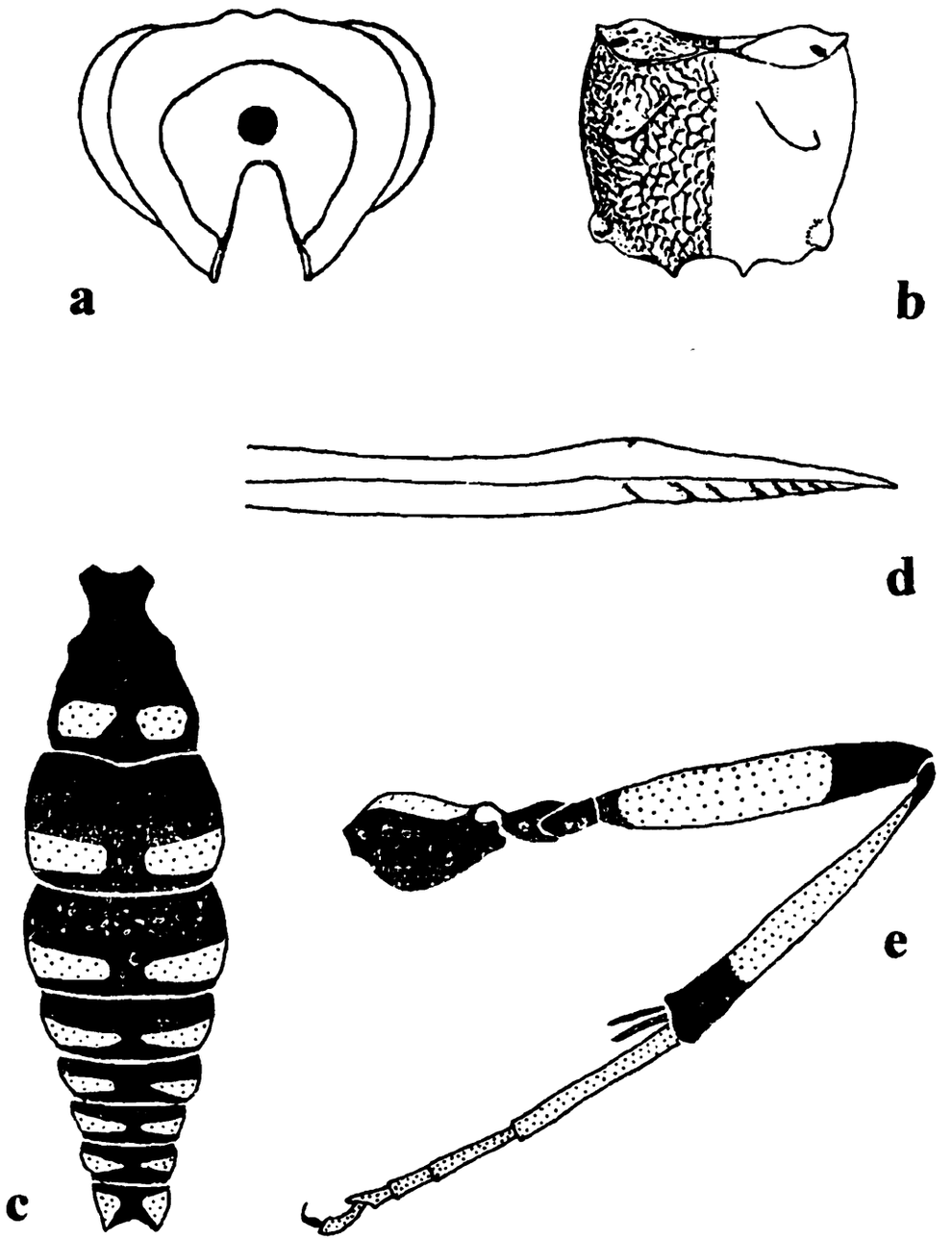

Fig. 64. *Listrognathus* (*L.*) *spinifrons* (Cameron) : **a**, rear view of head showing occipital and hypostomal carinae; **b**, dorsal view of propodeum showing sculpture; **c**, dorsal view of abdomen showing colour pattern; **d**, ovipositor tip. *L.*(*L.*) *heinrichi* Kamath : **e**, hind leg showing colour. (Source : Gupta & Kamath, 1967).

Male : Similar in structure and colour to female, except antennal segments 12-16 with a yellow band. Scutellum broadly yellow, at apex black. Hind coxa largely black with two oblong yellow marks laterally above and 1 spot apically below.

Length : Female, 10.5–12.5 mm; fore wing 8 mm; ovipositor sheath about 3.5 mm. Male, 10–12.5 mm; fore wing 7.5–10 mm.

Distribution : India : Himachal Pradesh (Khajjiar, 1925 m in Dalhousie Hills). Maharashtra (Chikalda, 1100m in Satpura Hills; Devlali; Matheran, 900m; Panhala Forest). Jharkhand (Namkum and Ambera Bero in Ranchi Dist.). Tamil Nadu (Combatore; Singara, 1050m; Yercaud, 1400m.). Kerala (Walayar Forest). Karnataka (Bangalore). Uttaranchal (Mohan in Kumaon Hills). Sikkim.

2. *Listrognathus (Listrognathus) laevifrons* (Cameron)

1903. *Suvalta laevifrons* Cameron, *Ztschr. System. Hymen. Dipt.*, **3** : 302. "Female" = Male. key, des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD).

1923. *Suvalta laevifrons* : Dutt, *Mem. Dept. Agri. India* (Ent. ser.), **8** : 24. India : Maharashtra : Poona.

1961. *Listrognathus (Suvalta) laevifrons* : Townes, Townes & Gupta *Mem. Amer. Ent. Inst.*, **1** : 176. n. comb. India.

1967. *Listrognathus (Listrognathus) laevifrons* : Gupta & Kamath, *Pacific Ins.*, **9** : 377. n. comb., key.

1987. *Listrognathus (Listrognathus) laevifrons* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 824.

Very little is known about this species from Khasi Hills in Meghalaya. Cameron (1903) gave a very short description of this species.

Female : Frons and vertex smooth without any punctures or striations. Apex of scutellum and metascutellum black, and stigma and nerves also black. Face, frons along the orbits, mark on thorax, base of scutellum, yellow. Anterior legs in general yellowish, anterior coxae black, posterior coxae black with yellow markings, hind femora yellowish, wings hyaline.

Body 15 mm long.

Distribution : India : Meghalaya (Khasi Hills).

3. *Listrognathus (Listrognathus) pallidinerva* (Cameron)

1904. *Suvalta pallidinerva* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **13** : 221. Female. des. Type : Female, India : Meghalaya: Khasi Hills (OXFORD).

1961. *Listrognathus (Suvalta) pallidinerva* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 177. n. comb. India.

1967. *Listrognathus (Listrognathus) pallidinerva* : Gupta & Kamath, *pacific Inst.*, **9** : 390. Male, Female. key, des. Myanmar. Mt. Popa, 600-1000 m.

1987. *Listrognathus (Listrognathus) pallidinerva* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 824, 825.

This species is close to *L. (L.) spinifrons* (Cam.) and can be distinguished by not having yellow markings on mesoscutum and lateral carina of scutellum. This species has great resemblance with *L. (L.) heinrichi* Kamath from Myammar, but can be distinguished by the characters given in the key to the species.

Male & Female : Similar in colour to *L. (L.) spinifrons* and *L. (L.) heinrichi.* Mandibular teeth of equal shape and size; frontal horn comparatively longer; notauli weakly marked; pronotal collar strongly striate in middle; propodeum basally striate and whole of thorax and propodeum comparatively more hairy.

Black. Mesoscutum and lateral carina of scutellum not marked yellow (Black). Fore and middle femora with a black line above. Hind coxa and trochanters black with yellow markings; hind femur black in apical 0.3-0.4; hind tibia black in apical 0.25-0.3; hind tarsus yellow, except its 1st segment only at base black.

Distribution : India : Meghalaya (Khasi Hills). *Elsewhere :* Myanmar (Mt. Popa, 600-1000m).

4. ***Listrognathus (Listrognathus) heinrichi*** Kamath (Fig. 64 : e)

1968. *Listrognathus (Listrognathus) heinrichi* Kamath, *Oriental Ins.*, **1** : 85 (1967). Female. key, des., fig. Type: Female, Myanmar : Mt. victoria, 2600 m. (GAINESVILLE).

1987. *Listrognathus (Listrognathus) heinrichi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 824.

This species is mainly recognised by the presence of a rhomboidal yellow spot at the apex of middle lobe of mesoscutum; second and third tergites moderately punctate. Ovipositor subcylindric, flattened between nodus and tip.

Female : Face coarsely punctate, sparsely towards orbits. Clypeus pyramidal in profile with scattered shallow punctures. Mandible with unequal teeth. Occipital carina evenly curved, joining hypostomal carina at an acute angle, the distance between their junction and base of mandible less than the basal width of mandible. Frons smooth and shiny, at sides rugulose, with a large median horn. Vertex with a few deep punctures, oculo-ocellar area smooth, with fine isolated punctures. Temple finely punctate; malar space mat. Pronotum striato-punctate, rugulose below; collar without tooth-like prominence at its lower end; pronotal shoulders moderately developed, obtuse, densely and shallowly punctate; epomia not so strong. Mesoscutum densely punctate, punctures sparse and shallow in the yellow marked area. Scutellum with scattered punctures and metascatellum smooth

and shiny. Mesopleurum strongly rugose and metapleurum rugoso-punctate. Propodeum reticulo-punctate, baso-lateral area with fine deep punctures, apical carina broadly interrupted in the middle, laterally forming short crests. Lower lateral edge of first tergite simple, postpetiole with a few punctures; basal 0.5 of second and third tergites with fine punctures, their apical halves and following tergites smooth and shiny. Ovipositor subcylindrical, flattened between nodus and tip.

Black. The following are yellow : 8–10 flagellar segments dorsally, clypeus, except its apex, base of mandible, face and frons along the orbits, lower half of temple, malar space broadly, pronotal shoulders, mesoscutum with a rhomboidal spot in the middle, scutellum broadly in middle, a spot on metascutellum, tegula, subtegular ridge, an oval mark in the center of mesopleurum, base of hind wing, apicolateral slopes including apophyses of propodeum. Fore and middle coxae and first trochanters mark above, yellow, their femora brownish-yellow except for a black band below, their tibae and tarsi brownish-yellow, apical half of fifth tarsal segment brownish. Hind (Fig. 64 : e) coxa black with a yellow mark above, trochanters black; femur except its extreme base and apical 0.3, tibia except its base and apical 0.25, and tarsus brownish-yellow. Wings hyaline. Apex of postpetiole with a yellow band, following tergites with apical bands, broadly interrupted is middle, yellow; eighth tergite without any band.

Male : Not Known.

Length : Female, 11.5–13 mm; fore wing 11–12 mm; ovipositor sheath 4 mm.

Distribution : Myanmar (Mt. Victoria, 2600 m).

5. ***Listrognathus (Listrognathus) rugifrons*** (Cameron)

1903. *Suvalta rugifrons* Cameron, *Ztschr. System. Hymen. Dipt.*, **3** : 302. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1923. *Suvalta rugifrons* : Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 24. (in part). India : Bihar : Chapra. [Specimen reported from Nagpur belongs to *L. (L.) spinifrons* (Cameron), cf. Gupta & Kamath].

1961. *Listrognathus (Suvalta) rugifrons* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 177. n. comb. India.

1967. *Listrognathus (Listrognathus) rugifrons* : Gupta & Kamath, *Pacific Ins.*, **9** : 378. key.

1987. *Listrognathus (Listrognathus) rugifrons* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 825.

This species is easily distinguished by having lower end of occipital carina moderately incurved and meeting hypostomal carina at right angle, not farther from base of mandible than basal width of mandible; postpetiole raised basally.

Female : Face and clypeus strongly punctate and sparsely covered with short white hair. Frons in middle and area behind ocelli strongly irregularly, mostly longitudinally striated. Pronotum above strongly but not closely, at base finely and closely punctate, scrobe strongly obliquely striated. Mesoscutum strongly punctate, reticulate in the middle. Scutellum punctate, covered with white hair; metascutellum smooth and shiny and deeply bifoveated at base. Mesopleurum strongly and closely punctate, punctures running into striations or reticulations. Metapleurum also strongly and closely punctate. Propodeum with stout apophyses; both the transverse carinae present, arched, area between carinae coarsely aciculated, in the middle also with a few coarse deep punctures and short striae; apical slope coarsely rugoso-reticulate. Second and following abdominal segments closely punctate.

Black. Antenna with a white band in the middle. The following are yellow: Face, clypeus, mandible, frons along the orbit narrowly and temple below broadly, a broad mark at the base of pronotum, tegula, subtegular ridge, scutellum largely, a mark on metascutellum, two large mark apically on propodeum covering apophyses also, propleurae below, mesopleurum with a broad and oblique mark and a small irregular mark at the base of hind wing. Legs in general dark yellow, their coxae and trochanters, yellowish-white; coxae at apex and apices of femora broadly and base of 1st tarsal segments narrowly, black. Apices of all abdominal tergites yellow; band on first tergite large and triangular.

Body about 10 mm long.

Distribution : India : Meghalaya (Khasi Hills).

6. ***Listrognathus (Listrognathus) rufipes*** (Cameron) (Fig. 65 : a–f)

1907. *Cratocryptus rufipes* Cameron, *J. Bombay Nat. Hist. Soc.*, **17** : 592. Female, key, des. Type : Female, India : Maharashtra: Deesa (LONDON).

1907. *Cratocryptus rufipes* : Cameron, *Ann. & Mag. Nat. Hist.*, (7) **20** : 25. key.

1961. *Fislistina? rufipes* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 157. n. comb. India.

1967. *Listrognathus (Listrognathus) perfecta* Gupta & Kamath, *Pacific Ins.*, **9** : 378. Male, Female. key, des., fig. Type: Female, India: Maharashtra : Mowar (GUPTA). India: Jharkhand: Ranchi Dist: Namkum. Uttarancha : New Forest, Dehra Dun, 600 m. Uttar Pradesh : Muradnagar. Himachal Pradesh : Palampur, 1400 m. Maharashtra : Matheran, 900 m.; Devlali. Java : Tijibodas. Syn. by Gupta, 1970.

1970. *Listrognathus (Listrognathus) rufipes* : Gupta, Ichneumon Hunting in India, p. 81. syn., distr.

1973. *Listrognathus rufipes:* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 11. syn.

1987. *Listrognathus (Listrognathus) rufipes*: Gupta, *Mem. Amer. Ent. Inst.*, **41** : 825.

This species is close to *L. (L.) confracta*. It however, can be distinguished by having apical carina of propodeum complete in middle (Fig. 65 : e). Frontal horn about 0.5 as long as scape (Fig. 65 : c). Hind tarsus with 1st and 5th segments black, rest yellow to brownish.

Female : Face coarsely and shallowly punctate, sparse towards orbits, rugose just below antennal sockets. Clypeus pyramidal, sparsely and shallowly punctate. Mandibular teeth equal in shape (Fig. 65 : b). Occipital carina sharply recurved and interrupted near the well raised hypostomal carina (Fig. 65 : d). Median horn of frons 0.5 as long as scape (Fig. 65 : c), area between horn and median ocellus irregularly striated. Vertex coarsely punctate posteriorly. Temple distinctly punctate. Malar space mat, as wide as basal width of mandible. Pronotum rugoso-punctate; epomia long, reaching upper shoulders and turning mesad giving an angular edge, shoulder obtuse, pronotal collar (Fig. 65 : a) without any tooth-like projection. Mesoscutum rugoso-punctate, notaulus sharp, extending up to the middle. Scutellum sparsely punctate, metascutellum smooth and shiny. Mesopleurum and metapleurum rugoso-punctate. Propodeum strongly rugoso-striate, basolateral area more punctate than striate, apical carina complete, forming weak lateral crests (Fig. 65 : e). First abdominal tergite sparsely and shallowly punctate medially, 2nd and 3rd tergites densely and coarsely punctate, punctures on 3rd smaller than those on 2nd, rest of tergites smooth and shiny. Ovipositor subcylindrical, flattened at tip.

Black. The following are yellow : 6–10 segments of flagellum, a spot on face, base of mandible, clypeus except apical depression, inner orbits completely, malar space and lower 0.3 of temple narrowly, lower end of pronotal collar, tegula, subtegular ridge, a triangular or an oval mark just below middle of mesopleurum, base of hind wing, scutellum, metascutellum, apicolateral slopes including apophyses, a mark on fore and middle coxae in front and laterally on outer side, narrowed obliquely towards apex. Trochanters, femora, tibiae, and 1st tarsal segments of fore and middle legs, reddish-brown, the last tarsal segment brownish-black. Hind leg with coxa, trochanter and femur, reddish-brown, extreme apex of femur, extreme base and apical 0.3 of tibia, black, rest reddish-brown; 1st, apical 0.5 of 4th, and 5th hind tarsal segments black, rest of the tarsal segments light brown to yellow (Fig. 65 : f). First and second abdominal tergites with broad yellow apical bands, bands on other tergites narrow.

Male : Similar to female in sculpture and colour, except apical transverse carina of propodeum very strong between the crests. Face, inner orbits and clypeus with coarse deep punctures; postpetiole with coarse shallow punctures.

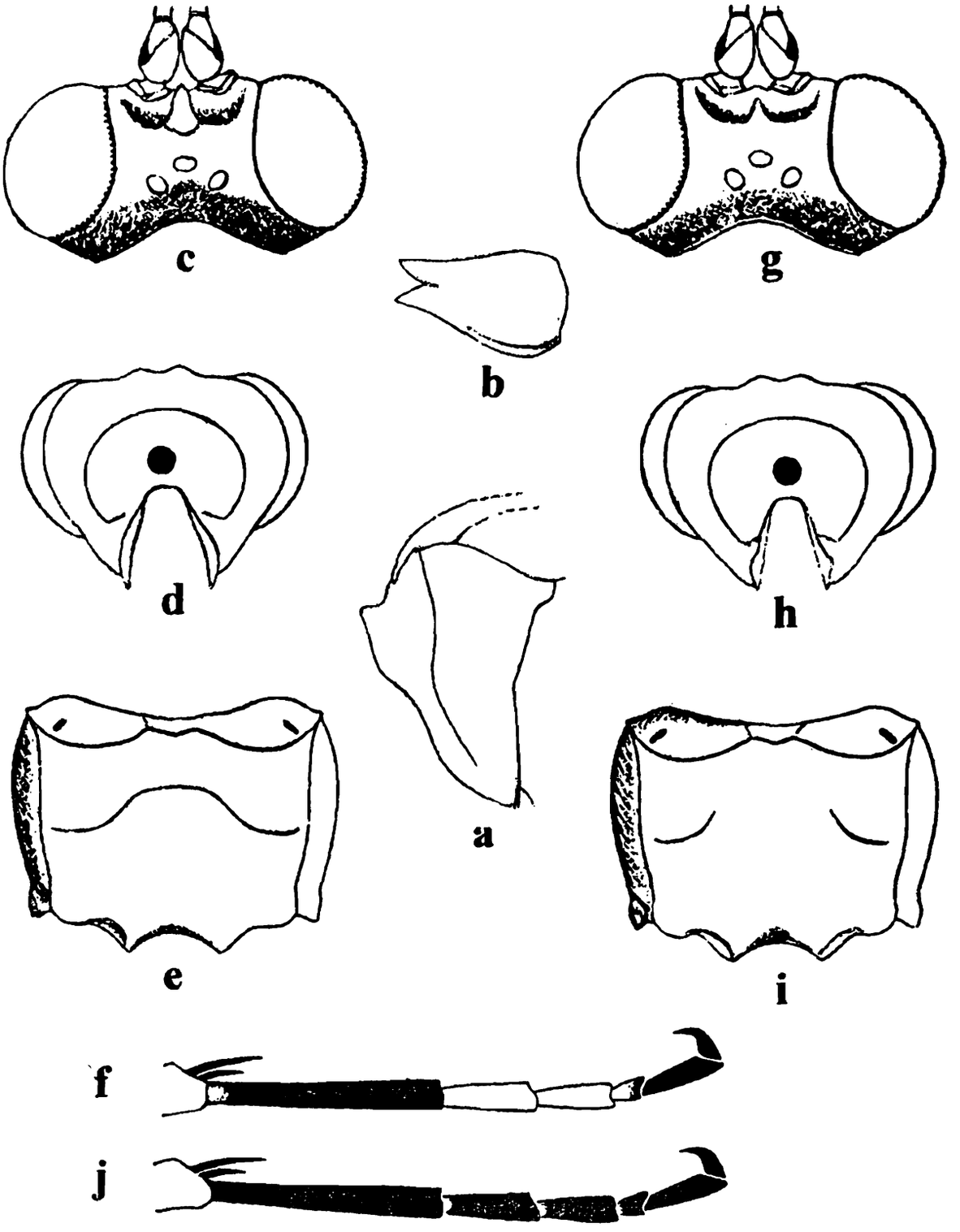

Fig. 65. *Listrognathus* (*L.*) *rufipes* (Cameron) : **a**, pronotum; **b**, mandible; **c**, top view of head showing horn; **d**, rear view of head showing occipital and hypostomal carinae; **e**, dorsal view of propodeum; **f**, hind tarsus showing colour. *L.(L.) confrecta* Gupta & Kamath : **g**, top view of head showing horn; **h**, rear view of head showing occipital and hypostomal carinae; **i**, dorsal view of propodeum; **j**, hind tarsus showing colour. (Source : Gupta & Kamath; 1967.

Black. Scape in front, 8–15 segments of flagellum, face wholly, malar space, 0.3 of lower outer orbits, mandible except teeth, 1st trochanteral segment of fore leg, yellow.

Length : Female, 8–10 mm; fore wing 6 mm; ovipositor sheath 3 mm. Male, 6–8 mm; fore wing 5–6 mm.

Distribution : India : Himachal Pradesh (Palampur, 1400m). Jharkhand (Namkum in Ranchi Dist.). Maharashtra (Deesa; Matheran, 900m; Devlali; Mowar). Uttaranchal (New Forest in Dehra Dun). Uttar Pradesh (Muradnagar). *Elsewhere :* Indonesia (Java).

7. *Listrognathus (Listrognathus) confracta* Gupta & Kamath (Fig. 65 : g–j)

1967. *Listrognathus (Listrognathus) confracta* Gupta & Kamath, 1967. *Pacific Ins.*, **9** : 381. Female. key, des., fig. Type: Female, India: Jharkhand: Ranchi Dist.: Namkum (GUPTA).

1987. *Listrognathus (Listrognathus) confracta* : Gupta, *Mem, Amer, Ent. Inst.*, **41** : 824. Syn.

This species is very close to *rufipes,* but can be easily distinguished by having apical carina of propodeum interrupted in the middle; frontal horn small and hind tarsus wholly brownish-black.

Female : Face strongly rugoso-punctate. Mandibular teeth equal in shape. Lower end of occipital carina sharply recurved, joining hypostomal carina at more than a right angle (Fig. 65 : h). Frons rugoso-striate, with some punctures between ocellus and horn, frontal horn small to very small (Fig. 65 : g). Pronotum rugoso-punctate, shoulder obtuse, shallowly punctate. Mesoscutum with coarse and deep punctures. Scutellum sparsely punctate at base. Propodeum strongly reticulo-punctate, punctures smaller on baso-lateral area, apophyses short and obtuse, apical carina between apophyses faint or broadly interrupted (Fig. 65 : i). Postpetiole, 2nd and 3rd tergites densely punctate, rest of the tergites smooth and shiny. Ovipositor tip flattened beyond nodus.

Black. Colour very much similar to *L. (L.) rufipes,* except that the hind tarsus is wholly brownish-black (Fig. 65 : j).

Male : Not Known.

Length : Female, 6–10 mm; fore wing 4.5–5.8 mm; ovipositor sheath about 2.75 mm.

Distribution : India : Jharkhand (Namkum in Ranchi Dist.).

8. *Listrognathus (Listrognathus) acuminata* Gupta & Kamath

This species is mainly distinguished by having vertex polished and smooth; occipital carina interrupted above; abdominal tergites 1–4 with complete yellow apical bands. Ovipositor tip laterally compressed and finely pointed at apex.

Two subspecies are recognised viz., *acuminata acuminata* Gupta & Kamath from India and *acuminata burmensis* Kamath from Myanmar.

8a. *Listrognathus (Listrognathus) acuminata acuminata* Gupta & Kamath (Fig. 66 : a–e)

1967. *Listrognathus (Listrognathus) acuminata* Gupta & Kamath, *Pacific Ins.*, **9**: 386. Male, Female. key, des., fig. Type: Female, India : Jharkhand : Ranchi (GUPTA). India : Jharkhand. Namkum. Tamil Nadu : Nilgiri Hills : Charangode, 1100 m.; Coimbatore. Kerala : Walayar Forest, 300 m.

1968. *Listrognathus (Listrognathus) acuminata acuminata:* Kamath, *Oriental Ins.*, **1** : 89 (1967). n. status.

1987. *Listrognathus* (*Listrognathus*) *acuminata acuminata*: Gupta, *Mem. Amer. Ent. Inst.*, **41** : 823.

This subspecies is mainly distinguished from other subspecies by the differences in the colour pattern of legs, *viz.*, hind leg with coxa light to dark brown, with an elongate yellow mark above, trochanters brownish-yellow, apical 0.1 of femur, basal 0.1 and apical 0.25 of tibia, brownish-black; tarsus brownish-black, its 2nd and 3rd segments light yellow.

Female : Face coarsely punctate. Clypeus sparsely punctate; inner orbits smooth. Mandible (Fig. 66 : b) with teeth unequal in shape; occipital carina interrupted above, joining hypostomal carina at a moderately acute angle (Fig. 66 : c). Frons with a moderate sized conical horn, irregular striations between horn and median ocellus. Vertex smooth, ocellar triangle rugose. Temple finely punctate. Malar space finely rugulose. Pronotum above coarsely punctate, in scrobes trans-striate, collar smooth with tooth-like projection on its lower margin (Fig. 66 : a). Mesoscutum strongly rugoso-punctate. Scutellum with shallow punctures, metascutellum smooth and shiny. Mesopleurum striato-rugose, prepectus coarsely rugose. Propodeum reticulate, at base reticulo-punctate, apico-lateral slope trans-striate, apical carina broadly interrupted in middle, forming moderately strong, acute sublateral crests. Metapleurum reticulo-punctate. Abdomen with postpetiole densely punctate; 2nd and 3rd tergites coarsely and deeply punctate, punctures more crowded basally and medially, but sparse at

apex, following tergites smooth and polished. Ovipositor (Fig. 66 : e) with notches at nodus, compressed, tip finely pointed.

Black. Antennal flagellum brownish-black, its 7–11 segments yellow above. The following are yellow : Face, clypeus, mandible except the teeth, inner orbits, lower half of outer orbit, malar space, pronotal collar, pronotal shoulders, scutellum, metascutellum, apico-lateral slopes, including apophyses of propodeum, tegula, subtegular ridge, an oval mark in the middle of mesopleurum, base of hind wing. Legs is general brownish-yellow, fore and middle coxae and trochanters light yellow, fore coxa at extreme base brownish, 5th segment of fore and middle tarsi brownish-black. Hind leg with coxa light brown to dark brown with an elongate yellow mark above, extreme apex of femur, extreme base and apical 0.25 of tibia, its 1st, 4th & 5th tarsal segments brownish-black, 2nd and 3rd light-yellow, rest brownish-yellow. Apices of 1–4 tergites with complete broad yellow bands, 5–8 tergites with an apical medially interrupted yellow band (Fig. 66 : d).

Male : Similar to female in all respect, except face strongly punctate; propodeal carina strong; postpetiole with moderately dense, deep punctures. Abdominal segments with moderately deep punctures. Antennal flagellum without a yellow band. Hind leg with coxa black, with a yellow mark above, its first trochanteral segment black, apical 0.3 of femur, extreme base and apical 0.3 of tibia; its first tarsal segment wholly, basal half of 2nd segment and whole of 5th segment brownish-black, rest brownish yellow.

Length : Female, 10–12 mm; fore wing 8.5 mm; ovipositor sheath 3 mm. Male, 10.5 mm; fore wing 8mm.

Distribution : India; Jharkhand (Ranchi, Namkum). Kerala (Walayar Forest). Tamil Nadu (Cherrangode, 1100 m; Coimbatore).

8b. ***Listrognathus (Listrognathus) acuminata burmensis*** Kamath

1964. *Listrognathus (Listrognathus) acuminata burmensis* Kamath, *Oriental Ins.* **1** : 89 (1967). Female. key, des. Type : Female, Myanmar; Mt. Victoria, 1400m. (GAINESVILLE).

1986. *Listrognathys (Listrognathus) acuminata burmensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 823.

Very much similar to *L. (L.) acuminata acuminata,* except as follows :

Female : 8–12 antennal segments yellowish-white above. Hind leg with coxa black, with a broad yellow spot above; first trochanteral segment, apical 0.25 of femur, basal 0.1 and apical 0.3 of tibia, basal 0.4 of 1st tarsal segment and whole of 5th tarsal segment, black; 2–4 tarsal segments yellowish-white, rest of legs yellowish.

Male : Not known.

Length : Female, 10 mm; forewing 8–5 mm; ovipositor sheath 3mm.

Distribution : Myanmar (Mt. Victoria, 1400m).

9. *Listrognathus (Listrognathus) assamensis* Gupta & Kamath (Fig. 66 : f, g)

1967. *Listrognathus (Listrognathus) assamensis* Gupta & Kamath, *Pacific Ins.*, **9** : 382. Female. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills: Cherrapunji, 1400 m. (GUPTA). Myanmar: Mt. Victoria, 1400 m.

1987. *Listrognathus (Listrognathus) assamensis* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 823.

This species is distinguished by having oblique or almost parallel striations between horn and median ocellus on frons. Metascutellum with a broad yellow spot. Abdomen with medially interrupted apical yellow bands.

Female : Face and clypeus shiny, punctate, tending to be rugose in middle. Inner orbits with a few scattered punctures. Mandibular teeth subequal in shape. Occipital and hypostomal carinae as shown in figure 66 : f. Frons with a longish, conical median horn, parallel striations between horn and median ocellus. Vertex with coarse punctures, ocello-ocular area strongly striated. Temple finely punctate. Malar space finely rugulose. Pronotum coarsely striato-punctate, lower margin with scattered punctures and an angular tooth at its middle as in *acuminata*. Epomia raised, pronotal shoulders strong and acute, sparsely punctate. Mesoscutum strongly rugoso-punctate. Scutellum shiny punctate; metascutellum smooth and shiny. Propodeum reticulo-punctate, baso-laterally tending to be rugoso-punctate, apical carina broadly interrupted in middle, forming strong sublateral crests. Mesopleurum strongly rugoso-punctate, striate just above middle coxa. Metapleurum reticulo-punctate. Postpetiole medially raised, with distinct deep, sparse punctures; 2nd tergite with large, deep punctures, 3rd tergite with small punctures, following smooth. Ovipositor subcylindrical, tapering towards apex (Fig. 66 : g); nodus with notches, apex evenly flattened, without median carina, lower valve with slanting teeth or ridges.

Black. The following are yellow : Antennal flagellum with 7–12 segments, face, clypeus except apical margin, mandible except teeth, malar space, temple below, vertex along eye margin, lower margin of pronotal collar, pronotal shoulder, scutellum, metascutellum, propodeum at its apico-lateral slopes including apophyses, mesopleurum with a spot in the middle, tegula, subtegular ridge, base of hind wing, postpetiole with broad triangular spots on apico-lateral corners, abdominal tergites with apical bands, band interrupted in middle. Leg in general dirty yellow to brownish-yellow; fore coxa except for an irregular black mark at

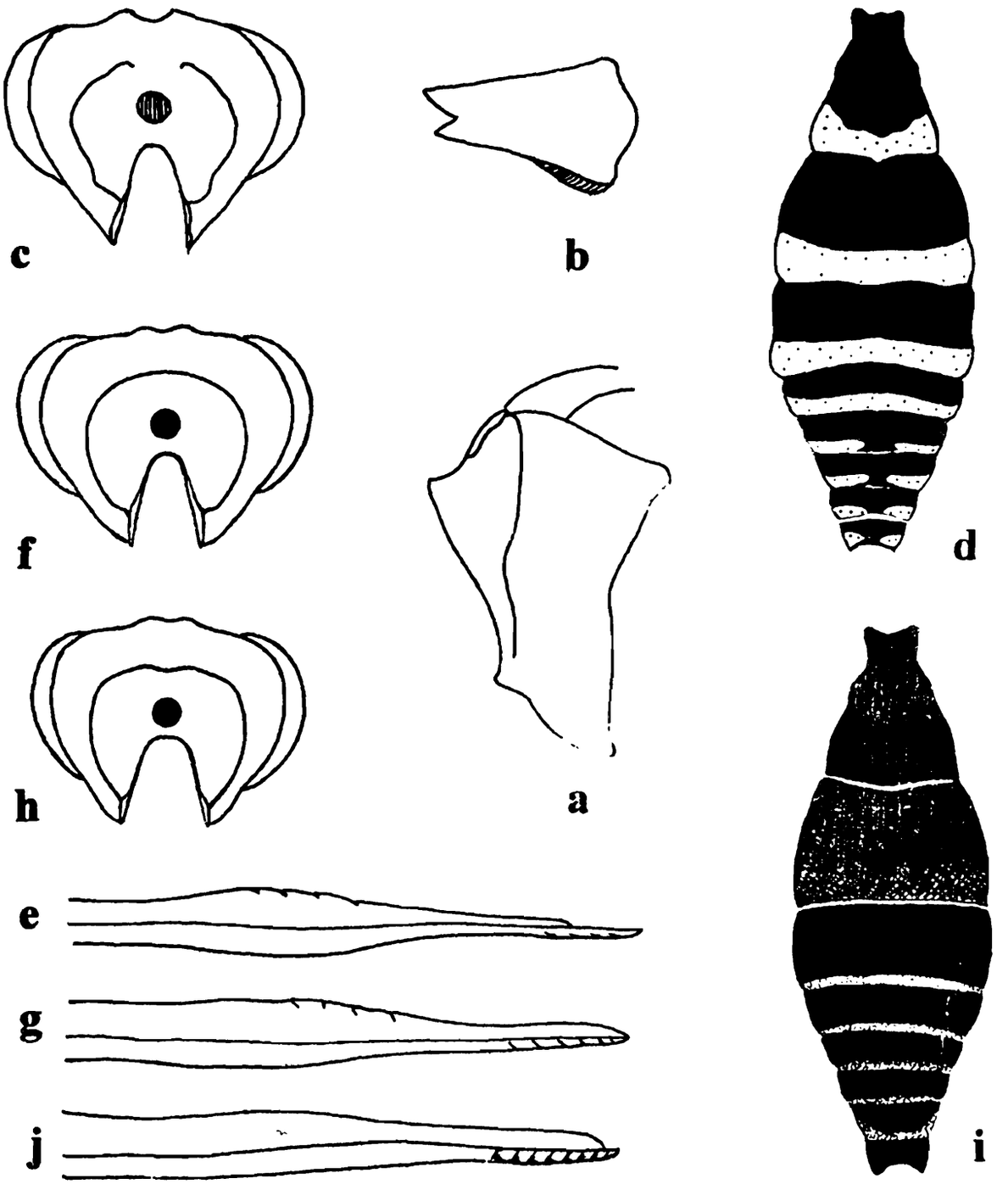

Fig. 66. *Listrognathus* (*L.*) *acuminata acuminata* Gupta & Kamath : **a**, pronotum; **b**, mandible; **c**, rear view of head showing occipital and hypostomal carinae; **d**, dorsal view of abdomen showing colour pattern; **e**, ovipositor tip. *L.*(*L.*) *assamensis* Gupta & Kamath : **f**, rear view of head showing occipital and hypostomal carinae; **g**, ovipositor tip. *L.*(*L.*) *nigriabdominalis* Gupta & Kamath : **h**, rear view of head showing occipital and hypostomal carinae; **i**, dorsal view of abdomen showing colour; **j**, ovipositor tip. (Source : Gupta & Kamath, 1967).

base below, trochanters, middle coxa and trochanters, yellow; fore and middle femora brownish-yellow with blackish-brown markings. 5th tarsal segment wholly black; hind coxa largely black with an oval dorsal and an irregular ventral yellow mark, both the spots meeting on inner side, hind trochanter, basal 0.6 of femur and tibia except its extreme base and apical 0.25, brownish-yellow, hind tarsus, except for basal 0.2 of 1st and 5th segment yellow.

Male : Not known.

Length : Female, 13.5 mm; fore wing 11mm; Ovipositor sheath 4–5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1400 m, in Khasi Hills). *Elsewhere :* Myanmar (Mt. Victoria).

10. *Listrognathus (Listrognathus) nigriabdominalis* Gupta & Kamath (Fig. 66 : h–j)

1967. *Listrognathus (Listrognathus) nigriabdominalis* Gupta & Kamath, *Pacific Ins.*, **9**: 384. Female key, des., fig. Type : Female, India : Meghalaya : Khasi Hills ; Cherrapunji, 1400 m. (GUPTA). India: Meghalaya : Jaintia Hills : Pynursla, 1350m.

1987. *Listrognathus (Listrognathus) nigriabdominalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 824.

This species can easily be distinguished by its moderately strong built and colour of abdomen, which is wholly black, except sometimes with faint narrow apical yellow abdominal bands.

Female : Face and basal 0.3 of clypeus coarsely punctate, rest of clypeus smooth. Upper tooth of mandible broader than the lower. Occipital carina joining hypostomal carina at an acute angle (Fig. 66 : h) and closer to the base of mandible. Median horn of frons of moderate size; frons with transverse and oblique striations between horn and median ocellus. Vertex coarsely punctate. Temple with dense shallow punctures. Malar space rugulose. Pronotal collar strongly striate, lower margin punctate, with an angular tooth-like prominence near its middle, pronotal shoulder strong and acute, punctate. Mesoscutum coarsely rugoso-punctate. Notauli shallow. Scutellum with sparse shallow punctures, at apex smooth. Metascutellum smooth and shiny. Mesopleurum rugoso-punctate. Metapleurum reticulo-punctate. Propodeum including its baso-lateral area reticulo-punctate, apical transverse carina interrupted in the middle, turned mesad and almost joining the basal carina, propodeal crests moderately long. Abdomen with postpetiole medially raised, coarsely punctate; 2nd tergite coarsely punctate; 3rd tergite with small and well separated punctures, its middle area with scattered punctures, apical bands on 2-3 tergites and following tergites wholly smooth and shiny. Ovipositor (Fig. 66 : j) subcylindical, dorsally depressed between nodus and tip, with a median carina, its tip blunt, rounded.

Black. The following are yellow : 6–13 flagellar segments above, face, clypeus except at apex, mandible except teeth, inner orbits completely, lower half of outer orbit, malar space, small spot on pronotal collar, pronotal shoulder broadly, scutellum, apico-lateral slopes of propodeum including lateral crests, mesopleurum with an oblong mark in the middle, tegula, subtegular ridge, base of hind wing. Fore and middle legs is general brownish-yellow, with their coxae broadly yellow above and black below, their trochanters also yellow. Fore femur on outer side and middle femur on inner side broadly black, extreme apices of fore and middle femora, bases of their tibiae and apices of 3rd and 4th tarsal segments brownish-black. Hind leg with coxa black, with a yellow mark above, apical half of femur, extreme base and apical 0.3 of tibia, apical half of fifth tarsal segment, black, rest of hind leg brownish-yellow. Abdomen (Fig. 66 : i) wholly black, except for a very narrow faint yellow bands on 3rd, 4th and 7th segments, 2nd tergite somewhat brown at apex, 5th and 6th obscurely yellow at apex, 7th with its lateral side also broadly yellow.

Male : Not Known.

Length : Female, 15.5 mm; fore wing 12 mm; ovipositor sheath 5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1400m; Pynursla, 1350 m).

2. Subgenus ***Listrognathus (Stivadens)*** Townes

1961. *Stivadens* Townes, *Mem. Amer. Ent. Inst.*, **1** : 472. Type-species : *Suvalta annulipes* Cameron; original designation.

Taxonomy : Townes & Townes, 1962 : 408, 412. Gupta & Kamath, 1967 : 392. Townes, 1970 : 261. Gauld, 1984 : 163 (as a synonym of *Suvalta).*

Distribution : Indo-Papuan Area.

This subgenus is mainly distinguished by having 1 or 2 strong teeth on its lower lateral edge of 1st abdominal tergite near the midlength.

Frons smooth and shiny. Upper tooth of mandible broader than lower (Fig. 67 : b). Lower end of occipital carina weakly curved, meeting hypostomal carina at an acute angle; hypostomal carina normal. Pronotal collar with an angulate tooth at its lower end (Fig. 67 : a); pronotal shoulders moderately developed and weakly obtuse.

Propodeum with prominent sublateral tubercles; apical transverse carina absent. Lower lateral edge of 1st abdominal tergite with 1 or 2 strong teeth near its midlength. Ovipositor subcylindrical; tip broadly depressed, sometimes with paired impressions on the dorsal valve.

This subgenus is represented by three species from India and Myanmar. A key to distinguish these species is a follows :

Key to the species of subgenus *Stivadens*

1. Lower margin of 1st tergite with a single strong tooth near its midlength. First abdominal tergite with a broad yellow triangular mark in middle, mark not extending to postpetiole (Fig. 67 : c). Ovipositor 0.5 as long as fore wing, its dorsal valve between nodus and apex depressed and with a series of fine, paired impressions (Fig. 67 : e). India : Jharkhand; Karnataka; Kerala; Tamil Nadu. China. Java ..... 11. *flavopetiolata* Gupta & Kamath

– Lower margin of 1st tergite with 2 strong teeth, 1 median and the other subbasal, petiole with yellow mark. Ovipositor less than 0.5 the length of fore wing, its dorsal valve between nodus and apex slightly to moderately flattened, without impressions 2

2. Hind femur black in its apical 0.4. First hind tarsal segment basally (in males most of it or wholly) blackish, about 2.7× as long as 2nd segment (less than 3.0); 4th segment yellow. Antennal flagellar segments 7 to 13 or sometimes up to 15 with a yellow dorsal band. Postpetiole conspicuously widened posteriorly, with scattered punctures around knob-like elevation. Baso-lateral area of propodeum rugose. India : Jharkhand; Karnataka; Maharashtra; Meghalaya; Tamil Nadu. Myanmar. China .... 12. *annulipes* (Cameron)

– Hind femur black in its apical 0.2. First, 4th and 5th tarsal segments wholly black; 1st segment about 0.3× as long as 2nd segment. Antennal flagellar segments 9–12 with a dorsal yellow band. Postpetiole not conspicuously widened, knob-like elevation smooth, with a few scattered punctures around. Baso-lateral area of propodeum trans-striate. India : Jharkhand; Karnataka; Uttaranchal ..... 13. *tirkyi* Gupta & Kamath

11. *Listrognathus (Stivadens) flavopetiolata* Gupta & Kamath (Fig. 67 : a–e)

1967. *Listrognathus (Stivadens) flavopetiolata* Gupta & Kamath, *Pacific Ins.*, **9**: 395. Female. key, des., fig. Type : Female, India : Karnataka: Kottegehar, 650 m. India : Jharkhand: Ranchi Dist. : Namkum. Kerala : Thekkady Wild Life Sanctuary, 1000 m. Tamil Nadu : Shevaroy Hills : Yercaud, 1400 m. Kerala : Walayar Forest, 300 m. Indonesia : Java: Dedjung, Genteng Bay. China: Hainan Is. : Ta Hian.

1987. *Listrognathus (Stivadens) flavopetiolata :* Gupta, *Mem. Amer. Ent. Inst.*, **41** : 826.

This species is easily recognised by having lower margin of 1st tergite with a single strong tooth near its midlength and 1st abdominal tegite with a broad yellow triangular mark in middle.

Female : Face coarsely punctate in middle, punctures sparse towards eye

margin. Clypeus sparsely punctate. Mandibular (Fig. 67 : b) teeth unequal in shape. Frons smooth and shiny. Frontal horn of moderate size. Vertex smooth, with a few scattered punctures between the ocelli. Temple smooth. Malar space mat. Pronotum largely trans-striate, except punctate above, pronotal shoulders weakly obtuse and with sparse, distinct punctures, pronotal collar (Fig. 67 : a) with a well defined angular tooth at its lower end, anterior margin thickened, not forming a flange. Mesoscutum rugoso-punctate, apically with sparse, coarse punctures. Scutellum sparsely but distinctly punctate; metascutellum smooth and shiny. Mesopleurum striato-punctate, at prepectus rugose. Metapleurum strongly rugose. Propodeum strongly reticulate, baso-lateral area rugoso-striate, apical carina absent, apophyses short, obtuse. Lower margin of 1st tergite (Fig. 67 : c) with a single strong tooth near its mid length; postpetiole strongly raised in middle at base with strong punctures, extreme apex smooth; 2nd tergite with moderately dense, coarse punctures, punctures sparse towards apex, punctures on 3rd tergite small, following tergites smooth and shiny. Ovipositor subcylindical, tip depressed, dorsal valve with a series of five paired impressions (Fig. 67 : e) usually six between nodus and apex.

Black. The following are yellow : 10–14 flagellar segments, face, clypeus except apical margin in center, mandible except teeth, inner orbits, lower 0.5 of temple, malar space, pronotal collar and shoulder, mesoscutum with two median elongate stripes, scutellum, apicolateral slopes including apophyses of propodeum, tegula broadly at base, subtegular ridge, a rectangular mark in the middle of mesopleurum, base of hind wing. Legs is general light to dark yellow : fore leg with coxa light yellow, at base black, femur and tibia brownish-yellow, its first tarsal segment brownish, 5th brownish-black; colour of middle leg similar to fore leg except coxa wholly light yellow and 1–4 tarsal segments brownish above. Hind leg (Fig. 67 : d) with coxa black, with yellow broad spot at base, trochanters, femur except its apical 0.2, extreme base and apical 0.3 of tibia, 1st tarsal segment wholly, apex of third, whole of fourth and fifth, black (sometimes 1–4 hind tarsal segments wholly yellow). Petiole with an elongate mark (Fig. 67 : c), apicolateral corners of postpetiole with a triangular mark and other tergites with apical bands, band interrupted in the middle, yellow. Wings clear hyaline.

Male : Not known.

Length : Female, 13–16.5 mm; fore wing 10–11.5 mm; ovipositor sheath 5–5.5 mm.

Distribution : India : Karnataka (Kottegehar, 650 m). Kerala (Thekkady WLS, 1000 m; Walayar Forests, 300 m). Jharkhand (Namkum in Ranchi Dist.). Tamil Nadu (Yercaud, 1400m in shevaroy Hills). *Elsewhere :* Indonesia : Java (Dedjoeng, Genteng Bay). China (Hainan Is. : Ta Hian).

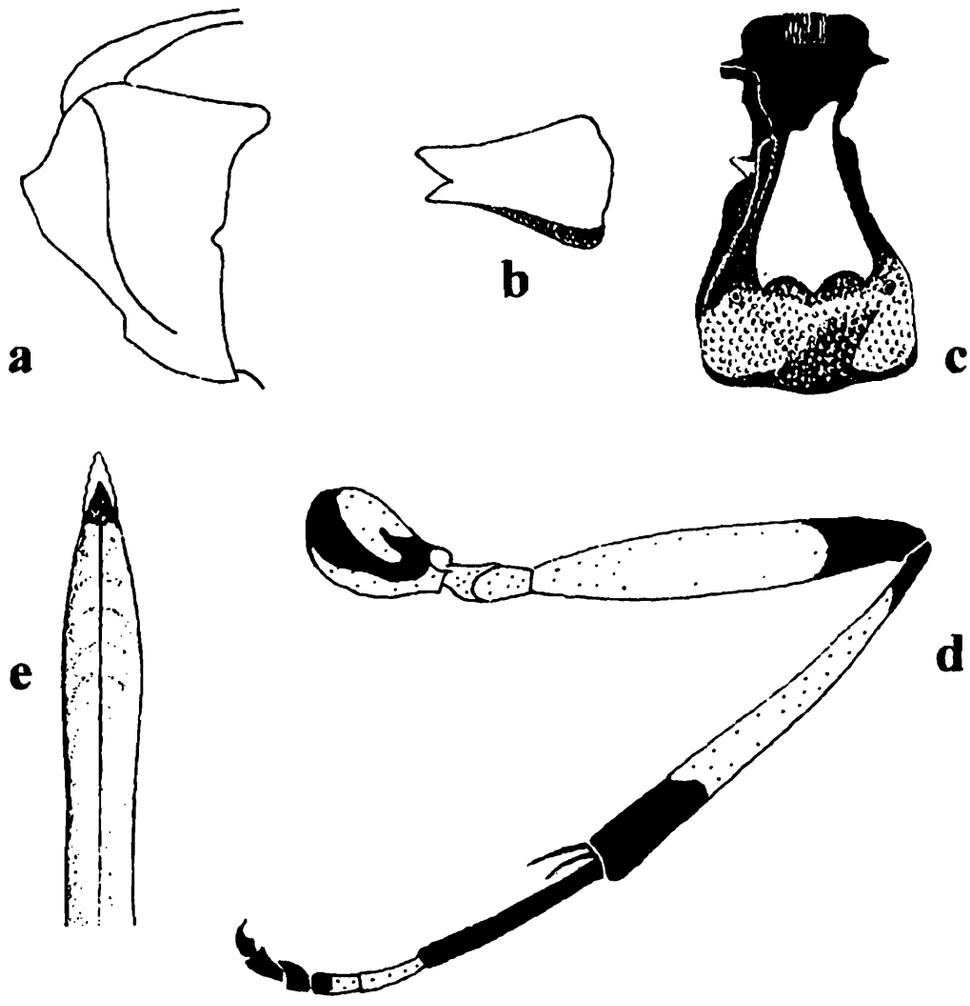

Fig. 67. *Listrognathus (stivadens) flavopetiolata* Gupta & Kamath : **a**, pronotum; **b**, mandible; **c**, first abdominal tergite; **d**, hind leg showing colour; **e**, ovipositor tip in dorsal view. (Source : Gupta & Kamath, 1967).

12. ***Listrognathus (Stivadens) annulipes*** (Cameron)

1904. *Suvalta annulipes* Cameron, *Ann. Mag. Nat. Hist.*, (7) **13** : 220. "Female"= Male. des. Type : India : Meghalaya : Khasi Hills (OXFORD).

1961. *Listrognathus (Stivadens) annulipes* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 177, 472. n. comb. India.

1967. *Listrognathus (Stivadens) annulipes :* Gupta & Kamath, *Pacific Ins.*, **9** : 392. Male, Female. key, des. India : Jharkhand : Ranchi Dist. : Namkum. Karnataka : Kottegehar, 650 m. Maharashtra : Mahabelashwar, 1400 m. Tamil Nadu : Shevaroy Hills : Yercaud, 1400 m. Sikkim. Myanmar : Maymyo, 800 m.; Mt. Victoria, 500 m. China : Hainan Is. : Ta Hian.

1987. *Listrognathus (Stivadens) annulipes* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 826.

This species is recognised by having its hind femur black in its apical 0.4; first hind tarsal segment basally (in males usually wholly) blackish; postpetiole

conspicuously widened posteriorly, with scattered punctures around knob-like elevation; baso-lateral area of propodeum rugose.

Female : Face rugose. Clypeus strongly pyramidal in profile with a few scattered punctures. Frons smooth, with a very short horn. Vertex with sparse but distinct punctures in ocellar triangle. Temple almost smooth and subpolished. Malar space rugulose. Pronotum in scrobe strongly trans-striate, densely punctate above, pronotal shoulders moderately developed, pronotal collar with a tooth at its lower end, epomia present. Mesoscutum rugoso-punctate on the middle lobe, lateral lobes largely shagreened with a few scattered punctures. Scutellum with a few shallow punctures; metascutellum smooth and shiny. Mesopleurum strongly rugoso-striate, middle yellow marked area striato-punctate, rest obliquely striated. Metapleurum rugoso-punctate. Propodeum largely strongly rugose to reticulate, apico-lateral slopes punctate, apical carina absent, apophyses short and obtuse. First hind tarsal segment 2.7 (less than 0.3×) as long as 2nd, lower margin of 1st tergite with 2 strong teeth, 1 subbasal and other median; postpetiole widened posteriorly with a knobe-like elevation at base, with moderately dense, and deep punctures in apicolateral corners and scattered punctures in the raised area, sometimes with a weak depression in the median dorsal aspect. 2nd and 3rd tergites with dense coarse punctures, following tergites smooth and subpolished. Ovipositor subcylindrical, less than 0.5 the length of fore wing, dorsal valve flattened between nodus and apex.

Black. The following are yellow: Face, clypeus except median apical portion, mandible except teeth, 7–13 or sometimes up to 15th flagellar segments, inner orbits, lower 0.5 of temple broadly, malar space, an elongate mark on pronotal collar, pronotal shoulder broadly, a pair of elongated stripes on mesoscutum, scutellum largely, dorsolateral slopes of propodeum including apophyses, tegula, subtegular ridge, a rectangular mark on mesopleurum, an irregular mark at the base of hind wing. Legs in general yellow to brownish-yellow hind leg with coxa black, with a broad yellow mark above and below, apical 0.4 of femur, extreme base and apical 0.4 of tibia, 1st tarsal segment basally and whole of 5th tarsal segment, black; its 1st tarsal segment and 2nd to 4th segments light yellow, rest of hind leg brownish-yellow. Wings clear hyaline. 1st abdominal tergite with broad triangular apicolateral spots, rest of the tergites with yellow apical bands, bands interrupted in the middle.

Male : Extremely similar to female in sculpture and colour except as follows : Face with strong punctures; clypeus almost without punctures; mesoscutum strongly rugoso-punctate.

Black. 12–18 flagellar segments yellow. Yellow mark on mesopleurum oval in shape. Bases of fore and middle coxae black. 1–4 tarsal segments of fore and

middle legs wholly yellow. Hind coxa black with an oblique mark above; basal 0.6 of hind femur reddish-yellow; 1st hind tarsal segment black.

Length : Female, 11.5–12.5 mm; fore wing 9.5 mm; ovipositor sheath 3.5 mm. Male, 10.5 mm; fore wing 9.5 mm.

Distribution : India : Karnataka (Kottegehar, 650 m.). Jharkhand (Namkum and GEL Mission compound in Ranchi dist.). Maharashtra (Mahabaleshwar, 1400 m). Meghalaya (Khasi Hills). Tamil Nadu (Yercaud, 1400 m in Shevarroy Hills). Sikkim. *Elsewhere* : Myanmar (Mt. Victoria 500m; Maymys, 800 m). China (Hainan Is. : Ta Hian).

13. ***Listrognathus (Stivadens) tirkyi*** Gupta & Kamath

1967. *Listrognathus (Stivadens) tirkyi* Gupta & Kamath, *Pacific Ins.*, **9** : 394. Female. key, des. Type : Female, India : Ranchi (GUPTA). India : Jharkhand : Ranchi Dist. : Namkum; Ambera Bero. Uttaranchal : Kumaon Hills : Garjia. Karnatata : Kottegehar, 650 m.

1987. *Listrognathus (Stivadens) tirkyi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 827.

This species is very close to *L. (S.) annulipes,* but differs in colour of antenna and hind leg, sculpture of propodeum and abdominal segments.

The female of this species agrees in most respect with the female of *L. (S.) annulipes*, except as below.

Median lobe of mesoscutum rugoso-punctate, apically sparsely punctate, its lateral lobes largely shagreened, with a few scattered punctures along the margins; baso-lateral areas of propodeum trans-striate to weakly rugose, apophyses short and obtuse. First hind tarsal segment 3.0 as long as 2nd; 2nd and 3rd abdominal tergites with coarse punctures.

Black. 9–12 antennal flagellar segments with a yellow dorsal band. Hind leg with coxa brownish-black with reddish tinge at apex and with a broad yellow spot at base; trochanters brownish-yellow; apical 0.2 of femur, extreme base and apical 0.45 of tibia, 1st tarsal segment broadly, 4th and 5th segments entirely black, rest brownish-yellow.

Male : Not known.

Length : Female, 11.5–14 mm; fore wing 9.5–10.5 mm; ovipositor sheath 3.5 mm.

Distribution : India : Jharkhand (GEL Mission Compound, and Namkum and Ambero Bero in Ranchi Dist.). Karnataka (Kottegehar, 650 m). Uttaranchal (Garjia in Kumaon Hills).

8. Genus ***Goryphus*** Holmgren (Fig. 68)

1868. *Goryphus* Holmgren, *Kongliga Svenska Fregatten Eugenies Resa,* **2** : 398. Type-species : *Goryphus basilaris* Holmgren : Designated by Viereck, 1914.

1868. *Psacus* Holmgren, *Kongliga Svenska Fregatten Eugenies Resa,* **3** : 400. Type-species : *Psacus (Goryphus) areolaris* Holmgren : Designated by Viereck, 1914.

1894. *Brachycoryphus* Kriechbaumer, *Berliner Ent. Ztschr.,* **39** : 46. Type-species : *Brachycoryphus calabaricus* Kriechbaumer; Designated by Viereck, 1914. Syn. by Townes, 1970.

1902. *Fislistina* Cameron, *J. Straits Branch Roy. Asiatic Soc.,* **37** : 56. Syn. by Townes, 1970.

1902. *Fislistina* Cameron, *Ann. & Mag. Nat. Hist.,* (7) **9** : 211. Type-species : *Fislistina maculipennis* Cameron; monobasic. Syn. by Townes, Townes & Gupta, 1961.

1905. *Cratocryptus* Cameron, *J. Straits Branch Roy. Asiatic Soc.,* **44** : 141. Type-species : *Cratocryptus maculiceps* Cameron; monobasic. Syn. by Roman, 1936.

1905. *Loiada* Cameron, *Ann. & Mag. Nat. Hist.,* (7) **16** : 166. Type-species : (*Loiada maculiceps* Cameron) = *Cratocryptus maculiceps* Cameron; monobasic. Syn. by Roman, 1936.

1906. *Cratocryptodes* Schulz, *Spolia Hymenopterologica,* p. 123. New name for *Cratocryptus.*

1968. *Cratocryptoides* Schmiedeknecht, *Genera Insectorum,* 75; 62. New name for *Cratocryptus.*

1914. *Scenopathus* Enderlein, *Beitrage zur Kenntnis der Land-und Susswasser-fauna Deutch-Sudwestafrikas Hymenoptera,* **1**(2) : 215. Type-species : *Scenopathus ferrugineus* Enderlein; original designation. Syn. by Townes 1970.

1952. *Miramilia* Seyrig, *Mem. Acad. Malgache,* **19** (39) : 179. Type-species : *Miramilia communis* Seyrig; original designation. Syn. with *Brachycoryphus* by Townes, Townes & Gupta, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 146. Townes, 1970 : 262. Jonathan & Gupta, 1973 : 9. Chiu et al., 1984 : 18. Gauld, 1984 : 156.

Hosts : Various small to mediaum sized cocoons or naked pupae of Lepidoptera. Chadwick & Nikitin (1976) also reported Curculionidae as hosts.

Distribution : Old World tropics.

This genus is easily recognised by having first abdominal tergite less than 2× as long as wide at apex and postpetiole much wider at base than long; ovipositor tip usually short and blunt, and not so pointed, and propodeal apophyses usually crest-like.

Body moderately small to large, about 7–12 mm long and stout. Clypeus distinctly separated from the face by a groove, roundly convex, apical margin impressed, without a tooth or any irregularity, laterally sometimes a little dilated. Mandible short, teeth equal or subequal (lower tooth slightly shorter than upper tooth). Frons with a narrow median carina extending from median ocellus to middle of antennal sockets. Occipital carina joining hypostomal carina some distance above the base of mandible. Epomia strong and long, continuous ventrally as a carina along the hind edge of pronotal collar. Sternaulus moderately strong, reaching middle coxa or at least more than 0.5 the distance to middle coxa; prepectal carina extending beyond 0.5 the height of mesopleurum; lateral carina of scutellum usually confined to its base, sometimes extending ±0.5 its length. Apical and basal carinae of propodeum present, apical carina usually absent or not well defined in the middle, laterally forming weak or moderately distinct crest-like apophyses; in males the apical carina often weak or absent; propodeal spiracle round to oval; median longitudinal carinae weakly or distinctly present only at the base of propodeum. Fore wing 5–7 mm long, areolet about 5 to 7× as high as the width of bordering veins, usually sqare or somewhat pentagonal, its second intercubitus faintly present; second recurrent vein subvertical; nervulus distinctly basad of basal vein; nervellus intercepted near its lower 0.3; mediella moderately arched; brachiella reaching nearly to wing margin. First tergite with lateral tooth at base, its ventro-lateral, dorso-lateral and median-dorsal carinae usually strong and complete, median-dorsal carinae extending a little beyond the spiracle. First tergite less than 2× as long as wide at apex, and postpetiole much wider at base (width=distance between the spiracles) than long (length=distnace between the spiracle and apex on mid-line). Ovipositor 3-5 mm long, stout, its tip rather short, with a distinct nodus, lower valve with oblique or subvertical teeth.

Goryphus is a rather large genus widely distributed in the tropical and subtropical parts of the Old World (Oriental and Ethiopian). Only one species, *Goryphus basilaris* occurs in Northern China (Eastern Palaearctic). Members of this genus are moderately large to small species with a robust built, and with the characteristic mesostenine pattern. The included species show variations in a number of characters, but it is at present difficult to subdivide the genus into subgenera or even genera. Two species groups, however, are recognized.

In India they have been collected extensively in the plains and at the foothills; only a few species occur above 2000m. They are active on undergrowth in sunshine and retire amongst bushes at sunset. The biology of one species (*Goryphus nursei*) has been worked out in some details. Species of *Goryphus* appear to parasitize prepupae or pupae of various Lepidoptera and Coleoptera.

Townes *et al.* (1961) included sixty-five taxa under *Goryphus, Fislistina* and *Brachycoryphus* from the Oriental Region. Of these, Jonathan & Gupta (1973)

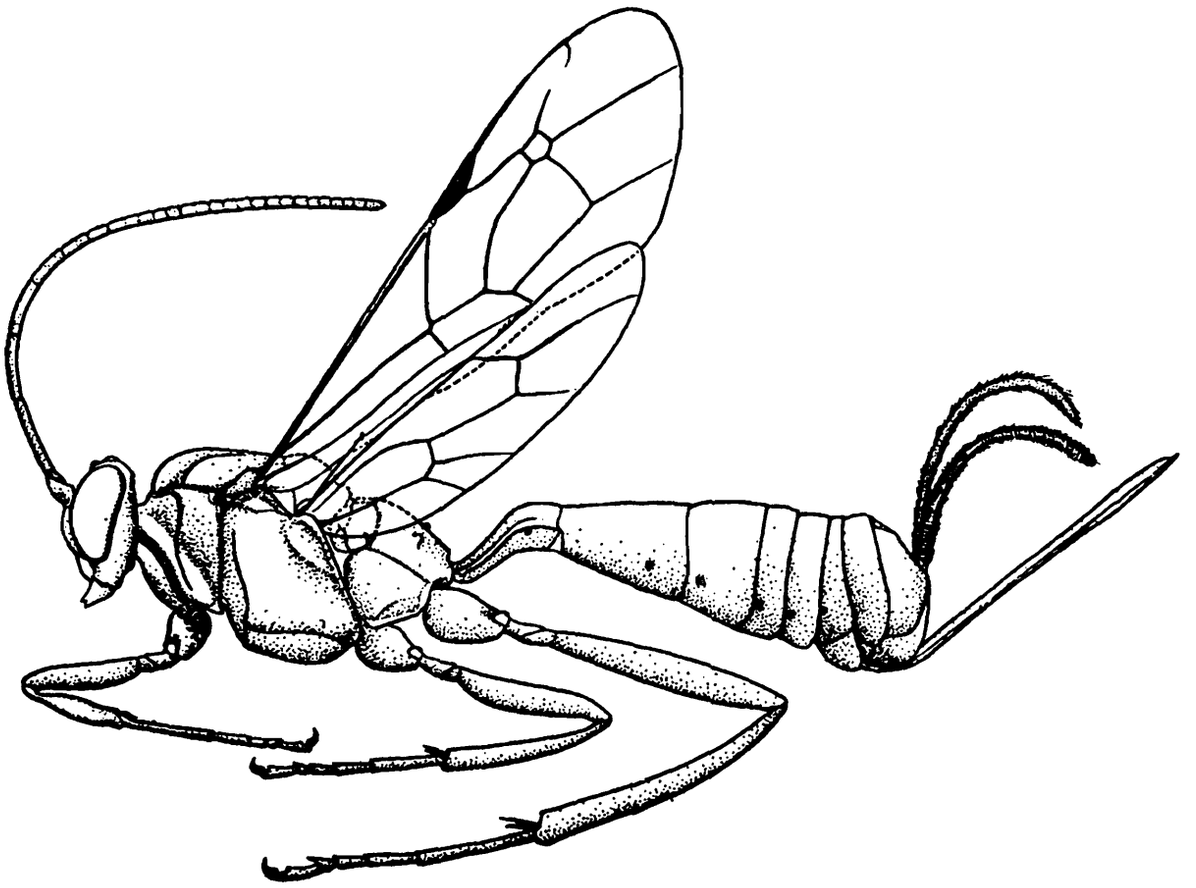

Fig. 68. *Goryphus basilaris* Holmgren : Body side view.

treated thirty-six species under *Goryphus,* ten transferred to *Skeatia,* nine synonymized either under *Goryphus* or *Skeatia* and the rest nine taxa could not be studied and their status (whether belonging to *Goryphus* or *Skeatia*) remained unsettled. In addition, seventeen new species and seven new subspecies were added by Jonathan & Gupta (1973) from Oriental region. *Mesostenoides angulicollis* Cameron, placed under *Vagenatha* in 1961, belongs to *Goryphus.*

Species of *Goryphus* appear to form two distinct species groups : (A) The Mesoxanthus Group, and (B) The Albomaculatus Group. In the Mesoxanthus Group, the first abdominal tergite is either shorter than the second tergite, or as long as the second (0.8 to 1.0×), while in the Albomaculatus Group, the first tergite is longer than the second tergite (1.2 to 1.5×).

The species falling under these two groups from India and adjacent countries can be distinguished by the following key.

Key to the species of *Goryphus*

1. First abdominal tergite shorter or as long as the second tergite (0.8 to 1.0×) ..... A. The Mesoxanthus Group...2

– First abdominal tergite longer than the second tergite (1.2 to 1.5×) ..... B. THE ALBOMACULATUS GROUP...15

2. Propodeum black, with various markings 3

– Propodeum red, with or without markings 7

3. Lateral carina of scutellum extending to its basal 0.5 or more. Apical carina of propodeum absent between apophyses; propodeum entirely black except the apophyses, which are faintly or distinctly yellow marked. Lateral carina of scutellum always marked yellow. (Face and frons along eye margin, pronotal collar and upper margin of pronotum, yellow; hind femur wholly reddish) India : Sikkim. Myanmar ..... 1. *sikkimensis* Jonathan & Gupta

– Lateral carina of scutellum confined to its base. Apical carina of propodeum present between apophyses (except in *dravidus*). Propodeum variously and broadly marked. Lateral carina of scutellum with or without marks 4

4. Face and frons entirely black, face in the middle deeply punctate. Hind tibia with a subbasal band 5

– Face and frons variously marked; face rugose to smooth and subpolished; some times weakly rugoso-punctate. Hind tibia with or without a subbasal band 6

5. Frons with two shallow areas behind each antennal socket, which are separated from each other by a triangular ridge. Ovipositor a little curved in the middle, lower valve with a few faint teeth near apex. Lateral carina of scutellum black. India : Uttaranchal.....2. *madhulikae* Jonathan & Gupta

– Frons with two shallow areas behind each antennal socket, which are not separated by a triangular ridge. Ovipositor not curved, straight and lower valve with a series of strong teeth. Lateral carina of scutellum yellow marked. India : Meghalaya; Himachal Pradesh; Uttaranchal; Karnataka. Myanmar. Sumatra ..... 3. *Cestus* Jonathan & Gupta

6. Face rugoso-punctate in the middle. Mesopleurum wrinkled, tending to be reticulate. Prepectal carina extending 0.75 the height of mesopleurum. Apical carina of propodeum broadly absent in the middle. Base of hind wing and metapleurum black. Lateral carina of scutellum, two lateral marks on propodeum and apices of first, second, sixth, seventh and eighth tergites, yellow marked. India : Meghalaya; Kerala; Karnataka and Tamil Nadu. Thailand. Singapore ..... 4. *dravidus* Jonathan & Gupta

– Face rugose in middle. Mesopleurum trans-rugose. Prepectal carina extending the full hight of mesopleurum. Apical carina of propodeum complete, strongly

arched in the middle. Base of hind wing, metapleurum, lateral carina of scutellum, propodeum broadly between apical carina and apex, and apices of all abdominal tergites yellow. India : Bihar; Kerala; Tamil Nadu... .... 5. *gibbosus* Jonathan & Gupta

7. Mesoscutum subpolished, without striae or aciculation along the margins and grooves. Scutellum evenly moderately convex, shiny, smooth or faintly and sparsely punctate. Lateral carina confined to its basal 0.25 8

– Mesoscutum dull, striate or aciculate along the margins and grooves. Scutellum flat to weakly arched, dull or subpolished, distinctly and closely punctate. Lateral carina of scutellum extending beyond its basal 0.5.....12

8. Lateral carina of scutellum marked, yellow. Hind tibia with a subbasal white band 9

– Lateral carina of scutellum not marked. Hind tibia without a subbsal band 10

9. Apical carina of propodeum complete and strongly arched. Face rugoso-punctate. Face, frons and pronotum black. India : Arunachal Pradesh; Jharkhand; Kerala; Karnataka; Uttaranchal. Myanmar. Indonesia .... 6. *rufobasalis* Betrem

– Apical carina of propodeum absent, except for weak sublateral crests. Face shallowly and closely punctate. Face in middle and along eye margin, frons along eye margin, upper margin of pronotum and pronotal collar, yellow. India : Jharkhand; Delhi; Uttar Pradesh. Myanmar .... 7. *flavorbitalis* Jonathan & Gupta

10. Face, frons along eye margin, upper margin of pronotum and two sublateral marks on propodeum yellow. India : Assam; Jharkhand; Himachal Pradesh; Maharashtra; Uttaranchal ..... 8. *difficilis* Jonathan & Gupta

– Face, frons and pronotum entirely black 11

11. Face and frons punctate in the middle. Mesopleurum largely rugose. Areolet large, about 6× as high as the width of bordering veins. Second tergite broadly orange at base. India : Karnataka .... 9. *lunatus* Jonathan & Gupta

– Face largely finely rugose, tending to be rugoso-punctate. Frons finely wrinkled. Mesopleurum largely wrinkled, tending to be reticulate above. Areolet about 4× as high as the width of bordering veins. Second tergite black at base. India : Andhra Pradesh. Indonesia. Malaysia. Singapore. Thailand. Philippines ..... 10. *mesoxanthus* (Brullé)

12. Scutellum red or black; subtegular ridge and tegula always entirely black...13

– Scutellum, subtegular ridge and tegula yellow (tegula sometimes partly black) 14

13. Pronotum largely coarsely striate. Metapleurum distinctly wrinkled. Prepectal carina extending to 0.75× the height of mesopleurum. Scutellum, middle and hind trochanters and femora red. Wings with fuscous bands. India : Assam; Tamil Nadu; Uttar Pradesh; Karnataka. Myanmar. China. Indonesia. Malaysia. Taiwan. Ryukyu..... 11. *basilaris* Holmgren

– Pronotum largely irregularly wrinkled. Metapleurum weakly rugose. Prepectal carina hardly extending 0.5× the height of mesopleurum. Scutellum, middle and hind trochanters and femora black. Wings clear. India : Assam ..... 12. *distinctus* Jonathan & Gupta

14. Lateral carina of scutellum and hind tarsus completely black. Temple smooth and shiny. Face finely longitudinally striate. Upper margin of pronotum obliquely and finely striate. Myanmar. Java. Krakatau Is. Lang Is. Philippines. ..... 13. *apicalis* Holmgren

– Lateral carina of scutellum yellow. Hind tarsus with a whitish band on first and second segments. Face rugose. Upper margin of pronotum wrinkled. Myanmar. Java. Taiwan. Hungtow Is. ..... 14. *hyalinoides* (Uchida)

15. Metapleurum and propodeum red 16

– Metapleurum and propodeum black (may be with white or yellow markings 21

16. Frons with a weak semicircular carina behind each antennal sockets, enclosing a shallow basin. Pronotum largely smooth, with a few striae in the middle. Mesoscutum and scutellum smooth. India : Kerala; Karnataka; Tamil Nadu. Sri Lanka ..... 15. *varibalteatus* (Cameron)

– Frons without a semicircular carina behind each antennal socket. Pronotum largely striate. Mesoscutum and scutellum usually with a few or more punctures 17

17. Frons with two orbital stripes along each eye margin. Propodeal apophyses yellow or red..... 18

– Frons black, without orbital stripes; propodeal apophyses not yellow, always red 20

18. Thorax almost entirely reddish. Propodeal apophyses red. Lateral carina of scutellum yellow marked. Second tergite entirely black. Hind tibia with a

subbasal white band. Second and third tergites strongly punctate, punctures running into striations. India : Bihar; Delhi; Gujarat; Maharashtra; Orissa; Punjab; Rajasthan; Tamil Nadu; Uttaranchal; Jharkhand; Uttar Pradesh. Pakistan ..... 16. *nursei* (Cameron)

– Thorax not as above, its pronotum and mesoscutum largely black; lateral carina of scutellum black. Second tergite with an apical yellowish band. Hind tibia without a subbasal band. Second and third tergites not so strongly punctate, punctures not running into striations 19

19. Face striato-punctate. Malar space about 0.7× the basal width of mandible. Prepectal carina extending 0.5× the height of mesopleurum. Metapleurum strongly rugose. Propodeum at base smooth. Areolet about 5× as high as the width of the bordering veins. India : Assam; Jharkhand; Uttaranchal. Indonesia ..... 17. *gandhii* Jonathan & Gupta

– Face minutely punctate. Malar space about 0.4× the basal width of mandible. Prepectal carina extending almost up to the base of subtegular ridge. Metapleurum finely rugoso-striate. Propodeum at base rugose. Areolet about 7× as high as the width of bordering veins. India : Maharashtra; Tamil Nadu. ..... 18. *nilgiricus* Jonathan & Gupta

20. Face wholly rugose. Malar space 0.75× the basal width of mandible. Lateral carina of scutellum extending to its basal 0.5. Propodeum finely reticulate in middle. Pronotum and mesoscutum red. India : Assam; Uttaranchal .... 19. *rangaparensis* Jonathan & Gupta

– Face rugoso-punctate. Malar space about 0.5× the basal width of mandible. Lateral carina of scutellum confined to its base. Propodeum strongly rugose in middle. Pronotum and mesoscutum largely black India : Assam; Kerala; Karnataka; Tamil Nadu; Uttarnachal. Myanmar .... 20. *apollonis* Jonathan & Gupta

21. Upper margin of pronotum moderately swollen. Propodeal apophyses or sublateral crests in female usually not blunt but present as crests or teeth 22

– Upper margin of pronotum strongly swollen. Propodeal apophyses in female usually blunt, and well separated, in male represented by weak crests or carinae 26

22. Mesoscutum without any mark at the apex of middle lobe. Pronotum and mesopleurum entirely black, except the subtegular ridge, yellow. (Frons along eye margin, metascutellum, tegula, metapleurum, apical slope of propodeum, apices of first to third, sixth and seventh tergites, yellow). Indian : Assam;

Bihar; Jharkhand; Delhi; Kerala; Maharashtra; Karnataka; Tamil Nadu; Uttaranchal; Uttar Pradesh ..... 21. *cinctipes* (Cameron)

– Mesoscutum with an oval mark at the apex of middle lobe. Pronotal collar and upper margin of pronotum yellow. Mesopleurum variously marked....23

23. Propodeum with a horse-shoe-shaped mark. (Face somewhat rugoso-punctate; lateral carina of scutellum black; metapleurum broadly yellow and hind leg in general yellowish-brown). India : Meghalaya; Jharkhand; Maharashtra; Uttaranchal. Myanmar ..... 22. *brahminus* (Cameron)

– Propodeum without a horse-shoe-shaped mark, may be variously marked 24

24. Face minutely and shallowly punctate. Frons weakly rugose. Mesopleurum moderately strongly trans-striate above. India : Meghalaya; Sikkim. .... 23. *albomaculatus* (Cameron)

– Face weakly rugose. Frons obliquely striate. Mesopleurum rugose to rugoso-striate above 25

25. Mesopleurum rugose below subtegular ridge. Speculum sparsely and minutely punctate. Metapleurum sparsely and minutely punctate. Metapleurum strongly wrinkled, tending to be reticulate. Fifth and sixth tergites entirely black. India : Kerala; Karnataka; Tamil Nadu..... ..... 24. *vinodi* Jonathan & Gupta

– Mesopleurum rugoso-striate below subtegular ridge. Speculum largely smooth and shiny, except for a few punctures above. Metapleurum strongly trans-wrinkled. Sixth tergite black, fifth apico-laterally, yellow. India : Meghalaya; Sikkim; West Bengal..... 25. *salutator* (Cameron)

26. Ventro-lateral carina of first abdominal segment subapically strongly expanded like a lateral tooth or flange. Shallow area behind antennal sockets separated by a median ridge. Mesopleurum and metapleurum largely reticulate. Apical band on fifth and sixth tergites interrupted in the middle. (Hind coxa orange, with a yellow mark above). India : Jharkhand; Kerala; Maharashtra; Uttaranchal. Malaysia..... 26. *villosus* Jonathan & Gupta

– Ventro-lateral carina of first abdominal segment not expanded like a tooth or flange 27

27. Lateral carina of scutellum yellow. Mesoscutum finely striato-punctate or aciculo-punctate 28

– Lateral carina of scutellum black. Mesoscutum finely punctate, aciculation or striations absent; if present, present only in the notaular grooves..... 29

28. Prepectal carina extending 0.75 the height of mesopleurum. Malar space about 0.6× the basal width of mandible. Frons around median acellus finely and obliquely striate. India : Jharkhand; Karnataka; Tamil Nadu. Indonesia ..... 27. *ochropus* (Brullé)

– Prepectal carina extending up to the base of subtegular ridge. Malar space about 0.44× the basal width of mandible. Frons around median occllus strongly wrinkled. India : Kerala. Sri Lanka ..... 28. *cameroni* (Betrem)

29. Third and fourth tergites with complete apical bands. Face rugulose in the middle. Malar space 0.5× the basal width of mandible. Hind tarsus largely blackish, with its second and third segments basally, yellowish. India : Jharkhand .....29. *parallelus* Jonathan & Gupta

– Third tergite without a band (Black); band on fourth tergite broadly interrupted in the middle. Face shallowly punctate in the middle. Malar space 0.8× the basal width of mandible. Hind tarsus largely orange, with its fifth tarsal segment dark brown. India : Jharkhand; Kerala; Maharashtra; Karnataka; Tamil Nadu; Uttar Pradesh. .....30. *tirkyi* Jonathan & Gupta

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Note : *Goryphus interceptus* (Cameron) and *Goryphus ornatipennis* could not be included in the key to the species.

A. The Mesoxanthus Group

This group is characterised by having the first abdominal tergite short or as long as the second tergite (0.8 to 1.0×). Areolet small to large, about 3 to 6× as high as the width of bordering veins, usually pentagonal in shape; second recurrent vein received near the middle. Upper margin of pronotum normal, rarely weakly swallen, and the ovipositor tip usually blunt, very rarely long and somewhat pointed.

1. ***Goryphus sikkimensis*** Jonathan & Gupta (Fig. 69 : a–e)

1973. *Goryphus sikkimensis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 42. Female, key. des., fig. Type : Female, India : Sikkim : Gangtok, 1670m. (GUPTA). India : Uttaranchal : Kumaon Hills : Dunia, Jeolikote, 1219m., Dehradun. West Bengal : Valley at Teesta Bridge, 200m. Myanmar : South Shan State, East of Taunggyi; Kambaiti, 200m.

1987. *Goryphus sikkimensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 846.

This species is distinguished by having the face and frons along the eye margin, pronotal collar and a small median mark anterior to epomia and fore coxa, yellow (Figs. 69 : a, b). The hind femur is largely reddish, mesopleurum strongly rugose,

lateral carina of scutellum extending up to its basal 0.75, and metapleurum and propodeum largely reticulate. The areolet of fore wing is about 5× higher than the width of bordering veins.

Female : Head and thorax covered with white hairs. Face weakly convex, rugose, rugulose at sides. Clypeus evenly convex, punctate. Mandible longitudinally striate with a few punctures. Malar space granulose, about 0.6× the basal width of mandible. Frons below ocellar triangle obliquely and coarsely striate, with a median longitudinal carina, at sides granulose. Vertex smooth and subpolished. Temple punctate. Pronotum trans-striate, striae finer at the upper margin. Mesoscutum rugulose, aciculate along the margins of each lobe, apex of middle lobe wrinkled. Scutellum subpolished, trans-rugose at base, smooth and shiny at apex; lateral carina of scutellum extending to its basal 0.75. Metascutellum smooth and shiny. Mesopleurum strongly rugose. Prepectal carina extending the full height of mesopleurum. Speculum punctate, and shiny. Metapleurum reticulate (sometimes rugose); juxtacoxal carina present. Propodeum largely reticulate, area basad of basal carina wrinkled to obliquely striate, apical carina absent; apophyses short and rounded; basal carina complete and straight; spiracles oval. Areolet pentagonal, about 5× as high as the width of bordering veins, intercubiti parallel; second intercubitus faint. First tergite granulose with a few scattered shallow punctures in between the spiracles, its apex and base smooth and shiny; second and third tergites tending to be shallow towards apices, the following tergites subpolished. Ovipositor moderately long (Fig. 69 : e)

Black. Fourth to ninth flagellar segments white above. The following are yellow : Face and frons with elongate marks along the eye margin (Fig. 69 : a), pronotal collar and a small mark at the anterior part of epomia, subtegular ridge, posterior half of tegula, scutellum except at the base, metascutellum, lateral carina of scutellum, tip of appophyses of propodeum, a small oval mark on mesopleurum near base of middle coxa, and a mark at the base of hind wing (Fig. 69 : b), apices of first and second tergites, and seventh and eighth tergites largely (Fig. 69 : c). Fore leg with coxa and its first trochanteral segment yellow, femur and tibia dark yellow, tarsus yellowish-brown, except with its fifth segment dark brown; middle leg with coxa and trochanter yellowish-brown, femur and tibia brown, tarsus yellowish-brown, except its fifth segment dark brown; hind coxa, trochanter and femur reddish, femur with a small dark brown mark at the apex, tibia dark yellow, except slightly at the base and largely at the apex dark brown, tarsus largely blackish or black; except apical 0.5 to 0.7 of second segment dirty white (Fig. 69 : d) (colour of tarsus slightly variable).

Male : Not known.

Length : Female, 9.5–10.5 mm; fore wing 7–7.5 mm; ovipositor sheath 3–3.5 mm.

Distribution : India : Sikkim (Gangtok, 1670m.). Uttaranchal (Dunia, Jeolikote, Dehra Dun in Kumaon Hills). West Bengal (Valley near Teesta Bridge). *Elsewhere* : Myanmar (South Shan State, East of Taunggyi, Kambaiti, 200m).

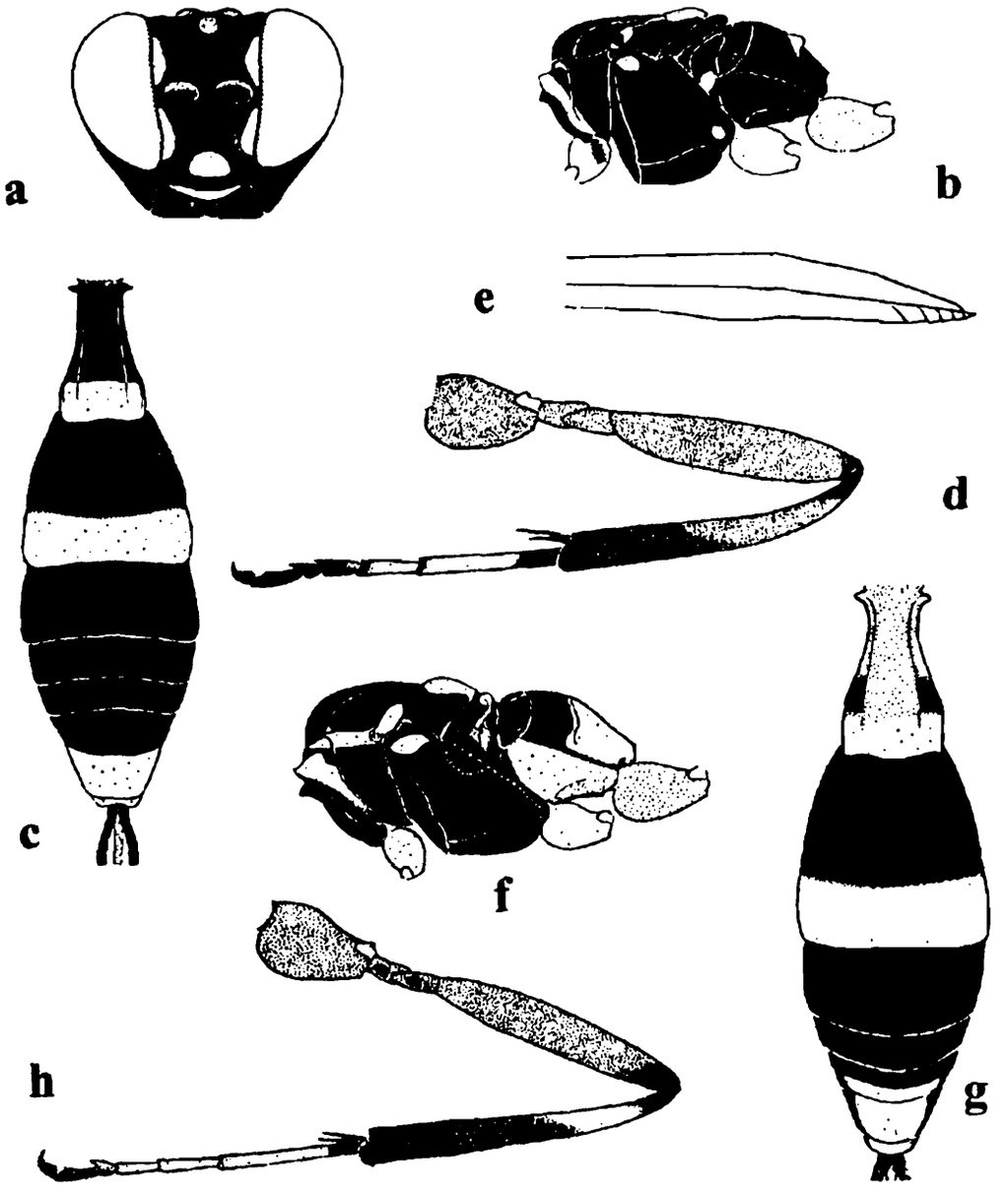

Fig. 69. Colour pattern : *Goryphus sikkimensis* Jonathan and Gupta : **a**, head front view; **b**, thorax side view; **c**, dorsal view of abdomen; **d**, hind leg; **e**, ovipositor tip. *Goryphus madhulikae* J & G : **f**, thorax side view; **g**, dorsal view of abdomen; **h**, hind leg.

2. ***Goryphus madhulikae*** Jonathan & Gupta (Fig. 69 : f–h)

1973. *Goryphus madhulikae* Jonathan & Gupta, *Oriental Ins. Monogr.* **3** : 50. Female, key. des., fig. Type : Female, India : Uttaranchal : Garjia, 609m (GUPTA).

1987. *Goryphus madhulikae* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 839.

This species is characterized by having the ovipositor a little curved in the middle and the lower valve with a few weak teeth near the tip. The antennal scrobes are separated by a triangular ridge. The face thickly punctate, the propodeum largely reticulate and the apical carina is strongly arched.

Female : Face subpolished, thickly punctate in the middle, smooth at sides, punctures above coalescent. Clypeus subpolished, apical margin not impressed. Malar space granulose, 0.5× the basal width of mandible. Antennal scrobes separated by a triangular ridge that extends between the antennal sockets, below ocellar triangle irregularly and obliquely striate, smooth at sides. Vertex smooth and subpolished. Temple smooth and shiny. Pronotum subpolished, trans-striate in the middle; obliquely rugose above at upper margin of pronotum, pronotal collar smooth. Mesoscutum weakly rugoso-punctate, aciculate along the margins. Scutellum and metascutellum smooth and shiny, lateral carina confined to its base. Mesopleurum wrinkled, striate along the speculum; speculum shiny; area below sternaulus shallowly and minutely punctate; prepectal carina more or less extending up to the base of subtegular ridge. Metapleurum trans-rugose, juxtacoxal carina present. Propodeum reticulate, area basad of basal carina rough and wrinkled, apical carina complete, strongly arched, basal carina more or less straight except in the middle, two longitudinal carinae present at the base, spiracle small and roundish. Areolet pentagonal, about 5× as high as the width of bordering veins, intercubiti convergent, second intercubitus faint. First tergite smooth and shiny; second and third tergites closely punctate; fourth tergite shallowly punctate, the following tergites subpolished. Ovipositor curved in the middle.

Black. Antenna blackish-brown with fifth to twelfth flagellar segments white above. Clypeus, mandible except the teeth, upper half of pronotal collar and upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum, metapleurum largely, and propodeum between apical carina and apex, yellow (Fig. 69 : f). Fore coxa and trochanter, apices of first and second tergites, sixth narrowly in the middle, seventh and eighth tergites broadly in the middle, dirty yellow (Fig. 69 : g). Fore femur, tibia (except at its outer margin, yellow) and tarsus yellowish-brown; middle coxa dirty yellow, trochanter yellowish-orange, femur light reddish-brown, tibia yellow, infuscate at its outer margin, tarsus brownish with fifth segment dark brown. Hind coxa, trochanter and femur reddish-brown, except second trochanteral segment, apex of femur blackish or dark brown, tibia dark brown with a subbasal yellow band (Fig. 69 : h), tarsus white except its first segment at its extreme base (colour of first segment variable, sometimes basal 0.1 to 0.5, dark brown) and fourth segment faintly and fifth segment completely dark brown. First tergite reddish-brown to dark orange, sometimes black in the middle near spiracles, black colour may be a little extensive (Fig. 69 : g).

Male : Not known.

Length : Female, 6 mm; fore wing 5 mm; ovipositor sheath 1.5 mm.

Distribution : India : Uttaranchal (Garjia, 609m).

3. ***Goryphus cestus*** Jonathan & Gupta (Fig. 70 : d)

This is a distinct species having the face thickly punctate, clypeus smooth and the malar space about 0.3 to 0.35× the basal width of mandible. The Lateral carina of

scutellum confined to its base, the mesopleurm rugose and the prepectal carina extending up to 0.75× the height of mesopleurm. The clypeus and the lateral carina of scutellum are yellow.

Female : Face subpolished, thickly punctate, tending to be reticulate above. Clypeus largely subpolished, with a few punctures, apical margin somewhat weakly truncate in the middle. Malar space granulose, 0.3× the basal width of mandible. Frons below ocellar tringle obliquely rugoso-punctate, at sides granulose with a few shallow scattered punctures; median longitudinal carina extending from the median ocellus. Vertex subpolished; temple shallowly and sparsely punctate. Pronotum shiny, trans-striate, striae very sparse and few, finely and obliquely striate above at the upper margin (sometimes less distinct); epomia reaching up to upper margin. Mesoscutum minutely punctate; scutellum and metascutellum smooth and shiny, lateral carina of scutellum confined to its base. Mesopleurum strongly wrinkled, finely striate above middle coxa, speculum shiny and minutely punctate, area below sternaulus largely smooth except just below sternaulus with short striae, prepectal carina extending up to 0.75 the height of mesopleurum. Metapleurum strongly wrinkled, tending, to be reticulate; juxtacoxal carina present. Propodeum reticulate. Basad of basal carina rough, apical carina complete, arched medially, apophyses crest-like, basal carina complete, turned forward in the middle; spiracles small roundish. Areolet pentagonal, 6× as high as the width of bordering veins; intercubiti parallel; second intercubitus faint. First tergite smooth and shiny except slightly granulo-punctate near spiracles; second and third tergites closely punctate; fourth tergite shallowly punctate; the following tergites subpolished. Ovipositor as in figure 70 : d.

Three subspecies are recognised *viz. cestus cestus* from North India and Myanmar, *cestus mysorensis* from South India and *cestus fumatus* from Indonesia (Jonathan & Gupta, 1973).

Key to the subspecies of *cestus*

1. Fore wing broadly in the middle and at apex with dark brown bands; metapleurum black; hind femur at its apical 0.4 dark brown. Frons below median ocellus obliquely striate. Speculum shiny and impunctate. Sumatra..... .....*cestus fumatus* Jonathan & Gupta (Not treated in the text)

– Fore wing clear, without dark brown bands; metapleurm yellow; hind femur only at the extreme apex blackish. Frons below median ocellus rugoso-punctate. Speculum minutely punctate 2

2. Hind tibia largely brown, its apex and base dark brown; subbasal band not well distinct; third abdominal tergite with a yellow band and eighth tergite entirely black. India : Karnataka ..... 3b. *cestus mysorensis* Jonathan & Gupta

3. Hind tibia brownish, its base and apex slightly darker and with a distinct subbasal band; third abdominal tergite black and eighth targite broadly in the middle yellow. India : Meghalaya; Himachal Pradesh; Uttaranchal. Myanmar .... 3a. *cestus cestus* Jonathan & Gupta

3a. ***Goryphus cestus cestus*** Jonathan & Gupta (Fig. 70 : a–c)

1973. *Goryphus cestus cestus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 47. **Female.** key, des, fig. Type : Female, India : Uttaranchal : Garjia, 609 m (GUPTA). **India** : Meghalaya : Jaintia Hills : Dawki. Himachal Pradesh : Nagrota, 914 m. Uttaranchal : Dehra Dun; Pawalgarh; Garhwal Hills : Srinagar, 609m. Myanmar : Shewbo.

1987. *Goryphus cestus cestus* : Gupta, *Mem. Amer. Ent Inst.*, **41** : 833.

Black. Antenna with apical half of fourth to basal half of tenth flagellar segments white above. The following are yellow : Clypeus, except the apical margin, mandible except the apices (Fig. 70 : a), tegula, subtegular ridge, scutellum, lateral carina of scutellum, metascutellum, metapleurm largely except at the basal region, propodeum (Fig. 70 : b) with a broad heart-shaped mark (except for the spindle-shaped mark at the apex in the middle, black), fore and middle coxae and fore trochanter largely, first and second tergites with apical bands, seventh and eighth tergites broadly in the middle (yellow colour may have a little orange hue). Fore femur light brown, tibia yellowish on outer side, infuscate at the inner side, tarsus with first and fifth segments dark brown, second, third and fourth segments infuscate; middle trochanter light orange, femur and tibia light brown, tibia slightly dark brown at base, tarsus largely dirty orange with its first segment largely (except apically) and fifth completely dark brown. Hind coxa, trochanter, femur slightly darker and with a black mark at apex, orange (Fig. 70 : c), tibia brown with apex and base darker and also with a yellow subbasal band, tarsus yellowish to dirty yellow, especially the third and fourth segment, its fifth segment dark brown (colour of hind first tarsal segment variable, sometimes 0.5 to 0.75 black).

Male : Not known.

Length : Female, 6–8.5 mm; fore wing 5.5–7 mm; ovipositor sheath 3–4.5 mm.

Distribution : India : Meghalaya (Dawki in Jaintia Hills). Himachal Pradesh (Nagrota, 914m). Uttaranchal (Dehra Dun, Garjia and Pawalgarh in Kumaon Hills; Srinagar in Garhwal Hills). *Elsewhere* : Myanmar (Shwebo).

3b. ***Goryphus cestus mysorensis*** Jonathan & Gupta

1973. *Goryphus cestus mysorensis* Jonathan & Gupta, *Oriental Ins Monogr.* **3** : 48. **Female.** key, des. Type : Female, India : Karnataka : Kottegehar, 640 m (GUPTA).

1987. *Goryphus cestus mysorensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 833.

This subspecies is extremely similar to *Goryphus cestus cestus* and is chiefly distinguished by its colour. The hind tibia brown, its base and apex dark brown, its subasal band not distinct, basal 0.5 of first hind tarsal segment black, third abdominal tergite also with a yellow band, and the eighth tergite entirely black (without a band).

Male : Not known.

Length : Female, 8.5 mm; fore wing 6.5 mm; ovipositor sheath 3.5 mm.

Distribution : India : Karnataka (Kottegehar, 640m).

4. *Goryphus dravidus* Jonathan & Gupta

This species is distinguished from the other species by the structure of the face, a little swollen upper margin of pronotum and the nature of the prepectal carina. The lateral carina of scutellum is confined to its base and the apical carina of propodeum absent in the middle. A mark on the lateral carina of scutellum, two sublateral marks on propodeum, and apices of first, second, sixth, seventh and eighth tergites, yellow.

Female : Body pubescent; face rugoso-punctate to rugoso-striate, tending to be wrinkled, at sides smooth and subpolished. Clypeus subpolished, with a few to more scattered shallow punctures, apical margin not impressed. Mandible subpolished, shallowly and obscurely punctate. Malar space strongly granulose, 0.5× the basal width of mandible. Frons sculpture variable, punctate to rugoso-punctate, sometimes tending to be striate, smooth and shiny at sides, with a median longitudinal carina. Vertex smooth and subpolished, slightly punctate behind lateral ocelli. Temple sparsely and minutely punctate. Pronotum subpolished, trans-striate, upper margin weakly swollen, epomia strong, reaching to the upper margin and then turned mesad. Mesoscutum minutely punctate, aciculate along the margins of each lobe. Scutellum and metascutellum largely smooth and shiny; lateral carina of scutellum confined to its base. Mesopleurum strongly wrinkled, tending to be reticulate, below sternaulus subpolished; speculum sparsely punctate; prepectal carina extending up to 0.75× the height of mesopleurum. Metapleurum trans-rugose to strongly reticulo-wrinkled, juxtacoxal carina present. Propodeum finely reticulate, finely wrinkled basad of basal carina; apical carina strongly turned forward, and interrupted in the middle; apophyses crest-like, basal carina complete, evenly arched; median longitudinal carinae present only at base. Areolet pentagonal, 5× as high as the width of bordering veins, intercubiti parallel, second intercubitus faint. First tergite smooth and shiny except for a few scattered punctures near spiracles, second and third tergites closely and deeply, and the fourth shallowly punctate; the following tergites subpolished.

Two subspecies are recognised, *viz.*, *Goryphus dravidus dravidus* Jonathan & Gupta (1973) from India, Thailand and Singapore, and *Goryphus dravidus vechti*

Jonathan & Gupta (1973) from Java. The two differ only in the degree of sculpture and colour as given below in the key. However, Indian subspecies has been descussed in detail.

Key to the subspecies of *dravidus*

1. Frons largely rugoso-punctate. Temple and base of hind wing black. Hind tarsus white, except first and fifth segments wholly and apical 0.5 of fourth segment black. India : Meghalaya; Kerala; Karnataka; Tamil Nadu. Thailand. Singapore..... 4a. *dravidus dravidus* Jonathan & Gupta

– Frons rugoso-striate. Temple with a mark near the base of mandible. Base of hind wing yellow. Hind tarsus wholly infuscate. Java ....*dravidus vechti* Jonathan & Gupta

4a. ***Goryphus dravidus dravidus*** Jonathan & Gupta (Fig. 70 : e)

1973. *Goryphus dravidus dravidus* Jonathan & Gupta, *Oriental Ins. Monogr.* **3** : 44. Female, key. des., fig. Type : Female, India : Karnataka : Kottegehar, 640m. (GUPTA). India : Meghalaya : Khasi Hills : Shillong. Kerala : Walayar Forest. Tamil nadu : Shevaroy Hills : Yercaud, 1371m, Tithimati. Thailand : Chieng Dao, Chiang Mai. Singapore.

1987. *Goryphus dravidus dravidus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 835.

This subspecies has a rugoso-punctate face, tending to be wrinkled, at sides smooth and subpolished; frons somewhat rugoso-punctate.

Female : Black. Fifth to tenth flagellar segments white above. The following are yellow : Face broadly near the eye margin (Sometimes with a mark in the middle, small or very extensive, joining the mark on clypeus), clypeus, mandible except at the apex, frons with two orbital stripes coming close to antennal sockets, pronotal collar wholly or in the apical half, upper margin of pronotum, tegula, subtegular ridge, scutellum and metascutellum, lateral carina of scutellum, propodeum in its apical half with two marks on either side, broader at the base and narrowed at apex (Fig. 70 : e), fore coxa and trochanter, first and second tergites apically, sixth narrowly at the apex in the middle, seventh and eighth tergites broadly (in some specimens fifth tergite also narrowly at the apex and in one specimen third tergite also apically with a band), yellow. Fore and middle femora and tibiae largely bright orange, their tarsi brownish, except their fifth tarsal segment dark brown. Hind coxa, trochanter and femur orange, except the femur with a blachish mark at apex, tibia yellowish-orange, except its basal and apical 0.2 black or blackish, tarsus white, except first and fifth segments more or less completely and fourth at its apical half, black (colour of first hind tarsal segment variable).

Male : Not known.

Length : Female, 6–9.5 mm; fore wing 4.5–6 mm; ovipositor sheath 2–3 mm.

Distribution : India : Meghalaya (Shillong in Khasi Hills). Karnataka (Kottegehar, 640 m.) Kerala (Walayar Forest). Tamil Nadu (Yercaud in Shevaroy Hills; Tithimatti). Thailand (Chieng Dao, Chiang Mai). Singapore.

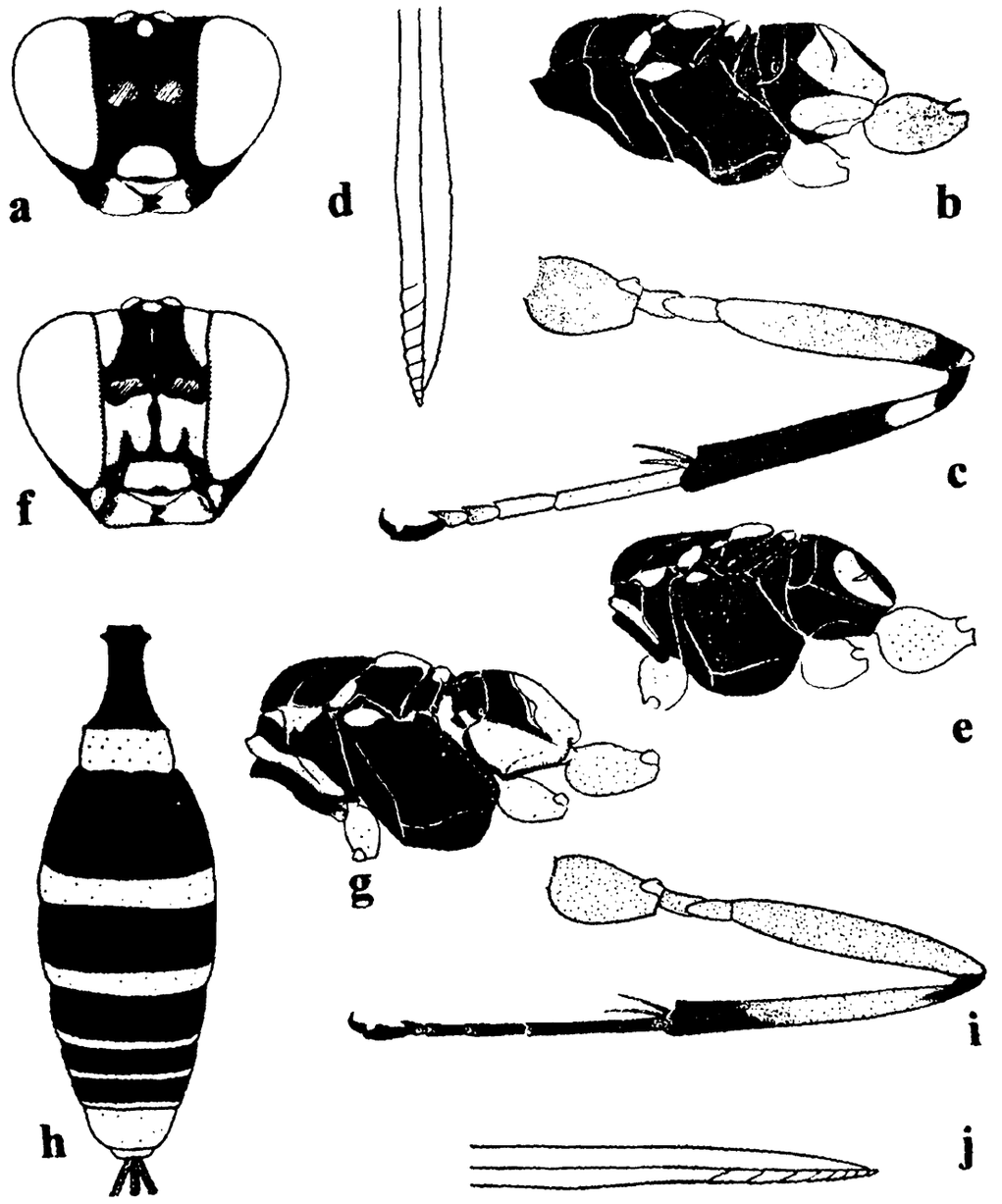

Fig. 70. Colour pattern : *Goryphus cestus cestus* Jonathan & Gupta : **a**, head front view; **b**, thorax side view; **c**, hind leg; **d**, ovipositor tip. *Goryphus dravidus* J&G : **e**, thorax side view *Goryhus gibbosus* J&G : **f**, head front view; **g**, thorax side view; **h**, abdomen dorsal view; **i**, hind leg; **j**, ovipositor tip.

5. ***Goryphus gibbosus*** Jonathan & Gupta (Fig. 70 : f–j)

1973. *Goryphus gibbosus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 49. Female, key. des., fig. Type : Female, India : Tamil Nadu : Kodai Hills : Oothu, 1158m. (GUPTA). India : Kerala : Walayar Forest : Watapara. Jharkhand : Ranchi Dist : Namkum.

1987. *Goryphus gibbosus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 836.

This species looks similar to *Goryphus cinctipes* (Cameron) in having similar marks on the propodeum and metapleurum. It is distinguished by having two broad irregular marks on face. The upper margin of pronotum, pronotal collar, and all the abdominal tergites at their apices, yellow.

Female : Face subpolished, rugose, near the eye margin, with a few scattered punctates, a groove like structure extending down from the centre of antennal sockets to the middle of face. Clypeus subpolished with a few scattered shallow punctures, apical margin impressed. Malar space granulose, 0.5× the basal width of mandible. Frons subpolished, smooth all over, a median longitudinal carina extending from the median ocellus to middle of antennal sockets, sometimes area below ocellar area with weak irregular wrinkles, at sides with a few punctures. Vertex smooth and subpolished. Pronotum subpolished, pronotal collar and upper margin almost smooth and shiny, in the middle trans-striate, epomia reaching to the upper margin, then turned mesad. Mesoscutum indistinctly punctate, aciculate along the margins of each lobe. Scutellum and metascutellum smooth and subpolished, lateral carina confined to its base. Mesopleurum trans-rugose, minutely punctate below sternaulus, trans-striate below speculum and along the mesopleural suture, speculum smooth and shiny, prepectal carina extending the full height of mesopleurum. Metapleurum trans-rugose, juxtacoxal carina present. Propodeum largely reticulate between basal carina and apex, area basad of basal carina rough, apical carina strongly arched, complete, basal carina more or less straight with median longitudinal carinae at base, apophyses weak crest-like. Areolet pentagonal, about 5× as high as the width of bordering veins, intercubiti slightly convergent, second intercubitus faint. First tergite smooth and shiny except sometimes shallowly and sparsely punctate near the spiracles, second and third tergites closely and the fourth shallowly punctate; the following tergites subpolished. Ovipositor shape very much different from other species, as shown in figure 70 : j.

Black. Fifth to tenth flagellar segments white above. The following are yellow : Face with two broad irregular marks, clypeus (Fig. 70 : f) (except along the clypeal margin), mandible, except at apex, a mark at the base of temple, elongate stripes along the eye margin, upper margin of pronotum and pronotal collar, tegula, subtegular ridge, scutellum and metascutellum, base of hind wing, metapleurum almost completely, propodeum between apical carina and apex (Fig. 70 : f), first, second and third abdominal tergites (Fig. 70 : g) apically, fourth, fifth and sixth tergites narrowly at apex (band on fifth and sixth tergites sometimes interrupted in the middle), and

seventh and eighth tergites broadly. Fore coxa and trochanter dirty yellow, femur light brown, tibia brown, tarsus dark brown; middle coxa dirty yellow, trochanter light orange, femur light brown, tibia infuscate, tarsus dark brown; hind coxa, trochanter, femur and tibia deep yellow, tibia with apical 0.25 and narrowly at base blackish, tarsus dark brown or blackish (Fig. 70 : i).

Male : Not known.

Length : Female, 8 mm; fore wing 6 mm; ovipositor sheath 4.5 mm.

Distribution : India : Jharkhand (Namkum nr. Ranchi). Kerala (Watapara in Walayar Forest). Tamil Nadu (Oothu in Kodai Hills).

6. *Goryphus rufobasalis* Betrem.

1921. *Mesostenus* sp. : Van Heurn, *Ent. Ber.*, **6** : 26. Male, Female. Host : *Acrocercops cramerella; Artona catoxantha.*

1941. *Goryphus rufobasalis* Betrem, *Treubia,* **18** : 73. Male, Female. key. des. Type : Female, Indonesia : Java (LEIDEN). Indonesia : Java : Kali Bakung South of Tegal; localities in Bogor, Banjumas, Pekalongan, Kedu & Jogjakarata. Host : *Artona catoxantha.*

1950. *Goryphus rufobasalis* : Vecht, *Coutrib. Gen. Agri. Res. Sta. Bogor,* 110 : 39. Male, Female. key, fig., biol. Indonesia : Java : Banjumas; Kedu; Jogjakarata; Pekalongan; Purworedjo; Jakarta; Udjung Genteng. Host : *Artona catoxantha.*

1961. *Goryphus rufobasalis* : Townes. Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 154.

1973. *Goryphus rufobasalis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 24. Male, Female, key. des. India : Arunachal Pradesh. Kerala : Walayar Forest. Karnataka : Kottegehar, 640m.; Bhagmandla, 850. Jharkhand : Ranchi : Namkum. Uttaranchal : Garjia, 604m. Myanmar : Mt. Victoria, 500m. Indonesia : Java : Djampang Tengah : Magelang : Kemiriamba; Wajochredjo; Danocredjo nr. Mertajoidan.

1987. *Goryphus rufobasalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 845.

This species can easily be distinguished by having a white subbasal band on hind tibia; lateral carina of scutellum yellow; apical carina present and strongly arched; face strongly rugoso-punctate; malar space 0.6× the basal width of mandible; prepectal carina extending up to the base of subtegular ridge and body largely covered with short white hairs.

Female : Body covered with white hairs. Face subpolished, strongly rugoso-punctate, tending to be rugose. Clypeus subploished, minutely and sparsely punctate, apical margin not impressed. Mandible subpolished, with subequal teeth. Malar space granulose, 0.6× the basal width of mandible. Frons obliquely wrinkled in the middle below ocellar triangle, at sides granulose with a few scattered shallow punctures, a

median longitudinal carina extending from median ocellus. Vertex subpolished, minutely punctate. Temple smooth. Pronotum coarsely trans-striate in lower half and obliquely striate above, area near neck smooth and shiny; epomia reaching to upper margin, then turned mesad. Mesoscutum minutely punctate. Scutellum and metascutellum largely smooth and shiny. Lateral carina of scutellum extending to its basal 0.25; mesopleurum rugose, finely wrinkled above, with short coarse striae along prepectal carina, sternaulus, mesopleural suture and speculum; area below sternaulus minutely punctate, speculum smooth and shiny; prepectal carina almost reaching to subtegular ridge. Metapleurum rugulose, juxtacoxal carina present. Propodeum finely reticulate between apical carina and apex, rugose above; apical carina complete, strongly and evenly arched in the middle, apophyses short and crest-like, basal carina complete; spiracles roundish, attached with the basal carina by a small carina. Areolet pentagonal, 5× as high as the width of bodering veins, intercubiti parallel, second intercubitus faint. First tergite smooth and shiny; second and third closely, and fourth minutely, punctate; the following tergites subpolished.

Black. Fourth to thirteenth flagellar segments white above. The following are yellow or dirty yellow. Clypeus at its basal half or sometimes completely, mandible except apices; frons above with two small orbital marks (these marks sometimes extensive, extending below as dark brown stripes), subtegular ridge, tegula, scutellum, metascutellum, lateral carina of scutellum, apices of first and second tergites, sixth tergite narrowly at the apex in the middle, and seventh and eighth tergites broadly. Base of hind wing, metanotal rim, metapleurum, propodeum and first tergite, ornage (colour may be light orange or red). Fore coxa and trochanter yellowish, femur and tibia light orange to red, except tibia yellowish at the inner side, tarsus dirty orange with first and fifth segments darker. Middle leg with coxa and trochanter, dirty yellow, femur and tibia dark yellow, except femur above and tibia largely infuscate, tibia with a yellowish subbasal band, tarsus yellowish with 0.75 of first and fifth segment completely brown. Hind coxa, trochanter and femur dark orange or brownish-orange (colour varies to reddish-brown), except marks on trochanters and apex of femur blackish, tibia blackish with a subbasal band extending up to 0.5 the lenth of tibia, tarsus white except the extreme base of first and fifth segment completely dark brown. Fore wing at apex and a cross band extending from the base of stigma, stigma and veins, brown.

Male : Similar to the female, but much polished and slender. Pronotum largely smooth and shiny with a few striae in the middle. Mesopleurum sparsely punctate. Metapleurum ruguloso-punctate. Propodeum largely wrinkled, both the transverse carinae present, rest of the body sculpture similar to the female.

Black. Antenna black. Face, temple below, frons along the eye margin, pronotal collar, upper margin of pronotum, base of hind wing, apex of third tergite, yellow. Hind leg dark orange to reddish, its trochanters, apex of femur, tibia except a broad

subbasal band and basal 0.5 of first hind tarsal segment blackish, rest of the colour similar to female.

Length : Female, 6–7 mm; fore wing 4–5.5 mm; ovipositor sheath 2–2.5 mm. Male, 6.5–7mm; fore wing 4–4.5 mm

Distribution : India : Arunachal Pradesh. Kerala (Walayar Forest). Karnataka (Kattegehar, 640m.; Bagmandla, 850m.). Jharkhand (Namkum in Ranchi dist.). Uttaranchal (Garjia, 640m.). *Elsewhere* : Myanmar (Mt. Victoria; 500m.). Indonesia : Java (Djampang Tengah; Megelang; Kemiriamba; Wajochredjo; Danocredjo nr. Mertajoidan; Banjumas; Kedu; Jogjakarata; Pekalongan; Purworedjo; Jakarata; Udjung Genteng; Kali Bakung south of Tegal, loc. in Bogor).

Host : *Artona catoxantha* and *Acrocercops cramerella* in Java.

7. ***Goryphus flavorbitalis*** Jonathan & Gupta (Fig. 71 : e)

This species is characterized by having the malar space 0.5× the basal width of mandible; frons above somewhat longitudinally striate; scutellum smooth and shiny, its lateral carina confined to its base. Apical transverse carina of propodeum absent, laterally present as weak crests, propodeum largely reticulate. Orbital mark on frons elongated.

Female : Face closely and shallowly punctate, regulose above near antennal sockets. Clypeus subpolished with a few scattered punctures. Malar space granulose, 0.5× the basal width of mandible subpolished, with subequal teeth. Antennal scrobe smooth and shiny. Frons below ocellar triangle irregularly longitudinally striate and with a median longitudinal carina. Vertex subpolished, minutely and indistinctly punctate. Temple minutely punctate. Pronotum irregularly trans-striate in the middle, upper margin and pronotal collar obscurely punctate. Mesoscutum minutely punctate. Scutellum and metascutellum smooth and shiny, lateral carina of scutellum confined to its base. Mesopleurum finely reticulate or rugose, smooth and subpolished below sternaulus, prepectal carina extending the full height of mesopleurum. Metapleurum rugose, tending to be reticulate at some places. Propodeum largely reticulate, extreme base smooth and shiny, and just basad of basal carina somewhat reticulo-punctate; apical carina broadly interrupted in the middle, apophyses short crest-like; basal carina complete, moderately turned forward medially. Areolet pentagonal, intercubiti parallel, second intercubitus faint. First tergite smooth and shiny, except for a few scattered punctures apicolaterally; second and third tergites closely punctate; the following tergites subpolished; ovipositor long (Fig. 71 : e).

Male : Similar to the female in sculpture and colour pattern, except being much slender and polished. Mesopleurum largely punctate, punctures shallow and sparse; short striae occurring along the prepectal carina in the upper half and near speculum

below subtegular ridge, and also in the sternal groove. First abdominal tergite smooth except rugulose laterally; second, third and fourth tergites densely punctate.

Two subspecies are recognised, *G. flavorbitalis flavorbitalis* Jonathan & Gupta from India and *G. flavorbitalis burmensis* Jonathan & Gupta from Myanmar. Both are very similar in general sculpture as well as in colour of the body except as stated in the key below :

Key to the species of *flavorbitalis*

1. Pronotal collar mark and mark on upper margin of pronotum not joined. First abdominal tergite black. Hind tarsus largely yellow, its first segment largely infuscate, fifth segment black. India : Delhi; Jharkhand; Uttar Pradesh. ..... 7a. *flavorbitalis flavorbitalis* Jonathan & Gupta

– Pronotal collar mark and mark on upper margin of pronotum joined anteriorly. First abdominal tergite reddish, with a brown mark in the middle. Hind tarsus largely white, except its fifth segment dark brown. Myanmar. ..... 7b. *flavorbitalis burmensis* Jonathan & Gupta

7a. ***Goryphus flavorbitalis flavorbitalis*** Jonathan & Gupta (Fig. 71 : a–d)

1973. *Goryphus flavorbitalis flaborbitalis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 19. Male, Female, key. des., fig. Type : Female, India Delhi (GUPTA). India : Uttar Pradesh : Kanpur. Jharkhand : Ranchi dist. : Namkum.

1987. *Goryphus flavorbitalis flaborbitalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 836.

Female : Black. Fifth to ninth flagellar segments white above. The following are yellow : Face (Fig. 71 : a) and clypeus largely (except the clypeal groove and malar space region, blackish or dark brown), mandibles except the apex and base, vertex with two elongate orbital stripes extending to the antennal sockets, a faint mark at the base of temple, upper 0.75 of pronotal collar and upper margin of pronotum in the middle, subtegular ridge, base of the hind wing, scutellum and lateral carina of scutellum, two elongate triangular stripes in the middle of propodeum (Fig. 71 : b), fore coxa, trochanter and middle coxa, apices of first and second tergites broadly, third and sixth tergites narrowly, seventh and eighth largely (Fig. 71 : c). Fore and middle femora and tibiae largely yellowish-brown, their tarsi infuscate, with fifth segment of both dark brown. Matapleurum and propodeum reddish. Hind coxa, trochanter and femur reddish; tibia brown, with a yellow mark near the base, and the extreme base blackish, tarsus yellow (colour variable), its first segment largely infuscate, fifth segment blackish (Fig. 71 : d); in some specimens sixth tergite completely black, seventh narrowly black at the base.

Male : Black. The following are yellow : A marks on face, clypeus, mandible and

temple near the base of mandible (more extensive than in female), metapleurum largely, except at the base, apical 0.66 of propodeum, first to fourth tergites apically and tip of abdomen broadly. Fore femur, tibia, tarsus and middle femur brownish; middle tarsus yellowish-brown and tarsus blackish; apex of hind femur, whole of hind tibia, except yellow band near the base, first and fifth hind tarsal segments completely, blackish; rest of tarsus white.

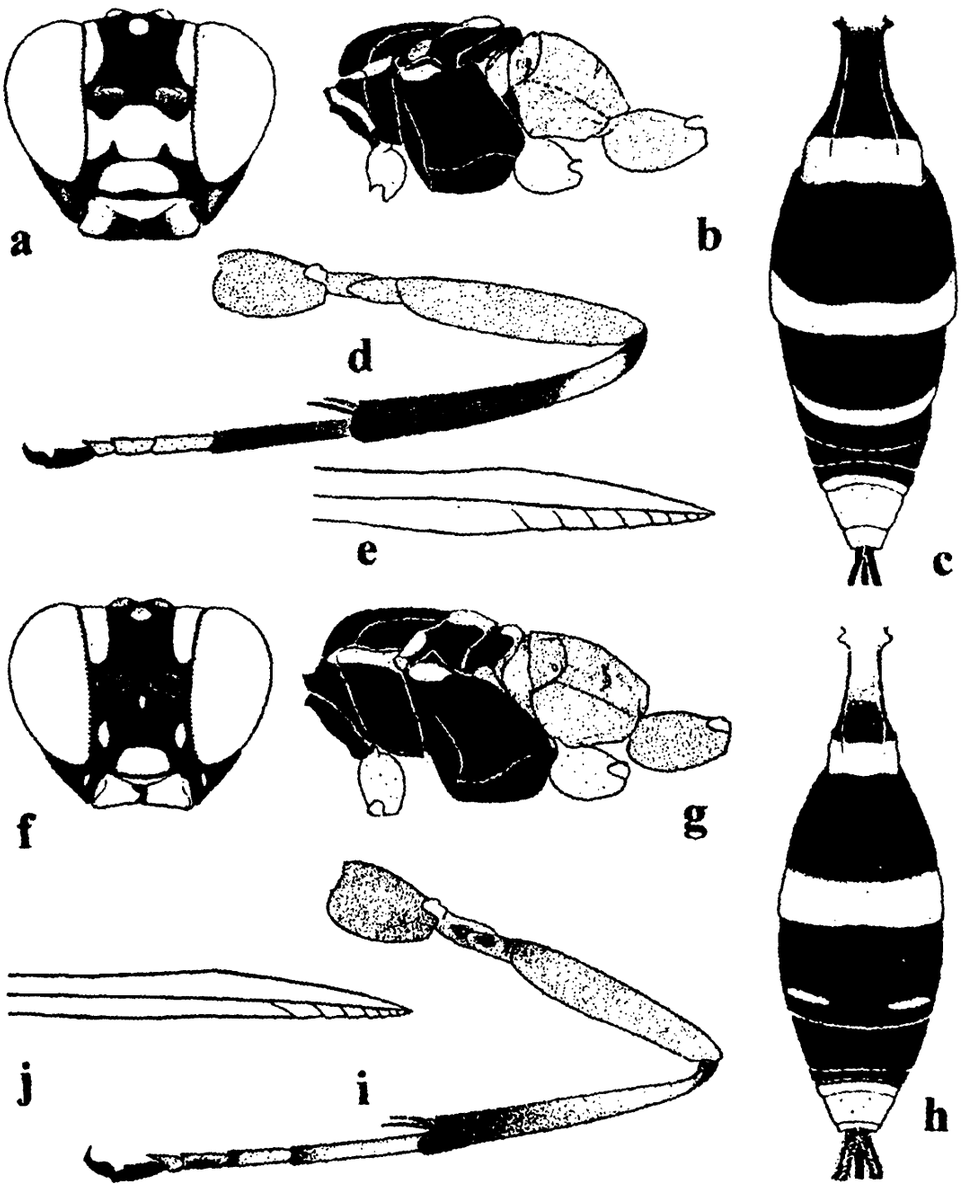

Fig. 71. Colour pattern : *Goryphus flavorbitalis flavorbitalis* Jonathan & Gupta : **a**, head front view; **b**, thorax side view; **c**, abdomen dorsal view; **d**, hind leg; **e**, ovipositer tip. *Goryphus difficilis* J & G : **f**, head front view; **g**, thorax side view; **h**, abdomen dorsal view; **i**, hind leg; **j**, ovipositor tip.

Length : Female, 7.5–9 mm; fore wing 5.5–6 mm; ovipositor sheath 4–4.5 mm. Male, 7–8 mm; fore wing 6–6.5 mm.

Distribution : India : Delhi; Uttar Pradesh (Kanpur); Jharkhand (Ranchi dist : Namkum).

7b. ***Goryphus flavorbitalis burmensis*** Jonathan & Gupta

1973. *Goryphus flavorbitalis burmensis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 20. key. des., Type : Female, Myanmar : S. Toungo (DEHRADUN).

1983. *Goryphus flavorbitalis burmensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 836.

This subspecies is very much similar to *flavorbitalis flavorbitalis* in sculpture of the body, except that the mark on pronotal collar and its upper margin joined anteriorly. First abdominal tergite somewhat reddish with a brown mark in the middle. Hind tarsus largely white with light brownish tinge, its fifth tarsal segment dark brown

Distribution : Myanmar (S. Tongo).

8. ***Goryphus difficilis*** Jonathan & Gupta (Fig. 71 : f–j)

1973. *Goryphus difficilis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 22. Male, Female, key. des., fig. Type : Female, India : Uttaranchal : Garjia, 609m. (GUPTA). India : Assam : Rangapara. Jharkhand : Ranchi. Himachal Pradesh : Nagrota, 914m. Maharashtra : Panhala Fort. Uttaranchal : Dehra Dun.

1987. *Goryphus difficilis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 835.

This species is characterized by having elongate orbital stripes on frons; malar space 0.5× the basal width of mandible; lateral carina of scutellum confined to its base; propodeum largely reticulate, and its apical carina absent in the middle.

Female : Face slightly convex in the middle, rugoso-punctate, clypeus subpolished with distinct punctures. Mandible subpolished with subequal teeth. Malar space granulose, 0.5× the basal width of manduible. Frons with area below ocellar triangle with weak oblique wrinkles, with a median longitudinal carina. Vertex subpolished, impunctate. Temple sublished, sparsely and minutely punctate. Pronotum trans-wrinkled in the middle, rest more or less smooth. Epomia reaching up to upper margin. Mesoscutum subpolished, obscurely punctate. Scutellum and metascutellum smooth and shiny; lateral carina of scutellum confined to its base. Mesopleurum rugose or tending to be finely reticulate, area below sternaulus minutely punctate; speculum smooth and shiny; prepectal carina extending up to the base of subtegular ridge. Metapleurum rugose, juxtacoxal carina present. Propodeum reticulate, at sides and basad of basal carina trans-rugose; apical carina broadly interrupted in the middle; basal carina straight; spiracle roundish; apophyses crest-like. Areolet

pentagonal, 6× as high as the width of bordering veins, intercubiti parallel, second intercubitus faint; first tergite smooth and shiny, with a few shallow punctures apicolaterally near spiracle; second and third tergites distinctly and closely, and fourth sparsely punctate; the following tergites subpolished. Ovipositor as in figure 71 : j.

Black. Fourth to tenth flagellar segments (fourth apically only) white above. The following are yellow. Face with two spindle-shaped marks on either side and sometimes a median spot below antennal sockets (these marks variable, sometimes extensive or sometimes absent), clypeus, mandible basally, a mark on temple below (sometimes absent), two elongate orbital stripes on frons (Fig. 71 : f) upper margin of pronotum, tegula, subtegular ridge, scutellum and metascutellum (Fig. 71 : g), base of hind wing, and two marks on either side of propodeum close to apophyses; Fore and middle coxae and trochanters, apices of first and second tergites, sixth tergite narrowly in the middle, seventh and eighth broadly in the middle, and sometimes the third tergite with two apicolateral marks (Fig. 71 : h). Propodeum reddish; base of first tergite red, blackish in the middle; fore femur brownish, tibia and tarsus largely (except its fifth segment, dark brown), infuscate. Middle leg with femur and tibia brownish, tarsus infuscate, its fifth tarsal segment dark brown. Hind coxa, trochanters and femur reddish; trochanters marked brown, tibia dark yellow, infuscate on its outer side and its apical 0.3 and extreme base blackish; tarsus dirty white with extreme apices of first and second segments, third and fourth segments largely, brown; its fifth segment dark brown (Fig. 71 : i).

Male : Much similar to the female, but slender and polished; colour much different; face, clypeus, temple, frons along the eye margin, pronotal collar, apical slope of propodeum, apices of first to third, sixth and seventh tergites, yellow. Hind leg dark orange, except trochanter, apex of femur, extreme base of tibia and its apex broadly and whole of tarsus black. Metapleurum and rest of propodeum also black.

Length : Female, 7.5–9 mm; fore wing 6–7 mm; ovipositor sheath 3–4 mm. Male, 5.5 mm; fore wing 3.5 mm.

Distribution : India : Assam (Rangapara, Sonajuli Tea Estate). Jharkhand (Ranchi). Himachal Pradesh (Nagrota, 914m.). Maharashtra (Panhala Fort). Uttaranchal (Garjia, 609m.; Dehra Dun).

This species superficially resembles *G. varibalteatus* (Cameron) in having clypeus, upper margin of pronotum base of hind wing, scutellum, and metascutellum, yellow; and also in having the metapleurum and propodeum red. It, however, differs from *varibalteatus* in having the face, mesopleurum and the apex of third abdominal tergite black, and the first tergite largely reddish at base. *G. varibalteatus* has a weak semicircular carina surrounding antennal scrobe, which is absent in the present species.

9. ***Goryphus lunatus*** Jonathan & Gupta (Fig. 72 : a–c)

1973. *Goryphus lunatus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 20. Female, key. des., fig. Type : Female, India : Karnataka : Mercara, 1219m. (GUPTA). India : Karnataka : Murnad, 610m.; Bhagmandla, 850m.

1987. *Goryphus lunatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 838.

This species is similar to G. *mesoxanthus mesoxanthus* (Brullé), but can be distinguished by its face and frons being punctate in the middle. The mesopleurum is largely rugose. The aerolet is moderately large, about 6× as high as the width of bordering veins. The second tergite at base light orange and the wings marked fuscous.

Female : Face rugoso-punctate above, punctate below and at sides near clypeus. Clypeus subpolished with a few shallow punctures, apical margin impressed. Malar space granulose, 0.3 to 0.7× the basal width of mandible. Temple sparsely punctate. Frons subpolished, sparsely punctate in the middle, smoother at sides. Vertex punctate. Pronotum trans-striate, striations starting from the posterior margin to the middle of pronotum, longitudinally and finely rugose above, otherwise smooth. Mesoscutum minutely punctate, middle lobe at apex wrinkled. Scutellum and metascutellum smooth and shiny, lateral carina confined to its base. Mesopleurum rugose, tending to be finely reticulate, below sternaulus smooth. Metapleurum reticulate, trans-rugose above, juxatacoxal carina present. Propodeum reticulate, trans-rugulose at sides, rugoso-punctate basad of basal carina; apical carina incomplete, broadly interrupted in the middle; apophyses crest-like; basal carina more or less straight evenly arched in the middle. Areolet pentagonal, intercubiti convergent, areolet 6× as high as the width of bordering veins, second intercubitus faint. First tergite smooth and shiny, except near the spiracle somewhat granulose with a few scattered shallow punctures; second, third and fourth tergites closely punctate, the following tergites subpolished.

Black. Fourth to eleventh flagellar segments white. The following are yellow : Clypeus (sometimes black), mandible, except its apex (Fig. 72 : a) tegula, scutellum, metascutellum, subtegular ridge, base of hind wing (Fig. 72 : b), apices of first and second tergites broadly, sixth narrowly, seventh and eighth largely (Fig. 72 : c), fore and middle coxae and trochanters, and base of first tergite tergite. Metapleurum, propodeum (except basad of basal carina in the middle, black), first tergite in the middle (except first tergite near the spiracles, black), and second tergite broadly at base, light orange. All the femora dark orange; fore and middle tibiae and tarsi and hind tibia largely infuscate; hind tarsus whitish, its fifth segment blackish, rest of the segments at their extreme apices infuscate. Fore and hind wings at apex and fore wing in the middle also faintly infuscate.

Male : Not known.

Length : Female, 6–8 mm; fore wing 4.5–5.5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Karnataka (Mercara, 1219m.; Murnad, 610 m.; Bhagmandla, 850 m.).

10. ***Goryphus mesoxanthus*** (Brullé)

This species can be distinguished by having the malar space 0.5× the basal width of mandible, prepectal carina extending almost up to the base of subtegular ridge, propodeum largely reticulate in the middle, areolet about 4× as high as the width of bordering veins, and the wings marked fuscous.

Female : Face largely finely rugose, sometimes tending to be rugoso-punctate. Clypeus subpolished, weakly and sparsely punctate, apical margin impressed. Mandible dull, weakly punctate, teeth subequal. Malar space granulose, 0.5× the basal width of mandible. Temple subpolished, sparsely and minutely punctate. Frons with weak shallow area behind antennal sockets, above finely irregularly wrinkled with a median longitudinal carina extending from median ocellus. Vertex weakly, minutely and sparsely punctate. Pronotum trans-striate, sometimes tending to be wrinkled, finely and obliquely striate above, extreme lower margin largely smooth, epomia strongly reaching upper margin. Mesoscutum largely minutely and sparsely punctate. Scutellum largely smooth, with faint sparse punctures, lateral carina confined to its base. Metascutellum smooth. Mesopleurum wrinkled, tending to be reticulate above, and finely striate along speculum and near middle coxa, below sternaulus indistinctly minutely and sparsely punctate; speculum smooth and shiny except minutely and sparsely punctate above; prepectal carina extending 0.9 or almost to the base of subtegular ridge. Metapleurum trans-rugose, tending to be wrinkled, juxtacoxal carina present. Propodeum between apical and basal carinae reticulate, at apex wrinkled, trans-wrinkled below apophyses, both the transverse carinae complete, apical carina usually weak or undefined in the middle, carina arched in the middle, apophyses weak crest-like, spiracle oval. Areolet pentagonal, about 4× as high as the width of bordering veins, intercubiti a little convergent, second intercubitus faint. First tergite smooth and subpolished, with a few scattered punctures in the middle, both the longitudinal carinae present, second and third tergites wholly and fourth at base, closely punctate; the following tergites mat. Ovipositor tip short, lower valve with distinct teeth.

Male : Essentially similar to the female, but more polished and slender. Face weakly rugulose in the middle, sparsely and shallowly punctate at sides. Frons shiny with a few undefined punctures below ocellar triangle. Vertex subpolished without distinct punctures. Temple with indistinct minute, sparse punctures. Pronotum largely smooth with a few striae. Mesoscutum subpolished and smooth. Metapleurum smooth except below juxtacoxal carina rugulose. Propodeum between basal carina and apex somewhat reticulate, basad of carina smooth. First tergite smooth, median longitudinal carinae at base not distinct, second to fourth tergites coarsely punctate, the following tergites mat and subpolished. Areolet small, about 3× as high as the width of bordering veins, intercubiti weakly convergent, nervulus slightly basad of basal vein.

Townes, townes & Gupta (1961) recognized eight subspecies under *G. mesoxanthus, viz., detritus, hyalinus, maculipennis, mesoxanthus, pulcher, ruber, rufifemur and unifasciatus*. Jonathan & Gupta (1973) considered the following five as valid subspecies : *mesoxanthus mesoxanthus* (Brullé) from the Indo-Malayan subregion; *mesoxanthus hyalinus* (Szépligeti) from Lombok Is.; *mesoxanthus unifasciatus* (Ashmead) from the Philippines and *mesoxanthus rufifemur* (Szépligeti) from New Guinea. *Goryphus detritus* Holmgren as a valid species. *Melcha maculipennis* Cameron, *Neomesostenus pulcher* Szépligeti, and *Goryphus maculipennis rubra* Cheesman as junior synomyms of *mesoxanthus mesoxanthus*.

Only one subspecies is reported from India and adjacent countries, which is discussed below :

10a. ***Goryphus mesoxanthus mesoxanthus*** (Brullé)

1846. *Cryptus mesoxanthus* Brullé, *In* Lepeletier : Histoire naturelle des Insectes. Hymenopteres, **4** : 196. Female. des. Type : Female, Indonesia : Java (Lost).

1876. *Cryptus trifasciatus* Taschenberg, *Ztschr. f. d. Ges. Naturw.,* **48** : 69. Female. des. Type : Female, Indinesia : Java (HALLE). Syn. by Betrem, 1941.

1903. *Melcha maculipennis* Cameron, *J. Straits Branch Roy. Asiatic Soc.,* **39** : 149. Female. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, Malaysia : Sarawak : Kuching (LONDON). Syn. by Jonathan & Gupta, 1973.

1907. *Goryphus javanicus* Roman, *In* Wiren & Others: Zoologische Studien T. Tullberg zum 65. Geburtstage gewidmet & c., p. 79. Female. key, des.. Type : Female, Indonesia : Java (STOCKHOLM). Syn. by Townes, Townes & Gupta, 1961.

1908. *Cryptus(?) mesoxanthus* : Schmiédeknecht, *Genera Insectorum,* **75** : 28. syn. notes.

1908. *Gambrus fasciatus* Szépligeti, *Notes Leyden Mus.,* **29** : 243. Female. key, des. Type : Female, Indonesia : Java : Semarang (Lost). Syn. with *javanicus* by Betrem, 1941.

1910. *Gambrus adornatus* : Szépligeti, *Notes Leyden Mus.,* **32** : 98. misdet. of *adornatus* Tosquinet, 1903. key. Indonesia : Java : Jakarta; Depok. Krakatau Is. (Verlaten Is.) in Sunda Strait.

1912. "Ichneumonidae, species C" : Roepke, *Meded. Proefsta. Midden-Java,* **5** : 19. Male, Female. des., fig. biol. Indonesia : Java. *Host* : *Acrocercops cramerella.*

1913. "*Goryphus* sp." : Marshall, *Rev. Appl. Ent.,* (A) **1** : 57.

1913. "*Mesostenus* species" : Roepke, *Meded. Proefsta. Midden-Java,* **12** : 4. Male, Female. syn. notes, biol. *Host* : *Acrocercops cramerella.*

1913. "*Mesostenus* species" : Roepke, *Meded. Proefsta. Midden-Java,* **13** : 4. biol.

1914. "Species C" : Roepke, *Verslag van de Tweede Vergadering van het Technisch Personeel van de particuliere Proefstations en van de Ambtenaren van het Department van Landbouw.,* p. 39-49. biol. Indonesia : Java. *Host* : *Acrocercops cramerella.*

1916. *Mesostenus adornatus* : Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** *:* 329, 335. misdet. of *adornatus* Tosquinet, 1903. key. Borneo. Indonesia : Graget Is. near New Guinea.

1916. *Neomesostenus pulcher* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** *:* 294. Male. key. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Male, Singapore (BUDAPEST). Syn. by Jonathan & Gupta 1973.

1917. *Mesostenus zarathae* Girault, *New Javanese Hymenoptera,* p. 7. Nomen nudum. Indonesia : Java. Hyperparasite : *Omphalomomyia thymus javae.*

1922. *Goryphus ornatipennis* : Roepke, Cacao, Onze Koloniale Landbouw, **11** : 112. Male, Female. misdet. of *ornatipennis* Cameron. syn., des., fig. biol. Indonesia. *Host* : *Acrocercops cramerella.*

1925. *Goryphus maculipennis* : Gater, *Malayan Agri. J.,* **13** : 100. des. Malaysia : Malaya. *Host* : *Artona catoxantha.*

1929. *Goryphus maculipennis* : Dammerman, The Agricultural Zoology of the Malay Archipelago, p. 149. *Host* : *Artona catoxantha.*

1929. "*Mesostenus* sp." : Dammerman, The Agricultural Zoology of the Malay Archipelago, p. 55, 353. Male, Female. des., biol. Indonesia : Java. *Host* : *Spider* egg bags; *Acrocercops cramerella.*

1933. *Goryphus maculipennis* : Corbett & Miller, *Bull. Dept. Agri. Fed. Malay States & Straits Settlements* (Sci. Ser.), **13** : 3. Malaysia : Malaya. *Host* : *Artona catoxantha.*

1934. *Goryphus maculipennis* : Ayyar & Margabandu, *Madras Agri. J.,* **22** : 349. India : Andhra Pradesh : Godaveri Dist. *Host* : *Scirpophaga* sp.

1937. *Goryphus maculipennis(!)* : Ayyar & Anantanarayanan, *Agri. and Live-stock in India,* **7** : 173. India : Andhra Pradesh : Godaveri Dist. : Samolkota *Host* : *Scirpophaga incertulas.* [?misdet].

1938. *Goryphus javanicus* : Tjoa, *Arch. v. Theecult. Nederland. Indie,* **3** : 200. biol. Indonesia : Java : *Host* : *Setora nitens.*

1941. *Goryphus maculipennis* : Betrem, *Treubia,* **18** : 46, 51. key, syn., des.

1941. *Neomesostenus pulcher* : Betrem, *Treubia,* **18** : 50. key.

1941. *Goryphus javanicus* : Betrem, *Treubia,* **18** : 68. Male, Female. key, syn., des., fig., biol. (in part). Indonesia : Java : Localities in Bogor; Priangan; Jakarta; Semarang; Madium; Kediri; Malang; Besuki. Kangean Is. : Petapan on east coast. Bali : Gitgit. *Hosts* : *Artona catoxantha; Acrocercops cramerella.* [Listed several species of Szépligeti as synonyms.]

1941. *Goryphus mesoxanthus* : Betrem, *Treubia,* **18** : 72. Female. key, syn., des. Indonesia : Several localities in Sumatra. Siberut Is. Kalimantan : Sangkulirang; Maluwi.

1941. *Goryphus maculipennis* : Cheesman. *Ann. & Mag. Nat. Hist.,* (11) **7** : 20 Female. des. fig.

1941. *Goryphus mesoxanthus* : Cheesman. *Ann. & Mag. Nat. Hist.,* (11) **7** : 22 Female. des. Indonesia : Java.

1941. *Goryphus mesoxanthus montana* Cheesman. *Ann. & Mag. Nat. Hist.,* (11) **7** : 22 Female. des. Type : Female, Indonesia : Java : Jampanga : Omg. Sukanegara, 700-1000m. (LEIDEN). Indonesia : Java : Tjibodas; Bogor : Tjiampen; Mt. Pangerango, 1500m.; Jampang Tengah. Syn. by Townes, Townes & Gupta, 1961.

1941. *Goryphus maculipennis rubra* Cheesman. *Ann. & Mag. Nat. Hist.,* (11) **7** : 22 Female. des. Type : Female, Indonesia : Mentawai Is. : Siberut (LEIDEN). Indonesia : Java : Mt. Pantjar. Syn. by Jonathan & Gupta, 1973.

1948. *Goryphus maculipennis* : Dammerman, *Verhandel. Koninklijke Nederlandsche Akad. Van Wetensch.* (Tweeds Sectie), **44** : 384. Indonesia : Java. Krakatau Is. in Sunda Strait. *Host* : *Brachartona* sp. (coconut palm pest).

1950. *Goryphus javanicus* : Vecht, *Contrib. Gen. Agri. Res. Sta. Bogor,* 110 : 39. Male, Female. key, fig., biol. Indonesia : Java : Purworedjo; Banyumas; Magelang; Patjitan. *Host* : *Artona catoxantha.*

1951. *Goryphus maculipennis* : Kalshoven, Sody & Bemmel, De Plagen van de Cultuurgewassen in Indonesie, 2 : 536. Indonesia. *Host* : *Oreta carnea.*

1961. *Goryphus mesoxanthus maculipennis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 152. lectotype design., n. comb. India. Java. Krakatau Is. Malaya. Singapore.

1961. *Goryphus mesoxanthus mesoxanthus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 152. n. comb., syn. Bali. Kalimantan. Graget Is. Java. Kangena Is. Krakatau Is. Siberut Is. Sumatra.

1961. *Goryphus mesoxanthus pulcher* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 153. lectotype design., n. comb. Singapore.

1961. *Goryphus mesoxanthus ruber* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 153. n. comb. Java Mentawai Is.

1968. *Goryphus mesoxanthus maculipennis* : Momoi, *Mushi,* **41** : 183. distr.

1973. *Goryphus mesoxanthus maculipennis* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 31. Male, Female, key, syn. des. Indonesia : Java : Widespread, recorded from several localities. Sumatra. Mentawai Is. Krakatau Is. Kalimantan. Malaysia : Malaya : Jowore; Kuala Lumpur. Sabah : Kabayan near Kinabalu, 600m. Thailand : Chiang Mai; Niki. Singapore. *Hosts* : *Setora nitens; Artona catoxantha; Acrocercops cramerella; Scirpophaga incertulas; Brachartona* sp.; *Oreta carnea.*

1987. *Goryphus mesoxanthus mesoxanthus* : Gupta, *Mem. Amer. Ent. Inst.,* 41 : 839.

Female : In the types of *montana* and *rubra*, the face tending to be finely wrinkled.

Black. Fifth to ninth flagellar segments white above. Clypeus, subtegular ridge, scutellum, sometimes matascutellum, apices of first, second, seventh and eighth tergites

broadly, yellowish. Metanotal rim, propodeum, middle and hind coxae, their trochanters and femora, reddish; legs otherwise largely blackish. Fore wing with two bands and hind wing at apex fuscous.

Male : Black face with an oval mark above, clypeus faintly, mandible largely except at apex, frons with two orbital marks, upper margin of pronotum, pronotal collar above, tegula, subtegular ridge, scutellum, base of hind wing, apices of first to fourth and seventh abdominal tergites, fore and middle coxae and trochanters, yellow. Metanotal rim, except base of hind wing, metapleurum, propodeum, and first tergite, dark orange (reddish). Legs largely dark orange (except fore and middle coxae and trochanters), all the tarsi, hind trochanters, apex of femur, and base and apex of tibia dark. Fore wing with two bands and hind wing at apex dark brown.

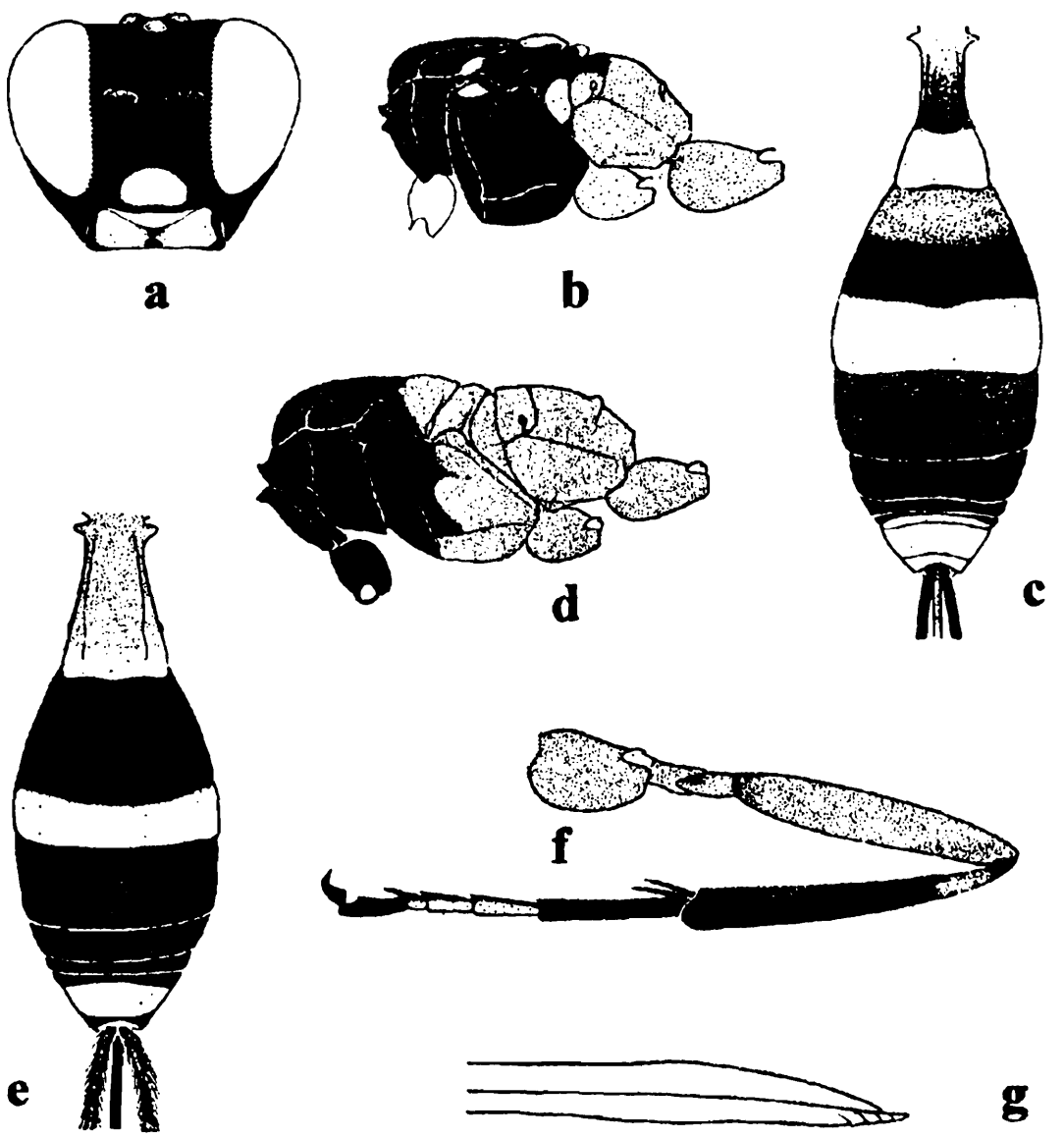

Fig. 72. Colour pattern : *Goryphus lunatus* Jonathan & Gupta : **a**, head front view; **b**, thorax side view; **c**, abdomen dorsal view. *Goryphus basilaris* Holmgren : **d**, thorax side view; **e**, abdomen dorsal view; **f**, hind leg; **g**, ovipositor tip.

Variations : This species shows a high degree of variations in colour. The yellow mark on clypeus may or may not be present and sometimes the mark is very small. Mandible except at apex yellowish. Mesopleurum near the base of middle coxa red. First abdominal tergites at base or entirely, red. Legs in *montana* and *rubra* largely reddish except their fore coxa yellow, broadly or narrowly black at base; fore tibia and tarsus, sometimes fore femur also, blackish. Middle femur, tibia and tarsus reddish brown to dark brown. Hind femur narrowly or broadly at apex, tibia and tarsus largely blackish or dark brown.

Length : Female 9–10 mm; fore wing 5.5–6 mm; ovipositor sheath 3 mm. Male, 6 mm; forewing 4 mm.

Distribution : India : Andhra Pradesh (Godaveri dist : Samalkota). *Elsewhere* : Indonesia : Java (Semerang; Jakarta; Depok; Krakatau Is.; Bogor; Priangan; Medium; Kadiri; Melang; Besuki; Kangean Is.; Jampanga; Omg; Sukanegara; Tjibodas; Tjiampen; Mt. Pangerango; Jampang Teugah; Mt. Pantjar; Purworedjo; Banyumas; Megelang; Patjitan; Mentauri Is., Siberut Is.; Sangkulirang; Maluri). Thailand (Chiang Mai). Singapore.

Hosts : Setora nintens. In literature also recorded from *Artona catoxantha, Acrocercops cramerella, Schoenobius incertulas (current name Tryporyza incertulas), Brachartona Sp.* (Coconut palm pest), *Oreta carnea.*

The occurrence of this subspecies in India is doubtful. The only reference is that of Ayyar and Margabandhu (1934), which may either refer to *Isotima javensis* or to *Goryphus basilaris*, both are similar in appearance to this subspecies.

11. ***Goryphus basilaris*** Holmgren (Fig. 72 : d–g)

1868. *Goryphus basilaris* Holmgren, *Kongliga Svenska fregatten Eugenies resa,* **2** : 398. Female, des., fig. Type : Female, China (STOCKHOLM).

1907. *Goryphus basilaris* Roman, *In Wiren & Others: Zoologische Studien T. Tullberg zum 65. Geburtstage gewidmet & c.*, p. 77. Female, key, des., fig.

1915. *Exetastes longicornis* Ishida, *Report of the Sugar Cane Borer in Formosa,* **1** : 104, **2** : pl. 14. Male, des., fig. Type : Male, Taiwan (SAPPORO). *Host* : *Proceras sacchariphagus.* Syn. by Townes, Townes & Gupta, 1961.

1916. *Mesostenus transiens* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 335. Male, Female, key, des. Lectotype : (designated by Townes, Townes & Gupta, 1961) : Male, Taiwan : Hsiaoliuchiu (=Lambeh Is.) (BUDAPEST).

1930. *Mecha(!) lemae* Sonan, *Trans. Nat. Hist. Soc. Formosa,* **20** : 359. Male, des. Type : Male, Taiwan : Taihoku : Shirin (=Taipei : Shilin) (WUFENG). *Host* : *Lema melanopa.* Syn. by Townes, 1984.

1930. *Mesostenus longicornis* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.,* **25** : 301 syn.

1931. *Exetastis (!) longicornis* : Moritsugu, *Rept. Dept. Agr. Govt.. Res. Inst.Formosa,* **50** : 42. des. Taiwan. *Host* : *Scirpophaga nivella.*

1931. *Mesostenus longicornis* : Matsumura, 6000 *Illustrations of Insects of Japan,* p. 55. Female, des., fig. Taiwan.

1931. *Mesostenus (Mesostenus) longicornis* : Uchida, *J. Faculty Agr. Hokkaido Imp. Univ.,* **30** : 186. Male, Female, key. Taiwan : Tainan; Hsinhua (=Shinka); Puli (=Horisha). *Host* : *Chilo sacchariphagus.*

1932. *Goryphus longicornis* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.,* **33** : 176. Male, Female, des. Taiwan : Talin (=Taihorin); Tinshungchi (=Chosokei); Fengshan; Taipei; Anping; Tainan;

1944. *Goryphus longicornis* : Sonan, *Bull. Govt. Agri. Res. Inst. Taiwan,* **222** : 14. Syn. *Hosts* : *Chilo sacchariphagus; Scirpophaga nivella;*

1944. *Melcha lemae* : Sonan, *Bull. Govt. Agri. Res. Inst. Taiwan,* **222** : 14. *Hosts* : *Lema oryzae.*

1956. *Goryphus longicornis* : Uchida, *Insecta Matsumurana,* **19** : 90. Male, Female. Ryukyus : Amami Oshima : Sumiyo; Santarotoge.

1957. *Goryphus longicornis* : Chao, *Acta Ent. Sinica,* **7** : 107. Male, Female. China : Fujian : Fuzhou. *Hosts : Pieris canidia; Histia rhodope.*

1961. *Goryphus basilaris* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 148. lectotype design. of *transiens,* syn. China. Taiwan. Ryukyus.

1961. *Goryphus lemae* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 151. n. comb. Taiwan.

1966. *Goryphus basilaris* : Momoi, *Mushi,* **40** : 5. Male, Female. Hong Kong : Fung Yuen, Tai Po (N. T.).

1968. *Goryphus basilaris* : Momoi, *Mushi,* **41** : 183. key, distr.

1969. *Goryphus basilaris* : Momoi, *Mushi,* **42** : 148. Female. China : Taiwan Hsien : Yuching.

1970. *Goryphus basilaris* : Momoi, *Pacific Ins.,* **12** : 356. Male, Female. key. Ryukyus : Kuchineshima; Nakanoshima; Amami Oshima : Yuwandake; Naze; Tokunoshima.

1973. *Goryphus basilaris* : Chu & He, *Utilization & Control of Animal,* 1973 (5) : 5. key, fig. China : Fujian; Sichuan. *Host* : *Scirpophaga incertulas; Sesamia inferens.*

1973. *Goryphus basilaris* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 26. Male, Female, key, syn. (in part), des., fig. India : Assam : Charduar Forest : Rangapara. Tamil Nadu : Pugalur. Karnataka : Mandya. Uttar Pradesh : Hardoi. Indonesia : Java : Djatiroto; Mt. Gede; Tapos. Taiwan : Hsiaoliuchiu (=Lambeh Is.). Myanmar : Tenasserim : Salween Valley. China. Malaya : Pahang : Cameron Highlands, 1067 m. *Host* : *Scirpophaga nivella.* [Indian specimens probably belong to *ornatipennis*.]

1973. *Goryphus lemae* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 101. Male. des. Taiwan. *Host* : *Lema melanopa; L. oryzae.*

1976. *Goryphus basilaris* : Chu, He & Yun, *Kunchong Zhishi,* **13** : 173. des., fig., biol. China : Zhejiang; Jiangxi; Hubei; Sichuan; Fujian; Guangdong; Guangxi; Guizhou; Yunnan. Taiwan. *Hosts* : *Naranga aenescens; Sesamia inferens; Chilo suppressalis; Chilo sacchariphagus; Scirpophaga nivella; Cnaphalocrocis medinalis; Histia rhodope; Pieris candidia; Eurukuttarus nigroplagiata; Parnara guttata; Dendrolimus punctatus.*

1978. *Goryphus basilaris* : Chu, He & Wu, *Atlas of Natural Enemies of Economic Insects,* p. 38. des., fig., biol. hosts. China : Widely distributed.

1981. *Goryphus basilaris* : Chao, *An Annotated Check-list of Insects from Fujian Province,* p. 294. China : Fujian. *Hosts* (in addition to those mentioned above) : *Leucania separata; Selepa celtis.*

1982. *Goryphus basilaris* : Chu, *Acts Agri. Univ. Zhejiangensis,* **6** : 26. Male, Female. China : Fujian : Fuzhou; Guizhou : Meitan. *Host* : *Dasychira baibarana.*

1984. *Goryphus basilaris* : He, *Acta Agri. Univ. Zhejiangensis,* **10** : 89. biol., host records. China : Several States. Parasite : *Sympiesis* sp.

1984. *Goryphus basilaris* : Townes, *J. Agri. Res. China,* **33** : 200. syn. and notes on type of *Melcha lemae.*

1984. *Goryphus basilaris* : Chiu et al., *Spcl. Publ. Taiwan Agri. Res. Inst.,* **15** : 18. correction of locality names. Taiwan : Anping; Fengshan; Hsiaoliuchiu; Hsinhua; Puli; Tainan; Taipei; Talin; Tingshungchi. *Hosts* : *Chilo sacchariphagus; Scirpophaga nivella.*

1987. *Goryphus basilaris* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 830.

This is a distinct species having posterior half of the thorax including scutellum and half of mesopleurum, first tergite, middle and hind trochanters and femora, red. Wings with fuscous marks. The pronotum is coarsely striate, metapleurum wrinkled, malar space 0.7× the basal width of mandible and the prepectal carina extending up to 0.75 the height of mesopleurum.

Female : Face strongly and closely punctate, tending to be irregularly striate or wrinkled, at sides near eye margin mat with a few shallow punctures. Clypeus strongly punctate, tending to be coarser towards the middle, apical margin impressed and smooth. Mandible puncto-striate at the base, smooth at apex with two subequal teeth. Malar space granulose, 0.7× the basal width of mandible. Antennal scrobes finely trans-striate. Frons below ocellar area obliquely irregularly striate, with a median longitudinal carina; sides of frons granulose with a few scattered shallow punctures. Vertex largely mat, dull, obscurely punctate. Temple subpolished, minutely and sparsely punctate. Pronotum coarsely trans-striate in the middle, irregularly wrinkled above, pronotal collar smooth, anterior area of pronotum with short ridges, epomia strong, complete, turned mesad. Mesoscutum finely aciculate along the margins of each lobe, middle lobe in the middle rugulose, lateral lobes tending to be smoother and subpolished. Scutellum rough and shallowly punctate. Metascutellum smooth, lateral carina of scutellum extending to its full length. Mesopleurum coarsely rugose,

short striae on both the sides of prepectal carina, finely striate below subtegular ridge and above middle coxa. Speculum and area below sternaulus minutely and shallowly punctate. Propodeum basad of basal carina rough and wrinkled, apical carina absent, apophyses crest-like, basal carina complete, slightely curved in the middle, spiracle moderately large and oval. Areolet pentagonal, 5× as high as the width of bordering veins, intercubiti parallel, second intercubitus faint. First tergite smooth and shiny except for a few shallow punctures in middle and a few punctures towards the apex; second and third tergites closely punctate; fourth tergite obscurely punctate; and the following tergites smooth and subpolished. Ovipositor as in figure 72 : g.

Black. Seventh to ninth flagellar segments (sometimes sixth segment also apically) white above; abdomen (Fig. 72 : e) with first and second tergites apically, seventh entirely and eighth narrowly at apex yellowish. Scutellum, metascutellum, posterior half of mesopleurum (sometimes less extensive), metapleurum, propodeum (Fig. 72 : d), and first tergite, red. Fore coxa black, its trochanter, femur, tibia and tarsus dark brownish-black, except tibia at inner margin dirty yellow. Middle coxa, trochanter and femur red, tibia reddish-brown, tarsus dark brown. Hind coxa, trochanter and femur red (except femur apically dark brown); tibia, first and fifth tarsal segments entirely and fourth segment apically, blackish-brown, rest of tarsus yellow (Fig. 72 : f) (hind tarsus colour largely variable). Wings hyaline with stigma and veins brown, fore wing with a fuscous band extending from the base of stigma to the lower margin.

Male : Similar to the female in colour and structure. Mesoscutum subpolished, minutely punctate; mesopleurum largely smooth and subpolished except finely wrinkled above, second to fifth tergites distinctly punctate, rest as in the female.

Black. Antenna black without a white band. Pronotal collar above, apex of third abdominal tergite, and first to third segments of hind tarsus, white; rest of the colour as in the female.

Length : Female, 10 mm; fore wing 6.5 mm; ovipositor sheath 4 mm. Male, 9 mm; fore wing 5.5 mm.

Distribution : India : Assam (Rangapara in Charduar Forest). Tamil Nadu (Puglur). Karnataka (Mandya). Uttar Pradesh (Hadoi). *Elsewhere* : Widely distributed in Taiwan, China, Rhykyus & Hong Kong. Indonesia : Java (Djatiroto; Mt. Gede : Tapas). Malaysia (Malaya : Pahang : Cameron High Lands). Myanmar (Tenasserim : Salwan Valley).

Hosts : *Scirpophaga nivella (current name Tryporyza nivella).* In literature also recorded from *Proceras sacchariphagus, P. venosata, Pieris candidia, Histia rhodope.*

This species superficially resembles another sugarcane top borer parasite, *Isotima javensis* Rohwer, and apparently has been confused in the past with that species (Gupta, 1961). This species, however, is not so common as *Isotima javensis* and turns up only occasionally in rearings in India. The two can easily be distinguished by the presence or absence of a semicircular carina on the frons.

12. ***Goryphus distinctus*** Jonathan & Gupta (Fig. 73 : a–d)

1973. *Goryphus distinctus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 20. Female, key. des., fig. Type : Female, India : Assam : Rangapara : Sonjuli Tea Estate (GUPTA).

1987. *Goryphus distinctus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 835.

This is a distinct species having the posterion half of the thorax (Fig.), including scutellum and the middle and hind coxae red. The legs are largely black. The wings are slightly infuscate apically. The malar space 0.75× the basal width of mandible; epomia short not reaching to upper margin, and the prepectal carina extending up to 0.5 the height of mesopleurum.

Female : Face dull, rugose, tending to be finely wrinkled, granulose at sides. Clypeus subpolished, with a few scattered shallow punctures, apical margin impressed. Malar space granulose, 0.75× the basal width of mandible. Frons rugose with oblique striations below ocellar area, finely granulose at sides. Vertex granulose. Temple granulose. Pronotum largely finely wrinkled, with a few strong striae in the middle groove. Epomia short, not reaching to upper margin of pronotum. Mesoscutum finely aciculate along the margins of each lobe. Basal more than half of scutellum densely and strongly punctate, tending to be finely reticulate, apex smooth and shiny; lateral carina of scutellum extending up to its basal 0.66; metascutellum subpolished and smooth. Mesopleurum and metapleurum rough and rugose, somewhat wrinkled near subtegular ridge, a few trans-striations occurring at the anterior margin; prepectal carina extending up to 0.5× the height of mesopleurum. Propodeum rugose between apical and basal carinae, rugoso-striate towards the apex and at sides; apical carina interrupted in the middle, basal carina complete, apophyses crest-like, spiracles oval. Areolet 6× as high as the width of bordering veins, intercubiti slightly convergent, second intercubitus faint. First tergite largely smooth and shiny, second and third tergites closely punctate, the following tergites subpolished; ovipositor as in figure 73 : d.

Black. Sixth to eighth flagellar segments white above. Posterior half of mesopleurum, metapleurum, propodeum (Fig. 73 : a), middle and hind coxae (sometimes apex of hind coxa blacks), red. Fore leg completely (except sometimes the apex of coxa brownish-yellow), rest of middle and hind legs, black (Fig. 73 : c). Apices of first and second abdominal tergites, seventh and eighth tergites broadly in the middle, yellow (Fig. 73 : b). Wings slightly infuscate in apical half.

Male : Not known.

Length : Female, 7 mm; fore wing 5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Assam (Sonajuli Tea Estate in Rangapara).

13. *Goryphus apicalis* Holmgren

1868. *Goryphus apicalis* Holmgren, *Kongliga Svenska Fregatten Eugenies Resa,* **2** : 399. Female. des. Type : Female, Philippines : Luzon : Manila (STOCKHOLM).

1905. *Agrothereutes nigritarsis* Ashmead, *Proc. U. S. Natl. Mus.*, **29** : 409. Female. des. Type : Female, Philippines : Luzon : Manila (WASHINGTON). Syn. by Townes, Townes & Gupta, 1961.

1907. *Goryphus apicalis* : Roman, *In* Wiren and others : Zoologische Studien...T Tullberg zum 65. Geburtstage gewidmet &c., p. 79. Female. key, des.

1908. *Spilocryptus (Agrothereutes) nigritarsis* : Schmiedeknecht, *Genera Insectorum*, **75** : 41. n. comb.

1908. *Gambrus similis* Szépligeti, *Notes Leyden Mus.*, **29** : 244, Female. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, Indonesia : Java : Semarang (BUDAPEST). Syn. by Townes, Townes & Gupta, 1961.

1910. *Gambrus similis* : Szépligeti, *Notes Leyden Mus.*, **32** : 98. key. Indonesia : Sunda Strait : Krakatau Is.; Lang Is.

1916. *Mesostenus similis* : Szépligeti, *Ann. Mus. Natl. Hungarici*, **14** : 329, 335. key. Indonesia : Java : Pelabuan.

1961. *Goryphus apicalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 148. syn. Java. Krakatau Is. Lang Is. Philippines.

1968. *Goryphus apicalis* : Momoi, *Mushi,* **41** : 183. key. Indonesia : Java; Krakatau Is.; Lang Is. Philippines.

1973. *Goryphus apicalis* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 36, 95. Male, Female, key, des. Philippines : Luzon : Manila; Gapan; N. Ecija. Indonesia : Java : Semarang. Krakatau Is.; Lang Is. Myanmar : Shwebo.

1987. *Goryphus apicalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 830.

This species is characterized by having its mesopleurum largely, metascutellum, propodeum and sometimes base of the first tergite, red. The lateral carina of scutellum black; face somewhat striate, upper margin of pronotum finely striate, malar space rough, 0.6× the basal width of mandible, scutellum smooth and shiny, and the propodeum largely reticulate, tending to be wrinkled with apical carina usually absent.

Female : Face wrinkled in the middle, rugose at side. Clypeus subpolished with minute, sparse punctures, apical margin impressed. Mandible rough with subequal teeth. Malar space rough to granulose, 0.6× the basal width of mandible. Frons below ocellar area obliquely and coarsely striate in the middle, with a median longitudinal carina extending from the median ocellus, at sides granulose with scattered shallow punctures or sometimes this area smooth without any punctation. Vertex subpolished. Temple obscurely punctate. Pronotum trans-striate to trans-wrinkled in the middle,

obliquely and finely striate above at upper margin, epomia strong, reaching up to upper margin then turned mesad. Mesoscutum minutely punctate, aciculate along the margins of each lobe. Scutellum and metascutellum smooth and shiny, lateral carina extending to its basal 0.25. Mesopleurum largely rugoso-striate, rugose in the middle, finely striate at inner margin of prepectal carina and mesopleural suture, speculum and area below sternaulus smooth and shiny. Metapleurum rugose to rugoso-striate, juxtacoxal carina present, propodeum finely reticulate, tending to be rugose in the middle, wrinkled above, area below apophyses and along pleural carina trans-striate, apical carina incomplete but faintly present in the middle, apophyses small crest-like, basal carina complete, straight, slightly turned forward in the middle, with two longitudinal carinae at base, spiracle attached to basal carina by a small carina. Areolet pentagonal, 7× as high as the width of bordering veins, second intercubitus faint. First tergite smooth and subpolished except at the apex finely granulose, area near spiracles with a few scattered shallow punctures, second and third tergites closely punctate, fourth tergite obscurely punctate at base, the following tergites subpolished.

Black. Fifth to ninth flagellar segments white above. Subtegular ridge, tegula (except apically brown), scutellum, apices of first and second abdominal tergites, and seventh and eighth tergites broadly, yellow (sometimes dirty yellow). Mesopleurum largely except near subtegular ridge, metascutellum, propodeum and sometimes base of first tergite red. Fore coxa largely blackish-brown, yellow apically; trochanter, femur and tibia dark reddish-brown, tarsus brown; middle coxa reddish-yellow, trochanter brownish with a dark brown mark on first trochanteral segment, femur brownish, tibia yellowish-brown; tarsus dark brown; hind coxa, trochanter, and femur, reddish, except both the trochanteral segments with a mark and apex of femur dark brown, tibia blackish with a lighter annulus at its subbsal region, and whole of tarsus dark brown.

Male : Resembles the female except much polished and slender; face, clypeus, frons, vertex and temple smooth. Malar space granulose. Pronotum striate along the posterior margin. Scutellum and metascutellum smooth. Mesopleurum subpolished, weakly rugoso-striate; metapleurum rugose. Propodeum reticulate. First tergite mat, with a few shallow punctures in the middle, second to fifth tergites closely and shallowly punctate; the following tergites mat and subpolished.

Black. Antenna entirely black. Face clypeus, mandible, frons and vertex along the eye margin, temple except above, pronotal collar, fore coxa and trochanter, yellow. Thorax and abdomen orange with bases of second to fifth tergites, sixth largely, and seventh broadly at base, black. Legs orange, with apex of fore tarsus and whole of middle tarsus, apex of hind femur, its tibia narrowly at base, broadly at apex and tarsus wholly dark brown to blackish. Wings clear.

Length : Female, 7–7.5 mm; fore wing 4–4.5 mm; ovipositor sheath about 2 mm. Male, 6.5 mm; fore wing 5–5.5 mm.

Distribution : Myanmar (Shwebo). Indonesia : Java (Semarang; Pelabuan). Sunda Strait (Krakatau Is.; Lang Is.). Philippines : Luzon (Manila; Gapan; N. Ecija).

14. ***Goryphus hyalinoides*** (Uchida)

1916. *Mesostenus opacus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 335 Female Name preocc. in *Goryphus* by Smith, 1860, key, des. Type : Taiwan : Pilam (BUDAPEST). Syn. By Townes, Townes & Gupta, 1961.

1931. *Mesostenus (Mesostenus) opacus* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 186. Female. key, fig. Taiwan : Kuraru; Ranrun; Naihonpo; Sinhwa; Yakanron; Baibara; Kiayi; Funkiko; Kusukusu.

1931. *Mesostenus (Mesostenus) hyalinoides* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 186. Female. key, des., fig. Type : Female, Taiwan : Kusukusu (SAPPORO).

1931. *Goryphus opacus* : Matsummura, 6000 illustrations of insects of Japan, p. 56, Female. des., fig. Taiwan.

1932. *Goryphus hyalinoides* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 173. Female. Taiwan : Talin (=Taihorin).

1932. *Goryphus kurarensis* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 174. Male. des. Types : Male, Taiwan : Kuraru; Talin (=Taihorin); Kangkou (=Kankau); Kosempo; Anping (SAPPORO). Syn. by Townes, Townes & Gupta, 1961.

1932. *Goryphus opacus* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 178. Female. Taiwan : Talin (=Taihorin); Kosempo; Teraso; Kangkou (=Kankau); Anping.

1937. *Goryphus opacus* : Uchida, *Insecta Matsumurana,* **12** : 9. Female. Taiwan : Hungtow Is.

1961. *Goryphus hyalinoides* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 150. syn. (in part). Taiwan. Hungtow Is. Java. Sumatra.

1973. *Goryphus hyalinoides* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 38. Male, Female, key, syn. des. Myanmar : Maymyo, 800m. Indonesia : Java : Sukabumi, 500-600m.

1984. *Goryphus hyalinoides* : Chiu et al., *Spcl. Publ. Taiwan Agri. Res. Inst.*, **15** : 18. correction of locality names. Taiwan : Anping; Chiai; Chiasien; Fenchifu; Hsinhua; Jenho; Kangkou; Kaoshihfo; Kueitzuchiao; Lanyu Island; Manshoutsun; Meiyuan; Neipu; Taitung; Talin; Wukunglun.

1987. *Goryphus hyalinoides* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 837.

This species is distinguished by having an oval mark in the middle of the face; pronotum with a mark near hind end of epomia; hind femur red and tibia without a subbasal yellowish band. The clear wings and moderately convex scutellum will readily distinguish it from other species.

Female : Face rugose; clypeus subpolished, sparsely punctate. Mandible somewhat striato-punctate. Malar space granulose, 0.55× the basal width of mandible. Frons longitudinally striate, median longitudinal carina present. Vertex subpolished. Temple smooth. Pronotum striate in the middle, finely wrinkled above, epomia strongly reaching upper margin then turned mesad. Mesoscutum largely finely aciculate. Scutellum subpolished and shallowly punctate, lateral carina extending up to its basal 0.5. Mesopleurum largely granulose, finely wrinkled tending to be reticulate above, speculum finely punctate, prepectal carina extending up to 0.8× the height of mesopleurum. Metapleurum finely wrinkled, juxtacoxal carina present. Propodeum strongly wrinkled, tending to be reticulate in the middle, striate at sides and below apophyses, apical carina arched, apophyses moderately strong, basal carina straight, slightly turned forward in the middle, spiracle oval. Areolet pentagonal, about 6× as high as the width of bordering veins; second intercubitius faint. First tergite largely smooth; second and third tergites with minute, shallow and dense punctures; the following tergites mat and subpolished. Ovipositor tip short, lower valve with a distinct series of teeth.

Black. Sixth to eleventh flagellar segments whitish above. The following are yellow : An oval mark in the middle of face, pronotal collar above, pronotum near hind end of epomia, tegula, scutellum, its lateral carina, metascutellum, subtegular ridge, apices of first and second tergites, and seventh and eighth broadly, and fore coxa and trochanter. Metapleurum, metanotal rim, base of hind wing, mesopleurum broadly above middle coxa, including speculum, whole of propodeum, first tergite, middle and hind coxae, trochanters and femora reddish or red. Fore femur and tibia dirty yellow, its tarsus fuscous; middle tibia dark yellow, broadly fuscous above, its tarsus dark brown. Hind tibia largely blackish, except its subbasal area yellowish, tarsus whitish, its first segment at base, second at apex and rest of the segments wholly dark brown to blackish.

Male : Much similar to female, except less strongly sculptured. Mesoscutum smooth. Mesopleurum sparsely punctate, somewhat striate below subtegular ridge. Metapleurum largely smooth. Propodeum weakly rugose. Second and third tergites shallowly punctate at base.

Black. Antenna black without a white band. Clypeus, mandible at base, two orbital marks on frons; first to fourth and seventh and eighth tergites, yellow. Hind trochanters, femur and tibia dark brown, except femur below along the lower margin and tibia with a subbasal band, yellow, its tarsus whitish except basal 0.5 of first segment and whole of fifth segment blackish, rest of the colour similar to that of the female.

Length : Female, 9 mm; fore wing 5.5 mm; ovipositor sheath 3.0 mm. Male, 8 mm; fore wing 5 mm.

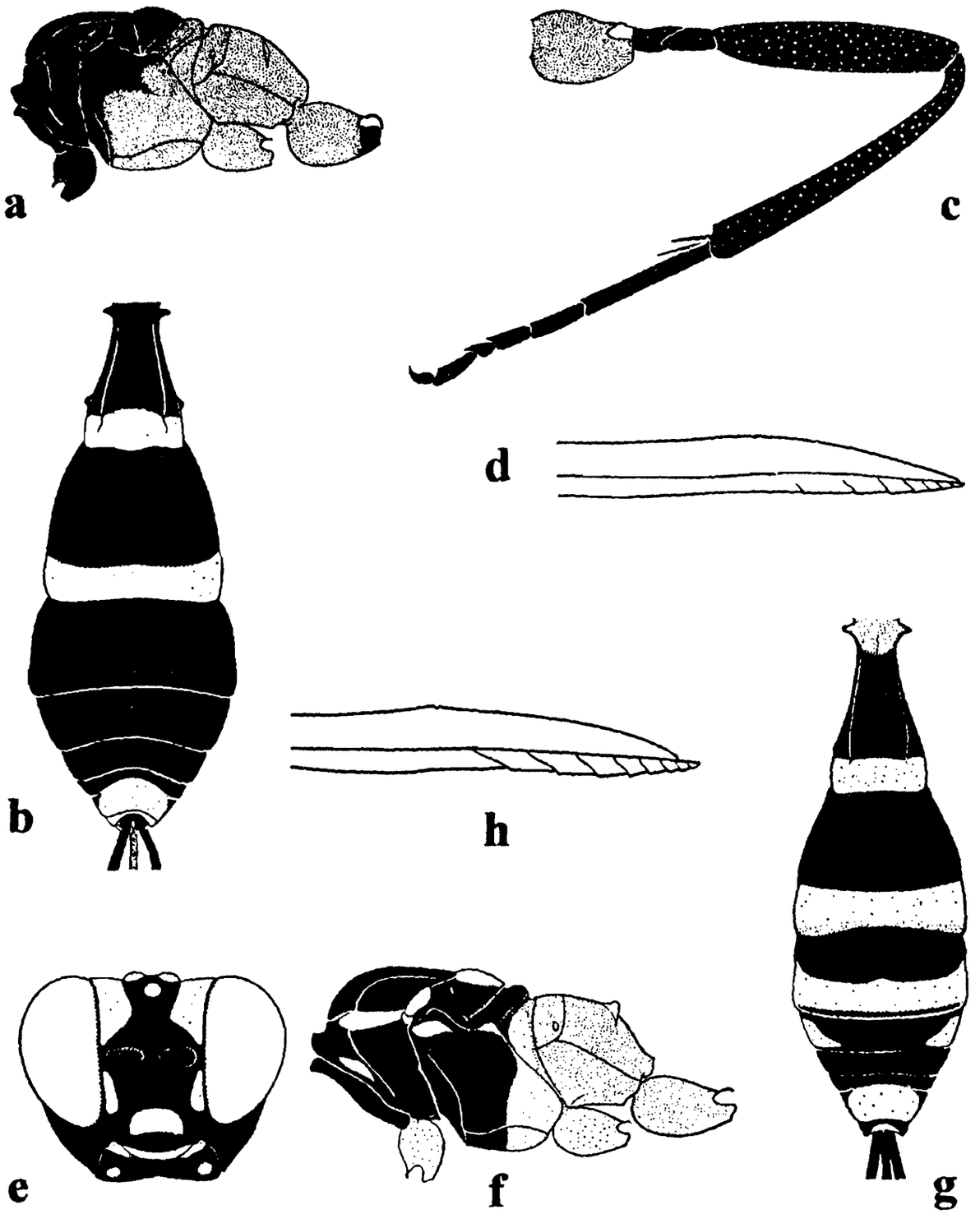

Fig. 73. Colour pattern : *Goryphus distinctus* Jonathan & Gupta : **a**, thorax side view; **b**, abdomen dorsal view; **c**, hind leg; **d**, ovipositor tip. *Goryphus varibalteatus* (Cameron) : **e**, head front view; **f**, thorax side view; **g**, abdomen dorsal view; **h**, ovipositor tip.

Distribution : Myanmar (Maymyo). Indonesia (Java & Sumatra). Taiwan (Pilam; Kuraru; Ranrun; Naihonpo; Sinhwa; Yakanron; Baibara; Kiaya; Funkiko; Kusukusu; Talin; Kanghou; Kosempo; Anping; Teraso; Huntow Is.; Chiai; Chiasien; Fenchifu; Hsinhua; Jeuho; Kangkou; Kaoshifo; Kueitzuchiao; Lanyu Is.; Manshoutsun; Meiyuan; Neipu; Taitung; Talin; Wukunglun.

B. The Albomaculatus Group

This group is characterized by having the first abdominal tergite distinctly longer (1.2–1.5×) than the second, lateral carina of scutellum usually confined to its base, or extending to its basal 0.5, areolet small to moderately large, 2 to 6x as high as the width of bordering veins, squarish to pentagonal and second recurrent vein received at the middle or near the second intercubitus. Most species have the upper margin of pronotum usually strongly swollen.

15. *Goryphus varibalteatus* (Cameron) (Fig. 73 : e–h)

1905. *Melcha varibalteata* Cameron, *Spolia Zeylanica,* **3** : 108. Male. des. Type : Male, Sri Lanka : Kandy (LONDON).

1905 *Melcha erythropus* Cameron, *Spolia Zeylanica,* **3** : 109. Female, des. fig. Type : Female, Sri Lanka : Peradeniya (LONDON). Syn. by Jonathan & Gupta, 1973.

1932. *Goryphus variibalteatus(!)* : Austin, *Tea Quart. J., Tea Res. Inst. Ceylon,* **5** : 52. n. comb. Sri Lanka. *Host* : *Macroplectra nararia.*

1933. *Goryphus variibalteatus(!)* : King, *Bull. Tea Res. Inst. Ceylon,* **10** : 28. Sri Lanka. *Host* : *Macroplectra nararia.*

1941. *Goryphus varibalteatus* : Betrem, *Treubia,* **18** : 46. Syn. notes.

1945. *Goryphus variibalteatus(!)* : Gadd, *Bull. Tea Res. Inst. Ceylon,* **26** : 36. Sri Lanka : Passara. *Hosts* : *Fornicia ceylonica; Macrocentrus homonae.*

1953. *Mesostenus wynaadesis* Rao, *Indian Forest* Rec. *(N.S.) Ent.*, **8** : 216, Female. des., fig. Type : Female, India : Tamil Nadu : Kannoth Range, Wynaad in Madras (DEHRA DUN). *Host* : *Pyrausta machaeralis.* Syn. by Jonathan & Gupta, 1973.

1961. *Goryphus erythropus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 149. n. comb. Sri Lanka.

1961. *Goryphus varibalteatus* : Towens, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 155. Sri Lanka.

1961. *Goryphus? wynaadensis* : Towens, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 155. n. comb. India.

1964. *Goryphus wynaadensis* : Gupta, *Pacific Ins.,* **6** : 233. syn. notes on type.

1973. *Goryphus varibalteatus* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 59. Male, Female, key, syn., des., fig. India : Tamil Nadu : Kannoth Range : Wynaad : Kodai Hills : Oothu, 1158m; Palni Hills : Palni. Kerala : Walayar Forest, 304m. Karnataka : Gunji, 609m; Bhagmandla, 853m. Sri Lanka : Kandy; Peradeniya; Wattamulla; Kandy; Tala Wakelle, *Hosts* : *Macroplectra nararia; Pyrausta machaeralis.*

1987. *Goryphus varibalteatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 847.

This species has a weak semicircular carina behind the antennal sockets enclosing a shallow basin. The pronotum, mesoscutum and scutellum are largely smooth.

Female : Face rugose above near antennal sockets, smooth and subpolished below and at sides, except for a few minute scattered punctures. Clypeus evenly arched, apical margin impressed, subpolished with a few minute punctures. Mandible subpolished, impunctate. Malar space granulose, 0.5× the basal with of mandible. Frons with semicircular carinae around each antennal scrobe (somewhat like *Isotima*). Frons below ocellar area obliquely and coarsely rugose, smoother at sides, with a median longitudinal carina, extending down from base of median ocellus. Vertex smooth. Temple smooth and shiny. Pronotum largely smooth except for a few trans-striae in the middle, epomia short not reaching to upper margin. Mesoscutum smooth, impunctate. Scutellum and metascutellum smooth and shiny, lateral carina confined to its base, mesopleurum rugoso-striate, tending to be finer below, area below sternaulus and above middle coxa smooth, prepectal carina extending up to 0.85 the height of mesopleurum. Metapleurum trans-striate, juxtacoxal carina present. Propodeum reticulate between apical carina and its apex, rugose above, basad of basal carina largely smooth and shiny, at sides striate, apical and basal carinae complete, apophyses moderately high, median longitudinal carinae present at base, spiracles oval. Areolet pentagonal, 5× as high as the width of bordering veins, intercubiti parallel, second intercubitus faint. First tergite smooth and shiny except for a few shallow scattered punctures in the middle; second and third tergites closely punctate, punctures tending to be shallow (or smooth) at apices; the following tergites subpolished. Ovipositor as in figure.

Black. Fourth to ninth flagellar segments, white above. The following are yellow : face (Fig. 73 : e) with two elongate marks near the eye margin (face slightly brownish in the middle, colour variable, sometimes completely black), basal half of clypeus, mandible at the base, two elongate orbital stripes coming close to antennal sockets, upper margin of pronotum, pronotal collar in the middle (sometimes black), tegula, subtegular ridge, scutellum, base of hind wing (Fig. 73 : f), apices of first, second and third tergites, fourth apico-laterally, seventh broadly in the middle, and eighth slightly at apex (Fig. 73 : g). Mesopleurum above the middle coxa, whole of propodeum and metapleurum, and all legs, reddish or dark orange. Fore coxa and trochanter yellow; middle coxa and trochanter dirty yellow; all tarsi dark brown; colour of first abdominal tergite largely variable, black to dark orange or reddish with a yellow apical band.

Male : Head and thorax smooth and shiny, pronotum with a few short striae in the middle. Mesopleurum irregularly rugoso-striate above on both sides of prepectal carina and slightly near speculum, in the lower half sparsely punctate. Metapleurum obscurely punctate, juxtacoxal carina present. Area between basal carina and apex of propodeum reticulate, apical carina and apophyses indistinct, basal carina complete. First abdominal tergite smooth and shiny; second, third and fourth tergites closely and fifth only at base, punctate; the following tergites subpolished.

Black. Antenna completely black. The following are yellow : face, clypeus, mandible, except the apices, orbital stripes, temple, pronotal collar, upper margin of pronotum, tegula, subtegulur ridge, scutellum, metascutellum, base of hind wing, first abdominal tergite at the base and apex, apices of second to fifth tergites, sixth and seventh broadly in the middle, and fore and middle coxae and trochanters. Propodeum reddish, along the basal carina brown. Fore femur and tibia and first and second tarsal segments dark yellow. A line each on femur and tibia above, and third segment brown; fourth and fifth tarsal segments dark brown. Middle femur and tibia yellowish-brown, femur and tibia with a line above, tarsus dark brown. Hind coxa reddish, first trochanteral segment black, second trochanteral segment and femur light brown with apices slightly darker, tibia blackish except in the middle lighter, tarsus white with basal 0.75 of first, fourth and fifth completely black. Wings hyaline, apex slightly smoky.

Length : Female, 6.5–8.5 mm; fore wing 4.5–6 mm; ovipositor sheath 3–3.5 mm. Male, 8 mm; fore wing 5.5 mm.

Distribution : India : Karnataka (Gunji, 609m.; Bhagmandla, 853m.). Kerala (Walayar Forest). Tamil Nadu (Kannoth Range, Wynaad; Oothu in Kodai Hills; Palni in Palni Hills). *Elsewhere* : Sri Lanka (Kandy; Paradeniya; Passara; Wattamulla; Tala Wakelle).

Hosts : *Macroplectra nararia,* and *Pyrausta machaeralis.* In litrature *Fornicia ceylonica and Macrocentrus homonae.*

16. ***Goryphus nursei*** (Cameron)

1907. *Melcha nursei* Cameron, *J. Bombay Nat. Hist. Soc.,* **17** : 593. Female des. Type : Female, India : Maharashtra : Deesa (LONDON).

1919. *Melcha nursei* : Dutt, *Bull. Res. Inst. Pusa India,* **89** : 8. India : Uttar Pradesh : Kanpur. Bihar : Pusa. *Hosts* : *Earias vittella; Thysanoplusia orichalcea.*

1923. *Melcha nursei* : Dutt, *Mem. Dept. Agri. India (Ent. Ser.),* **8** : 23. India : Bihar : Chapra. Maharashtra : Pune. Tamil Nadu : Coimbatore.

1934. *Melcha nursei* : Husain & Mathur, Rept. Proc. 5th Ent. Meet. Pusa, p. 46. Male, Female. biol. India : Haryana : Hansi. Punjab : Jullandhar. Pakistan : Lyallpur; Lahore; Sargodha. *Host* : *Earias insulana.*

1934. *Goryphus nursei* : Ayyar & Margabandu, *Madras Agri. J.*, **22** : 441. n. comb. India : Tamil Nadu : Coimbatore. *Host* : *Psychid.*

1934. *Melcha nursei* : Beeson & Chatterjee. *Indian Forest Rec. (N.S.) Ent.*, **1** : 161. biol. India : Orissa : Puri Division. Punjab : Hoshiarpur Division : Jullandhar. Pakistan : Lahore; Lyallpur. *Hosts* : *Eumeta variegata; Earias insulana; Thysanoplusia orichalcea.*

1936. *Melcha nursei* : Husain. *Rept. Dept. Agri. Punjab India,* 1930-31 to 1934-35; 176. India : Punjab. Pakistan. *Host* : *Syllepte derogata.*

1936. *Melcha nersei(!)* : Deshpande & Nadkarny, *Sci. Monogr. Imp.. Coun. Agri. Res. India.*, **10** : 62. Male, Female. biol. India : Gujarat : Adajan near Surat. *Host* : *Earias* spp.

1938. *Goryphus nursei* : Brahmachari, *J. Bombay Nat. Hist. Soc.*, **40** : 61. *Host* : *Eumeta crameri.*

1939. *Goryphus nursei* : Glover, *Indian J. Ent.*, **1** : 99. Male, Female. biol. *Host* : *Coccidyphaga scitula.*

1939. *Melcha nursei* : Pruthi, *Sci. Rept. Imp. Agri. Res. Inst. New Delhi,* 1937-38; 114. biol.

1940. *Melcha nursei* : Pruthi, *Sci Rept. Imp. Agri. Res. Inst. New Delhi,* 1937-39, 117. Male, Female. biol. *Host* : *Earias* spp.

1945. *Melcha nursei* : Ahmad & Ghulamullah, *Indian J. Ent.*, **6** : 53. fig., biol. Northern India. *Host* : *Earias* spp.

1946. *Goryphus nursei* : Khan & Verma, *Indian J. Ent.*, **7** : 57. Male, Female. biol. India : Haryana : Rohtak. Punjab : Ludhiana. Pakistan : Sialkot; Lyallpur; Multan. *Host* : *Earias* spp.

1951. *Melcha nursei* : Rao & Kurian, *Indian J. Ent.*, **13** : 73. Male, Female. des., fig. India : New Delhi.

1960. *Melcha nursei* : Rao & Grover, *Proc. Natl. Acad. Sci. India,* (B) **30** : 287. Female. India : Maharashtra : Nagpur.

1960. *Goryphus nursei* : Ghani, Rept. Commonw. Inst. Biol. Control, p. 13. Pakistan. *Host* : *Syllepte derogata.*

1961. *Brachycoryphus nursei* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 158. n. comb. India : Pakistan.

1970. *Brachycoryphus nursei* : Rao, *Marathwada Univ. J. Sci.*, **9** : 92. Female. India : Maharashtra : Marathwada : Aurangabad.

1973. *Goryphus nursei* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 62. Male, Female, key, des., fig. India : Rajasthan : Dholpur. Jharkhand : Ranchi Dist. : Namkum; Torpa. Delhi. Uttaranchal : Dehra Dun : New Forest. Punjab : Shahdara Plantation; Hoshiarpur; Tehrah Plantation. Maharashtra : Bombay : N. Thana. Pakistan : Rawalpindi.

1981. *Goryphus nursei* : Basarkar & Nikam, *Indian J. Parasitol.*, **5** : 183. biol.

1982. *Goryphus nursei* : Basarkar & Nikam, *Sci. & Culture*, **48** : 289. biol.

1982. *Goryphus nursei* : Basarkar & Nikam, *Ztschr. Angew Ent.*, **93** : 213. biol. *Host* : *Earias vittella.*

1985. *Goryphus nursei* : He, *Acta Agri. Univ. Zhejiangensis,* **11** : 330. Male, Female. des., fig., biol. China : Yunnan : Binchuan; Baoshan. *Hosts* : *Earias vitella; E. insulana.*

1987. *Goryphus nursei* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 842.

This species is distinguished by having the face and clypeus strongly punctate, malar space 0.8× the basal width of mandible, lateral carina of scutellum confined to its base, prepectal carina extending up to the base of subtegular ridge and propodeum largely reticulate. The areolet is small and squarish, second and third tergites strongly punctate, punctures running into striations, and the head and thorax are largely reddish.

Female : Face and clypeus closely and strongly punctate, clypeus tending to be smooth towards the apex, face and clypeus slightly convex in middle. Antennal scrobe shallow, smooth and shiny. Frons striato-wrinkled in the middle and at the sides of median ocellus, a median carina extending down from median ocellus. Vertex subpolished without distinct punctures. Temple largely smooth and shiny. Malar space weakly granulose, about 0.8× the basal width of mandible. Mandible somewhat striato-punctate, teeth subequal. Pronotum coarsely striate, striae tending to be oblique at upper margin, extreme upper margin with a few punctures in between the striae, epomia strongly reaching upper margin, then turned mesad. Mesoscutum closely and strongly punctate, striate along margins of each lobe. Scutellum shiny, sparsely punctate, lateral carina more or less confined to its base. Metascutellum smooth and shiny. Mesopleurum rugose, tending to be wrinkled above, area above middle coxa somewhat striate, prepectus punctate, area below sternaulus and speculum smooth, prepectal carina extending almost up to the base of subtegular ridge. Metapleurum finely wrinkled above, punctate below, juxtacoxal carina present. Propodeum largely reticulate, basad of basal carina trans-wrinkled, both transverse carinae strong and complete, basal carina more or less straight, apical carina evenly and strongly arched, bow-shaped, lateral crest much weaker, spiracle small and oval. Areolet small, squarish, about 3× as high as the width of bordering veins, second recurrent vein received near second intercubitus, nervellus broken at its lower 0.3. First tergite short about 1.3× as long as wide at apex, both the dorsal carinae long and the tergite dorsally strongly and sparsely punctate in the middle; second and third tergites strongly and closely punctate, punctures running into striations; fourth tergite less strongly and sparsely punctate; the following tergites subpolished. Ovipositor tip not so long and blunt, upper valve a little convex, lower valve with distinct teeth.

Black. Head and thorax red or dark orange; eighth to tenth flagellar segments white above. Face and frons along the eye margin, tegula, subtegular ridge, lateral carina of scutellum, apices of first, fifth to eighth tergites, yellow. Legs in general reddish, except fore and middle tibia and tarsus tending to be brownish; hind femur broadly at apex, whole of tibia and tarsus blackish, tibia with a subbasal yellowish band.

Male : Essentially similar to the female. Frons around median ocellus wrinkled and with distinct punctures, interocellar area strongly punctate. Malar space about 0.6× the basal width of mandible. Upper margin of pronotum sparsely punctate. Mesopleurum rugoso-punctate; metapleurum reticulate; fourth tergite strongly punctate.

Colour similar to the female, except antenna entirely black without a white band; frons and ocellar triangle black. Clypeus, upper margin of pronotum and sometimes collar, apices of second broadly and fourth tergite narrowly, yellow.

Length : Female, 10.5 mm; fore wing 7 mm; ovipositor sheath 5 mm. Male, 8.5 mm; fore wing 5.5 mm.

Distribution : India : Bihar (Pusa; Chapra). Jharkhand (Ranchi; Namkum; Torpa). Delhi. Rajasthan (Dholpur). Haryana (Hansi; Rohtak). Gujarat (Adajan nr. Surat). Orissa (Puri). Punjab (Ludhiana, Jullandhar, Hoshiarpur). Tamil Nadu (Coimbatore). Uttar Pradesh (Kanpur). Maharashtra (Deesa; Pune; Nagpur; Aurangabad; Bombay). Uttaranchal (Dehra Dun). *Elsewhere* : China (Yunnan : Binchuan; Baushan). Pakistan (Lyallpur; Lahore; Sargodha; Sialkot; Multan; Rawalpindi).

17. ***Goryphus gandhii*** Jonathan & Gupta (Fig. 74 : a–d)

1973. *Goryphus gandhii* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 55. Female, key. des., fig. Type : Female : Assam : Rangapara : Sonajuli Tea Estate (GUPTA). India : Uttaranchal : Garhwal Hills : Srinagar; Kumaon Hills : Garjia, 609m. Jharkhand : Ranchi dist. : Namkum. Indonesia : Java : Bogor : Pabuaran, 250m. India : "Bidadi."

1987. *Goryphus gandhii* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 836.

This species is distinguished by having the face striato-punctate; malar space about 0.7× the basal width of mandible; prepectal carian extending up to 0.5 the height of mesopleurum and metapleurum strongly rugose. The apices of first, second and fifth tergites and the tip of abdomen (Fig. 74 : b) yellow and the propodeum reddish with its apophyses marked yellow (Fig. 74 : a).

Female : Face strongly and closely striato-punctate, striae somewhat oblique. Clypeus subpolished, somewhat pyramidal in shape, sparsely and shallowly punctate, apical margin without any irregularity. Mandible rough with subequal teeth. Malar

space granulose, 0.7× the basal width of mandible. Frons subpolished, antennal scrobe smooth and shiny, obscurely punctate, with a few oblique striae below ocellar area in the middle and at sides, and with a median longitudinal carina. Vertex smooth and shiny. Temple sparsely punctate, subpolished. Pronotum trans-striate, obliquely and finely striate above, anterior margin near neck smooth and shiny, epomia striaght, ending at the upper margin. Mesoscutum punctate, striae fine and transverse, middle lobe with longitudinal striae in the middle. Scutellum and metascutellum smooth and shiny, except scutellum with a few shallow punctures, lateral carina of scutellum extending up to its basal 0.25. Mesopleurum rugoso-striate, short striae occur along prepectal carina and lower half of mesopleural suture and mesopleural pit, area below sternaulus finely striate, speculum subpolished, sparsely punctate, prepectal carina incomplete, extending up to only 0.5 the height of mesopleurum. Metapleurum strongly rugose, juxtacoxal carina present. Propodeum rugoso-reticulate between basal carina and its apex, smooth and shiny at extreme base, apical carina incomplete, sometimes present in the middle, apophyses short and conical, basal carina complete, evenly arched and turned forward in the middle, carina somewhat wavy near the spiracles, spiracles oval, median longitudinal carinae present at base. Areolet pentagonal, 5× as high as the width of bordering veins, intercubiti slightly convergent, second intercubitus faint. First tergite largely smooth and shiny except in the middle with a few punctures; second and third tergites closely punctate, tending to be smoother at apex; the following tergites subpolished. Ovipositor as in figure 74 : d.

Black. Seventh to ninth flagellar segments white above. Clypeus, except apically, mandible, except the apex, orbital marks on frons (size variable), scutellum, pronotal collar basally (sometimes variable), upper margin of pronotum, tegula, subtegular ridge, apophyses (Fig. 74 : a), apices of first and second tergites and fifth, sixth, seventh and eighth tergites broadly in the middle (Fig. 74 : b), yellow. Mesopleurum largely except prepectus, whole of propodeum and metapleurum, dark orange to reddish. First abdominal tergite except the apical yellow band, largely red at the base and tending to be dark reddish-brown in the middle. Fore coxa and trochanter, yellowish, except coxa at the base and spots on trochanteral segments, black, femur and tibia light brown, femur darker above, tarsus brown. Middle leg largely reddish with tarsus brown; hind coxa, trochanter and femur reddish, a mark on second trochanteral segment and apex of femur largely, blackish, tibia blackish-brown with subbasal area light brown, tarsus dark brown with basal 0.5 of first segment dirty yellow (Fig. 74 : c).

Male : Not known.

Length : Female, 5 mm; fore wing 4 mm; ovipositor sheath 1.5mm.

Distribution : India : Assam (Rangapara : Sonajuli Tea Estate). Jharkhand (Namkum in Ranchi dist.). Uttaranchal : Srinagar in Garhwal Hills; Garjia in Kumaon Hills. *Elsewhere* : Java.

This species is close to *G. nilgiricus* Jonathan & Gupta in having the orbital stripes along the eye margins and the propodeal apophyses, yellow.

18. ***Goryphus nilgiricus*** Jonathan & Gupta (Fig. 74 : e–h)

1973. *Goryphus nilgiricus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 66. Female, key. des., fig. Type : Female, India : Tamil Nadu : Nilgiri Hills : Devbetta, 2133m. (GUPTA). India : Maharashtra : Mahabaleshwar, 1330m.

1987. *Goryphus nilgiricus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 842.

This species has face minutely punctate, malar space 0.4× the basal width of mandible, prepectal carina extending almost up to the base of subtegular ridge and

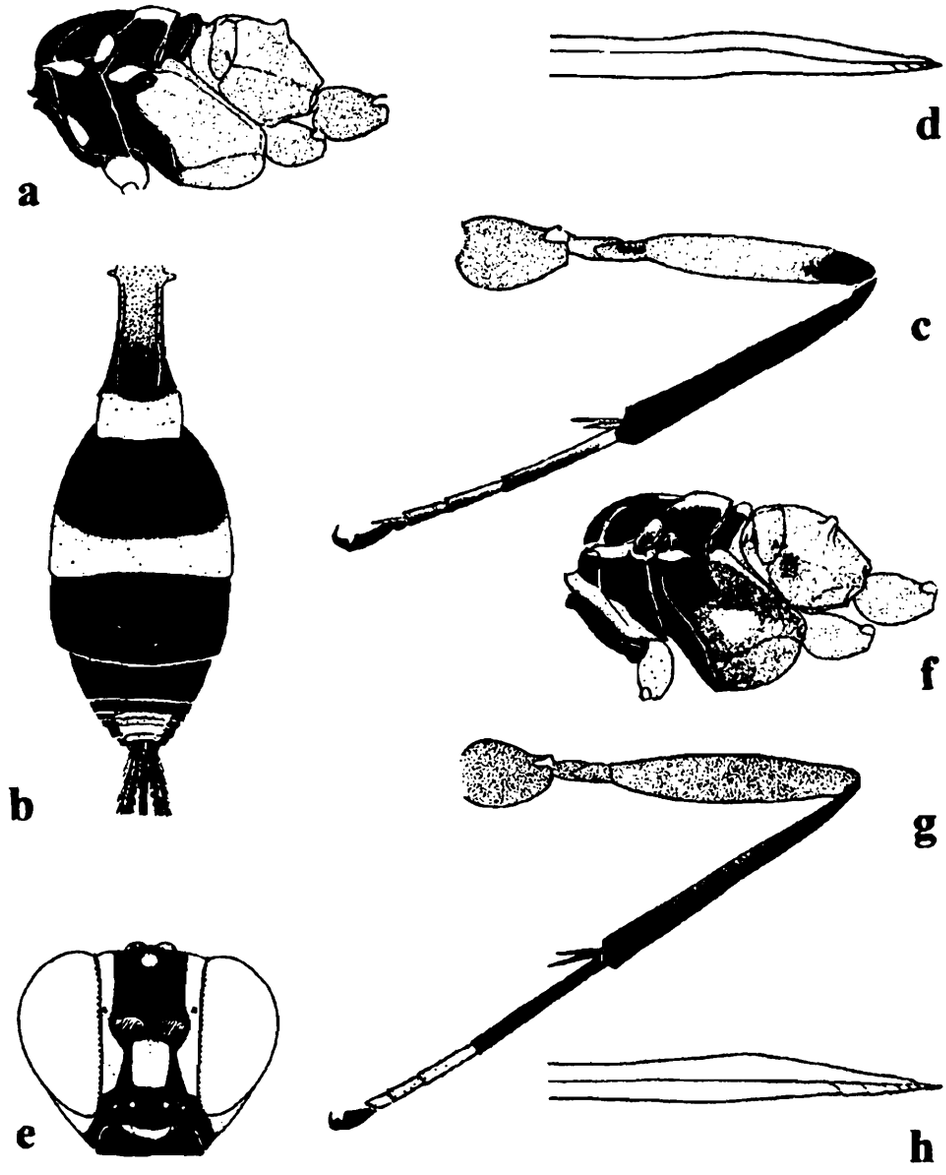

Fig. 74. Colour pattern : *Goryphus gandhii* Jonathan & Gupta : **a**, thorax side view; **b**, abdomen dorsal view; **c**, hind leg; **d**, ovipositor tip. *Goryphus nilgiricus* J & G : **e**, head front view; **f**, thorax side view; **g**, hind leg; **h**, ovipositor tip.

the metapleurum finely rugoso-striate. The areolet is about 7× as high as the width of bordering veins and the frons along the eye margin (Fig. 74 : e).

Female : Face minutely punctate, punctures sparse at sides (Sometimes shallow or indistinct), obiquely rugose below each antennal sockets. Clypeus closely and densely punctate at base, sparsely punctate at apex, apical margin impressed, truncate in the middle. Mandible longitudinally striate with punctures in between the striae. Malar space granulose, 0.37 to 0.4× the basal width of mandible. Frons below ocellar triangle weakly and obliquely striate. Vertex smooth and subpolished. Temple subpolished, obscurely punctate. Pronotum coarsely trans-striate, somewhat finely and obliquely striate above at upper margin, epomia reaching up to upper margin. Mesoscutum punctate, aciculate along the margins of each lobe. Scutellum subpolished, minutely punctate, lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum finely trans-striate, area below sternaulus minutely punctate, striate along sternaulus, speculum smooth and shiny, prepectal carina extending full height of mesopleurum; metapleurum finely rugoso-striate, juxtacoxal carina present. Propodeum strongly wrinkled, at places tending to be reticulate, area below apophyses striate, striae extending to pleural carina, area basad of basal carina rugose, apical carina not distinctly formed, apophyses moderately strong, basal carina complete, evenly turned forward in the middle, spiracles oval. Areolet pentagonal, 7× as high as the width of bordering veins, intercubiti convergent, second intercubitus faint. First tergite largely smooth and subpolished, somewhat granulose at apex; second and third tergites densely punctate, punctures tending to be shallow towards the apex, giving a granulose look; the following tergites subpolished. Ovipositor as in figure 74 : h.

Black. Fourth to ninth flagellar segments white above. A small or large squarish mark in the centre of face, inner orbits throughout, a mark on temple (Fig. 74 : e), pronotal collar, upper margin of pronotum, scutellum, metascutellum, a small mark at the posterior corner of tegula, subtegular ridge, an irregular mark in the centre of mesopleurum, base of hind wing (Fig. 74 : f), apophyses broadly, apices of first and second tergites, seventh and eighth tergites broadly, yellow. Posterior half of mesopleurum, propodeum, metapleurum and first tergite except at the base, red. Fore coxa and first trochanteral segment, yellow, except for a blackish mark on the first trochanteral segment, its second trocchanteral segment, femur, tibia and tarsus brownish, except that tarsus more darker and its fifth tarsal segment dark brown. Middle coxa reddish with a yellow mark; trochanter, femur, tibia light brown; tarsus brown, with fifth segment dark brown. Hind coxa red, trochanter and femur reddish-brown, except for a dark mark on second trochanter, segment, and apex of femur and tibia blackish-brown, tibia ventrally with yellowish tinge, tarsus white with the basal 0.75 of its first segment and whole of fifth, dark brown, sometimes whole of first segment and basal 0.5 of second, and fourth and fifth segments, dark brown; apical 0.5 of second and third wholly white (Fig. 74 : g)

Male : Not known.

Length : Female, 7.5 mm; fore wing 6 mm; ovipositor sheath 3.5 mm.

Distribution : India : Tamil Nadu (Devbetta in Nilgiri Hills). Maharashtra (Mahabaleshwar 1330m.)

19. ***Goryphus rangaparensis*** Jonathan & Gupta (Fig. 75 : a–d)

1973. *Goryphus rangaparensis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 54. Female, key. des., fig. Type : Female, India : Assam : Rangapara (GUPTA). India : Uttaranchal : Garjia.

1987. *Goryphus rangaparensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 844.

This species is characterized by having the malar space about 0.75× the basal width of mandible, lateral carina of scutellum extending up to its basal 0.5, face largely rugose, propodeum finely reticulate in the middle and the thorax being largely red (Fig. 75 : a).

Female : Face distinctly rugose all over, with a median shallow furrow below antennal sockets. Clypeus subpolished, minutely punctate. Mandible subpolished with subequal teeth, rough with a few punctures. Malar space granulose, 0.75× the basal width of mandible. Frons largely granulose, irregularly and obliquely wrinkled in the middle below the ocellar triangle and also with a median longitudinal carina. Vertex obscurely punctate. Temple shiny, minutely punctate. Pronotum trans-striate, obliquely striate above, epomia reaching to its upper margin, then turned mesad. Mesoscutum obscurely punctate, finely aciculate along margins of each lobe. Scutellum subpolished, shallowly punctate at base, lateral carina extending up to its basal 0.5. Metascutellum smooth and shiny. Mesopleurum largely rugose, striate along the mesopleural suture (sometimes striae short and less distinct), area below sternaulus finely striate, speculum subpolished, minutely and sparsely punctate, prepectal carina extending up to 0.75 the height of mesopleurum. Metapleurum trans-rugose, juxtacoxal carina present; propodeum finely reticulate in apical half, basal half rugose, trans-striate below apophyses and at its sides, apophyses short and narrow, basal carina complete, median longitudinal carinae present at base, spiracle moderately large, roundish. Areolet pentagonal, wider than high, 5× as high as the width of bordering veins, intercubiti convergent, second intercubitus faint. First tergite largely smooth and subpolished, sparsely and shallowly punctate in middle near spiracle; second and third tergites closely and fourth obscurely punctate; the following tergites subpolished. Ovipositor as in figure 75 : d.

Black. Head black; fifth to ninth flagellar segment white above. Thorax wholly red except propleurum blackish (sometimes anterior part or whole of pronotum blackish) (Fig. 75 : a). Tegula, subtegular ridge slightly, scutellum, apices of first and second

tergites, seventh and eighth tergites broadly (Fig. 75 : b), yellow or dirty yellow. Fore leg with coxa largely yellow, reddish at the base, its first trochanteral segment dark brown, second segment and femur light brown, tibia yellow at base, blackish at apex, tarsus dark brown. Middle coxa reddish-yellow, trochanter darker, femur light brown, tibia and tarsus black, except tibia at base yellowish. Hind coxa and femur reddish, trochanter, tibia and tarsus largely dark brown, except the tibia slightly lighter at its basal half (Fig. 75 : c); Colour of first abdominal tergite variable from red to black, with an apical yellow band.

Male : Not known.

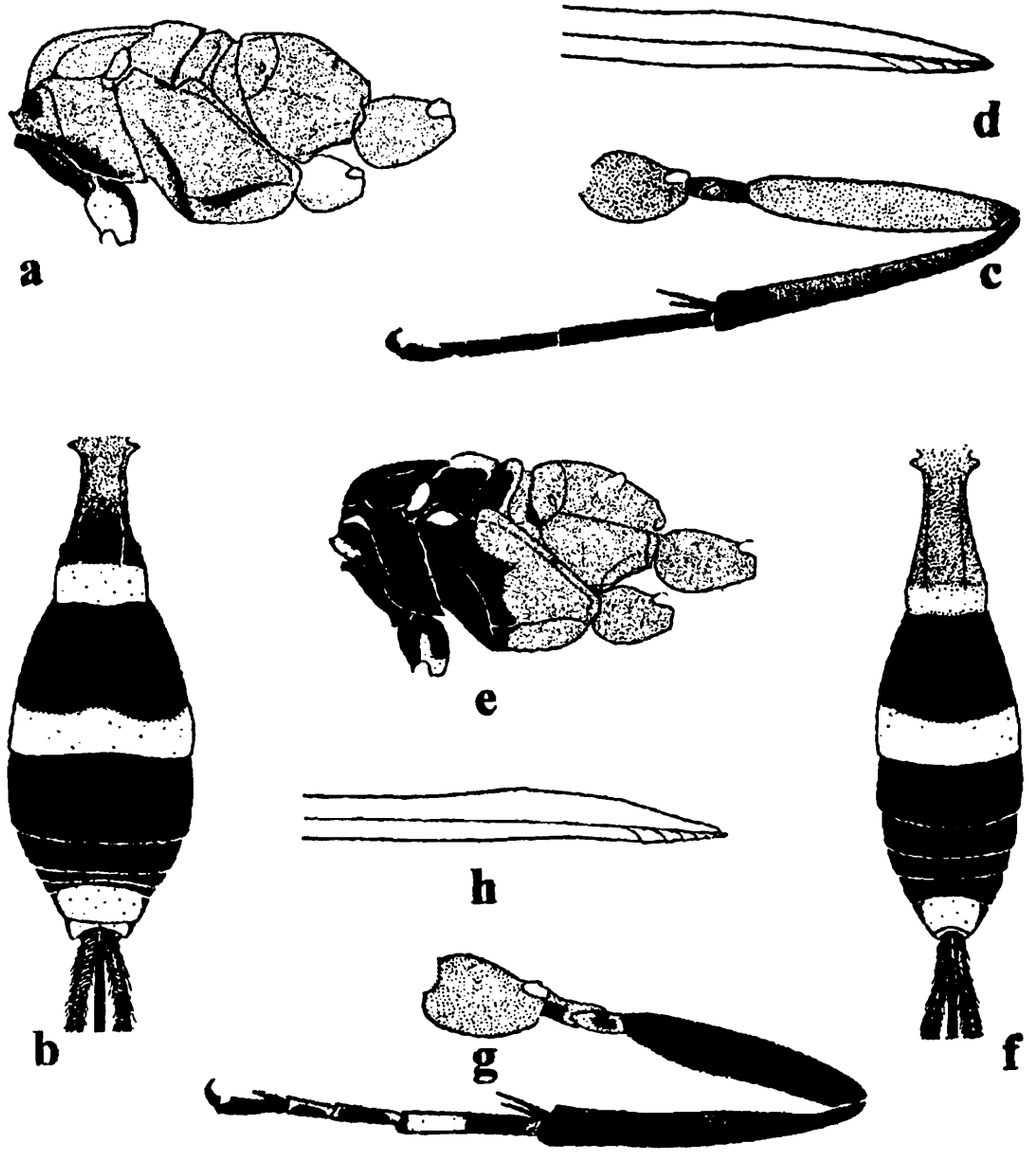

Fig. 75. Colour pattern : *Goryphus rangaparensis* Jonathan & Gupta : **a**, thorax.side view; **b**, abdomen dorsal view; **c**, hind leg; **d**, ovipositor tip. *Goryphus apollonis* J & G : **e**, thorax side view; **f**, abdomen dorsal view; **g**, hind leg; **h**, ovipositor tip.

Length : Female, 6.5–9 mm; fore wing 5–6 mm; ovipositor sheath 2–2.5 mm.

Distribution : India : Assam (Sonajuli Tea Estate in Rangapara). Uttaranchal (Garjia).

This species is close to *G. apollonis,* Jonathan & Gupta, in having the mesoscutum and scutellum largely smooth, with only a few punctures; frons black without any orbital mark and the propodeum largely red without any mark.

20. ***Goryphus apollonis*** Jonathan & Gupta (Fig. 75 : e–h)

1973. *Goryphus apollonis* Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 57. Female, key. des., Type : Female : India : Karnataka : Mercara, 1219m (GUPTA). India : Tamil Nadu : Kodai Hills : Oothu, 1158m. Assam : Charduar Forest; Rangapara. Uttaranchal : Mussoorie, 2288m. Karnataka : Bhagmandla; Kottegehar, 640m; Murnard, 609m. Kerala : Thekkady Sanctuary. Meghalaya : Jaintia Hills : Dawki. Myanmar : Nanhlaing Res. Shwebo.

1987. *Goryphus apollonis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 830.

This species is characterized by having the face rugoso-punctate, malar space about 0.5× the basal width of mandible, lateral carina of scutellum confined to its base, and the propodeum strongly rugose in the middle. The head and anterior half of thorax is black, and the rest of the thorax, including propodeum, and the first abdominal tergite red (Fig. 75 : f).

Female : Face rugoso-punctate, punctures very close and deep. Clypeus subpolished, minutely and sparsely punctate, evenly arched, apical margin impressed, especially at sides. Mandible rough at base, smoother at apex. Malar space granulose, 0.55× the basal width of mandible. Frons largely obliquely striate in the middle below ocellar triangle, granulose at sides. Vertex obscurely punctate. Temple subpolished, minutely punctate. Pronotum striate, finely obliquely striate above and at upper margin, epomia strong, complete, turned mesad. Mesoscutum smooth or sometimes granulose, finely aciculate along margins of each lobe. Scutellum and metascutellum impunctate, subpolished, lateral carina of scutellum confined to its base. Mesopleurum rugose in the middle, finely striate just above and below the sternaulus and along mesopleural suture below speculum; short striae also occur along prepectal carina; speculum smooth, with a few minute scattered punctures; prepectal carina extending up to 0.75 the height of mesopleurum. Metapleurum rugose, trans-rugose towards the base of hind coxa, juxtacoxal carina present. Propodeum strongly rugose, rugae or wrinkles transverse at sides and below apophyses, somewhat longitudinal in the middle, irregular above, apical carina incomplete, apophyses short and compressed, basal carina complete, evenly arched, with median longitudinal stumps of carinae, spiracles oval. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti somewhat convergent, second intercubitus faint. First tergite more or less smooth and

shiny, with a few indistinct shallow punctures near spiracle, second to fourth tergites closely punctate; fifth also somewhat obscurely punctate, the following tergites subpolished. Ovipositor as in figure 75 : h.

Black. Fourth to ninth flagellar segments white above; head and anterior half of thorax black (Fig. 75 : e), rest of thorax including propodeum and first tergite, red. The following are yellow : a mark on the extreme anterior part of pronotum (just behind the head), a line on the upper margin of pronotum anteriorly, tegula, subtegular ridge, scutellum, lateral carina of scutellum, apices of first and second abdominal (Fig. 75 : f) tergites, seventh and eighth tergites broadly in the middle. Fore coxa black, except its apex and trochanters, yellow, femur light brown, darker above, tibia yellowish, and blackish above, tarsus blackish-brown. Middle coxa reddish, trochanter yellowish-red, femur light brown with orange to reddish tinge, tibia dark yellow except blackish above, tarsus blackish. Hind coxa, trochanter and femur, red, with the trochanter broadly spotted and femur at apex dark brown, tibia blackish with the subbasal area lighter, tarsus largely black with the apical 0.6 of first tarsal segment, whitish (tarsal colour variable) (Fig. 75 : g).

Male : Similar to the female but more polished. Frons, vertex and temple smooth and subpolished. Pronotum without striae, largely polished. Mesoscutum not aciculate along the margins. Metapleurum minutely and shallowly punctate. Propodeum somewhat weakly rugoso-punctate; second and third tergites minutely punctate; fourth tergite shallowly punctate.

Black. Antenna without a median band. The following are yellow : face in the middle, clypeus, mandible, except the tip, pronotal collar, scutellum, lateral carina of scutellum, tegula, subtegular ridge, apices of second, third, fourth and seventh tergites, fore and middle coxae and their trochanters. Hind tarsus with second to fourth segments, white; rest of thorax including mesopleurum, metapleurum, metanotal rim, propodeum and first tergite largely reddish. Colour somewhat varibale in the males.

Length : Female, 7–10 mm; fore wing 5–6.5 mm; ovipositor sheath 2.5–3 mm. Male 7 mm; fore wing 5 mm.

Distribution : India : Assam (Charduar Forest, Rangapara). Karnataka (Mercara, 1219m.; Bhagmandla; Kottegehar, 640m; Murnard, 609m). Kerala (Thekkady Sanctuary). Meghalaya (Dawki in Jaintia Hills). Uttaranchal (Mussoorie, 2288m). Tamil Nadu (Oothu in Kodai Hills). *Elsewhere* : Myanmar (Nanhlaing Res. : Shwebo).

21. ***Goryphus cinctipes*** (Cameron) (Fig. 76 : a–d)

1905. *Melcha maculiceps* Cameron, *Spolia Zeylanica*, **3** : 110. Female. Name preocc. In *Goryphus* by *Cratocryptus maculiceps* Cameron, 1905. des. Type : Female, Sri Lanka : Peradeniya (LONDON). Host : Chrysomelid beetle.

1905. *Melcha cinctipes* Cameron, *Spolia Zeylanica*, **3** : 107. Male. des. Type : Male, Sri Lanka : Peradeniya (LONDON), Syn. by Jonathan & Gupta, 1973.

1914. *Goryphus maculiceps* : Morley, *Rec. Indian. Mus.*, **8** : 327. Female. des. India : Assam : Sadiya.

1923. *Melcha maculiceps* Dutt, *Mem. Dept. Agr. India (Ent. Ser.)*, **8** : 23. India : Bihar : Chapra; Pusa. Bangla Desh : Dacca.

1925. *Goryphus maculiceps* : Gater, *Malayan Agri. J.*, **13** : 100. des. Malaya. *Host* : *Artona catoxantha.*

1923. *Goryphus maculiceps* : Dammerman, The Agricultural Zoology of the Malay Archipelago, p. 149. *Host* : *Artona catoxantha.*

1941. *Goryphus maculiceps* : Betrem, *Treubia*, **18** : 46, 56. key. syn., des.

1941. *Melcha cinctipes* : Betrem, *Treubia*, **18** : 60. key.

1961. *Goryphus cinctipes* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 149. n. comb. Sri Lanka.

1961. *Goryphus zonalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 155. new name for *Melcha maculiceps* Cameron, 1905. India. Malaya. Bangla Desh. [In 1961, both *Melcha maculiceps* Cameron, 1905 and *Mesostenus maculiceps* Cameron, 1904 were placed in *Goryphus.*]

1973. *Goryphus cinctipes* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 72. Male, Female. key, syn., des., fig. Sri Lanka : Peradeniya. India : Bihar : Chapra; Pusa. Jharkhand : Ranchi Dist. : Ambera Bero; Namkum. Uttar Pradesh : Muradnagar; Sikandrabad. Uttaranchal : Pant Nagar; Kumaon Hills : Garjia; Mohan; Dunia. Delhi. Karnataka : Londa, 609m. Maharasthra : Nagpur. Kerala : Walayar Forest : Watapara. Andhra Pradesh : Pasara. Tamil Nadu : Palni Hills : Palni. *Host* : *Artona catoxantha;* Chrysomelid beetle.

1987. *Goryphus cinctipes* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 833.

This species has the mesopleurum strongly rugose, second and third tergites deeply and coarsely punctate and the mesoscutum without any mark. Metapleurum wholly and apical slope of propodeum, yellow (Fig. 76 : b).

Female : Face closely and distinctly punctate, punctures running into rugosities, rugosities more prominent below antennal sockets. Clypeus subpolished, sparsely and shallowly punctate, evenly convex, apical margin impressed. Mandible subpolished obscurely punctate at base. Malar space granulose, 0.4× the basal width of mandible. Frons below ocellar triangle closely and distinctly puncto-wrinkled, wrinkles oblique and irregular, side of frons largely smooth with a few scattered punctures, area in front of median ocellus slightly depressed and with a median longitudinal carina extending down to middle of antennal sockets, carina not continuous but interrupted

in the middle. Vertex smooth and subpolished. Temple distinctly punctate and subpolished. Pronotum coarsely trans-striate, obliquely and irregularly striate above, epomia strong and reaching to upper margin then turned mesad. Mesoscutum minutely punctate, faintly aciculate along the margins. Scutellum minutely punctate, lateral carina confined to its base; metascutellum smooth and shiny. Mesopleurum, strongly rugose, speculum shiny with a few minute punctures, area just above middle coxa finely to coarsely striate, area just above and below sternaulus somewhat trans-aciculate, rest of sternal area minutely punctate, prepectal carina reaching the full height of mesopleurum. Metapleurum rugose to rugoso-striate, finely striate just above juxtacoxal carina (tending to be irregularly wrinkled). Propodeum coarsely reticulate between apical carina and apex, area below apophyses striate, striae extending up to pleural carina, area between apical and basal carinae wrinkled, basad of basal carina irregularly wrinkled, apical carina complete, strongly arched in the middle, apophyses crest-like, basal carina more or less straight, spiracle oval. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti parallel, second intercubitus faint. First tergite largely smooth and shiny, except apico-laterally, near spiracles shallowly punctate, punctures running into longitudinal striations; second and third tergites closely, fourth shallowly at base, punctate; the following tergites subpolished.

Black. Fourth to tenth flagellar segments white above. The following are yellow : face (Fig. 76 : a) with an oval mark in the middle and two small to large mark on either side, clypeus, except apical margin, mandible broadly at base, orbital stripes on frons extending up to antennal sockets, sometimes a mark on pronotal collar, scutellum, metascutellum, tegula, subtegular ridge, base of hind wing, metapleurum largely, apical slope of propodeum wholly (Fig. 76 : b), apices of first to third tergites, sixth tergite narrowly at apex, seventh tergite broadly (Fig. 76 : c). First tergite except apically, black, but in some specimens tending to be reddish towards base or sometimes completely reddish. Legs largely reddish-orange, fore and middle coxae (except fore coxa at the base, black) and trochanters, yellow. Middle coxa and trochanter dirty yellow, their tibiae and tarsi infuscate, and fifth segments dark brown. Hind coxa, trochanter and femur reddish-orange; tibia infuscate, its apex and base broadly dark brown to black, tarsus dirty white, its fifth segment dark brown (Fig. 76 : d).

Male : Much similar to female except frons largely smooth with a few punctures; pronotum smooth and shiny with a few striae; mesopleurum shiny, with a weakly rugose area in the middle; metapleurum and propodeum tending to be finely wrinkled; second and third tergites, and fourth tergite shallowly a base, punctate.

Black. Antenna without a whitish band. Face completely; pronotum largely, apices of first to third and seventh and eighth tergites broadly, yellow. Hind leg dark orange, its trochanters, tibia broadly at apex and at extreme base, and tarsus, blackish to black, except apical half of its second tarsal segment to basal half of fourth segments white.

Length : Female, 6–8 mm; fore wing 4.5–6.5 mm; ovipositor sheath 2.5–3.5 mm. Male, 5.5 mm; fore wing 4 mm.

Distribution : India : Assam (Sadiya). Andhra Pradesh (Pasara). Bihar (Chapra; Pusa). Jharkhand (Ranchi, Namkum; Ambera Bero). Delhi. Kerala (Watapara in Walayar Forest). Maharashtra (Nagpur; Bombay; Metheran, 914m; Panhala Fort, 914m). Karnataka (Londa, Kottegehar, Anmod; Gunji). Tamil Nadu (Palni in Palni Hills). Uttar Pradesh (Muradnagar; Sikandrabad). Uttaranchal (Dunia; Mohan; Pantnagar; Garjia in Kumaon Hills). *Elsewhere* : Bangla Desh (Dacca). Sri Lanka (Peradeniya). Malaya.

Host : *Artona catoxantha* and Chrysomelid beetle.

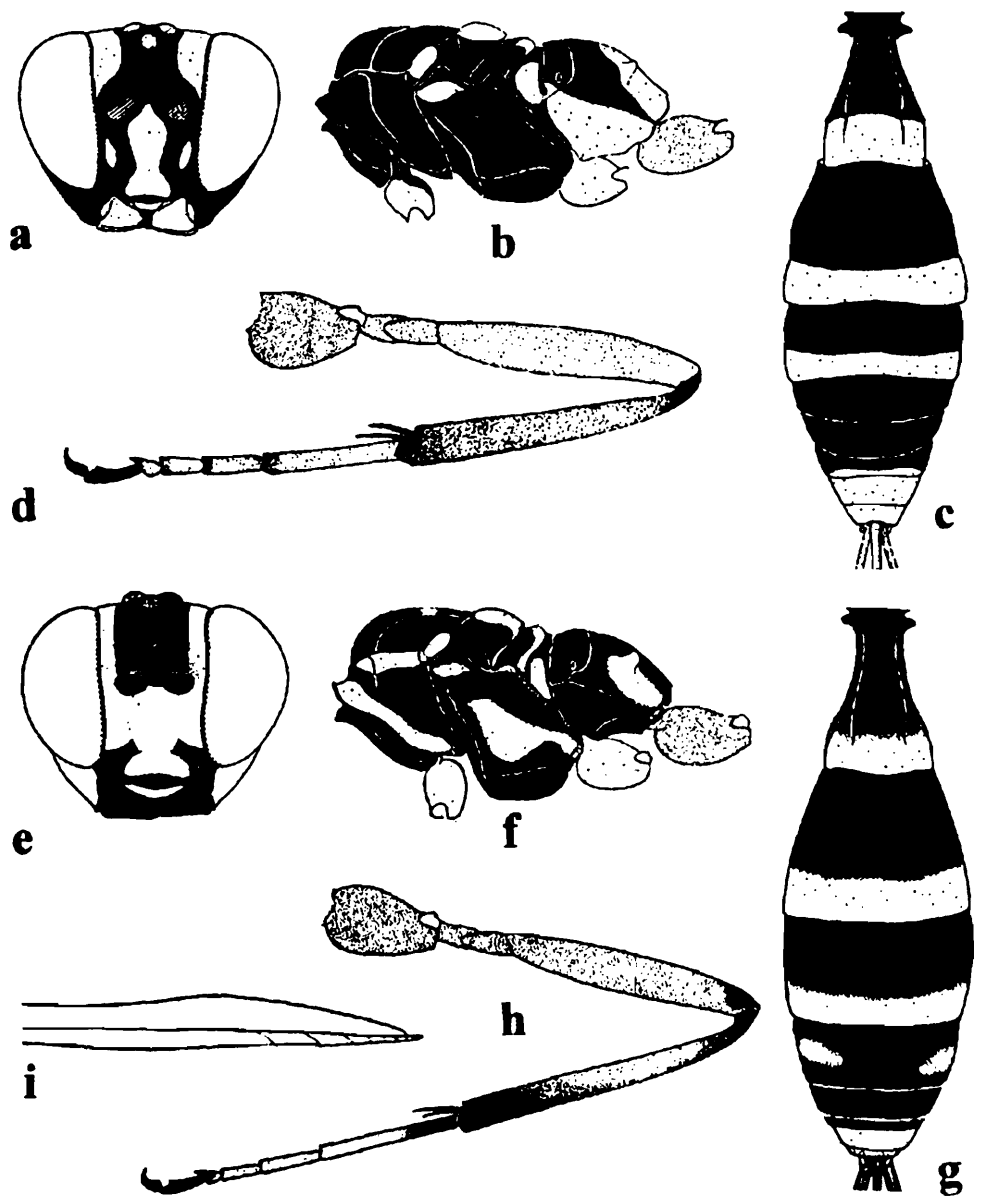

Fig. 76. Colour pattern : *Goryphus cinctipes* (Cameron) : **a**, head front view; **b**, thorax side view; **c**, abdomen dorsal view; **d**, hind leg. *Goryphus albomaculatus* (Cameron) : **e**, head front view; **f**, thorax side view; **g**, abdomen dorsal view; **h**, hind leg; **i**, ovipositor tip.

22. *Goryphus brahminus* (Cameron)

1904. *Mesostenus brahminus* Cameron, *Trans. Ent. Soc. London,* 1904 : 113. des. Type : India : Meghalaya : Khasi Hills (OXFORD).

1907. *Mesostenoideus brahminus* Cameron, *Ann. Mag. Nat. Hist.,* (7) **20** : 23. n. comb.

1961. *Goryphus brahminus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 148. n. comb. India.

1973. *Goryphus brahminus* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 76. Male, Female. key, des. India : Meghalaya : Khasi Hills. Jharkhand : Ranchi : Namkum; Kera. Maharashtra : Metheran. Uttaranchal : Dehra Dun : New Forest. Mayanmar : Madalay Dist. : Maymyo. *Host* : *Phessus* sp.

1987. *Goryphus brahminus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 832.

This is a distinct species having face rugoso-punctate, malar space rugose, about 0.4× the basal width of mandible, mesoscutum striato-punctate, prepectal carina extending up to the base of the subtegular ridge, mesopleurum below subtegular ridge somewhat reticulate and metapleurum largely smooth. The Propodeum has an inverted horse-shoe-shaped mark, and all the abdominal tergites yellow at their apices.

Female : Face rugoso-punctate, tending to be smooth at sides. Clypeus evenly convex, smooth, with a few shallow punctures at base. Mandible smooth with subequal teeth. Malar space rugose, 0.4× the basal width of mandible. Frons below median ocellus rugose, obliquely striate on either side of median longitudinal carina, at sides smooth. Vertex shallowly punctate behind the ocellar triangle, smooth at sides. Temple smooth. Pronotum in the middle striate, extreme upper margin and pronotal collar faintly punctate, epomia strong, extending up to upper margin then turned mesad. Mesoscutum moderately strongly punctate, striate along the margins of each lobe. Scutellum and metascutellum smooth and subpolished, lateral carina of scutellum confined to its base. Mesopleurum in the middle of upper half strongly wrinkled, tending to be reticulate towards the base of subtegular ridge, lower half somewhat rugose, tending to be smoother towards base of middle coxa, speculum and area below sternaulus smooth and shiny, prepectal carina extending up to the base of subtegular ridge. Metapleurum subpolished, somewhat rugulose, juxtacoxal carina present. Propodeum largely reticulate, finely wrinkled basad of basal carina, area below apophyses somewhat trans-striate, basal carina evenly turned forward in the middle, apical carina not defined (absent), apophyses moderately high and strong, spiracle longish-oval. Areolet squarish, small, about 2.5× as high as the width of bordering veins. First tergite largely smooth and shiny, except sparsely punctate towards the apex, second and third tergites densely punctate, the following tergites mat or subpolished. Ovipositor tip moderately long, teeth on lower valve moderately strong.

Black. Fourth to tenth flagellar segments white above. The following are yellow : face and clypeus jointly except the apical margin of clypeus, malar space, two elongate orbital stripes extending from vertex to the facial mark, temple except above, pronotal collar, upper margin of pronotum, apex of middle lobe of mesoscutum, tegula, subtegular ridge, scutellum, metascutellum, a board mark on mesopleurum just above sternaulus, speculum, base of hind wing, metapleurum broadly in the middle, a somewhat inverted horse-shoe-shaped mark on the apical slope of propodeum, apices of all the abdominal tergites except the bands on fifth and sixth tergites interrupted in the middle, fore and middle coxae and trochanters. Legs in general yellowish-brown, except the fifth segment of fore and middle tarsi, hind leg with coxa at apex above, extreme apex of its femur, base and apex of tibia, basal 0.7 of first and fifth tarsal segment entirely, dark brown.

Male : Similar to the female but much slender and polished; frons and vertex dull, largely smooth; pronotum trans-striate; mesopleurum reticulo-wrinkled; metapleurm finely reticulate; second tergite much shallowly punctate, following mat.

Black. Ninth to seventeenth flagellar segments white; hind leg with coxa black except for an oval yellow mark above, femur and tibia at their bases and apices black.

Length : Female, 8–12 mm; fore wing 5.5–9 mm; ovipositor sheath 3–4.5 mm. Male, 8.5–10 mm; fore wing 6–7.5 mm.

Distribution : India : Meghalaya (Khasi Hills). Jharkhand (Ranchi : Namkum; Kara). Maharashtra (Matheran). Uttaranchal (Dehra Dun : New Forest). *Elsewhere* : Myanmar (Mandalay Dist. : Maymyo).

Host : *Phessus* sp.

23. ***Goryphus albomaculatus*** (Cameron) (Fig. 76 : e–i)

1902. *Fenenias albomaculatus* Cameron, *Ann. Mag. Nat. Hist.*, (7) **9** : 212. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD)

1914. *Mesostenoideus albomaculatus* : Morley, *Ann. Mag. Nat. Hist.*, (8) **14** : 410. n. comb. (Synonymy based on a false "type").

1936. *Gotra albomaculata* : Cheesman, *Nava Guinea,* **17** : 359. n. comb. (Synonymy based on a false "type".)

1940. *Gotra albomaculata : Uchida, Insecta Matsumurana,* **14** : 121.

1961. *Goryphus albomaculatus :* Towens, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 147. *n. comb. Syn. India.*

1973. *Goryphus albomaculatus :* Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** *: 71. Female. key. des. fig. India : Meghalaya : Khasi Hills, Sikkim : Gangtok,* 1676 m.

1987. *Goryphus albomaculatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 829.

This species has the mesopleurum coarsely trans-striate in the middle, prepectal carina more or less completely extending the full height of mesopleurum, face and clypeus broadly yellow, orbital stripes on frons elongated and the hind coxa and femur largely reddish.

Female : Face subpolished, minutely and shallowly punctate, area just below antennal sockets somewhat rugulose. Clypeus subpolished, shallowly and sparsely punctate, evenly arched, apical margin impressed, mandible subpolished, somewhat longitudinally rugulose, smooth at the apex, malar space granulose, 0.5× the basal width of mandible. Frons below ocellar area weakly rugose, sides of frons somewhat granulose, tending to be smooth, with a median carina extending from the base of median ocellus. Vertex subpolished, obscurely punctate. Temple with a few scattered punctures. Pronotum largely trans-striate, finely and obliquely striate above, epomia strong, reaching to upper margin, then turned mesad. Mesoscutum minutely punctate in the middle of each lobe, aciculate along the margin of each lobe. Scutellum and metascutellum subpolished, convex, shallowly punctate, lateral carina extending up to its basal 0.45. Mesopleurum coarsely trans-striate, finely striate below and above sternaulus, speculum minutely punctate, prepectal carina extending the full height of mesopleurum. Metapleurum trans-wrinkled, juxtacoxal carina present. Propodeum in its apical 0.5 coarsely and strongly wrinked, basal 0.5 somewhat finely and irregularly wrinkled, area below apophyses striate, striae extending to pleural carina, basad of basal carina obliquely wrinkled, apical carina more or less complete, apophyses crest-like, basal carina complete, slightly arched in the middle, spiracles oval. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti convergent, second intercubitus faint. First tergite largely smooth and shiny, but granulose in middle and apico-laterally, with a few scattered punctures in the middle; second and third tergites closely punctate; the following tergites subpolished. Ovipositor as in figure 76 : i.

Black. Fourth to ninth flagellar segments white above. Face, clypeus (face and clypeal marks joining each other), temple largely, orbital stripes elongate, joining the facial mark and also extending behind on temple (Fig. 76 : e), pronotal collar, upper margin of pronotum, a mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, triangular mark on mesopleurum extending from the middle of mesopleurum to the base of middle coxa, base of hind wing, two broad and elongate marks on propodeum starting from apophyses to the apex of propodeum (Fig. 76 : f), apices of first to third tergites, fourth tergite slightly laterally, seventh and eighth tergites broadly (Fig. 76 : g). Fore coxa and its first trochanteral segment dirty yellow, second trochanteral segment light orange, femur and tibia orangish-brown, tibia slightly infuscate above, tarsus dark brown. Middle coxa and trochanter yellowish-orange, femur and tibia light brown, tibia infuscate above, its first and fifth tarsal segments blackish, rest of the segments brown. Hind coxa,

trochanter and femur dark orange (with reddish tinge), extreme apex of femur marked dark brown, tibia yellow with blackish tinge, its base and apex blackish; its tarsus white with basal 0.4 of first segment, fourth segment slightly at apex and fifth completely, blackish (Fig. 76 : h).

Male : Not known.

Length : Female, 8 mm; fore wing 5.5 mm; ovipositor sheath 3 mm.

Distribution : India : Meghalaya (Khasi Hills). Sikkim (Gangtok).

24. ***Goryphus vinodi*** Jonathan & Gupta (Fig. 77 : a–e)

1973. *Goryphus vinodi* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 67. Female, key. des., fig. Type : Female, India : Karnataka : Bhagmandla, 853m. (GUPTA). India : Karnataka : Kottegchar, 640m; Murnard, 609m; Mercara, 1219m. Kerala : Walayar Forest; Thekkady Sanctuary. Tamil Nadu : Kodai Hills : Oothu, 1158m.

1987. *Goryphus vinodi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 848.

This species is distinguished by having a rugose mesopleurum, sparsely and minutely punctate speculum and the metapleurum tending to be reticulate. The lateral carina of scutellum marketed yellow (Fig. 77 : b) and the legs are largely dark orange.

Female : Face rugose, rugulose at sides. Clypeus shallowly punctate at the base, smooth at apex, evenly arched, apical margin impressed. Mandible subpolished, obscurely punctate, malar space granulose, 0.5× the basal width of mandible. Frons obliquely striate in the middle below ocellar area, smoother at sides, a median longitudinal carina extending from the base of median ocellus. Vertex subpolished. Temple subpolished, obscurely punctate. Pronotum coarsely trans-striate, rugose above at upper margin; epomia complete, reaching to upper margin, then turned mesad. Mesoscutum minutely and shallowly punctate, with striae running in between. Scutellum subpolished, shallowly and minutely punctate; lateral carina of scutellum extending up to its basal 0.5. Metascutellum smooth and shiny. Mesopleurum rugose, tending to be rugoso-striate below subtegular ridge, near prepectal carina above and between speculum and middle coxa; area just below sternaulus finely striate, further below minutely punctate to smooth. Speculum subpolished with sparse minute punctures; prepectal carina extending up to 0.85 the height of mesopleurum. Metapleurum wrinkled, juxtacoxal carina present. Propodeum wrinkled in its apical half, tending to be reticulate towards base, area below apophyses and at sides somewhat trans-striate, basad of basal carina finely rugose, apical carina absent, apophyses long, basal carina complete, median longitudinal carinae present at base, spiracles oval. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti parallel, second intercubitus faint. First tergite smooth and subpolished, except in the middle near spiracles granuloso-punctate; second and third tergites closely punctate,

punctures tending to be shallow and indistinct towards apex; the following tergites subpolished. Ovipositor as in figure 77 : e.

Black. Third to base of ninth flagellar segment white above. The following are yellow : face with an oval mark in the centre (sometimes this mark faint or absent), two elongate marks on either side near eye margins; basal half of clypeus, temple, elongated orbital stripes on frons reaching up to antennal sockets (Fig. 77 : a), upper margin of pronotum, pronotal collar wholly (this mark sometimes broken in to two), oval mark at the apex of middle lobe of mesoscutum a mark on tegula, subtegular ridge, scutellum, metascutellum, base of hind wing, one or two marks on mesopleurum (one above and one below sternaulus near base of middle coxa), a ring-shaped mark on propodeum (Fig. 77 : b), a line on metapleurum, apices of first to third abdominal (Fig. 77 : c) tergites, fourth narrowly in the middle, seventh and eighth broadly. First abdominal tergite doarsally at base also yellow. Legs in general orange; fore and middle coxae and trochanters, yellow or dirty yellow; fifth segment of middle tarsi, extreme apex of femur and apex of hind tibia dark brown; hind tarsus white, with its first segment at base, fourth segment largely and fifth wholly, brownish (Fig. 77 : d).

Male : Not known.

Length : Female, 8–9.5 mm; fore wing 5–6 mm; ovipositor sheath 3–3.5 mm.

Distribution : India : Karnataka (Bhagmandla, 853m.; Kottegehar, 640m; Gunji, 609m.; Murnard, 609m; Mercara, 1219m). Kerala (Walayar Forest; Thekkady Sanctuary). Tamil Nadu (Oothu, 1158m in Kodai Hills).

This species is close to *G. salutator* (Cameron) in having the body largely rugose, malar space 0.5× the basal width of mandible, frons striate, mesopleurum rugoso-striate, metapleurum and propodeum wrinkled, but in *G. vinodi*, the body sculpture is stronger, mark on mesopleurum small, and fifth and sixth tergites entirely black.

25 ***Goryphus salutator*** (Cameron)

1904. *Mesostenus salutator* Cameron, *Trans. Ent. Sec. London,* 1904 : 117, des. Type : India : Meghalaya : Khasi Hills (OXFORD).

1907. *Mesostenoideus salutator*(!) : Cameron, *Ann. Mag. Nat. Hist.,* (7) **20** : 23. n. comb.

1961. *Goryphus salutator* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 154. n. comb. India.

1973. *Goryphus salutator* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 69. Male, Female. key. des. India : Meghalaya : Cherrapunji in Khasi Hills, 1235m. West Bengal : Rangiroon 1897m nr. Darjeeling. Sikkim : Gangtok, 1676m.

1987. *Goryphus salutator* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 845.

This species is close to *G. vinodi* Jonathan & Gupta in general appearance, but can be distinguished by its mesopleurum rugoso-striate below subtegular ridge, largely smooth and shiny speculum, smooth scutellum, and the lateral carina of scutellum extending up to its basal 0.3. The lateral carina of scutellum marked yellow.

Female : Face subpolished, rugose. Clypeus largely smooth, evenly arched, indistinctly punctate, apical margin impressed, clypeal groove deep, apical margin in the middle slightly notched. Mandible subpolished and obscurely punctate. Malar space granulose, 0.5× the basal width of mandible. Frons below ocellar area obliquely striae, striae may be few or more, a median longitudinal carina extending from the base of median ocellus, frons at sides smooth. Vertex subpolished. Temple sparsely and minutely punctate. Pronotum coarsely trans-striate, obliquely striate above (sometimes oblique striae at upper margin less distinct). Mesoscutum aciculo-punctate, aciculate along the margins of each lobe. Scutellum and metascutellum smooth and subpolished; lateral carina of scutellum extending up to its basal 0.3. Mesopleurum finely rugoso-striate, below sternaulus subpolished and sparsely punctate, speculum smooth and shiny, prepectal carina extending the full height of mesopleurum. Metapleurum strongly wrinkled, tending to be reticulate, juxtacoxal carina present. Propodeum strongly wrinkled, tending to be reticulate towards the apex, at sides somewhat striate, area basad of basal carina rugose, apical carina more or less absent, apophyses moderately large, crest-like, basal carina straight complete, median longitudinal carinae present at base, spiracles oval. Areolet pentagonal, 6× as high as the width of bodering veins, intercubiti parallel, second intercubitus faint. First tergite largely subpolished and smooth, except for a few shallow punctures near the spiracles; second and third tergites closely punctate, punctures tending to be shallow at apex; fourth tergite also indistinctly punctate at base only; the following tergites subpolished.

Black. Apical half of fourth to tenth flagellar segments white above. The following are yellow : face in the middle with an oval mark, clypeus except at apical margin, mandible at base, whole of inner orbit, temple, pronotal collar, upper margin of pronotum, oval mark at the apex of middle lobe of mesoscutum, scutellum, lateral carina of scutellum, metascutellum, tegula, subtegular ridge, an elongate curved mark on mesopleurum, extending from base of subtegular ridge to base of middle coxa, base of hind wing, a line along the pleural carina on metapleurum, a broad shield-shaped mark on propodeum (except a black longish oval mark in the centre of the shield-shaped mark), apices of first to fourth abdominal tergites, fifth tergite apico-laterally, and seventh and eighth tergites broadly. Fore coxa and trochanter dirty yellow, femur, tibia and tarsus brownish, except an infuscate line on tibia above and fifth tarsal segment dark brown. Middle coxa dirty yellow, trochanter light orange, femur light brown, tibia and tarsus blackish-brown, tibia on inner side lighter. Hind coxca, trochanter and femur brown, second trochanteral segment and extreme apex of femur darker; tibia yellow with blackish tinge, its apex and base blackish, tarsus white, with basal 0.3 of first segment and whole of fifth segment dark brown or black.

Male : Essentially similar to the female; body much polished and slender, frons smooth and shiny, median carina short. Pronotum largely smooth with a few striae in the middle. Mesoscutum without aciculi along the margins. Lateral carina of scutellum confined to its base; mesopleurum and metapleurum smooth and shiny except for a few scattered punctures in the middle of mesopleurum; second to sixth tergites closely punctate.

Black. Antenna black, without a white band; face, clypeus, temple, speculum, apices of all the abdominal tergites, mark on mesopleurum small, situated just above middle coxa, yellow; rest of the colour similar to female.

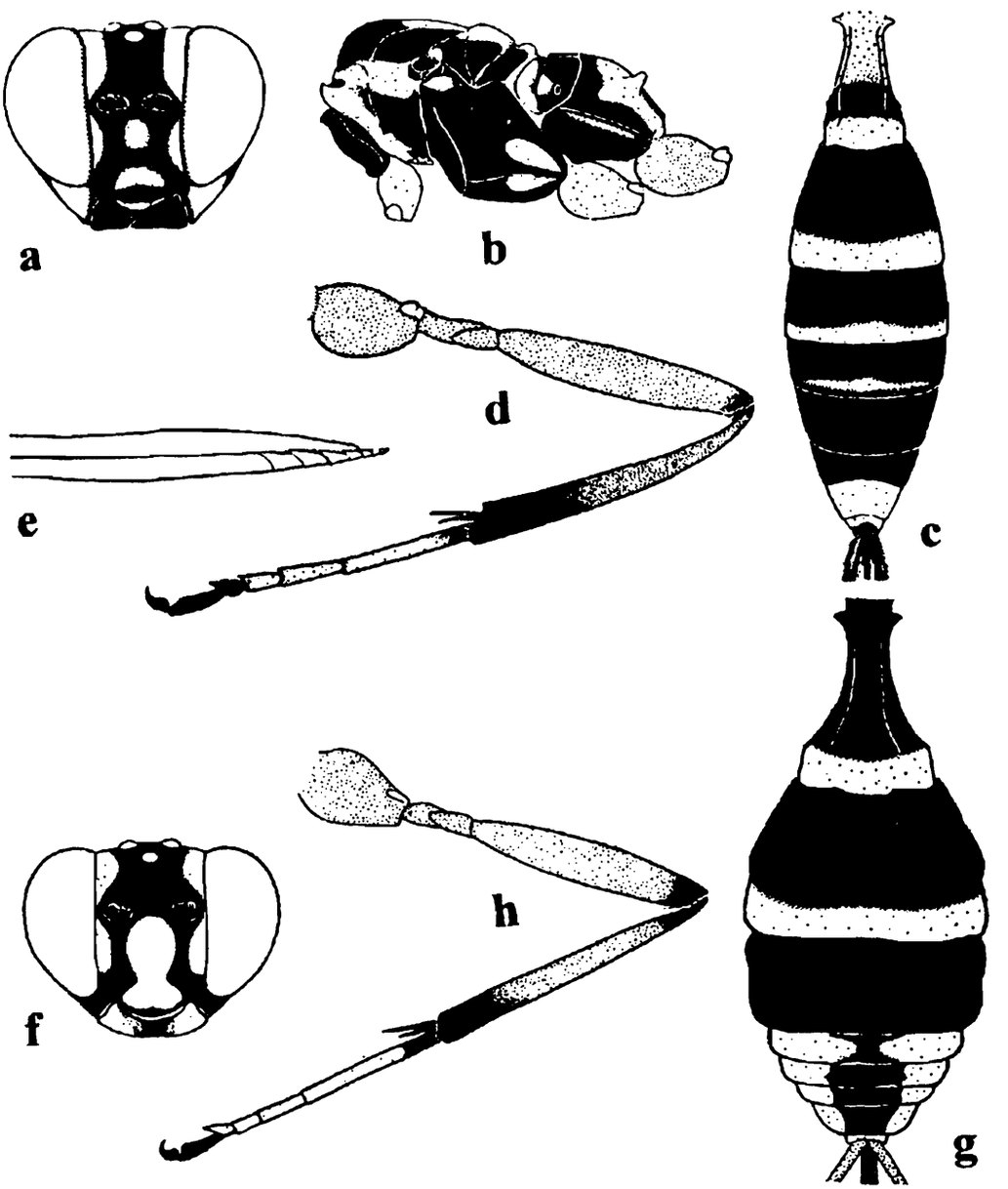

Fig. 77. Colour pattern : *Goryphus vinodi* Jonathan & Gupta : **a**, head front view; **b**, thorax side view; **c**, abdomen dorsal view; **d**, hind leg; **e**, ovipositor tip. *Goryphus villosus* J & G : **f**, head front view; **g**, abdomen dorsal view; **h**, hind leg.

Length : Female, 7–8 mm; fore wing 6-7 mm; ovipositor sheath 2.5–3 mm. Male, 6–5 mm; fore wing 5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1235m in Khasi Hills). West Bengal (Rangiroon, 1897m nr. Darjeeling). Sikkim (Gangtok, 1676m).

26. ***Goryphus villosus*** Jonathan & Gupta (Fig. 77 : f–h)

1973. *Goryphus villosus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 79. Female, key. des., fig. Type : Female, India : Kerala : Walayar Forest (GUPTA). India : Jharkhand : Ranchi Dist. : Namkum. Maharashtra : Bombay; Panhala Fort. Uttaranchal : Garjia, 609m. Malaya : Penang : Ferringgi Rock Catchment Area.

1987. *Goryphus villosus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 848.

This species is distinguished by having the hind coxa orange and without any black mark on its lower side. The face is rugose in the middle, malar space 0.5× the basal width of mandible, antennal scrobes separated by a ridge, and mesopleurum, metapleurum and propodeum reticulate.

Female : Body largely covered with fairly long white hairs. Face and clypeus moderately convex in the middle, face rugose, tending to be shallowly punctate towards sides, clypeus shallowly and sparsely punctate. Mandible short and thick, somewhat rugulose, teeth almost equal. Malar space rugose, 0.5× the basal width of mandible, frons with antennal scrobes separated by a ridge, area below median ocellus somewhat irregularly rugoso-striate, at sides largely smooth. Vertex and temple smooth and shiny except near the base of mandible irregularly striate. Pronotum with its upper margin moderately swollen, middle groove striate, tending to be wrinkled above, extreme upper margin shallowly and sparsely punctate, epomia short but strong, pronotal collar and lower margin smooth. Mesoscutum moderately strongly punctate, punctures strongly coalescent, and striate along the margins of each lobe, scutellum and metascutellum smooth and shiny, lateral carina of scutellum confined to its base. Mesopleurum, metapleurum and propodeum strongly reticulate, speculum smooth and shiny, and area below sternaulus sparsely punctate, prepectal carina extending 0.75 the height of mesopleurum; juxtacoxal carina present. Basal carina of propodeum turned forward in the middle, apical carina absent, apophyses like rounded tubercles, spiracle oval. Areolet small, about 3× as high as the width of bordering veins. First tergite little longer than second, median dorsal carinae weakly present, tergite smooth and shiny, a few punctures in the middle, ventro-lateral carina distinctly expanded like a flange towards the apex; second and third tergites densely and strongly punctate, fourth tergite sparsely and shallowly punctate at base; the following tergites mat and subpolished. Ovipositir tip short, teeth weak.

Black. Sixth to tenth flagellar segments white above. The following are yellow : face (Fig. 77 : f) in the middle and also along the eye margins, clypeus (mark joined with the median mark on face), mandible except the tip, frons along the margin with

two stripes extending from the level of lateral ocellus to base of antenna; upper margin of pronotum, pronotal collar, tegula, scutellum, metascutellum, subtegular ridge, apophyses, apices of all the abdominal tergites, except bands on fifth and sixth tergites interrupted in the middle (Fig. 77 : g), fore and middle coxae and trochanters. Legs in general dark orange except fifth segments of fore and middle tarsi blackish. Hind leg (Fig. 77 : h) with extreme apex of femur, apex and base of tibia, 0.25–0.85 of first and whole of fifth segment of tarsus, blackish (colour of hind tarsus somewhat variable).

Male : Not known.

Length : Female, 9 mm; fore wing 6.5 mm; ovipositor sheath 3 mm.

Distribution : India : Jharkhand (Ranchi : Namkum). Kerala (Walayar Forest). Maharashtra (Bombay; Panhala Fort). Uttaranchal (Garjia, 609 m). *Elsewhere* : Malaya (Penang : Ferringgi Rock Catchment Area).

27. ***Goryphus ochropus*** (Brullé)

1846. *Mesostenus ochropus* Brullé, *In* Lepeletier : Histoire naturelle des insectes. Hymenopteres, 4 : 232. Type : Female, Des. "Indes orientales" (PARIS).

1903 *Mesostenus* sp. Koningsberger, *Meded. u. 'S Lands Plantentuin,* **64** : 80. fig. Indonesia. *Host* : *Ocinara signifera.*

1941. *Goryphus ochropus* : Betrem, *Treubia,* **18** : 74. Male, Female. n. comb., key, syn., des., Indonesia : Java : Bogor; Getas. Hosts : *"Bombyx waringi = Ocinara dilectula"*

1961. *Goryphus ochropus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 157. n. comb. "Indes Orientales." Java.

1973. *Goryphus ochropus* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 85. Male, Female. key, des. India : Tamil Nadu : Chennai. Karnataka : Mallipatna; Tithimatti; Gunji, 610m. Jharkhand : Ranchi dist. : Torpa. Indonesia : Java : Bogor. *Hosts* : *Pyrausta machaeralis; Ocinara dilectula.*

1987. *Goryphus ochropus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 843.

This species can be recognized by having lateral carinae of scutellum, face almost entirely and almost all the abdominal tergites with an apical band, yellow.

Female : Face and clypeus shiny, sparsely and shallowly punctate, face in the middle somewhat ruguloso-punctate. Frons obliquely and finely striate above, median longitudinal carina present, frons at side smooth with a few scattered shallow punctures. Vertex with a few minute punctures in intra-ocellar space and behind ocellar triangle. Pronotum coarsely striate. Mesoscutum finely punctate, aciculate along the margins and notauli. Scutellum subpolished with a few shallow punctures, lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum strongly rugose in the upper half, lower half shiny with minute and sparse punctures,

few striation just above middle coxa, speculum smooth and shiny, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum strongly rugoso-wrinkled, juxtacoxal carina not defined. Propodeum largely reticulate, apophyses moderately high, spiracles longish oval. First abdominal tergite smooth, with a few punctures apico-laterally, second and third tergites with dense, moderately small punctures, punctures strongly coalescent, following tergites mat and subpolished.

Black. Fifth to tenth flagellar segments white above. The following are yellow : face clypeus, mandible, frons and vertex along the orbits, temple near the base of mandible, pronotal collar, upper margin of pronotum, scutellum, lateral carina of scutellum, metascutellum faintly, subtegular ridge, base of hind wing, two large triangular marks on apical slope of propodeum, apices of all the tergites except the bands on fourth and fifth tergites present laterally like small patches, bands on sixth and seventh tergites have black marks in the centre. Legs in general yellowish-red; except fore and middle coxae and trochanters yellow; apical segments of fore and middle tarsi brown; hind coxa faintly yellowish above, base and apex of hind tibia, basal 0.75 of first, fourth and fifth hind tarsal segments almost entirely, dark brown to blackish. Wings clear and hyaline.

Male : Similar to female, except much polished and slender. Face and clypeus with weak punctures, face tending to be rugulose; frons and vertex with a few shallow punctures; pronotum smooth with striations only in the middle groove; mesoscutum distinctly punctate; scutellum with indistinct punctures; mesopleurum somewhat reticulo-punctate; metapleurum and propodeum largely reticulate; second to fourth tergites densely punctate, following tergites mat and dull.

Black. Flagellum entirely black. The following are yellow : face, clypeus except the apical margin in the middle, mandible except the tip, frons and vertex along the eye margin, pronotal collar, upper margin of pronotum, tegula, subtegular ridge, scutellum lateral carina of scutellum, base of hind wing, apical slope of propodeum except an elongate black mark above the area of insertion of petiole, apices of first to fifth tergites, seventh broadly, fore and middle coxae and trochanters. Rest of fore and middle legs reddish-yellow, except the fifth segment of their tarsi, brown. Hind leg somewhat more darker than fore and middle legs, hind coxa at apex, trochanter wholly, femur at base and apex, tibia at extreme base and apical 0.5, first and basal 0.5 of second tarsal segment, blackish; apical 0.5 of second and third segments wholly whitish. Wings clear hyaline.

Length : Female, 8.9 mm; fore wing 6.5–7 mm; ovipositor sheath 3.3–5 mm. Male, 8 mm; fore wing 6 mm.

Distribution : India : Jharkhand (Ranchi : Torpa). Karnataka (Mallipatna; Tithimatti; Gunji, 610m). Tamil Nadu (Chennai). *Elsewhere* : Indonesia : Java (Bogor)

Host : *Ocinara dilectula* and *Hapalia machaeralis.*

28. *Goryphus cameroni* Betrem

1905. *Melcha reticulata* Cameron, *Spolia Zeylanica,* **3** : 108. Male. Name preocc. by Cameron, July 1905. des. Type : Male, Sri Lanka : Matale (LONDON). Host : *Psyche subteralbata.*

1941. *Goryphus cameroni* Betrem, *Treubia,* **18** : 48, 60. new name, key.

1961. *Fislistina cameroni* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 156. n. comb. Sri Lanka.

1973. *Goryphus cameroni* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 87. Male, Female, key, des. Sri Lanka : Matale. India : Kerala : Walayar Forest. Host : *Psyche subteralbata.*

1987. *Goryphus cameroni* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 833.

Female : Face subpolished rugoso-punctate, at side shallowly punctate. Clypeus with a few punctures in the basal half. Frons around median ocellus strongly wrinkled. Vertex smooth and subpolished. Temple dull, sparsely and shallowly punctate. Malar space dull, about 0.44× the basal width of mandible. Pronotum coarsely striate, upper margin and pronotal collar smooth. Mesoscutum distinctly aciculo-punctate. Scutellum and metascutellum smooth and shiny, its lateral carina confined to its base. Mesopleurum reticulate, speculum smooth and shiny, area below sternaulus distinctly punctate, prepectal carina extending full height of mesopleurum. Metapleurum strongly reticulate, juxtacoxal carina present. Propodeum almost strongly reticulate, apical carina broadly interrupted in the middle, laterally present as crest-like apophyses, spiracle small, oval. First abdominal tergite smooth and shiny; second and third tergites densely punctate, tending to be mat towards the apices, following tergites mat and subpolished.

Black. Fifth to tenth flagellar segments white above. All the abdominal tergites with apical bands, except the bands on fourth and fifth tergites interrupted in the middle, fore and middle coxae and trochanters, yellow. Legs in general orange, except fifth segment of fore and middle tarsi, base and apex of hind tibia and first, fourth and fifth segments of hind tarsus dark brown to black.

Male : The male fully agrees with the female described above, except only in a few characters which are given below :

Lateral carina of scutellum black; legs largely yellowish-brown, apices of first to fourth abdominal tergite and seventh yellow (fifth and sixth tergites entirely black).

Length : Female, 8.5 mm; fore wing 6 mm; ovipositor sheath 3 mm. Male, 7 mm; fore wing 6 mm.

Distribution : India : Kerala (Walayar Forest). *Elsewhere* : Sri Lanka (Matale).

Host : *Psyche subteralbata.*

29. ***Goryphus parallelus*** Jonathan & Gupta

1973. *Goryphus parallelus* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 94. Female, key, des. Type : Female, India : Jharkhand : Ranchi Dist. : Namkum (GUPTA).

1987. *Goryphus parallelus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 844.

Extremely similar and sympatric to *G. tirkyi* Jonathan & Gupta and distinguished mainly by the shape of the ovipositor and colour of the abdominal tergites and hind leg.

Female : Similar to *G. tirkyi*, except as follows : Face subpolished rugulose in the middle, shallowly and sparsely punctate at sides. Clypeus largely smooth with a few punctures. Mandible with sparse minute punctures. Malar space granulose, 0.5× the basal width of mandible. Pronotum striate in the middle, upper margin obliquely striato-punctate, pronotal collar smooth. Mesoscutum moderately strongly punctate; tending to be striate along the grooves. Scutellum and metascutellum smooth, lateral carina of scutellum confined to its base. Mesopleurum smooth, lateral carina of scutellum confined to its base. Mesopleurum largely wrinkled, below sternaulus punctate, speculum smooth and shiny, prepectal carina extending to about 0.75 the height of mesopleurum. Metapleurum and propodeum largely reticulate, basad of basal carina somewhat reticulo-punctate, basal carina weakly turned forward in the middle, apical carina absent, apophyses moderately high, like tubercles, spiracle oval. Areolet small, about 3x as high as the width of bordering veins. First tergite smooth and shiny, both the longitudinal carinae distinctly present, second and third tergites densely punctate, the following tergites mat and subpolished. Ovipositor tip moderately long, teeth on lower valve strong.

Black. Colour similar to *G. tirkyi* except as follows : Fifth to eleventh flagellar segments white above; third and fourth tergites also with distinct apical bands; hind tarsus largely blackish, except its second and third segments only basally blackish.

Male : Not known.

Length : Female, 8.5 mm; fore wing 6.5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Jharkhand (Ranchi Dist : Namkum).

30. ***Goryphus tirkyi*** Jonathan & Gupta

1973. *Goryphus tirkyi* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 92. Male, Female, key, des. Type : Female, India : Jharkhand : Ranchi Dist. : Namkum (GUPTA). India : Jharkhand : Ranchi Dist. : Karva; Khuti; Torpa; Ratu. Kerala : Walayar Forest. Maharashtra : Mowar. Uttar Pradesh : Muradnagar. Tamil Nadu : Coimbatore. Karnataka : Fraserpet (Coorg). Myanmar : Kyetpyugan Res. : Insein; Maymyo. *Host* : *Orgyia postica.*

1987. *Goryphus tirkyi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 846.

This species is distinguished by having the malar space 0.8× the basal width of mandible; mesoscutum strongly punctate, scutellum smooth and shiny, its lateral carina confined to its base; meso- and metapleurum, and propodeum largely reticulate; apical bands on fourth to seventh tergites interrupted in the middle; wings clear, hyaline.

Female : Face and clypeus moderately convex, shallowly punctate. Frons below median ocellus somewhat obliquely striate, median carina not well defined, laterally subpolished with a few scattered shallow punctures. Vertex smooth and shiny. Temple shallowly and sparsely punctate. Mandible rugulose, teeth subequal. Malar space granulose, 0.8× the basal width of mandible. Pronotum striate in the middle groove, pronotal collar very faintly punctate, upper and lower margins largely smooth and shiny, epomia strong reaching up to upper margin. Mesoscutum strongly punctate. Scutellum and metascutellum smooth and shiny, lateral carina confined to its base. Mesopleurum strongly reticulate, speculum smooth and shiny, area below sternaulus shallowly punctate, prepectal carina extending about 0.75 the height of mesopleurum. Metapleurum and propodeum reticulate, except propodeum below apophyses transstriate, basal carina of propodeum turned forward in the middle, apical carina absent, apophyses moderately high, like tubercles, spiracle oval. Areolet small about 3× as high as the width of bordering veins. First tergite largely smooth and shiny with a few punctures in the middle, both the longitudinal carinae distinctly present; second and third tergites strongly and densely punctate; fourth tergite at base punctate, following tergites subpolished and mat. Ovipositor tip moderately long but not pointed, lower valve with a few teeth.

Black. Sixth to tenth flagellar segments white above. The following are yellow : face with a trilobate mark, mark on clypeus joined with the facial mark, frons with two elongate orbital stripes extending up to facial mark and also backward on vertex; mandible, except the tip, temple below near the base of mandible, upper margin of pronotum, pronotal collar, tegula, subtegular ridge, scutellum, metascutellum, base of hind wing, two elongate triangular stripes passing through the apophyses on propodeum, apices of first, second and fourth to seventh tergites; sometimes third tergite also faintly marked apically, bands on fourth to seventh tergites interrupted in the middle and sublaterally also absent. Legs in general reddish or dark orange, except fore coxa apically and middle coxa entirely and an oval mark on hind coxa above, whitish; base and apex of hind tibia and its fifth tarsal segment blackish or dark brown.

Male : Essentially similar to the female; clypeus indistinctly punctate or smooth, malar space 0.6× the basal width of mandible; pronotum largely smooth, striate in the middle.

Black. Antenna black, without a white band; propodeum with a single broad mark

at the apical slope; apices of first to third and fifth to seventh tergites, yellow, except the band on fifth interrupted in the middle. Legs in general dark yellow to orange, except fore and middle coxae, trochanters and fore tarsus yellowish; middle tarsus brown; hind trochanter, apex of femur, extreme base of tibia and its apex broadly, and whole of tarsus, black.

Length : Female, 6.5–8 mm; fore wing 5–6 mm; ovipositor sheath 2.5–3 mm. Male, 6 mm; fore wing 4–5 mm.

Distribution : India : Jharkhand (Ranchi dist. : Namkum; Kurva; Khuti; Torpa; Ratu). Karnataka (Fraserpet : Coorg). Kerala (Walayar Forest). Maharashtra (Mowar). Uttar Pradesh (Muradnagar). Tamil Nadu (Coimbatore). *Elsewhere* : Myanmar (Kyetpyugan Res. : Insein; Maymyo).

Host : Thiacidas postica.

31. ***Goryphus interceptus*** (Cameron)

1907. *Mesostensus interceptus* Cameron, *Tijdschr. v. Ent.*, **50** : 85. Male. des. Type : Male, India : Sikkim (LONDON).

1941. *Mesostensus interceptus* : Betrem, *Treubia*, **18** : 64. key.

1973. *Goryphus interceptus* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 98. Male des. Sikkim.

1987. *Goryphus interceptus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 838.

Male : Body smooth and shiny. Face obscurely striated above. Frons with a few striations. Pronotum and mesopleurum largely smooth. Mesopleurum in the lower half obscurely striated, metapleurum irregularly, obliquely striated. Propodeum at base smooth, apically strongly reticulated. Abdomen smooth, second and third tergites somewhat aciculated.

Black. Flagellum with a broad white band in the middle. The following are yellow : Face, clypeus, mandible, palpi, triangular mark also above, scutellum, apical slope of propodeum, base of hind wing, apices of first to third tergites and seventh wholly. Legs in general yellow, except middle tarsus black; hind leg with basal 0.5 of coxa and of tarsus reddish; tibia and rest of tarsus yellow, except the base and apex of tibia blackish. Wings clear hyaline.

Distribution : India : Sikkim.

32. ***Goryphus ornatipennis*** (Cameron)

1907. *Melcha ornatipennis* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **19** : 179. Male. des. Type : Male, Myanmar : Tenasserim : Salween Valley (LONDON).

1922. *Goryphus ornatipennis* : Roepke, Cacao, Onze Koloniale landbouw, **11** : **112. n.** comb., syn. (in part).

1941. *Goryphus kalshoveni* Betrem, *Treubia,* **18** : 87. Male, Female. key, des., Type : Female, Indonesia : Java : Mt. Gede : Tapos, 800m. (Betrem Coll., LEIDEN). Indonesia : Java : Bogor : Tjilendek; Mt. Tangkuban Perahu. Syn. by Townes, Townes & Gupta, 1961.

1961. *Geryphus ornatipennis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : **154.** syn.

1968. *Goryphus ornatipennis* : Momoi, *Mushi,* **41** : 184. *Host* : *Scirpophaga incertulus.*

1961. *Melcha ornatipennis* : Rao & Krishnaswamy, *FAO Plant Protection Bull.,* **9** : **69.** India : Introduced from North India to South. *Host* : *Scirpophaga nivella.*

1973. *Goryphus ornatipennis* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : **26. syn. (in** part). [*G. ornatipennis* was synonymized under *basilaris,* but the two appear distinct.]

1987. *Goryphus ornatipennis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 844.

The following account is based on a description given by Betrem (1941).

Female : Occipital carina sinuate; declivous part of vertex short. Malar space wide. Frontal scrobes deep with curved striae. Mesoscutum along the margins and in notauli finely trans-striate. Scutellum at base punctate, its lateral carina moderately long. Propodeum without distinct apical transverse carina, lateral crests moderately strong. First tergite gradually broadened apically; postpetiole with sides convergent. Second tergite distinctly punctate. Areolet large; nervellus intercepted at the middle.

Black. the following are yellowish-white : maxillary palpi, except last two segments, labrum, 5-9 flagellar segments above, base of hind wing, apices of first, second, sixth in middle, seventh almost wholly, except sides of seventh and eighth largely, black. The red are : scutellum, metascutellum, a mark on mesopleurum above middle coxa, propodeum and metapleurum. Legs in general red, except fore coxa and trochanter, outer side of fore and middle tibiae, hind tibia wholly, all tarsi, black. Inner side of fore tibia white.

Male : Very much similar to female, except mesoscutum smooth not trans-striate. Middle lobe of mesoscutum at sides and notauli grove with trans-striae. Propodeum without distinct apophyses, except for law lateral crests. Postpetiole quadrate, between the spiracles punctate.

Black. The following are yellowish-white : labrum, mandibles, apices of first, second, third, whole of sixth and seventh tertiges. The red are : mesoscutum posteriorly or entirely, scutellum, mesopleurum, metanotal rim, metapleurum and propodeum. Legs in general red, except white are : fore coxa and tibia anteriorly, 3–4 segments of hind tarsus. Black are : rest of fore coxa, fore trochanter, rest of all tibiae and middle and

hind tarsi, extreme apex of hind femur, middle and hind trochanters, and fore tarsi brown. Wings with dark brown cross band.

Length : Female, 12 mm; fore wing 9 mm; ovipositer sheath 3.5 mm. Male, 10 mm; forewing 7 mm.

Distribution : Myanmar (Tenasserim : Salween Valley). Indonesia (Java : Mt Gede : Tapos, 800m; Bogor : Tjilendek; Mt Tangkuban, Perahu).

9. Genus ***Skeatia*** Cameron (Fig. 78 : a–c)

1901. *Skeatia* Cameron, *Proc. Zool. Soc. London,* 1901 : 39. Type-species : (*Skeatia nigrispina* Cameron) = *brookeanus* Cameron; designated by Viereck, 1914.

1902. *Latteva* Cameron, *J. Straits Branch Roy. Asiatic Soc.,* **37** : 59. Type-species : *Latteva albobalteata* Cameron; monobasic. Syn. by Jonathan & Gupta, 1973 (Previously syn. under *Goryphus* by Townes, Townes & Gupta, 1961).

1902. *Ancaria* Cameron, *Ann. & Mag. Nat. Hist.,* (7) **9** : 204. Type-species : *Ancaria fuscinervis* Cameron; monobasic. Syn. by Jonathan & Gupta, 1973.

1952. *Holia* Seyrig, *Mem. Acad. Malgache,* **19**(39) : 184. Type-species : *Holia brutalis* Seyring; Original designation. Syn. by Jonathan & Gupta 1973. (Previously syn. under *Goryphus* by Townes, Townes & Gupta, 1961).

Taxonomy : Cheesman, 1941 : 27. Townes, Townes & Gupta, 1961 : 146 (under *Goryphus*). Townes, 1970 : 262 (under *Goryphus*). Jonathan & Gupta, 1973 : 104 (Separate genus).

Distribution : Indo-Australian Region.

This genus is mainly distinguished by having first abdominal tergite 2× or more as long as wide at apex, and postpetiole as wide or less wider than long at base. Ovipositor tip usually long and pointed and propodeal apophyses usually long and pointed rarely crest-like.

Body large to small, about 6–13 mm long and stout. Face weakly convex in the middle. Clypeus separated from face by a groove, apical margin impressed, without a tooth, laterally sometimes weakly dilated. Mandible short, sometimes moderately long, teeth subequal. Frons shallow behind antennal sockets, sometimes frons wholly depressed, and with a median longitudinal carina. Eyes large and usually bulging. Occipital carina complete, joining hypostomal carina slightly above the base of mandible. Epomia strong, reaching to upper margin and then usually turned mesad. Mesoscutum moderately arched; notauli deep. Sternaulus usually deep and reachaing up to the base of middle coxa. Prepectal carina strong, extending usually beyond 0.5 the height of mesopleurum. Scutellum somewhat longer, its lateral carina usually weak but sometimes extending beyond its 0.5.

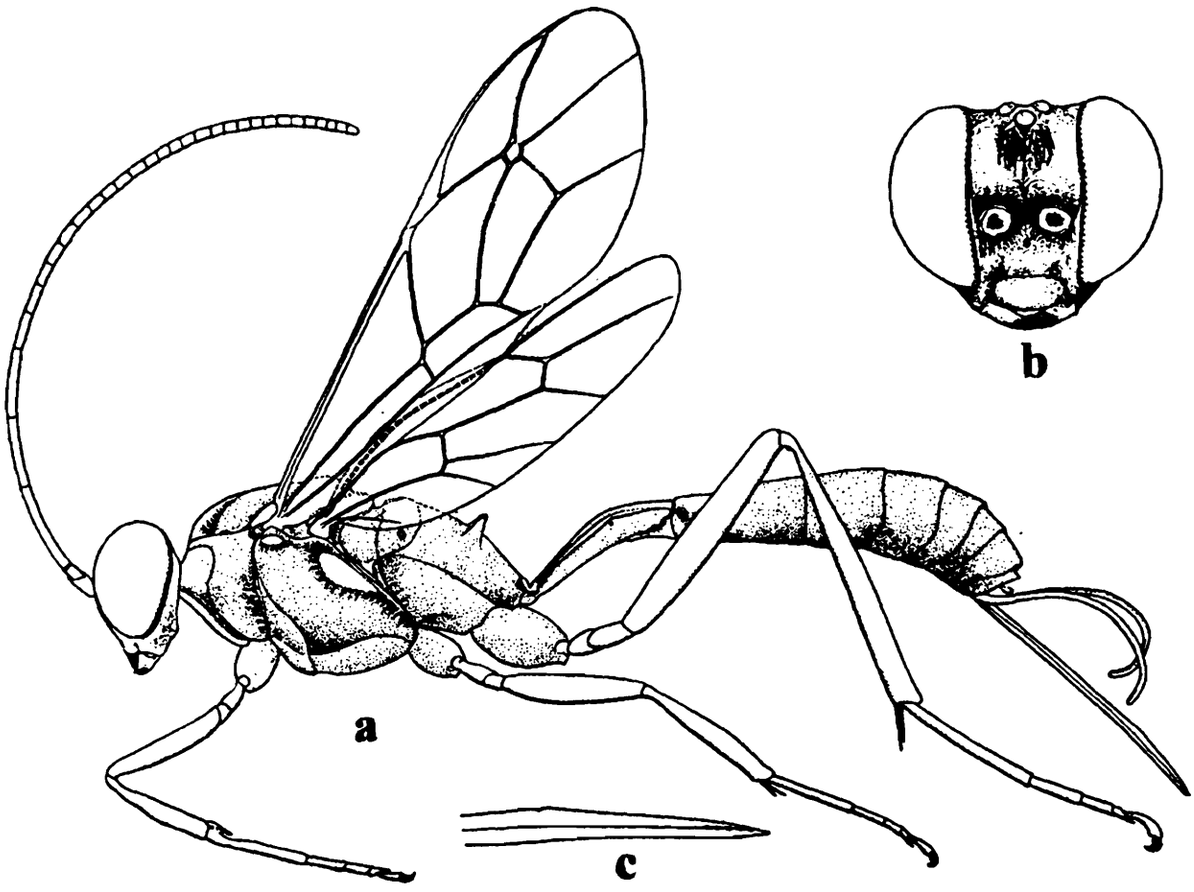

Fig. 78. *Skeatia* Cameron (*Skeatia brookeana*) : **a**, body side view; **b**, head front view; **c**, ovipositor tip.

Apical carina of propodeum strong and complete, sometimes absent in the middle, laterally forming moderately long and pointed apophyses, apophyses sometimes short and crest-like; median longitudinal carina weakly or strongly present at the base of propodeum; base of metanotum with two projections on each side, weak or distinct, opposing similar projections on the base of propodeum. Fore wing about 5–7.5 mm long; areolet pentagonal, 5 to 7× as high as the width of bordering veins, second intercubitus faint, nervulus basad of basal vein, nervellus intercepted distinctly below the middle; mediella moderately arched; brachiella reaching to the wing margin. First abdominal tergite long, weakly arched in the middle, more than 2× as long as wide at apex, its spiracles are close to each other than to the apex, postpetiole as wide or less wider than long (width=distnace between the spiracles, and length=distnace between the spiracles and apex on mid-line). Ovipositor usually about 4–5 mm long, its tip long and with or without distinct nodus, lower valve with weak or distinct oblique or subvertical teeth.

Jonathan & Gupta (1973) reported twenty species from Oriental Region and three species from Australian Region. Of these, sixteen species are recorded from India and adjacent countries.

Key to the species of *Skeatia*

1. First abdominal tergite short or as long as the second tergite (Face weakly rugose; metapleurum strongly rugose in the middle. Apices of all abdominal tergites yellow. India : Sikkim ..... 1. *cariniscuta* (Cameron)

– First abdominal tergite longer than second tergite (1.2× or more)..... 2

2. Propodeum largely red 3

– Propodeum largely black 6

3. Face and clypeus densely and minutely punctate. Malar space 0.75× the basal width of mandible. Frons densely punctate. Pronotum rugose in the middle rather than striate. Second and third tergites closely, minutely and shallowly punctate. Thorax, first and second tergites completely, dark orange or reddish; frons with two elongate orbital stripes. India : Assam; Andhra Pradesh; Madhya Pradesh; Maharashtra; Rajasthan; Uttaranchal; Uttar Pradesh. ..... 2. *infernalis* (Cameron)

– Not as above. Face largely rugose. Clypeus rugose or shallowly and sparsely punctate, punctures usually not defined. Malar space 0.5 to 0.6× the basal width of mandible. Frons granulose. Pronotum strongly to weakly striate or smoother in the middle. Second and third tergites granulose. Thorax not entirely red to orange, first and second tergites black, frons without orbital stripes 4

4. Pronotum largely smooth. Scutellum and metapleurum smooth. Mesopleurum largely smooth, weakly trans-rugose above. Propodeum weakly rugose, basad of basal carina smooth. India : Maharashtra; Karnataka .... 3. *simulator* Jonathan & Gupta

– Pronotum punctate, striate in the middle groove. Scutellum minutely punctate. Metapleurum finely to coarsely striate. Mesopleurum striate. Propodeum strongly wrinkled, basad of its basal carina weakly punctate to longitudinally running striations 5

5. Pronotum coarsely striate in the middle, upper margin finely obliquely striate. Mesopleurum and metapleurum coarsely striate. Propodeum long in profile, between apical and basal carinae longitudinally wrinkled. Mesopleurum usually black in its anterior half; hind femur largely dark brown to blackish. India : Meghalaya; Assam; Bihar; Tamil Nadu. Java. Taiwan .... 4. *fuscinervis* (Cameron)

– Pronotum with a few striae in the middle, weakly punctate at upper margin. Mesopleurum and metapleurum finely trans-striate. Propodeum short in

profile, between apical and basal carinae wrinkled (wrinkles not running longitudinally). Mesopleurum largely; hind femur wholly, reddish. India : Meghalaya; Karnataka; Maharashtra ..... 5. *rubricata* Jonathan & Gupta

6. Lateral carina of scutellum marked yellow and apical slope of propodeum with two broad or triangular lateral marks 7

– Lateral carina of scutellum black and propodeum black or marked variously 13

7 All the abdominal tergites yellow apically. Malar space 0.5× the basal width of mandible. (hind leg deep yellow, its coxa wholly, femur and tibia at their apical 0.4, black). India : Meghalaya; West Bengal..... ..... 6. *versatilis* (Cameron)

– Not all the abdominal tergites yellow apically. Malar space 0.43 to 0.7× the basal width of mandible. (malar space width not known in the case of *albotarsatus* and *maculiceps*) 8

8. Face in the middle and along the eye margin, frons along the eye margin and clypeus, yellow. Hind tibia with or without a subbasal white band. Lateral carina of scutellum extending to its basal 0.5 (known only in *maculifrons*) 9

– Face, clypeus and frons without any mark (Black). Hind tibia with a subbasal band (band on *theodorai* and *cameroni* somewhat dull). Lateral carina of scutellum confined to its base or extending less than 0.5 to its length .. 10

9. Face rugulose. Frons rugose with short oblique striate. Propodeum strongly wrinkled, at some places reticulate. Mesopleurum rugoso-striate. India : Himachal Pradesh; Uttaranchal; West Bengal. Java..... ..... 7 *maculifrons* Jonathan & Gupta

– Face and frons closely punctate. Propodeum rugose. Mesopleurum shagreened, obscurely striated. India : Bihar; Meghalaya..... 8. *maculiceps* (Cameron)

10. Apical carina of propodeum incomplete in between the apophyses. Face rugoso-punctate 11

– Apical carina of propodeum complete in between the apophyses. Face largely rugose 12

1. Lateral carina of scutellum confined to its base. Pronotal collar above and extreme upper margin of pronotum near epomia, yellowish. Subbasal band on hind tibia narrow. Apical 0.2 to fourth tarsal segment of hind tarsus, whitish. India : Karnataka ..... 9. *theodorai* Jonathan & Gupta

– Lateral carina of scutellum extending to its basal 0.3. Pronotum entirely black. Subbasal band on hind tibia much broader. Apical 0.75 of first segment to fourth segment of hind tarsus whitish. India : Meghalaya .... 10. *rothneyi* Jonathan & Gupta

12. Malar space about 0.7× the basal width of mandible. Frons mat, without carinae (except a median carina). Vertex smooth. Lateral carina of scutellum more or less confined to its base. Area basad of basal carina of propodeum shiny with a few scattered punctures. India : Meghalaya .... 11. *cameroni* Jonathan & Gupta

– Malar space about 0.57× the basal width of mandible. Frons rugoso-striate on either side of median carina and shallowly punctate at sides. Vertex minutely punctate. Lateral carina of scutellum extending to is basal 0.4. Area basad of basal carina of propodeum punctate with longitudinally running striations. India : Uttaranchal ..... 12. *doonense* Jonathan & Gupta

13, All the abdominal tergites with apical bands (bands on fifth and sixth tergites interrupted in the middle). Pronotal collar and speculum yellow (mesopleurum and metapleurum weakly rugose and dull, post-petiole granulose and mat). India : Meghalaya..... 13. *rugosa* Jonathan & Gupta

– Not all tergites with apical bands (number of bands variable), fourth tergite always black. Pronotal collar and speculum usually black 14

14. Malar space more than the basal width of mandible (1.16×). Antennal scrobes distinctly separated by a median V-shaped ridge, frons further above longitudinally striate. Mesoscutum finely aciculo-punctate. Metapleurum reticulate. Face yellow. Apical slope of propodeum with two lateral elongate yellow marks. India : Assam; Karnataka; Kerala; Meghalaya; Maharashtra; Jharkhand; Tamil Nadu ..... 14. *mysorense* Jonathan & Gupta

– Malar space 0.5 to 0.57× the basal width of mandible. Antennal scrobes without a median V-shaped ridge, frons further above coarsely trans-striate to wrinkled. Mesoscutum distinctly punctate. Face black; propodeum with two yellow oval marks including apophyses 15

15. Mesopleurum wholly strongly trans-rugose. Metapleurum striato-rugose, lateral carina of scutellum extending up to its basal 0.2. Frons with two orbital stripes along the eye margin; first tergite reddish. India : Karnataka. Sri Lanka ..... 15. *onusta* (Walker)

– Mesopleurum trans-rugose above. Metapleurum largely strongly wrinkled. Areolet rectangular in shape, higher than wide. Lateral carina of scutellum extending up to its basal 0.4. Frons black, without orbital stripes; first tergite also black. Myanmar ..... 16 *nigropetiolata* Jonathan & Gupta

1. ***Skeatia cariniscuta*** (Cameron) (Fig. 79 : a–e)

1907. *Mesostenoides cariniscutis* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **20** : 22. **Female.** des. Type : Female, India : Sikkim (LONDON).

1907. *Mesostenoides cariniscutis* (!) : Cameron, *J. Straits Branch Roy. Asiatic Soc.*, **48** : 18. des.

1941. *Mesostenoides cariniscutis* : Betrem, *Treubia*, **18** : 55. Key.

1961. *Goryphus cariniscutis* : Townes, Townes & Gupta, 1961, *Mem. Amer. Ent. Inst.*, **1** : 149. n. comb, India.

1973. *Skeatia cariniscuta* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 135. **Female,** key, des., fig. India : Meghalaya : Jaintia Hills : Dawki, Assam : Charduar Forest : Rangapara. Sikkim.

1987. *Skeatia cariniscuta* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 850.

This species is mainly characterized by having thorax largely rugose, the lateral carina of scutellum extending to its basal 0.5, propodeum black, with propodeal (Fig. 79 : b) crests only whitish and the apices of all tergites yellowish (Fig. 79 : c).

Female : Face finely rugose and dull. Clypeus subpolished with scattered shallow punctures, apical margin impressed somewhat truncate in the middle, smooth and shiny. Mandible punctate, punctures running into striations, with subequal teeth. Malar space granulose, 0.6× the basal width of mandible. Frons below ocellar triangle rough with short oblique striae, sides of frons dull and smooth, median longitudinal carina short and weak. Vertex and temple subpolished. Pronotum wrinkled, somewhat trans-wrinkled in the middle, epomia strong, reaching up to upper margin, then turned mesad. Mesoscutum subpolished, obscurely punctate, aciculate along the margins of each lobe. Scutellum subpolished and smooth except for a few punctures at the apex, lateral carina extending to its basal 0.6; metascutellum smooth and shiny. Mesopleurum strongly rugose, speculum shiny with a few scattered punctures, just below sternaulus finely rugoso-striate, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum strongly rugose or closely wrinkled, juxtacoxal carina obscurely present. Propodeum closely wrinkled, tending to be reticulate, area basad of basal carina longitudinally rugoso-punctate, apical carina absent, apophyses thick and moderately large, basal carina complete, moderately turned forward in the middle, spiracles large and oval. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti subparallel. First tergite largely smooth and shiny except in the middle and apico-laterally somewhat granulo-punctate, second and third tergites closely punctate, the following tergites subpolished. Ovipositor as in figure 79 : e.

Black. The following are yellow : face in the middle and along the eye margin (Fig. 79 : a), clypeus, except the apical margin of clypeus in the middle, mandible at base, two orbital stripes on frons, extending to facial mark, temple, pronotal collar, a narrow line at the upper margin of pronotum, scutellum, lateral carina of scutellum, metascutellum, tegula, subtegular ridge, base of hind wing, a small mark on mesopleurum just above the middle coxa, apophyses of propodeum (Fig. 79 : b), apices of all the abdominal tergites (Fig. 79 : c). Fore coxa and trochanter yellow, femur, tibia and tarsus dark yellow, except tibia and tarsus highly infuscate and its fifth tarsal segment dark brown; middle coxa and trochanter yellow, femur, and tibia dark yellow, tarsus blackish-brown. Hind coxa and basal 0.66 of femur dark yellow, trochanter and apical 0.33 of femur black, tibia yellow except slightly at the base and apical 0.4 black, tarsus white, except its first segment at the extreme base, fourth slightly at apex and fifth segment completely, black (Fig. 79 : d).

Male : Unknown.

Length : Female, 8.5 mm; fore wing 6.5 mm; ovipositor sheath 3 mm.

Distribution : India : Assam (Rangapara in Charduar Forest); Meghalaya : Jaintia Hills (Dawki). Sikkim.

2. ***Skeatia infernalis*** (Cameron) (Fig. 79 : f–j)

1897. *Cryptus infernalis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **41**(4) : 14. [Female]. des. Type : Female, India : Uttar Pradesh : Agra (LONDON).

1916. *Neomesostenus indicus* Szépligeti, *Ann. Mus. Natl. Hungrici,* **14** : 293. Male. Key, des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Male, India : Maharashtra : Bombay (BUDAPEST). Syn by Janathan & Gupta, 1973.

1961. *Goryphus indicus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 151. Lectotype design, n. comb, India.

1961. *Goryphus infernalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 151. n. comb, India.

1973. *Skeatia infernalis* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 115. Male, Female, key, des., fig. India : Rajasthan : Dhalpur, Alwar. Uttar Pradesh : Agra; Muradnagar. Uttaranchal : Dehra Dun. Assam : Rangapara. Andhra Pradesh : Nagram. Maharashtra : Bombay; Nasik. Madhya Pradesh : Pachmarhi, 1066m.

1987. *Skeatia infernalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 851.

This species is characterized by having the malar space 0.75× the basal width of mandible; face, clypeus and frons densely punctate. Thorax, first and second abdominal tergites dark orange (Figs. 79 : h) and frons with two elongate orbital stripes (Fig. 79 : f)

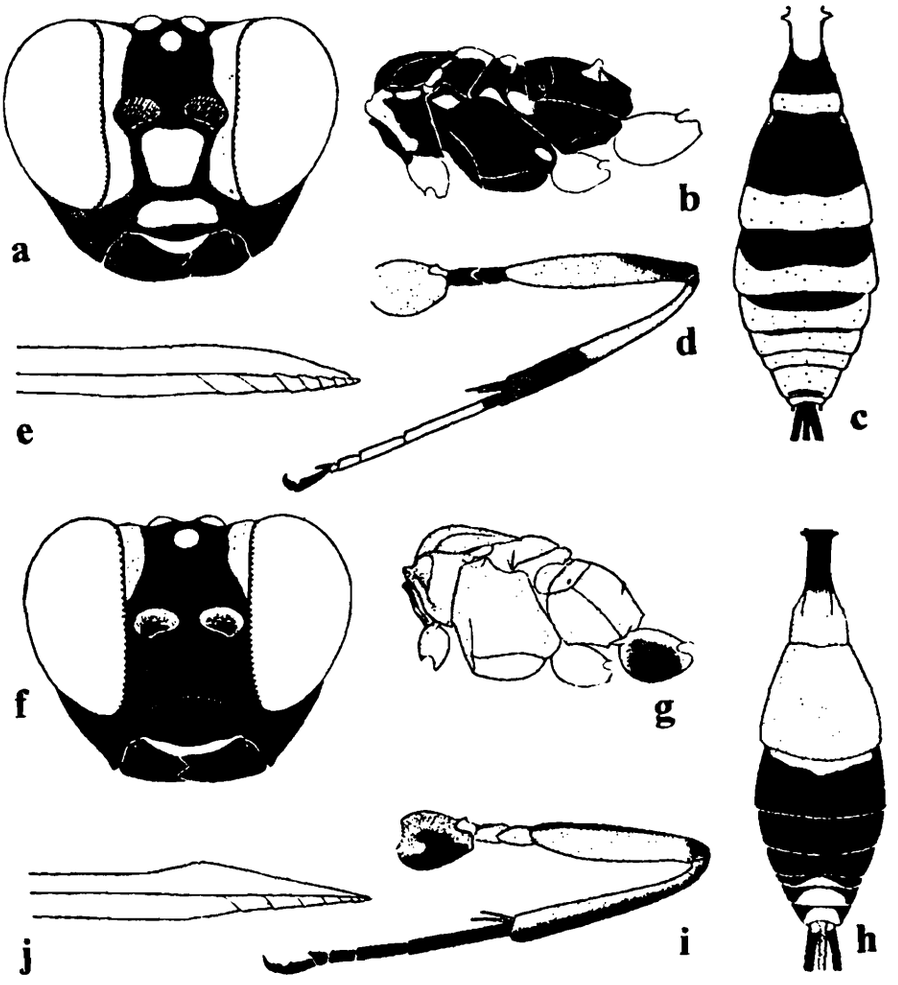

Fig. 79. Colour pattern : *Skeatia cariniscuta* (Cameron) : **a**, head front view; **b**, thorax side view; **c**, abdomen dorsal view; **d**, hind leg; **e**, ovipositor tip. *Skeatia infernalis* (Cameron) : **f**, head front view; **g**, thorax side view; **h**, abdomen dorsal view; **i**, hind leg; **j**, ovipositor tip.

Female : Face and clypeus dull, densely and minutely punctate, except the clypeus at apex, apical margin in the middle somewhat truncate. Mandible rugoso-punctate, with subequal teeth. Malar space granulo-punctate, 0.75× the basal width of mandible; antennal scrobes somewhat striate, area below median ocellus densely punctate in the middle, punctures tending to be shallow at sides, irregular rugae also occur along with the punctures. Vertex minutely punctate. Temple punctate. Pronotum somewhat puncto-rugulose (punctures tending to be indistinct), with a few trans-striae in the middle, epomia strong, completely reaching to upper margin, then turned mesad. Mesoscutum minutely punctate. Scutellum slightly convex, minutely punctate, lateral carina extending up to its basal 0.5; metascutellum shiny, largely smooth or obscurely punctate. Mesopleurum strongly rugose to obscurely trans-rugose; area just below subtegular ridge, speculum and also below sternaulus punctate; prepectal carina extending to the full height of mesopleurum. Metapleurum strongly rugose, juxtacoxal carina not

well defined. Propodeum between basal carina and apex largely strongly rugose, tending to be reticulate, area basad of basal carina sparsely but deeply punctate, especially around spiracles, punctures running into striations; apical carina complete, strongly turned forward medially, basal carina complete, turned forward narrowly in the middle, spiracles large and roundish. Areolet pentagonal, 5× as high as the width of bordering veins. First tergite smooth and shiny, except for a few shallow punctures apico-laterally, second and third tergites densely punctate, the following smooth and subpolished. Ovipositor as in figure (79 : j).

Black. Fourth to tenth flagellar segments white above; head black, except two yellow elongate orbital stripes (Fig. 79 : f) reaching near to antennal sockets; whole of thorax (Fig. 79 : g), first and second abdominal tergites, sometimes third also at base, dark orange (Fig. 79 : h), except propleurum (pronotal collar sometimes slightly), first tergite at base and rest of abdominal tergites black; except the sixth narrowly, seventh and eighth tergites medially at apex, yellowish. Leg largely dark orange, except the fore leg with a mark on coxa and apices of its tarsal segments brown, fifth tarsal segment dark brown. Middle leg dark orange except a line on dorsal side of tibia and whole of tarsus, infuscate. Hind coxa largely black except at base dark orange, trochanters and femur dark orange, except the trochanteral segments and femur above and at its apex dark brown, tibia dark yellow with a blackish broad line dorsally, tarsus largely blackish to black (Fig. 79 : i).

Male : Much similar to female, slender and subpolished; pronotum, mesoscutum, scutellum, mesopleurum, metapleurum and propodeum distinctly punctate, except speculum on mesopleurum smooth and shiny and propodeum tending to be reticulate. First tergite sparsely punctate at apex and second to fourth tergites much closely and shallowly punctate.

Length : Female, 5–7 mm; fore wing 3.5–4.5 mm; ovipositor sheath 2–2.5 mm. Male, 5–7.5 mm; fore wing 3.5–4.5 mm.

Distribution : India : Assam (Rangapara in Charduar Forest). Andhra Pradesh (Nagram). Madhya Pradesh (Pachmarhi, 1066m). Maharashtra (Bombay, Nasik). Rajasthan (Dholpur, Alwar). Uttaranchal (Dehra Dun). Uttar Pradesh (Agra, Muradnagar).

3. ***Skeatia simulator*** Jonathan & Gupta

1973. *Skeatia simulator* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 114. Male, Female, key, des., fig. Type : Female, India : Maharashtra : Mahabaleshwar, 1371m (GUPTA). India : Karnataka : Khemmangundi.

1987. *Skeatia simulator* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 853.

2000. *Skeatia simulator* : Jonathan, State Fauna Series 4 : Fauna of Meghalaya, Part 7 : 566. Female. Key. India : Maghalaya : South Garo Hills : Songsak.

Extremely similar and sympatric to *Skeatia rubricata* and distinguished mainly by its largely smooth and polished pronotum, pleurae and base of propodeum.

Female : Face rugulose in middle, somewhat striato-rugulose above near antennal sockets, at sides smoother. Clypeus subpolished, sparsely and shallowly punctate, apical margin in the middle slightly notched. Mandible punctate at base, with subequal teeth. Malar space granulose, 0.55× the basal width of mandible. Frons below ocellar triangle granulose, a median longitudinal carina extending from the base of median ocellus. Temple smooth and shiny. Pronotum largely subpolished and smooth, except for a few trans-ridges in the middle and sparsely and minutely punctate at upper margin, epomia storng, reaching upper margin, then turned mesad. Mesoscutum subpolished, minutely and sparsely punctate. Scutellum smooth, lateral carina extending to its basal 0.3. Metascutellum smooth and shiny. Mesopleurum subpolished, largely smooth, except short trans-striae along the inner margin of prepectal carina and speculum,. area below sternaulus, and speculum wholly minutely punctate, prepectal carina extending the full height of mesopleurum. Metapleurum smooth, juxtacoxal carina present. Propodeum between basal carina and apex rugose, area basad of basal carina smooth and shiny, apical carina complete, bow-shaped, apophyses short, crest-like, basal carina straight, slightly turned forward in the middle, spiracles small oval. Areolet pentagonal, 7× as high as the width of bordering veins. First tergite finely and second tergite strongly granulose, except the first tergite smoother at apex and base, the following tergites subpolished. Ovipositor about half as long as fore wing.

The colour of this species is similar to *Skeatia rubricata.*

Male : Similar to the female but much slender, smooth and polished. Prepectal carina extending 0.75 the height of mesopleurum. Propodeum between apical and basal carinae somewhat longitudinally striate, basad of basal carina smooth and apicad of apical carina somewhat rugulose; both the transverse carinae complete. First abdominal tergite smooth and slender; the following tergites dull and granulose.

Black. Scape, face in the middle, clypeus, mandible, except at apex, pronotal collar, subtegular ridge, tegula, lateral carina of scutellum, scutellum, whitish-yellow. Thorax (except the mesoscutum and rest of pronotum black), first abdominal tergite largely (except near the spiracles blackish), apices of second to fourth tergites and seventh broadly, deep yellow. Fore leg largely deep yellow, except a line above on femur and fifth tarsal segment largely, brown. Middle leg with its coxa and trochanter yellow, rest yellowish-brown, middle tarsus entirely

black. Hind leg largely black, except coxa deep yellow with a black mark at apex, trochanter and femur below, deep yellow.

Length : Female, 5.5 mm; fore wing 4 mm; ovipositor sheath 1.5 mm. Male, 5 mm; fore wing 4 mm.

Distribution : India : Maharashtra (Mahabaleshwar, 1371m). Karnataka (Khemmangundi).

4. ***Skeatia fuscinervis*** (Cameron) (Fig. 80 : a–d)

1902. *Ancaria fuscinervis* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **9** : 205. Female. des. Lectotype (designated by Townes, Townes & Gupta, 1961). Female, India : Meghalaya : Khasi Hills (OXFORD).

1908. *Mesostenus fuscinervis* : Schmiedekneeht, *Genera Insectorum*, **75** : 54. n. comb.

1914. *Goryphus fuscinervis* : Morley, *Rec. Indian Mus.*, **8** : 327. Male, Female. n. comb. India : Assam : Dibrugarh : Rotung, 400m; Saidya.

1923. *Melcha fuscinervis* : Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 23. n. comb. India : Bihar : Chapra; Pusa. Maghalaya : Khasi Hills, 300-400m.

1931. *Mesostenus (Stenarella) subpentagonalis* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 183. Female. key. des., fig. Type : Female, Taiwan : Ranrun; Goppo (SAPPORO). Syn. by Townes, Townes & Gupta, 1961.

1932. *Goryplus suishanus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 174. Male, des. Leetotype (designated by Townes, Townes & Gupta, 1961) : Male, Taiwan : Suisha [ryo] (EBERSWALDE). Taiwan : Anping : Feugshan; Taihorin. Syn. by Townes, Townes & Gupta, 1961.

1932. *Mesostenus (Mesostenus) subpentagonalis* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 181. Female, n. comb. Taiwan : Suisharyo; Taihorin.

1934. *Goryphus fuscinervis* : Ayyar & Margabandhu, *Madras Agri. J.*, **22** : 441. India : Tamil Nadu : Coimbatore. Host *Ocinara* sp.

1941. *Ancaria fuscinervis* : Betrem, *Treubia*, **18** : 91. Female. key, des., fig. Indonesia : Java : localities in Bogor; Semarang; Malang.

1961. *Goryphus fuscinervis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 150. Lectotype desing., Syn. Taiwan. India. Java.

1973. *Skeatia fuscinervis* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 109. Male, Female. n. comb., key. des., fig. India : Meghalaya : Khasi Hills : Shillong; Cherrapunji, 1235m. Indonesia : Java : Panggerango; Tjibodas, 400m.

1984. *Skeatia fuscinervis* : Chiu *et al.*, *Spcl. Publ. Taiwan Agri. Res. Inst.*, **15** : 19. Correction of locality names. Taiwan : Anping; Fengshan; Jenho; Peipu; Shuishe; Shuisheliao; Talin.

1987. *Skeatia fuscinervis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 851.

This species is characterized by its coarsely striate pronotum, mesopleurum and metapleurum; shape of the propodeum and by the colour of the mesopleurum and hind femur.

Female : Face dull rugulose, tending to be finer towards clypeal groove. Clypeus evenly arched, subpolished, destinctly punctate, apical margin impressed and shiny, somewhat truncate in the middle. Mandible punctate, punctures running into striations. Malar space granulose, 0.6× the basal width of mandible. Frons with antennal scrobes smooth and shiny, below ocellar area strongly granulose, with a median carina extending from base of median ocellus to middle of antennal sockets, this carina not continuous but interrupted in the middle. Vertex subpolished. Temple sparsely and minutely punctate. Pronotum subpolished, coarsely trans-striate, minutely punctate above at upper margin, pronotal collar indistinctly punctate, epomia strong, reaching to upper margin. Mesoscutum subpolished, without distinct punctures. Scutellum convex, subpolished, minutely punctate, lateral carina extending up to its basal 0.4. Metascutellum minutely and shallowly punctate. Mesopleurum coarsely trans-striate in middle, area below subtegular ridge and mesopleural pit smooth, prepectus irregularly striate, speculum shiny and minutely punctate, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum subpolished, coarsely trans-striate, smooth below juxtacoxal carina. Propodeum strongly wrinkled, area below apophyses and at sides trans-striate, striae reaching to pleural carina, area basad of basal carina largely smooth or indistinctly punctate, shape of apical carina variable, basal carina straight, without median longitudinal carinae at base, spiracles large and oval. Areolet pentagonal, 7× as high as the width of bordering veings, intercubiti converging, second intercubitus faint. First tergite granulose, granules stronger apico-laterally, at apex smooth and shiny; second and third tergites also granulose, tending to be smoother at their apices, the following tergites subpolished. Ovipositor as in figure 80 : d.

Black. Fourth to seventh flagellar segments white above; a mark on the anterior margin of pronotum just behind the head, scutellum laterally, its lateral carinae, a mark at the apex of tegula, subtegular ridge (Fig. 80 : a), second abdominal tergite at apex and seventh and eighth tergites largely, whitish-yellow (Fig. 80 : b). Scutellum medially, metascutellum, posterior 0.3 of mesopleurum, base of hind wing, whole of propodeum and first abdominal tergite largely, red (Fig. 80 : b) (first tergite subapico-laterally black). Fore coxa and trochanter yellowish; femur and tibia yellowish-brown, except for a line on femur and tibia, and tarsus wholly dark brown. Middle coxa and trochanter yellow, except a small mark on the coxa in the middle, first trochanteral segment at base and second trochanteral segment at apex dark brown; middle femur, tibia and tarsus dark brown to

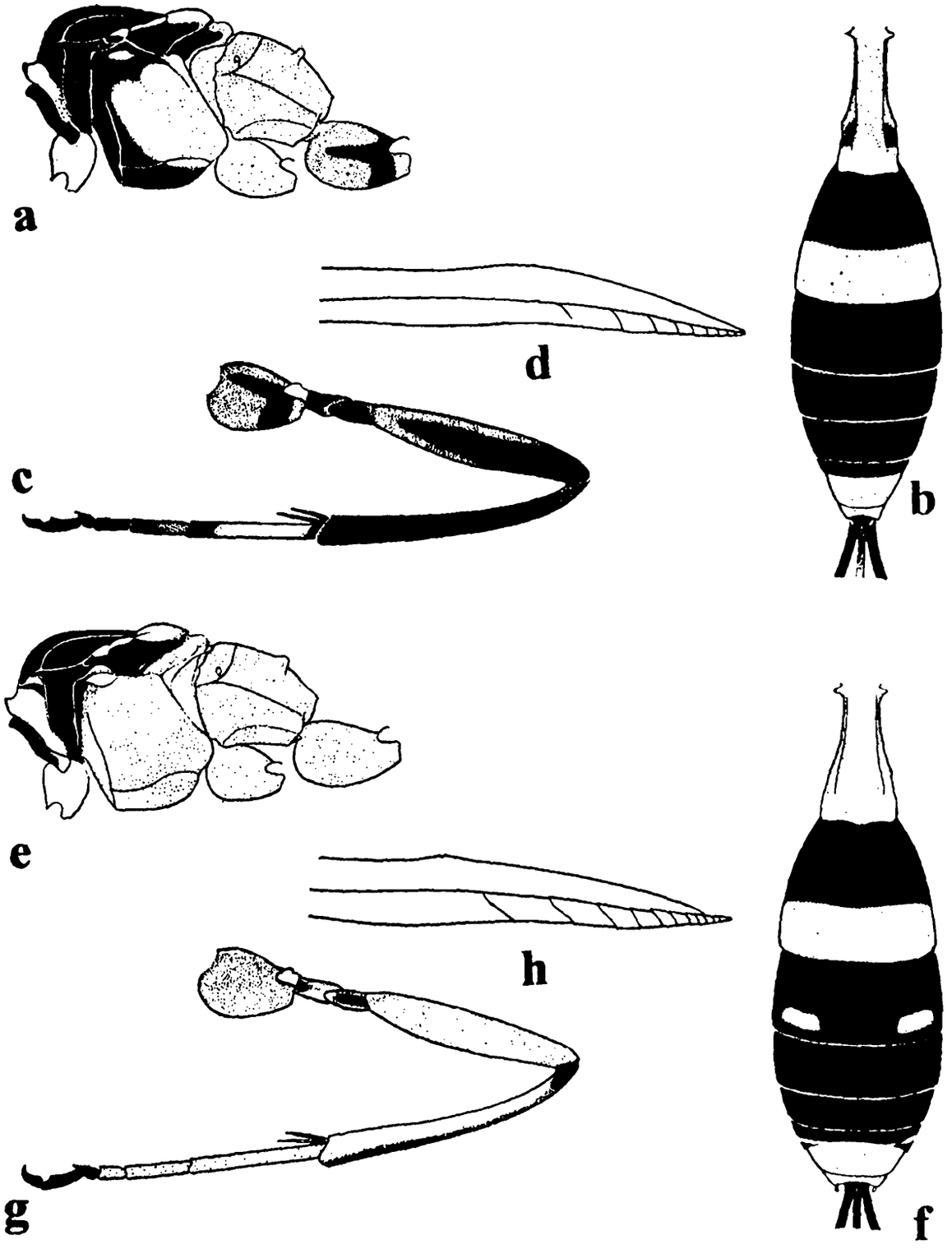

Fig. 80. Colour pattern : *Skeatia fuscinervis* (Cameron) : **a**, thorax side view; **b**, abdomen dorsal view; **c**, hind leg; **d**, ovipositor tip. *Skeatia rubricata* Jonathan & Gupta : **e**, thorax side view; **f**, abdomen dorsal view; **g**, hind leg; **h**, ovipositor tip.

blackish, except tibia slightly yellowish at base and apex. Hind coxa red with a broad and elongate black mark, trochanter largely black, first trochanteral segment apically; femur and tibia, dark brown to blackish, femur with a reddish tinge above basally, and tibia yellowish at its basal 0.25; tarsus largely yellow, with the extreme apices of first and second segments and whole of third, fourth and fifth segments, dark brown (Fig. 80 : c).

Male : Similar to the female; mesopleurum and metapleurum minutely punctate, mesopleurum with a few striae along the speculum.

Black. Flagellum black; scape, an oval mark on face, mandible, pronotal collar largely, and second and third tergites apically, yellow. Legs darker than female; hind tarsus largely white, with basal 0.6 of first and fifth segments wholly blackish; colour otherwise similar to the female.

Length : Female, 7–8 mm; fore wing 5.5–6.5 mm; ovipositor sheath 2–3 mm. Male, 8 mm; fore wing 6 mm.

Distribution : India : Meghalaya (Cherrapunji, 1235m; Shillong). Assam (Dibrugarh, Rotung, Saidya). Bihar (Pusa). Tamil Nadu (Combatore). *Elsewhere :* Indonesia : Java (Bogor, Semerang, Malang, Panggeramgo, Tijibodas). Taiwan (Ranrun, Hoppo, Suisha, Peipu, Anping, Fengshan, Taihorin, Suishero, Jenho, Shuishelio, Talin).

Host : Ocinara sp.

5. ***Skeatia rubricata*** Jonathan & Gupta (Fig. 80 : e–h)

1902. *Skeatia rubricata* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 111. Male, Female. key, des., fig. Type : Female, India : Karnataka : Bhagmandla, 853m (GUPTA). India : Karnataka : Mercara, 1219m; Kottegehar, 669 m; Khemmangundi, Murnad, 610m. Maharashtra : Mahabaleshwar, 1971m; Meghalaya: Khasi Hills : Cherrapunji, 1235m.

1987. *Skeatia rubricata* : Gupta, *Mem. Amer, Ent. Inst.*, **41** : 853.

2000. *Skeatia rubricata* : Jonathan, State Fauna series 4 : Fauna of Meghalaya, Part 7 : 565. India : Meghalaya : Cherrapunji.

This species has a few striations in the middle of pronotum and weak punctures at the upper margin. The lateral carina of scutellum extends to its basal 0.6. The meso- and metapleurum finely striate. The mesopleurum and hind femur largely red.

Female : Face subpolished, shallowly and sparsely punctate at sides, closely punctate in the middle, punctures running into fine striations (sometimes finely aciculate). Clypeus subpolished, weakly convex, shallowly and sparsely punctate,

apical margin impressed and shiny. Mandible punctate at base. Malar space granulose, 0.55× the basal width of mandible. Frons below ocellar triange strongly granulose, with longitudinal rugae in the middle, a median longitudinal carina extending from median ocellus. Vertex subpolished. Temple subpolished impunctate. Pronotum with a few trans-striae in the middle, punctate or rugulosopunctate above (sometimes punctures running into striations), pronotal collar smooth and shiny, area behind epomia at anterior margin with a few transstriae, epomia strongly reaching to upper margin, then turned mesad. Mesoscutum subpolished, minutely punctate. Scutellum moderately convex [less than in *fuscinervis* (Cameron)], minutely punctate, lateral carina extending to its basal 0.6; metascutellum smooth and shiny. Mesopleurum finely trans-striate. Speculum and area below sternaulus subpolished and minutely punctate, prepectal carina extending 0.85 the height of mesopleurum. Metapleurum finely trans-striate, rugulose above, area just below juxtacoxal carina smooth. Propodeum between apical and basal carinae strongly wrinkled, wrinkles converging towards the apical carina, area apicad of apical carina rugose, and area below apophyses and at sides trans-wrinkled, area based of basal carina granulose with longitudinally running carinae. Apical carina complete and bow-shaped, apophyses moderately large, basal carina more or less straight, median longitudinal carinae present at base, spiracles oval. Areolet pentagonal, 7× as high as the width of bordering veins. First abdominal tergite largely granulose, smooth and shiny at apex and base, second tergite largely granulose, smooth and shiny at apex and base, second tergite granulose, tending to be smooth, following tergites subpolished. Ovipositor as in figure 80 : h.

Black. Antenna with scape and pedicel largely whitish-yellow with black marks, fourth to eighth flagellar segments (sometimes ninth slightly at the base) white above. Pronotal collar, anterior part of epomia, tegula largely at apex, scutellum largely at base, lateral carina of scutellum, subtegular ridge (Fig. 80 : e), first abdominal tergite faintly at apex, second tergite with distinct apical band, third tergite with two oval mark at the subapical region on either side, seventh and eighth tergites broadly, yellow or whitish-yellow (Fig. 80 : f). Metascutellum, mesopleurum largely (except the prepectus, black), base of hind wing, metanotal region, metapleurum, propodeum and first tergite (except at apex), red (Fig. 890 : e). Fore coxa and first trochanteral segment yellow, second trochanteral segment, femur, tibia and tarsus yellowish-brown, except the tibia slightly more yellow and tarsus a little darker. Middle coxa and first trochanteral segment reddish-yellow, its second trochanteral segment, femur and tibia dark orange, except tibia with a dark line above, tarsus dark brown. Hind coxa, trochanter and femur reddish, except the trochanter with blackish marks, tibia dark yellow, infuscate above and at extreme base, tarsus also dark yellow, except its fourth and fifth segments dark brown (Fig. 80 : g).

Male : Face largely shiny, with a few minute punctures. Clypeus, frons, vertex and pronotum smooth and shiny. Mesoscutum and scutellum shiny, minutely and sparsely punctate. Mesopleurum smooth. Metapleurum with sparse and indistinct punctures. Propodeum between basal carina and apex obliquely finely wrinkled. First abdominal tergite smooth, second to fourth tergites wholly and fifth tergite at base densely punctate, rest mat.

Black. Antenna entirely black, except the pedicel and scape marked whitish. Face in the middle above, clypeus, mandible (except the apices), pronotal collar broadly, scutellum, lateral carina of scutellum, tegula, subtegular ridge, fore and middle coxae and trochanters. apices of first to fourth and seventh tergites, yellowish. Mesopleurum, base of hind wing, metapleurum, propodeum, rest of first tergite (except in the middle marked, black), light orange. Fore femur, tibia and tarsus deep yellow, except a line on femur and tibia dorsally and fifth tarsal segment, brownish. Middle femur and tibia dark yellow with a broad line above, and also tarsus, dark brown. Hind coxa, trochanter and femur light orange to dark yellow, except apico-laterally, both the trochanteral segments marked broadly, femur dorsally and apically, dark brown, tibia and tarsus blackish, except tibia baso-ventrally yellow; tarsus with second and third segments whitish, clouded with fuscous, tarsus colour variable, sometimes apical 0.5 of first segment to fourth segment whitish.

Length : Female, 6.5–10 mm; fore wing 5–7 mm; ovipositor sheath 2–4 mm. Male, 5.5–6.5 mm; fore wing 4.5–5.5 mm.

Distribution : India : Meghalaya (Cherrapunji, in Khasi Hills); Karnataka (Bhagmandla, 853m; Mercara, 1219m; Kattegehar, 669m; Khemmangundi Murnard, 610m). Maharashtra (Mahabaleshwar, 1971 m).

6. ***Skeatia versatilis*** (Cameron) (Fig. 81 : a, b)

1904. *Mesostenus versatilis* Cameron, *Trans. Ent. Soc. London,* 1904 : 118. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1907. *Mesostenoides versatilis* Cameron, *Ann. Mag. Nat. Hist.,* (7) **20** : 23. n. comb.

1941. *Mesostenus versatilis* : Betrem, *Treubia,* **18** : 61. Key.

1961. *Goryphus versatilis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 155. n. comb. India.

1973. *Skeatia versatilis* : Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 133. Female n. comb., key., des., Fig. India : West Bengal : Tista-Kalimpong Route. Meghalaya : Khasi Hills.

1987. *Skeatia versatilis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 853.

This species has apices of all the abdominal tergites yellow; face largely yellowish; face weakly and closely punctate; mesopleurum strongly rugose, tending to be finely wrinkled above; metapleurum strongly wrinkled to reticulate, and the head and thorax with long fine hairs.

Female : Head and thorax covered with long fine hairs. Face subpolished, punctate in the middle, rugose at sides. Clypeus convex, subpolished weakly punctate, apical margin impressed. Mandible distinctly and closely punctate, with subequal teeth. Malar space granulose, 0.55× the basal width of mandible. Antennal scrobes weakly depressed, below ocellar triangle in the middle obliquely and irregularly striate, at sides largely smooth and subpolished with a few scattered shallow punctures. Vertex indistinctly punctate. Temple minutely punctate. Pronotum trans-striate in the middle, irregularly and obliquely striate above, lower margin obscurely punctate, epomia strongly reaching up to upper margin, then turned mesad. Mesoscutum minutely punctate, aciculate along the margins of each lobe. Scutellum shiny with minute scattered punctures, lateral carina extending to its basal 0.25. Metascutellum smooth and shiny. Mesopleurum strongly rugose, speculum shiny with a few scattered punctures, area below sternaulus minutely punctate, prepectal carina extending 0.75 the height of mesopleurum; metapleurum coarsely wrinkled, juxtacoxal carina obscure. Propodeum largely reticulate between basal carina and apex, area basad of basal carina puncto-wrinkled, wrinkles irregular and oblique, apical carina absent, apophyses long and pointed, basal carina complete, evenly arched, and turned forward in the middle, spiracles large and longish oval. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti slightly convergent. First tergite largely smooth and subpolished, granulose in the middle with a few punctures, second and third tergites densely punctate, the following tergites subpolished.

Black. Fourth to tenth flagellar segments white above. The following are yellow : a trilobed mark on face (except for a black oval mark in the middle), clypeus except the apical margin, narrow and irregular orbital stripes on frons, upper margin of pronotum, a mark on anterior margin of pronotal collar, scutellum (except for two black mark at its base), lateral carina of scutellum, metascutellum, tegula, subtegular ridge, base of hind wing, two elongate stripes on either side of propodeum starting from apophyses (including apophyses) to the apex of propodeum, apices of all the abdominal (Fig. 81 : a) tergites. Fore coxa, trochanter and femur yellow, except femur light orange above, tibia orange, infuscate above, tarsus dark orange with its fifth segment brown. Middle coxa, trochanter yellow, femur light orange, tibia orange somewhat infuscate, tarsus dark brown. Hind coxa, and femur at its basal 0.75 dark orange, apical 0.25 of coxa and of femur and whole of trochanter black, tibia yellowish-orange except at the extreme base

and 0.4 at the apex, black; tarsus white except 0.3 of first segment, fourth slightly at apex, fifth completely black (Fig. 81 : b).

Male : Not known.

Length : Female, 11 mm; fore wing 8.5 mm; ovipositor sheath 4.5 mm.

Distribution : India : Meghalaya (Khasi Hills). West Bengal (Kalimpong-Tista route).

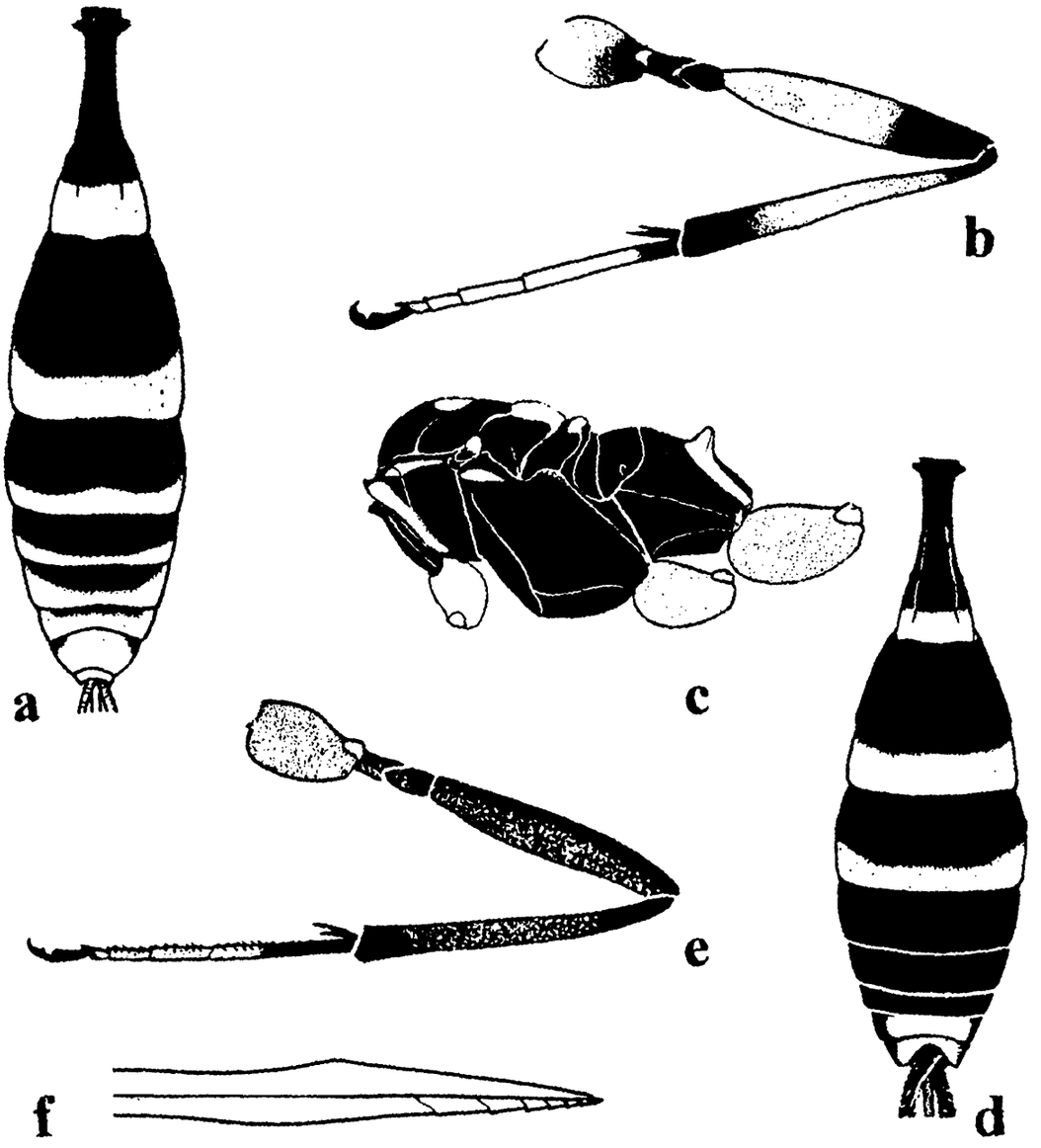

Fig. 81. Colour pattern : *Skeatia versatilis* (Cameron) : **a**, abdomen dorsal view; **b**, hind leg. *Skeatia maculifrons* Jonathan & Gupta : **c**, thorax side view; **d**, abdomen dorsal view; **e**, hind leg; **f**, ovipositor tip.

7 ***Skeatia maculifrons*** Jonathan & Gupta (Fig. 81 : c–f)

1973. *Skeatia maculifrons* Jonathan & Gupta, *Oriented Ins. Monogr.*, **3** : 119. Female key, des., fig. Type Female, India: Himachal Pradesh : Dalhousie Hills : Benikhet, 1534m (GUPTA). India : Himachal Pradesh : Dalhousie Hills : Khajjiar, 1920 m. Uttaranchal: Kumaon Hills : Jeolikote, 1210 m; Garjia, 610 m; Garhwal Hills : Govind Ghat, 1828 m; Phata, 1524 m. West Bengal : Darjeeling Hills; Rangiroon, 1897 m. Meghalaya : Charrapunji, 1235 m. Indonesia : Java : Mt.Ungaram.

1987. *Skeatia maculifrons* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 852.

This species is distinguished by having the face rugulose, metapleurum finely wrinkled, propodeum based of basal carina rugose to finely wrinkled and apical carina absent. Lateral carina of scutellum extending up to its basal 0.5. The face, clypeus and frons yellow marked.

Female : Face dull, rugulose, smooth at sides near eye margin. Clypeus subpolished with scattered shallow punctures, apical margin impressed. Mandible punctate, punctures running into striations. Malar space granulo-punctate, 0.43× the basal width of mandible. Frons below ocellar area rugose with short oblique striae, a median carina extending from median ocellus. Vertex dull minutely and shallowly punctate, tending to be smoother at sides. Temple distinctly punctate. Pronotum striato-wrinkled, striate in the middle, distinctly wrinkled above and at upper margin, epomia strongly reaching to upper margin, then turned mesad. Mesoscutum dull, densely punctate, tending to be granulose, aciculate along the margins of each lobe. Scutellum largely subpolished, obscurely punctate, lateral carina extending to its basal 0.5. Metascutellum smooth and shiny. Mesopleurum rugoso-striate, short striae occur along the inner margin of prepectus and speculum, speculum subpolished and punctate, below sternaulus also punctate, punctures running into striations, prepectal carina extending the full height of mesopleurum. Metapleurum finely wrinkled, juxtacoxal carina present. Propodeum strongly wrinkled, at some places wrinkles tending to be reticulate, area below apophyses trans-wrinkled, basad of basal carina rugose with irregular striae; apical carina absent; apophyses large, conical, basal carina more or less straight except slightly forwarded in the middle with two longitudinal stumps of carinae, spiracles roundish oval. Areolet pentagonal, oblong, 7× as high as the width of bordering veins. First abdominal tergite granulose, with a few scattered shallow punctures in the middle, second and third tergites densely punctate, punctures on third much shallow, the following tergites subpolished. Ovipositor as in figure 81 : f.

Black. Fourth to ninth flagellar segments white above. The following are yellow : face with a mark, clypeus broadly at base except the apical margin, whole of inner orbits, pronotal collar, upper margin of pronotum, apex of middle lobe of mesoscutum, lateral carina of scutellum, metascutellum, tegula largely, subtegular

ridge, propodeum with two large broad triangular marks (Fig. 81 : c), apices of first to third tergites, seventh and eighth tergites broadly (Fig. 81 : d). Fore coxa and first trochanteral segment yellow, second trochanteral segment, femur and tibia dark orange, tarsus brown, except its fifth tarsal segment dark brown. Middle coxa and trochanter yellow with a reddish tinge, femur and tibia dark orange except tibia light brown above, tarsus brown, its fifth segment dark brown. Hind coxa reddish, trochanter, femur and tibia light brownish, except dark brown marks on both the trochanteral segments and apex of femur, tibia at apex and at base, and above dark brown, tarsus white, except basal 0.75 of first segment, fourth largely, fifth segments wholly dark brown or blackish (Fig. 81 : e).

Male : Not Known

Length : Female 7–9 mm; fore wing 6–7 mm; ovipositor sheath 2–3 mm.

Distribution : India : Himachal Pradesh (Benikhet, 1524 m; Khajjiar, 1920 m). Uttaranchal (Jeolikote, 1219m in Kumaon Hills; Phata 1524m & Govind Ghat, 1828m in Garhwal Hills, Garjia 610m in Kumaon Hills). West Bengal. (Rangiroon 1897m in Darjeeling Hills). *Elsewhere :* Indonesia: Java (Goenoeng, Oengaran).

This species is close to *S. doonense* by having the apical slope of propodeum with two broad and elongate marks, lateral carina of scutellum marked yellow. Face largely rugose apical carina absent and the frons with two elongate stripes.

8. ***Skeatia maculiceps*** (Cameron)

1904. *Mesostenus maculiceps* Cameron, *Trans. Ent. Soc. London,* **1904** : 119. Female des. Type : Female, India : Khasi Hills in Meghalaya (OXFORD).

1907. *Mesostenoideus maculiceps* : Cameron, *Ann. Mag. Nat. Hist.,* (7) **20** : 23. syn.

1923. *Mesostenoides* (!) *maculiceps* : Dutt, *Mem. Dept. Agr. India (Ent.),* **8** : 24 India : Pusa in Bihar.

1961. *Goryphus maculiceps* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 151.

1973. *Skeatia maculiceps* : Jonathan & Gupta, *Oriental Ins. Monogr.,* **3** : 121. Female. n.comb., key, des. India : Meghalaya : Khasi Hills.

1987. *Skeatia maculiceps* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 851.

This species is allied to *Skeatia maculifrons* by having similar colour pattern, but can be distinguished by having the face and frons closely punctate, propodeum rugose; and the mesopleurum shagreened and obscurely striated.

Female : Face closely punctate and covered with short hairs. Clypeus smooth. Frons and vertex closely punctate. Mososcutum dull, leathery. Scutellum smooth. Pronotum striated. Mesopleurum shagreened, obscurely striated. Metapleurum

obliquely striate. Propodeum finely rugose, and towards the apex and below apophyses trans-striate.

Black. Seventh to tenth flagellar segments white above. The following are yellow : palpi, clypeus, a large mark on face, frons and vertex along the eye margin, pronotal collar, upper margin of pronotum narrowly, apex of middle lobe of mesoscutum, scutellum and its lateral carina, tegula, subtegular ridge, metascutellum, two broad triangular marks on the apical slope of propodeum, apices of first, second and third, and seventh and eighth entirely. Legs reddish-yellow, except fore and middle coxae and trochanters yellow and their tarsi slightly darker at apex; hind tibia above, basal 0.8 of first segment and fifth segment of hind tarsus completely brown. Wings clear hyaline.

Male : Not known.

Length : Female 10 mm.

Distribution : India : Meghalaya (Khasi Hills). Bihar (Pusa).

9. ***Skeatia theodorai*** Jonathan & Gupta, (Fig. 82 : a, b)

1973. *Skeatia theodorai* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 131. Female, key, des., fig. Type : Female, India : Karnataka : Gunji, 610 m (GUPTA).

1987. *Skeatia theodorai* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 853.

This species is distinguished from other species by having frons obliquely striate, propodeum strongly longitudinally striato-punctate at base, malar space about 0.7× the basal width of mandible, prepectal carina extending 0.75 the height of mesopleurum and basal carina of propodeum straight. The mandible, lateral carina of scutellum and subbasal band on the hind tibia yellow (Fig. 81 : b).

Female : Face rugoso-punctate, wrinkled in the middle. Clypeus subpolished, minutely and sparsely punctate at its basal half. Mandible with equal teeth. Malar space granulose, 0.7× the basal width of mandible. Frons dull, somewhat obliquely striate in the middle, and with a median longitudinal carina extending from the median ocellus. Frons laterally shallowly and sparsely punctate. Vertex largely mat, without distinct punctures. Temple closely and shallowly punctate. Pronotum coarsely striate in the middly, upper margin distinctly closely punctate, punctures running into striations, lower margin shiny with faint punctures, epomia strong, reaching up to upper margin, then turned mesad. Mesoscutum distinctly minutely punctate, punctures appear to be running into stritions. Scutellum subpolished, minutely and weakly punctate, lateral carina more or less confined to its base. Metascutellum smooth and shiny. Mesopleurum strongly rugose, rugae tending to be transverse above along speculum and finer toward the base of

middle coxa; speculum weakly punctate, prepectal carina extending about 0.75 the height of mesopleurum, below sternaulus distinctly punctate, punctures running into striations. Metapleurum strongly wrinkled, tending to be reticulate, juxtacoxal carina present. Propodeum longer in profile, area between basal carina and apex strongly wrinkled, basad of basal carina longitudinally striate with punctures in between the striae, basal carina complete and straight, apical carina absent, apophyses long and pointed, spiracle moderately large and longish. Areolet pentagonal about 4× as high as the width bordering veins. First tergite smooth and shiny, sowewhat granulose and with a few scattered punctures in the middle, second and third tergites mat and subpolished. Ovipositor tip long and pointed.

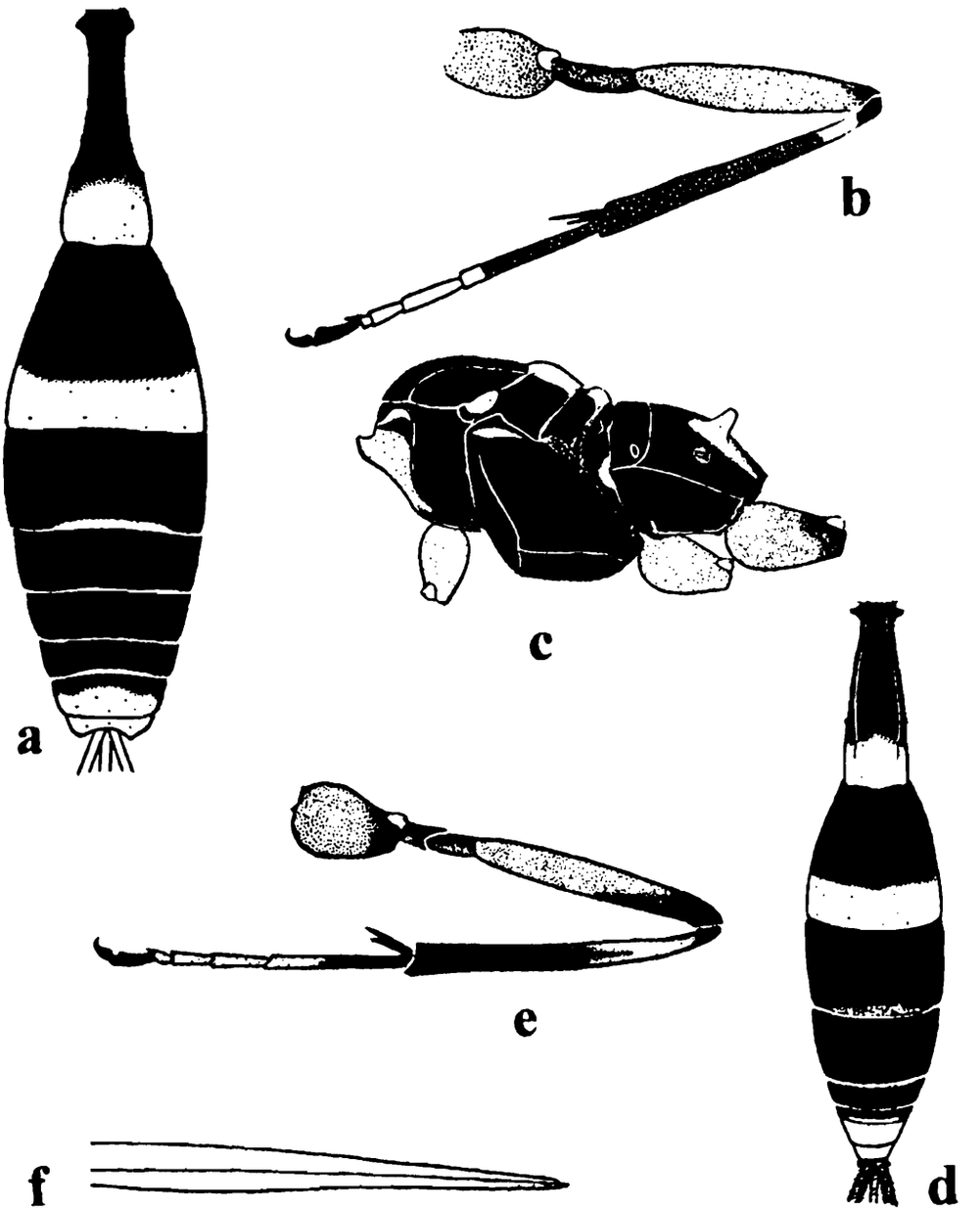

Fig. 82. Colour pattern : *Skeatia theodorai* Jonathan & Gupta : **a**, abdomen, dorsal view; **b**, hind leg. *Skeatia doonense* J & G : **c**, thorax, side view; **d**, abdomen, dorsal view; **e**, hind leg; **f**, ovipositor tip.

Black. Fourth to ninth flagellar segments white above. The following are yellow : mandible except its apex, pronotal collar, upper margin of pronotum along the epomia, tegula, subtegular ridge, scutellum, lateral carina of scutellum, metascutellum, two oval marks on either sides of propodeum including apophyses, apices of first, second tergites, third and sixth tergites narrowly, seventh and eighth broadly (Fig. 82 : a). Legs in general dark orange, except fore and middle tibiae infuscate, and their tarsi dark brown. Hind leg (Fig. 82 : b) with trochanter largely, femur at extreme apex, whole of tibia (except a subbasal band, yellow), dark brown to blackish, apical 0.2 of first, to basal 0.5 of fourth tarsal segments white, rest of tarsus blackish. Wings clear hyaline.

Male : Not known.

Length : Female 11 mm; fore wing 6.5 mm; ovipositor sheath 3.0 mm.

Distribution : India : Karnataka (Gunji, 610m).

This species is close to *S. nigropetiolata* Jonathan & Gupta in the nature of the marks on pronotal collar, propodeum and a subbasal band on hind tibia and the colour of the first tergite. The malar space in this species, however, is much longer than in *nigropetiolata* and marks on the lateral carinae are also distinct. It approaches *S. onusta* (Walker) in the nature of similar marks on propodeum, but the length of the malar space, colour of the mandible, frons, lateral carina of scutellum, first tergite and of the hind leg will distinguish the two.

10. ***Skeatia rothneyi*** Jonathan & Gupta

1973. *Skeatia rothneyi* Jonathan & Gupta, *Oriented Ins. Monogr.*, **3** : 132. Female. key, des. Type; Female, India : Meghalaya : Khasi Hills (OXFORD).

1987. *Skeatia rothneyi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 853.

This species differs from the other species by having the face ruguloso-punctate in the middle, malar space about 0.68× the basal width of mandible, frons obliquely striate in the centre, propodeum longer in profile and by the absence of the apical carina of propodeum. The colour of abdomen and hind leg is also different.

Female : Face subpolished, rugose above, ruguloso-punctate below. Clypeus shiny, sparsely punctate. Mandible with subequal teeth. Malar space granulose, 0.66× the basal width of mandible. Frons obliquely striate in the centre, with median longitudinal carina extending down from the median ocellus; frons laterally mat and dull. Vertex and temple smooth and subpolished. Pronotum largely strongly striate, lower area smooth and shiny, epomia strong reaching upper margin then turned mesad. Mesoscutum densely punctate, punctures running into the striations. Scutellum shiny, sparsely punctate at base, its lateral carina extending up to its basal 0.3. Metascutellum smooth and shiny. Mesopleurum

moderately strongly rugose tending to be rugoso-striate above, speculum subpolished minutely punctate with very finely running striations, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum strongly wrinkled, juxtacoxal carina not clearly seen among the wrinkles (but present). Propodeum longer in profile, area between basal carina and apex of propodeum strongly wrinkled, basad of basal carina minutely and closely punctate with longitudinally running striations, basal carina complete strongly turned forward in the middle, apical carina absent, apophyses long and pointed, spiracles moderately large and longish. Areolet moderately large about 4× as high as the width of bordering veins. First tergite largely smooth and shiny, with a few minute punctures in the middle; second and third tergites with densely crowded punctures, the following tergites mat and subpolished. Ovipositor tip long and pointed.

Black. Apex of fourth to ninth flagellar segments white above. Mandible, except its apex, lateral carina of scutellum, scutellum except at base, metascutellum, apophyses of propodeum, apices of first to third abdominal tergites, band much narrow in the middle, seventh and eighth tergites broadly in the middle, yellow. Fore leg with coxa and trochanter, yellow; femur and tibia deep yellow, its tarsus yellowish-brown. Middle leg with coxa, trochanter, femur and tibia deep yellow. Hind leg with coxa deep yellow, except dark brown apically, trochanter, femur and tibia dark brown except tibia with a subbasal broad yellow band, its tarsus yellow, except basal 0.25 of first segment and whole of fifth segment dark brown. Wings clear hyaline.

Male : Not known.

Length : Female 10 mm; fore wing 8 mm; ovipositor sheath 3.5 mm.

Distribution : India : Meghalaya (Khasi Hills).

This species is close to *S. theodorai* Jonathan & Gupta by having the apical carina of propodeum incomplete and the face largely rugoso-punctate, but is different by having the lateral carina of scutellum extending to its basal 0.3, pronotum entirely black and the band on hind tibia much broader.

11. ***Skeatia cameroni*** Jonathan & Gupta

1973. *Skeatia cameroni* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 123. Female. key, des. Type; Female, India : Meghalaya : Khasi Hills (OXFORD).

1987. *Skeatia cameroni* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 849.

This species can be distinguished by its dull and weakly rugose face; malar space 0.7× the basal width of mandible; lateral carina of scutellum more or less confined to its base and mesopleurum largely with weak and sparse punctures. The lateral carina of scutellum marked yellow, and fourth and fifth abdominal tergites entirely black.

Female : Head and thorax covered with fine hairs. Face dull weakly rugose. Clypeus subpolished, with weak, minute and sparse punctures. Malar space granulose, about 0.7× the basal width of mandible. Frons dull and largely mat, a median carina extending down from the base of median ocellus. Vertex smooth and subpolished. Temple dull, with sparse and shallow punctures. Pronotum coarsely striate, upper margin finely and obliquely striate, weak punctures also present in between the striae, extreme lower margin and collar dull, without distinct punctures, epomia long and reaching up to the upper margin and then turned mesad. Mesoscutum and scutellum subpolished, minutely punctate; lateral carina of scutellum more or less confined to its base. Mesopleurum subpolished weakly and sparsely punctate, at some places with weak rugosities in between the punctures, finely striate along the inner margin of speculum, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum trans-rugose, with undefined punctures along with the striae; juxtacoxal carina present. Propodeum between apical and basal carinae finely wrinkled, apicad of apical carina somewhat trans-striate, basad of basal carina shiny with a few scattered shallow punctures, apical carina complete, apophyses crest-like, spiracle oval. Areolet pentagonal about 6× as high as the width of bordering vein. First abdominal tergite granulose, its apex and base smooth and shiny, second and third tergites minutely and densely punctate, the following tergites mat and subpolished. Ovipositor tip long and pointed.

Black. Fifth to ninth flagellar segments white above. The following are yellow : pronotal collar, a small mark at the upper margin of pronotum, subtegular ridge, tegula, scutellum, lateral carina of scutellum, metascutellum, area between apical carina and apex of propodeum, apices of first and second tergites, broadly, apices of third and sixth tergites much narrowly and seventh and eighth wholly. Fore and middle legs dark yellow, except their femora and tibiae above and their tarsi, brownish. Hind leg yellowish-brown, except its coxa apico-laterally, femur above and broadly towards the apex, tibia largely, except a subbasal yellowish band, basal 0.75 of first, second to fourth tarsal segment whitish. Wings clear hyaline.

Male : Not knwon.

Length : Female 8.5 mm; fore wing 7 mm; ovipositor sheath 2.5 mm.

Distribution : India : Meghalaya (Khasi Hills).

This species is close to *S. doonense* Jonathan & Gupta by having the apical carina of propodeum complete and face largely rugose. It, however, differs from that species by having malar space 0.75× the basal width of mandible and the frons without carination.

12. ***Skeatia doonense*** Jonathan & Gupta (Fig. 82 : c–f)

1973. *Skeatia doonense* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 122. Female, key, des., fig. Type: Female, India : Uttaranchal : Dehra Dun (DEHRADUN).

1987. *Skeatia doonense* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 850.

This is a distinct species with the face rugose, metapleurum strongly wrinkled (tending to be reticulate), with longitudinally running striations basad of basal carina; apical carina of the propodeum absent. The lateral carina of scutellum yellow marked and the head largely black.

Female : Head and thorax covered with dense hairs. Face dull and rugose. Clypeus subpolished, sparsely punctate, apical margin impressed and shiny. Mandible subpolished with subequal teeth. Malar space finely granulose, 0.57× the basal width of mandible. Frons below ocellar triangle rugose and also with oblique striae on either side of median carina, carina extends from the base of median ocellus to middle of antennal sockets, frons at sides shallowly and sparsely punctate, punctures running into fine, striations. Vertex minutely and shallowly punctate. Temple minutely punctate. Pronotum in its lower half coarsely wrinkled except at the extreme lower margin punctate, upper half puncto-rugose, epomia reaching to upper margin of pronotum then turned mesad. Mesoscutum densely and minutely punctate, striate or aciculate along the margins of each lobe. Scutellum minutely punctate, lateral carina extending to its basal 0.4. Mesopleurum strongly rugose, rugae tending to be transverse, rugae stronger along the inner margin of prepectal carina and speculum, area below sternaulus puncto-striate, prepectal carina extending 0.85 the height of mesopleurum. Metapleurum strongly rugose, juxtacoxal carina present. Propodeum wrinkled, tending to be reticulate towards the apex, area basad of basal carina punctate, punctures running into longitudinal striations, apical carina complete, apophyses long and pointed, basal carina straight, spircles longish oval. Areolet pentagonal, 7× as high as the width of bordering veins, intercubiti convergent. First tergite in the middle granulose with a few scattered shallow punctures, its apex and base smooth and shiny, second and third tergites closely but shallowly punctate, the following subpolished. Ovipositor as in figure (82 : f).

Black. The following are yellow : Mandible, except the apex, pronotal collar, upper margin along the anterior part of epomia, scutellum, its lateral carina (Fig. 82 : c), metascutellum, tegula, subtegular ridge, two elongate triangular marks on propodeum, apices of first and second tergites, extreme apical margin of third tergite very faintly, apex of sixth tergite narrowly in the middle, seventh and eighth tergites broadly in the middle (Fig. 82 : d). Fore coxa and first trochanteral segment yellow, second trochanteral segment and femur light orange, tibia yellow, tarsus dark brown, except basal 0.75 of first segment yellowish-

brown. Middle coxa yellowish with dark brown tinge at the apical half, trochanter and femur dark orange, tibia dirty yellow, except at the base dark brown, tarsus dark brown. Hind coxa trochanter and femur reddish-brown, except coxa slightly at apex, trochanteral segments above and femur at apex dark brown; tibia dark brown or blackish, except with a subbasal yellow band, tarsus whitish-yellow, except the basal 0.6 of first segment and fifth segment completely blackish (Fig. 82 : e).

Male : Not Known.

Length : Female 11 mm; fore wing 8.5 mm; ovipositor sheath 3.0 mm.

Distribution : India : Uttaranchal (Dehra Dun).

This species is close to *S. maculifrons* Jonathan & Gupta in having similar marks on propodeum and on lateral carina of scutellum, but the apical carina distinct and complete and the frons black, without any mark.

13. ***Skeatia rugosa*** Jonathan & Gupta (Fig. 83 : a–e)

1973. *Skeatia rugosa* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 124. Female, key, des., fig. Type: Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1235m (GUPTA). India : Meghalaya : Jaintia Hills : Pynursla. 1341 m.

1987. *Skeatia rugosa* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 853.

This species is characterized by having the face, pronotum, mesopleurum and propodeum weakly rugose. All the abdominal tergites with apical bands and the bands on fifth and sixth tergites interrupted in the middle.

Female : Face weakly rugose, at sides granulose or mat. Clypeus indistinctly punctate at base, apical margin impressed, smooth and shiny. Mandible obscurely punctate with subequal teeth. Malar space granulose, 0.8× the basal width of mandible. Antennal scrobes and frons above weakly rugose, with a median longitudinal carina extending from the median ocellus. Vertex subpolished, mat. Temple subpolished. Pronotum subpolished, trans-rugose, pronotal collar smooth, epomia reaching to upper margin then turned mesad. Mesoscutum finely and densely punctate, subpolished. Scutellum subpolished, its lateral carina extending to its basal 0.22, metascutellum subpolished. Mesopleurum finely rugose, speculum dull, puncto-rugulose, prepectal carina extending 0.6 the height of mesopleurum. Metapleurum weakly rugose, juxtacoxal carina present. Propodeum between basal carina and apex wrinkled, area apicad of apical carina with distinct wrinkles, area basad of basal carina weakly puncto-rugulose, apical carina faintly present, apophyses short and conical, basal carina complete, evenly arched, strongly turned forward in the middle, spiracles roundish. Areolet pentagonal, 6× as high as the width of bordering veins, intercubiti convergent; brachiella vein short. First

abdominal tergite granulose in the middle, its base and apex smooth and shiny, second and third tergites densely punctate, the following tergites subpolished. Ovipositor as in figure 83 : e.

Black. Fifth to tenth flagellar segments white above. The following are yellow : face (Fig. 83 : a), clypeus, (except the face below antennal sockets and above clypeal fovae and apical margin of clypeus, blackish), temple, frons and vertex along the eye margin, pronotal collar, upper margin of pronotum, roundish mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, subtegular ridge, speculum, base of hind wing, area below juxtacoxal carina, apical 0.5 of

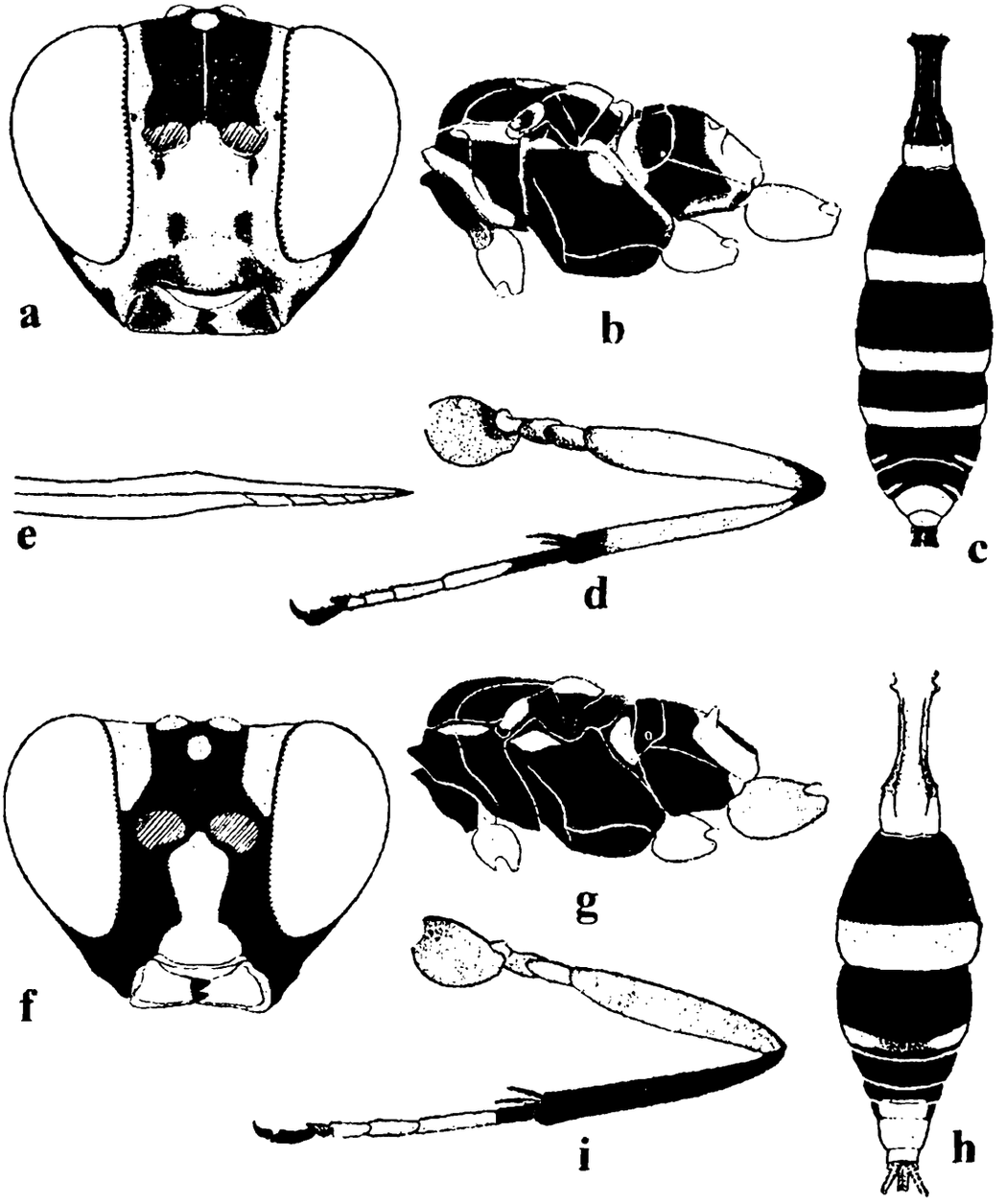

Fig. 83. Colour pattern : *Skeatia rugosa* Jonathan & Gupta : **a**, head front view; **b**, thorax side view; **c**, abdomen dorsal view; **d**, hind leg; **e**, ovipositor tip. *Skeatia mysorensis* J & G : **f**, head front view; **g**, thorax side view; **h**, abdomen dorsal view; **i**, hind leg.

propodeum (Fig. 83 : b), apices of first to fourth tergites, fifth and sixth narrowly at sides, seventh and eighth tergites largely (Fig. 83 : c). Fore coxa and trochanter yellow, femur and tibia dark orange, except tibia infuscate above, tarsus blackish-brown, except the fifth segment dark brown. Middle leg with coxa and first trochanteral segment dirty yellow, its second trochanteral segment, femur and tibia dark orange, tarsus infuscate. Hind coxa reddish, trochanter, femur and tibia, dark yellow, except the trochanter with marks, extreme apex of femur, apex and base of tibia, dark brown; hind tarsus white with basal 0.5 of first segment and whole of fifth segment blackish (Fig. 83 : d).

Male : Not Known.

Length : Female 6–7.5 mm; fore wing 5–6 mm; ovipositor sheath 3–4 mm.

Distribution : India : Meghalaya (Cherrapunji, 1235m, in Khasi Hills, Pynursla, 1341 in Jaintia Hills).

14. ***Skeatia mysorensis*** Jonathan & Gupta (Fig. 83 : f–i)

1973. *Skeatia mysorensis* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 117. key, des., fig. Type: Female, India : Karnataka : Bhagmandla, 853 m. (GUPTA). India : Karnataka : Kottegehar, 640 m; Mercara, 1219 m; Londa, 609m; Murnad, 609 m; Anmod, 761 m; Mudigere, 609 m; Gunji, 609 m; Bangalore. Maharashtra : Panhala Fort, 914m; Nagpur. Jharkhand : Ranchi : Namkum. Assam : Gauhati. Meghalaya : Khasi Hills : Cherrapunji, 1235m. Kerala : Walayar Forest. Tamil Nadu : Kadamparai.

1987. *Skeatia mysorensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 852.

This is a distinct species, having the malar space more than 1.0× the basal width of mandible, antennal scrobes distinctly separated by a median V-shaped ridge and mesoscutum being aciculo-punctate. The apical slope of propodeum with two yellow elongate lateral marks (Fig. 83 : g).

Female : Face rugulose in the middle, rugose at sides. Clypeus convex, apical margin impressed, shallowly punctate. Mandible subplished with subequal teeth. Malar space granulose, 1.16× the basal width of mandible. Antennal scrobes separated by a V-shaped ridge, below ocellar triangle obliquely, coarsely and irregularly striate, at sides somewhat granulose or mat. Vertex subpolished, minutely punctate; temple rough. Pronotum subpolished, striate in the middle, striae irregular, finely obliquely striate above at upper margin, epomia reaching to the upper margin of pronotum. Mesoscutum aciculo-punctate, distinctly punctate in the middle of each lobe. Scutellum smooth and shiny, obscurely punctate, lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum strongly rugose, tending to be reticulate, speculum smooth and shiny, just below sternaulus finely striate, ventrally punctate, prepectal carina extending 0.7 the

height of mesopleurum. Metapleurum reticulate, juxtacoxal carina present. Propodeum reticulo-wrinkled, area below apophyses at sides somewhat transstriate, area basad of basal carina usually complete, apophyses moderately large, basal carina straight, somewhat conical in the middle with two longitudinal stumps of carinae, spiracles roundish oval. Areolet pentagonal, 6× as high as the width of bordering veins. First tergite largely subpolished and smooth, except in middle near spiracles with a few scattered shallow punctures, second and third tergites closely punctate, punctures on second tergite more densely crowded than on third; fourth tergite also punctate, but only at the extreme base and sides, the following tergites mat and subpolished.

Black. Fifth to tenth flagellar segments white above. The following are yellow : face (Fig. 83 : f) with an elongate mark, clypeus, mandible, except at apex, orbital stripes elongate reaching down below the level of median ocellus, a narrow line at upper margin of pronotum, scutellum, metasctellum (less distinctly), tegula, subtegular ridge, base of hind wing, shield-shaped mark (Fig. 83 : g) on propodeum (except a broad black line at its petiolar region), apices of first to third and fifth to eighth tergites, except the band on third tergite faint and somewhat interrupted in the middle, bands on fifth and sixth tergites incomplete at sides, while bands on seventh and eighth very broad (Fig. 83 : h). First tergite at base slightly to largely reddish; fore and middle legs with coxae and trochanters, yellow, femora light to dark orange, tibiae dark yellow and somwhat infuscate, tarsi brown with their fifth segment dark brown. Hind coxa, trochanter and femur dark orange, tibia largely blackish with yellowish tinge except at apex and base dark brown or black, tarsus white or light yellow with basal 0.3 of first segment and fifth segment completely blackish, fourth segment somewhat brown (Fig. 83 : i).

Male : Not Known.

Length : Female 7–10 mm; fore wing 5.5–7; ovipositor sheath 2–3 mm.

Distribution : India : Assam (Gauhati). Jharkhand (Ranchi, Namkum). Meghalaya (Cherrapunji, 1235 m in Khasi Hills). Kerala (Walayar Forest). Tamil Nadu (Kadamparai). Maharashtra (Panhala Fort, 914 m; Nagpur). Karnataka (Bhagmandla, 853 m; Kottegehar, 640 m; Mercara, 1219 m; Londa, 609 m; Murnad, 609 m; Anmod, 761 m; Mudigere, 609 m; Gunji, 609 m; Banglore).

15. ***Skeatia onusta*** (Walker) (Fig. 84 : a, b)

1859. *Cryptus onustus* Tennent, Ceylon : An Account of the land ... with Notices of its Natural History....and Productions (Edition 3), **1** : 282. Nomen nudum. Sri Lanka.

1860. *Cryptus* ? *onustus* Walker, *Ann. & Mag. Nat. Hist.*, (3) **5** : 306. Female. des. Type : Female, Sri Lanka (LONDON).

1961. *Goryphus onusta* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst,* **1** : 154. n. Comb. Sri Lanka.

1973. *Skeatia onustus* : Janathan & Gupta, *Oriental Ins. Monogr.*, **3** : 128. Female. n. Comb., key, des., fig. India Karnataka : Gunji, 609m. Sri Lanka.

1987. *Skeatia onustus* : Gupt, *Mem. Amer. Ent. Inst.*, **41** : 852.

This species is distinguished from the other species by having the face and clypeus black, propodeum with two small oval marks, including apophyses and first tergite reddish. Frons above coarsely striate and the mesopleurum is distinctly punctate.

Female : Face strongly rugose. Clypeus subpolished, distinctly and closely punctate at the base, tending to be smooth towards apex, apical margin impressed, slightly truncate in the middle. Mandible distinctly punctate, smooth and shiny at the apex, teeth subequal. Malar space granulose, 0.57× the basal width of mandible. Frons with antennal scrobes depressed, trans-striate below ocellar area, median longitudinal carina short, extending from the median ocellus, at sides frons rugulose. Vertex indistinctly punctate. Temple punctate. Pronotum

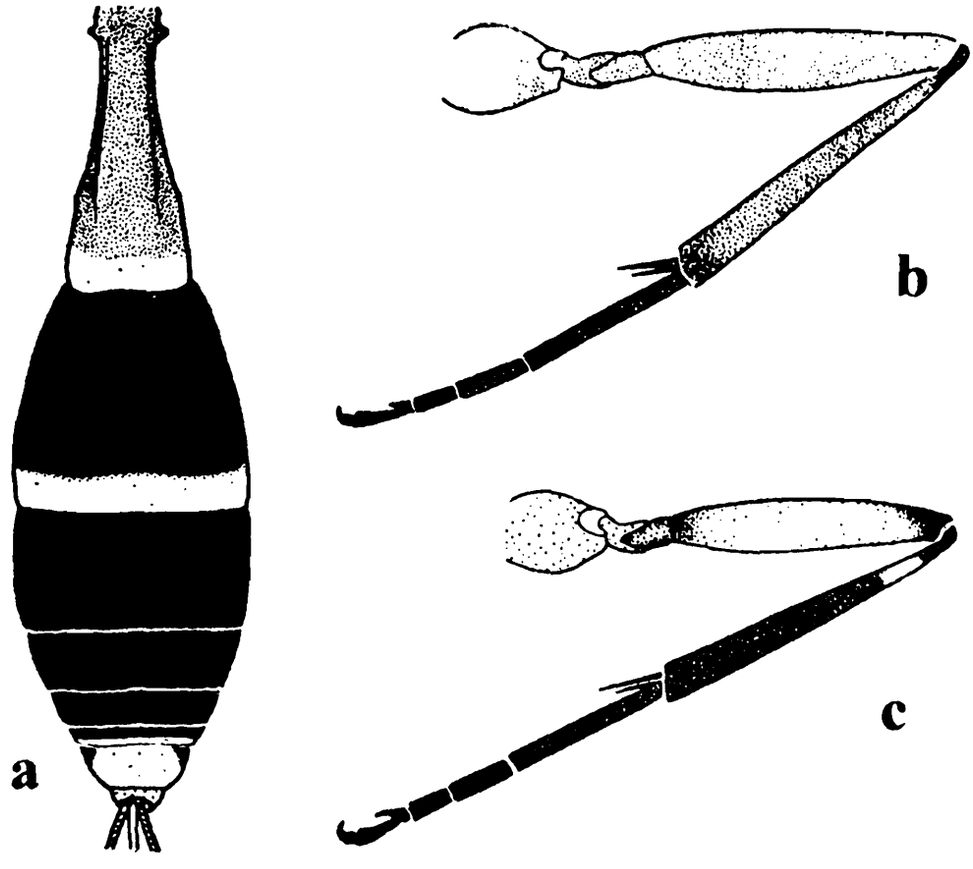

Fig. 84. Colour pattern : *Skeatia onusta* (Walker) : **a**, abdomen dorsal view; **b**, hind leg. *Skeatia nigropetiolata* Jonathan & Gupta : **c**, hind leg.

subpolished, trans-striate in the middle, obliquely and irregularly striate above, pronotal collar smooth, epomia strong, reaching to upper margin, then turned mesad. Mesoscutum subpolished minutely punctate. Scutellum subpolished and punctate, lateral carina extending to its basal 0.2. Metascutellum smooth and shiny. Mesopleurum strongly trans-rugose, speculum distinctly punctate, area below sternaulus distinctly punctate, prepectal carina extending 0.8 the height of mesopleurum. Metapleurum striato-rugose, juxtacoxal carina obscure. Propodeum strongly wrinkled between basal carina and apex, tending to be reticulate, area below apophyses with regular transverse wrinkles, apical carina complete, strongly turned forward in the middle, basal carina straight at sides, broadly arched in the middle, spiracles large and longish-oval. Areolet pentagonal, 5× as high as the width of bordering veins, intercubiti parallel. First tergite smooth and shiny, second and third tergites minutely and finely punctate, the following tergites subpolished.

Black. Fifth to tenth flagellar segments white. The following are yellow : an obscure mark above on face, elongate orbital marks on frons extending far below the level of median ocellus, a mark at the anterior margin of pronotal collar, tegula, subtegular ridge, scutellum, metascutellum, two marks on either side of propodeum including apophyses, apex of first tergite irregularly, second tergite with a regular band, sixth narrowly at apex and seventh and eighth tergites broadly (Fig. 84 : a). Rest of first tergite dark orange; fore, middle and hind legs (Fig. 84 : b) largely orange, except fore and middle coxae and their trochanters yellow with orange tinge and all the tarsi tending to be more dark orange to light brownish.

Male : Not Known.

Length : Female, 10.5 mm; fore wing 7.5 mm; ovipositor sheath 3.0 mm.

Distribution : India : Karnataka (Gunji, 609m). *Elsewhere :* Sri Lanka.

16. ***Skeatia nigropetiolata*** Jonathan & Gupta (Fig. 84 : c)

1973. *Skeatia nigropetiolata* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 130. Female. key, des., fig. Type : Female, Myanmar : Myitkyina Res. : Funkaung Road Sadon (STOCKHOLM).

1987. *Skeatia nigropetiolata* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 852.

This species looks similar to *S. onusta* (Walker) in its general structure and colour pattern, but can be distinguished by having lateral carina of scutellum extending up to its basal 0.4; mesopleurum trans-rugose above; metapleurum and propodeum largely strongly wrinkled and frons and first tergite black.

Female : Face strongly rugose. Clypeus closely and shallowly punctate at base, smooth and shiny towards the apex. Mandible minutely and closely punctate, teeth subequal. Malar space granulose, 0.5× the basal width of mandible. Frons largely shallow and wrinkled, trans-wrinkled towards the antennal sockets, a strong median longitudinal carina extending down from the median ocellus. Vertex closely and shallowly punctate. Temple distinctly punctate. Pronotum coarsely striate in the middle, obliquely striate above, extreme upper margin distinctly, and lower margin faintly punctate, epomia extending up to upper margin, then turned mesad. Mesoscutum closely punctate; scutellum subpolished, minutely and shallowly punctate, lateral carina extending to its basal 0.4; metascutellum smooth and shiny. Mesopleurum largely rugose, trans-rugose above, speculum subpolished distinctly punctate, just below sternaulus faintly punctate, prepectal carina extending almost up to the base of subtegular ridge. Metapleurum wrinkled, juxtacoxal carina not well defined; propodeum between basal carina and apex strongly wrinkled, tending to be reticulate, basad of basal carina punctate, punctures strongly running into striations, spiracle large and longish; basal carina strongly turned forward in the middle, apical carina complete, evenly arched in the middle, apophyses moderately long and pointed. Areolet higher than wide, about 5× as high as the width of bordering veins. First tergite smooth and subpolished with a few scattered punctures in the middle, second and third tergites densely punctate, punctures small, the following tergites mat and subpolished. Ovipositor tip long and pointed.

Black. Fifth to tenth flagellar segments white above. The following are yellow : clypeus, face sometimes in the middle, pronotal collar above, scutellum, metascutellum, subtegular ridge, obscure mark at the base of hind wing, two crescentic marks on either side of propodeum including apophyses, apices of first, second and sixth tergites narrowly, seventh and eighth tergites broadly. Fore and middle coxae and trochanters yellow, femora and tibiae yellowish-brown, their tarsi brown. Hind coxa, trochanter and femur yellowish-brown, except trochanter, femur at apex, tibia and tarsus wholly, dark brown to blackish, hind tibia with a subbasal yellowish band (Fig. 84 : c). Wings clear hyaline.

Male : Not Known.

Length : Female, 9.5 mm; fore wing 7 mm; ovipositor sheath 3.5 mm.

Distribution : Myanmar (Myitkyina).

10. Genus ***Perjiva*** Jonathan & Gupta (Fig. 85 : a–c)

1973. *Perjiva* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 141. Type-species : *Perjiva namkumense* Jonathan & Gupta; original designation.

Distribution : Oriental Region.

This genus is mainly distinguished by having apex of clypeus broadly truncate, with a small subapical median tooth. Spiracle of first abdomimal tergite at mid-length or a little behind, and ovipositor strongly laterally compressed.

Head large, broader than long. Clypeus weakly arched, apical margin broadly truncate, apical margin with a subapical tooth, lateral margin of clypeus somewhat dilated. Malar space almost as wide as the basal width of mandible; mandible with subequal teeth. Antennal scrobes shallow. Pronotum little small in size. Epomia strongly reaching to upper margin then turned mesad. Lateral carina of scutellum confined to its base. Prepectal carina extending 0.5-0.6 the height of mesopleurum, sternaulus moderately deep, extending more than 0.75 the distance to middle coxa; juxtacoxal carina weakly present or absent. Propodeum little longer in profile, basal carina present, apical carina not distinct, or absent, apophyses like very weak crests, area basalis wide, spiracle small, round or oval. First abdominal tergite short, about, 1.6× as long as wide at apex, spiracles present at mid-length or a little behind, dorso-median carinae weakly and dorso-lateral carina strongly present, ventro-lateral carina and ventral angulation

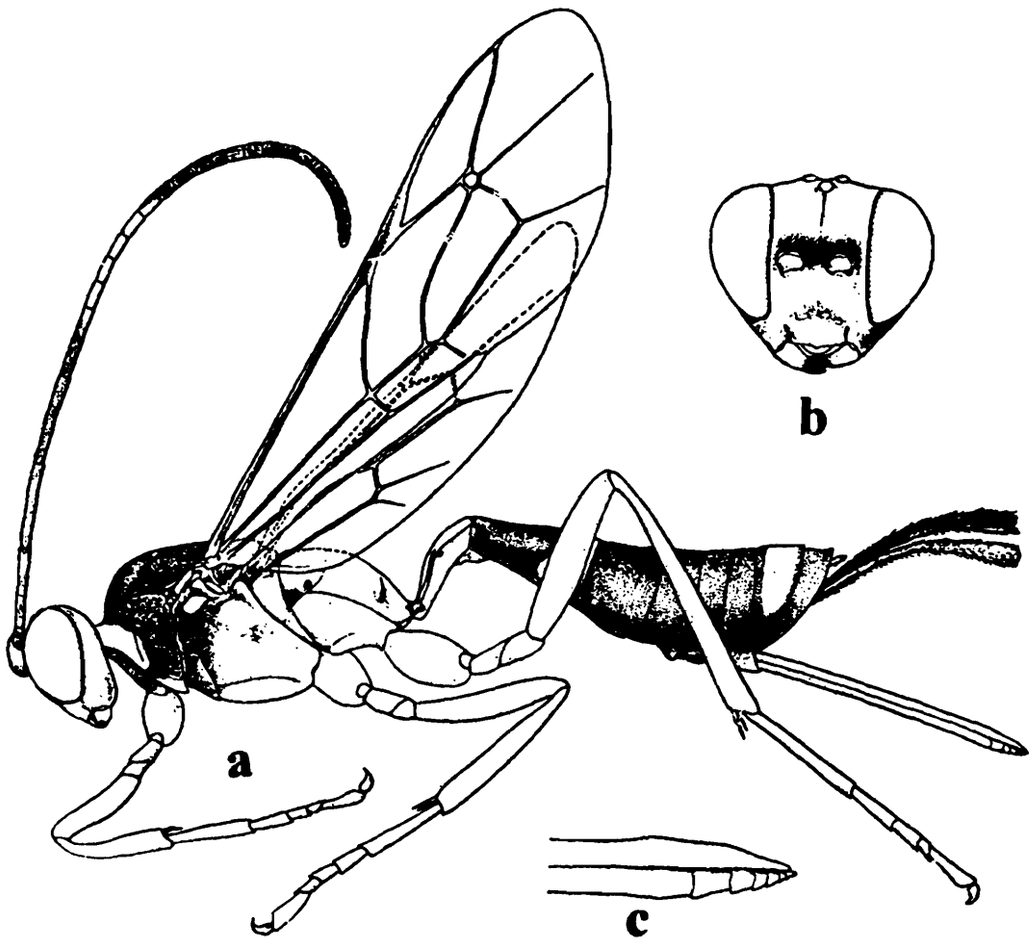

Fig. 85. *Perjiva* Jonathan & Gupta (*Perjiva namkumense*) : **a**, body side view; **b**, head front view; **c**, ovipositor tip.

present, base of the tergite with acute lateral teeth-like projections. Areolet quadrish or pentagonal, about 5× as high as the width of bordering veins, intercubiti parallel or subparallel, second intercubitus as high or shorter than first, nervulus basad of basal vein, nervellus intercepted below the middle. Ovipositor strongly laterally compressed, lower valve with a few but strong teeth.

Length : Female, 8.5–11.5 mm; fore wing 6.5–8 mm; ovipositor sheath 2–4 mm.

This genus is differentiated from *Goryphus* primarily by the nature of clypeus, shape of propodeum, first tergite and compressed ovipositor.

This genus is known from India and Java. A key to Indian species is given below :

Key to the species of *Perjiva*

1. Mesopleurum largely and first abdominal tergite entirely, red. First tergite without a yellow apical band. Fore wing with or without fuscous mark. Mesoscutum deeply punctate.. 2

— Mesopleurum almost entirely and first abdominal tergite, except apically, black. First tergite with a yellow apical band. Fore wing always with a fuscous mark. Mesoscutum weakly punctate 3

2. Frons just below median ocellus rugose. Punctures on face not running into striations. Mesopleurum below subtegular ridge reticulate, rugose in the middle. Propodeum basad of basal carina punctate, punctures coalescent. India : Jharkhand. ..... 1. *namkumense* Jonathan & Gupta

— Frons just below median ocellus obliquely striate. Punctures on face running into striations. Mesopleurum below subtegular ridge wrinkled, finely and closely reticulate in the middle. Propodeum basad of basal carina wrinkled in the middle, reticulate at sides near spiracles. India : Jharkhand. .... 2. *geminata* Jouathan & Gupta

3. Face deeply punctate in the middle. Frons granulose with a few rugae below ocellar triangle. Propodeum largely reticulo-wrinkled in the middle, basad of basal carina reticulate, spiracle oval. Second intercubitus distinctly shorter than first. Metanotal rim, base of hind wing and metanotum entirely red, without any fuscous marks; eighth tergite with a yellow apical band. India : Uttaranchal ..... 3. *kamathi* Jonathan & Gupta.

— Face ruguloso-punctate in the middle. Frons weakly rugose below ocellar triangle. Propodeum in the middle with fine semicircular carinae, basad of basal carina largely rugoso-punctate, spiracle circular. Fore wing with intercubiti parallel, second intercubitus as high as first. Metanotal rim, base

of hind wing and metapleurum red with fuscous marks; eighth tergite without any apical band. Java .... *semicyclosa* Jonathan & Gupta (not treated in text)

1. ***Perjiva namkumense*** Jonathan & Gupta (Fig. 86 : a–d)

1973. *Perjiva namkumense* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 142. Female. key, des., fig. Type : Female, India : Jharkhand: Ranchi dist. : Namkum (GUPTA).

1987. *Perjiva namkumense* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 854.

This species is distinguished by its subpolished body, distinctly punctate face, mesopleurum in the middle rugose, area below subtegular ridge reticulate, and the propodeum basad of basal carina punctate, the punctures strongly coalescent.

Female : Body largely subpolished. Face distinctly punctate, punctures tending to be sparse towards the eye margin. Clypeus closely and shallowly punctate. mandible dull, with indistinct punctures, teeth subequal. Malar space granulose, 1.0× the basal width of mandible. Frons above weakly rugose, at sides rugulose and with a few shallow punctures, a median longitudinal carina extending from median ocellus. Vertex shallowly punctate. Temple very minutely and sparsely punctate or smooth. Pronotum trans-striate, sometimes wrinkled, area above and pronotal collar weakly punctate, its extreme upper margin weakly wrinkled, epomia strongly reaching upper margin then turned mesad. Mesoscutum closely and moderately deeply punctate, punctures along the margins of each lobe distinctly running into striations. Scutellum with minute, sparse and weak punctures; lateral carina confined to its base. Metascutellum smooth. Mesopleurum in the middle rugose, area below sternaulus weakly punctate, speculum minutely and sparsely punctate, prepectal carina extending 0.55 the height of mesopleurum. Metapleurum finely wrinkled, at some places reticulate, juxtacoxal carina not well defined. Propodeum with area between basal carina and apex wrinkled, reticulate at the side, basad of basal carina punctate, punctures large and strongly coalescent, basal carina strong and straight, except slightly forwarded in the middle, apical carina absent, except present laterally as weak carinae, spiracles small and round. First tergite sparsely punctate, except smooth at apex and base; second to fourth tergites closely punctate, fifth shallowly punctate at base, the following tergites mat and subpolished. Areolet pentagonal, intercubiti subparallel, second intercubitus much shorter than first. Ovipositor strongly compressed (Fig. 86 : d).

Black. Fifth to tenth flagellar segments whitish above. The following are yellow : mandible faintly at base, pronotal collar, tegula, subtegular ridge, scutellum, lateral carina of scutellum, metascutellum, apices of second, seventh and eighth tergites. Posterior half of mesopleurum largely, metanotal rim, base of hind wing,

metapleurum, propodeum and first tergite, red (Fig. 86 : a, b). Fore and middle legs dark yellow, except fore coxa black at its inner side, and their tarsi brown. Hind leg (Fig. 86 : c) reddish except apical segments of tarsus brownish. Fore wing with a fuscous mark in the middle.

Male : Not Known.

Length : Female, 8–9.5 mm; fore wing 6–7 mm; ovipositor sheath 2 mm.

Distribution : India : Jharkhand (Ranchi dist. : Namkum).

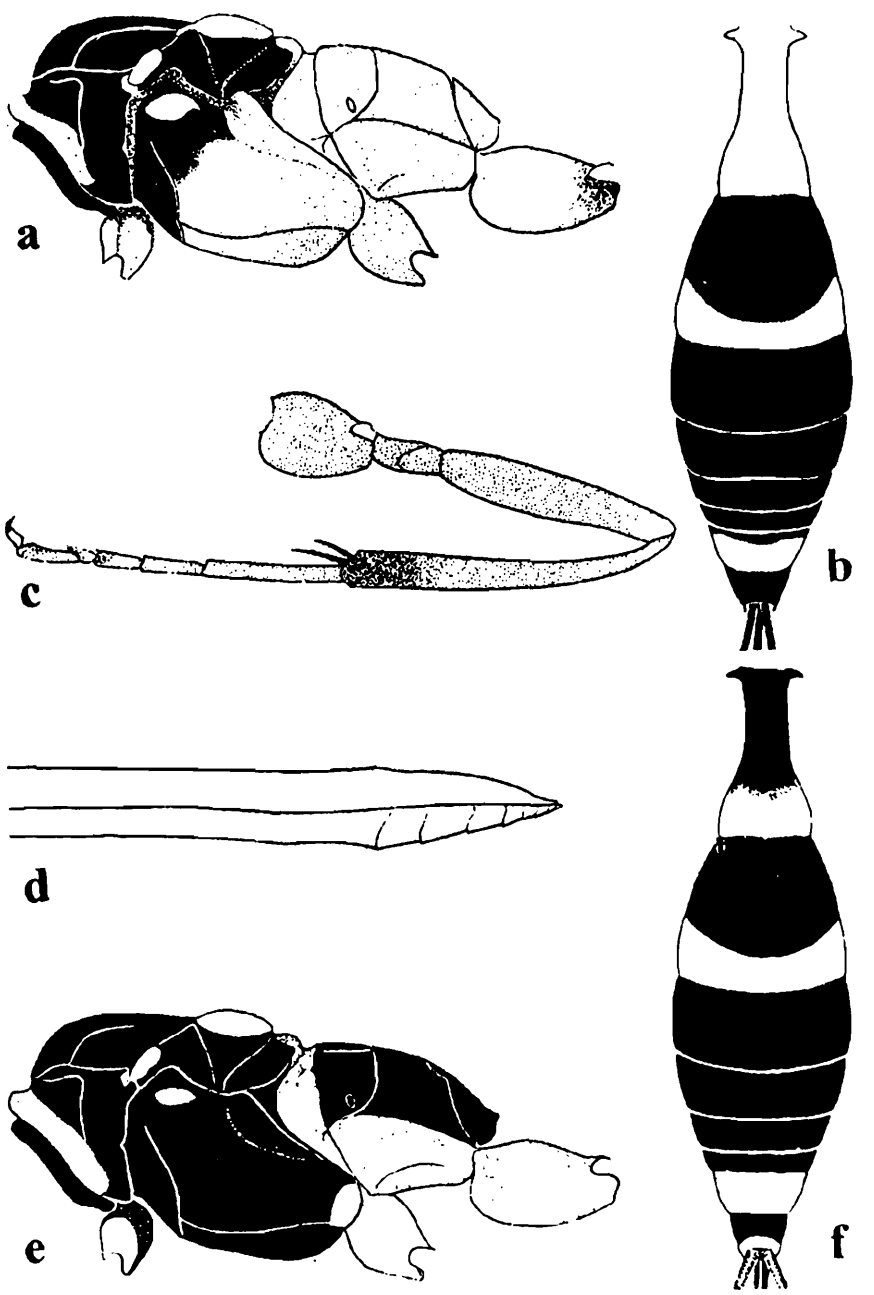

Fig. 86. Colour pattern. *Perjiva namkumense* Jonathan & Gupta : **a**, thorax side view; **b**, abdomen dorsal view; **c**, hind leg; **d**, ovipositor tip. *Perjiva kamathi* J&G : **e**, thorax side view; **f**, abdomen dorsal view.

2. *Perjiva geminata* Jonathan & Gupta

1973. *Perjiva geminata* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 143. Female key, des., fig. Type : Female, India : Jharkhand: Ranchi (GUPTA). India : Jharkhand : Ranchi dist : Namkum.

1987. *Perjiva geminata* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 854.

This species is close to *Perjiva namkumense* Jonathan & Gupta by having mesopleurum and first tergite red and first tergite without having an apical band. It is distinguished by having frons obliquely striate below median ocellus, punctures on face somewhat running into striations. Propodeum basad of basal carina wrinkled in the middle and reticulate at sides.

Female : Body subpolished. Face densely punctate, punctures above and along the eye margin running into striations. Clypeus evenly punctate. Mandible shallowly punctate, teeth subequal. Malar space granulose, 1.0× the basal width of mandible. Frons above and at sides ruguloso-punctate, punctures much shallow and scattered, below median ocellus obliquely striate, sometimes striae irregular and weak, median longitudinal carina present. Vertex minutely punctate. Temple shiny, minutely and sparsely punctate. Pronotum largely trans-wrinkled to striate, sparsely punctate above, extreme upper margin densely reticulate, pronotal collar weakly punctate, epomia reaching upper margin then turned mesad. Mesoscutum closely and moderately strongly punctate, aciculate along the margins of each lobe. Scutellum dull, shallowly punctate, lateral carina confined to its base; metascutellum smooth. Mesopleurum in the middle finely and closely reticulate, tending to be rugose towards the base of middle coxa, area just below subtegular ridge wrinkled, speculum and just below sternaulus shallowly punctate, prepectal carina extending 0.6 the height of mesopleurum. Metapleurum finely wrinkled, tending to be weakly reticulate above along the pleural carina, juxtacoxal carina not well defined, or indistinct. Propodeum between basal carina and apex largely finely reticulate, sometimes finely wrinkled in the middle, reticulate at sides, basad of basal carina wrinkled in the middle, distinctly reticulate laterally near spiracles, basal carina strong and weakly arched in the middle, apical carina absent, laterally present as weak crests, spiracles small and oval. Second to fourth tergites closely punctate, punctures on fourth tending to be shallow and indistinct towards the apex, the following tergites mat and subpolished. First tergite, ovipositor and wings similar to *namkumense.*

Colour almost similar to *P. namkumense* Jonathan & Gupta except fore wing clear and hyaline without a fuscous mark below the stigma.

Male : Not Known.

Length : Female, 8.5–10.5 mm; fore wing 6.5–8 mm; ovipositor sheath 2–3 mm.

Distribution : India : Jharkhand (Ranchi : Namkum).

3. ***Perjiva kamathi*** Jonathan & Gupta (Fig. 86 : e, f)

1973. *Perjiva kamathi* Jonathan & Gupta, *Oriental Ins. Monogr.*, **3** : 144. Female. key, des., fig. Type : Female, India : Uttaranchal : Garjia, 609 m (GUPTA).

1987. *Perjiva kamathi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 852.

This species is mainly characterized by having the face deeply punctate in the middle; frons granulose with a few rugae below ocellar triangle; propodeum largely reticulate to wrinkled, basad of basal carina reticulate; second intercubitus distinctly shorter than first, and the eighth tergite with a yellow apical band.

Female : Body largely subpolished. Face distinctly punctate, punctures moderately deep, tending to be sparse and shallow towards the eye margin. Clypeus coarsely and sparsely punctate, smooth and shiny at the apex. Mandible with indistinct punctures, teeth subequal. Malar space granulose, 1.0× the basal width of mandible. Frons above somewhat granulose with a few rugae, at sides mat and with a few minute punctures, median longitudinal carina indistinct. Temple shiny, sparsely and minutely punctate. Vertex all over minutely punctate. Pronotum coarsely striate, upper margin deeply punctate, pronotal collar and towards the lower margin with a few punctures, epomia strongly reaching upper margin, then turned mesad. Mesoscutum closely and moderately deeply punctate, lateral carina not extending beyond its basal 0.2. Metascutellum smooth. Mesopleurum largely finely reticulate, at some places tending to be wrinkled, below sternaulus and speculum minutely punctate, prepectal carina extending 0.7 the height of mesopleurum. Metapleurum reticulate, tending to be wrinkled below, juxtacoxal carina not defined (absent). Propodeum between basal carina and apex reticulo-wrinkled, apical carina absent, crest hardly present, basad of basal carina largely reticulate, basal carina strong, weakly turned forwad in the middle, spiracle moderately large, oval. First abdominal tergite short, its spiracles just in the middle, tergite dorsally and laterally strongly punctate, except its extreme apex and base smooth, second to fourth tergites closely punctate, punctures on fourth tergite shallow, the following tergites mat and subpolished. Areolet pentagonal, intercubiti subparallel, second intercubitus much shorter than first intercubitus.

Black. Fifth to tenth flagellar segments white above. The following are yellow : mandible at base, scutellum, pronotal collar, tegula, subtegular ridge, apices of first, second, seventh and eighth tergites (Fig. 86 : e, f). Metanotal rim, metascutellum, base of hind wing, a mark on mesopleurum just above middle coxa, metapleurum and propodeum, red. Legs largely dark yellow, except fore coxa at base blackish; fore and middle tarsi brown. Hind leg somewhat reddish, except apical segments of tarsus tending to be brown. Fore wing with a fuscous mark.

Male : Not Known.

Length : Female, 8.5 mm; fore wing 6.5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Uttaranchal (Garjia, 609m).

11. Genus ***Fotsiforia*** Seyrig (Fig. 87 : a–c)

1952. *Fotsiforia* Seyrig, *Mem. Acad. Malgache,* **19** [39] : 190. Type-species : *Fotsiforia carinifrons* Seyrig; Original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 144 (as a Syn. of *Isotima).* Townes, 1970 : 265 (as a syn. of *Isotima*). Jonathan, 1980 : 13.

Distribution : Afrotropical and Oriental regions.

This genus has a strong and long epomia, which is reaching up to the upper margin of pronotum, then turned mesad, usually ending in an elevated area. Brachiella complete and reaching more or less up to the wing margin. Apical margin of clypeus weakly truncate. The first abdominal tergite 2× as long as broad at apex, postpetiole broader than long. Nervulus always basad of basal vein.

Female : Head moderately large, broader than long. Face in the middle and sublaterally weakly raised. Clypeus weakly convex, apical margin impressed, blunt (weakly truncate) without any tooth or irregularity. Mandible thick, teeth small, more

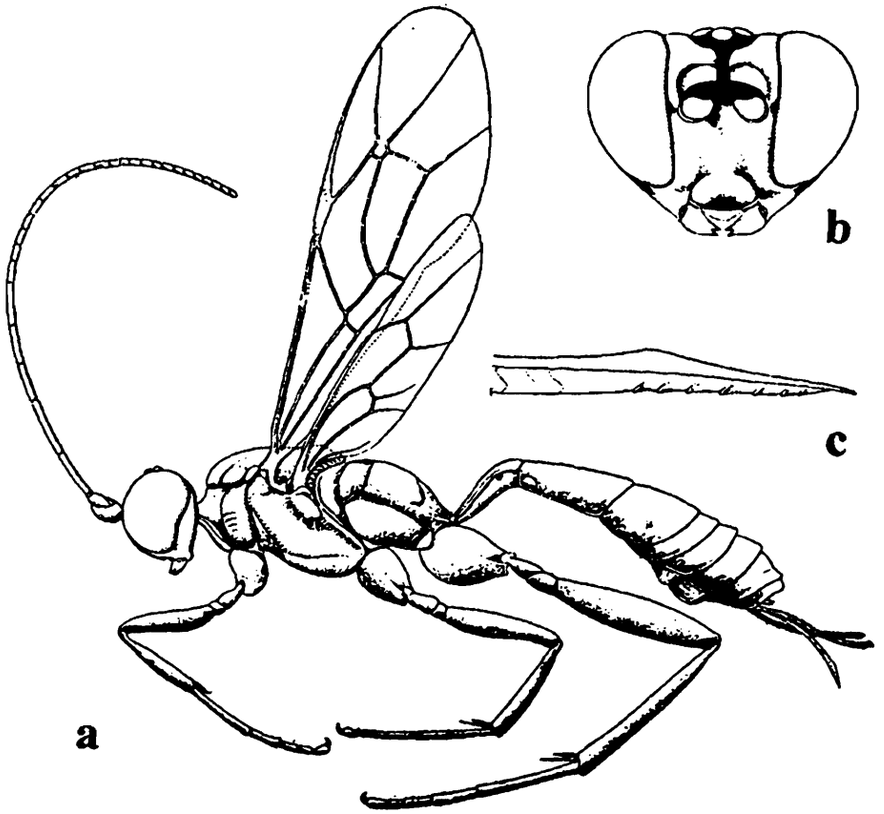

Fig. 87. *Fotsiforia* Seyrig : *Fotsiforia assamensis* Jonathan : **a**, body side view; **b**, front view of head; **c**, ovipositor tip.

or less equal, pointed. Frons sloping outwards from the median ocellus; appears to be more horizontal. Antennal scrobe shallow bounded by a distinct carina. Epomia strongly reaching to upper margin, then turned mesad forming an elevation. Lateral carina of scutellum either confined to its base or extending more than 0.75× its length. Prepectal carina extending 0.75× or more, the heigh of mesopleurum, sternaulus extending 0.5 to 1.0 the base of middle coxa. Both the transverse carinae of propodeum present, apical carina present or sometimes absent in the middle, carinae moderately to strongly turned forward in the middle, apophyses low crest-like to strong and long. First abdominal tergite short, about 2× as long as broad at the apex, its spiracles close to the apex than to each other, spiracles somewhat projecting. Base of the tergite with lateral tooth-like projections, dorsolateral carina present, extending the full length or sometimes short, dorso-median carina present or absent, ventro-lateral carina weakly or strongly present; second abdominal tergite longer than first, about 1.25× as long as first tergite. Areolet somewhat broader than high, pentagonal, second intercubitus faint, distinctly shorter than first, second recurrent vein strongly curved in the middle nervulus basad of basal vein, somewhat sloping towards the base, nervellus intercepted at or little below or above the middle, brachiella present, extending more than 0.5 the distance to wing margin. Ovipositor moderately long, weakly arched in the middle or straight, tip long and lower valve with series of teeth.

Length : Female, 6.5–8 mm; fore wing 4.5–6 mm; ovipositor sheath about 1.5 mm.

Type species : *Fotsiforia carinifrons* Seyrig.

This is a small genus known from Afrotropical and Oriental regions. Jonathan (1980 : 13) reported six species : *F. carinifrons* from Madagascar & Ghana; *F. flavrifrons* and *F. similis* from Philippines and *F. mysorensis; F. assamensis* and *F. sundrica* from India. A key to Indian species is as follows :

A key to species of *Fotsiforia*

1. Thorax largely black; variously marked with yellow : pronotal collar and upper margin of pronotum, tegula, subtegular ridge, scutellum, base of hind wing, trilobate mark apically on propodeum. India : Uttaranchal .... 3. *sundrica* Jonathan

– Thorax or atleast propodeum deep orange or red 2

2. Pronotum in the middle largely smooth and shiny with 2-3 striations. Mesopleurum in the middle largely closely punctate, punctures running into striations. Clypeus and mesopleurum, black. India : Karnataka .... 1. *mysorense* Jonathan

– Pronotum subpolished, closely trans-striate in the middle. Mesopleurum finely trans-striate in the middle. Basal half of clypeus, yellow. Mesopleurum red. India : Assam ..... 2. *assamensis* Jonathan

1. ***Fotsiforia mysorense*** Jonathan (Fig. 88 : a–c)

1980. *Fotsiforia mysorense* Jonathan, *Rec. zool. Surv. India, Occ. Paper*, **17**: 16. Female. key, des., fig. Type : Female, India : Karnataka : Bhagmandla, 853 m. (GUPTA).

1987. *Fotsiforia mysorense* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 854.

This species is characterized by having mesopleurum in the middle largely closely punctate, punctures running into striations; malar space about 0.7× the basal width of mandible; propodeum largely reticulate, and by having clypeus and mesopleurum black.

Female : face rugulose, clypeus closely punctuate at base, punctures tending to be shallow and sparse towards the apex, extreme apex smooth and subpolished, apical margin impressed. Malar space rough and granulose, 0.7× the basal width of mandible; mandible largely subpolished, with few punctures, teeth more or less equal. Frons with area around ocelli somewhat rugoso-punctuate, at sides largely smooth with faint indication of shallow punctures, a groove extending down from median ocellus to the middle of antennal sockets. Vertex closely punctuate. Temple subpolished, thickly punctate, punctures towards the base of mandible coalescent. Pronotum largely smooth and shiny except for a few trans-striae in the middle, its extreme upper margin rugulose and pronotal collar faintly punctate, epomia strongly reaching to upper margin, then turned mesad forming an elevation. Mesoscutum subpolished minutely punctuate. Scutullum subpolished shallowly and sparsely punctate, lateral carina confined to its base only. Metascutellum subpolished, hardly punctate. Mesopleurum subpolished, lower half in the middle densely and strongly punctuate, punctures running into striations, upper half in the middle shallowly and sparsely punctuate, striate along the anterior margin of speculum and also along prepectal carina, speculum shiny with faint punctures, mesosternum coarsely punctate, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum subpolished finely wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex finely reticulate, basad of basal carina coarsely and shallowly punctuate, punctures running into striations, extreme base smooth and shiny, apical carina weak, evenly and moderately arched in the middle, basal carina strong, turned forward in the middle, spiracle longish, apophyses low crest-like. First abdominal tergite short, smooth and shiny at apex and base, coarsely and shallowly punctate in the middle, second and third tergites closely punctate, following tergites subpolished. Areolet broader than high, about 0.7× as high as the portion of second recurrent vein above bulla, intercubiti parallel, second intercubitus faint, nervulus distinctly basad, nervellus intercepted at the middle. Ovipositor sheath about 0.6× as long as hind tibia.

Black : Fifth to tenth flagellar segements white above. The following are yellow or pale yellow : face (Fig. 88 : b) completely, mandible (except at the apex), orbital stripes extending from temple to the base of antennal sockets including semicircular

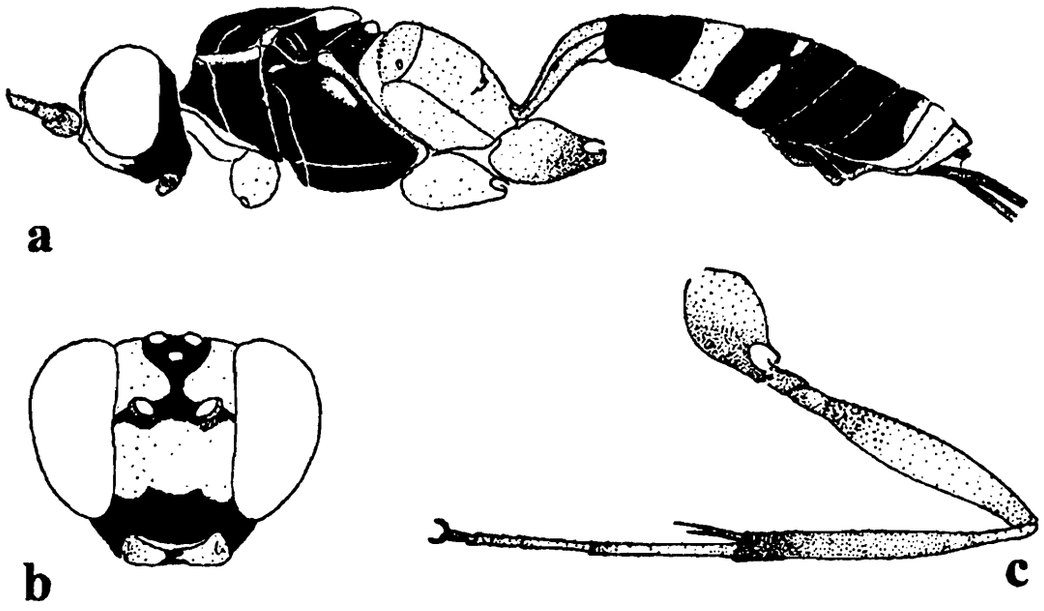

Fig. 88. *Fotsiforia mysorense* Jonathan : Colour pattern : **a**, body side view; **b**, front view of head; **c**, hind leg.

carina, pronotal collar, upper margin of pronotum, tegula, subtegular ridge, speculum, scutellum, metascutellum, base of hind wing narrowly along the lateral margins, propodeum with two lateral marks on apophyses, apices of first, second abdominal tergites, sixth tergite narrowly in the middle, seventh and eighth tergites wholly, third tergite with faint irregular band at apex (Fig. 88 : a). Base of hind wing except a mark, metapleurum, propodeum, first abdominal tergite (except the apical yellow band) dark orange. First tergite blackish in the middle. Fore coxa and first trochanteral segment, yellow; its second trochanteral segment, femur, tibia and tarsus yellowish–brown, except its fifth tarsal segment dark brown. Middle coxa and first trochanteral segment, yellow, second trochanteral segment blackish-brown, femur dark orange, tibia and tarsus yellowish-brown. Hind (Fig. 88 : c) coxa dark orange with a blackish mark apicolaterally, trochanter largely piceous, femur dark orange with its extreme apex and base dark brown, tibia brown, its extreme base and apical 0.2 dark brown and with a subbasal yellowish band, tarsus yellow, clouded with fuscous, its fifth segment dark brown.

Male : Not known.

Length : Female, 7.5 mm; fore wing 5.5 mm; ovipositor sheath 1.75 mm.

Distribution : India : Karnataka (Bhagmandla, 853m).

2. ***Fotsiforia assamense*** Jonathan (Fig. 89 : a–c)

1980. *Fotsiforia assamense* Jonathan, *Rec. zool. Surv. India, Occ. Paper*, **17** : 18. Female. key, des., fig. Type : Female; India : Assam : Charduar Forest near Rangapara (GUPTA).

1987. *Fotsiforia assamense* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 854.

This species is close to *Fotsiforia mysorense* Jonathan. It can be distinguished by having pronotum subpolished, closely trans-striate in the middle; mesopleurum finely trans-wrinkled in the middle; propodeum finely wrinked and mesopleurum largely red (Fig. 89 : a).

Female: face dull, ruguloso-punctate. Clypeus subpolished, its apical 0.25 smooth and shiny, basally shallowly punctate, punctures not well distinct, apical margin impressed and truncate. Malar space strongly granulose, 0.6× the basal width of mandible. Mandible subpolished with more or less equal teeth. Frons with area around ocelli somewhat rugose, at sides shallowly punctate. Vertex distinctly closely punctate. Temple strongly rugoso-punctate. Pronotum subpolished closely trans-striate in the middle, finely obliquely striato-punctate above at upper margin, lower margin smooth. Mesoscutum distinctly punctate. Scutellum faintly punctate, lateral carina confined to its base. Metascutellum punctate. Mesopleurum subpolished, lower half up to sternaulus and along anterior margin of speculum finely trans-wrinkled with punctures in between, upper half in the middle largely smooth with sparse minute punctures, area along prepectal carina trans-wrinkled, area just above sternaulus near prepectal carina punctate, punctures running into irregular striations, speculum shallowly and sparsely punctate, mesosternum closely punctate, punctures tending to be coalescent, just below sternaulus rugoso-punctate, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum strongly rugose, juxtacoxal carina present. Propodeum between basal carina and apex wrinkled, basad of basal carina closely rugoso-punctate, apical carina strongly turned forward in the middle, basal carina more or less straight, spiracles roundish, apophyses very low crest-like. First abdominal tergite short about 2.5× as long as broad at apex, spiracles highly projecting and close to the apex than to each other, dorso-median longitudinal carina absent, tergite smooth and shiny at base, distinctly punctate in the middle, puncture tending to be shallow and sparse towards the apex, second and third tergites closely punctate, following tergites subpolished. Areolet broader than high, more than 0.6× as high as the portion of second recurrent vein above bulla, intercubiti subparallel, second intercubitus faint, nervulus distinctly basad of basal vein; nervellus intercepted at the middle, brachiella present. Ovipositor sheath 0.6× as long as hind tibia.

Black. Antenna with scape and first to third flagellar segments yellowish-brown; sixth to fifteenth segments (fifth slightly apically) white above. The following are yellow or dirty yellow : face wholly (Fig. 89 : b), clypeus basally, mandible (except at the apex), temple below near the base of mandible, two orbital stripes extending from vertex to the base of antennal sockets, upper margin of pronotum, pronotal collar narrowly above and broadly below, subtegular ridge, tegula, speculum, scutellum, metascutellum, two lateral triangular marks on propodeum (Fig. 89 : a), apices of first to third abdominal tergites with bands, sixth tergite narrowly at apex in the middle,

seventh and eighth tergites broadly. Mesopleurum, base of hind wing, metapleurum, metanotal rim, propodeum and first abdominal tergite (except prepectus of mesopleurum blackish, and as mentioned for others above), reddish; middle lobe of mesoscutum also with reddish tinge; fore coxa and trochasnters whitish-yellow; femur, tibia and first, second tarsal segments dark yellow, tibia above and rest of tarsus infuscate, fifth tarsal segment dark brown; middle coxa and trochanter whitish-yellow, femur light orange, tibia yellow, infuscate above. Hind leg (Fig. 89 : c) with coxa reddish, with a apico-ventral black mark, its first trochanteral segment yellow with

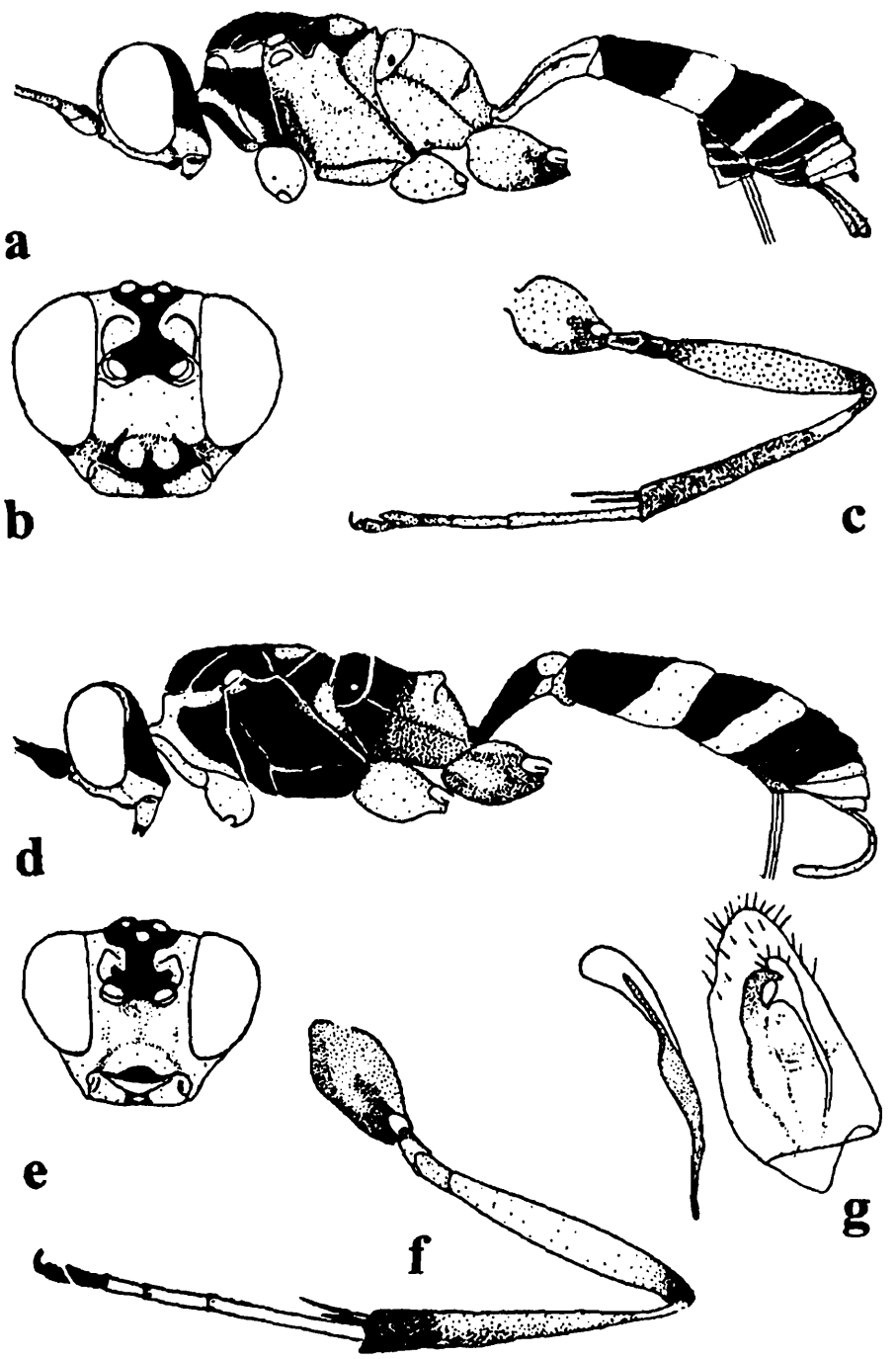

Fig. 89. *Fotsiforia assamense* Jonathan : **a**, body side view; **b**, head front view; **c**, hind leg. *F. sundrica* Jonathan : **d**, body side view; **e**, head front view; **f**, hind leg; **g**, male genitalia.

a piceous mark above, second segment largely blackish-brown, femur reddish-brown, its extreme apex and base blackish, tibia fuscous with a basal yellow band, tarsus whitish-yellow except third segment faintly subapically, fourth and fifth segments blackish or black.

Male : Not known.

Length : Female, 6.5 mm; fore wing 4.5 mm; ovipositor sheath about 1.75 mm.

Distribution : India : Assam. (Charduar Forest in Rangapara dist.)

3. ***Fotsiforia sundrica*** Jonathan (Fig. 89 : d–g)

1980. *Fotsiforia sundrica* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17**: 22, Male, Female. Key, des., fig. Type: Female, India : Uttaranchal : Garjia, 610m (GUPTA). India : Uttaranchal: Sat Tal in Kumaon Hills; 1371 m.

1987. *Fotsiforia sundrica* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 855.

This species can be distinguished by having malar space 0.8× the basal width of mandible. Frons rugose, mesopleurum finely striate, nervellus intercepted at its lower 0.4; face, frons along the eye margin, vertex, temple, malar space, mandible broadly, yellow (Fig. 89 : e).

Female : face largely rugose, somewhat trans-rugose in the middle. Clypeus thickly and deeply punctate, shallowly punctate at sides. Malar space rough, 0.8× the basal width of mandible. Frons weakly rugose. Vertex dull, shallowly punctate. Temple thickly punctate, punctures running into rugosities towards the base of mandible. Pronotum subpolished, striate, obliquely and finely striate at the upper margin; lower margin smooth. Mesoscutum minutely punctate, subpolished. Scutellum largely smooth and subpolished, its lateral carina confined to its base. Mesopleurum largely finely striate, above with a few punctures, speculum shiny, sparsely and minutely punctate, prepectal carina extending 0.8× the heigh of mesopleurum. Metapleurum trans-rugose, juxtacoxal carina present, propodeum between basal carina and apex finely wrinkled, at some places tending to be reticulate, basad of basal carina rugoso-punctate, punctures more defined towards the base, both the transverse carinae complete, apical carina strongly turned forward in the middle, the carina laterally forming weak sublateral crests, spiracle small oval. Areolet little higher than wide, about 0.45× as the portion of second recurrent vein above bulla, nervulus basad, nervellus intercepted at its lower 0.4×. First abdominal tergite with dorso-median longitudinal carinae weakly present, tergite smooth and shiny at apex and base, middle area shallowly punctate, second and third tergites closely punctate, following tergites subpolished. Ovipositor sheath 0.55× as long as hind tibia.

Black. Fifth to eleventh flagellar segments white above. The following are yellow : face (Fig. 89 : e), clypeus (except in the middle to apical margin), frons broadly along

the eye margin, this mark extending on vertex as narrow orbital stripes, mandibles, except the teeth, malar space, upper margin of pronotum, pronotal collar, scutellum, metascutellum, base of hind wing, tegula, subtegular ridge, a somewhat trilobate mark on propodeum (Fig. 89 : d), apices of first to third and sixth tergites, seventh and eighth tergites wholly. Fore and middle legs largely dark yellow, except fore and middle coxae and their trochanters light yellow; and fore tibia and tarsus infuscate. Middle femur, tibia and tarsus largely, infuscate. Hind leg (Fig. 89 : f) largely light orange, its coxa apicobasally, first trochanteral segment, femur at apex, tibia largely (except a yellow subbasal band), fourth and fifth tarsal segments, dark brown to blackish. Wings clear hyaline.

Male : The carina above antennal sockets highly expanded and high like flanges. Pronotum subpolished sparsely but distinctly punctate, and with a few striae in the middle groove. Mesoscutum deeply punctate. Mesopleurum shiny with sparse and deep punctures, near speculum and above sternaulus rugoso-punctate, speculum smooth and polished. Metapleurum punctate. Propodeum largely rugose, basad of basal carina with few punctures, apical carina and lateral crests obscured. Genitalia as in figure 89 : g.

Black. Eleventh to twenty-eighth flagellar segments white; head largely (except ocellar triangle, area around the triangle, vertex, and back of head, black), pronotal collar, upper margin of pronotum, subtegular ridge, upper part of speculum, tegula, scutellum metascutellum, base of hind wing, apices of all the abdominal tergites, fore and middle coxae and their trochanters, yellow. Fore femur dark yellow, tibia and tarsus yellowish-brown, its fifth tarsal segment dark brown. Middle femur and tibia brownish-yellow, somewhat infuscate above, its tarsus brown. Hind coxa and femur orange, except coxa below and at apex, femur at its apical 0.2, trochanters largely, blackish. Hind tibia dark brown with a yellow subbasal band, tarsus white, except its fifth segment dark brown. Propodeum dark orange, except black at base.

Length : Female, 8 mm; fore wing 6 mm; ovipositor sheath 1.5 mm. Male, 7.5 mm; fore wing 5.5 mm.

Distribution : India : Uttaranchal (Garjia, 610 m).

12. Genus ***Gambroides*** Betrem (Fig. 90 : a–c)

1941. *Gambroides* Betrem, *Treubia*, **18** : 67. Type-species : *Eripternimorpha javensis* Rohwer; original designation.

1952. *Vadonia* Seyrig, *Mem. Acad. Malgache*, **19**[39] : 181. Type-species : *Vadonia nimbipennis* Seyrig; original designation. Syn. by Jonathan, 1980. (Previously synonymized under *Isotima* by Townes, Townes & Gupta, 1961).

Taxonomy : Townes, Townes & Gupta, 1961 : 144. (as a syn. of *Isotima).* Townes, 1970 : 265 (as a syn. of *Isotima).* Jonathan, 1980 : 24. Gauld, 1984 : 155.

Host : Graminaceous stem-boring Lepidoptera.

Distribution : Afrotropical and Oriental regions. Gauld reported a single specimen from Australia, which may be of *G. javensis.*

This genus can readily be distinguished by the absence of distinct epomia, moderately shallow notauli, the absence of sternaulus, prepectal carina extending not beyond 0.5 the height of mesopleurum. First abdominal tergite gradually broadened from base to apex and the postpetiole almost quadrate. Nervellus intercepted above the middle. Thorax much longer in profile.

Head of moderate size, about as broad as long. Clypeus evenly convex, apical margin impressed, without a median tooth or any irregularity. Mandible short and thick, teeth subequal, lower tooth little shorter than upper. Frons flat, not depressed, shallow area above each antennal socket bordered by a semicircular carina, carina always simple in both the sexes. Epomia on pronotum obscured. Notauli shallow. Scutellum flat to moderately convex, its lateral carina extending not beyond its basal 0.3. Prepectal carina short, extending not more than 0.5 the height of mesopleurum,

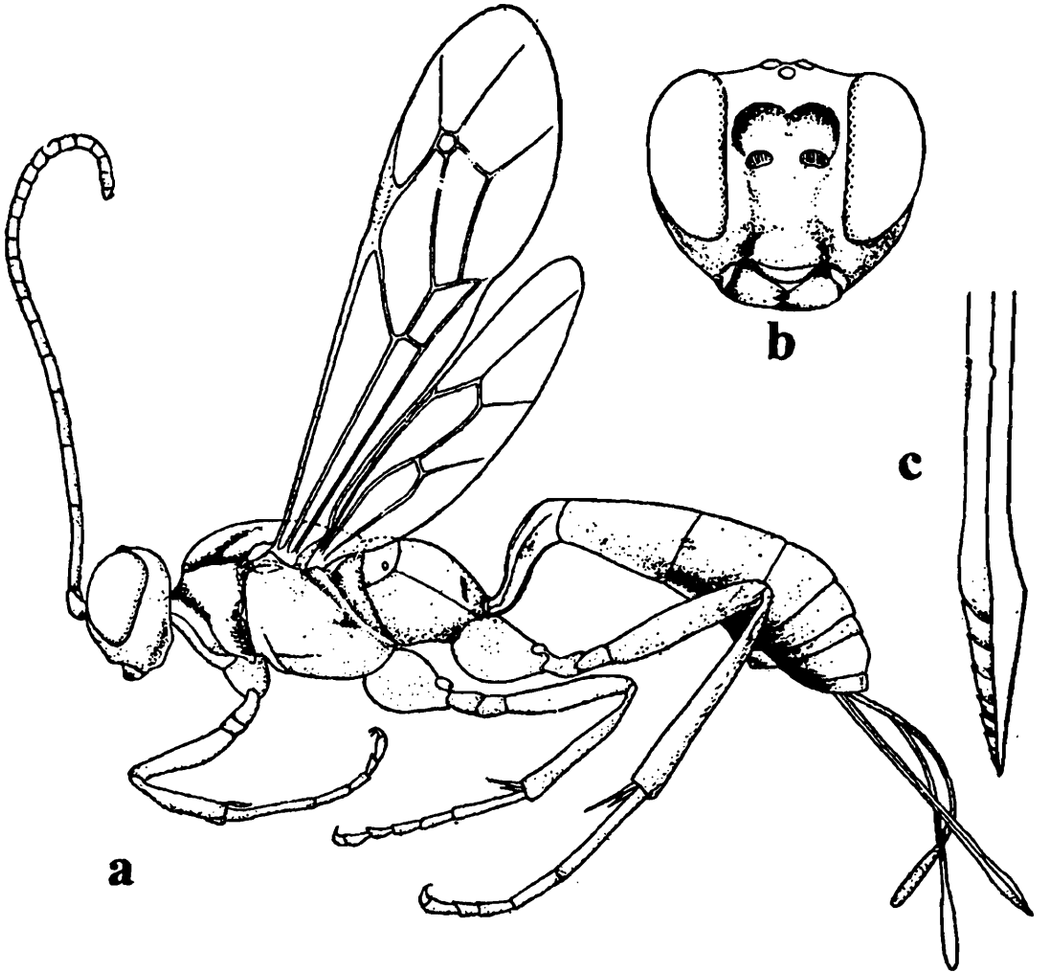

Fig. 90. *Gambroides* Betrem : *javensis* (Rohwer) : **a**, body side view; **b**, head front view; **c**, ovipositor tip.

sternaulus almost obscured or short and weak as in *nimbipennis*. Basal carina of propodeum always present, apical carina present or absent, apophyses weak, crest-like, spiracle small, oval. Areolet moderately large about 1.3 as high as the portion of second recurrent vein above bulla, pentagonal, second intercubitus faintly present, nervulus apicad or distad of basal vein, nervellus intercepted at its upper 0.36–0.4; mediella moderately to strongly arched, brachiella usually entirely absent, except in *nimbipennis* extending 0.5 the distance to wing margin. First tergite short, about 2× as long as wide at apex, lateral tooth present at base, dorso-median and dorso-lateral and ventro-lateral carinae distinctly present, tergite quadrate in cross-section at base, postpetiole more or less as long as wide. Ovipositor long, compressed, tip slightly upcurved and with a distinct nodus.

Length : Female, 7–9.5 mm; fore wing 5–6.5 mm; ovipositor sheath about 2.5–3 mm.

Type-species : *Eripternimorpha javensis* Rohwer.

This is a small genus. It occurs in the Oriental and Ethiopian regions. This genus includes : *Eripternimorpha dammernani* Rohwer (1918); *E. javensis* Rohwer (1918); *Vadonina nimbipennis* Seyrig (1952); *Isotima chilonis* : Townes, Townes & Gupta (1961) and *Gambroides rangaparensis Jonathan* (1980).

Two species are referable to this genus. These can be distinguished by the following key.

A key to the species of *Gambroides*

1. Apical carina of propodeum present. First abdominal tergite red, without an apical yellow band. Malar space 0.75× the basal width of mandible. India : Assam..... 1. *rangaparensis* Jonathan

– Apical carina of propodeum entirely absent. First abdominal tergite also red with a narrow apical yellow band. Malar space 0.6× the basal width of mandible. Widely distributed in India. Indonesia. China. Bangla Desh. Hawaii ..... 2. *javensis* (Rohwer)

1. ***Gambroides rangaparensis*** Jonathan (Fig. 91 : a, b)

1980. *Gambroides rangaparensis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17**: 27. Female key, des., fig. Type : Female, India : Assam : Rangapura : Sonjuli Tea Estate. (GUPTA).

1987. *Gambroides rangaparensis* : Gupta, *Mem. Amer. Ent. Soc.,* **41** : 857.

This species can be recognized by its first abdominal tergite, middle and hind coxae, trochanters and femora red; black mesoscutum. Malar space about 0.75× the basal width of mandible.

Female : Face dull, thickly and strongly punctate all over. Clypeus thickly punctate at the base, sparsely punctate towards the apex, apical margin impressed and truncate. Mandible punctate, punctures running into striations, teeth subequal. Malar space rough, 0.8× the basal width of mandible. Frons dull thickly and strongly punctate. Vertex distinctly punctate, distance between median and lateral ocelli 0.6 as compared to the distance between lateral ocelli. Temple distinctly punctate. Pronotum in its upper half thickly punctate with a few trans-striae in the middle groove, pronotal collar somewhat irregularly wrinkled, lower margin smooth and shiny, epomia absent. Mesoscutum coarsely punctate. Scutellum subpolished, coarsely punctate, lateral carina extending to its basal 0.25 or less, metascutellum subpolished very minutely punctate. Mesopleurum rugose, tending to be coarser above towards the subtegular ridge, area below sternaulus closely punctate tending to be smoother below, sternaulus very short and shallow, prepectal carina extending 0.5 the height of mesopleurum. Metapleurum rugulose, juxtacoxal carina absent. Propodeum between basal carina and apex coarsely rugose, tending to be somewhat wrinkled above in the middle, area basad of basal carina shiny with a few scattered shallow punctures; basal carina strongly arched in the middle; apical carina weakly present, apophyses absent, spiracles moderately large longish oval. First abdominal tergite subpolished, at apex smooth and shiny, both the dorsal longitudinal carinae present; second and third tergites coarsely punctate, punctures tending to be shallow towards the apex, fourth tergite minutely punctate, smooth at its apical 0.5, following tergites subpolished. Fore wing with areolet pentagonal, 1.1× as high as the portion of second recurrent vein above bulla, intercubiti slightly convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted above the middle, brachiella absent. Ovipositor sheath about 1.0× as long as hind tibia.

Black. Sixth to ninth antennal segments (six segment only at the apex and ninth at the base) white above; whole of head pronotum, mesoscutum, tegula and anterior half of mesopleurum, black; posterior half of mesopleurum, scutellum, metascutellum, metapleurum, propodium and first abdominal tergite, reddish (Fig. 91 : a). Second abdominal tergite at the apex, seventh and eighth tergites broadly in the middle (sometime sixth tergite also faintly at the apex in the middle), yellow. Fore leg more or less blackish or black, except tibia slightly yellowish below; middle coxa, trochanter and femur reddish, except trochanter with blackish marks, tibia and tarsus blackish. Hind (Fig. 91 : b) coxa trochanter and femur reddish, except trochanter and apex of femur blackish, tibia and tarsus black. Fore wing with a brown cross band below stigma.

Male : Not known.

Length : Female 8 mm; fore wing 5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Assam (Sonajuli Tea Estate in Rangapara dist.)

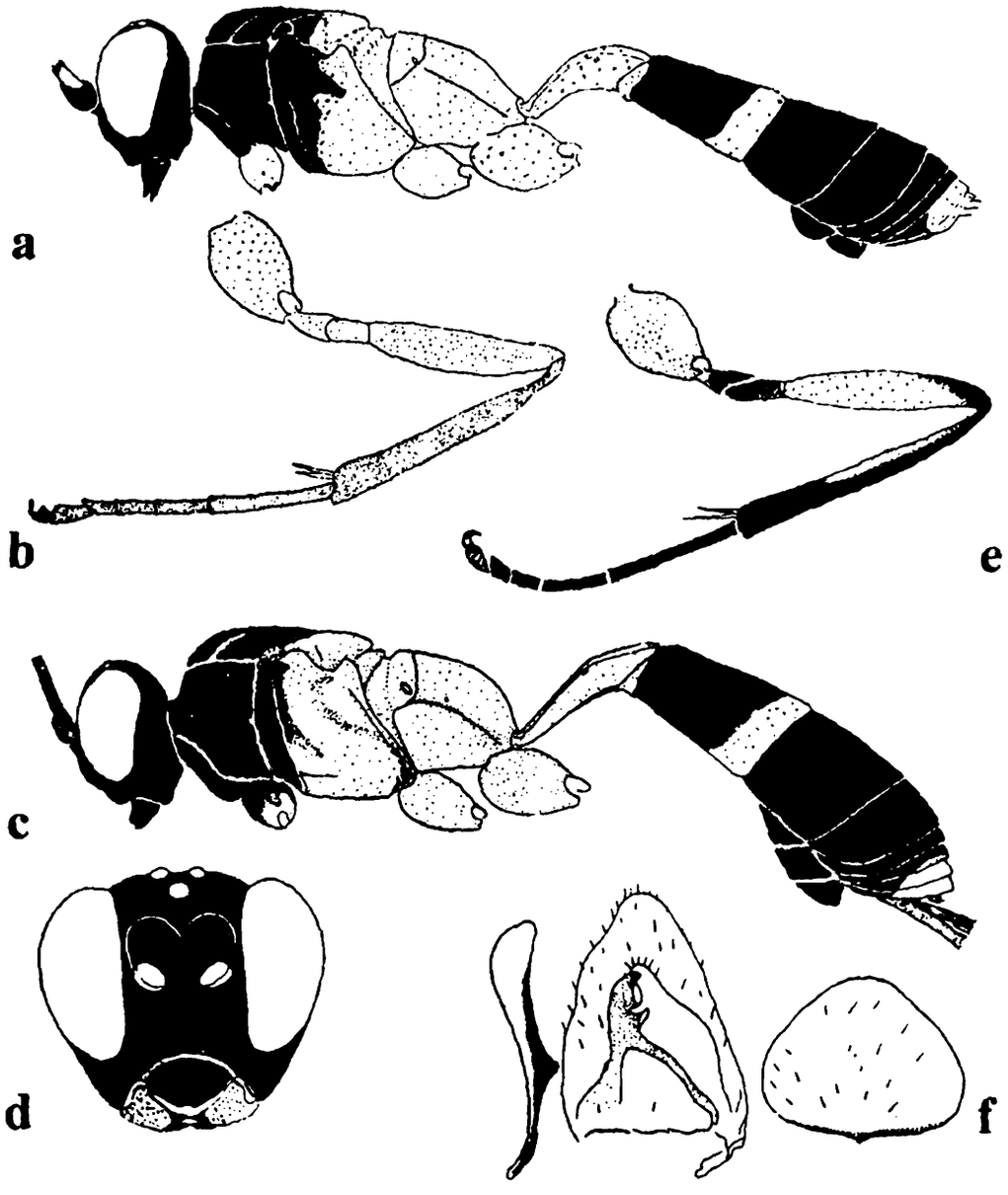

Fig. 91. *Gambroides rangaparensis* Jonathan : Colour pattern : **a,** body side view; **b**, hind leg. *Gambroides javensis* (Rohwer) : Colour pattern : **c**, body side view; **d**, head front view; **e**, hind leg; **f**, male genitalia.

2. ***Gambroides javensis*** (Rohwer) (Fig. 91 : c–f)

1918. *Eripternimorpha javensis* Rohwer, *Proc. U.S. Natl. Mus.*, **54** : 564. Female, key, des. Type : Female, Indonesia : Java : Pasurocan (WASHINGTON). Host: *Scirpophaga excerptalis.*

1919. *Melcha ornatipennis* : Dutt, *Bull. Agri. Res. Inst. Pusa, India,* **89** : 8. misdet. of *ornatipennis* Cameron. India : Bihar : Pusa; Chapra. Host : *Scirpophaga nivella.*

1923. *Melcha ornatipennis* : Dutt, *Mem. Dept. Agri. India* (Ent. Ser.), **8** : 23. misdet of *ornatipennis* Cameron. India : Bihar : Chapra; Pusa; Baghowine; Laheria Sarai. Host : *Scirpophaga nivella.*

1929. *Eripternimorpha javensis*: Hazelhoff, *Jaarv. Proefsta. Oost-Java Suikerindus,* 1928 : 102. biol. Indonesia : Java. Host : Topborer of sugarcane.

1929. *Eripternimorpha javensis* : Dammerman, The Agricultural Zoology of the Malay Archipelago, p. 67. Host : *Scirpophaga nivella.*

1933. *Eripternimorpha javensis* : Hart, *Meded. Proefsta. v. Java-Suikerindus,* 1933 : 792. biol. Host : *Scirpophaga excerptalis.*

1937. *Melcha ornatipennis :* Isaac, *Sci. Repts, Imp. Agri. Res. Inst.* New Delhi, 1936-37 : 176. misdet. of *ornatipennis* Cameron. India. : Haryana : Karnal. Host : *Scirpophaga* sp.

1941. *Gambroides javensis* : Betrem, *Treubia* **18** : 67. n.comb.

1942. *Melcha ornatipennis* : Mathur, *Indian J. Ent.,* **4** : 234. Male, Female. misdet of *Ornatipennis* Cameron. India : Harayana : Karnal. Host : *Scirpophaga* sp.

1946. *Melcha Ornatipennis* : Ahmad & Mathur, *Indian J. Ent.,* **7** : 21. Male, Female. misdet of *ornatipennis* Cameron. des., fig., biol. Host : *Scirpophaga nivella.*

1950. *Eripternimorpha javensis* : Kolshoven & Vecht, De Plagen Van de Culture ge wassen in Indonesia, **1** : 426. Host: *Scirpophaga excerptalis.*

1951. *Melcha ornatipennis* : Rao & Kurian, *Indian J. Ent.,* 13 : 76. Male, Female. misdet of *ornatipennis* Cameron. des., fig. India : Uttar Pradesh : Agra. Host : *Scirpophaga nivella.*

1952. *Melcha ornatipennis* : Vazirani, *J. Zool. Soc. India,* **4** : 101. misdet. of *ornatipennis* Cameron. biol. India : West Bengal : Calcutta : Tollygunge. Host : *Dineutus unidentatus.*

1953. *Melcha ornatipennis* : Rao, *Indian Forest Rec :* (N.S.). *Ent,* **8** : 213. Female. misdet. of *ornatipennis* Cameron. des. India : West Bengal : Calcutta.

1960. *Melcha ornatipennis* : Rao & Grover, *Proc. Natl. Acad. Sci India,* (B) **30** : 287. Female. misdet. India : Maharashtra : Nagpur.

1961. *Isotima javensis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 145. n.Comb.

1961. *Isotima javensis* : Gupta, *Indian J. Ent.,* **23** : 7. Male, Female. Syn., des. India : Delhi : Pusa. Haryana : Karnal. Andhra Pradesh : Samalkot. Host : *Scirpophaga nivella.*

1964. *Isotima javensis* : Gupta, *Indian J. Ent.,* **26** : 253. syn. notes, distr., biol. India : Haryana : Sonepat. Tamil Nadu : Coimbatore. Andhra Pradesh : Samalkot; Kadiam. Host : *Scirpophaga sp., S. incertulas.*

1965. *Isotima javensis* : Bennett, *Tech. Bull.* C.I.B.C., **5** : 107. India. Trinidad (Introduced, 1960). Host : *Scirpophaga nivella.*

1968. *Isotima javensis* : Momoi, *Mushi,* **41** : 183. Key. India. Java.

1970. *Isotima javensis* : Rao, *Marathwada Univ. J. Sci.* **9** : 92. Female. Maharashtra : Aurangabad.

1973. *Isotima javensis* : Chu & He, Utilization and Control of Animal, 1973(5) 5 : key, fig. China : Guangdong. Host : *Scirpophaga incertulas.*

1977. *Isotima javensis* : Rahman, *Indian J. Ent.,* 38 (1976) : 101-109. biol. Bangladesh : Widespread. Host. *Scirpophaga nivella.*

1980. *Gambroides javensis* : Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 30. Mall, Female. key, des., fig. India : Assam : Gauhati. Meghalaya : Jauharabad. Uttar Pradesh : Lucknow; Hardoi. Orissa : Bhubaneshwar. Karnataka : Mandya. Tamil Nadu : Pugalur. Host : *Scirpophaga nivella*; *Dineutes unidentatus.*

1984. *Isotima javensis* : He, *Acta Agri. Univ. Zhejiangensis.,* **10** : 89. biol. China : Guangdong : Qionghai ; Ding'an ; Yaxian. Host : *Scirpophaga incertulas.*

1987. *Gambrorides javensis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 857.

This species is very close to *G. rangaparensis* Jonathan. It can be recognized by the absence of apical carina of propodeum and first abdominal tergite red with a distinct yellow apical band.

Female : Face dull, closely punctate, punctures small and at some places running into striations. Clypeus subpolished, closely punctate, apical margin impressed and truncate. Malar space granulose, 0.6× the basal width of mandible, closely punctate, punctures coalescent, teeth subequal, blunt at the apices. Frons dull closely punctate in the middle, sparsely at sides; antennal scrobe with fine striations. Vertex subpolished minutely and sparsely punctate, distance between median and lateral ocelli 0.6 as compared to the distance between lateral ocelli. Temple distinctly punctate, punctures above small and close, tending to be sparse and large towards the base of mandible. Pronotum closely punctate except the lower margin smooth and shiny, and posterior margin in the middle groove irregularly rugoso-punctate, epomia indistinct. Mesoscutum deeply and closely punctate. Scutellum with deep punctures, lateral carina extending to its basal 0.3. Metascutllum shiny, not distinctly punctate. Mesopleurum from subtegular ridge up to the middle obliquely rugose, in the middle tending to be trans-rugose, further below up to mesosternum minutely and closely punctate, punctures running into fine rugosities, speculum shiny and sparsely punctate, sternaulus not well defined; prepectal carina extending 0.6 the height of mesopleurum. Metapleurum weakly and finely rugose, juxtacoxal carina not distinctly present. Propodeum with area between basal carina and apex finely wrinkled, area basad of basal carina shiny with scattered shallow punctures, area around spiracles closely punctate, apical carina more or less absent; basal carina moderately arched in the middle, spiracles moderately large and oval. First abdominal tergite short, about 2× as long as broad at the apex, spiracles close to each other than to the apex, tergite largely smooth and shiny, except in the middle and apico-laterally sparsely and

shallowly punctate, second to fifth tergites punctate, punctures weak on fourth and fifth tergites, following tergites subpolished. Areolet pentagonal, about 1× as high as the portion of second recurrent vein above bulla, intercubiti convergent nervulus interstitial, nervellus intercepted distinctly above the middle, brachiella absent. Ovipositor sheath about 1.2× as long as hind tibia.

Black. Antenna with sixth to nineth flagellar segments white above. Head black; mandibe dark yellow (Fig. 91 : d). Thorax beyond a vertical line drawn approximately from the anterior margin of scutellum (sometimes whole of thorax except pronotal collar red), propodum and first abdominal tergite, red (Fig. 91 : c) (sometime colour of first tergite variable, its apex with a narrow yellow apical band and further below slightly light brownish). A faint mark on pronotal collar above, apex of second tergite, apex of sixth narrowly in the middle, seventh and eighth tergites broadly in the middle, yellow (Fig. 91 : c). Fore leg largely dark brown to blackish, except femur above and apically, tibia largely below brownish-yellow. Middle coxa red, trochanter, tibia and tarsus blackish, except tibia below and at apex yellowish; femur reddish-brown with a dark brown line above. Hind coxa and femur largely reddish except a small mark at the extreme apex of femur brown, trochanter, tibia and tarsus dark brown to blackish (Fig. 91 : e). Wings hyaline, fore wing with a large brownish spot below stigma.

Male : Essentially similar to female, head all over closely punctate, Mesopleurum and mesostenum closely punctate except above ruguloso-punctate. First tergite largely granulose in the middle, with a few punctures, apex and base smooth and shiny, second to seventh tergites punctate, rest of body structure almost similar to female. Genitalia as in figure 91 : f.

Black : Antenna without a band, its basal segments light brownish below. Fore leg with coxa, trochanter and tibia yellow or dark yellow except coxa at base and apex blackish, femur brownish-yellow, tending to be yellow towards the apex, and a mark at the base above dark brown, tarsus dark yellow its apical segments slightly infuscate. Middle coxa red, trochanter reddish-yellow, femur reddish-brown, slightly brownish at base above, tibia yellow except apical 0.33 and whole of tarsus dark brown. Hind leg similar to female. Apices of first to third tergites and seventh tergite broadly yellow. Brown spot in fore wing very faint or absent, rest of body colour exactly similar to female.

Length : Female, 9.5 mm; fore wing 6 mm; ovipositor sheath 3.5 mm. Male, 9 mm; fore wing 5.5 mm.

Distribution : India : Assam (Guahati). Bihar (Pusa ; Chapra ; Baghownie ; Laheri Sarai). Delhi. Andhra Pradesh (Samalkot; Kadiam). Haryana (Karnal). Karnataka (Mandya). Maharashtra (Nagpur; Aurangabad). Meghalaya (Jauharabad). Orissa (Bhubaneshwar). Tamil Nadu (Coimbatore; Pugalur). Punjab. Uttar Pradesh (Agra;

Lucknow; Hardoi). West Bengal (Calcutta; Tollygunge). *Elsewhere* : Indonesia : Java (Parucan). China (Guangdong ; Qionghai ; Dingam). Bangladesh. Hawaii ?

Host : Tryporyza nivella and *Dineutus unidentatus.*

13. Genus ***Isotima*** Foerster (Fig. 92 : a–d)

1869. *Isotima* Foerster, *Verh : Naturh. Ver.* Rheinlande, **25** : 182. Type-species : *Isotima albicineta* Ashmead; designated by Townes, 1957.

Taxonomy : Townes, Townes & Gupta, 1961 : 144. Townes, 1970 : 265. Jonathan, 1980 : 34.

Distribution : Oriental Region.

This is a distinct genus, mainly characterized by its short epomia, sternaulus extending up to the base of middle coxa; first tergite short and stout, about 2 to 2.5× as long as broad at the apex; postpetiole broader than long; nervellus interepted usually at or below the middle, and the absence of brachiella.

Head moderately large, as broad as long or little broader or longer than broad (Fig. 92 : b). Clypeus of moderate size, convex, apical margin impressed, apex moderately arched, without a median irregularity. Frons sloping from the base of median ocellus to antennal sockets, usually with a weak median vertical groove or carina, also with a semicircular carina (Fig. 92 : b) above each antennal socket that encloses a shallow basin, this carina in male often developed or specialized into flanges or horns. Mandible short to moderately long, lower tooth slightly shorter than upper tooth. Lateral part of pronotal collar moderately wide and moderately convex, epomia short reaching down on to collar, but never reaching the upper margin of pronotum. Lateral carina of scutellum extending to its basal 0.2 to 0.75. Prepectal carina extending beyond 0.5 the height of mesopleurum, sternaulus extending up to the base of middle coxa. Both the transverse carinae (Fig. 92 : c) of propodeum present, basal carina strong and complete, apical carina complete or obsolescent in the middle, with weak or moderate sublateral crests. First abdominal tergite short, and stout, with a lateral tooth at base, about 2× or rarely 2.5× as long as broad at the apex, its spiracles close to the apex than to each other, tergite at base usually quadrate in crosssection, its dorso-median, dorso-lateral and ventro-lateral carinae present, usually sharp but sometimes weak or blunt, the dorso-lateral and ventro-lateral carina complete, the median dorsal carina reaching to or beyond spiracle, sometime ventro-lateral angulation weak (edge rounded). Areolet (Fig. 92 : a) usually square to somewhat pentagonal, the second intercubitus present but faint, second recurrent vein vertical or subvertical, nervulus usually interstitial but may be little distad or basad of basal vein; nervellus intercepted usually at or below the middle; mediella strongly arched; brachiella absent. Ovipositor tip moderately short, with distinct nodus and usually distinct oblique ridges or teeth on lower valve (Fig. 92 : d).

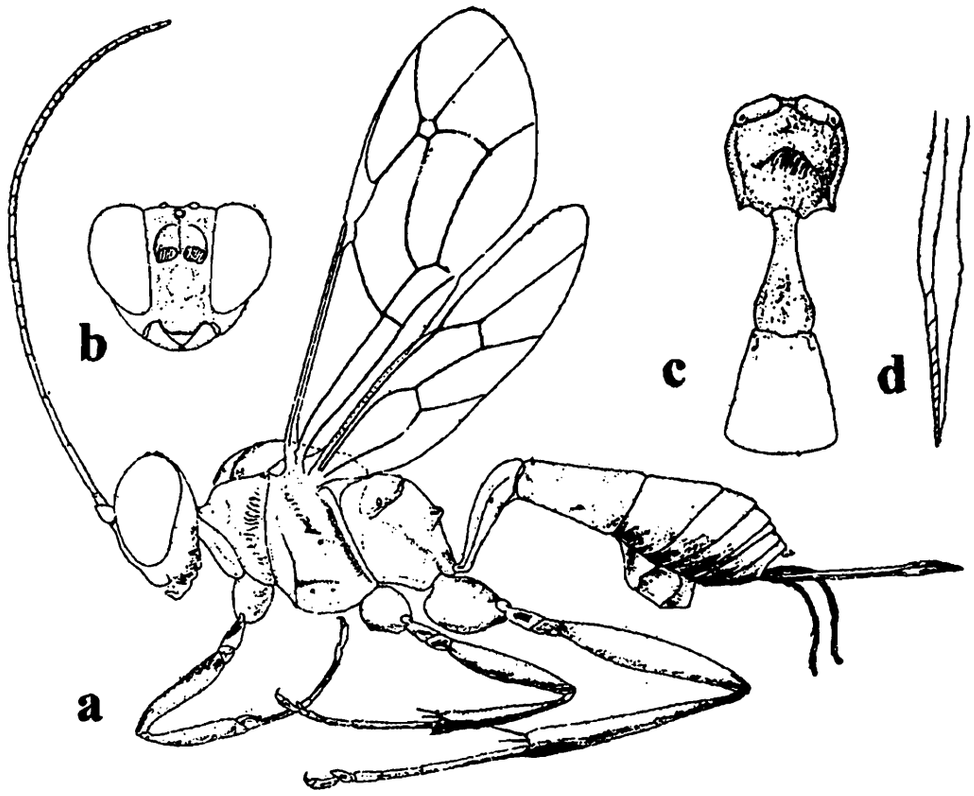

Fig. 92. *Isotima albicineta* Ashmead : **a**, body side view; **b**, head front view; **c**, dorsal view of propodeum and 1st & 2nd tergites; **d**, ovipositor tip.

Length : Female, 5–9.5 mm; fore wing 3.5–6.5 mm; ovipositor sheath 2–3.5 mm.

This is a moderately large genus. It occurs in the Oriental Region. Jonathan (1980 : 34) treated 19 species and added one more species from Andaman Is. (Jonathan, 1982 : 153). Of these, 15 species are discussed below from India and adjacent countries.

The species of *Isotima* form three distinct species groups : (A) the Bicarinata Group, (B) the Tricolor Group and (C) the Albicineta Group. Species falling is Albicineta Group do not occur in Indian subregion.

Key to the species of *Isotima*

1. Semicircular carina behind each antennal scrobe highly specialized in female, projecting like a flange. Frons along the eye margin and its semicircular carina marked yellow ..... A. The Bicarinata Group.....3

– Semicircular carina normal 2

2. Mesopleurum largely rugose, rugoso-punctate or wrinkled; scutellum normal. Wings clear hyaline or marked with faint fuscous marks.....
..... B. The Tricolor Group 5

– Mesopleurum largely smooth and shiny. Scutellum pyramidal in shape. Fore wing with broad dark fuscous marks .....
..... C. THE ALBICINETA GROUP [Not recorded from area of study]

3. Nervellus intercepted at the middle. Lateral carina of scutellum marked yellow. Malar space about 0.4× the basal width of mandible. Lateral carina of scutellum extending to its basal 0.65. India : Kerala; Temil Nadu.....1. *bicarinata* Jonathan

– Nervellus intercepted distinctly below the middle, lateral carina of scutellum not marked. Malar space about 0.53 to 0.56× the basal width of mandible. Lateral carina of scutellum extending to its basal 0.5 4

4. Areolet large, about 0.85× as high as the portion of second recurrent vein above bulla. Pronotum strongly striate. Mesopleurum strongly rugose. Pronotum black with collar yellow. India : Delhi; Karnataka; Kerala; Maharashtra; Tamil Nadu; Uttaranchal ..... 2. *rufipleuralis* Jonathan

– Areolet small about 0.7× as high as the portion of second recurrent vein above bulla, pronotum with a few fine striations. Mesopleurum weakly rugose to rugulose. Pronotum largely reddish orange, except the collar, yellow. India : Karnataka; Kerala ..... 3. *kamathi* Jonathan

5. Nervellus intercepted at or above the middle 6

– Nervellus intercepted distinctly below the middle 10

6. Frons densely and moderately strongly punctate. Nervellus intercepted far above the middle (0.3-0.4). Hind leg largely black 7

– Frons granulose to strongly rugose. Nervellus intercepted at the middle. Hind leg with atleast the femur red 8

7. Pronotum trans-rugose in middle. Mesopleurum closely punctate. Metapleurum and propodeum closely punctate. First abdominal tergite with distinct dorso-median carinae. Flagellum without a band. Hind coxa and first tergite (except the apical band), black. Males with first to third tergites with apical yellow bands. India : Assam; Karnataka; Uttaranchal; Uttar Pradesh .....
..... 4. *punctata* Jonathan

– Pronotum coarsely trans-striate. Mesopleurum rugoso-punctate in the middle. Metapleurum rugose. Propodeum rugoso-reticulate. First tergite without dorso-median carinae. Flagellum with a white band, hind coxa basally and first tergite largely, red. Males with first to fourth tergites with apical yellow bands. India : Punjab; Uttaranchal. Philippines ..... 5. *annulata* Jonathan

8. Thorax entirely red, except propleurum black. Frons little raised in the middle. Lateral carina of scutellum extending to its basal 0.7. Areolet large about 0.9×

as high as the portion of second recurrent vein above bulla. Nervellus intercepted at the middle. India : Himachal Pradesh; Uttaranchal. Java ..... 6. *ruficollis* (Holmgren)

– Thorax not entirely red, atleast its propleurae and pronotum always black.....9

9. Lateral carina of scutellum marked yellow at base and middle coxa yellow; (Face thickly punctate, frons rough and rugose and propodeum largely reticulate in the middle). India : Maharashtra ..... 7. *panhalensis* Jonathan

– Lateral carina of scutellum not marked. Middle coxa red. (First tergite without an apical band, pronotal collar wholly black without yellow spot above). India : Karnataka ..... 8. *emaculata* Jonathan

10. Lateral carina of scutellum extending to its basal 0.75 or more 11

– Lateral carina extending to its basal 0.2 to 0.6 14

11. First abdominal tergite with a narrow apical yellow band 12

– First abdominal tergite without an apical band 13

12. Thorax with propleurum, pronotum (except the collar), mesoscutum, mesopleurum narrowly along the pronotal suture, black. Mesopleurum and metapleurum largely finely rugoso-wrinkled. Juxtacoxal carina present. Speculum minutely and sparsely punctate. India : Andaman Is..... 9. *andamanensis* Jonathan

– Thorax largely red. Mesopleurum and metapleurum finely wrinkled, juxtacoxal carina obscured; speculum on mesopleurum smooth and shiny. India : Tamil Nadu. Myanmar; Java; Philippines; Taiwan and Krakatau ..... 10. *rufithorax* (Szépligeti)

13. Pronotal collar almost wholly, tegula, subtegular ridge, yellow; mesoscutum black. First tergite usually wholly red. Male : abdominal tergites first to seventh or atleast first to fourth and seventh with yellow apical bands. India : Widely in several states. Myanmar ..... 11. *pusilla* (Szépligeti)

– Pronotal collar above with a small yellow mark. Tegula, subtegular ridge and mesoscutum largely red. First tergite red at apex. Male : abdomen uniformly deep orange except seventh tergite black with a yellow apical spot. India : Assam; West Bengal ..... 12. *difficilis* Jonathan

14. Lateral carina of scutellum extending to its basal about 0.5. Fore coxa yellow. First tergite with a distinct yellow apical band and hind femur red, except narrowly at apex, blackish. India : Maharashtra. Indonesia ..... 13. *quadrata* (Szépligeti)

– Lateral carina of scutellum confined to its basal 0.2. Fore coxa reddish or reddish-brown. First abdominal tergite without a distinct moderately broad apical band, except sometimes in *semirufa*, narrow band of reddish-yellow colour present. Hind femur red with its apical 0.3-0.5, black 15

15. Frons obliquely rugoso-punctate in the middle. Pronotum largely rugoso-wrinkled in the middle, punctate above with running striations. Mesoscutum wholly black. Hind coxa red, black at apex. China, in lit. "Indes Orientalis" .... 14. *tricolor* (Brullé)

– Frons finely obliquely wrinkled in the middle. Pronotum reticulo-punctate in the middle, distinctly punctate above. Mesoscutum with middle lobe in front with reddish hue. Hind coxa wholly red. India : Assam, Orissa. China .... 15. *semirufa* Jonathan

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[*Isotima tripartita* (Brullé) could not be included in the key and the text.]

(A) The Bicarinata Group

This group is characterized by having semicircular carina behind each antennal scrobe highly specialized in female, projecting like a flange. Frons along the eye margin and its semicircular carina marked yellow.

1. ***Isotima bicarinata*** Jonathan (Fig. 93 : a–d).

1980. *Isotima bicarinata* Jonathan, *Rec. zool. Surv. India, Occ. Paper*, **17** : 38. Male, Female. key, des., fig. Type : Female, India : Tamil Nadu : Palni Hills : Palni (GUPTA). India: Kerala : Walayar Forest.

1987. *Isotima bicarinata* Gupta : *Mem. Amer. Ent. Inst.*, **41** : 858.

This species is close to *Isotima rufipleuralis* Jonathan and *Isotima kamathi* Jonathan. It can be recognized by having nervellus intercepted at the middle, malar space about 0.4× the basal width of mandible. Lateral carina of scutellum marked yellow.

Female : Face subpolished thickly punctate, punctures in the middle coalescent and tending to be rugoso-punctate. Clypeus subpolished, punctate, punctures dense at the base and sparse towards the apex, extreme apex smooth and shiny, apical margin wavy, not entire, notched in the middle, impressed. Malar space granulose, 0.44× the basal width of mandible. Mandible longitudinally puncto-striate, teeth subequal, lower tooth slightly shorter than upper. Frons strongly rugose in the middle, smooth at sides, a groove extending down from median ocellus to the middle of antennal sockets, semicircular carina above each antennal sockets moderately broad and high like a flange. Vertex subpolished, shallowly and closely punctate. Temple

thickly punctate. Pronotum subpolished coarsely trans-striate in the middle, lower margin shiny, shallowly and minutely punctate, upper margin distinctly closely punctate, pronotal collar smooth and subpolished, epomia moderately strong not reaching up to upper margin. Mesoscutum subpolished, distinctly minutely punctate. Scutellum subpolished, shallowly punctate, lateral carina extending to its basal 0.65. Metascutellum subpolished, faintly punctate. Mesopoleurum weakly to strongly rugose tending to be wrinkled, area just below subtegular ridge, somewhat finely rugoso-punctate, area below speculum along the mesopleural suture trans-striate, speculum shiny, with scattered minute punctures, just below sternaulus rugoso-punctate, mesosternum subpolished, minutely punctate. Metapleurum subpolished, irregularly trans-striate, juxtacoxal carina present. Area between basal carina and apex of propodeum closely wrinkled, at sides below apophyses trans-wrinkled, at some places tending to be reticulate, area basad of basal carina closely punctate, punctures running into longitudinal striations, spiracle large and oval, both apical and basal carinae arched in the middle, apophyses crest-like. First abdominal tergite short about 2× as long as broad at the apex, both the dorsal longitudinal carinae present, smooth and shiny at apex and base, coarsely punctate in the middle; second tergite closely punctate, third and fourth shallowly punctate, punctures on second tergite more crowded at the base, following tergites subpolished. Areolet (Fig. 93 : a) about 0.7× as high as the portion of second recurrent vein above bulla, intercubiti convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted at the middle, brachiella absent. Ovipositor sheath about 1.0× as long as hind tibia.

Black. Antenna with fourth to ninth flagellar segments white above. The following are yellow : semicircular carina (Fig. 93 : c) on frons completely, two lateral stripes extending from the level of lateral ocelli and joining mark of semicircular carinae, pronotal collar (Fig. 93 : b) except below, tegula, subtegular ridge, lateral carina of scutellum, apices of first and second abdominal tergites, seventh and eighth tergites broadly in the middle. Posterior half of mesopleurum (variable), whole of scutellum, metascutellum, base of hind wing, propodeum and base of first abdominal tergite, red or reddish (Fig. 93 : b). Fore coxa and trochanter yellow, femur, tibia and tarsus brown, except femur at the extreme base, tibia above blackish and fifth tarsal segment dark brown. Middle coxa and trochanter largely reddish except above yellowish. Femur light brown, tibia and tarsus blackish, except tibia below mixed with yellow and apical half of fifth tarsal segment dark brown. Hind coxa reddish, trochanter yellowish with broad black marks, femur yellowish-brown, with a blackish mark at the apex, tibia and tarsus largely blackish-brown, except tibia below in the middle mixed with yellow. Wings light brownish, hyaline.

Male : Pronotum largely smooth and shiny except for a few faint trans-striae in the middle. Mesopleurum largely polished, with coarse sparse punctures, area along prepectal carina above and area above speculum rugoso-punctate, speculum polished

faintly minutely punctate. Metapleurum and base of hind wing coarsely punctate. Propodeum largely reticulo-punctate, basad of basal carina subpolished and sparsely minutely punctate. First abdominal tergite dull, following tergites punctate, punctures on second and third tergites more crowded, and tending to be shallow on the following tergites, rest of the body structure similar to female. Genitalia as in figure 93 : d.

Black. Antennal flagellum without a band on the middle segments; face, clypeus, malar space, mandible (except at apex), temple, semicircular carina on frons, lateral stripes on frons, upper margin of pronotum and pronotal collar broadly, tegula,

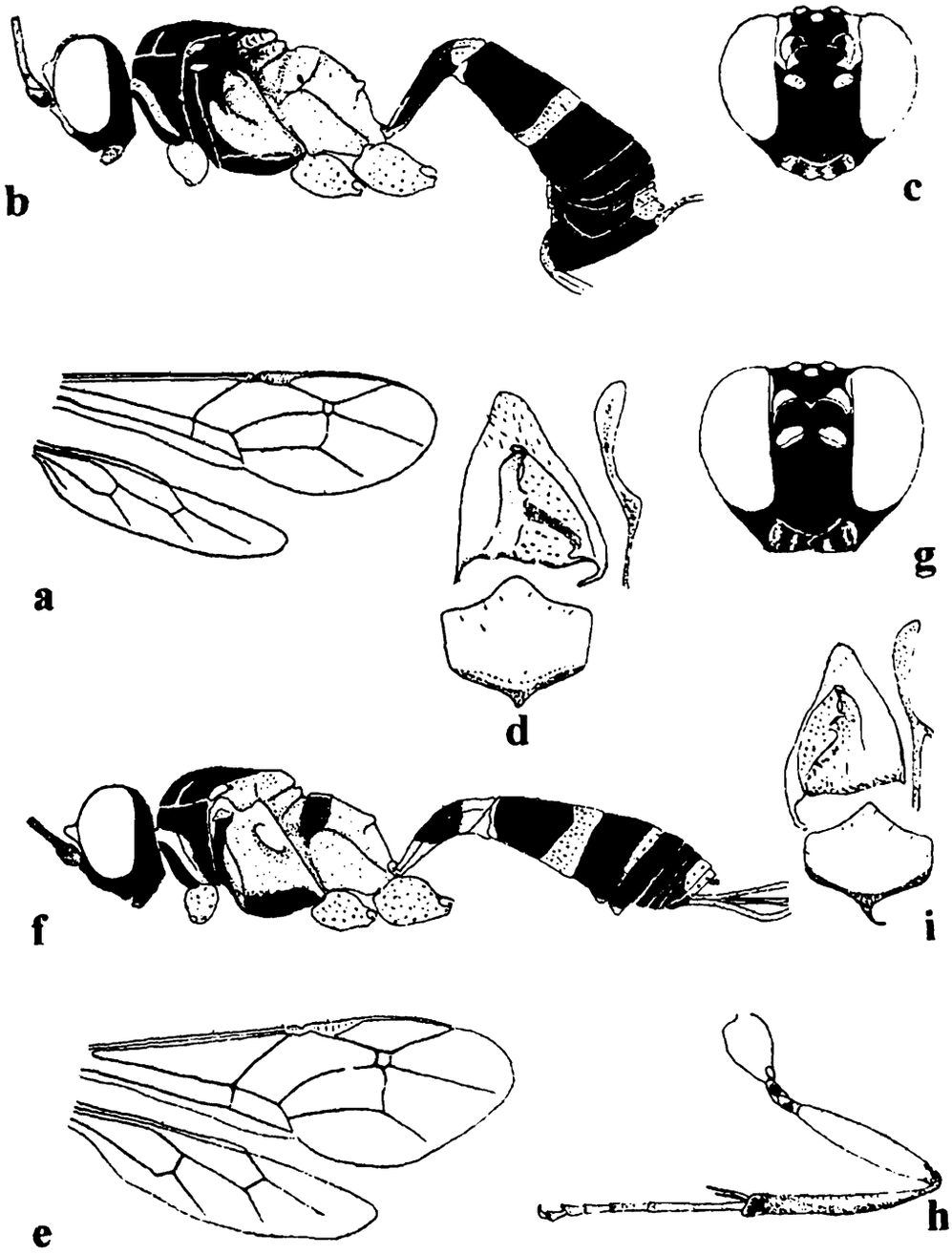

Fig. 93. *Isotima bicarinata* Jonathan : **a**, fore and hind wings; **b**, body side view; **c**, head front view; **d**, male genitalia. *I. rufipleuralis* Jonathan : **e**, fore and hind wings; **f**, body side view; **g**, head front view; **h**, hind leg; **i**, male genitalia.

subtegular ridge, scutellum and lateral carina, metascutellum, apices of first to fifth (sometimes sixth faintly), seventh and eighth abdominal tergites broadly in the middle, yellow; rest of thorax (except mesoscutum which is black), base of first abdominal tergite dark orange. Legs similar to female except slightly lighter in shade.

Length : Female, 5.5–9 mm; fore wing 4–6 mm; ovipositor sheath 2.5–4 mm. Male, 5–9 mm; fore wing 3–5.5 mm.

Distribution : India : Kerala (Walayar Forest). Tamil Nadu (Palni).

2. ***Isotima rufipleuralis*** Jonathan (Fig. 93 : e–i)

1980. *Isotima rufipleuralis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 40. Male, Female. key, des., fig. Type : Female, India : Karnataka : Bhagmandla, 853 m (GUPTA). India : Karnataka : Mercara, 1219 m; Murnard, 699 m; Kattegehar, 640 m; Londa, 609 m; Khemmangundi; Mudigere, 604 m; Santaverry, 1219 m; Gunji, 609 m; Anmod, 762 m; Ammathi, 1000 m; S. Coorg. Tamil Nadu : Kodai Hills : Oothu, 1158 m; Shevaroy Hills : Yercaud, 1371 m; Kerala : Walayar Forest : Watapara; Thekkady Wildlife Sancuary. Maharashtra : Panhala Fort, 914 m; Uttar Pradesh : Dehra Dun; Mohakampur; Garjia. Delhi.

1987. *Isotima rufipleuralis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 859.

This species is close to *Isotima kamathi* Jonathan in having nervellus intercepted below the middle and lateral carina of scutellum not marked. It can be recognised by having strong striae on pronotum, mesopleurum being strongly rugose and thorax with more of black markings.

Female : Face dull, rugoso-punctate in the middle, at sides distinctly punctate. Clypeus distinctly punctate, punctures close at the base, tending to be sparse towards the apex, apex smooth and shiny, apical margin impressed, somewhat truncate or notched in the middle. Malar space granulose, 0.55× the basal width of mandible. Mandible moderately broad, strongly puncto-striae, teeth more or less equal. Frons rough and rugoso-punctate in the middle and at sides of median ocellus, at sides toward eye margin shallowly punctate, a groove extending down from the base of median ocellus to middle of antennal sockets, semicircular carina broad and high like a flange. Vertex subpolished much shallowly and closely punctate. Temple distinctly punctate. Pronotum dull, coarsely trans-striate in the middle, lower and upper margin shallowly punctate, upper margin also with faint indication of fine oblique striations, epomia moderately strong, not reaching to upper margin, pronotal collar largely smooth, shallowly punctate above. Mesoscutum subpolished distinctly minutely punctate. Scutellum subpolished, minutley punctate, lateral carina extending to its basal 0.5. Metascutellum smooth and subpolished. Mesopleurum strongly rugose, area in the middle with weak punctures, posterio-ventral part just below speculum trans-rugose and antero-ventral part just above sternaulus subpolished, minutely

punctate, mesosternum subpolished minutely and sparsely punctate, prepectal carina extending 0.62 the height of mesopleurum. Metapleurum subpolished, finely trans-wrinkled, juxtacoxal carina present. Propodeum with area between basal carina and apex irregularly wrinkled, somewhat trans-wrinkled below apophyses and sides, basad of basal carina except the extreme base strongly punctate, punctures near basal carina running into striations, punctures around spiracle very close and coalescent, spiracle large and oval, apical carina evenly arched, apophyses crest-like, basal carina evenly arched, but slightly dipped in the middle. First abdominal tergite short, little less than 2× as long as broad at the apex, both dorso-longitudinal carinae present, tergite smooth and shiny at apex and base, punctate in the middle, punctures sparse in the middle, close near the spiracles, second and third tergites minutely and densely punctate, punctures on third tergite very shallow, following tergites subpolished. Areolet (Fig. 93 : e) pentagonal, about 0.85× as high as the portion of second recurrent vein above bulla; intercubiti more or less parallel, second intercubitus faint, nervulus interstitial, nervellus intercepted below the middle, brachiella absent. Ovipositor sheath about 1.2× as long as hind tibia.

Black. Fourth to ninth antennal segments (fourth segment only with its apical half) white above. Semicircular carina (Fig. 93 : g) above on frons completely, two lateral stripes extending from the level or even below the level (variable) of median ocellus and joining semicircular mark, subtegular ridge, tegula, apices of first and second abdominal tergites, seventh and eighth tergites broadly, yellow (Fig. 93 : f). Mesopleurum largely (except prepectus, mesosternum, black, sometimes colour may be more extensive), base of hind wing, scutellum, metascutellum, metapleurum, propodeum (except basad of basal carina largely black), extreme base of first abdominal tergite, dark orange. Fore coxa and trochanter, yellow; femur, tibia and tarsus brown; tibia above, tarsus wholly clouded with fuscous. Middle coxa and trochanter dirty yellow; femur, tibia and tarsus same as of fore leg. Hind coxa (Fig. 93 : h) and trochanter browinsh-orange, with a mark apico-laterally and both the trochanteral segments largely above, blackish; femur dark orange tending to be brownish-orange towards the base, tibia and tarsus yellowish-brown, both highly infuscate, and tibia at its base and apex, brown or dark brown.

Male : Similar to female, but more polished and slender. Malar apace 0.6× the basal width of mandible. Frons strongly and sparsely punctate with a few longitudinal striae extending down from the base of median ocellus. Vertex distinctly and sparsely punctate. Pronotum largely polished with few short rugae in the middle groove and faint punctures on pronotal collar and upper margin. Scutellum subpolished distinctly punctate, lateral carina extending to its basal 0.2. Mesopleurum with minute sparse punctures in the middle, upper half and mesosternum smooth and shiny, few short trans-striae along the enterior margin of speculum. Metapleurum largely smooth and shiny except for a few minute punctures above. Propodeum finely reticulate, basad of

basal carina smooth and shiny with faint sparse punctures. First abdominal tergite smooth and shiny with shallow punctures in the middle, rest of the tergites distinctly and closely punctate, punctures tending to be shallow towards the last tergite. Genitalia as in figure 93 : i.

Black. Antennae completely black. Face, clypeus, malar space, mandible except at apex, temple, semicircular carina, and lateral stripes, pronotal collar broadly, tegula, subtegular ridge, apices of all the abdominal tergites, yellow. Thorax largely dark orange, except mesoscutum anteriorly, propodeum basad of basal carina, black (black colour variable, may be extensive in some). Basal half of first abdominal tergite yellowish-orange. Legs colour much similar to female, except all the tarsi dark brown or blackish and tending to be still more darker towards the apical segments, apex of hind femur with a black mark.

Length : Female, 4.5–8.5 mm; fore wing 3.5–7.5 mm; ovipositor sheath about 1.5–3.0 mm. Male, 5–8 mm; fore wing 4–5 mm.

Distribution : India : Delhi. Karnataka (Bhagmandla, 853 m.; Mercara, 1219 m; Murnard, 699 m; Kattegehar, 640 m; Londa, 609 m; Khemmangundi; Mudigere, 604 m; Santaverry, 1219 m; Gunji, 609 m; Anmod, 762 m; Ammathi, 1000 m; S. Coorg). Tamil Nadu (Kodai Hills : Oothu, 1158 m; Shevaroy Hills : Yercaud, 1371 m). Kerala (Walayar Forest : Watapara; Thekkady Wildlife Sancuary). Maharashtra (Panhala Fort, 914 m). Uttaranchal (Dehra Dun; Mohakampur and Garjia).

3. ***Isotima kamathi*** Jonathan (Fig. 94 : a–d)

1980. *Isotima kamathi* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 43. Female. key, des., fig. Type : Female, India : Kerala : Walayar Forest (GUPTA). India : Kerala : Thekkady. Karnataka : Mercara, 1219 m.

1987. *Isotima kamathi* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 858.

This species is recognised from its closely related species *Isotima rufipleuralis* Jonathan by having mesopleurum and pronotum weakly sculptured, thorax and first tergite largely reddish-orange.

Female : Face dull, rugoso-punctate in the middle, punctate at sides; sometimes punctures at sides not well formed. Clypeus subpolished, sparsely punctate, punctures tending to be few towards the apex, apical margin smooth and shiny impressed, somewhat weakly notched in the middle. Malar space finely granulose, 0.53× the basal width of mandible. Mandible longitudinally striato-punctate, teeth subequal. Frons with area below and at sides of median ocellus rugoso-punctate, rugae longitudinally extending, extreme sides of frons smooth and subpolished, a groove extending down from median ocellus to the middle of antennal sockets, semicircular carina above each antennal sockets moderately broad and high like flange. Vertex

subpolished, indistinctly punctate. Temple shallowly punctate. Pronotum subpolished, finely trans-striate in the middle, upper margin faintly and obliquely striate, upper and lower margin faintly punctate, pronotal collar largely smooth except for a few punctures above, epomia moderately strong, not reaching to upper margin. Mesoscutum subpolished. Scutellum subpolished, shallowly punctate, lateral carina extending to its basal 0.5; metascutellum subpolished. Mesopleurum weakly rugose tending to be rugulose above near subtegular ridge, and striate below speculum along mesopleural

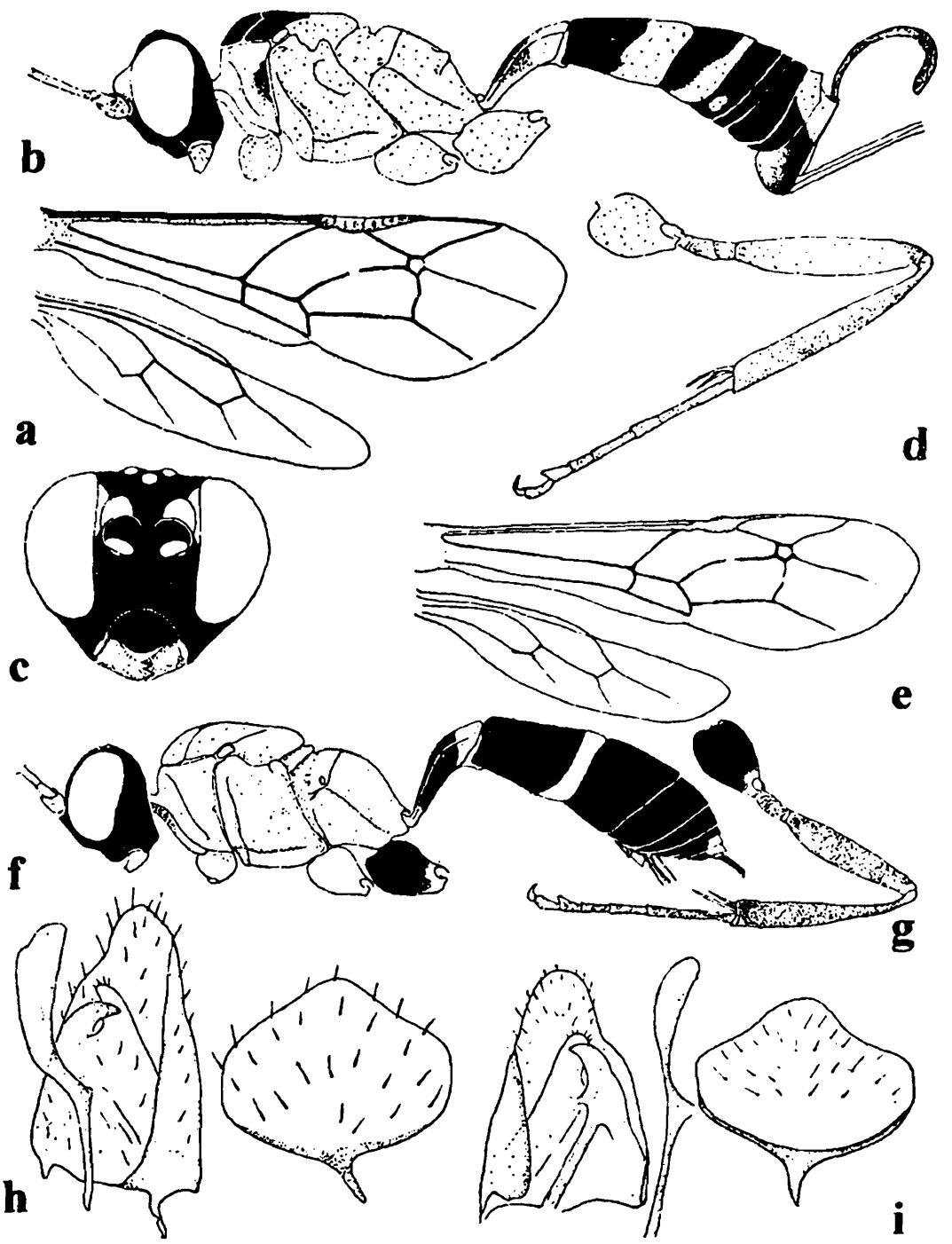

Fig. 94. *Isotima kamathi* Jonathan : **a**, fore and hind wings; **b**, body side view; **c**, head front view; **d**, hind leg. *I. punctata* Jonathan : **e**, fore and hind wings; **f**, body side view; **g**, hind leg; **h**, male genitalia. *I. annulata* Jonathan : **i**, male genitalia.

suture, speculum subpolished, faintly minutely punctate, area just below sternaulus somewhat rugoso-punctate, further below subpolished, faintly minutely and sparsely punctate, prepectal carina extending 0.7× the height of mesopleurum. Metapleurum subpolished, trans-rugose, juxtacoxal carina present. Propodeum between basal carina and apex finely wrinkled, below apophyses trans-wrinkled, basad of basal carina subpolished, distinctly and sparsely punctate, spiracles moderately large and oval, apical and basal carinae evenly arched in the middle, apophyses crest-like; first abdominal tergite short, about 2× as long as broad at the apex, spiracles as close to each other as to the apex, both the dorsal longitudinal carinae present, tergite subpolished, base and apex smooth and shiny, with a few punctures in the middle, second tergite with densely crowded punctures, third tergite shallowly punctate, following tergites subpolished. Areolet (Fig. 94 : a) about 7× as high as the portion of second recurrent vein above bulla, intercubiti convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted below the middle, brachiella absent. Ovipositor sheath about 0.75× as long as hind tibia.

Black. Antenna with fourth to eleventh flagellar segments white above. The following are yellow : semicircular carina on frons (Fig. 94 : c) completely, two lateral stripes extending from the level of median ocellus and joining mark of semicircular carina, pronotal collar (except below), subtegular ridge, tegula (sometimes subtegular ridge and tegula, dark orange), apices of first and second abdominal tergites with apical band, third tergite also with an apical band, but the latter is not uniform, seventh and eighth tergites broadly in the middle (Fig. 94 : b). Whole of thorax largely dark orange, except pronotum along its posterior margin with a triangular mark, whole of mesoscutum largely (variable), prepectus below and sometimes mesosternum anteriorly, black. First abdominal tergite yellowish-brown at base; fore coxa and first trochanteral segment dirty yellow; femur, tibia and tarsus yellowish-brown, except tibia and tarsus highly infuscate, its fifth tarsal segment dark brown. Middle coxa and first trochanteral segment dark yellow, except first trochanteral segment with a blackish mark; second trochanteral segment, femur and tibia dark orange, tending to be light brown, with femur at the apex above and tibia broadly above blackish, tarsus infuscate, its fifth segment dark brown. Hind coxa, trochanter and femur dark orange, except trochanter with two marks, femur at extreme base and apex blackish, tibia and tarsus brown, except tibia broadly at apex, extreme base and above blackish, fifth tarsal segment dark brown above (Fig. 94 : d).

Male : Not known.

Length : Female, 6.5 mm; fore wing 4.5 mm; ovipositor sheath about 2 mm.

Distribution : India : Kerala (Walayar Forest; Thekkady Sanctuary). Karnataka (Mercara, 1219 m).

(B) The Tricolor Group

This group is characterized by having mesopleurum largely rugose or rugoso-punctate or wrinkled; scutellum normal; wings clear hyaline or marked with faint fuscous maks.

The following species are referrable to this group :

4. ***Isotima punctata*** Jonathan (Fig. 94 : e–h)

1980. *Isotima punctata* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 45. Male, Female. key, des., fig. Type : Female, India : Uttar Pradesh : Muradnagar (GUPTA). India Uttaranchal : Dehra Dun, 600 m; New Forest; Garjia, 609 m. Karnataka : Santaverry, 1219 m. Assam : Rangapara : Sonajuli Tea Estate. Philippines : Luzon : Manila.

1987. *Isotima punctata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 858.

This species is similar and sympatric to *Isotima annulata* Jonathan in having nervellus intercepted far above the middle, body densely punctate and legs largely black, but it can be distinguished by having pronotum trans-rugose in the middle, mesopleurum densely punctate, metapleurum and propodeum also closely punctate and first tergite with distinct dorso-median carinae. Antennal flagellum of female without a white band; hind coxa and first tergite (except its apical band) black; male with first to third tergites with apical bands.

Female : Face clypeus, frons, vertex, malar and temple densely punctate. Malar space 0.85 the basal width of mandible. Apical margin of clypeus impressed not evenly arched but truncate. Mandible minutely punctate at the base, teeth more or less equal. Pronotum trans-rugose in the middle, upper margin somewhat obliquely finely rugulose, epomia strong reaching up to upper margin. Mesoscutum and scutellum densely punctate. Lateral carina of scutellum extending to its basal 0.45×; metascutellum minutely punctate. Mesopleurum densely punctate, punctures coalescent, speculum subpolished sparsely and shallowly punctate, anterior margin of speculum with short striae, area below sternaulus distinctly coarsely punctate, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum closely punctate, punctures shallow and coalescent, juxtacoxal carina present. Propodeum subpolished, area between basal carina and apex closely punctate, punctures moderately deep and at some places coalescent, area basad of basal carina around spiracles puncto-rugose, extreme base in the middle smooth and shiny, basal carina strong and complete evenly arched in the middle, apical carina complete, weak in the middle evenly arched, apophyses very low, spiracles small and round. First abdominal tergite smooth and subpolished, second and third tergites closely punctate, fourth tergite coarsely and shallowly punctate, punctures tending to be shallow and indistinct towards the apex, following tergites subpolished. Fore wing (Fig. 94 : e) with areolet pentagonal, about 1.0× as high as the portion of second recurrent vein above bulla, intercubiti

convergent, second intercubitus faint, nervulus slightly distad, nervellus intercepted 0.35× above the middle, brachiella absent. Ovipositor sheath about 0.7× as long as hind tibia.

Black. Antennal flagellum without a white band. Head completely black. Thorax (Fig. 94 : f) completely red, except pronotal collar along the margin slightly blackish, apices of first and second abdominal tergites, seventh and eighth tergites broadly, yellowish. Fore leg with coxa light brown below and dark brown above, trochanter and femur dark brown, except each trochanteral segment along the margins and femur at the apex lighter, tibia and tarsus yellowish-brown, its fifth tarsal segment dark brown. Middle coxa and first trochanteral segment reddish, second trochanteral segment, femur, tibia and tarsus dark brown except the apical half of femur and basal half of tibia light brown. Hind leg (Fig. 94 : g) more or less black, except femur and tibia lighter at subbasal area. Fore wing light brownish at its apical half.

Male : Whole of head thickly punctate, punctures much coalescent; lateral carina of scutellum extending to its basal 0.25; apex of first abdominal tergite subpolished with scattered shallow punctures, second to sixth tergites coarsely punctate, seventh and eighth tergites indistinctly punctate, rest of the body structure similar to female. Genitalia as in figure 94 : h.

Black. Scape above on its outerside, mandible at the base, apices of first to third abdominal tergites, seventh and eighth tergites broadly, yellow or dirty yellow. Fore coxa and trochanter yellow; femur, tibia and tarsus dark yellow, except femur light brownish above. Middle coxa and trochanter yellow, femur, tibia and tarsus yellowish-brown, its femur, tarsus slightly darker. Hind leg largely black, except first trochanteral segment wholly and extreme base of second segment, and tibia at the base yellowish, rest of the body colour similar to female.

Length : Female, 6 mm; fore wing 4 mm; ovipositor sheath about 1.5 mm. Male, 7 mm; fore wing 4 mm.

Distribution : India : Assam (Rangapara, Sonajuli Tea Estate). Karnataka (Santaverry, 1219 m). Uttaranchal (Dehra Dun; New Forest, and Garjia). Uttar Pradesh (Muradnagar). *Elsewhere* : Philippines (Manila).

5. ***Isotima annulata*** Jonathan (Fig. 94 : i)

1980. *Isotima annulata* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 47. Male, Female. key, des., fig. Type : Female, India : Uttaranchal : Dehra Dun, 600 m. (GUPTA). India : Punjab : Bhatinda.

1987. *Isotima annulata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 858.

Essentially similar to *Isotima punctata* Jonathan in sculpture and colour except as below.

Female : Frons with distinct oblique striations below median ocellus. Pronotum subpolished, coarsely trans-striate, its extreme upper margin with fine oblique rugulae and minute punctures. Mesopleurum in the middle rugoso-punctate, rest densely punctate, anterior to speculum above striate. Metapleurum weakly rugose, juxtacoxal carina weak. Propodeum between basal carina and apex rugoso-reticulate, basad of basal carina rugulose with a few punctures. First abdominal tergite smooth, dorso-median carinae absent, second and third tergites densely punctate, following tergites mat and subpolished.

Black. Antennal flagellum with segments sixth to tenth white above. Maxillary palpi yellowish, with its fifth apical segment brownish. Hind coxa black with its basal 0.4 red. First abdominal tergite broadly red at base.

Male : Similar to female except more slender, abdominal tergites first to fourth with yellow apical band. Genitalia as in figure 94 : i.

Length : Female, 4–6.5 mm; fore wing 3–4.75 mm; ovipositor sheath 0.9–1.2 mm. Male, 5 mm; fore wing 4.5 mm.

Distribution : India : Uttaranchal (Dehra Dun). Punjab (Bhatinda).

6. ***Isotima ruficollis*** (Holmgren) (Fig. 95 : a–c)

1868. *Goryphus ruficollis* Holmgren, *Kongliga Svenska Fregatten Eugenies Resa.*, **2.** 400. Male, Female. des. Type : Female, Indonesia : Java (STOCKHOLM).

1907. *Goryphus ruficollis* : Roman, *In* Wiren and others : Zoologische Studien.. T. Tullberg zum 65. Geburtstage Gewidmet &c., p. 80. Male, Female. key. des., fig.

1961. *Isotima ruficollis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 146. n. comb. Java.

1980. *Isotima ruficollis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 48. Male, Female. key, des., fig. Indonesia : Java : Bogor, Dudukjava, 280 m; Bojong. Djengkel, 300 m; Tjikaret, 400 m. Philippines : Cotabato : Pikit. India : Uttaranchal : Garjia, 609 m; Dehra Dun : New Forest. Himachal Pradesh : Palampur.

1987. *Isotima ruficollis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 859.

2000. *Isotima ruficollis* : Jonathan, *State Fauna Series* 4 : *Fauna of Meghalaya*, Part 7 : 567. Female, India : Meghalaya : South Garo Hills : Songsak (Z.S.I., Calcutta).

This is a distinct species having thorax almost entirely red; frons little raised in the middle; lateral carina of scutellum extending to its basal, 0.7; areolet large, about 0.9× as high as the portion of second recurrent vein above bulla and nervellus intercepted at the middle.

Female : Face weakly rugoso-punctate, punctures weak and not well distinct.

Clypeus sparsely and minutely punctate; at apex smooth and shiny. Mandible rough, lower tooth slightly shorter than upper. Malar space granulose, about 0.6× the basal width of mandible. Frons in the middle slightly raised, largely rugoso-punctate with a few oblique carinae starting from the base of median ocellus, at side weakly rugulosopunctate. Vertex minutely and closely punctate. Temple minutely punctate. Pronotum coarsely striate in the middle, upper and lower margins and pronotal collar above weakly rugoso-punctate, punctures extremely shallow and not well defined, epomia strong reaching to upper margin. Mesoscutum shiny, minutely and sparsely punctate, punctures sometimes not well defined. Scutellum shiny, sparsely and shallowly punctate, lateral carina extending to its basal 0.7; metascutellum smooth and subpolished. Mesopleurum largely rugose, an oval area little below subtegular ridge and speculum subpolished, much shallowly and sparsely punctate, prepectal carina extending 0.75 the height of mesopleurum, area below sternaulus finely aciculopunctate, sternaulus extending up to the base of middle coxa. Metapleurum coarsely trans-rugose, tending to be finely wrinkled, juxtacoxal carina complete. Propodeum between basal carina and apex finely wrinkled to finely reticulate, area basad of basal carina shiny with a few scattered punctures, spiracle oval, small; both the transverse carinae complete and arched in the middle, apical carina laterally forming crest-like apophyses. First abdominal tergite about 2× as long as wide at apex, tergite dorsally shiny with a few punctures in the middle and apico-laterally, both longitudinal carinae present; second and third tergites densely punctate, following tergites mat and subpolished. Areolet pentagonal (Fig. 95 : a) about 0.9× as high as the portion of second recurrent vein above bulla, nervellus intercepted at the middle, brachiella absent. Ovipositor sheath about 0.8× as long as hind tibia.

Black. Antenna with fifth to tenth segment white. Whole of thorax red, except the propleurum and sometimes pronotal collar, mesosternum and tegula black. Apices of first, second, seventh and eighth tergites, yellowish (Fig. 95 : b). Legs (Fig. 95 : c) largely reddish, except fore and middle legs with their trochanters and tarsi, brown. Hind trochanter, apex of femur, whole of tibia and tarsus, brown to dark brown (legs colour variable), fore wing with a light brown spot below stigma.

Male : Face and clypeus densely punctate. Frons with coalescent punctures and also with striae radiating from ocellar area. Vertex and temple densely punctate. Mesoscutum closely punctate, punctures running into striations. Mesopleurum densely and shallowly punctate, speculum shiny sparsely punctate. Metapleurum densely and shallowly punctate, second to fifth tergites punctate, punctures much shallow on fourth and fifth tergites, following tergites mat and subpolished; rest similar to female.

Black. Mandible except the apex; pronotal collar above, apices of first, second and seventh tergites, yellowish. Fore leg largely brownish. Middle coxa and trochanter reddish-orange, rest of middle-leg brown. Hind leg largely dark brown, wings without brownish spot.

Length : Female, 6.5–9 mm; fore wing 4.5–6.5 mm; ovipositor sheath 2–3.5 mm. Male, 4.5 mm; fore wing 3 mm.

Distribution : India : Himachal Pradesh (Palampur). Uttaranchal (Dehra Dun; Garjia, 609 m). Meghalaya (Songsak in S. Garo Hills). *Elsewhere* : Indonesia : Java (Bogor; Dudukjava, 280 m; Bojong; Djengkel, 300 m; Tjikaret, 400 m). Philippines : Cotabato (Pikit).

7. ***Isotima panhalensis*** Jonathan (Fig. 95 : d–f)

1980. *Isotima panhalensis* Jonathan, *Rec. zool. Surv. India, Occ. Paper*, **17** : 49. Female. key, des., fig. Type : Female, India : Maharashtra : Panhala Fort (GUPTA).

1987. *Isotima panhalensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 858.

This species can easily be distinguished by having yellow marks at the base of lateral carina of scutellum (Fig. 95 : d) and fore and middle coxae also yellow. Face thickly punctate, frons rough and rugose, propodeum largely reticulate in the middle.

Female : Face thickly punctate in the middle, tending to be coarsely rugose above near antennal sockets and also at sides, punctures below running into striations. Clypeus subpolished with sparse shallow punctures, apical margin impressed and wavy, mandible longitudinally puncto-striate, teeth subequal. Malar space 0.55× the basal width of mandible. Frons strongly rugose and rough in the middle, at sides granulo-punctate, punctures few and shallow. Vertex smooth and subpolished distinctly punctate. Pronotum subpolished, trans-striate, striae tending to be irregular and wrinkled, upper margin with few coarse punctures, pronotal collar largely smooth, epomia strong reaching to upper margin. Mesoscutum subpolished minutely punctate. Scutellum subpolished punctate, lateral carina extending to its basal 0.25; metascuttellum subpolished indistinctly punctate. Mesopleurum coarsely rugose, tending to be wrinkled along the prepectal carina, area below sternaulus subpolished, minutely punctate, speculum subpolished minutely and shallowly punctate, area above middle coxa along the mesopleural suture with transverse striae, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum rugose tending to be somewhat finely trans-wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex reticulate, area basad of basal carina in the middle subpolished with a few scattered punctures, area around and behind spiracle distinctly and closely punctate, basal carina strong, slightly curved in the middle, apical carina not distinct in the middle, apophyses crest-like, spiracle moderately large, oval. First abdominal tergite subpolished somewhat mat, apex smooth and shiny except for a few scattered punctures, both the dorsal longitudinal carinae present, second and third tergites closely punctate, following tergites subpolished. Fore wing with areolet pentagonal, 0.8× as high as the portion of second recurrent vein above bulla, intercubiti parallel, second intercubitus faint, nervulus interstitial, nervellus intercepted at the middle, brachiella absent. Ovipositor sheath above 0.9× as long as hind tibia.

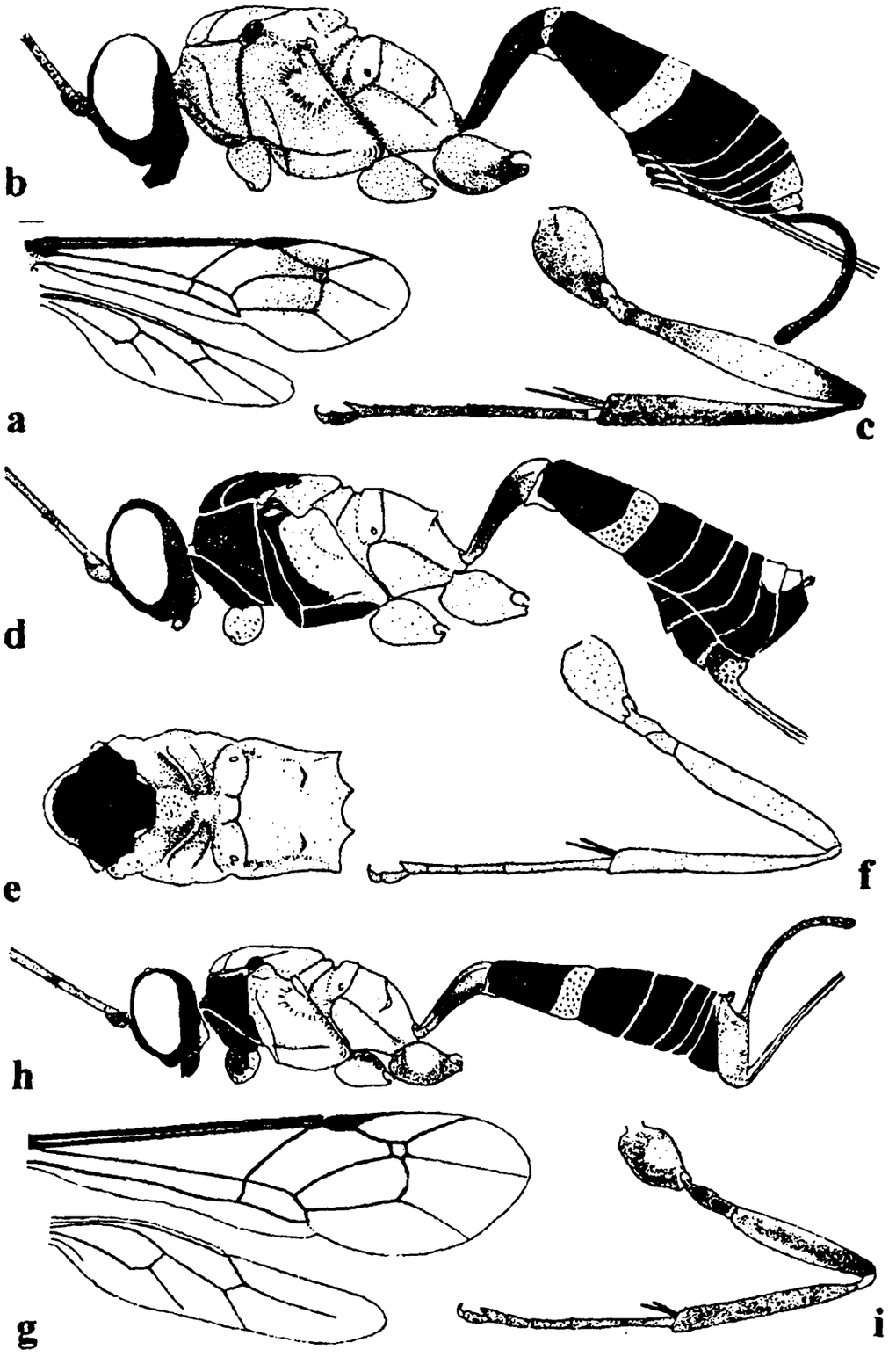

Fig. 95. *Isotima ruficollis* (Holm.) : **a**, fore and hind wing; **b**, body side view; **c**, hind leg. *I. panhalensis* Jonathan : **d**, body side view; **e**, thorax dorsal view; **f**, hind leg. *I. emaculata* Jonathan : **g**, fore and hind wing, **h**, body side view; **i**, hind leg.

Black. Antenna with fourth to ninth flagellar segments white above. Head, pronotum (except a small yellowish mark at the top of pronotal collar), mesoscutum, ventral area below sternaulus and prepectus of mesopleurum completely, black. Lateral carina of scutellum (Fig. 95 : d, e), rest of mesopleurum (Fig. 95 : d), apices of first and second abdominal tergites, seventh and eighth tergites broadly in the middle, yellow. Fore leg with coxa and first trochanteral segment yellow, second trochanteral segment, its femur and tibia, dark yellow, except tibia infuscate above, tarsus brownish and fifth tarsal segment dark brown. Middle leg with coxa and trochanter yellow, trochanter infuscate, femur yellowish-brown, tibia and tarsus brownish, fifth tarsal segment dark brown. Hind coxa, trochanter and femur (Fig. 95 : f) dark orange or reddish, except first trochanteral segement dark brown; tibia and tarsus blackish-brown, fifth tarsal segment dark brown. Fore wing faintly in the middle and its apex, light brownish.

Male : Not known.

Length : Female, 8 mm; fore wing 5.5 mm; ovipositor sheath 3 mm.

Distribution : India : Maharashtra (Panhala Fort).

8. ***Isotima emaculata*** Jonathan (Fig. 95 : g–i)

1980. *Isotima emaculata* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 51. Female. key, des., fig. Type : Female, India : Karnataka : Londa, 609 m. (GUPTA).

1987. *Isotima emaculata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 858.

This species can be recognised from its allied species by the absence of yellow marks at the base of lateral carina of scutellum and by not having a yellow band at the apex of first tergite. The pronotal collar wholly black with no yellowish spot above.

Female : Face closely punctate all over, punctures in the middle running into striations. Clypeus subpolished, coarsely punctate, tending to be sparse at the apex, apical margin impressed, smooth and shiny, wavy, somewhat notched in the middle. Mandible closely punctate with longitudinal striations, teeth subequal, lower tooth slightly shorter than the upper. Malar space granulo-punctate, 0.66× the basal width of mandible. Frons strongly rugose and rough with scattered punctures, sometimes in the middle punctate with irregularly running striae, and at sides shallowly and closely punctate, antennal scrobe with fine aciculations. Vertex dull, closely and shallowly punctate. Temple strongly punctate. Pronotum subpolished, coarsely trans-wrinkled, somewhat obliquely wrinkled above, upper margin with sparse shallow punctures, lower margin distinctly coarsely punctate, pronotal collar also sparsely and shallowly punctate, epomia moderately strong, reaching to upper margin. Mesoscutum subpolished, minutely punctate. Scutellum subpolished, coarsely punctate, lateral carina extending to its basal 0.45. Metascutellum indistinctly punctate. Mesopleurum

subpolished, strongly rugose, tending to be closely wrinkled, sometimes area below sternaulus minutely punctate, speculum subpolished minutely punctate, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum densely wrinkled, at some places tending to be reticulate, juxtacoxal carina present. Propodeum between basal carina and apex weakly reticulate, below apophyses somewhat trans-wrinkled, area basad of basal carina smooth and shiny, below and around spiracles with coarse deep punctures, punctures tending to be coalescent, apical carina largely weak, at sides present as low crest-like apophyses, basal carina more or less straight, slightly curved in the middle, spiracles moderately large and round. First abdominal tergite subpolished with scattered shallow punctures in middle; second and third tergites closely, fourth tergite faintly punctate, following tergites subpolished. Fore wing (Fig. 95 : g) with areolet pentagonal, 0.85× as high as the portion of second recurrent above bulla, intercubiti slightly convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted at the middle, brachiella absent. Ovipositor long, sheath 0.85× as long as hind tibia.

Black. Antenna with fifth to ninth segments (fifth segment only at its apex) white above. Head completely black. Pronotum largely black except slightly at the upper margin and posterior area reddish, sometimes whole of pronotum black (colour variable). Mesoscutum colour variable, largely black to red. Tegula black except reddish at the base. Mesopleurum, secutellum, metascutellum, metapleurum and propodeum (Fig. 95 : h) red. First abdominal tergite black, except dorsally at the apex and base red. Second tergite with an apical band, seventh and eighth tergites broadly in middle (Fig. 95 : h) yellow. Fore leg largely blackish, except coxa at base reddish, femur at apex and tibia below light brownish-yellow. Middle coxa and femur reddish, except coxa at apex and femur with a line above, black; its trochanter largely, tibia and tarsus completely blackish. Hind coxa (Fig. 95 : i) and femur, red, except coxa at base and apex, femur at apical 0.25, or sometimes wholly, black; trochanter, tibia and tarsus black. Fore wing with light brown band in the middle.

Male : Unknown.

Length : Female, 9.5 mm; fore wing 5.5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Karnataka (Londa, 609 m).

9. ***Isotima andamanensis*** Jonathan (Fig. 96 : a–c)

1982. *Isotima andamanensis* Jonathan, *Colemania,* **1** : 153. Female. des., fig. Type : Female, India : South Andaman Is. : Port Blair : Dhani-Khari Dam (Z.S.I., Calcutta).

1987. *Isotima andamaensis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 858.

This species is very close to *I. rufithorax* (Szépligeti). However, it can be distinguished by having mesoscutum, scutellum and speculum on mesopleurum punctate and thorax not entirely black.

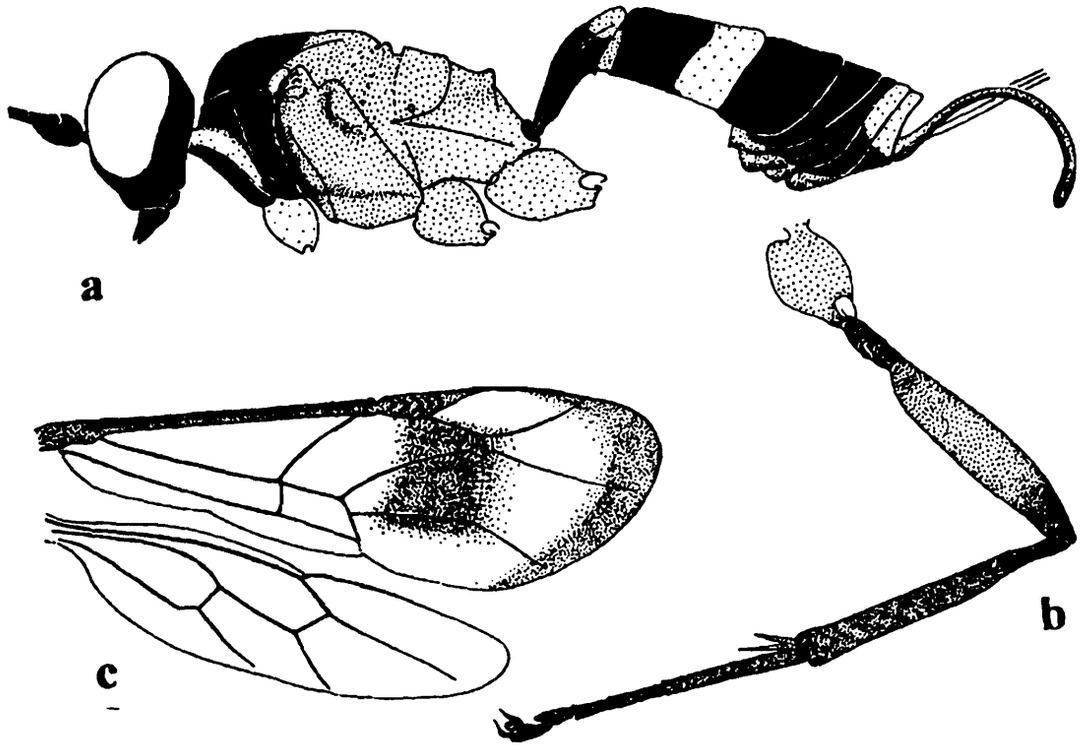

Fig. 96. *Isotima andamanensis* Jonathan : Colour pattern : **a**, body side view; **b**, hind leg; **c**, fore and hind wings showing venation and fuscous markings.

Female : Face moderately rugoso-punctate, punctures with irregular striations. Clypeus subpolished, distinctly punctate, interspaces more than 3× their own diameter, apical margin impressed, smooth, with a median notch. Malar space granulose, 0.6× the basal width of mandible. Frons finely and obliquely striate in the middle, rugulose at the sides; semicircular carina above antennal scrobes deep, smooth and shiny. Vertex smooth and subpolished. Temple subpolished with fine, dense punctures. Pronotum subpolished, trans-striate in the middle groove, with fine oblique striae, with punctures at the upper margin, extreme lower margin sparsely punctate; epomia long and strong. Mesoscutum with minute and close punctures, scutellum shiny with sparse fine punctures, its lateral carina extending more than 0.75 of its length. Mesopleurum largely finely rugoso-wrinkled, fine oblique striation in sternal groove, speculum minutely and sparsely punctate; prepectal carina extending 0.7× the height of mesopleurum. Metapleurum finely trans-rugoso-wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex finely rugoso-wrinkled, basad of basal carina at sides punctate; both the transverse carinae arched, bow-shaped; apophyses low, crest-like. First abdominal tergite smooth and shiny, second wholly and third at base with dense minute punctures, following tergites mat and subpolished. Fore wing (Fig. 96 : c) with areolet pentagonal, intercubiti weakly convergent, about 0.8× as high as the portion of second recurrent vein above bulla; nervulus interstitial. Hind wing with nervellus intercepted at its lower 0.4, brachiella absent (Fig. 96 : c). Ovipositor long, its tip moderately long and blunt with a distinct nodus, ovipositor sheath about 0.8× as long as hind tibia.

Black. Antennal flagellum with fourth to ninth segments above, white. Two elongate orbital stripes on frons, pronotal collar, tegula and subtegular ridge, yellow; rest of pronotum, mesoscutum wholly, mesopleurum narrowly along the pronotal suture, black; thorax otherwise bright red (Fig. 96 : a). Abdomen black with apices of first tergite narrowly and second broadly, seventh and eighth apicomedially, yellow (Fig. 96 : a). Fore leg with coxa yellow, rest yellowish-brown to dark brown. Middle and hind legs (Fig. 96 : b) with their coxae red, the trochanters, femora, tibiae and tarsi, dark brown to black, except middle femur with reddish hue. Wings hyaline with broad mark in the middle and extreme apex brown (Fig. 96 : c).

Male : Not known.

Length : Female, 7.0 mm; fore wing 5.0 mm; ovipositor sheath 2.0 mm.

Distribution : India : S. Andaman Is. (Port Blair, Dhani-Khari Dam).

10. ***Isotima rufithorax*** (Szépligeti) (Fig. 97 : a–c)

1910. *Gambrus rufithorax* Szépligeti, *Notes Leyden Mus.*, **32** : 100 Male. key, des. Type : Male, Indonesia : Krakatau Is. in Sunda Strait (BUDAPEST).

1916. *Mesostenus rufithorax* : Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 329.

1932. *Goryphus taiwanellus* f. *rufithorax* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 178. Female. Name preocc. in *Isotima* by Szépligeti, 1910 and by Uchida, 1931. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, Taiwan : Tainan, May 7, 1912 (EBERSWALDE) Syn. by Townes, Townes & Gupta, 1961.

1961. *Isotima rufithorax* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 146. lectotype design., syn. Taiwan. Krakatau Is.

1980. *Isotima rufithorax* : Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 52. Male, Female. key, des., fig. Philippines : Negros : Mt. Canlaon, 1100 m. Luzon : Laguna : Los Banos; Manila; Mt. Santo Tomas; Benaue. Mindoro : Calapan : San Luis; Son Manuel; Pangasinan. Leyte : Tacloban. Indonesia : Java : Mt. Gede, 1000 m.; Bogor; Dudukjava. India : Tamil Nadu : Anmalai Hills, 1220-1520 m. Myanmar : Maymyo, 800 m.

1987. *Isotima rufithorax* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 860.

This and the following species of this group resembles very closely to each other in colour and sculpture. But this one can easily be separated from others in having mesopleurum and metapleurum finely wrinkled, juxtacoxal carina obscured. The thorax largely red and first abdominal tergite with a distinct yellow apical band (Fig. 97 : a).

Female : Face weakly rugoso-punctate punctures large and shallow. Clypeus subpolished, closely and shallowly punctate, its apical margin sinuate and notched in the middle. Mandible punctate. Malar space strongly granulose, about 0.6× the basal width of mandible. Frons dull, obliquely rugose in the middle, rugulose at sides.

Antennal scrobes moderately deep, smooth and shiny. Vertex mat and dull. Temple strongly and closely punctate. Pronotum subpolished, trans-rugose, rugulose at upper margin, pronotal collar and lower margin largely smooth. Mesoscutum largely smooth and shiny with no distinct punctures. Scutellum and metascutellum smooth and shiny; lateral carina of scutellum extending to its basal 0.75. Mesopleurum largely finely wrinkled, area above middle coxa with fine striations, speculum smooth and shiny, prepectal carina extending 0.7× the height of mesopleurum, sternaulus extending up to the base of middle coxa. Metapleurum strongly rugose, juxtacoxal carina not well defined among the rugae, propodeum with area between basal carina and apex reticulate, tending to be wrinkled towards the apex, area basad of basal carina near spiracles rugoso-punctate, in the middle smooth, spiracle moderately large and longish-oval, both the transverse carinae strong, evenly arched in the middle; apophyses moderately strong and high. First abdominal tergite largely smooth and subpolished; second tergite densely punctate; third tergite closely and shallowly punctate at base, its apical region and the following tergites mat and subpolished. Fore wing with areolet moderately large, pentagonal, intercubiti convergent, areolet about 1.0× as high as portion of second recurrent vein above bulla, nervulus interstitial or little apicad of basal vein, nervellus intercepted at its lower 0.4, brachiella absent (Fig. 97 : b). Ovipositor sheath about 0.9× as long as hind tibia.

Black. Antennal flagellum with fifth to seventh segments (variable, sometimes fourth to nineth segments) yellowish above. Head entirely black except sometimes face above with reddish hue. Thorax red, pronotal collar above and subtegular ridge yellow, colour variable, sometimes propleurum, pronotum partly or largely, mesoscutum also partly, black. First tergite black, broadly red at base and sides, colour variable, sometimes red colour confined to its base only. Apices of abdominal tergites first, second, seventh and eighth broadly in the middle, yellow (Fig. (97 : a). Legs in general reddish-brown; fore coxa dirty yellow, its femur and tibia with a broad dark brown line above. Hind coxa, femur and tibia largely reddish, except coxa and femur at apex, trochanter and tarsus largely dark brown. Wings hyaline with a broad light brown mark in the middle and at the extreme apex, brownish (Fig. 97 : b).

Male : Essentially similar to female, more slender and polished. Clypeus sparsely and shllowly punctate. Frons with semicircular carina modified into horn-like processes. Vertex and temple shiny with sparse and shallow punctures. Pronotum and mesoscutum smooth and shiny. Mesopleurum shiny, largely sparsely and shallowly punctate, weakly rugoso-punctate in the middle. Metapleurum shiny, sparsely and minutely punctate; juxtacoxal carina present. Abdominal tergites second and third at base densely and shallowly punctate, rest similar to female. Genitatia as in figure 97 : c.

Black. Antennal flagellum without a band. Face, clypeus, mandible, temple except above, frons along the eye margin, carina above antennal scrobe, pronotal collar,

subtegular ridge, apices of first to fourth tergites and fifth narrowly and faintly, yellow. Thorax largely deep orange, except sometimes pronotum and mesoscutum with black. First tergite deep orange with a small to extensive black mark above in the middles. Legs in general reddish-yellow, except fore and middle coxae yellow and their tarsi largely brown. Hind leg with trochanter, femur at apex, tibia largely at base and apex and tarsus largely, brown. Wings largely clear hyaline, except infuscate at the apex.

Length : Female, 6–7 mm; fore wing 4.5–5 mm; ovipositor sheath 2.75 mm. Male, 5–6.5 mm; fore wing 3.5–4 mm.

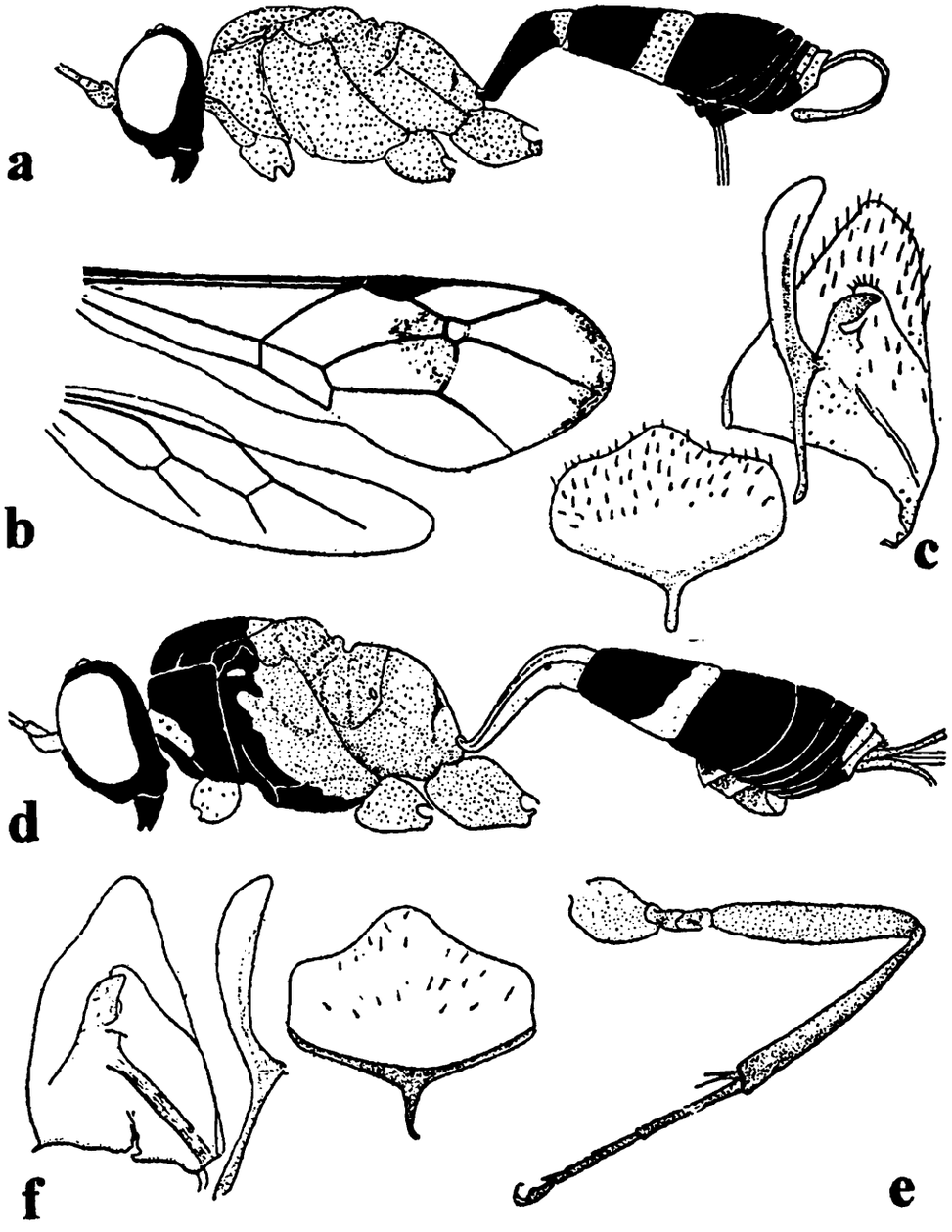

Fig. 97. *Isotima rufithorax* (Szép.) : **a**, body side view; **b**, fore and hind wings; **c**, male genitalia. *I. pusilla* (Szép.) : **d**, body side view; **e**, hind leg; **f**, male genitalia.

Distribution : India : Tamil Nadu (Anamalai Hills). *Elsewhere* : Myanmar (Maymyo, 800 m.). Indonesia : Java (Mt. Gede, 1000 m; Dogor; Dudukjava). Taiwan (Tainan). Philippines : Negros (Mt. Canlaon, 1100 m); Luzon (Laguna; Los Banos; Manila; Mt. Santo Tomas; Benaue); Mindoro (Calapan; San Luis; Son Manuel; Pangasinan); Leyte (Tacloban).

11. ***Isotima pusilla*** (Szépligeti) (Fig. 97 : d–f)

1916. *Neomesostenus pusillus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 294. Male. key, des. Type : Female, India : Maharashtra : Bombay (BUDAPEST).

1916. *Neomesostenus minutus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 294. Male. key, des. Type : Male, India : Maharashtra : Matheran (BUDAPEST). Syn. by Townes, Townes & Gupta, 1961.

1916. *Neomesostenus persimilis* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 294. Male. key, des. Lectotype : (designated by Townes, Townes & Gupta, 1961) : Male, India : Maharashtra : Bombay (BUDAPEST). Syn. by Jonathan, 1980.

1961. *Isotima persimilis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 145. lectotype design., n. comb. India.

1961. *Isotima pusilla* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 145. n. comb., syn. India.

1980. *Isotima pusilla* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 54. Male, Female. key, syn., des., fig. India : Several localities in Maharashtra; Bihar; Rajasthan; Uttar Pradesh; Uttaranchal; Delhi; Tamil Nadu; Kerala; Karnataka; Punjab; Assam. Myanmar. Host : *Pyrausta macheralis.*

1987. *Isotima pusilla* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 859.

This species is very close to *Isotima quadrata* (Szépligeti) and *I. difficilis* Jonathan, but can be recognized by the characters mentioned in the key.

Female : Body subpolished; face rugoso-punctate in the middle, coarsely punctate at sides, clypeus with moderately strong sparse to close punctures, smooth at extreme apex, apical margin sinuate. Malar space granulose, about 0.6× the basal width of mandible; mandibles longitudinally striate, with punctures in between the striae. Frons variable, obliquely rugoso-striate to moderately granuloso-punctate; antennal scrobes deep, smooth and shiny. Vertex closely punctate. Temple minutely and closely punctate. Pronotum subpolished, its sculpture somewhat variable, trans-wrinkled to irregularly wrinkled, wrinkles weak to moderately strong, upper margin with very fine wrinkles and distinct punctrues, lower margin and collar minutely and sparsely punctate, mesoscutum with weak minute sparse punctrues. Scutellum flat to moderately arched, minutely and sparsely punctate, its lateral carina extending to its basal 0.7–0.75; metascutellum smooth and shiny. Mesopleurum largely rugoso-

reticulate, trans-striate above near middle coxa and mesopleural suture, speculum shiny minutely and sparsely punctate, prepectal carina extending about 0.7× the height of mesopleurum, sometimes extending up to the base of subtegular ridge. Metapleurum moderately strongly rugoso-reticulate, juxtacoxal carina present. Propodeum between basal carina and apex moderately strongly reticulo-wrinkled, below apophyses and at sides trans-wrinkled, basad of basal carina smooth in the middle, at sides near spiracle shallowly and closely punctate, spiracle of moderate size, both the transverse carinae complete, apical carina strongly evenly arched in the middle, apophyses moderately strongly high, crest-like. First abdominal tergite smooth, except apico-laterally and sometimes in the middle shallowly punctate; second and third tergites densely and minutely punctate; following tergites mat and subpolished. Areolet of moderate size, about 0.85× as high as the portion of second recurrent vein above bulla, nervulus interstitial, nervellus intercepted at its lower 0.4, brachiella entirely absent. Ovipositor long, stout, its sheath about 0.9× as long as hind tibia.

Black. Antenna with pedicel above, fourth to ninth flagellar segments (sometimes tenth also), white above. Head entirely black. Pronotum, mesoscutum, and anterior portion of mesopleurum, black, the black colour on mesopleurum greatly variable, it may be little more or less extensive; rest of thorax and first abdominal segments bright red (except sometimes first tergite with more or less of black colour (variable). First tergite with no apical yellow band. Pronotal collar, subtegular ridge, apex of second tergite, seventh and eighth tergites broadly, yellow (Fig. 97 : d). Legs in general red; fore coxa and trochanter yellowish; its femur tibia and tarsus dirty yellow with a light brownish hue. Middle coxa and trochanter reddish-yellow; femur reddish, tibia and tarsus yellowish-brown, tarsus tending to be darker. Hind coxa, trochanter and femur red, except trochanter broadly marked, femur narrowly at apex, and tibia (except towards the base) and tarsus largely dark brown (Fig. 97 : e). Wings brownish hyaline, with a faint cloud near the areolet and at extreme apex.

Male : Essentially similar to female in their sculpture but show great degree of differences in their colour. Frons moderately strongly rugoso-punctate, frontal carina high, flange-like. Mesopleurum shiny, weakly rugose with moderately deep punctures. Speculum smooth and shiny. Metapleurum coarsely rugose. Fourth abdominal tergite also shallowly and densely punctate, rest similar to female. Genitalia as in figure (97 : f).

Black. Antenna with scape yellow, flagellum entirely black. The following are yellow : face, clypeus, mandible except the tip, frons along the eye margin including frontal carinae, temple in its lower 0.75, pronotal collar, apices of all the abdominal tergites (as in *pusilla*) or apices of first to fifth and seventh tergites (as in *persimilis*) or apices of first to fourth and seventh tergites (as in *minutus*). Rest of thorax and legs largely reddish-yellow or deep orange, except thorax with mesoscutum largely (as in *minutus*) or partly (as in many other specimens), blackish or black. Legs with

fore, middle coxae and trochanters yellow, middle tarsus dark brown. Hind trochanter with two small spots, its femur at the extreme apex, tibia narrowly at base and largely towards and apex and whole of tarsus dark brown.

Length : Female, 3.5–7.25 mm; fore wing 3–5 mm; ovipositor sheath 1.25–2.5 mm. Male, 4.5–7.5 mm; fore wing 3–5.5 mm.

Distribution : India : Assam (Sonajuli T.E. in Rangapara). Delhi (Shakli Nagar, Azadpur). Jharkhand (Ranchi, Namkum). Karnataka (Kottegehar, 640 m). Kerala (Watapara in Walayar Forest). Maharashtra (Bombay, Matheran, 914 m.; Mahabaleshwar; Chikalda, 1096 m). Punjab (Nagrota, 914 m). Rajasthan (Dhalpur; Silliserh near Alwar). Tamil Nadu (Palni in Palni Hills). Uttar Pradesh (Agra; Bulandshaher; Muradnagar). Uttaranchal (Garjia, 609 m; Harbertpur; Mahakampur; Jeolikote in Kumaon Hills; Dehra Dun and Saharanpur. *Elsewhere* : Myanmar (Mt. Popa; Mt. Victoria and Yanaungmyin Res.)

Host : *Hapalia macharalis.*

12. ***Isotima difficilis*** Jonathan (Fig. 98 : a, b)

1980. *Isotima difficilis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 58. Male, Female. key, des., fig. Type : Female, India : West Bengal : Tista-Kalimpong route (GUPTA). India : Assam : Rangapara : Sonajuli Tea Estate; Tarajuli Tea Estate.

1987. *Isotima difficilis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 858.

This species is distinguished from *Isotima pusilla* (Széplegeti) by having a small yellow mark on pronotal collar above; thorax except pronotum largely red (Fig. 98 : a). The abdominal tergites of male uniformly deep orange, except the seventh tergite black with a apical yellow spot.

Female : Face dull, rugoso-punctate in the middle, closely punctate at sides, punctures tending to be coalescent. Clypeus subpolished closely punctate at base, sparsely punctate towards the apex, apical margin impressed, wavy, notched in the middle. Malar space granulose, 0.7× the basal width of mandible; mandible longitudinally striate with punctures in between the striae, teeth subequal, lower tooth slightly shorter than above. Frons in the middle below ocellar area obliquely rugose, at sides shallowly punctate. Vertex mat; temple closely punctate, tending to be rugoso-punctate or punctures running into striation towards the base of mandible. Pronotum subpolished, in the middle with a few trans-wrinkles or irregular wrinkles, upper margin obliquely and finely rugose or wrinkled; lower margin shiny, few sparse rugae and minute punctures, pronotal collar above with coarse shallow punctures, epomia strong, but not reaching to upper margin. Mesoscutum subpolished, minutely and sparsely punctate. Scutellum subpolished, minutely punctate, lateral carina extending to its basal 0.7. Metascutellum subpolished. Mesopleurum subpolished,

rugose, area just below subtegular ridge finely wrinkled, further below an area with few sparse punctures and with fine and weak running striations, speculum subpolished with sparse punctures, prepectus ruguloso-punctate, mesosternum minutely punctate, prepectal carina extending 0.85 the height of mesopleurum. Metapleurum somewhat coarsely trans-wrinkled, sometimes rugose, juxtacoxal carina present. Propodeum between basal carina and apex finely wrinkled, basad of basal carina shiny with scattered punctures, area around spiracles somewhat rugulose, spiracles oval, apical carina strongly arched, carina weak in the middle, apophyses crest-like, basal carina more or less straight except slightly turned forward in the middle. First tergite smooth and shiny at apex and base, in the middle weakly mat with very few scattered punctures, at sides between dorso-median and lateral carina distinctly granulo-punctate; second and third tergites closely punctate, punctures on second tergite more crowded, following tergites subpolished. Areolet pentagonal, 1.0× as high as the portion of second recurrent vein above bulla, nervulus interstitial, nervellus intercepted slightly below the middle, brachiella absent. Ovipositor long, its sheath about 0.75× as long as hind tibia.

Black. Antenna with fourth to ninth flagellar segments white above; whole of head, propleurae and pronotum, black, extreme upper and posterior margin of pronotum sometimes reddish, black colour may be little more extensive, extending up to subtegular ridge, prepectal carina and anterior part of mesoscutum; rest of thorax including propodeum red, extreme upper corner of pronotal collar with a small mark, second abdominal tergite, seventh and eighth tergites broadly, yellow (Fig. 98 : a); colour of first abdominal tergite greatly variable, its apical half red (sometimes reddish-yellow at the extreme apex), and basal half black, sometimes whole tergite black except narrowly at apex red. Fore coxa reddish-yellow, with a dark brown mark apico-laterally, its first trochanteral segment dark brown, second segment and femur reddish-brown, except femur darker in its basal half, tibia and whole of tarsus blackish, except tibia below yellow. Middle coxa reddish, trochanter largely brownish, femur reddish (sometimes reddish-brown), tibia and tarsus blackish, except tibia narrowly below light brown. Hind coxa reddish to dark reddish-brown, its apex blackish, trochanter largely black, femur light reddish-brown to dark reddish-brown, its apical 0.1–0.3 blackish, tibia and tarsus black, except tibia below in the middle lighter in shade. Wings hyaline, fore wing faintly at the apex and with a distinct cloud in the middle near areolet, light brown.

Male : Essentially similar to the female; face rugose; clypeus subpolished with few scattered shallow punctures. Frons rugoso-punctate; carina above antennal scrobe high flange-like. Vertex mat and subpolished. Pronotum largely smooth and shiny. Mesopleurum closely punctate, punctures tending to be sparse towards the subtegular ridge. Metapleurum finely wrinkled. First abdominal tergite smooth, second to sixth tergites granulose, with dense shallow punctures, seventh tergite mat subpolished; genitalia as in figure 98 : b.

Body largely orange in colour. Antennal flagellum blackish, except scape, pedicel and first segment brownish-yellow in front. Head yellow, except frons in middle and vertex wholly, black. Second to seventh abdominal tergites subbasally, all the tarsi and hind tibia narrowly at base and broadly at apex dark brown. Apex of seventh tergite with a yellow spot. Wings clear hyaline.

Length : Female, 5–7 mm; fore wing 3.5–4.4 mm; ovipositor sheath 2 mm. Male, 5.5 mm; fore wing; 4.5 mm.

Distribution : India : Assam (Sonajuli and Tarajuli Tea Estates in Rangapara). West Bengal (Tista-Kalimpong route).

13. ***Isotima quadrata*** (Szépligeti) (Fig. 98 : g)

1908. *Gambrus quadratus* Szépligeti, *Notes Leyden Mus.*, **29** : 243. Female, key, des. Type : Female, Indonesia : Java : Semarang (BUDAPEST).

1919. *Gambrus quadratus* : Szépligeti, *Notes Leyden Mus.*, **32** : 98. key. Indonesia : Java : Jakarta.

1916. *Mesostenus quadratus* : Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 334. Female. Name preocc. in *Isotima* by Szepligeti, 1908. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, Indonesia : Java : Semarang (BUDAPEST, the same specimen as type of *Gambrus quadratus* Szépligeti). India : Maharashtra : Matheran. Syn. by Townes, Townes & Gupta, 1961.

1941. *Mesostenus szépligetii* Betrem, *Treubia,* **18** : 51. new name for *Mesostenus quadratus* Szépligeti. key.

1961. *Isotima quadrata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 146. n. comb. India. Java.

1980. *Isotima quadrata* : Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 64. Female. key, des., fig. Indonesia : Java : Semarang; Batavia; Mt. Tjmerang; Djampang Tengah; Melang. [Occurrence in India not confirmed.]

1987. *Isotima quadrata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 859.

This species can be recognized from its allied species viz., *Isotima pusilla* by having the following characters : Lateral carina of scutellum extending to its basal about 0.6; frons strongly rugoso-striate; antennal scrobe smooth and shiny; vertex smooth; propodeum largely reticulate. The pronotal collar, subtegular ridge, and face usually in the middle, yellow.

Female : Face all over weakly rugoso-punctate. Clypeus subpolished, coarsely and shallowly punctate. Malar space granulose, 0.6× the basal width of mandible. Frons moderately strongly rugoso-striate, at sides strongly granulose, with a median groove extending from the base of median ocellus. Antennal scrobes deep, smooth and shiny.

Vertex mat and subpolished. Temple ruguloso-punctate, punctures moderately coarse and shallow. Pronotum coarsely trans-striate in the middle, obliquely striate to rugoso-striate above, extreme upper margin with undefined coarse shallow punctures, appears to be weakly rugoso-punctate, extreme lower margin largely smooth, pronotal collar rough. Mesoscutum subpolished, indistinctly punctate. Scutellum and metascutellum largely smooth, lateral carina of scutellum extending to its basal 0.6. Mesopleurum all over weakly to strongly rugose, minutely punctate below sternaulus, speculum subpolished with a few weak punctures, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum rugose, juxtacoxal carina present. Propodeum between basal carina and apex weakly reticulate, sometimes reticulation so weak that area

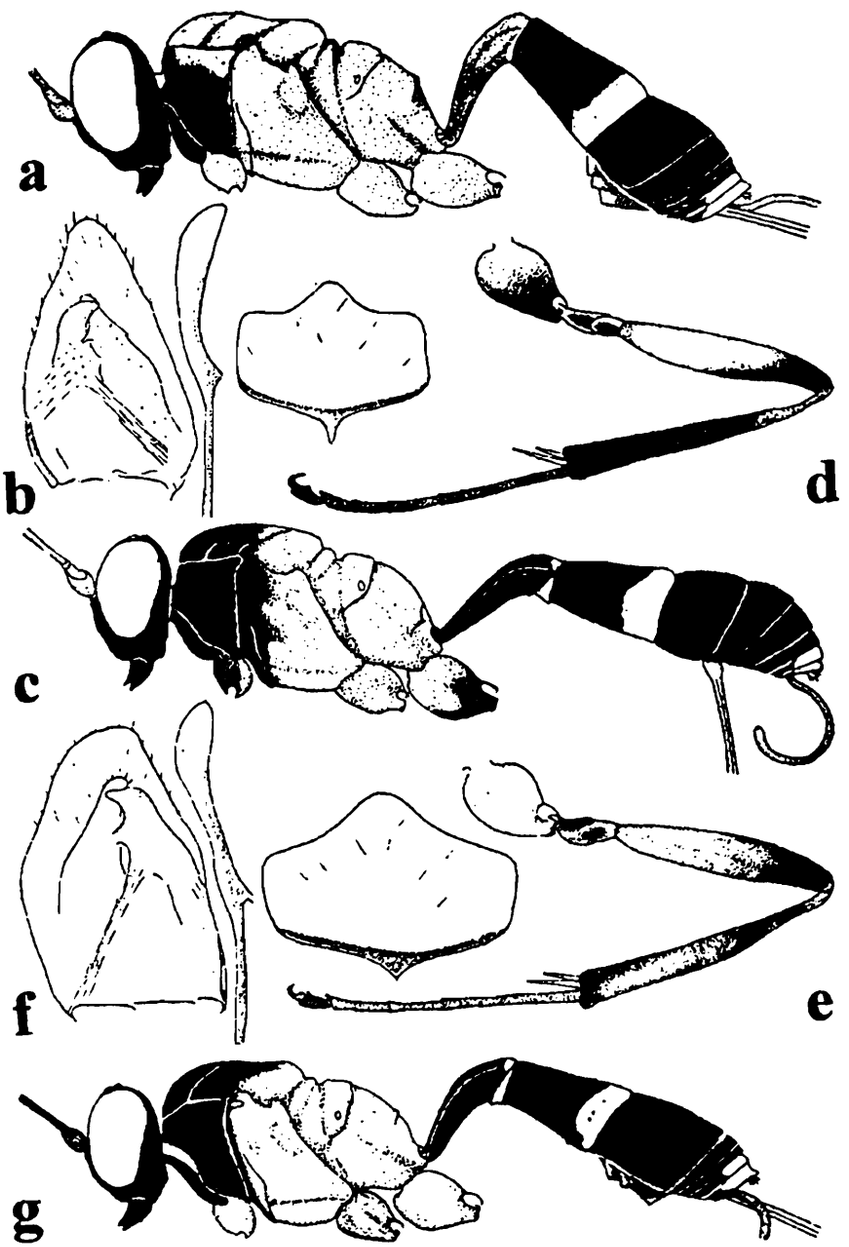

Fig. 98. *Isotima difficilis* : **a**, body side view; **b**, male genitalia. *I. tricolor* (Brullé) : **c**, body side view; **d**, hind leg. *I. semirufa* (Szep.) : **e**, hind leg; **f**, male genitalia. *I. quadrata* (Szep.) : **g**, body side view.

appears to be finely wrinkled, area basad of basal carina near the spiracles rugoso-punctate, spiracle small longish-oval, both the transverse carinae arched in the middle, apical carina weak or absent in the middle, laterally present as weak crests. First abdominal tergite largely mat and subpolished, with scattered shallow punctures in the postpetiolar area, tergite moderately broad at apex, second and third tergites densely punctate, following tergites mat and subpolished. Areolet moderately large, pentagonal, about 1.0× as high as the portion of second recurrent vein above bulla, nervulus interstitial, nervellus intercepted below, or sometimes near the middle, brachiella absent. Ovipositor long, sheath about 0.75× as long as hind tibia.

Black. Antenna dark brown to black, with fourth to ninth flagellar segments white above. Head entirely black, except sometimes with a readdish-yellow hue in front. Pronotum, mesoscutum and sometimes mesopleurum near subtegular ridge, black; rest of the thorax red. Pronotal collar above, apices of first, second, seventh and eighth tergites yellowish-white (Fig. 98 : g). Legs in general reddish; fore coxa somewhat reddish-yellow, its tarsus brownish. Middle tarsus with a line above and tarsus wholly brown; hind trochanter faintly, femur at its extreme apex, tibia largely towards the apex and tarsus wholly, dark brown. Wings hyaline with a yellowish hue, fore wing with a broad light brownish spot near the areolet.

Male : Not known.

Length : Female, 5.5–9.0 mm; fore wing 4–6 mm; ovipositor sheath 1.5–2.5 mm.

Distribution : India : Maharashtra (Matheran). *Elsewhere* : Indonesia : Java (Semarang; Jakarta; Batavia; Mt. Tjerang; Djampang Tengah and Malang).

14. ***Isotima tricolor*** (Brullé) (Fig. 98 : c, d)

1846. *Cryptus tricolor* Brullé, *In* Lepeletier : Histoire Naturelle des Insectes, Hymenopteres, **4** : 195. "Male" = Female. des. Type. Female, "Indes Orientales" (PARIS).

1908. *Cryptus(?) tricolor* : Schmiedeknecht, *Genera Insectorum,* **75** : 32. syn. notes.

1961. *Isotima tricolor* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 146. n. comb. "India Orientales"

1980. *Isotima tricolor* : Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 60. Female. key, des., fig. China : Fujian : Shaowu Hsien, 1200-1500 m.; Guangdong (=Kwangtung) : Yim Na San.

1987. *Isotima tricolor* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 860.

This species is very similar to *Isotima semirufa* Jonathan. It is distinguished by having frons obliquely rugoso-punctate in the middle; pronotum largely rugoso-wrinkled in the middle. It has mesoscutum wholly black and hind coxa red, with black at apex (Fig. 98 : d).

Female : Face densely rugoso-punctate. Clypeus sparsely punctate, subpolished, apical margin impressed, polished. Mandible longitudinally striate. Frons strongly and obliquely rugoso-punctate in the middle, rugulose at sides, antennal scrobe without aciculations (smooth and shiny). Vertex closely and shallowly punctate, dull. Temple shallowly and coarsely punctate. Malar space granulose, 0.66× the basal width of mandible. Pronotum strongly rugoso-wrinkled in the middle, scrobe densely punctate above with running striations, towards the lower margin with a impunctate smooth and shiny area, pronotal collar with coarse irregular punctures with running striations. Mesoscutum subpolished, minutely and closely punctate. Scutellum minutely and shallowly punctate, its lateral carina confined to its basal 0.2; metascutellum smooth and shiny. Mesopleurum with moderately strong rugae, speculum smooth, prepectal carina extending more or less up to the base of subtegular ridge. Metapleurum moderately strongly rugose, tending to be finely wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex moderately reticulate, at sides somewhat wrinkled, area basad of basal carina rugoso-punctate, punctures coarse, much coalescent and not well defined, spiracle of moderate size, round; apical carina fine, bow-shaped, apophyses crest-like. First abdominal tergite largely mat and subpolished, second tergite closely punctate, third tergite closely and shallowly punctate, following tergites mat and subpolished. Fore wing with areolet moderately large, pentagonal, intercubiti convergent, areolet about 1.2× as high as the portion second recurrent vein above bulla, nervulus interstitial, nervellus intercepted at or slightly below the middle, brachiella absent. Ovipositor sheath about 1.1× as long as hind tibia.

Black. Antenna with scape, pedicel, first and second flagellar segments, yellowish-brown; fifth to eighth flagellar segments yellowish above. Head pronotum, mesoscutum and anterior 0.25 of mesopleurum entirely black; rest of thorax red. First tergite usually black with a red patch on postpetiole dorsally, sometimes this red patch more extensive. Apices of first tergite narrowly, second tergite moderately, seventh and eighth tergites broadly in the middle, yellow (Fig. 98 : c). Legs in general red with brown to black markings; fore leg reddish-brown, except coxa at base and femur at apex reddish. Middle leg largely red with coxa at apex narrowly, femur at extreme apex and below, and whole of tibia and tarsus blackish. Hind leg red, except coxa at apex, trochanter largely, apical 0.33 and sometimes more than 0.75 of femur, whole of tibia and tarsus, black (Fig. 98 : d) except tibia at basal 0.2 lighter in colour. Fore wing with a broad mark near areolet, a mark at base and apex, light brown.

Male : Not known.

Length : Female, 9 mm; fore wing 6 mm; ovipositor sheath 2.5 mm.

Distribution : India : "Indes Orientalis" *Elsewhere* : China (Shaowu Hsien, 1200-1500 m; Gungdong; (=Kwangtung) : Yim Na San.

Remarks : Distribution of this species in Indian subregion is not confirmed.

15. ***Isotima semirufa*** Jonathan (Fig. 98 : e, f)

1980. *Isotima semirufa* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 61. Male, Female. key, des., fig. Type : Female, India : Assam : Rangapara : Sonajuli Tea Estate (GUPTA). India : Assam : Rangapara : Tarajuli Tea Estate; Charduar Forest. Orissa : Joypore, 520 m. China : E. Kwangtung : Yim Na San.

1987. *Isotima semirufa* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 860.

This species is chiefly recognized by having frons obliquely wrinkled in the middle; pronotum reticulo-punctate and distinctly punctate above. The mesoscutum with a reddish hue in front of middle lobe and hind coxa wholly red (Fig. 98 : e).

Female : Face dull, punctate in the middle, punctures large and close, sometimes coalescent, at sides and above near antennal sockets rugoso-punctate. Clypeus subpolished, at base and in the middle sparsely punctate, apex smooth and shiny, apical margin impressed, wavy, notched in the middle. Malar space rugulose, 0.7× the basal width of mandible. Mandible longitudinally punctate. Frons in the middle below ocellar area somewhat finely obliquely wrinkled with a few punctures, at sides largely granulose with a few shallow scattered punctures. Vertex minutely punctate. Temple deeply and sparsely punctate, subpolished. Pronotum in the middle reticulo-punctate and above distinctly and closely punctate, punctrues tending to be coalescent, sometimes wrinkled, lower area shiny with minute scattered punctures, pronotal collar with faint punctures, epomia not reaching to upper margin. Mesoscutum subpolished, minutely punctate. Scutellum punctate; lateral carina extending to its basal 0.2; metascutellum subpolished, hardly punctate. Mesopleurum largely strongly rugose at some places tending to be wrinkled, area below subtegular ridge minutely and sparsely punctate, triangular area just above sternaulus near to prepectal carina subpolished and minutely punctate, trans-striate along mesopleural suture, speculum shiny, minutely and sparsely punctate, area just below sternaulus finely wrinkled with punctures, mesosternum sparsely punctate, prepectal carina extending 0.7 the height of mesopleurum. Metapleurum subpolished, somewhat trans-wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex largely wrinkled, tending to be reticulate between basal carina and apex largely wrinkled, tending to be reticulate between apical and basal carinae, at sides and below apophyses trans-wrinkled, basad of basal carina subpolished, punctate, punctures large and moderately deep, at sides punctures running into striations, spiracles large and longish, apical carina strongly arched in the middle, apophyses crest-like, basal carina moderately turned forward in the middle. First abdominal tergite short about 2× as long as broad at apex, dorso-median longitudinal carinae ending at the level of spiracles, tergite largely smooth and shiny, except in the middle with few large shallow punctures, lateral area between longitudinal carinae near spiracle strongly granulose with scattered shallow punctures, second and third tergites closely punctate, punctures on second tergite more crowded, fourth tergite shallowly punctate at base, following tergites subpolished. Areolet

pentagonal, about 1.2× as high as the portion of second recurrent vein above bulla, intercubiti convergent, nervulus interstitial, nervellus intercepted at the middle, brachiella absent. Ovipositor long, its sheath about 0.9× as long as hind tibia.

Black. Antenna with first and second segments of flagellum brownish, fifth to ninth segments white above. Whole of head, propleurae, pronotum, mesoscutum, prepectus, subtegular ridge, and area below that, black; rest of mesopleurum, base of hind wing, metanotal rim, scutellum, metascutellum, metapleurum, and propodeum, red. First abdominal tergite colour greatly variable, red to black. Apices of first (sometimes faint), second tergite, sixth narrowly in the middle, seventh and eighth tergites broadly, yellow. Fore leg largely reddish-brown, except second trochanteral segment, a line on tibia above and whole of tarsus dark brown. Middle coxa, trochanter and femur red, except femur at extreme apex dark brown, tibia and tarsus dark brown or blackish, except tibia narrowly below yellowish. Hind coxa and femur red, except a mark at the apex of coxa and apical 0.35 of femur blackish, trochanter largely, tibia and tarsus wholly dark brown or blackish (Fig. 98 : e). Wings hyaline, fore wing with a cloud in the middle near areolet and at apex, brownish.

Male : Face subpolished, shallowly punctate, punctures tending to be coalescent in the middle. Clypeus weakly punctate at base, rest smooth and shiny. Malar space granulose, 0.55 the basal width of mandible. Mandible largely polished with a few coarse punctures; semicircular carina on frons high and flange-like, frons subpolished with a few shallow scattered punctures. Vertex smooth and shiny. Temple shiny, with sparse minute punctures. Pronotum largely polished except in the middle and at upper margin punctate, epomia short. Mesoscutum subpolished minutely punctate. Scutellum flat, sparsely, minutely punctate; lateral carina confined to its base. Metascutellum smooth and subpolished. Mesopleurum ruguloso-punctate, mesosternum coarsely punctate, speculum subpolished, prepectal carina extending 0.6 the height of mesopleurum. Metapleurum coarsely punctate, punctures very close and coalescent, juxtacoxal carina present. Propodeum between basal carina and apex reticulo-punctate, basad of basal carina largely smooth and shiny, at sides towards spiracles punctate, apical and basal carinae slightly arched in the middle, spiracles large and oval. First abdominal tergite long and slender, smooth and shiny, second to seventh abdominal tergites punctate, punctures tending to be shallow towards the tip of abdomen. Wings similar to female. Genitalia as in figure 98 : f.

Largely light orange. Antenna brownish-yellow. Head black, except clypeus and mandible, yellow. Abdomen blackish, except first, seventh and eighth tergites completely and apices of second to sixth tergites, yellow. Fore coxa and femur light orange, rest yellow, except fifth tarsal segment at apex brownish. Middle leg largely orange, except tarsus light brownish. Hind coxa, trochanter and femur reddish-yellow, femur with a mark at its extreme apex, tibia and tarsus dark yellow, except tibia at apex and extreme base, and fifth tarsal segment at apex, fuscous.

Length : Female, 5.5–9 mm; fore wing 4.5–6 mm; ovipositor sheath 2.5–3.5 mm. Male, 8–9 mm; fore wing; 5–5.5 mm.

Distribution : India : Assam (Sonajuli and Tarajuli Tea Estates and Charduar Forest in Rangapara). Orissa (Joypore). *Elsewhere* : China (Yim Na San in Kwangtung).

14. Genus ***Formostenus*** Uchida (Fig. 99 : a–d)

This genus is characterized mainly by the shape of first abdominal tergite being long and slender, postpetiole much longer than wide at base. The abdomen is usually long and somewhat spindle-shaped. Brachiella vein present and usually short, but sometimes extending beyond 0.5 the distance to wing margin. The ovipositor tip long and pointed and usually curved (Fig. 99 : c).

Head moderately large, as long as broad or sometimes much longer than broad. Clypeus convex, apical margin impressed, apex arched, without median irregularity. Frons sloping towards the antennal sockets, weakly arched or sometimes depressed, usually with a median vertical groove, with a crescentric concave area above each antennal socket, bordered dorsally by an arched carina, the carina sometimes projecting as flange or tooth, especially in males. Mandible (Fig. 99 : b) with subequal teeth, lower tooth mostly shorter than upper. Epomia on pronotum moderately strong and long, but reaching the upper margin of pronotum. Scutellum moderately to strongly arched, its lateral carina extending to its basal 0.33-0.66, sometimes confined to its base only; prepectal carina extending 0.6-0.9 the height of mesopleurum, sternaulus usually extending up to the base of middle coxa except unusually short and weak in *Indostenus* Jonathan both the transverse carinae of propodeum usually present, carinae rather straight and complete, sometimes apical carinae obsolescent in the middle as in *Indostenus*, apophyses crest-like to moderately high and pointed, spiracle small to large, oval to longish, slit-like. First abdominal tergite long and cylindrical about 3× as long as broad at apex, petiole rounded and tubular, spiracles close to each other than to apex (post-petiole longer than broad), tergite at base somewhat rounded or oval in cross-section, dorso-median carinae usually present but sometimes faint or absent, dorsolateral carina always present, ventro-lateral carina weakly to strongly present, this carina in most species tending to be more ventral rather than lateral, ventro-lateral angulation not very acute, but rounded. Areolet small to large, pentagonal, second intercubitus faintly present, second recurrent vein subvertical, nervulus usually interstitial, sometimes slightly distad or basad of basal vein, nervellus intercepted at or above the middle, sometimes slightly below the middle; mediella moderately strongly arched, brachiella present, sometimes like a small stump (Fig. 99 : a). Ovipositor tip long and pointed, teeth on lower valve in most species not well defined, extreme tip straight to curved downward (Fig. 99 : c).

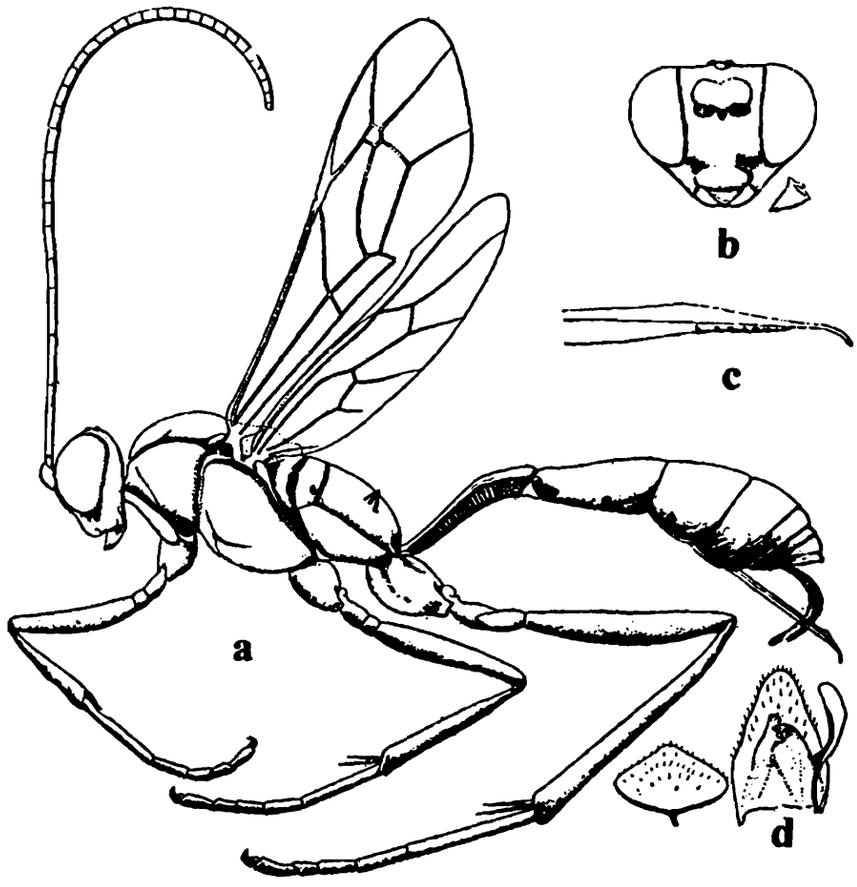

Fig. 99. *Formostenus (Indostenus) nigrus* Jonathan : **a**, body side view; **b**, head front view; **c**, ovipositor; **d**, male genitalia.

Length : Female, 7.5–14 mm; fore wing 6–10 mm; ovipositor sheath about 1.5–3.0 mm.

Type-species : *Formostenus angularis* Uchida.

This is a moderately large genus, known to occur in the Oriental Region. In Oriental Region this genus is widely distributed in Indian subcontinent and is also known from Myanmar, Java, Borneo, Philippines, Taiwan and China.

Jonathan (1980) reported one new subgenus and 22 new species in addition to two earlier known species from Oriental Region. In India and adjacent countries, this genus is represented by 14 species. The genus is divisible into two subgenera viz, *Formostenus* (*Formostenus*) Uchida, 1931 and *Formostenus* (*Indostenus*) Jonathan, 1980. A key to subgenera and species of Indian subregion is as follows :

Key to the subgenera and the species of *Formostenus*

1. Apical carina of propodeum absent. Nervellus intercepted at its upper 0.2; nervulus opposite to basal vein; brachiella present and exceptionally extending beyond 0.5 the distance to wing margin. (Body largely black, except a broad apical band at

the apex of second tergite, seventh and eighth tergites narrowly at apex, yellow). India : Assam. Java. Philippines..... ..... 1. Subgenus ***Indostenus*** Jonathan .....1. *nigrus* Jonathan

– Apical carina of propodeum present. Nervellus intercepted at or slightly above or below the middle; nervulus opposite or little distad of basal vein; brachiella absent or present as a small stump .....2. Subgenus ***Formostenus*** Uchida...2

2. Thorax black, with or without markings 3

– Thorax not entirely black, partly or entirely red, or atleast its propodeum and the area at the base of hind wing, red 6

3. Thorax without any mark, except scutellum and metascutellum with reddish or yellowish hue 4

– Thorax with various marks 5

4. Pronotum and mesopleurum trans-striate. Scutellum minutely punctate, lateral carina short, extending to its basal 0.3. Metapleurum finely trans-striate. Propodeum largely, weakly and finely wrinkled. India : Meghalaya; Assam.... ..... 2. *cherraensis* Jonathan

– Pronotum strongly and irregularly wrinkled. Mesopleurum strongly rugose. Scutellum with minute and sparse punctures in the middle and with a few short striae at sides, extending from the lateral carina. Lateral carina extending to its basal 0.7. Metapleurum strongly trans-wrinkled. India : Assam .... 3. *rugosus* Jonathan

5. Face completely yellow. Pronotal collar, metapleurum and propodeum black, metapleurum trans-striate. Propodeum stongly reticulo-wrinkled; abdominal tergites broad, abdomen spindle-shaped. India : Sikkim; West Bengal; Uttaranchal. Myanmar ..... 4. *flavofasciatus* Jonathan

– Face in the middle and along the eye margin, pronotal collar, propodeum between apical carina and apex, metapleurum above the base of hind coxa, yellow. Metapleurum and propodeum finely wrinkled. India : Meghalaya .... 5. *flavorbitalis* Jonathan

6. Pronotum, mesoscutum and mesopleurum black 7

– Thorax almost wholly red, except sometimes mesoscutum with dark brown or blackish tinge 9

7. Nervellus intercepted at its lower 0.4. Semicircular carinae (in female) above each antennal scrobe specialized into high flanges. Malar space about 0.57× the basal width of mandible. Lateral carina of scutellum confined to its base. Scutellum yellow. India : Assam ..... 6. *bidentatus* Jonathan

– Nervellus intercepted above the middle, semicircular carina simple. Malar space more than 0.57× the basal width of mandible. Lateral carina of scutellum extending to its basal 0.5 to 0.75. Scutellum red 8

8. Pronotum coarsely striate, its extreme upper margin somewhat rugose. Mesopleurum largely trans-striate. Lateral carina of scutellum extending to its basal 0.75. Propodeum between basal carina and apex strongly wrinkled. Base of hind wing, metapleurum and propodeum red, without any blackish marks. India : Meghalaya .... 7. *striatus* Jonathan

– Pronotum with a few coarse striae in the middle, its upper half (0.5) finely rugose. Mesopleurum largely rugose. Lateral carina of scutellum extending to its basal 0.5. Propodeum between basal carina and apex finely wrinkled. Base of hind wing, lower margin of metapleurum and apex of propodeum, blackish. India : Meghalaya ..... 8. *rugipectus* Jonathan

9. Abdominal tergites shiny, third and following tergites smooth, without any punctation 10

– Abdominal tergites dull or subpolished, third tergite usually densely punctate, following mat 11

10. Mesopleurum with sparse, shallow and minute punctures; sternaulus extending 0.5 the distance to middle coxa. Upper margin of pronotum largely finely punctate. First abdominal tergite finely punctate. Pronotum and mesoscutum orange with blackish hue. Myanmar ..... 9. *malaisei* Jonathan

– Mesopleurum finely trans-aciculate; sternaulus extending 0.75 the distance to middle coxa. Upper margin of pronotum finely aciculate with fine punctures in between the aciculi. First abdominal tergite smooth (without punctures) and polished. Pronotum and mesoscutum orange, without blackish hue. Myanmar... ..... 10. *aciculatus* Jonathan

11. Face in the middle rugoso-punctate. Malar space about 1.0× the basal width of mandible. Frons obliquely striate. (Face along the eye margin whitish; thorax entirely orange). Myanmar ..... 11. *rufiscens* Jonathan

– Face in the middle rugulose to rugose (without any puncture). Malar space about 1.33× the basal width of mandible. Frons rugose 12

12. Pronotum largely rugulose, except for a few short striae in the middle groove. Occipital carina sharply bent at lower end. Lateral carina of scutellum extending less than half (0.4). (Mesopleurum largely with weak trans-rugae, mesopleural pit deep; prepectal carina about 0.55 the height of mesopleurum. Propodeum finely wrinkled). Myanmar ..... 12. *burmensis* Jonathan

– Pronotum distinctly striate all over. Occipital carina evenly arched. Lateral carina of scutellum extending more than half (0.5–0.6) the length of scutellum 13

13. Propodeal spiracle circular and protruding. Third abdominal tergite minutely and uniformly punctate, tergite largely dull. Propodeum coarsely rugose. Myanmar ..... 13. *tanypetiolatus* Jonathan

– Propodeal spiracle elongate, not protruding; third abdominal tergite not uniformly punctate, punctures largely confined to its baso-lateral area, tergite in the middle impunctate and subpolished. Propodeum finely rugose. Myanmar ..... 14. *kambaitiensis* Jonathan

1. Subgenus ***Formostenus (Indostenus)*** Jonathan (Fig. 99 : a–d)

1980. *Indostenus* Jonathan, *Rec. Zool. Surv. India, Occ. Paper,* **17** : 76. Type-species : *Formostenus (Indostenus) nigrus*; original designation.

Distribution : Oriental Region.

Upper tooth of mandible (Fig. 99 : b) much longer, about 3× longer than the lower tooth. Apical carina of propodeum absent. Nervellus intercepted at its lower 0.2. Nervulus opposite to basal vein. Brachiella long and extending more than 0.5 the distance to wing margin (Fig. 99 : a).

This subgenus is represented by a single species, which is detailed below.

1. ***Formostenus (Indostenus) nigrus*** Jonathan (Fig. 99 : a–d)

1980. *Formostenus (Indostenus) nigrus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 77. Male, Female. key, des., fig. Type : Female, India : Assam : Rangapara : Sonajuli Tea Estate (GUPTA). Indonesia : Java : Wijnkoops Bay; Bandung, 700 m. Philippines : Mindoro : Victoria : Alcate. Luzon : Manila.

This species is distinguished by having body black, except apical bands on second, seventh and eighth abdominal tergites, yellow. The apical carina of propodeum absent, nervellus intercepted far above the middle (0.2) and brachiella long.

Female : Face and clypeus strongly and coarsely trans-rugose. Clypeus moderate to strongly convex, subpolished with a few punctures at apex. Malar space rough, 1.0× the basal width of mandible. Mandible subpolished, hardly punctate. Frons all over strongly rough and wrinkled. Vertex somewhat granulose tending to be rugose near ocellar triangle, with a few scattered shallow punctures. Temple strongly rugose. Pronotum irregularly wrinkled in the lower half, upper half tending to be obliquely and coarsely striate, epomia moderately strong, pronotal collar subpolished, somewhat minutely punctate. Mesoscutum strongly rugose along the margins of each lobe, finely rugose in the middle of each lobe, notauli not well defined. Scutellum moderately

convex, strongly reticulate; its apex subpolished with minute punctures, lateral carina extending to its basal 0.7. Metascutellum subpolished, minutely punctate. Mesopleurum wrinkled, at some places tending to be reticulate, below sternaulus finely rugoso-punctate, prepectal carina extending 0.6 the height of mesopleurum. Metapleurum strongly wrinkled to reticulate, juxtacoxal carina absent. Propodeum finely reticulate, at some places wrinkled, below apophyses trans-wrinkled, area basad of basal carina reticulo-punctate, apophyses moderately high and conical; basal carina complete, evenly arched, spiracle large and longish. Fore wing (Fig. 99 : a) with areolet pentagonal, intercubiti more or less parallel, second intercubitus faint. First abdominal tergite smooth and shiny basally, apically granuloso-punctate, punctures shallow and running into striations, second and third tergites closely and finely punctate, punctures tending to be shallow and indistinct towards the apices, following tergites subpolished. Ovipositor (Fig. 99 : c) tip long and pointed, ovipositor sheath 0.33× and long as hind tibia.

Whole of body black, except seventh to eleventh flagellar segments (seventh segment only at its extreme apex) white above; a broad apical band at the apex of second abdominal tergite, seventh and eighth tergites narrowly at apices, yellow. Wing slightly light brownish.

Male : Similar to female, except that the flagellum without a white band and apices of second and seventh tergites yellow. Genitatia as in figure 99 : d.

Length : Female, 10–12 mm; fore wing 7–9 mm; ovipositor sheath about 2 mm. Male, 9.5–13 mm; fore wing 6–8 mm.

Distribution : India : Assam (Sonajuli Tea Estates in Rangapara dist.). *Elsewhere* : Indonesia : Java (Wijn Koops Boy). Philippines : Mindoro (Alcate, Victoria); Luzon (Manila).

2. Subgenus ***Formostenus (Formostenus)*** Uchida

1931. *Formostenus* Uchida, *J. Fac. Agri. Hokkaido Imp. University,* **30** : 180. Type-species : *Mesostenus (Formostenus) angularis* Uchida; Original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 144. (as a Syn. of *Isotima*). Townes, 1976 : 265 (as a Syn. of *Isotima*). Jonathan, 1980 : 72, 78.

Distribution : Oriental Region.

Teeth of mandible subequal. Apical carina of propodeum present. Nervellus variously positioned. Nervulus opposite or little distad of basal vein. Brachiella absent or present as a small stump.

This subgenus is widely distributed in Oriental Region. In Indian subregion this subgenus is represented by 13 species, which are detailed below :

2. ***Formostenus (Formostenus) cherraensis*** Jonathan (Fig. 100 : a–c)

1980. *Formostenus (Formostenus) cherraensis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 79. Female. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1235 m. (GUPTA). India : "Assam."

1987. *Formostenus (Formostenus) cherraensis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 862.

This species is very close to *Formostenus rugosus* Jonathan. It can be distinguished by having lateral carina of scutellum short, extending about 0.3 at its base; pronotum and mesopleurum trans-striate and propodeum largely with fine wrinkles.

Female : Face finely rugose, tending to be strong towards the antennal sockets and smoother towards the sides of face. Clypeus subpolished, minutely and sparsely, punctate, apical margin impressed, trunctate in the middle. Malar space granulose, 1.2× the basal width of mandible. Frons with its middle area little raised, somewhat rugulose, at sides subpolished, hardly punctate. Vertex subpolished, indistinctly punctate. Temple subpolished, minutely and sparsely punctate. Pronotum coarsely trans-striate in the middle, upper and lower margin finely rugulose, extreme lower corner subpolished, pronotal collar subpolished, epomia moderately strong, not reaching to upper margin. Mesoscutum subpolished, minutely punctate. Scutellum subpolished, minutely punctate, lateral carina extending to its basal 0.33; metascutellum subpolished, with few minute punctures. Mesopleurum dull, very finely trans-striate, tending to be rugulose in the middle, speculum subpolished, minutely and sparsely punctate, area below sternaulus ruguloso-punctate, prepectal carina extending 0.75 the height of mesopleurum. Metapleurum dull, finely trans-rugose, rugae stronger along the juxtacoxal carina and along pleural carina, juxtacoxal carina present. Propodeum between apical and basal carinae finely wrinkled, wrinkles coarser along the carinae and at sides, area between apical carina and apex coarsely wrinkled, trans-wrinkled at sides, basad of basal carina subpolished, in the middle with shallow, sparse punctures, at sides finely aciculate, aciculi circular around spiracles, spiracle large longish, apical carina strong complete, evenly arched in the middle, basal carina strong, more or less straight. First abdominal tergite smooth and subpolished, except few punctures at apex and near spiracles, second and third tergites dull, finely and closely punctate, punctures tending to be indistinct towards the apex, following tergites subpolished. Fore wing with areolet pentagonal, about 0.75× as high as the portion of second recurrent vein above bulla, intercubiti slightly convergent, nervulus interstitial (or slightly distad), nervellus intercepted at the middle, brachiella vein present faintly. Ovipositor tip long, pointed and curved, sheath about 0.6× as long as hind tibia.

Black. Apical half of fourth to ninth flagellar segments white above. Face (Fig. 100 : b) dark brownish-black with two lateral yellow stripes; a mark on metapleurum just above hind coxa, apices of first and second abdominal tergites, third tergite baso-laterally, sixth narrowly at apex, seventh and eighth tergites broadly, yellow

(Fig. 100 : a). Fore leg with coxa, trochanter, femur and tibia dark yellow, except tibia above and whole of tarsus fuscous, fifth tarsal segment dark brown. Middle coxa, trochanter, femur, dirty yellow, except femur and trochanter fuscous above, tibia and tarsus fuscous, its fifth tarsal segment dark brown. Hind coxa, trochanter and femur brownish-yellow, except coxa above, trochanteral segments largely, femur at its upper half and at apex, dark brown; tibia dark blackish-brown, lighter below, tarsus yellow, its fourth segment at apex and fifth segment wholly, dark brown (Fig. 100 : c).

Male : Not known.

Length : Female, 10–14 mm; fore wing 7.5–10 mm; ovipositor sheath about 2.5–3 mm.

Distribution : India : Meghalaya (Cherrapunji, 1235 m). Assam.

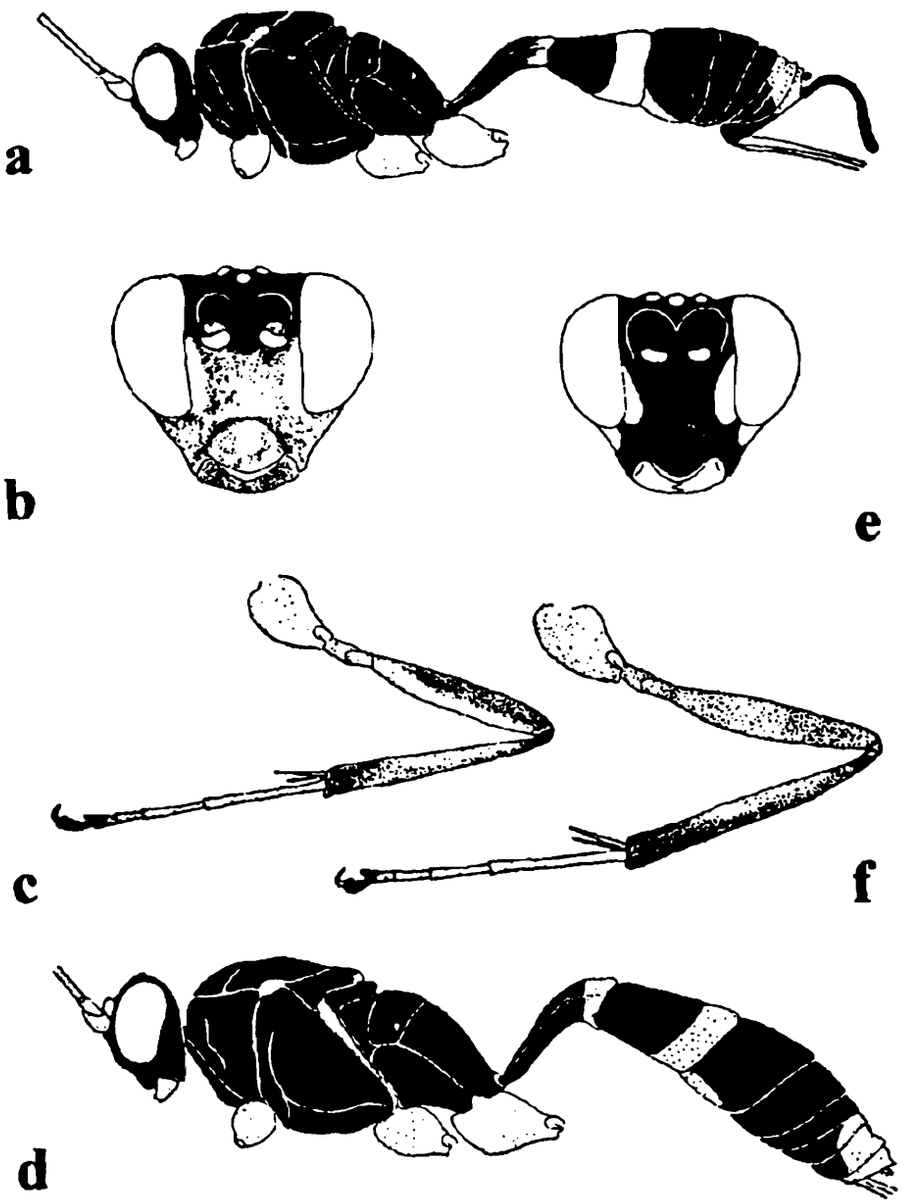

Fig. 100. Colour Pattern. *Formostenus (F.) cherraensis* Jonathan : **a**, body side view; **b**, head front view; **c**, hind leg. *F.(F.) rugosus* Jonathan : **d**, body side view; **e**, head front view; **f**, hind leg.

3. ***Formostenus (Formostenus) rugosus*** Jonathan (Fig. 100 : d–f)

1980. *Formostenus (Formostenus) rugosus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 80. Female. key, des., fig. Type : Female, India : Assam : Rangapara : Charduar Forest (GUPTA).

1987. *Formostenus (Formostenus) rugosus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 864.

This species is distinguished by having pronotum strongly and irregularly wrinkled; scutellum minutely and sparsely punctate with a few striae at sides, its lateral carina extending to its basal 0.7 and metapleurum strongly trans-wrinkled.

Female : Face strongly rugose in the middle, at sides more or less smooth. Clypeus subpolished, at base near the groove rugose, shallowly and sparsely punctate towards the apex, extreme apex smooth and shiny, apical margin weakly impressed in the middle. Malar space granulose, 1.1× the basal width of mandible; mandible subpolished, indistinctly punctate. Frons subpolished, rugoso-punctate in the middle, at sides smooth with few scattered shallow punctures. Vertex subpolished and smooth, temple with distinct shallow punctures. Pronotum strongly and irregularly wrinkled, at upper margin closely wrinkled, epomia strong, not reaching to upper margin. Mesoscutum subpolished, faintly punctate. Scutellum subpolished, minutely punctate, basal half with few short lateral transverse striae extending from the lateral carina towards the middle, lateral carina extending to its basal 0.68. Metascutellum subpolished, minutely punctate. Mesopleurum strongly rugose, tending to be wrinkled, speculum minutely punctate, a deep depression present above speculum, prepectal carina extending 0.9 the height of mesopleurum. Metapleurum strongly trans-wrinkled, juxtacoxal carina present. Propodeum with area between basal and apical carinae strongly irregularly wrinkled, between apical carina and apex somewhat strongly trans-wrinkled, basad of basal carina shiny with a few scattered punctures, punctures near basal carina coalescent, spiracle moderately large, oval with a semicircular carina around, apical and basal carinae complete and more or less straight, apophyses crest-like. First abdominal tergite subpolished and smooth, somewhat granulose toward the apex, second tergite shallowly, closely and minutely punctate, following tergites smooth and subpolished. Fore wing with areolet pentagonal, about 0.55× as high as the portion of second recurrent vein above bulla, intercubiti parallel, nervulus distad, nervellus intercepted slightly above the middle, brachiella present as a minute stump. Ovipositor tip long, pointed, curved, its sheath about 0.5 as long as hind tibia.

Black. Antenna with fourth to tenth segments white above. Head completely black, except faint mark on either side of face and temple below, dirty yellow (Fig. 100 : e). Apices of first and second abdominal tergites, third tergite along the lateral margins, sixth narrowly at apex, seventh and eighth broadly, yellow (Fig. 100 : d). Fore leg with coxa and first trochanteral segment and femur, yellowish-orange, tibia and tarsus yellow, mixed with fuscous above, its fifth tarsal segment dark brown. Middle

leg with coxa yellow, trochanter and femur yellowish-brown, tibia and tarsus blackish with yellow hue, its fifth tarsal segment dark brown. Hind coxa and trochanter dark brown, except trochanteral segments with blackish marks above, femur dark brown tending to be more blackish-brown towards the apex, tibia blackish, except subbasal area with yellowish hue, tarsus yellow, its fourth segment apically and fifth segment wholly, dark brown (Fig. 100 : f). Wings light yellowish hyaline.

Male : Not known.

Length : Female, 12.5 mm; fore wing 9 mm; ovipositor sheath 3 mm.

Distribution : India : Assam (Rangapara : Charduar Forest).

4. ***Formostenus (Formostenus) flavofasciatus*** Jonathan (Fig. 101 : a–c)

1980. *Formostenus (Formostenus) flavofasciatus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 83. Female. key, des., fig. Type : Female, India : Sikkim : Gangtok, 1676 m. (GUPTA). India : West Bengal : Darjeeling Hills : Rangiroon, 1905 m. : Uttaranchal : Kumaon Hills : Chaubatia, 1943 m. Myanmar : Mt. Victoria, 1400-2200 m.

1987. *Formostenus (Formostenus) flavofasciatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 862.

This species can be recognized from its allied species, *F. flavorbitalis* Jonathan, by having face completely yellow; pronotal collar, metapleurum and propodeum black; metapleurum trans-striate and propodeum moderately strongly reticulo-wrinkled. The abdomen spindle shaped.

Female : Face subpolished, weakly rugose, rugae somewhat diverging, at sides sparsely and shallowly punctate. Clypeus subpolished, less convex, sparsely punctate, smooth and shiny at apex, apical margin in the middle impressed. Malar space granulose, 1.0× the basal width of mandible, mandible subpolished, punctate with longitudinal striations, teeth subequal. Frons subpolished, closely and shallowly punctate in the middle, punctures running into striations, at sides largely smooth with a few scattered minute punctures. Vertex subpolished. Temple shallowly punctate. Pronotum subpolished, trans-striate in the middle, lower margin shallowly and minutely punctate, upper margin closely punctate, punctures running into striations, epomia moderately strong, not reaching up to upper margin, pronotal collar smooth and shiny above. Mesoscutum subpolished. Scutellum subpolished, minutely punctate, lateral carina extending to its basal 0.5. Mesopleurum subpolished, finely striolate in the middle of lower half, upper half and near prepectal carina, and also near speculum finely rugose, speculum subpolished, faintly minutely punctate, area below sternaulus distinctly and minutely punctate, prepectal carina extending 0.72× the height of mesopleurum. Metapleurum largely trans-striate to rugoso-striate, extreme base of metapleurum subpolished and distinctly punctate, juxtacoxal carina present. Propodeum moderately strongly reticulo-wrinkled, area between apical carina and

apex coarsely irregularly rugose, basad of basal carina smooth and shiny except for a few punctures, spiracle moderately large and oval, both the carinae more of less straight and complete, apical carina weak in the middle, apophyses crest-like. First abdominal tergite smooth and shiny dorsally, second tergite closely punctate, third tergite punctate at sides and smooth in the middle, following tergites smooth and subpolished. Fore wing with areolet pentagonal, about 0.9× as high as the portion of second recurrent vein above bulla, second intercubitus faint, intercubiti slightly convergent, nervellus intercepted slightly above the middle, nervulus interstitial, brachiella present as a minute stump. Ovipositor tip long, pointed, curved, sheath about 0.4× as long as hind tibia.

Black. Fifth to ninth flagellar segments white above. Face with a trilobed mark, malar space, temple broadly, frons with two lateral stripes which extends from the level of median ocellus and joins with facial mark (Fig. 101 : a), edge of pronotal collar slightly, tegula, subtegular ridge, mesopleurum (Fig. 101 : b) with a curved elongate mark extending up to the base of middle coxa, sometimes this mark faint, lower corner of speculum slightly, a mark on metapleurum just above hind coxa, apices of first and second abdominal tergites and sometimes third to fifth abdominal tergites laterally, sixth tergite narrowly at apex, seventh and eighth tergites broadly, yellow or dirty yellow (Fig. 101 : b). Scutellum, metascutellum wholly, area around and apicad of apical carina of propodeum, extreme base of first abdominal tergite, yellowish-brown to dark brown. Fore leg with coxa and first trochanteral segment yellow, except first trochanteral segment with a fuscous mark, second trochanteral segment and femur light brown, tibia and tarsus brown with fuscous hue. Middle coxa yellow, trochanter largely infuscate, femur light brown, tibia and tarsus dark brown. Hind coxa brown, trochanteral segments largely blackish, femur brown tending to be darker towards the apex, tibia blackish, except in the middle with light yellow hue, tarsus pale, its fourth segment at apex and fifth wholly, brown (Fig. 101 : c).

Male : Not known.

Length : Female, 10–12 mm; fore wing 8–10 mm; ovipositor sheath 2–2.5 mm.

Distribution : India : Sikkim (Gangtok, 1676 m). Uttaranchal (Chaubatia, 1943 m nr. Ranikhet). West Bengal (Rangiroon, 1905 m nr. Darjeeling). *Elsewhere* : Myanmar (Mt. Victoria, 1400-2200 m).

5. ***Formostenus (Formostenus) flavorbitalis*** Jonathan (Fig. 101 : d–f)

1980. *Formostenus (Formostenus) flavorbitalis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 84. Female. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Shillong : Botanical Garden, 1400 m. (GUPTA).

1987. *Formostenus (Formostenus) flavorbitalis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 863.

This species is close to *F. flavofasciatus* Jonathan, in general appearance, but can be distinguished by having metapleurum and propodeum between basal carina and apex finely wrinkled. The pronotal collar, mesopleurum above the base of middle coxa, propodeum between apical carina and apex, metapleurum above the base of hind coxa and first abdominal segment ventrally, yellow.

Female : Face subpolished, obliquely rugose, granulose at sides. Clypeus punctate at base, smooth at apex, apical margin impressed. Malar space granulose, 0.71× the basal width of mandible. Mandible weakly longitudinally striato-punctate, lower tooth distinctly shorter than upper. Frons finely striate with punctures in between the striae, at sides granulose. Vertex very minutely punctate behind ocellar area, at sides

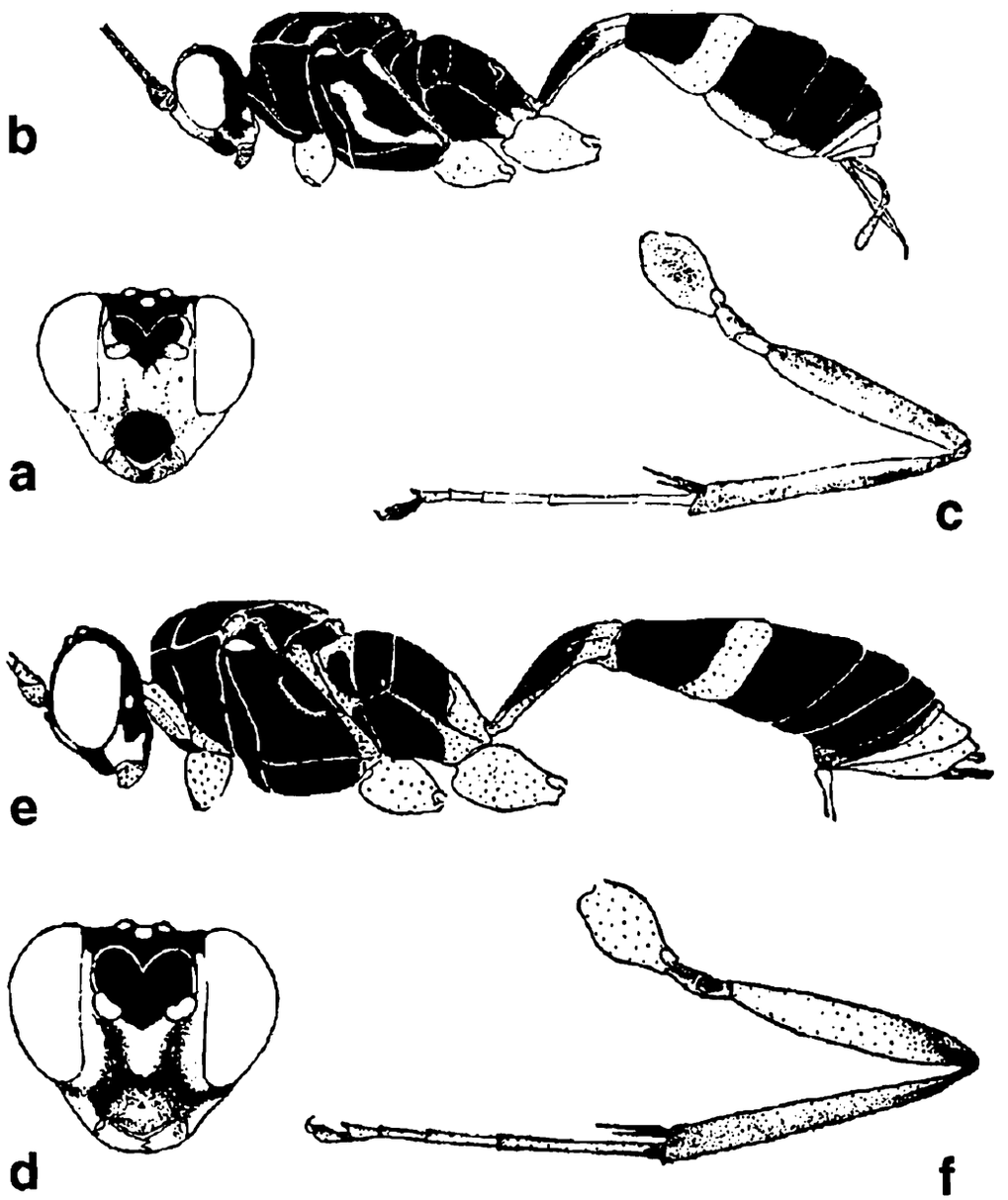

Fig. 101. Colour Pattern. *Formostenus (F.) flavofasciatus* Jonathan : **a**, body side view; **b**, head front view; **c**, hind leg. *F.(F.) flavorbitatis* Jonathan : **d**, body side view; **e**, head front view; **f**, hind leg.

smooth. Temple distinctly punctate, striate towards the base of mandible. Pronotum striate, striae tending to be irregular above, pronotal collar somewhat rugose, epomia strong. Mesoscutum subpolished. Scutellum minutely and shallowly punctate, lateral carina extending at its basal 0.5. Metascutellum smooth. Mesopleurum largely closely trans-striate, speculum sparsely and shallowly punctate, below sternaulus with a few punctures, prepectal carina extending up to the base of subtegular ridge; metapleurum wrinkled, juxtacoxal carina weakly present. Propodeum between basal carina and apex finely wrinkled, basad of basal carina largely smooth and shiny with a few scattered punctures in the middle and near the spiracles, apical and basal carinae strong, straight and complete, apical carina laterally forming moderately strong crest-like apophyses. First abdominal tergite with dorso-median longitudinal carinae absent, tergite dorsally smooth and subpolished; second tergite strongly granulose, following tergites mat or subpolished. Areolet pentagonal, 0.5× as high as the portion of second recurrent vein above bulla, intercubiti convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted at the middle, brachiella present, but not extending more than half the distance from nervellus to the wing margin. Ovipositor tip curved, sheath 0.66× as long as hind tibia.

Black. Antenna with fifth to ninth flagellar segments above, white. The following are yellow : face (Fig. 101 : d) in the middle and along the eye margin, clypeus faintly, frons along the margin, mark not extending beyond the level of semicircular carina, mandible at base, temple around malar space, pronotal collar, tegula, scutellum, metascutellum, subtegular ridge, base of hind wing above, mesopleurum along the mesopleural suture, metapleurum above hind coxa, propodeum between apical carina and apex (Fig. 101 : e), first abdominal segment at apex and base and also ventrally, apices of tergites second, sixth narrowly, seventh and eighth broadly. Fore leg with coxa and trochanter yellow, femur, tibia and tarsus, brownish-yellow. Middle coxa yellow, trochanter, femur, tibia and tarsus slightly dark brownish-yellow. Hind coxa and femur reddish-brown, trochanter and tibia largely brown, except tibia yellowish below, tarsus yellowish-brown (Fig. 101 : f).

Male : Not known.

Length : Female, 8 mm; fore wing 6 mm; ovipositor sheath 2 mm.

Distribution : India : Meghalaya (Shillong, Botanical Garden, Khasi Hills).

6. ***Formostenus (Formostenus) bidentatus*** Jonathan (Fig. 102 : a–d)

1980. *Formostenus (Formostenus) bidentatus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 88. Female. key, des., fig. Type : Female, India : Assam : Rangapara : Charduar Forest (GUPTA).

1987. *Formostenus (Formostenus) bidentatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 862.

Female : Face sparsely punctate, apical margin impressed, truncate in the middle. Malar space granulose above, punctate below, 0.57× the basal width of mandible; mandible thickly punctate, teeth subequal, lower tooth slightly shorter than above; semicircular carinae (Fig. 102 : a) enclosing shallow area above each antennal sockets specialized into flanges. Frons largely closely punctate, punctures in the middle coalescent and running into striations, at extreme sides near eye margin strongly granulo-punctate. Vertex subpolished, shallowly and sparsely punctate. Temple subpolished, distinctly punctate, punctures tending to be coalescent toward the base of mandible. Pronotum subpolished, coarsely trans-striate in the middle, upper margin closely punctate, lower margin shiny and minutely punctate, epomia moderately strong, not reaching to upper margin. Mesoscutum subpolished, minutely punctate. Scutellum polished, with sparse minute punctures, lateral carina of scutellum confined to its base only. Metascutellum subpolished, mesopleurum subpolished, transversely rugoso-striate, tending to be finer below towards the sternaulus, speculum subpolished, shallowly and sparsely punctate, area just above sternaulus near prepectal carina subpolished and somewhat ruguloso-punctate, below sternaulus dull, sparsely and shallowly punctate, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum irregularly wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex finely wrinkled, extreme base of propodeum smooth and shiny, area just basad of basal carina with shallow punctures, spiracle moderately large and oval, apical and basal carinae complete and more or less straight, apophyses crest-like. First abdominal tergite largely smooth and subpolished, except granulose near the spiracles, dorso-median longitudinal carinae faint; second and third tergites shallowly and closely punctate, following tergites subpolished. Fore wing with areolet pentagonal, 0.75× as high as the portion of second recurrent vein above bulla; intercubiti slightly convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted below the middle, brachiella absent (Fig. 102 : b). Ovipositor long, tip long and pointed, sheath about 0.7× as long as hind tibia.

Black. Fifth to eleventh flagellar segments white above. Head, pronotum including propleurum, mesoscutum, mesopleurum, a mark above on metapleurum (this mark quite extensive, extending beyond pleural carina over the side of propodeum), base of hind wing completely, black. Scutellum, metascutellum, apex of second abdominal tergite, sixth tergite narrowly in the middle, seventh and eighth broadly, yellow; rest of metapleurum and propodeum reddish. First abdominal tergite at base and apex brownish-yellow (Fig. 102 : c). Fore leg in general yellow, except tibia and tarsus above light fuscous, and fifth tarsal segment dark brown. Middle leg with coxa, trochanter and femur dark yellow, tibia yellowish below and infuscate above, tarsus largely blackish-brown, except apices of all its tarsal segments lighter in shade. Hind coxa dark orange except its apical half blackish; trochanteral segments largely, femur and tibia blackish, except femur below and tibia at base lighter in shade mixed with brown; tarsus white, except basal 0.25 of first and fifth segment wholly dark brown or blackish (Fig. 102 : d).

Male : Not known.

Length : Female, 7.5 mm; fore wing 6 mm; ovipositor sheath 2 mm.

Distribution : India : Assam (Charduar Forest in Rangapara Dist.).

7. ***Formostenus (Formostenus) striatus*** Jonathan (Fig. 102 : e–h)

1980. *Formostenus (Formostenus) striatus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 90. Female. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1235 m. (GUPTA).

1987. *Formostenus (Formostenus) striatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 864.

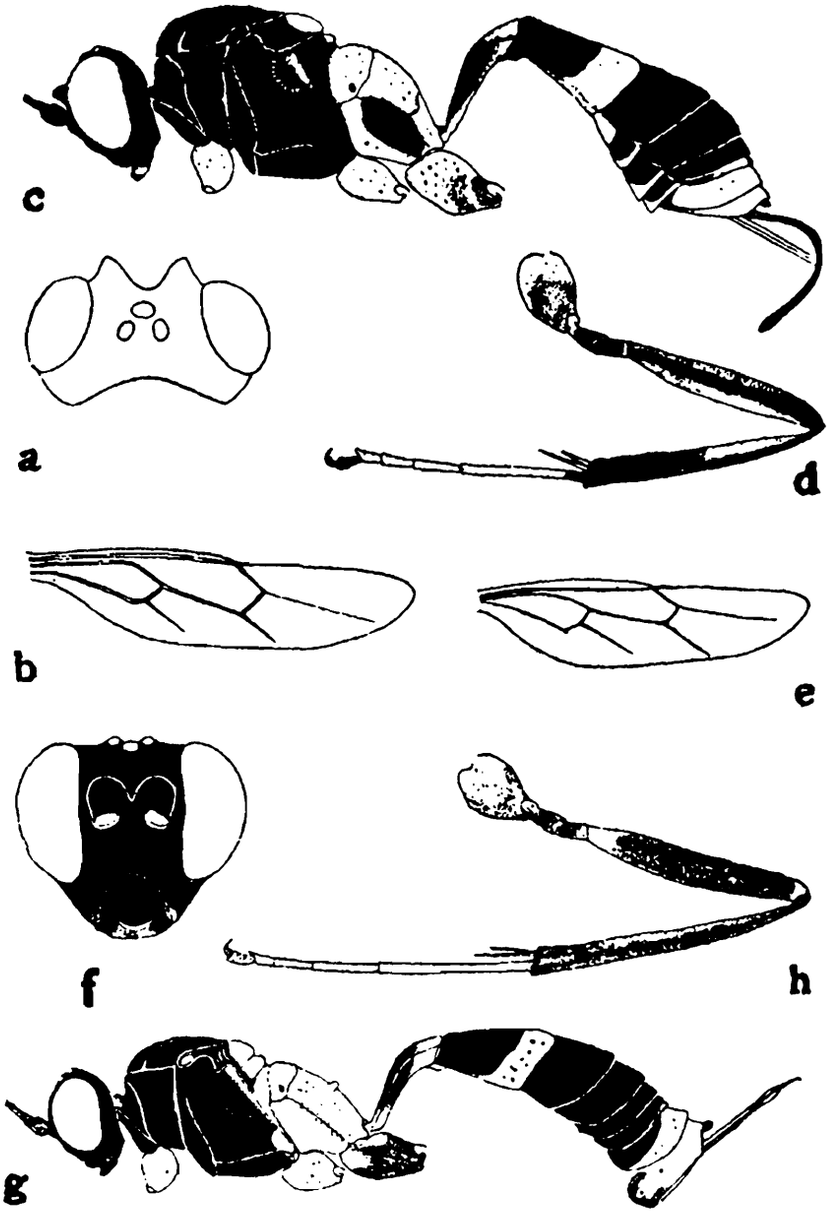

Fig. 102. *Formostenus (F.) bidentatus* : Jonathan : **a**, head top view; **b**, hind wings; **c**, body side view; **d**, hind leg. *F.(F.) striatus* : Jonathan : **e**, hind wings; **f**, head front view, **g**, body side view; **h**, hind leg.

This species is close to *Formostenus rugipectus* Jonathan, in having nervellus intercepted above the middle, semicircular carina simple and similar body colour in general. It is distinguished by having mesopleurum largely trans-striate, propodeum in the middle strongly wrinkled. The basal area of hind wing, metapleurum and propodeum wholly, red (Fig. 102 : g).

Female : Face rugose in the middle, at sides more or less smooth, with few scattered shallow punctures. Clypeus subpolished, moderately arched; apical margin impressed, with scattered punctures. Malar space granulose, 0.87× the basal width of mandible. Mandible subpolished, punctate, punctures running in to longitudinal striations, upper tooth of mandible longer than the lower; frons with area below median ocellus irregularly longitudinally striate or rugoso-striate, at sides granulose. Vertex subpolished, hardly punctate. Temple distinctly punctate. Pronotum subpolished coarsely trans-striate in the middle, rugose at the extreme lower margin, epomia strong, reaching up to upper margin. Mesoscutum largely subpolished, faintly punctate. Scutellum subpolished, minutely punctate, lateral carina extending to its basal 0.75; metascutellum impunctate. Mesopleurum coarsely striate, upper half of mesopleurum weakly rugoso-striate, speculum subpolished with shallow minute punctures, area below sternaulus smooth and subpolished except fine striae along the sternaulus; prepectal carina extending 0.7× the height of mesopleurum. Metapleurum trans-wrinkled, juxtacoxal carina faintly present; area between basal carina and apex of propodeum strongly wrinkled, tending to be reticulate, especially in the basal half of propodeum, area basad of basal carina largely smooth and shiny except for a few punctures near spiracles and in the middle, apical and basal carinae strong, apophyses moderately high, crest-like, spiracles moderately large and round. First abdominal tergite dull, without distinct punctures, somewhat granulose, both the dorsal carinae distinctly present; second and third tergites finely and densely punctate, following tergites subpolished. Fore wing with areolet pentagonal, 0.63× as high as the portion of second of recurrent vein above bulla, intercubiti slightly convergent, nervulus more or less interstitial, nervellus intercepted slightly above the middle, brachiella absent (Fig. 102 : e). Ovipositor tip long, pointed and curved, sheath 0.55× as long as hind tibia.

Black. Fifth to ninth flagellar segments (fifth segment only at the apex) white above. Head completely black (Fig. 102 : f). Pronotal collar slightly at the top, tegula, fore and middle coxae, apices of first and second abdominal tergites, sixth tergite faintly and narrowly at apex, seventh and eighth tergites more or less wholly, yellow. Whole of propodeum, scutellum and metascutellum, base of hind wing, mesopleurum just above middle coxa, red (Fig. 102 : g). Fore leg with first trochanteral segement light yellow with infuscate mark above, second trochanteral segment, whole of femur, dark yellow, tibia and tarsus light yellow and infuscate all over. Middle leg with trochanter and femur dark yellow, except trochanteral segments with dark brown

marks, tibia and tarsus infuscate. Hind coxa (except at the base, red), trochanter largely, femur and tibia, dark brown or blackish, except femur reddish-brown at its base and tibia yellowish at its base below, hind tarsus pale yellow, its fourth slightly and fifth segments completely dark brown (Fig. 102 : h).

Male : Not known.

Length : Female, 9–9.5 mm; fore wing 7–8 mm; ovipositor sheath 2.5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1235 m in Khasi Hills).

8. ***Formostenus (Formostenus) rugipectus*** Jonathan (Fig. 103 : a, b)

1980. *Formostenus (Formostenus) rugipectus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 91. Female. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1235 m. (GUPTA).

1987. *Formostenus (Formostenus) rugipectus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 863.

This species is recognized from *F. striatus* Jonathan by having mesopleurum largely rugose, lateral carina of scutellum extending to its basal 0.5, propodeum between its basal carina and apex finely wrinkled. The base of hind wing, metapleurum below and propodeum at extreme apex, black (Fig. 103 : b).

Female : Face dull, largely rugose, sometimes tending to be rugoso-punctate at sides. Clypeus subpolished, sparsely punctate, apical margin impressed. Malar space granulose, 0.8× the basal width of mandible. Mandible subpolished, with a few longitudinal striae, teeth subequal, lower tooth slightly shorter than upper. Frons shallowly and closely punctate, punctures running into longitudinal striations, at sides distinctly granulose. Vertex subpolished. Temple distinctly punctate, punctures towards the base of mandible running into striations. Pronotum coarsely striate in the middle, its upper half finely rugose, extreme lower margin and pronotal collar subpolished and smooth, epomia moderately strong, not reaching to upper margin. Mesoscutum subpolished, hardly punctate. Scutellum minutely and shallowly punctate, lateral carina extending to its basal 0.5; metascutellum subpolished. Mesopleurum coarsely rugose, tending to be finer above, speculum subpolished and minutely punctate, below sternaulus subpolished, faintly punctate, prepectal carina extending 0.75× the height of mesopleurum. Metapleurum rugose, tending to be rugoso-punctate towards the base and somewhat trans-rugose towards the apex, juxtacoxal carina present, area below juxtacoxal carina somewhat finely rugoso-punctate, rugae tending to the transverse. Propodeum between basal carina and apex finely wrinkled, basad of basal carina smooth and subpolished, area behind spiracles with irregular punctures, apical carina completely arched in the middle, apophyses low and crest-like, basal carina more or less straight, spiracles moderately large and oval. First abdominal tergite with its basal 0.33 smooth and shiny, rest granulose, dorso-median and dorso-lateral

carinae distinctly present; second tergite closely, third tergite faintly punctate, following tergites smooth and subpolished. Fore wing with areolet pentagonal 0.75× as high as the portion of second recurrent vein above bulla, intercubiti convergent, second intercubitus faint, nervulus interstitial, nervellus intercepted slightly above the middle, brachiella absent (except for a minute stump) (Fig. 103 : a). Ovipositor tip long, pointed, curved, its sheath about 0.4× as long as hind tibia.

Black. Fifth to ninth flagellar segments white above. Whole of head, pronotum, mesoscutum, mesopleurum (sometimes less extensively), lower half of metapleurum, apical part of propodeum, black. Rest of propodeum and metapleurum, scutellum and metascutellum, reddish (Fig. 103 : b). First abdominal tergite at base brownish; apices of first and second tergites, third tergite narrowly at lateral margins, sixth tergite narrowly at apex, seventh and eighth broadly, yellow (Fig. 103 : b). Fore leg with coxa and first trochanteral segment yellow, second trochanteral segment, femur, tibia and tarsus, dark yellow, except fifth tarsal segment dark brown, while whole of tibia and tarsus clouded with fuscous. Middle leg with coxa yellow, trochanter brown, femur tibia and tarsus reddish-yellow, fifth tarsal segment dark-brown. Hind leg largely reddish-brown, except apical 0.33 of femur darker, tibia brown except its subbasal area yellowish-brown, tarsus yellow, its fifth segment dark brown.

Male : Not known.

Length : Female, 8.5 mm; fore wing 6 mm; ovipositor sheath about 1.5 mm.

Distribution : India : Meghalaya (Cherrapunji 1235 m in Khasi Hills).

9. ***Formostenus (Formostenus) malaisei*** Jonathan (Fig. 103 : c–e)

1980. *Formostenus (Formostenus) malaisei* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 93. Female. key, des., fig. Type : Female, Myanmar : Kambaiti, 2000 m (STOCKHOLM).

1987. *Formostenus (Formostenus) malaisei* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 863.

This and the following five species from Myanmar closely resemble each other in having wings largely clear hyaline, without dark patches on fore wing, body weakly sculptured and also in having a very similar colour pattern.

This species can be recognized from its closely allied species *Formostenus aciculatus* Jonathan by having mesopleurum minutely punctate, sternaulus short (0.5) and pronotum and mesoscutum orange with blackish hue (Fig. 103 : e).

Female : Face weakly rugose, rugoso-punctate in the middle. Clypeus shallowly and sparsely punctate, smooth and shiny towards the apex. Malar space granulo-punctate, 1.5× the basal width of mandible, lower tooth of mandible shorter than upper, teeth pointed. Middle area of frons slightly raised, subpolished, minutely and sparsely punctate, at sides mat with a few punctures. Vertex subpolished. Temple

sparsely punctate. Pronotum trans-striate in the middle, its upper and lower margin minutely punctate. Mesoscutum subpolished without distinct punctures. Scutellum very minutely and shallowly punctate, its lateral carina extending to its basal 0.35. Mesopleurum minutely and sparsely punctate, punctures on speculum distinct, prepectal carina extending 0.7× the height of mesopleurum, sternaulus extending about 0.5 the distance to middle coxa. Metapleurum with indistinct punctures, juxtacoxal carina short. Propodeum between apical and basal carinae ruguloso-punctate, punctures moderately deep and large, area between apical carina and apex subpolished, both the transverse carinae complete, apophyses moderately large and conical, spiracle

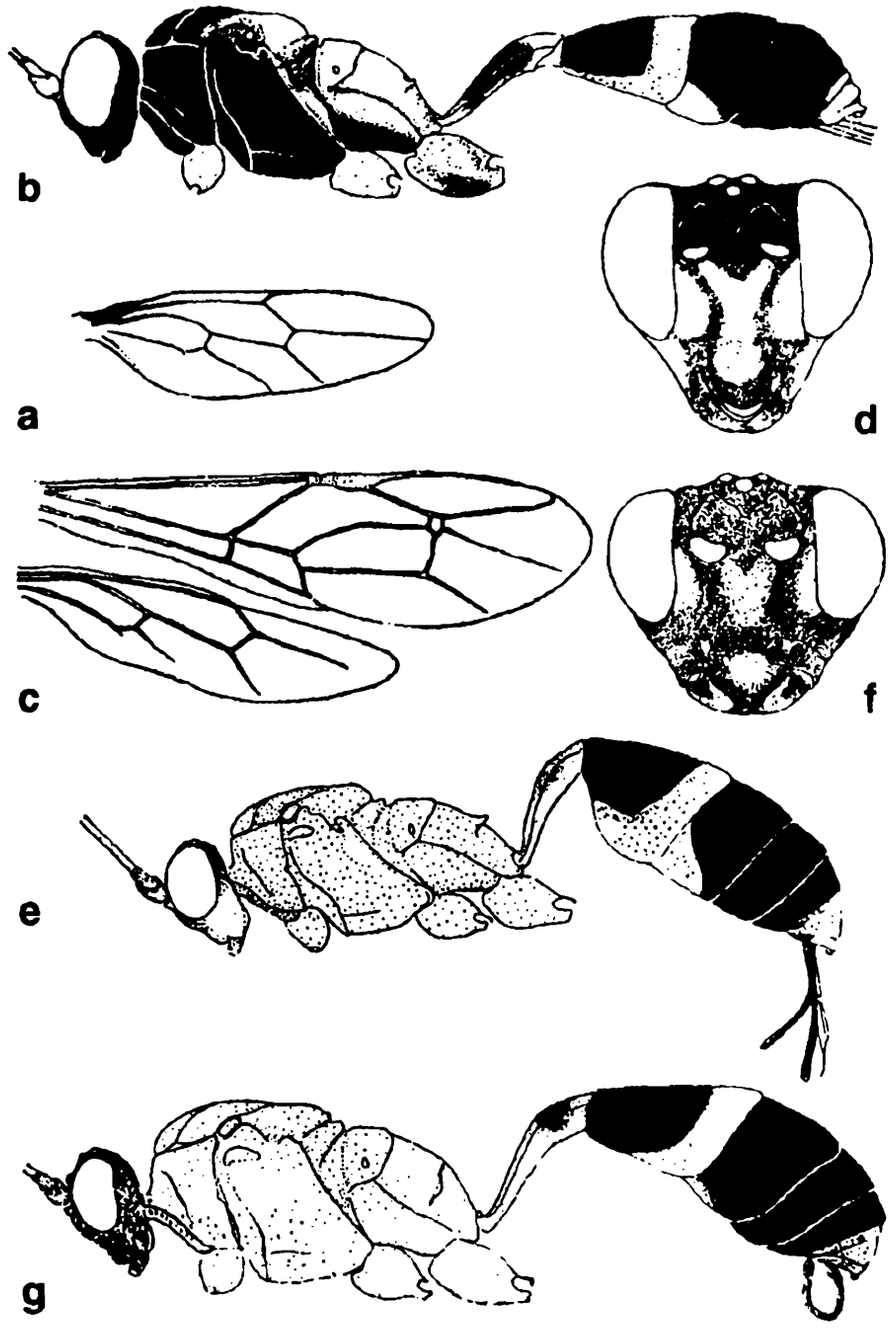

Fig. 103. *Formostenus (F.) rugipectus* Jonathan : **a**, hind wings; **b**, body side view. *F.(F.) malaisei* Jonathan : **c**, fore and hind wings; **d**, head front view; **e**, body side view. *F.(F.) aciculatus* Jonathan : **f**, head front view; **g**, body side view.

oval. First abdominal tergite largely smooth without punctures, dorso-median and dorso-lateral carinae distinct, ventro-lateral carina present in the upper half, petiole rounded, following tergites shiny, second tergite wholly and third tergite laterally closely and weakly punctate, rest all smooth. Areolet about 0.7× as high as the portion of second recurrent vein above bulla, nervulus slightly distad of basal vein, nervellus intercepted slightly below the middle, brachiella as small stump (Fig. 103 : c). Ovipositor tip long and pointed, tip curved, sheath about 0.5× as long as hind tibia.

Orange. Fifth to ninth flagellar segments white above. Face and clypeus largely reddish-brown, except face faintly in the middle and distinctly along the eye margin yellow; rest of the head blackish-brown. (Fig. 103 : d). Mesoscutum and pronotum blackish (colour variable). Apices of abdominal tergites first and second, third at sides, sixth narrowly in the middle, seventh and eighth wholly, yellow. First tergite reddish except in the middle, brown, rest of abdomen black (Fig. 103 : e). Legs largely reddish-brown, except fore coxa yellowish and middle and hind legs infuscate.

Male : Not known.

Length : Female, 11–12 mm; fore wing 9.5–10 mm; ovipositor sheath 2 mm.

Distribution : India : Myanmar (Kambaiti, 2000 m).

10. ***Formostenus (Formostenus) aciculatus*** Jonathan (Fig. 103 : f, g)

1980. *Formostenus (Formostenus) aciculatus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 94. Female. key, des., fig. Type : Female, Myanmar : Kambaiti, 2000 m (STOCKHOLM).

1987. *Formostenus (Formostenus) aciculatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 861.

This species has mesopleurum finely trans-aciculate, sternaulus extending 0.75 the distance to middle coxa, upper margin of pronotum finely aciculate with fine punctures, first abdominal tergite smooth and polished. The pronotum and mesoscutum (Fig. 103 : g) orange, without any blackish hue.

Female : Face finely obliquely rugose, at sides rugulose. Clypeus shiny, sparsely punctate. Malar space granulose, 1.6× the basal width of mandible. Lower tooth of mandible slightly smaller than upper. Frons in the middle distinctly punctate with finely running striations, lateral area mat. Vertex subpolished, smooth. Temple distinctly and sparsely punctate, punctures with longitudinally running striations towards the base of mandible. Pronotum coarsely trans-striate in the middle, minutely and weakly punctate at the upper and lower margin, punctures at upper margin running into fine aciculations. Mesoscutum shiny, impunctate. Scutellum obscurely punctate, its lateral carina extending to its basal 0.26. Mesopleurum finely aciculate, punctate below and above sternaulus and at speculum, prepectal carina extending 0.7× the height of mesopleurum, sternaulus extending 0.75× the distance to middle coxa, mesopleural pit just below speculum deep and rounded. Metapleurum weakly

trans-aciculate in the middle, juxtacoxal carina faintly (or absent) present. Propodeum largely smooth and polished with a few scattered shallow punctures, and weakly striate below each crest-like apophyses, apical carina somewhat weak in the middle, spiracle oval and moderately large. First tergite shiny, impunctate, petiole rounded, its dorso-median carinae absent, following tergites polished, without punctures. Areolet higher than wide, about 0.5× as high as the portion of second recurrent vein above bulla, nervulus slightly distad of basal vein, nervellus intercepted at the middle, brachiella present as a small stump. Ovipositor tip long pointed and curved, its sheath 0.5× as long as hind tibia.

Orange. Fifth to tenth flagellar segments white above. Head (Fig. 103 : f) largely blackish-brown, except face in the middle and at sides, yellow. Apices of first and second abdominal tergites, seventh and eighth tergites wholly, yellow (Fig. 103 : g). Legs largely dark orange, except apical segments of fore and middle legs, hind coxa at apex, trochanter, femur and tibia largely, brownish. Hind tarsus yellowish, its third segments at apex, fourth and fifth wholly brown. First abdominal tergite subapically and rest of abdomen black.

Male : Not known.

Length : Female, 11–11.5 mm; fore wing 9.5 mm; ovipositor sheath 2 mm.

Distribution : Myanmar (Kambaiti, 1800 m).

11. ***Formostenus (Formostenus) rufiscens*** Jonathan

1980. *Formostenus (Formostenus) rufiscens* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 95. Female. key, des., fig. Type : Female, Myanmar : Kambaiti, 2000 m (STOCKHOLM).

1987. *Formostenus (Formostenus) rufiscens* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 863.

This species has face rugoso-punctate in the middle; malar space about 1.0× the basal width of mandible; frons obliquely striate. The face white along the eye margin and thorax entirely orange.

Female : Face ruguloso-punctate, punctures shallow and not well defined, area long the eye margin smooth. Clypeus subpolished, sparsely and shallowly punctate. Malar space granulose, about 1.1× the basal width of mandible. Frons with strong striations, extending from the ocellar area to downward, at sides granulose, scrobe smooth the shiny. Vertex and upper 0.5 of temple smooth and shiny, lower 0.5 of temple sparsely and shallowly punctate, punctures moderately coarse. Pronotum trans-striate in the middle, upper area irregularly weakly striate, lower margin broadly smooth and shiny, epomia short and strong. Mesoscutum and metascutellum smooth. scutellum minutely and sparsely punctate, its lateral carina extending to its basal 0.25. Mesopleurum subpolished, indistinctly punctate, the middle area weakly trans-

rugose, short ridges along the inner margin of prepectal carina and along the upper margin of speculum; prepectal carina extending 0.66× the height of mesopleurum. Metapleurum largely with moderate and strong trans-rugae, juxtacoxal carina present. Propodeum between basal carina and apex with moderately strong wrinkles, tending to be trans-wrinkled apico-laterally, basad of basal carina smooth; spiracle small, oval. First tergite dorsally smooth and shiny; second and third tergites granulose and dull, following tergites mat and subpolished. Areolet moderately large, about 0.66× as high as the portion of second recurrent vein above bulla; nervulus basad of basal vein, nervellus intercepted almost at the middle, brachiella present as a small stump. Ovipositor tip long, pointed and straight, sheath about 0.5× as long as hind tibia.

Head and thorax largely deep orange. Antenna dark brown, except scape and basal two flagellar segments, yellowish-brown, sixth to ninth flagellar segments white above; face along the eye margin yellow. Frons above, vertex, back of head and temple above dark brown to blackish. First abdominal tergite orange; apices of first narrowly, second broadly, sixth narrowly in the middle, seventh and eighth tergites almost wholly, yellow. Legs in general deep orange, except hind leg with apical 0.5 of femur and tibia at base broadly dark brown.

Male : Not known.

Length : Female, 10 mm; fore wing 8 mm; ovipositor sheath 2 mm.

Distribution : Myanmar (Kambaiti, 2000 m).

12. ***Formostenus (Formostenus) burmensis*** Jonathan (Fig. 104 : a–c)

1980. *Formostenus (Formostenus) burmensis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 96. Female. key, des., fig. Type : Female, Myanmar : Kambaiti, 2000 m (STOCKHOLM).

1987. *Formostenus (Formostenus) burmensis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 862.

This species is characterized hy having pronotum largely rugulose, occipital carina sharply bent at lower end, mesopleurum weakly trans-rugose and propodeum finely wrinkled.

Female : Face weakly rugose, somewhat rugoso-punctate towards the clypeal groove, rugulose towards the eye margin. Clypeus subpolished, shallowly and sparsely punctate, smooth towards the apex. Malar space granulose, 1.3× the basal width of mandible; mandible with a few scattered punctures, teeth subequal. Frons in the middle longitudinally rugose, granulose at sides. Vertex minutely punctate just behind ocellar triangle, rest subpolished and smooth. Temple sparsely punctate, tending to be striate or rugose towards the base of mandible. Pronotum with a few weak trans-striae in the middle, rugulose above and at lower margin, epomia short and strong. Mesoscutum smooth and subpolished. Scutellum without distinct punctures, lateral carina extending to its basal 0.5; metascutellum smooth. Mesopleurum weakly trans-rugose, below

sternaulus indistinctly punctate, speculum hardly punctate, mesopleural pit deep, prepectal carina extending 0.55× the height of mesopleurum. Metapleurum wrinkled, tending to be somewhat trans-wrinkled, juxtacoxal carina present. Propodeum between basal carina and apex wrinkled, basad of basal carina smooth and shiny, except weakly rugose around spiracles, spiracles longish oval, both the transverse carinae strong and straight, apical carina forming lateral crests. First abdominal tergite long, dorso-median carinae weak, petiole rounded, ventro-lateral carina present; tergite granulose, smooth and shiny at base, second and third tergites minutely and densely punctate, following mat and subpolished. Areolet pentagonal 0.7× as high as the portion of second recurrent vein above bulla, second intercubitus faint, nervulus interstitial, nervellus intercepted slightly above or below the middle (variable), brachiella present as a minute stump. Ovipositor short, heavy near nodus, tapering towards the tip, sheath 0.5× as long as hind tibia.

Black. Antenna brownish with fifth to ninth segments white above; face (Fig. 104 : a) and clypeus in middle, whole of thorax (Fig. 104 : b), first abdominal segment at base, reddish or dark orange. Head largely black with reddish hue. Abdomen black, except apices of first, second and sixth, seventh and eighth entirely, yellow. Fore leg largely reddish except coxa and trochanter yellowish, and tarsus infuscate. Middle leg reddish, its femur, tibia and tarsus slightly infuscate. Hind leg reddish-brown, coxa red, except apically, trochanter, femur and tibia towards the apex dark brown; tarsus yellowish, its apical segments at apex brownish (Fig. 104 : c).

Male : Not known.

Length : Female, 8.5 mm; fore wing 7 mm; ovipositor sheath 1.5 mm.

Distribution : Myanmar (Kambaiti, 2000 m).

13. ***Formostenus (Formostenus) tanypetiolatus*** Jonathan (Fig. 104 : d)

1980. *Formostenus (Formostenus) tanypetiolatus* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 97. Female. key, des., fig. Type : Female, Myanmar : Kambaiti, 2000 m (STOCKHOLM).

1987. *Formostenus (Formostenus) tanypetiolatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 864.

This species is close to *F. kambaitiensis* Jonathan. It is recognized by having propodeal spiracles circular and protruding, third abdominal tergite uniformly minutely punctate, propodeum coarsely rugose and nervulus interstitial.

Female : Face distinctly rugose below the antennal sockets, in the middle rugulose, at sides mat with a few scattered punctures. Clypeus subpolished, sparsely punctate. Malar space granulose, 1.33× the basal width of mandible; lower tooth of mandible distinctly smaller than the upper. Frons little raised in the middle, this area rough and rugose, frons at sides mat. Vertex smooth and subpolished. Temple sparsely and

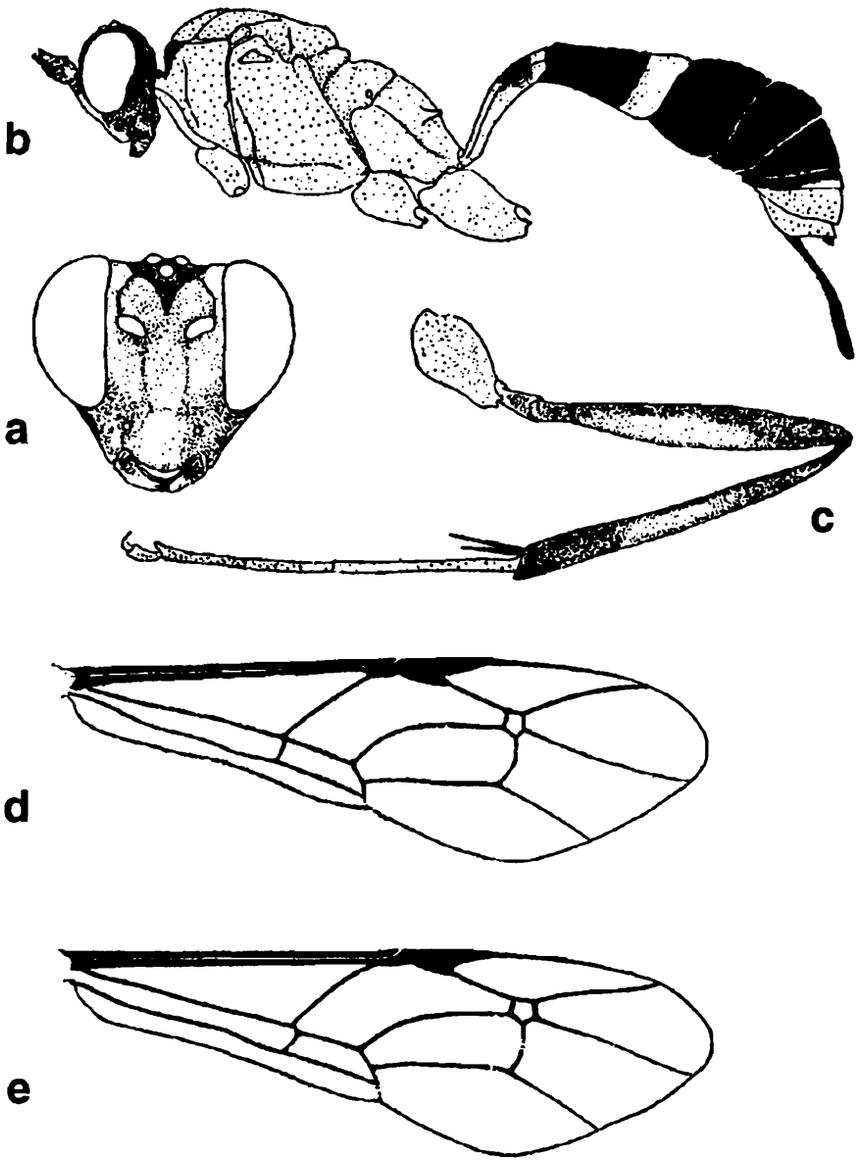

Fig. 104. Colour pattern. *Formostenus (F.) burmensis* Jonathan : **a**, head front view; **b**, body side view; **c**, hind leg. *F.(F.) tanypetiolatus* Jonathan : **d**, fore wing. *F.(F.) kambaitiensis* : **e**, fore wing.

shallowly punctate. Pronotum distinctly striate, striae somewhat circular. Mesoscutum subpolished, smooth. Scutellum minutely and sparsely punctate, lateral carina extending to its basal 0.5. Mesopleurum finely striate, speculum shiny, with a few weak punctures, prepectal carina extending 0.66× the height of mesopleurum, sternaulus extending 0.75 the distance to middle coxa. Metapleurum trans-rugose, juxtacoxal carina present. Propodeum between basal carina and apex distinctly rugose, somewhat trans-rugose below apical carina, apophyses crest-like, basad of basal carina smooth and shiny, spiracle rounded and protruding, both the transverse carinae complete and straight. First abdominal tergite smooth and shiny, dorso-median carinae absent, petiole rounded, second and third tergites minutely and densely punctate, punctures on third tergite tending to be more shallow, following tergites subpolished

and mat. Areolet about as high as wide, about 0.57× as high as the portion of second recurrent vein above bulla, nervulus interstitial to basal vein (Fig. 104 : d); nervellus intercepted at the middle, brachiella present, extending 0.3 the distance to wing margin. Ovipositor tip long, straight and pointed, sheath 0.6× as long as hind tibia.

Orange. Fifth to ninth flagellar segments white above. Frons, vertex, mesoscutum, sometimes pronotum also, with blackish hue. Apex of second tergite (sometimes apex of first tergite also), seventh and eighth tergites wholly, yellow. Legs largely reddish-brown, except their tibia and tarsi tending to brownish. Hind tarsus dark yellow, with the apex of its fourth segment and fifth segment largely brown; rest of abdomen, except as mentioned above black.

Male : Unknown.

Length : Female, 11.5 mm; fore wing 10 mm; ovipositor sheath 2 mm.

Distribution : Myanmar (Kambaiti, 2000 m).

14. ***Formostenus (Formostenus) kambaitiensis*** Jonathan (Fig. 104 : e)

1980. *Formostenus (Formostenus) kambaitiensis* Jonathan, *Rec. zool. Surv. India, Occ. Paper,* **17** : 98. Female. key, des., fig. Type : Female, Myanmar : Kambaiti, 2000 m (STOCKHOLM).

1987. *Formostenus (Formostenus) kambaitiensis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 863.

This species is recognized by having mesopleurum aciculate; propodeal spiracles elongate, not protruding; third tergite only laterally minutely puncate and nervulus distad of basal vein.

Female : Face weakly rugose in the middle, smooth with a few punctures at sides. Clypeus sparsely punctate. Malar space granulose 1.33× the basal width of mandible. Lower tooth of mandible little smaller than the upper. Middle area of frons little raised, largely rugose, with a few undefined punctures, at sides mat. Vertex subpolished, smooth, except with minute sparse punctures just behind ocellar triangle. Temple distinctly sparsely punctate, punctures running into striations towards the base of mandible. Pronotum largely striate, striae tending to be finer towards the upper margin, lower margin minutely and sparsely punctate. Mesoscutum shiny and smooth. Scutellum minutely and sparsely punctate, its lateral carina extending to its basal 0.33. Mesopleurum very finely and weakly aciculate, area just below subtegular ridge and speculum, minutely punctate, prepectal carina extending 0.75× the height of mesopleurum, sternaulus extending 0.7 the distance to middle coxa; metapleurum finely trans-rugose, juxtacoxal carina distinctly present. Propodeum between basal carina and apex rugose, tending to finely wrinkled towards the apex, basad of basal carina largely smooth and shiny, except for a few punctures around spiracle, spiracle

elongate; both the transverse carinae complete, apophyses conical. First abdominal tergite smooth and shiny, dorso-median longitudinal carinae absent, petiole rounded; second tergite wholly and third tergite laterally closely punctate, middle of third tergite and the following tergites mat. Areolet of fore wing about as high as wide, about 0.57× as high as portion of second recurrent vein above bulla, nervulus distad of basal vein (Fig. 104 : e), nervellus intercepted at the middle, brachiella present as a small stump. Ovipositor tip long, pointed and straight; sheath about 0.5× as long as hind tibia.

Orange. Fifth to ninth flagellar segments white above. Head largely blackish, except face and clypeus reddish-brown and face along the eye margin with elongated yellow marks. Thorax dark orange, except pronotum, mesoscutum and area around subtegular ridge with moderately dark blackish hue. Apices of first and second abdominal tergites, third tergite laterally, seventh and eighth wholly, yellow. Legs in general reddish-brown, except fore coxa yellowish; apices of all the tarsi and hind leg wholly tending to be brown. First abdominal tergite subapically with a dark brown mark.

Male : Not known.

Length : Female, 11 mm; fore wing 9.5 mm; ovipositor sheath 2 mm.

Distribution : Myanmar (Kambaiti, 2000 m).

15. Genus ***Melcha*** Cameron (Fig. 105 : a–c)

1902. *Melcha* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **9** : 153. Type-species : *Melcha varipes* Cameron; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 172 (as syn. of *Buodias)*. Gupta, 1969 : 25. Townes, 1970 : 268.

Distribution : Indo-Papuan Region.

Body of moderate proportions to rather slender. Frons with a median vertical carina. Clypeus strongly convex, without a median tooth or irregularity. Occipital carina weakly to strongly sinuate, meeting hypostomal carina above base of mandible. Lower tooth of mandible shorter than the upper. Apical 0.1 ± of male flagellum in many species strongly flattered. Epomia long and strong. Sternaulus arched, reaching up to middle coxa. Lateral carina of scutellum on its basal 0.4, sometimes carina absent. Basal carina of propodum present, apical earina weak or absent in the middle, laterally forming sharp apophyses. Areolet small, squarish, rectangular about 0.65 as high as the portion of second recurrent vein infront of bulla. Medialla moderately to strongly arched. Nervulus vertical. Nervellus intercepted near its lower 0.27 Brachiella reaching to near wing margin. First abdominal tergite slender, with lateral tooth a base, without ventro-lateral

longitudinal carina, its dorso-lateral and median-dorsal carinae weak to moderately strong. Ovipositor sheath about 0.8× as long as hind tibia, its tip 8× as long as deep, without distinct nodus and teeth.

This genus is readily distinguished by having antennal flagellum of male strongly flattened apically, preapical segments serrated (Fig. 105 : d, f); and dorsal rim of propodeum with two acute spines on each side opposing similar projections on metanotum.

This genus occurs in Indo-Papuan subregion. Gupta (1987 : 864) reported seven species. Only two species have been described from Indian subregion.

Key to the species of *Melcha*

1. Coxae largely yellow; hind femur also largely yellow, its apical 0.25 black. Mesopleurum finely rugose. Male antenna flattered preapically, segments not serrated. India : Meghalaya; Uttaranchal ..... 1. *varipes* Cameron

– Coxae largely blackish-brown; hind femur wholly black. Mesopleurum rugoso-striate. Male antenna flattered at tip, preapically serrated. India : Assam; Sikkim ..... 2. *annulitarsis* (Cameron)

1. *Melcha varipes* Cameron (Fig. 105 : d, e)

1902. *Melcha varipes* Cameron, *Ann. Mag. Nat. Hist.*, (7) **9** : 154. Female. des. lectotype (designated by Gupta, 1969) : Female, India : Meghalaya. Khasi Hills (OXFORD). [Types in both London and Oxford Museums. Oxford specimen was designated as type in 1961. This speciment was selected as lectotyre in 1969.]

1969. *Melcha varipes* : Gupta, *Oriental Ins.*, **3** : 26. Male, Female. Lectotype design., key, des., fig. India : Meghalaya : Khasi Hills : Shillong : Botanical Garden, 1460 m. Uttranchal : Garhwal Hills : Pipalkoti; 1220 m.

1987. *Melcha varipes* : Gupta, *Mem. Amer, Ent. Inst.*, **41** : 866.

This species being the generotype, all the morphological characters are as stated under generic description and other characters as given in the key and illustrated in figures. Gupta (1969) examined the types at London and Oxford museums.

Distribution : India : Meghalaya (Shillong, Botanical Garden); Uttaranchal (Pipalkoli, 1220m in Garhwal Hills).

2. *Melcha annulitarsis* (Cameron) (Fig. 105 : f, g)

1907. *Buodias annulitarsis* Cameron, *Tijdschr. V. Ent.*, **50** : 88. Male. des. Type : Male, India : Sikkim (LONDON).

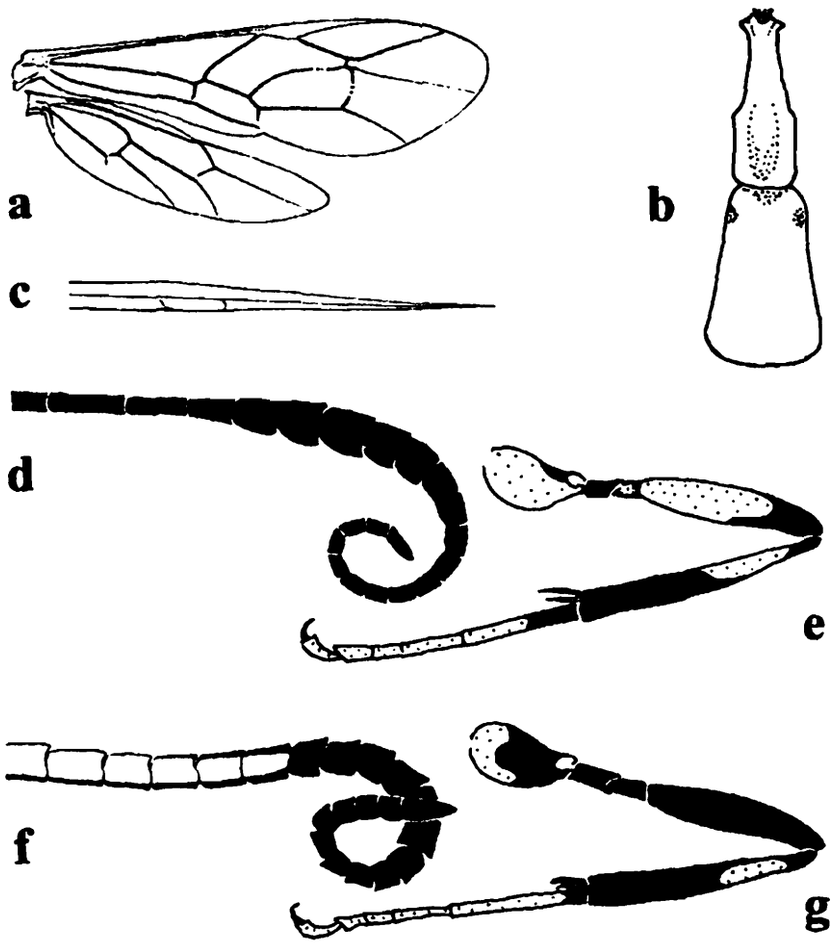

Fig. 105. *Melcha* Cameron : **a**, fore and hind wings showing vention; **b**, first and second abdominal tergite in dorsal view; **c**, ovipositor tip. *Melcha varipes* Cameron : **d**, apical segments of male antenna; **e**, hind leg showing colour pattern. *Melcha annulitarsis* (Cam.) : **f**, apical segments of male antenna; **g**, hind leg showing colour pattern.

1969. *Melcha annulitarsis* : Gupta, *Oriental Ins.*, **3**: 28. n. comp., key, des., fig. India; Sikkim. Assam : Rangapara : Charduar Forest.

1987. *Melcha annulitarsis* : Gupta, *Mem. Amer, Ent. Inst.*, **41** : 865.

Gupta (1969) gave the following short description of the species :

Male : Pronotum in its upper 0.5 sparsely punctate, lower 0.5 strongly sriate. Mesopleurum in its upper 0.5 obliquely and irregularly striate, lower 0.5 finely closely reticulate. Mesosternal furrow wide. Metapleurum strongly reticulate. Propodeum with its apical carina not so stout, apophyses long and pointed, 4× longer than wide at base. Antenna strongly flattened beyond 2–3 basal segments to the tip and the segments are serrated. Ovipositor tapered to a pointed tip, about 0.5 the length of abdomen.

Black. The following are yellow or dark yellow : face, clypeus, malar space, mandible, except the teeth, frons along the eye margin narrowly, tegula,

subtegular ridge, scutellum except black at base, lateral carinae of scutellum, apical slope of propodeum including apophyses, apices of 1–3 and 7th abdominal tergites with apical bands. Legs in general yellow or deep yellow, except hind coxa black, broadly yellow above and below; tibiae and tarsi black, except tibiae with a subbasal band and first tarsal segment at base, black. Wings hyaline, stigma and veins black.

Length : Male, 15 mm.

Distribution : India : Assam (Rangapara in Charduar Forest). Sikkim

16. Genus ***Euchalinus*** Townes (Fig. 106 : a–c)

1961. *Euchalinus* Townes, *Mem. Amer. Ent. Inst.*, 1 : 471. Type-species : *Skeatia balteata* Cameron; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 158. Townes, 1970 : 267. Gauld, 1984 : 153.

Distribution : Indo-Australian.

Frons with a median vertical carina. Clypeus strongly convex, apical margin impressed, without a median tooth or irregularity. Occipital carina strongly sinuate, joining hypostomal carina above base of mandible. Lower tooth of mandible about half as long as upper tooth. Epomia strong and very long, extending up to the upper margin and there turned mesad. Sternaulus sinuate, reaching up to middle coxa. Scutellum without lateral carina, except sometimes present at base. Propodeum short, spiracle round or short elliptic, its basal carina complete. Apical carina with lateral crests or apophyses. Areolet 0.7× as high as

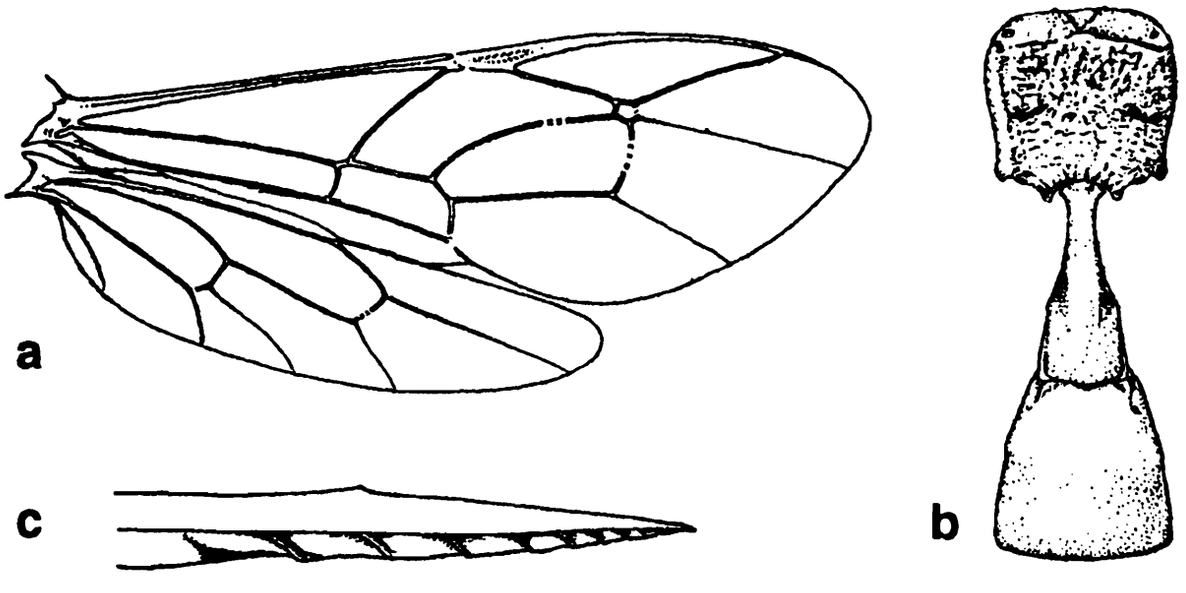

Fig. 106. *Euchalinus* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propedeum, first and second tergite; **c**, ovipositor tip. (Source : Townes, 1970).

the portion of second recurrent vein above bulla, intercubiti parallel or weakly convergent. Nervellus intercepted near its upper 0.32. Brachiella reaching to near wing margin. First abdominal tergite with basal lateral tooth, ventro-lateral and dorso-lateral carinae complete and sharp. Ovipositor sheath about 0.9× as long as hind tibia, its tip rather long and gradually tapered, its nodus strong, weak or absent, teeth oblique.

This is a moderately large genus, widely distributed in Indo-Australian region. In India and adjacent countries, it is represented by four species.

Key to the species of *Euchalinus*

1. Mesopleurum largely black 2

– Mesopleurum black, marked with yellow markings 3

2. Hind coxa red. Sri Lanka ..... 1. *pedalis* Townes *et al.*

– Hind coxa dark yellow with black markings. India : Meghalaya .... 2. *reticulatus* (Cameron)

3. Face and clypeus covered with short silvery hair. Legs in general reddish-yellow India : Meghalaya ..... 3. *respondens* (Cameron)

– Face and clypeus bare, not covered with hair. Legs in general deep yellow (only males). India : Sikkim ..... 4. *pugnatus* (Cameron)

1. ***Euchalinus pedalis*** Townes *et al.*

1905. *Melcha annulipes* Cameron, *Spolia Zeylanica,* **3** : 107. Female. Name preocc. by Cameron, 1903. des. Type : Female, Sri Lanka : Peradeniya (LONDON)

1961. *Euchalinus pedalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 159. n. name. Sri Lanka.

1987. *Euchalinus pedalis* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 867.

Very little is known about this species from Sri Lanka. It can be recognised by having mesoscutum and abdomen closely punctate. Mesopleurum without any white or yellowish-white mark. Metapleurum near the base of hind coxa and apices of first and second abdominal tergites, whitish-yellow. Petiole and hind coxa, red.

Female : Frons just below median ocellus closely, irregularly, longitudinally striate, with a median longitudinal carina. Face finely rugose. Mesoscutum finely and closely rugoso-punctate. Scutellum smooth. Propodeum at base irragularly rugose, towards apex distinctly sparsely trans-striate. Pronotum in scrobe strongly

striate. Mesopleurum closely, irregularly, obliquely striate and aciculated. Metapleurum strongly and obliquely striate. Abdomen largely mat and subpolished, except 2nd and 3rd tergites closely punctate.

Black. Antennal flagellum with a white band in middle. The following are yellow : an oval mark in the center of face, clypeus, palpi, mandible except teeth, frons along the eye margin, pronotum broadly, tegula subtegular ridge, scutellum, propodeum broadly, extending over to metapleurum, 1st and 2nd abdominal tergites broadly at apex and apical four segments largely. Petiole reddish, legs in general reddish; fore and middle coxae and trochanters white, hind tibia blackish with a broad band near the base; hind tarsus, except apical segment white. Wings clear hyaline, stigma and veins dark brown.

Male : Not known.

Length : Female, 6–7 mm; ovipositor 2 mm.

Distribution : Sri Lanka (Peradaniya),

2. ***Euchalinus reticulatus*** (Cameron)

1902. *Mesostenus reticulatus* Cameron, *Trans. Ent. Soc. London,* 1904 : 116. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1907. *Mesostenoides reticulatus* Cameron, *Ann. & Mag. Nat. Hist.,* (7) **20** ; 23. n. comb.

1941. *Mesostenoides reticulatus* : Betrem, *Treubia,* **18** : 58. key.

1961. *Euchalinus reticulatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 159. n. comb. India.

1987. *Euchalinus reticulatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 867.

This species is mainly recognised by having mesopleurum largely black with yellow markings and hind coxa largely yellow with black marks.

Female : Face and base of clypeus coarsely punctate. Frons and vertex strongly striated in the middle, at some places tending to be reticulate and at sides smooth and shiny. Pronotum, except below strongly irregularly striated. Middle lobe of mesoscutum closely punctate, at sides and towards the apex coarsely striated, in the center with a broad shallow longitudinal depression, lateral lobes along the sides striated. Scutellum smooth and somewhat hairy. Mesopleurum basally above rugoso-punctate. Metapleurum strongly rugose, tending to be reticulate, juxtacoxal carina present. Propodeum strongly reticulate, except at base behind basal carina smooth, apophyses large and stout.

Black. 5–12 antennal segments yellowish-white. Face, clypeus, inner orbrits up to vertex, mandible except teeth, palpi, pronotal collar above and below,

tegula, scutellum, metascutellum, propodeum at apex including apophyses and apices of all the abdominal tergites, yellow. Legs brownish-yellow; hind coxa below, apex of hind femur and tibia, black.

Length : Female, 15–16 mm.

Distribution : India : Meghalaya (Khasi Hills).

3. ***Euchalinus respondens*** (Cameron)

1904. *Mesostenus respondens* Cameron, *Trans. Ent. Soc. London,* 1904 : 112. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1907. *Mesostenoideus respondens* : Cameron, *Ann. & Mag. Nat. Hist.,* (7) **20** : 23. n. comb.

1961. *Euchalinus respondens* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 159. n. comb. India.

1987. *Euchalinus respondens* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 867.

This species can easily be distinguished by having face and clypeus covered with silvery hair and legs in general reddish-yellow.

Female : Face and clypeus covered with short silvery hair. Vertex largely rugose, except for irregular striae in the middle below the median ocellus. Pronotum mat and subpolished, striate above. Mesoscutum finely trans-striate. Scutellum impunctate. Mesopleurum closely punctate, reticulate towards the base. Metapleurum reticulate above. juxtacoxal carina present. Propodeum finely reticulate, tending to be strongly and coarsely reticulate towards the apex, apophyses blunt. Abdomen including petiole mat and shagreened.

Black. 6–15 antennal segments white above. Face, clypeus except at sides, mandible at base, palpi and outer orbits, white. Pronotal collar, a mark on middle lobe of mesoscutum at apex, scutellum, mesopleurum with a crescent-shaped, mark near the base of hind wing, a large mark on lower side, triangularly narrowed at the apex. Metapleurum with an oblique mark. Propodeum broadly at apex including apophyses. Apices of first, second and eighth tergites broadly and middle tergites narrowly at apex, yellow. Legs in general reddish-yellow. Fore and middle and also hind coxae and trochanters, yellowish, except hind coxae with a somewhat triangular black mark in the middle. Hind tibia at apex, extreme base of its first and whole of fifth tarsal segment, blackish; its middle segments yellowish. Wings clear hyaline.

Length : Female, 13–14 mm; ovipositor sheath about 2 mm.

Distribution : India : Meghalaya (Khasi Hills).

4. ***Euchalinus pugnatus*** (Cameron)

1907. *Mesostenus pugnatus* Cameron, *Tijdschr. v. Ent.*, **50** : 86. Male des. Type : Male, India : Sikkim (LONDON).

1961. *Euchalinus pugnatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 159. n. comb. India.

1987. *Enchalinus pugnatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 867.

This species is known by its male only and can be distinguished by the following combination of characters :

Male : Face and clypeus without hair. Head and thorax largely smooth and subpolished, except face obscurely punctate. Pronotum in the middle and mesopleurum above striate. Propodeum basally smooth, area between apical and basal carinae irregularly obliquely striated; apicad of apical carina somewhat strongly reticulated. Areolet squarish.

Black. The following are yellow : Face, clypeus, mandible except the teeth, whole of orbit except outer orbit above, pronotal collar, scutellum, a roundish mark on mesopleurum above, propodeum and metapleurum at base, apical slope of propodeum, metapleurum broadly and apices of abdominal tergites. Legs in general yellowish-brown. Hind leg with femur reddish, except outer side of coxa, trocharter, femur narrowly at apex, apical 0.5 of tibia, first tarsal segment, black. Wings clear hyaline.

Length : Male, 8 mm.

Distribution : Sikkim.

17. Genus ***Baltazaria*** Townes (Fig. 107 : a–c)

1961. *Baltazaria* Townes, *Mem. Amer. Ent. Inst.*, **1** : 472. Type-species : *Cryptus tribax* Tosquinet. Original designation.

Taxonomy : Townes, Townes, Gupta, 1961 : 175, 472. Townes 1970 : 266. Gupta, 1987 : 868.

Distribution : Oriental and Neotropical regions.

Body of moderate proportions. Frons with a median vertical carina. Clypeus convex, impressed near apex, without a median tooth or irregularity. Occipital carina not sinuate, meeting hypostomal carina some distance above base of mandible. Lower tooth of mandible a little shorter than upper tooth. Epomia long. Sternaulus reaching middle coxa, weakly sinuate. Scutellum with lateral carina extending 0.2 to 0.6 at its base, sometimes this carina may be absent. Basal and apical carinae of propodeum complete, apical carina with lateral crest high and tooth-like in female. Areolet about 0.9× as high as the portion of second

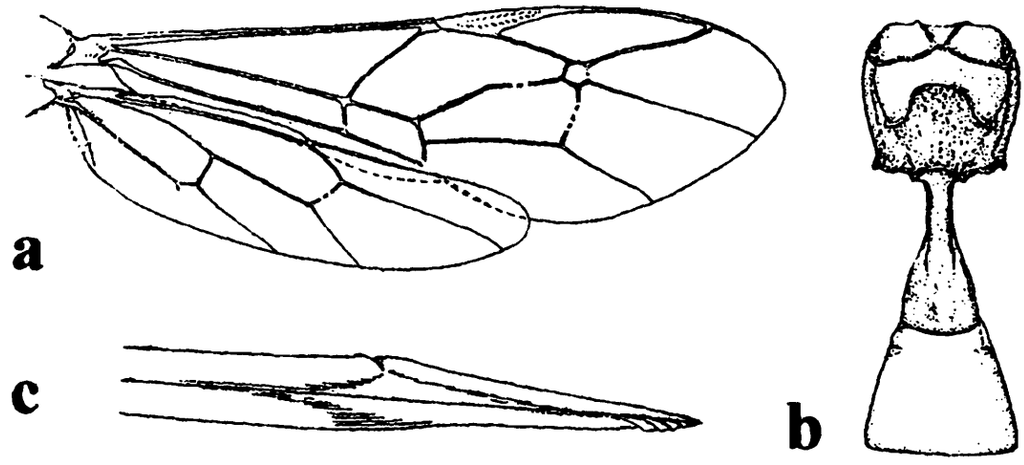

Fig. 107. *Baltazaria* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergite; **c**, ovipositor tip. (Source : Townes 1970).

recurrent vein above bulla, little higher than wide, second recurrent vein vertical. Mediella strongly arched. Nervellus intercepted near its lower 0.4. Brachiella almost or entirely lacking. First abdominal tergite with a lateral tooth at base, all the longitudinal carinae sharp and complete, except medium-dorsal carinae end between base and apical 0.8 of postpetiole. Ovipositor sheath about 1.0× as long as hind tibia, tip with distinct nodus and distinct teeth.

This moderate sized genus, occurs in the Oriental and Neotropical regions. In Oriental Region seven species have been reported under this genus. *Baltazaria caligata* (Cameron) is the only species known from India, which is discussed below :

1. ***Baltazaria caligata*** (Cameron)

1904. *Mesostenus caligatus* Cameron, *Trans. Ent. Soc. London,* 1904 : 116. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Baltazaria caligata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 175. n. Comp.India.

1987. *Baltazaria caligata* : Gupta, *Mem. Amer, Ent. Inst.,* **41** : 868.

Female : Face strongly and closely punctate, its upper part at sides faintly striate. Clypeus weakly and closely punctate. Frons and vertex coarsely mat. Frons somewhat depressed with a longitudinal carina in the center. Mesopleurum mat and subpolished, covered with short fine black hair. Mesopleurum obliquely puncto-striate. Propodeum weakly reticulate, distinctly punctate at base and apex, its transverse carina arched but straight in center. First abdominal segment smooth and shiny, gradually dialated from the middle to the apex, second segment somewhat aciculated.

Black. The palpi, upper and lower margin of pronotam, tegula, scutellum, an oval mark at the apex of middle lobe of mesoscutum, propodeum at apex including lateral crests, large crescent-shaped mark at base, first and second abdominal segments at apex, last abdominal segment wholly and basal two segments ventrally, yellow. Legs in general reddish-yellow, fore and middle coxae and trochanters, white, apex of hind tibia dark brown.

Length : Female 8 mm; fore wing 7mm; ovipositor 2 mm.

Distribution : India : Meghalaya (Khasi Hills).

18. Genus ***Colaulus*** Townes (Fig. 108 : a–c)

1970. *Colaulus* Townes, *Mem. Amer. Ent. Inst.*, **12** : 269. Type-species : *Colaulus carinatus* Townes; original designation.

Taxonomy : Jonathan, 1992 : 77.

Distribution : Oriental Region.

Body moderately slender. Head wider than long. Clypeus evenly convex, its apical margin arched or sometimes straight and impressed, without a median tooth or irregularity. Mandibles stout, lower tooth slightly shorter than the upper tooth. Frons evenly arched, with a short to long median vertical carina. Occipital carina complete, joining hypostomal carina above the base of mandible. Epomia short to moderately long. Mesoscutum weakly to moderately convex, notauli short to long and deep, reaching far beyond the middle. Mesopleurum with prepectal carina extending 0.5 or up to the base of subtegular ridge. Sternaulus short (0.4) to long. Juxtacoxal carina present. Both the transverse carinae of propodeum

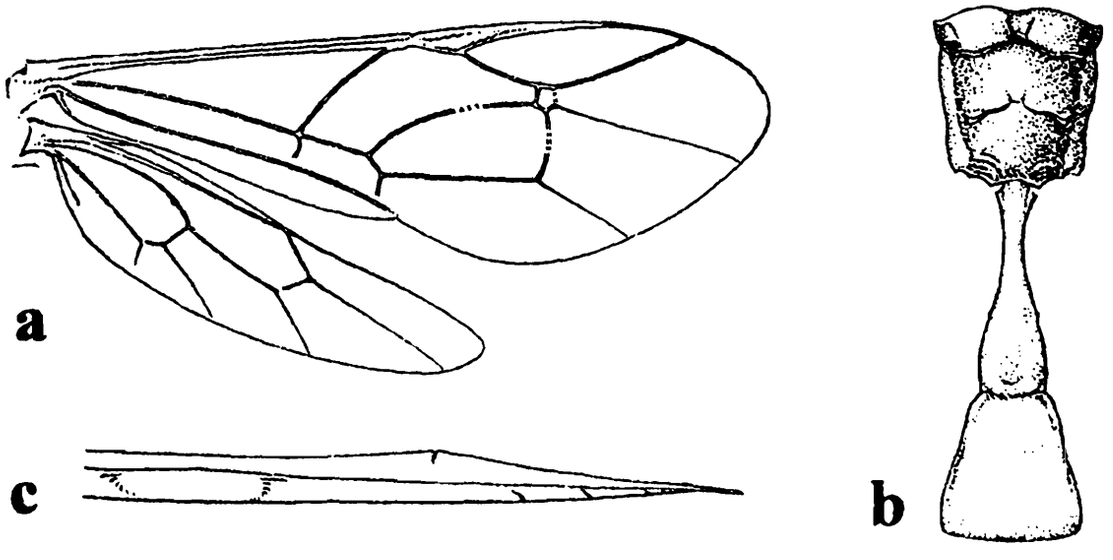

Fig. 108. *Colaulus* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

complete, spiracle round to short elliptic. First tergite slender, about 3.5× as long as wide at apex, tergite at base without a distinct lateral tooth, except for a weak angulation, petiolar area narrow and tubular. Postpetiole rectangular; dorso-median carinae almost absent, dorso-lateral carinae extending from base to apex, ventro-lateral carinae absent except near the apex, tergite roundish in cross-section. Postpetiole 2.0× as long as wide, spiracles close to each other than to apex. Areolet of moderate size, higher than wide, pentagonal, 0.8× as high as the portion of second recurrent vein above bulla, intercubiti convergent, second recurrent curved. Nervulus interstitial or little based. Nervellus intercepted at its lower 0.4, mediella strongly arched, brachiella present or absent, axillus parallel to wing margin. Ovipositor long, about 0.9 to 1.3× as long as hind tibia, its tip long and pointed, lower valve with weak teeth.

This genus is confined to Oriental Region and widely distributed in India. Townes (1970) described this genus based on a species from Philippines and Myanmar. Jonathan (1992), added five new species from India and Nepal. The species under this genus from Orient Region can be distinguished by the following key :

Key to the species of *Colaulus*

1. First, second and third abdominal tergites almost entirely, black. Species from Philippines and Myanmar ..... 6. *carinatus* Townes

– First abdominal tergite almost entirely, second tergite broadly at apex and thrid tergite narrowly to broadly at apex yellowish-brown to reddish (not black). Species from India and Nepal 2

2. Thorax entirely yellowish-brown. Pronotal collar narrowly yellow. (Mesocutum and scutellum smooth and shiny. Mesopleurum, metapleurum and propodeum largely smooth and shiny with minute scattered punctures). India : Tamil Nadu; Kerala ..... 1. *lucidus* Jonathan

– Thorax not entirely yellow (yellowish-brown), atleast its mesoscutum and/or pronotum black; pronotal collar with or without a yellow band 3

3. Face entirely black. Clypeus black or yellow. Hind tarsus entirely dark brown. 4

– Face and clypeus, yellow. Hind tarsus from apical 0.25 of 1st segment to 4th segment whitish. 5

4. Clypeus yellow. Frons with broad yellow orbital marks. Body largely with weak punctures and rugosities. Lateral carina more or less confined to its base. Antennal segments 6th to 12th, whitish. India : Karnataka; Tamil Nadu ..... 2. *erugus* Jonathan

– Clypeus and frons entirely black. Body largely densely punctate. Lateral carina of scutellum extending at its basal 0.25. Antannal segments 6th to 10th, whitish. India: Assam; Kerala. Nepal ..... 3. *punctatus* Jonathan

5. Face laterally black, in the middle yellow. Pronotum (except the collar) and mesopleurum, black. Face densely punctate. Pronotal collar above the base of fore coxa shallowly punctate. Brachiella in hind wing represented by a short stump ..... 4. *septentrionalis* Jonathan

– Face laterally and in the middle yellow. Pronotum (except collar) and mesoplurum, deep yellow. Face rugoso-punctate. Pronotal collar above the base of fore coxa smooth and shiny. Brachiella in hind wing present. .... 5. *flavofaciatus* Jonathan

1. ***Colaulus lucidus*** Jonathan (Fig. 109 : a–c)

1992. *Colaulus lucidus* Jonathan, *Rec. zool. Surv. India*, **92** (1-4) : 79. Male, Female, Key, des, fig. Type : Female, India : Tamil Nadu : Oothu in Kodai Hills, 1200 m (Z.S.I., Calcutta). India : Tamil Nadu : Oothu is Kodai Hills, 1200 m. Kerala : Walayar Forest.

This species is distinguished by having thorax entirely yellowish-brown; pronotal collar yellow and body largely smooth and shiny.

Female : Body in general subpolished. Face finely and shallowly punctate all over. Clypeus sparsely and shallowly punctate. Malar space granulose, 0.7× the basal width of mandible. Frons largely smooth and shiny, with a few scattered punctures in the middle. Vertex and temple shiny, with minute sparse punctures, punctures on vertex not well defined. Pronotum with pronotal collar and upper margin broadly smooth and shiny, its posterior margin weakly rugose, epomia long extending up to upper margin. Mesoscutum, scutellum and metascutellum smooth and shiny. Lateral carina of scutellum more or less confined to its base. Mesopleurum, metaplurum and propodeum largely smooth and shiny, except for a few scattered shallow punctures on meso- and metapleurm and a few striation along the anterior margin of speculum. Propodeum apicad of apical carina rugose, apical carina of propodeum in the middle in broken line, apophyses crest-like. First tergite smooth, second and third tergites strongly granulose, fourth and following tergites mat and subpolished. Brachiella vein present as a small stump. Other details of structure and wing as under generic description.

Yellowish-brown. Antenna black with scape brown, 6th to 12th flagellar segments white above. Head (Fig. 109 : a) black except clypeus and mandible, brown; mandibular teeth dark brown. Frons along the eye margin with two moderately wide and elongated orbital stripes, pronotal collar, subtegular ridge (faintly) and tegula, yellow (Fig. 109 : b). Legs in general yellowish-brown, except

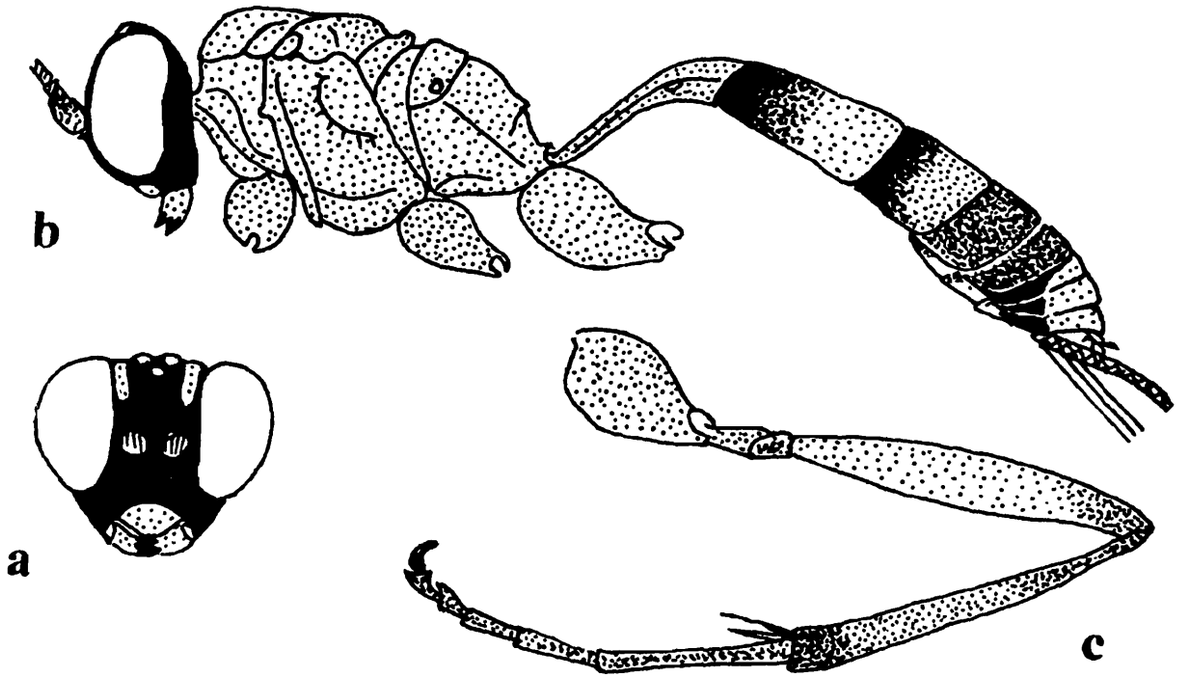

Fig. 109. *Colaulus lucidus* Jonathan : Showing colour pattern. **a**, front view of head; **b**, side view of body; **c**, hind leg.

middle and hind tarsus, hind tibia almost wholly and extreme apex of hind femur, dark brown (Fig. 109 : c). Abdomen blackish brown to black, except its tergite wholly, second and third tergites broadly at apex (sometimes second and third tergites wholly) yellowish-brown. Fourth to sixth tergites black, except sixth tergite apico-medially, and seventh and eighth tergites almost wholly, white. Wings clear hyaline.

Male : Essentially similar to female in sculpture and colour, except as follows :

Body largely smooth and shiny; face with distinct punctures. Epomia short. Apical carina of propodeum indistinct. Second to seventh tergites mat and closely punctate.

10th to 15th flagellar segments white above. Scape and clypeus, reddish-brown. All the tergites with broad apical yellowish-brown bands, the bands on apical tergites faint. Hind leg with trochanter largely, femur at apex, wholly of tibia, first and fifth tarsal segments, dark brown to blackish. Second to fourth hind tarsal segments white; rest of colour similar to female.

Length : Female, 6.0 mm; fore wing 4.5 mm; ovipositor sheath 2.5 mm. Male, 5.0 mm; fore wing 4.0 mm.

Distribution : India : Tamil Nadu (Oathu in Kodai Hills) and Kerala (Walayar Forest).

2. ***Colaulus erugus*** Jonathan (Fig. 110 : a–d)

1992. *Colaulus erugus* Jonathan, *Rec. zool. Surv. India*, **92** (1-4) : 81. Male, Female, Key, des, fig. Type : Female, India : Karnataka : Kattegehar, 665m (Z.S.I., Calcutta). India : Karnataka : Kottegehar, 665m; Tamil Nadu : Yercaud 1364m in Shivarey Hills.

This species is characterized by having face entirely black; clypeus yellowish or reddish-brown. Frons with yellow orbital marks. Antennal segments 6th to 12th whitish. Pronotum largely rugose in its lower 0.5 and lateral carina of scutellum confined to its base.

Female : Face subpolished, finely rugoso-punctate. Clypeus subpolished, sparsely and minutely punctate. Malar space granulose, 0.75× the basal width of mandible. Frons and vertex smooth and shiny. Temple with minute scattered punctures. Pronotum coarsely striate in the lower half, upper half with fine oblique striations, extreme upper margin with indistinct punctures. Mesoscutum shiny, minutely and sparsely punctate. Scutellum and metascutellum largely smooth and shiny, except scutellum with sparse and minute punctures at base, lateral carina of scutellum more or less confined to its base. Mesopleurum shiny with fine and sparse punctures, coarsely striate above near subtegular ridge and speculum, prepectal carina extending up to the base of subtegular ridge. Metapleurum shiny, sparsely and shallowly punctate, juxtacoxal carina present. Propodeum subpolished, based of basal carina smooth, apicad of apical carina rugose, area between apical and basal carinae sparsely and shallowly punctate;

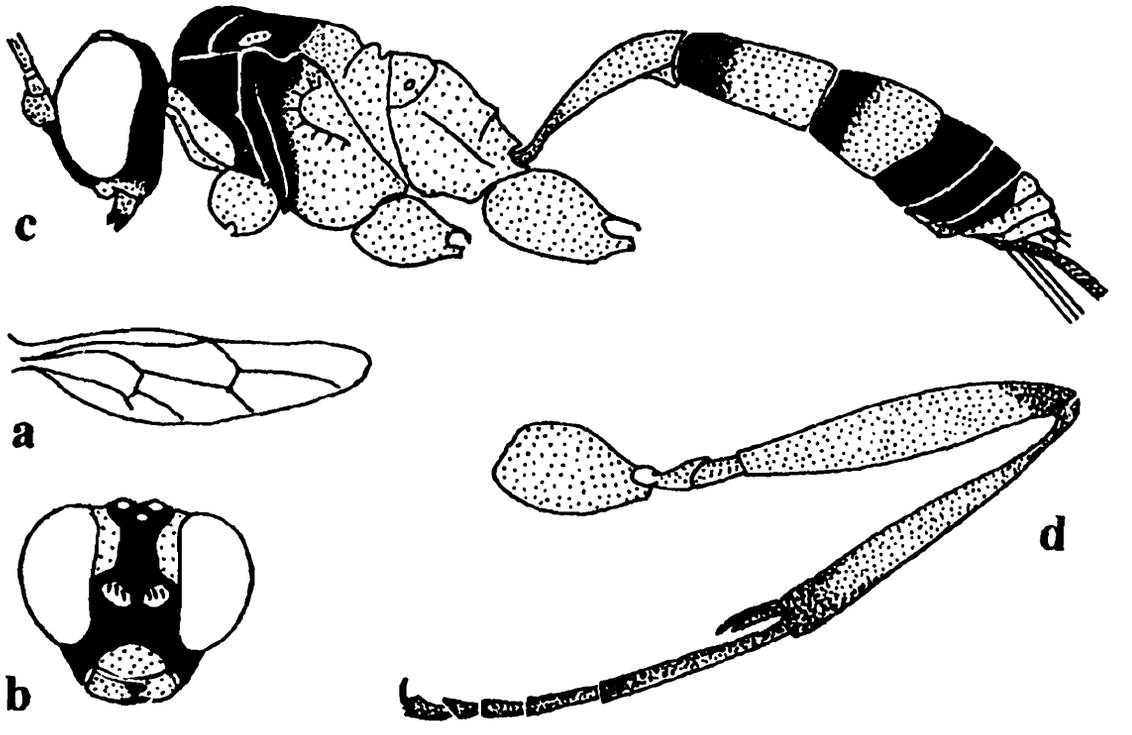

Fig. 110. *Colaulus erugus* Jonathan : Showing colour pattern. **b**, front view of head; **c**, side view of body; **d**, hind leg. **a**, hind wing showing venation.

apical carina absent in the middle. First tergite smooth and shiny, second and third tergites densely and finely punctate at base, granulose towards the apex, following tergites mat and subpolished. Nervulus basad of basal vein by a distance greater than the width of the vein; brachiella present as a short stump (Fig. 110 : a). Ovipositor long and its tip pointed.

Colour similar to *Colaulus lucidus* Jonathan except as follows : clypeus entirely yellow. Mesoscutum, pronotum (except the collar, yellow) and anterior half of mesopleurum, black. First tergite at its basal 0.3 with brownish hue. Second and third tergites at their basal 0.33 blackish, apical 0.6 yellowish-brown (Fig. 110 : b–d).

Male : Essentially similar to female in sculpture and colour except as follows : Body more slender and polished, sculpture weak. Pronotal collar broadly yellow. First tergite wholly, second and third broadly, fourth and fifth narrowly at apex, yellowish-brown. Sixth tergite wholly blackish-brown. Seventh tergite yellow, except its extreme base blackish. Third and fourth segments of hind tarsus whitish-yellow.

Length : Female, 6.0 mm; fore wing 4.5 mm; ovipositor sheath 2.0 mm. Male, 5.0 mm; fore wing 4.0 mm.

Distribution : India : Karnataka (Kottegehar, 665m, Mercara, 1150 m) and Tamil Nadu (Yercaud, 1364 m in Shevarey Hills).

3. ***Colaulus punctatus*** Jonathan (Fig. 111 : a–d)

1992. *Colaulus punctatus* Jonathan, *Rec. zool. Surv. India*, **92** (1-4) : 83. Female, key, des, fig. Type : Female, India : Assam : Rangapara Sonajuli Tea Estate (Z.S.I., Calcutta). India : Assam : Rangapara : Sonajuli Tea Estate. Kerala : Walayar Forest. Nepal : Gorakna.

This species is close to *Colaulus erugus* Jonathan by having face yellow and hind tarsus dark brown. It can be easily distinguished by having body densely punctate; frons without orbital marks and antennal segments 6th to 10th whitish.

Female : Body subpolished. Face with moderately dense punctures, surface appears to be reticulo-punctate. Clypeus closely punctate at basal half, tending to be smooth and shiny towards the apex. Malar space strongly granulose, 0.83× the basal width of mandible. Frons and vertex with moderate size punctures. Pronotum moderately strongly punctate, punctures in the groove dense and with running striations. Mesoscutum closely punctate. Scutellum shiny with sparse small punctures, lateral carina of scutellum confined to its basal 0.25. Mesopleurum wholly with dense, moderately strong punctures, prepectal carina extending up to the base of subtegular ridge. Metapleurum densely punctate,

surface appears to be reticulo-punctate, juxtacoxal carina present. Propodeum between basal carina and apex reticulo-punctate, basad of basal carina smooth and shiny, apical carina weak in the middle, lateral apophyses crest-like. First tergite smooth and shiny, with a few indistinct punctures. Second and third tergites strongly granulose, following tergites mat and subplished. Brachiella in hind wing absent (Fig. 111 : a).

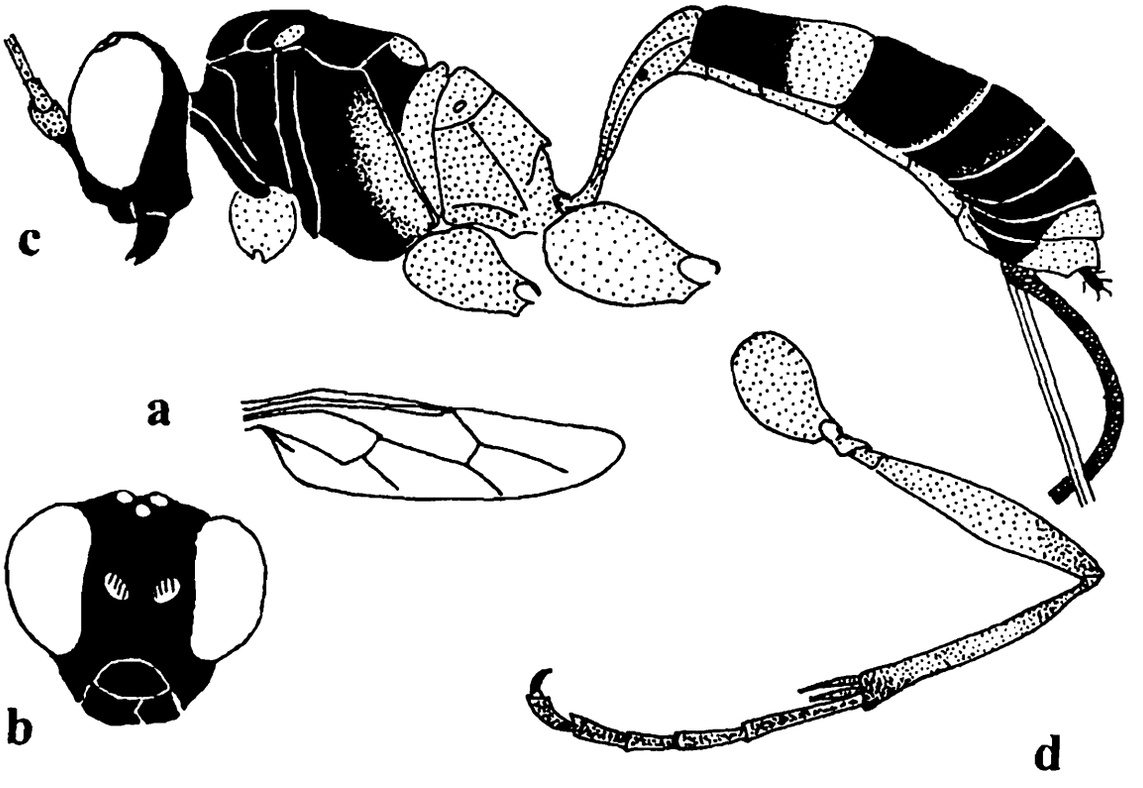

Fig. 111. *Colaulus punctatus* Jonathan : **a**, hind wing showing venation; showing colour pattern : **b**, front view of head; **c**, body side view; **d**, hind leg.

Black. Antennal flagellum from extreme apex of 6th to 10th segment above white. Scape in front yellowish-brown. Head black (Fig. 111 : b). The following are reddish : mesopleurum along the posterior margin, scutellum at apex, tegula, metascutellum, metapleurum, propodeum, first tergite, apical 0.4 of second tergite, extreme apical margins of third and fourth tergites. Seventh and eighth tergites dorsally white, abdomen ventrally reddish-brown (Fig. 111 : d). Fore leg with coxa and trochanter yellowish, rest deep yellow. Middle leg with coxa and trochanter, yellowish, femur deep yellow, tibia nd tarsus brownish. Hind coxa, trochanter and femur reddish-brown, extreme apex of femur, tibia and tarsus wholly, dark brown (Fig. 111 : d). Wings clear hyaline.

Male : Not knwon.

Length : Female, 4.75–6.5 mm; fore wing 3–4.5 mm; ovipositor sheath 1.5–2.2 mm.

Distribution : India : Assam (Rangapara, Sonajuli Tea State). Kerala (Walayar Forest). Nepal (Gorakna).

4. ***Colaulus septentrionalis*** Jonathan (Fig. 112 : a–d)

1992. *Colaulus septentrionalis* Jonathan, *Rec. zool. Surv. India*, **92** (1-4) : 84. Male, Female, key, des, fig. Type : Female, India : Himachal Pradesh : Banikhat, 1524 m (Z.S.I., Calcutta). India : Himachal Pradesh : Banikhat, 1524 m; Uttaranchal : Barkot, 1212 m; Chaubattia, 200 m in Kumaon Hills.

This species is close to *Colaulus flavofaciatus* Jonathan in having face and clypeus yellow and hind tarsus largely whitish. It is distinguished by having face in the middle and clypeus wholly yellow. Pronotum and mesopleurum largely black. Face densely punctate. Pronotal collar above the base of fore coxa shallowly punctate.

Female : Face subpolished, densely granuloso-punctate. Clypeus subpolished sparsely and shallowly punctate. Malar space granulose, 0.7× the basal width of mandible. Frons sparsely and finely punctate, punctures weak along the eye margin. Vertex and temple subpolished, sparsely and finely punctate, punctures on vertex weak. Mandible punctate. Pronotum at its lower 0.5 coarsely transstriate, upper 0.5 shiny with sparse fine punctures; pronotal collar just above the base of fore caxa shallowly punctate. Epomia moderately long and strong. Mesoscutum and metascutellum shiny with sparse and indistinct punctures. Lateral carina of scutellum confined to its basal 0.2. Mesopleurum shiny with fine and sparse punctures, short but strong striae present at the anterior margin of speculum, prepectal carina extending up to the base of subtegular ridge. Metapleurum shiny, sparsely punctate above, closely punctate below, juxtacoxal carina present. Propodeum shiny, basad of basal carina with a few scattered shallow punctures, between basal and apical carinae sparsely punctate, apicad of apical carina rugose; apical carina complete, apophyses weak, low crest-like. First tergite shiny, its petiolar area smoth, postpetiole sparsely punctate. Second to fourth tergites with dense fine punctures, tergites apically appears to be granulose, following tergites mat and subpolished. Ovipositor and wings similar to *Colaulus erugus* (Fig. 112 : a).

Black. Antennal flagellum from 6th to 12th segments white; scape and pedicel brown in front. Face in the middle, clypeus (mark on these two fused), mandible (except the teeth) (Fig. 112 : b), orbital stripes on frons (Fig. 112 : c), pronotal collar, tegula, subtegular ridge faintly, scutellum (except at base, brownish), fore and middle coxae and their first trochanteral segments, apices of sixth to eight tergites, yellowish-white. Metapleurum, base of hind wing, metascutellum, mesopleurum along the pleural suture, propodeum, first tergite (except at base brownish) and hind coxae, red. Second and third tergites broadly at apex and legs in general, yellowish-brown. Apex of fore tarsus, middle tarsus almost wholly, hind tarsus (Fig. 112 : d) with the basal 0.75 of first segment and fifth segment wholly, dark brown; rest of hind tarsus whitish. Wings clear hyaline.

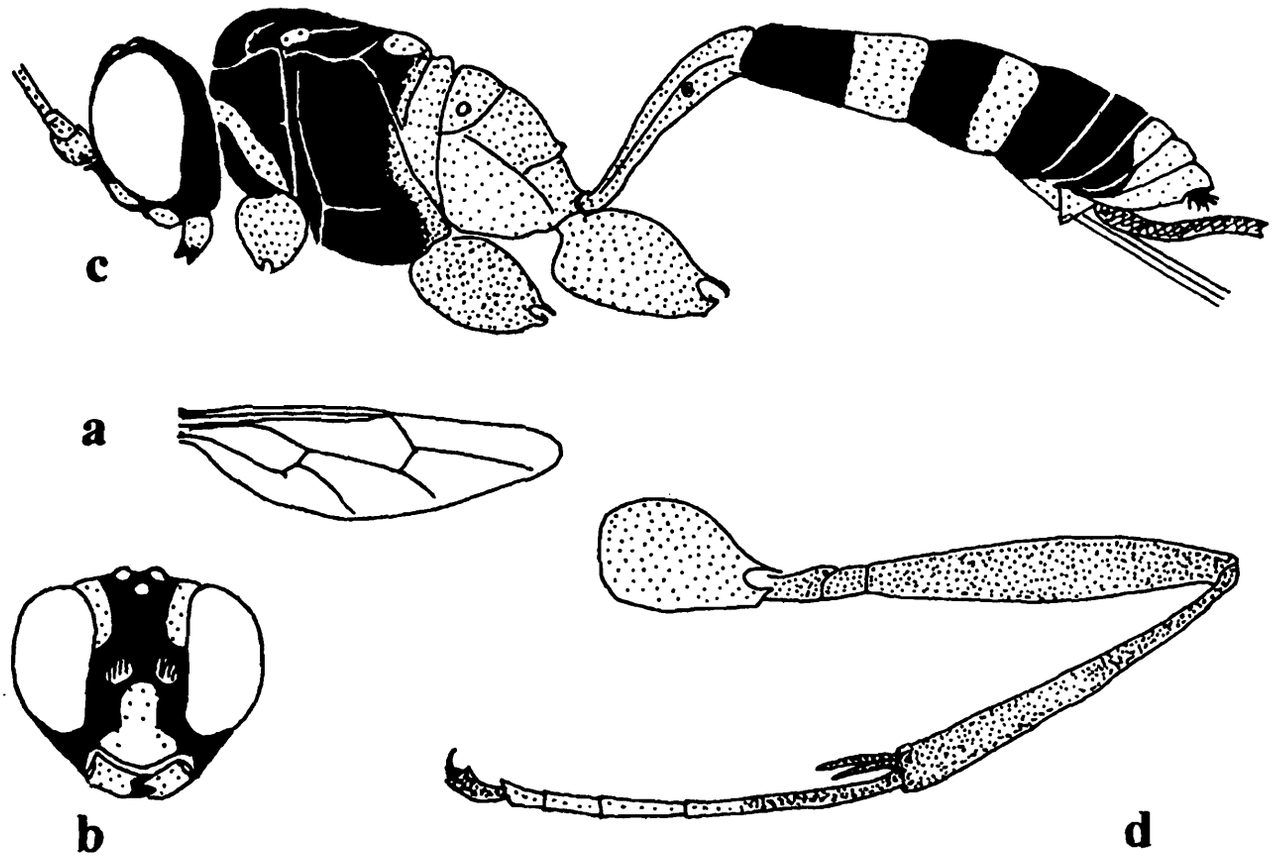

Fig. 112. *Colaulus septentrionalis* Jonathan : **a**, hind wing showing venation; showing colour pattern : **b**, front view of head; **c**, side view of body; **d**, hind leg.

Male : Similar to female, except more polished, slender and weakly sculptured. Colour also similar to female except flagellum with 9th-16th segments white; face and clypeus wholly and temple near the base of mandible, yellowish. Second tergite broadly at apex brown, following tergites blackish-brown. Seventh tergite except at base, broadly whitish.

Length : Female, 7–8 mm; fore wing 5–5.5 mm; ovipositor sheath 1.75 mm. Male, 7–7.5 mm; fore wing 4.5–5.5 mm.

Distribution : India : Himachal Pradesh (Banikhet, 1524 m, Manali 1828 m, Nichar, 2440m and Uttaranchal (Barkot, 1212 m; Chaubattia 200 m).

5. ***Colaulus flavofaciatus*** Jonathan (Fig. 113 : a–d)

1992. *Colaulus flavofaciatus* Jonathan, *Rec. zool. Surv. India,* **92** (1-4) : 86. Female, key, des, Type : Female, India : Kerala : Connanore (Z.S.I., Calcutta).

This species is distinguished by having face in the middle and at sides, yellow. Face rugoso-punctate. Pronotal collar above the base of fore coxa smooth and shiny and brachiella present in hind wing.

Female : Body subpolished. Face largely weakly rugoso-punctate. Clypeus largely smooth and shiny, except minutely punctate along the clypeal groove. Malar space granulose, 0.75 the basal width of mandible. Frons largely smooth and shiny. Vertex and temple shiny with sparse minute punctures. Pronotum above the base of fore coxa smooth and shiny, rest somewhat trans-rugoso-punctate. Mesoscutum sparsely and minutely punctate. Scutellum with indistinct punctures at base, lateral carina extending up to it basal 0.4. Metascutellum smooth and shiny. Mesopleurum smooth and shiny except above minutely punctate. Prepectal carina extending up to the base of subtegular ridge. Metapleurum with sparse minute weak punctures; juxtacoxal carina present. Propodeum with both the transverse carinae complete, smooth and shiny between apical carina and base; apicad of apical carina rugose; apophyses crest-like. First tergite smooth, second and third strongly granulose, fourth and following tergites mat and subpolished. Brachiella in hind wing present (Fig. 113 : a).

Body largely yellowish-brown. Antennae dark brown, with scape yellowish-brown. 6th to 12th flagellar segments white above. Face brownish. The following are yellow : the face (Fig. 113 : b) with two elongate mark along the eye margin and a bilobed mark in the middle, clypeus wholly, mandibles (except the teeth), frons along the eye margin, pronotal collar below, tegula, fore and middle coxae,

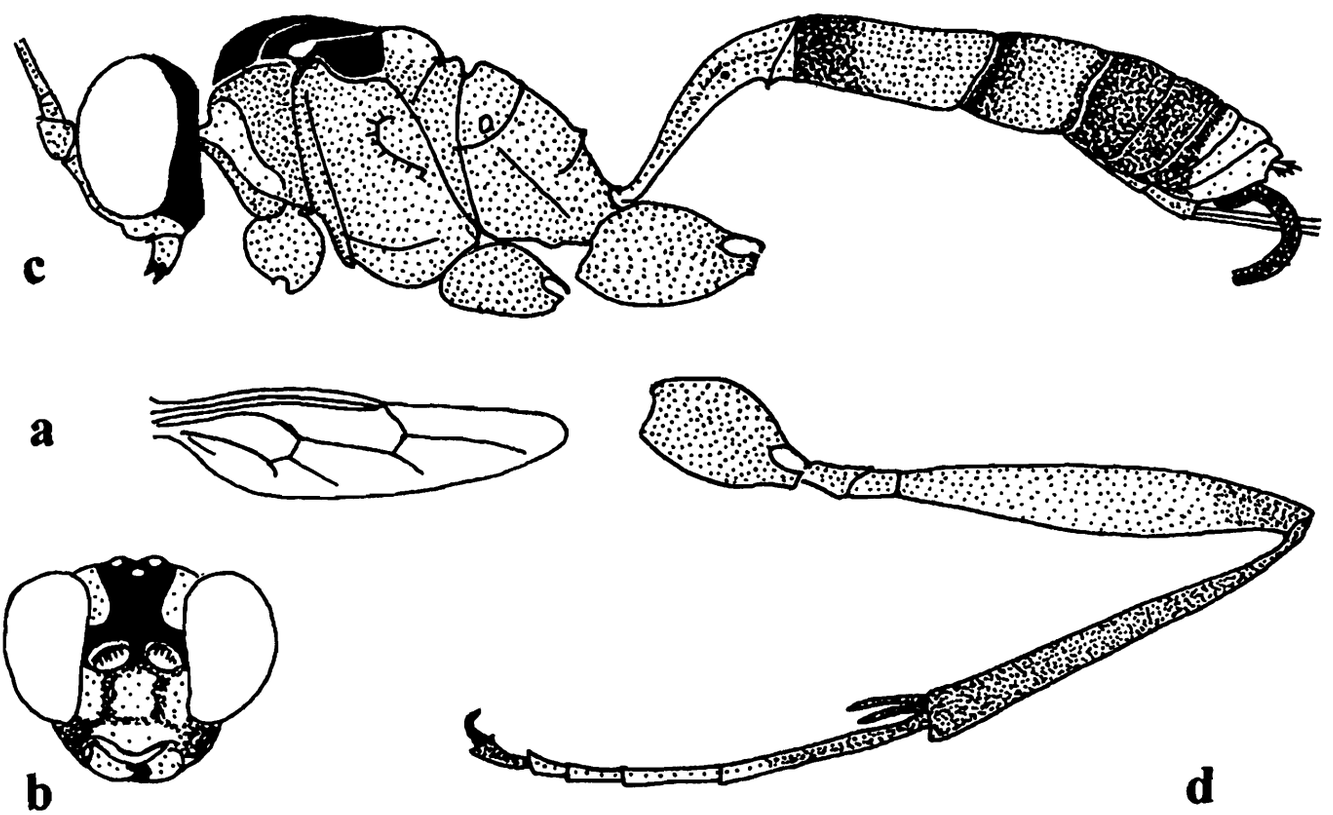

Fig. 113. *Colaulus flavofaciatus* Jonathan : **a**, hind wing showing venation; showing colour pattern : **b**, front view of head; **c**, side view of body; **d**, hind leg.

scutellum and metascutellum. Mesoscutum black (Fig. 113 : c). Abdomen yellowish-brown, except its second and third tergites at base and fourth to sixth tergites wholly, blackish-brown. Extreme apex of sixth tergite and seventh and eighth tergites almost wholly, white (Fig. 113 : c). Legs yellowish-brown, except extreme apex of hind femur, tibia largely, basal 0.8 of first segment and whole of 5th segment of hind trsus, dark brown, rest of hind tarsus whitish (Fig. 113 : d). Wing clear hyaline.

Male : Unknown.

Length : Female 7 mm; fore wing 4.5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Kerala (Connanore).

6. *Colaulus carinatus* Townes

Female : Pronotum at sides wrinkled with a few weak coarse punctures in the center along with fime punctures. Propodeum between the transverse carinae with weak moderately large punctures and also with irregular weak wrinkles, below the apical carina with large shallow punctures, that are separated by their 0.7 their diameter. Apical carina complete with law sublateral crests.

Male : Propodeum smooth; apical carina of propodeum represented by widely separated low sublateral crests.

Townes (1970) described two subspecies from Philippines and Myanmar. The Myanmar subspecies is discussed below.

6a. *Colaulus carinatus typhodes* Townes

1970. *Colaulus carinatus typhodes* Townes, *Mem. Amer. Ent. Inst.*, **12** : 271. Male, Female, key, des. Type : Female, Myammar : Mt. Popa, 600-1000m (GAINESVILLE).

1987. *Colaulus carinatus typhodes* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 869.

This species is mainly distinguished from the subspecies from Philippines by having mesopleurum entirely black.

Male, Female : White band on flagellum spread over about 11 segments in male and about 8 segments in female. Mesepisternum, mesepimeron, upper division of metapleurum, and metanotum, except for scutellum, black. Mesepisternum usually with a narrow ferruginous margin next to middle coxa. Metapleurum sometimes with a brownish patch. Hind coxa with a brown mark in front. Hind femur brownish in front. Fore and middle femora and tibiae fulvous. Hind leg is general fulvous.

Distribution : Myanmar (Mt. Popa, 600–1000 m).

19. Genus ***Pseudotricapus*** Jonathan (Fig. 114 : a–d)

1987. *Pseudotricapus* Jonathan, *Bull. zool. Surv. India*, **8** (1-3) : 57. Type-species : *Pseudotricapus longipetiolatus* Jonathan; original designation.

Distribution : India.

Body slender, the head rather wider than long. Frons with a median vertical carina (Fig. 114 : b). Face short, wider than long, with a median and two lateral swellings. Clypeus somewhat rectangular, at base with a transverse swelling, its apical margin weakly arched and with a pointed median tooth (Fig. 114 : b). Occipital carina sinuate and joining hypostomal carina at the base of mandible. Mandible strong with almost equal teeth; malar space and area near the base of mandible strongly depressed. Epomia moderate in size. Notauli long and deep and meeting each other behind scutellum. Sternaulus deep with cross-ridges in the groove, extending ± 0.6 the length of mesopleurum. Propodeum (Fig. 114 : c) long in profile, both the transverse carinae weakly arched and complete, apical carina forming low crest-like apophyses; spiracle about 2.5× as long as wide. Areolet pentagonal, about 0.6× as high as the portion of second recurrent vein

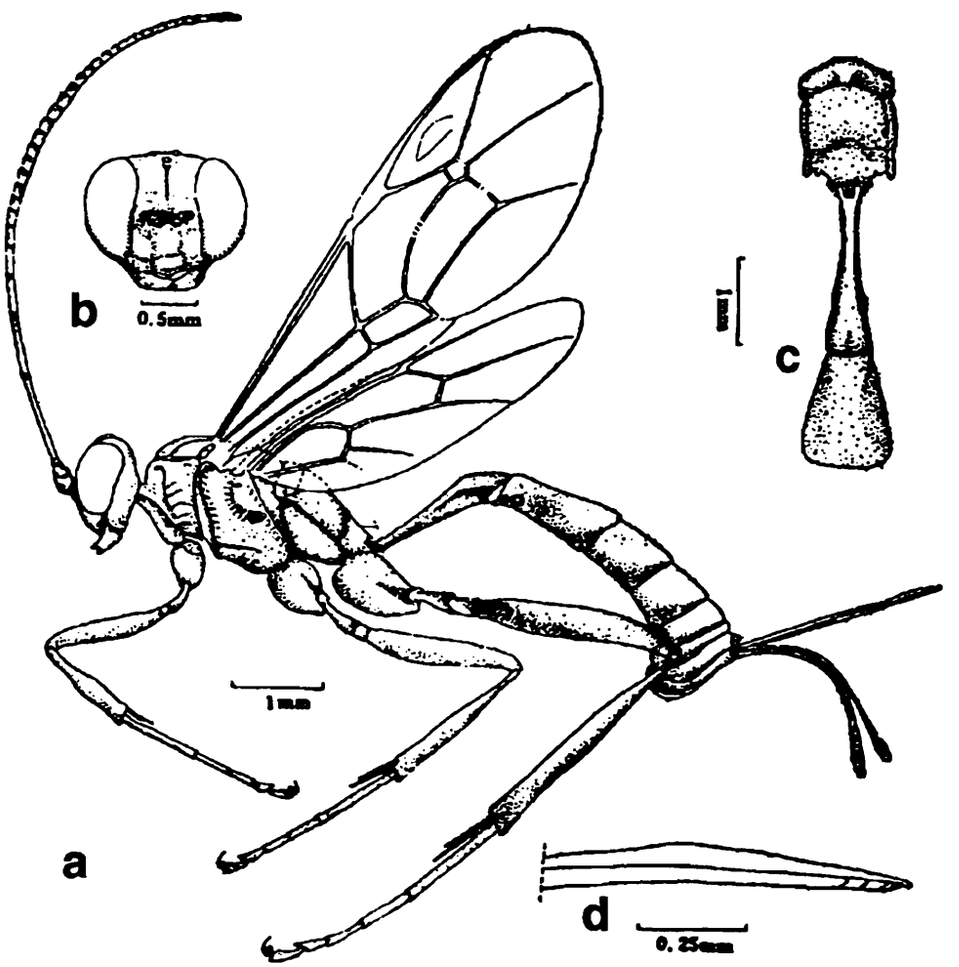

Fig. 114. *Pseudotricapus longipetiolatus*, Jonathan : **a**, side view of whole insect; **b**, head in front view; **c**, propodeum and first tergite in dorsal view; **d**, ovipositor tip.

above bulla; intercubiti weakly convergent, second recurrent evenly arched. Nervulus interstial. Nervellus intercepted at its lower 0.4, brachiella faintly present (Fig. 114 : a). First tergite long and slender, about 3.6× as long as wide at apex, at base with distinct lateral tooth, petiolar area long and tubular, postpetiole longer than wide, spiracles close to each other than to apex, dorso-median carinae absent, dorso-lateral and ventro-lateral carinae present between spiracle and apex; spiracle small, round. Ovipositor long, about as long as hind tibia, its tip long and pointed, lower valve with 3-4 weak teeth (Fig. 114 : d).

This genus is represented by a single species from India, which is discussed below :

1. ***Pseudotricapus longipetiolatus*** Jonathan (Fig. 115 : a–c)

1987. *Pseudotricapus longipetiolatus,* Jonathan, *Bull. zool. Surv. India*, 8 (1-3) : 59, Male, Female, key, des., fig. Type Female, India : Sikkim : Gangtok, 1650 m (Z.S.I., Calcutta) India : West Bengal : Rangiroon, 2000m nr. Darjeeling (Z.S.I., Calcutta).

Female : Face subpolished, ruguloso-punctate, punctures shallow, face on lateral swellings minutely and sparsely punctate. Clypeus sparsely and shallowly punctate at the basal swelling, rest smooth and shiny. Malar space granulose, about equal to the basal width of mandible. Frons largely smooth and shiny except for a few scattered small punctures in the middle. Vertex and temple smooth and shiny, except temple below sparsely punctate. Pronotal collar smooth, striate in the scrobe, obliquely striato-wrinkled above, with sparse punctures in between the striae. Mesoscutum smooth and shiny. Scutellum, metascutellum smooth and shiny, lateral carinae more or less confined to its base. Mesopleurum smooth and polished, prepactal carina extending up to the base of subtegualr ridge, short ridges present in the groove along the anterior margin of speculum to the base of subtegular ridge. Metapleurum subpolished weakly punctate, juxtacoxal carina absent. Propodeum between apical carina and base smooth and shiny, except for a few scattered shallow punctures, apicad of apical carina rugose. First tergite with sparse punctures in the apical half, rest smooth; second and third tergites with dense fine puncture, following tergites mat and subpolished; other structures and wing venation as stated under generic description.

Black. Antennal flagellum from apex of 5th to 11th segments above, white; scape and pedicel reddish-brown in front. Clypeus at base, mandible except the teeth, orbital stripes (Fig. 115 : a) on frons, pronotal collar narrowly, tegula, subtegular ridge, apical 0.45 of scutellum, metascutellum, apices of abdominal tergites first to third, sixth in the middle, seventh and eighth wholly, yellow (Fig. 115 : b). Fore and middle legs with their coxae and trochanters yellowish, their femora, tibiae and tarsi, dark yellow, except middle tarsus clouded with dark brown. Hind leg (Fig. 115 : c) with coxa, trochanter and femur yellowish-brown with an oval yellow mark above on coxa, its trochanter and femur at apex

Fig. 115. *Pscudotricapus longipetiolatus* Jonathan : Showing colour pattern. **a**, front view of head; **b**, side view of body; **c**, hind leg.

dark brown, its tibia blackish with light yellow at base, tarsus white except basal 0.5 of its first segment and whole of fifth segment and apex of fourth, blackish. Wings clear hyaline.

Male : Similar to female in all respects; except body more polished and slender; upper margin of pronotum shiny with sparse minute punctures; 11th to 15th flagellar segments white; clypeus without any mark; orbital mark on frons small, oval; almost all the tergites narrowly and seventh tergite broadly, yellow.

Length : Female, 5.2–9 mm; fore wing 4–6 mm; ovipositor sheath 1.75–2.25. Male, 5.75–8 mm; fore wing 4.5–5.75.

Description : India : Sikkim (Gangtok 1650m) and West Bengal (Rangiroon, 2000m near Darjeeling).

VI. THE TRIBE COESULINI

The members of this tribe are readily recognised by having a median longitudinal groove between apical and basal carinae of propodeum and on each side of the groove a longitudinal swelling; both the transverse carinae complete, evenly arcuate. Hind rim of metapleurum without a small angular or tooth-like widening just laterad of each side of metascutellum. Apical 0.7 of mediella weakly to strongly arched. Brachiella present.

This tribe is represented by genus *Coesula,* a moderately small genus of the Oriental Region. Gupta & Jonathan (1968) have reported 18 species/subspecies from Orient. In India this genus is known by seven species and three subspecies.

1. Genus ***Coesula*** Cameron (Fig. 116 : a–e)

1905. *Coesula* Cameron. *J. Straits Branch Roy. Asiatic Soc.*, **44** : 145. Type-species : *Coesula fulvipes* Cameron; monobasic.

1931. *Striatostenus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 177. Syn. by Townes, 1957. Type-species : *Striatostenus areolatus* Uchida; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 167. Townes, 1970 : 294. Gupta & Jonathan 1969 : 155.

Distribution : Indo-Papuan area.

Clypeus roundly convex, apical margin impressed. Eyes large. Malar space 0.25 to 0.57 the basal width of mandible, mandibles with two equal teeth. Frons shiny, hairy, a shallow furrow in the middle extending to the level of antennal sockets. Vertex smooth. Antenna as long as the body, basal segments elongated, 6-12 segments widened and flattened, apical segments gradually tapering. Epomia present. Sternaulus deep, extending the whole length of mesopleurum. Notauli deep and well developed, prepectal carina complete or incomplete. Propodeal (Fig. 116 : e) spiracle small, oval; both the apical and basal propodeal carinae complete, with a median longitudinal groove between them and with a longitudinal swelling on each side of the groove. Wings (Fig. 116 : a) hyaline; areolet small, pentagonal, second intercubitus faint or absent, nervulus slightly basad of basal vein; nervellus intercepted below the middle, disco-cubital nervure angled in the middle, with a minute stump at the angle; postpetiole gradually widened apically, spiracle just behind the middle, spiracles close to each other than to the apex of the segment. Ovipositor (Fig. 116 : c) one third the length of body.

Species of *Coesula* appear to form two distinct species groups : The Fulvipes Group, having the prepectal carina incomplete and not extending to the subtegular ridge and the Erugens Group, in which the prepectal carina completely extending to subtegular ridge. *C. fulvipes, C. simulator, C. gibberosa and C. lucida* belong to the Fulvipes Group, while *C. erugens, C. flavorbitalis and C. varuna* belong to the Erugens Group.

Key to the species of *Coesula*

1. Prepectal carina not reaching up to subtegular ridge. A THE FULVIPES GROUP 2

– Prepectal carina complete, reaching up to subtegular ridge. B. THE ERUGENS GROUP 6

2. Mesopleurum striate, atleast in the upper half; lower half with striae or tending to be punctate 3

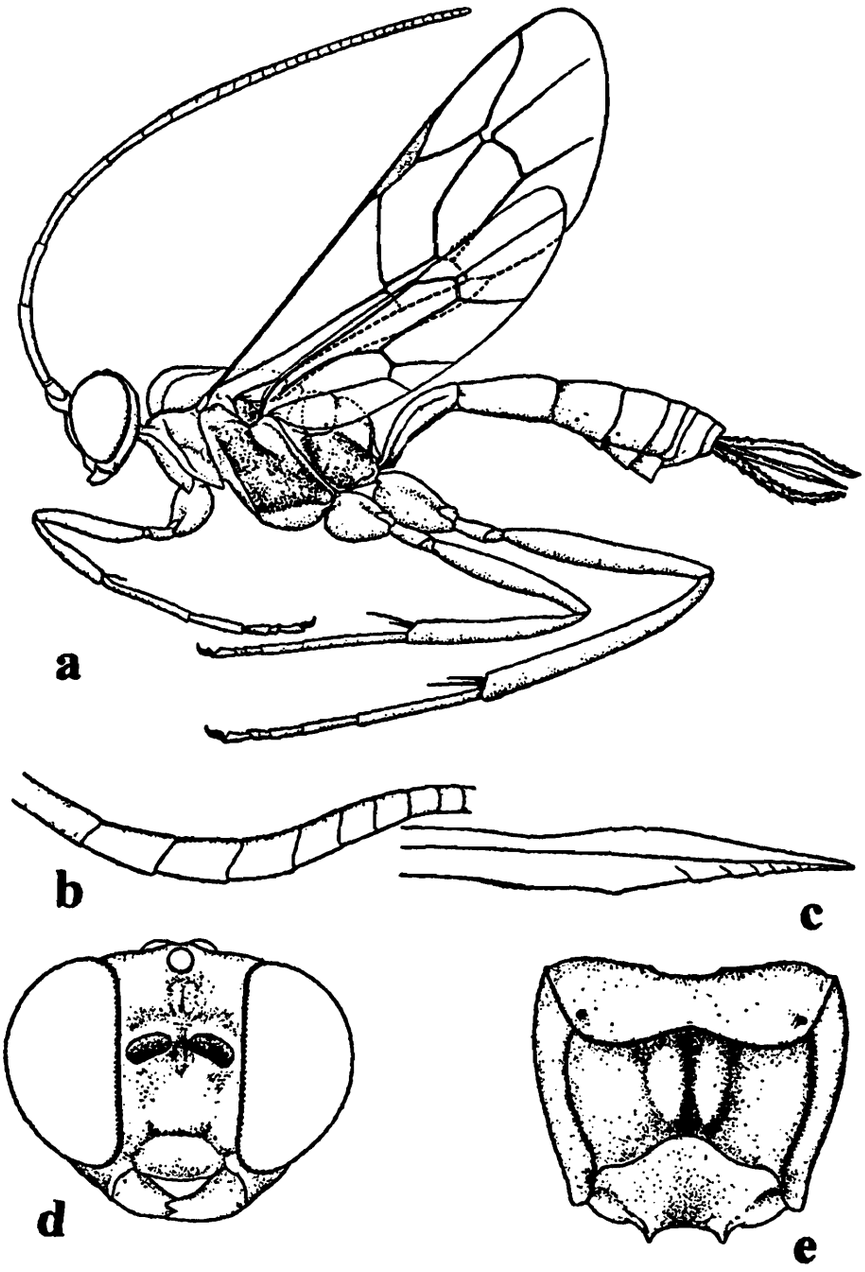

Fig. 116. *Coesula* Cameron : **a**, side view of female; **b**, antenna; **c**, ovipositor tip; **d**, head front view; **e**, dorsal view of propodeum.

– Mesopleurum subpolished, impunctate or weakly trans-striate, lower portion always smooth 4

3. Mesopleurum closely trans-striate, lower portion finely, but not punctate or smooth. Metapleurum very finely striate. Propodeum with longitudinal striations between apical and basal carinae. Malar space 0.5× the basal width of mandible. Pronotal collar largely black. India : Meghalaya; Uttaranchal; Madhya Pradesh. Malaysia. Myanmar. Mentawai .....
..... 1. *fulvipes* Cameron

– Mesopleurum striate above and rugulose below. Metapleurum smooth. Propodeum without longitudinal carinae between its basal and apical carinae (smooth). Malar space 0.3× the basal width of mandible. Pronotal collar yellow. India : Karnataka ..... 2. *simulator* Gupta & Jonathan

4. Mesopleurum and metapleurum smooth and largely shiny. (Orbital yellow mark on vertex elongate; face black; side of thorax wholly orange; pronotal colar and clypeus, yellow; 5th tergite without apical band). India : Tamil Nadu ..... 3. *lucida* Gupta & Jonathan

– Mesopleurum with weak trans-striations in the middle (which may be more distinct near subtegular ridge). Metapleurum granulose 5

5. First abdominal tergite shiny, with a few scattered shallow punctures. Apical carina of propodeum Ω-shape bend in the middle. Malar space 0.33 to 0.4× the basal width of mandible. 7th and 8th tergites broadly yellow. India : Tamil Nadu ..... 4. *gibberosa* Gupta & Jonathan

– First abdominal tergite granulose, without punctures. Apical carina of propodeum evenly arched. Malar space 0.5× the basal width of mandible. 7th and 8th tergites with narrow yellow apical bands. Myanmar : Mt. Popa ..... 5. *heinrichi* Gupta & Jonathan

6. Area between apical and basal carinae of propodeum almost smooth and shiny without distinct sculpture. Metapleurum smooth. Lateral carina of scutellum confined to its base. India : Meghalaya; Karnataka .... 6. *erugens* Gupta & Jonathan

– Area between apical and basal carinae of propodeum usually with short or distinct longitudinal ridges or carinae. Metapleurum finely striate or rugoso-striate or sometimes granulose. Lateral carina of scutellum extending to its basal 0.2-0.55 7

7. Pronotum minutely punctate, trans-striate in the middle and along the posterior margin, upper rectangular area with fine shallow punctures. Scutellum polished with a few fine punctures. Mesopleurum coarsely striate in the upper half, lower half minutely punctate. Area between apical and basal carinae of propodeum with strong longitudinal striations (except the middle swollen area). Lateral carina of scutellum extending to its basal 0.55. India : Meghalaya. Myanmar. ..... 7. *flavorbitalis* Gupta & Jonathan

– Pronotum not punctate, rather coarsely or finely granulate. Mesopleurum finely trans-striate above. Area between apical and basal carinae of propodeum not strongly longitudinally striate; (with a very few longitudinal ridges laterad to median swellings). 1st abdominal tergite granulate. Lateral carina of scutellum extending to its basal 0.25. India : Meghalaya; West Bengal ..... 8. *varuna* Gupta & Jonathan

A. The Fulvipes Group

1. *Coesula fulvipes* Cameron

Female : Face wider than long, finely, closely, transversely rugose to rugulose and sometimes smooth at the sides. Clypeus moderately convex, sparsely to minutely punctate. Mandible tapering to the apex, teeth equal. Malar space 0.3 to 0.5× the basal width of mandible. Eyes large. Temples receding behind and head very strongly narrowed beneath; ocelli large. Prepectal carina incomplete, not reaching to subtegular ridge. Pronotum strongly to weakly striate in the middle, smooth or punctate at upper and lower margin. Mesoscutum punctate. Mesopleurum distinctly, closely and finely trans-striate. Metapleurum closely to finely trans-striate. Propodeum between the basal and apical carinae longitudinally striate to rugoso-striate. Colour of wing veins and stigma black.

Six subspecies are recognised from Oriental Region : *C. fulvipes fulvipes* Cameron from Sarawak, *fulvipes areolata* Uchida from Taiwan, *fulvipes siporensis* Cheesman from Sipora, Mentawai Island, *fulvipes burmensis* Gupta & Jonathan from Myanmar, *fulvipes septentrionalis* Gupta & Jonathan from North India (Dawki in Meghalaya; Pawalgarh and Dehra Dun in Uttaranchal; and Pachmari in M.P.) and *fulvipes mysorensis* Gupta & Jonathan from South India (Kottegehar in Karnataka).

A key to the Indian subregion subspecies is given below :

Key to the subspecies of *fulvipes*

1. Hind tarsus with only the base of the first segment and whole of fifth segment, black; rest of tarsus yellowish-white. 2

– Hind tarsus with basal 0.4–0.6 of the first segment, apical half of fourth and whole of fifth segment, black, rest of tarsus yellowish-white. (Metapleurum and hind coxa brownish-yellow, except coxa with a black streak at sides. India : Karnataka. ..... 1c. *mysorensis* Gupta & Jonathan

2. Metapleurum largely black to brownish (especially in males). Hind coxa largely brownish-yellow with a black streak laterally. India : Uttaranchal; Meghalaya; Assam; Madhya Pradesh. Malaysia .... 1a. *septentrionalis* Gupta & Jonathan

– Metapleurum wholly black. Hind coxa black with an elongated yellow dorsal mark. Maynmar ..... 1b. *burmensis* Gupta & Jonathan

1a. *Coesula fulvipes septentrionalis* Gupta & Jonathan (Fig. 117 : a)

1969. *Coesula fulvipes septentrionalis* Gupta & Jonathan, *Oriental Ins.*, **2** : 162 (1968). Male, Female, key, des., fig. Type : Female, India : Uttaranchal : Dehra Dun

(GUPTA). India : Uttaranchal : Mohakkampur; Garjia, 600m; Jeolikote, 1200m. Meghalaya : Jaintia Hills : Dawki. Assam : Rangapara : Charduar Forest. Madhya Pradesh. Pachmarhi, 1075m. Malaysia : Malaya : Perak : Larut Hills, 1100-1400m.

1987. *Coesula fulvipes septentrionalis* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 872. Syn.

This subspecies can readily be distinguished by the shape of the pale orbital mark on the vertex, colour of the sixth abdominal tergite, and of the hind tarsus (Fig. 117 : a).

Female : Face dull, finely rugose in the middle, rugulose at sides. Clypeus shiny with a few coarse punctures. Malar space 0.32 to 0.37× the basal width of mandible. Frons and vertex shiny with sparse pubescence. Pronotum with striations along the groove, upper area smooth with a few shallow punctures. Mesoscutum subpolished, pubescent. Scutellum polished and sparsely punctate, lateral carina extending to its basal 0.4. Mesopleurum somewhat coarsely trans-striate, particularly in the middle, very finely striate below. Metapleurum distinctly and closely trans-striate. Propodeum with the area between basal and apical carinae and sides of median swellings shallowly rugoso-striate, sometimes striations almost indistinct, apical carina rather very strong with two distinct longitudinal carinae between it and apex of propodeum, often with a few striations on its lateral sides, basal area smooth. 1st abdominal tergite rugoso-punctate basally and laterally, finely rugulose in the middle, apical margin with scattered punctures at sides, and smooth in the middle, second and third tergites very closely and moderately strongly punctate, the punctures somewhat smaller and tending to be shallow towards the apex; fourth and following tergites subpolished and smooth.

Black, Face with a big oval yellow spot in the middle; vertex with an oblique triangular orbital pale marks, not conspicuously extending below the level of median ocellus, not touching the lateral ocellus, sometimes this mark slightly more extensive, extending slightly beyond the level of median ocellus and coming close to lateral ocellus. 6–12 antennal segments with a white band on its upper side. Mesoscutum with a big spot at the apex of middle lobe, scutellum and postscutellum, yellow; metanotum yellow at the sides. Metapleurum usually black in the basal 0.75 and brownish-yellow in the apical region, its colour varying from largely black to brownish; region above the basal carina completely black, this black mark extending laterally and also along the outer margin of median swelling to about half its length. Fore leg with coxa, trochanter, femur and tibia brownish-yellow; tibia, tarsus and claws more fuscate. Middle leg with coxa, trochanter and femur brownish; tarsus and claws infuscate. Hind leg (Fig. 117 : a) brownish, with a black mark on outer apical part of coxa; second segment of trochanter and extreme base and apex of femur black; tibia blackish-brown, except for a broad sub-basal yellow band, blackish apically, tarsus largely white,

the extreme base of first segment and the fifth segment completely black; black marks on hind femur and tibia slightly variable. First abdominal tergite with a broad apical yellow band, second and third tergites with moderately broad apical yellow bands, fourth with somewhat narrow band (band sometimes interrupted or even absent), fifth tergite black, sixth tergite narrowly yellow (except in one female from Dehra Dun), seventh and eighth largely yellow.

Male : Similar to female but more polished; pronotal collar smooth and shiny with striation in the median groove. Mesopleurum trans-striate in the upper half and smoother in the lower half. Metapleurum indistinctly striate, subpolished. Lateral area of propodeum almost smooth and with a few wrinkles, lateral carina of scutellum extending only to its basal 0.25.

Black. Orbital pale mark on vertex slightly smaller. Clypeus sometimes yellowish at the sides. Metapleurum almost wholly yellowish-brown. Apical band of fourth abdominal tergite usually broadly interrupted in the middle, fifth and sixth tergites completely black.

Length : Female 8.5–9 mm; fore wing 5.5–7.5 mm; ovipositor sheath 1.75 mm. Male, 6.5–8.5 mm; fore wing 6–6.5 mm.

Distribution : India : Uttaranchal (Dehra Dun, Garjia, Mohakkampur, Pawalgarh, Jeolikote, 1200m in Kumaon Hills). Meghalaya (Dawki in Jaintia Hills). Assam (Rangapara in Charduar Forest). Madhya Pradesh (Pachmarhi, 1075m). *Elsewhere* : Malaysia (Malaya).

1b. ***Coesula fulvipes burmensis*** Gupta & Jonathan

1969. *Coesula fulvipes burmensis* Gupta & Jonathan, *Oriental Ins.*, **2** : 166 (1968). Male, Female. key, des. Type : Female, Myanmar : Maymyo, 800m (GAINESVILLE). Myanmar : Mt. Popa, 600-1000 m; Mt. Victoria, 1400m.

1987. *Coesula fulvipes burmenis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 871. Syn.

Male and female : Extremely similar to *fulvipes septentrionalis* Gupta & Jonathan and chiefly distinguished by its colour. The pale orbital mark on vertex 3.0 to 4.0 the width of a lateral ocellus. Metapleurum wholly black. Hind coxa largely black laterally, with an elongate yellow spot dorsally. Hind tarsus as in *septentrionalis;* fifth and sixth abdominal tergites usually narrowly apicolaterally and seventh largely, yellowish; rest of colour as in *septentrionalis.*

The pale orbital mark sometimes extensive and similar to that in *fuvipes mysorensis* Gupta & Jonathan; hind fifth tarsal segment may be only half black and rest yellow, and the fifth and sixth abdominal tergites may not have yellow markings on them. Other yellow markings on the body also vary to a slight extent.

Length : Female, 8–10 mm; fore wing 6–7 mm; ovipositor sheath 2 mm. Male, 7 mm; fore wing 6 mm.

Distribution : Myanmar (Maymyo, 800m; Mt. Popa, 600–1000m; Mt. Victoria, 1400m).

1c. ***Coesula fulvipes mysorensis*** Gupta & Jonathan (Fig. 117 : b, c)

1969. *Coesula fulvipes mysorensis* Gupta & Jonathan, *Oriental Ins.*, **2** : 164 (1968). Male, Female, key, des., fig. Type : Female, India : Karnataka : Kottegehar, 650m (GUPTA).

1987. *Coesula fulvipes mysorensis* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 872. Syn.

Female : Face rugose in the middle and finely rugulose at the sides. Clypeus minutely, sparsely punctate. Malar space 0.5× the basal width of mandible. Frons and vertex shiny with sparse pubescence. Pronotum with weak striations along the middle groove, upper area smooth with shallow punctures. Mesoscutum subpolished, pubescent. Scutellum moderately swollen, polished with a few fine punctures, lateral carina of scutellum extending to its basal 0.44. Mesopleurum finely trans-striate in the middle, striations slightly coarser above. Metapleurum with regular close trans-striations. Propodeum with longitudinal striations laterally between the basal carina and apical carina, longitudinal carinae absent between apical carina and apex of propodeum. 1st abdominal tergite finely rugoso-punctate basally and somewhat striato-punctate laterally, smoother in middle at apical region, second and third tergites very closely, moderately and strongly punctate, punctures tending to be shallow towards the apex, fourth and following tergites subpolished.

Black. Vertex with two elongated pale yellow marks (Fig. 117 : b) extending on frons below the level of median ocellus to above ±0.5 the distance between the antennal socket and median ocellus, sometimes these marks slightly more extensive. Metapleurum brownish-yellow. Propodeum largely brownish-yellow; blackish just above the basal carina, this black mark variously receding and may be present only in the central basal area or just near the base of propodeum and near basal carina. Fore leg with coxa, trochanter and femur basally, yellowish-white; tibia and apical tarsal segments with more fuscous marks; middle leg with coxa and trochanter light brown, femur and tibia brownish, tarsus and claws blackish. Hind leg (Fig. 117 : c) brownish-yellow, with the apicolateral part of coxa and second trochanteral segment, extreme apex of femur, base and apex of tibia, first tarsal segment in basal 0.6, fourth segment apically and the whole of fifth segment including claws, black; rest of tarsus largely white, tibia also with fuscous markings along its length; black markings on tibia and first and fourth tarsal segments variable. Sixth abdominal tergite without yellow band; rest of the colouration similar to *C. fulvipes septentrionalis* Gupta & Jonathan.

Male : Similar to female but more polished; pronotum, metapleurum and propodeum with less distinct punctures and striations, pronotum polished above, metapleurum subpolished with indistinct striations, basal portion of propodeum smooth any shiny.

Black. Pronotal collar white except in the lower region. Mesopleurum with white mark just above the articulation of hind coxa; mesopleurum below sternaulus with whitish spots. Middle tarsus darker; hind coxa with an elongated mark, both the trochanteral segments and hind tibia largely blackish, fourth tarsal segment white. Clypeus sometimes with whitish-yellow spots.

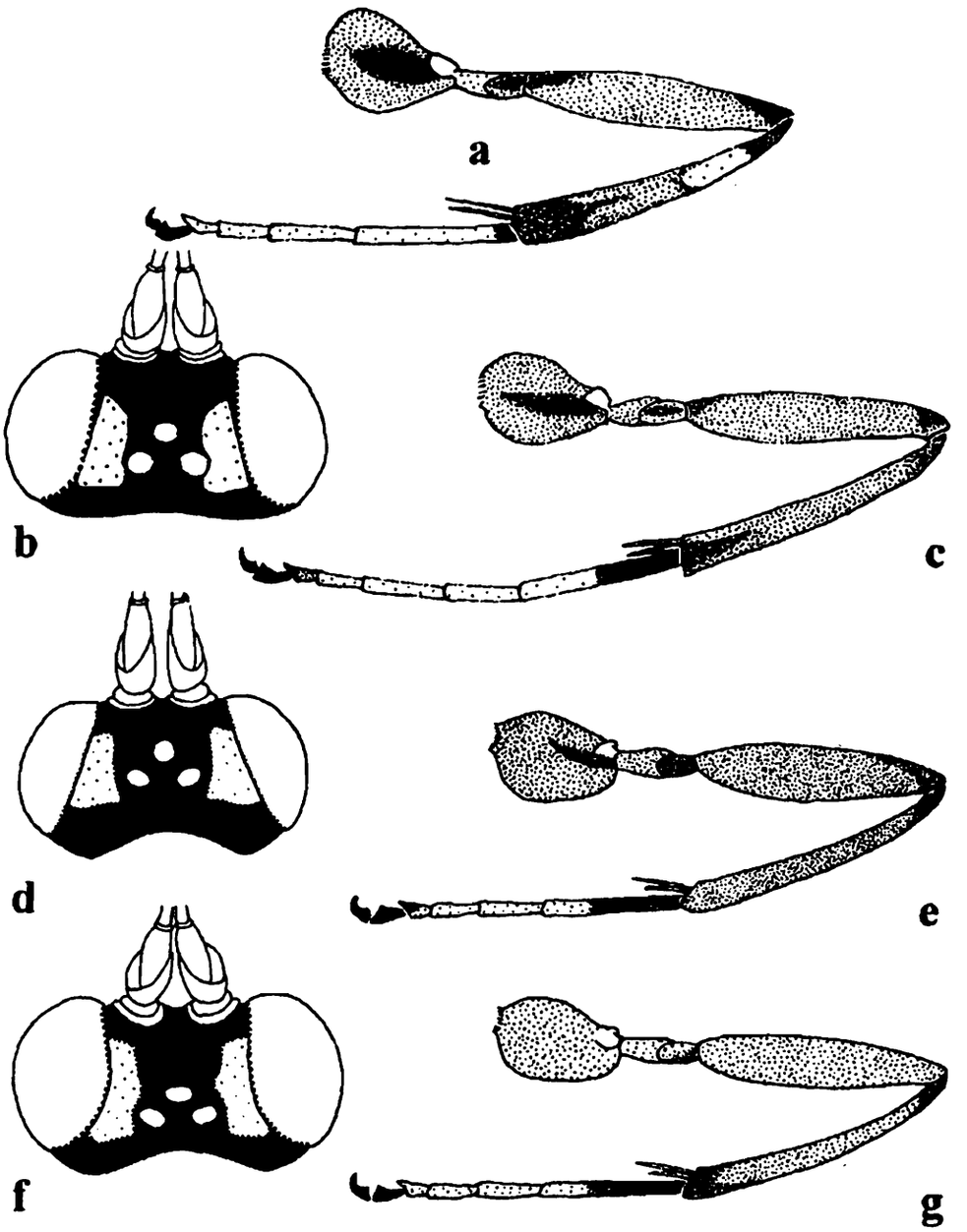

Fig. 117. Colour pattern : *Coesula fulvipes septentrionalis* Gupta & Jonathan : **a**, hind leg. *C. f. mysorensis* G & J : **b**, head dorsal view; **c**, hind leg. *C. simulator* G & J : **d**, head dorsal view. *C. lucida* G & J : **e**, hind leg. *C. gibberosa* G & J : **f**, head dorsal view; **g**, hind leg.

Length : Female 7–9 mm; fore wing 5.5–7.5 mm; ovipositor sheath 2 mm. Male, 7–8 mm; fore wing 5–5.5 mm.

Distribution : India : Karnataka (Kottegehar, 650m).

2. ***Coesula simulator*** Gupta & Jonathan (Fig. 117 : d)

1969. *Coesula simulator* Gupta & Jonathan, *Oriental Ins.*, **2** : 166 (1968). Male, Female, key, des., fig. Type : Female, India : Karnataka : Western Ghats : Kottegehar, 650m (GUPTA). India : Karnataka : Ammatti, 920m.

1987. *Coesula simulator* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 873. Syn.

Extremely similar and sympatric to *C. fulvipes mysorensis* and distinguished mainly by its smoother pleurae and propodeum, and yellowish pronotal collar.

Female : Face slightly convex, rugose in the middle, rugulose at the sides. Clypeus convex, polished with sparse, coarse punctures. Malar space 0.3× the basal width of mandible. Frons shiny, hairy, median furrow very indistinct. Vertex smooth and shiny. Prepectal carina not completely extending to subtegular ridge. Pronotum with weak irregular striations in the middle along the median groove, upper region with distinct minute shallow punctures. Scutellum moderately swollen, polished, with a very few coarse punctures, lateral carina of scutellum extending to its basal 0.33. Mesopleurum coarsely striate above, finely rugulose below. Metapleurum indistinctly rugulose or may be smoother, always shiny; middle region of propodeum smooth except for a few irregular longitudinal striations at the sides of middle swollen area, region basad of basal carina and apicad of apical carina smooth and shiny. 1st abdominal tergite punctate in the middle, with shallow punctures at sides, punctures becoming indistinct and sparse towards base and apex respectively, second and third tergites very closely, moderately strongly punctate, punctures tending to be shallow towards apex, 4th and 5th tergites with minute shallow punctures, the following tergites tending to be smooth.

Black. 6–10 antennal segments with white dorsal stripe. The following are yellow : Face with a big oval spot in the middle; clypeus with two oval spots at the base; vertex (Fig. 117 : d) with two elongate marks extending on the frons below the level of median ocellus to about ±0.5 the distance between the antennal socket and median ocellus; scape on the ventral side; pronotal collar; a small mark on the upper margin of pronotum; mesoscutum with a big spot at the apex of middle lobe; subtegular ridge, tegula, scutellum and metascutellum. Metanotum brownish-yellow. Metapleurum brownish. Propodeum brown, median swollen area yellowish, blackish along the basal carina. Fore coxa, trochanter and base of femur yellow, rest of femur, tibia, tarsus and claws dark brown, with infuscate markings. Middle coxa and trochanters yellowish-brown, femur and tibia dark

brown, tarsus and claws infuscate. Hind leg brownish with a faint infuscate spot at the apicolateral part of coxa, a dark spot at second trochanteral segment, extreme apex of femur, base and apex of tibia, basal 0.6 of first tarsal segment, fourth tarsal segment completely except slightly at the base, fifth segment wholly and claws, blackish, rest of the tarsus white. Abdominal colour pattern same as in *C. fulvipes mysorensis.*

Male : Similar to female but more polished and slender. Pronotum smooth and shiny, impunctate with striations in the middle area. Mesopleurum with regular strong trans-striations in the upper middle half, lower half smooth, prepectus punctate. Metapleurum almost smooth. Basal area of propodeum with short longitudinal striations extending from basal carina, middle area also with somewhat oblique striations, of which few extend on median swollen area; area apicad of apical carina rough.

Black. Clypeus with a single elongate mark; orbital pale marks on the vertex smaller, less extensive than in female; pronotum without a yellow spot at the upper margin; mesopleurum black, the lower basal area brownish. Propodeum basally between spiracles, black; rest of the area brown. Colouration of abdomen same as in female; hind tarsus with 0.5 of first tarsal segment, fifth segment wholly and claws black, rest white; colouration otherwise similar to that of female.

Length : Female, 7 mm; fore wing 5.5 mm; ovipositor sheath 2 mm; Male, 8.5 mm; fore wing 6.5 mm.

Distribution : India : Karnataka (Kottegehar, 650 in Western Ghats; Ammatti, 920m in South Coorg).

3. ***Coesula lucida*** Gupta & Jonathan (Fig. 117 : e)

1969. *Coesula lucida* Gupta & Jonathan, *Oriental Ins.*, **2** : 173 (1968). Male, Female, key, des., fig. India : Tamil Nadu : Shevaroy Hills : Yercaud, 1350m (OTTAWA).

1987. *Coesula lucida* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 872.

This species has the whole side of the thorax yellowish-brown. The pale orbital marks on vertex are elongate, extending up to the antennal sockets. The malar space 0.42× the basal width of mandible and the lateral carina of scutellum extend to its basal 0.25.

Female : Face evenly and clypeus in the middle granulose. Malar space 0.42× the basal width of mandible. Frons smooth and shiny. Vertex minutely punctate. Epomia weak. Pronotum, mesoscutum, scutellum subpolished without distinct punctation or striations; lateral carina confined to its basal 0.25. Meso- and metapleurum smooth and polished, (mesopleurum may have indications of very

faint striae in the middle), juxta coxal carina present. Propodeum polished without distinct punctures or striae, apical carina normal. Wings hyaline, areolet about 5× higher than the width of bordering veins. 1st abdominal tergite evenly granulose except the apex, smooth; second and third tergites strongly granulose, tending to be mat towards apex, following tergites subpolished.

Black, and yellowish-brown. Face slightly near the antennal sockets; clypeus and mandible (except apices); vertex with elongate orbital stripes, coming close to lateral ocellus, yellow. Antenna with scape on its outer side brown and 6–11 segments white. Pronotum (except apical corner near tegula, which is black) and an usual mark at the apex of middle lobe of mesoscutum, yellow. Tegula blackish-brown. Subtegular ridge, scutellum and metascutellum yellow; whole of the side of thorax and leg in general yellowish-brown. Pronotum with a brownish mark near tegula, propodeum yellowish-brown with fuscous marks on the basal area. Hind leg (Fig. 117 : e) with a streak on coxa and second trochanteral segment blackish, hind second and third tarsal segments yellowish-white; area around the junction of all femora and tibia also lightly fuscous; sometimes faint fuscous marks on tibiae. First tergite brown, lighter at apex, second to fourth tergites with broad apical bands, fifth tergite more or less brown, sixth completely blackish, apex of abdomen with an oval yellow apical mark.

Male : Similar to female but slender, propodeum with a few scattered shallow punctures laterad to median swellings; second abdominal tergite distincly punctate, punctures very close and shallow, 3rd tergite also punctate, but punctures less distinct.

Black. Face, clypeus and mandible pale yellow, except the apices of mandibular teeth; antenna with 10-13 segment white; pronotum wholly whitish-yellow; hind tibia and tarsus largely blackish.

Length : Female 7 mm; fore wing 6 mm; ovipositor sheath 2 mm. Male, 5.5 mm; fore wing 5 mm.

Distribution : India : Tamil Nadu (Yercaud in Shevaroy Hills).

4. ***Coesula gibberosa*** Gupta & Jonathan (Fig. 117 : f, g)

1969. *Coesula gibberosa* Gupta & Jonathan, *Oriental Ins.*, **2** : 170 (1968). Male, Female, key, des., fig. Type : Female, India : Tamil Nadu : Kodaikanal, 2000m, (OTTAWA). India : Tamil Nadu : Nilgiri Hills : Naduvattam.

1987. *Coesula gibberosa* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 872.

The Ω-shaped bend in the middle of the apical propodeal carina is very characteristic of this species. It is further distinguished by smooth and shiny

postpetiole, metapleurum and lower half of mesopleurum being shiny and minutely punctate and the malar space varying from 0.33 to 0.4× the basal width of mandible.

Female : Face strongly granulate, with a few shallow punctures in the middle. Clypeus subpolished with coarse, sparse punctures. Malar space 0.33–0.4× the basal width of mandione. Frons granulose. Vertex subpolished, minutely punctate. Epomia moderately strong. Pronotum smooth except minutely punctate at the upper margin. Mesoscutum subpolished, mat. Scutellum shiny with a few punctures at the base, lateral carina confined to its basal 0.15. Mesopleurum trans-striate in the upper half, and shallowly and minutely punctate in the lower half. Metapleurum also minutely punctate and shiny, juxtacoxal carina present. Propodeum shiny, apical carina considerably turned forward medially and area between apical and basal carinae with a few longitudinal wrinkles on sides, otherwise smooth. Wings hyaline. Areolet about 7× than the width of bordering veins, nervulus interstitial, nervellus intercepted below the middle. 1st abdominal tergite subpolished, shiny at apex, with scattered shallow punctures laterally; second and third tergites with distinct punctures, punctures on third less strong than on second, punctures tending to be shallow and fewer towards apices, following tergites without distinct punctures, smooth and subpolished.

Black. 6–12 or 7–11 antennal segments white above. The following are yellow : Face yellow except along the eye margin, clypeus and mandible, except at their apices, vertex with two elongate stripes extending below the level of median ocellus (Fig. 117 : f), pronotal collar, a mark at the apex of middle lobe, tegula, subtegular ridge. Scutellum and metascutellum brownish-yellow. Mesopleurum largely black to largely yellowish-brown. Metapleurum and propodeum dark yellowish-brown, except with fuscous marking at the basal and pleural carinae of propodeum. Fore leg largely yellow, fifth tarsal segment dark brown. Middle leg yellow, with tarsal segments dark brown. Hind leg (Fig. 117 : g) dark yellow with second trochanteral segment, base and apex of tibia, brown, tarsus pale yellow with basal 0.75 of first and fifth segments blackish-brown. 1st, 2nd and 3rd abdominal tergites with yellow apical bands, (6th may be with a narrow band) tip of abdomen with a yellow oval mark.

Male : Similar to female but polished and slender in appearance; antennal segment 11–16, face and clypeus wholly, yellow. Hind tarsus white with the first and fifth segments largely black.

Variations : This species is quite variable, both in colour and sculpture of the mesopleurum. Generally the upper part of mesopleurum striate, but in a few specimens the striae are very weak and in one specimen almost smooth and

shiny. The metapleurum usually minutely punctate and shiny, but it may also show indistinct rugae. The colour of the mesopleurum is highly variable; the front portion is generally black, but it may also be yellowish-brown. The hind coxa may or may not have a blackish line on its outer side; femur and tibia may have very light fuscous marks at their apex and base respectively and the first hind tarsal segment also shows variability in the extent of the fuscous mark.

Length : Female 9 mm; fore wing 6.5 mm; ovipositor sheath 2.5 mm. Male, 6 mm, fore wing 5 mm.

Distribution : India : Tamil Nadu (Kodaikanal, 2000m; Naduvattam in Nilgiri Hills).

5. ***Coesula heinrichi*** Gupta & Jonathan (Fig. 118 : a, b)

1969. *Coesula heinrichi* Gupta & Jonathan, *Oriental Ins.*, **2** : 173 (1968). Male, Female, key, des., fig. Type : Female, Myanmar : Mt. Popa, 600–1000m (GAINESVILLE).

1987. *Coesula heinrichi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 872.

This species is distinguished from the other species by the structure of pronotum, nature of lateral carina of scutellum, structure of propodeum and 1st abdominal tergite and the colour pattern of clypeus and face. Vertex is with two elongate yellow stripes extending along the eye margin to near the antennal sockets but not touching the lateral ocellus (Fig. 118 : a). The colour of hind leg is as in figure 18 : b.

Female : Face dull, moderately convex, granulose in the middle and sides. Clypeus subpolished with a few coarse punctures. Mandible smooth and impunctate. Frons and vertex smooth and shiny, latter with a few punctures in ocellar triangle. Malar space 0.5× the basal width of mandible. Prepectal carina not reaching to subtegular ridge. Pronotum subpolished but punctate above, without striations in middle. Mesoscutum subpolished, minutely punctate. Scutellum smooth and shiny; lateral carina of scutellum extending to its basal 0.30. Mesopleurum subpolished, impunctate, weakly trans-striate, striations stronger near subtegular ridge and along prepectal carina. Metapleurum subpolished without distinct striations, juxta coxal carina distinctly present. Propodeum smooth and shiny, (with faint indication of striations on the sides of median swelling). 1st abdominal tergite with distinct median and lateral carinae, distinctly granulose in the middle, granules becoming indistinct to towards apex and base; second abdominal tergite closely punctate, punctures somewhat larger and sparse at base, third tergite finely and closely punctate, following tergites with indistinct punctures.

Brownish-yellow. 5–11 antennal segments white above. The following are yellow : Face, except black near the eye margin, clypeus, mandible, its apex blackish, frons and vertex with two elongated stripes extending along the eye margin to near the antennal, not touching the lateral ocellus (Fig. 118 : a), pronotal collar, mesoscutum with a spot at the apex of middle lobe, tegula. Metapleurum sometimes with a brown mark at its lower margin near hind coxa. Propodeum brownish-yellow, blackish along the basal carina (someimes dark brown), this mark variously extending towards the base of propodeum. Fore and middle leg brownish-yellow, tarsus darker. Hind coxa, trochanter and femur yellowish-brown, coxa with dark brown spots on its outer upper and inner basal areas, trochanteral segments with dark brown spots on their outer side, extreme apex of femur darker, tibia brownish, its apex largely and base slightly darker, tarsus white except 0.4 to 0.5 of first, extreme apex of fourth and fifth segments completely, blackish (Fig. 118 : b). Abdomen dark brownish-black, its first tergite with a broad apical band extending variously in middle toward base, second, third and fourth with broader apical bands, fifth and sixth tergites brown, seventh and eight with narrow apical brownish bands.

Male : Similar to female but more polished and slender. Pronotum smooth and shiny without any striation and punctures. Mesopleurum shiny with a few sparse punctures and a few striations in middle, metapleurum shiny with scattered shallow punctures above. 1st abdominal tergites granulose with a few shallow punctures at apex, second tergite closely punctate, punctures becoming shallow and indistinct towards apex, puctures on third tergite shallow and minute, sparse at apex.

Brownish-yellow. Antenna with 10–15 segments whitish; pronotum light brownish-yellow without any markings; hind tarsus white except the basal 0.6 to 0.8 of first tarsal segment and fifth tarsal segment completely blackish-brown; all the abdominal tergites with broad brown bands.

Length : Female, 8 mm; fore wing 6 mm; ovipositor sheath 2 mm; Male, 9 mm; fore wing 7 mm.

Distribution : Myanmar (Mt. Popa, 600-1000 m).

This species resembles *C. simulator* and *C. fulvipes*. It is close to *simulator* in having the frons and vertex smooth and shiny, metapleurum subpolished without striations and the 1st abdominal tergite granulose in the middle. It resembles *fulvipes* in having the malar space 0.5 the basal width of mandible. It however differs from *simulator* and *fulvipes* in having pronotum subpolished, without striations in the middle groove, face distinctly granulose and in its body colour pattern.

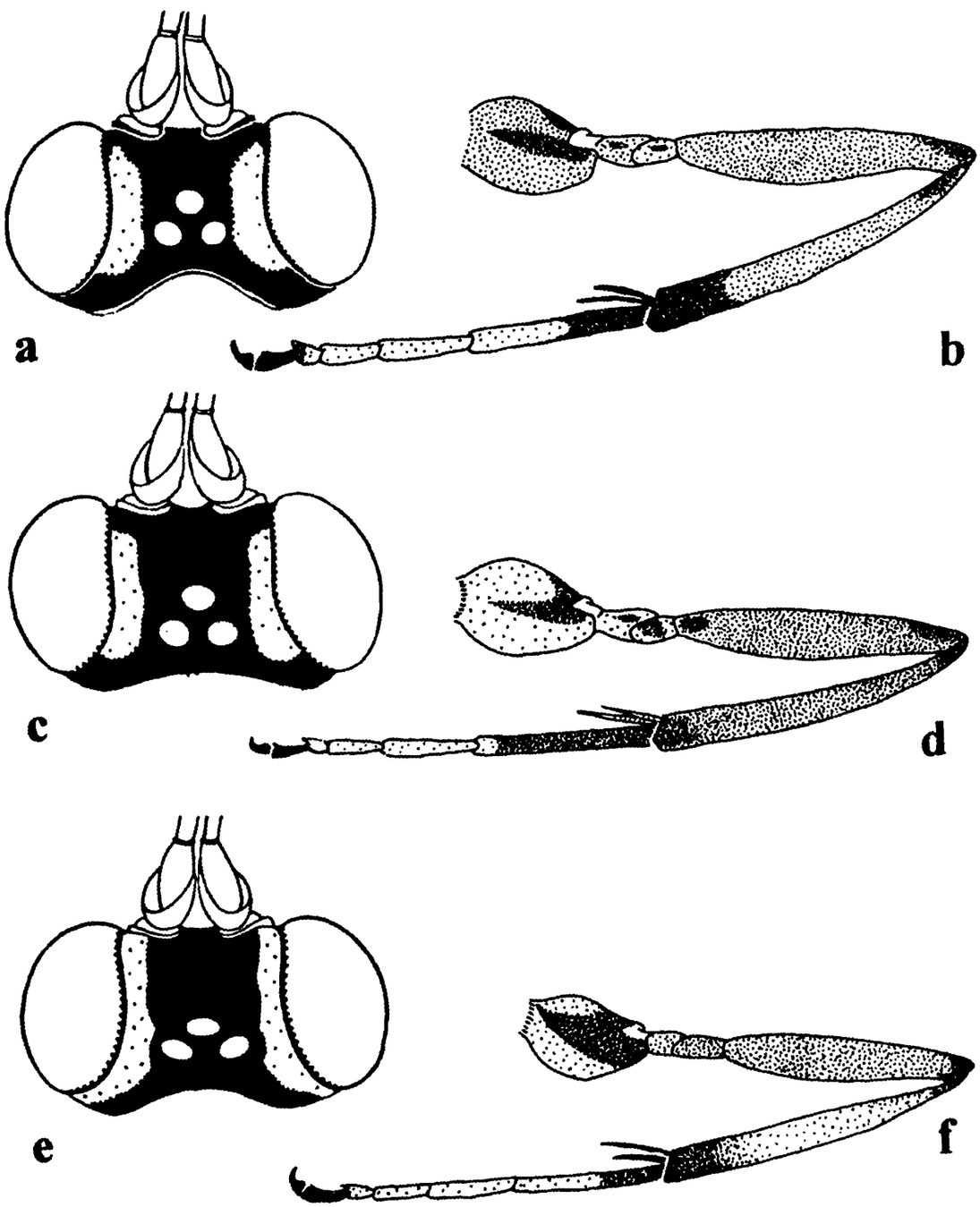

Fig. 118. Colour pattern : *Coesula heinrichi* Gupta & Jonathan : **a**, head dorsal view; **b**, hind leg. *C. erugens* G & J : **c**, head dorsal view; **d**, hind leg. *C. varuna* G & J : **e**, head dorsal view; **f**, hind leg.

B. The Erugens Group

6. *Coesula erugens* Gupta & Jonathan (Fig. 118 : c, d)

1969. *Coesula erugens* Gupta & Jonathan, *Oriental Ins.*, **2** : 178 (1968). Female, key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1400m (GUPTA). India : Meghalaya : Shillong, 1400m. Karnataka : Khemmangundi.

1987. *Coesula erugens* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 871.

This species is characterized by its smoother appearance and having very few wrinkles on the mesopleurum. Its smooth metapleurae and propodeum colour of the pronotum, and the nature of the pale orbital mark will readily distinguish it from the succeeding species, *C. flavorbitalis*. This and the following species have the prepectal carina completely extending up to the base of subtegular ridge.

Female : Face subpolished, less convex, completely rugulose. Clypeus evenly convex, shiny, with very few shallow punctures. Malar space 0.43× the basal width of mandible. Frons and vertex shiny with sparse pubescence. Prepectal carina completely extending to subtegular ridge. Pronotum smooth and shiny with striations only in the middle groove. Scutellum polished and almost impunctate, lateral carina of scutellum not conspicuously extending on the scutellum. Mesopleurum striate only along the oblique depression and near tegula, otherwise smooth. Metapleurum smooth. Propodeum smooth, shiny and impunctate basad of basal carina, region between basal and apical carinae polished and without striations, with a few longitudinal striations apicad of apical carina. 1st abdominal tergite granulose basally and laterally, smooth and shiny apically, second tergite with distinct punctures, which are less crowded at the base and becoming sparse and shallow towards the apex, third tergite with small and densely crowded punctures, becoming sparse and shallow towards the apex; the following tergites smooth.

Black. Body broadly yellow laterally. Face largely except the inner orbits, clypeus, mandibles except apices, malar space and lower temple, vertex (Fig. 118 : c) with two elongate orbital stripes, these stripes extending along the eye margin to near the antennal sockets, not touching the lateral ocellus; pronotal collar and lower half of pronotum, yellow. Mesopleurum almost wholly yellowish-brown. Prepectus, area just below tegular ridge and along sternaulus, blackish. Propodeum brownish with two broad baso-lateral blackish areas. Fore coxa and trochanter yellow, femur and tibia brownish-yellow, tarsus darker. Middle coxa with two black spots at its apex, tarsus and claws dark brown, rest as fore leg. Hind coxa and trochanter yellowish-brown, coxa with a large elongate black mark on its outer margin, both the segments of trochanter with black spots, femur and tibia light brown, slightly blackish at their apices and bases, first tarsal segment dark brown, slightly white at the apex, second and third purely

white, fourth, fifth and claws dark brown (Fig. 118 : d). First abdominal tergite with a broad apical band extending variously in the middle towards the base, second to fourth tergites with broad apical bands, band on second tergite slightly broader and extensive, fifth and sixth tergites dark brownish-black, faintly yellow at their extreme apices, seventh tergite narrowly and eighth broadly, yellow.

Male : Unknown.

Length : Female 4.5 mm; fore wing 3.5–5 mm; ovipositor sheath 1.5–2 mm.

Distribution : India : Karnataka (Khemmangundi). Meghalaya (Cherrapunji, 1400m and Shillong 1400m in Khasi Hills).

7 ***Coesula flavorbitalis*** Gupta & Jonathan

This species is characterized by having a complete yellow stripe encircling the whole orbit. The pleurae and propodeum are coarser than in *C. erugens* and the pronotum is almost completely brownish.

Gupta and Jonathan (1969) recognised two subspecies : *C. flavorbitalis flavorbitalis* from India and *flavorbitalis victoriae* from Myanmar. Both the subspecies are discussed below :

7a. ***Coesula flavorbitalis flavorbitalis*** Gupta & Jonathan

1969. *Coesula flavorbitalis flavorbitalis* Gupta & Jonathan, *Oriental Ins.*, **2** : 180 (1968). Female, key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1400m (GUPTA).

1987. *Coesula flavorbitalis flavorbitalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 871.

Female : Face moderately convex, rugulose, striate just below the antennal sockets. Clypeus evenly convex, polished with very few shallow punctures. Malar space 0.4× the basal width of mandible. Frons shiny, furrow broad and deep, region between the antennal sockets and median ocellus with raised rugulose area on either side of median furrow. Prepectal carina completely extending to the subtegular ridge. Pronotum minutely punctate, trans-striated in the middle and along the posterior margin, the upper rectangular area with fine shallow punctures. Scutellum polished with a few fine punctures, lateral carina extending to its basal 0.55. Mesopleurum coarsely striated in the upper half, minutely punctate in lower half; mesopleurum more distinctly punctate below sternaulus. Metapleurum finely trans-striate. Propodeum shiny, region between the basal and apical carinae (except the median swollen area) with strong longitudinal striations, middle swollen area smooth and shiny, area apicad of apical carina with a few irregular ridges. 1st abdominal tergite finely granulose, becoming mat

towards apex, second tergite very closely punctate, the punctures, somewhat larger and not so close at base, third tergite evenly and closely punctate, fourth tergite minutely and shallowly punctate, the following tergites subpolished.

Black, largely yellowish-brown. Face, clypeus, mandibles (except the apices of teeth), temple, outer and inner orbits completely, yellow. Vertex black, orbital pale mark encircling the whole orbit. Thorax yellow, except that pronotum slightly infuscate at the upper edge near mesoscutum. Mesoscutum, prepectus, sternaulus, area around the meso- and metapleural sutures and along basal propodeal carina and pleural carina, black. Mesoscutum with usual yellow spot at the apex of middle lobe. Scutellum and metascutellum yellow. Fore leg completely brownish-yellow, tarsal segments and claws darker. Middle leg brownish-yellow with a black spot at the apex of coxa, last two tarsal segments and claws darker. Hind leg brown, coxa with a big elongate mark on its outer side, second trochanteral segment, apex of femur, base and apex of tibia and base of first tarsal segment infuscate, apex of first tarsal segment yellowish-white (other tarsal segments and claws broken). First abdominal tergite in the middle and apically and the second tergite broadly at the apex, brown; third and fourth with moderately broad brown bands, fifth and sixth with faint bands, seventh and eighth largely yellowish-brown.

Male : Unknown.

Length : Female 9.5 mm; fore wing 7.5 mm; ovipositor sheath 2.5 mm.

Distribution : India : Meghalaya (Cherrapunji, 1400m in Khasi Hills).

7b. ***Coesula flavorbitalis victoriae*** Gupta & Jonathan

1969. *Coesula flavorbitalis victoriae* Gupta & Jonathan, *Oriental Ins.*, **2** : 181 (1968). Female, key, des. Type : Female, Myanmar : Mt. Victoria, 1400m (GAINESVILE).

1987. *Coesula flavorbitalis victoriae* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 871.

Similar to *C. flavorbitalis flavorbitalis,* except for some differences in the sculpture of body.

Female : Face dull, rough and somewhat granulose; malar space 0.5× the basal width of mandible, lateral carina of scutellum extending to its basal 0.33; mesopleurum rugose below sternaulus.

Colour same as that of *flavorbitalis flavorbitalis.*

Male : Unknown.

Length : Female, 10mm; fore wing 7 mm; ovipositor sheath 2.5.

Distribution : Myanmar (Mt. Victoria, 1400m).

8. ***Coesula varuna*** Gupta & Jonathan (Fig. 118 : e, f)

1969. *Coesula varuna* Gupta & Jonathan, *Oriental Ins.*, **2** : 181 (1968). Female, key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji, 1400m (GUPTA). India : West Bengal : Darjeeling [doubtfully placed under this species.]

1987. *Coesula varuna* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 873.

This species is close to *C. flavorbitalis* in having the orbital mark (Fig. 118 : e) completely encircling the orbit. It is distinguished by having pronotum granulose (not punctate); mesopleurum finely trans-striate above; area between apical and basal carinae of propodeum not strongly longitudinally striate. 1st abdominal tergite granulose and the lateral carina of scutellum confined largely at its base.

Female : Face dull, granulose; clypeus subpolished with a few shallow puncture. Malar space 0.5× the basal width of mandible. Frons, vertex, pronotum and mesoscutum subpolished. Scutellum smooth and shiny, lateral carina extending to its basal 0.25. Mesopleurum finely and weakly trans-striate, prepectus and area below sternaulus granulose. Metapleurum striate, juxta coxal carina strong. Propodeum smooth and shiny except for a few ridges laterad to median swellings and along basal carina. Wings hyaline, areolet about 7× higher than the width of bordering veins. First abdominal tergite distinctly granulose, with coarse shallow punctures along the lateral margins, extreme apex and base almost smooth and shiny, second and third tergites strongly and fourth moderately granulose, tending to be mat towards the apices of tergites, following tergites subpolished.

Black. Face, clypeus and mandible yellow, except apices of mandibular teeth. Orbital mark on vertex (Fig. 118 : e) encircling the whole orbit. Antenna with 6–11 segments pure white. Pronotal collar and upper margin of pronotum, yellow. Mesoscutum slightly brownish in the middle, with an oval spot at the apex of middle lobe and tegula, brownish-yellow. Subtegular ridge, a large mark covering 0.75 of mesopleurum, scutellum and metascutellum, yellow. Area below hind wing brownish-yellow. Metapleurum largely yellow except near hind coxa and juxta-coxa carina. Propodeum largely yellow, brownish basad of basal carina, blackish along the pleural and basal carinae and at the sides of median swellings. Fore coxa and trochanter yellow, rest of fore leg brownish. Middle coxa and trochanter yellow, latter slightly darker, femur and tibia brown, tarsus infuscate. Hind coxa with an elongate black mark and a yellow spot above and dark yellow below, 1st trochanteral segment yellowish, 2nd trochanteral segment and femur brown with apex blackish, tibia little lighter, with apex and base black, basal 0.33 of 1st and whole of 5th tarsal segments black, rest of tarsus white (Fig. 118 : f). 1st abdominal tergite blackish-brown in the middle, tending to be yellow at apex, 2nd to 6th tergites with yellow apical bands, 7th and 8th completely yellow.

Male : Unknown.

Length : Female 8 mm; fore wing 8 mm; ovipositor sheath 2 mm.

Distribution : India : Meghalaya (Cherrapunji, 1400m in Khasi Hills).

VII. THE TRIBE VAGENATHINI

This tribe is easily distinguished by having a strong pronotal tubercle or tooth at upper end of epomia. Occipital carina near hypostomal carina strongly sinuate, reaching to the base of mandible.

Body of moderate proportions. Frons sometimes with a weak median carina. Clypeus 2× as wide as long, with a weak median projection or median pair of tubercles. Mandible short; its lower tooth a little shorter than upper tooth. Occipital carina near to hypostomal carina strongly sinuate and reaching up to the base of mandible. Upper margin of pronotum a little swollen. Epomia long, ending dorsally in a tubercle or crest near upper margin of pronotum. Notaulus shallow or deep, short or long. Mesopleural fovea not connected with mesopleureal suture by a groove. Sternaulus arched or sinuate, reaching base of middle coxa. Postpectal carina complete. Propodeum moderately long, spiracle short elliptic to elongate, its basal carina complete, its apical carina represented by a pair of apophyses. Fore femur not swollen. Ramulus absent. Areolet medium sized, wider than high. Nervulus far basad of basal vein. Mediella weakly to strongly arched. Nervellus intercepted between lower 0.47 and 0.32. Brachiella present. Tip of axillus converging towards anal margin. First tergite with a lateral tooth at base, its spiracle a little behind middle, longitudinal carinae all strong. Ovipositor sheath 0.3 to 1.0 as long as hind tibia. Ovipositor moderately thick, stout, tip long, with or without a nodus, with oblique teeth.

This tribe occurs in Oriental Region and is represented by two genera, viz., *Vagenatha* Cameron and *Stetholophus* Townes. Only the latter is found in Indian subregion.

1. Genus ***Stetholophus*** Townes (Fig. 119 : a–c)

1970. *Stetholophus* Townes, *Mem. Amer. Ent. Inst.*, **12** : 295. Type-species : *Stetholopus axillaris* Townes.

Distribution : Myanmar.

This genus is mainly distinguished by the absence of teeth or claws at hind end of subtegular ridge, hind edge of tegula, under side of first abdominal segment and on the side of first tergite just behind spiracles (such teeth or claws are present in other genus : *Vagenatha)*; areolet 0.6 as high as the section of second

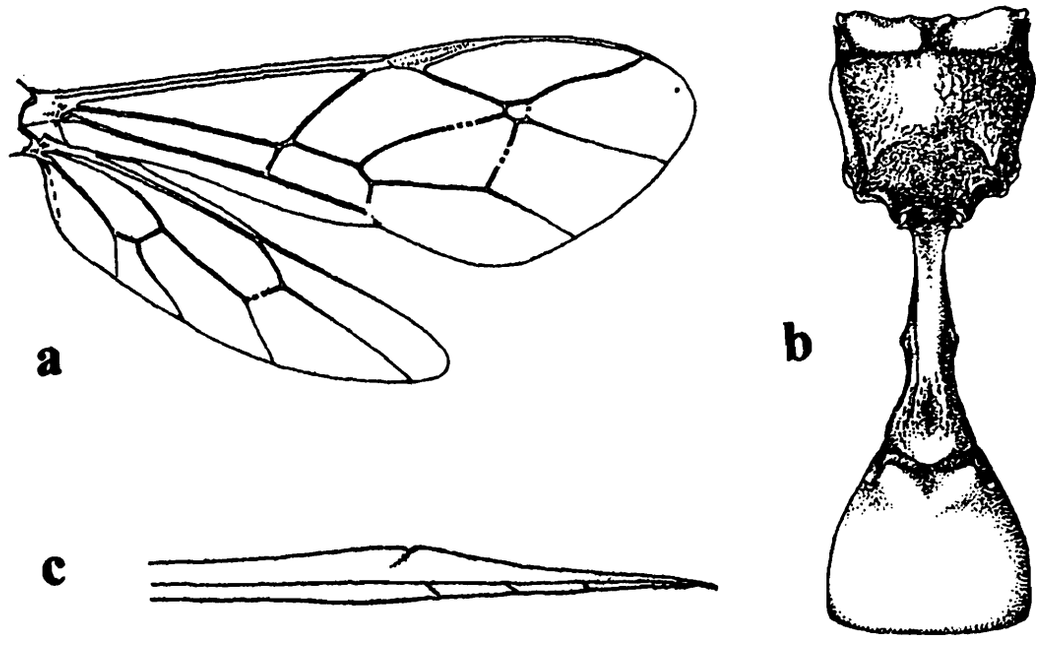

Fig. 119. *Stetholophus* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

recurrent vein above bulla. Clypeus with a lobe at the center. Tergites 2-6 of male with a median or post-median transverse furrow. Ovipositor sheath about 0.34 as long as hind tibia.

This genus is represented by a single species from Myanmar. The description given by Townes (1970) is reproduced below.

1. ***Stetholophus axillaris*** Townes

1970. *Stetholophus axillaris* Townes, *Mem. Amer. Ent. Inst.*, **12** : 296. Male, Female, des., fig. Type : Female, Myanmar: Maymyo, 800m. (GAINESVILLE).

1987. *Stetholophus axillaris* : Gupta, *Mem. Ent. Inst.*, **41** : 873.

Female & Male : Mesopleurum with long horizontal wrinkles in front of speculum, below these wrinkles rugulose. Metapleurum reticulo-wrinkled, juxtacoxal area smooth. Rest of the structural characters as discussed under generic description.

Black. Antennal flagellum with a white band covering about 7 segments. Palpi, tegula and subtegular ridge also white. Propodeal apophyses yellowish. First abdominal segment in male yellow, subapically brownish, first segment in female brownish, its basal 0.45 and apical 0.15 yellowish. Apical 0.3 of second tergite whitish, band narrowed medially. Third tergite in female with a large apicolateral white mark. Apicolateral edge of fourth tergite in female whitish. Third and fourth tergites in male sometimes with apicolateral white marks. Sixth tergite of

male with its apical edge whitish. Seventh tergite in male wholly white, tergites 5-7 in female white, except fifth at base black. Fore and middle legs in general pale-yellow, their coxae and trochanters light yellow and tarsi at apex brown. Hind coxa, trochanter and femur light yellow, femur darker at apex; tibia dark brown, pale at base and with a subbasal dark brown band, tarsus white, apical 0.6 of fifth tarsal segment and extreme base of first segment dark brown. Fore wing 6–7 mm long.

Distribution : Myanmar (Maymyo, 800m).

VIII. THE TRIBE CERATOCRYPTINI

The members of this tribe are recognised by having body slender, sometimes of moderate proportions, or rarely stout. Frons with a median horn or pair of horns at the centre. Clypeus with its apical margin convex or sometimes truncate, often with one or two teeth or tubercle at centre. Mandibular teeth equal or lower tooth shorter than upper tooth. Lower end of occipital carina straight, curved, or sinuate, joining hypostomal carina above or at the base of mandible. Upper margin of pronotum usually swollen. Epomia strong. Notaulus long, sharp. Sternaulus extending up to 0.65 the distance to middle coxa. Propodeum moderately short to quite long, basal carina complete, its apical carina complete, incomplete, or absent, usually present as a pair of low crests. Areolet moderately small to very small wider than high. Nervulus basad of basal vein, sometimes opposite or rarely distad. Nervellus intercepted below, at or a little above the middle. Mediella very weakly arched to strongly arched. Brachiella usually present. Tip of axillus converging towards anal margin. Ovipositor sheath 0.7-1.1× as long as hind tibia, tip elongate lanceolate, its lower valve with oblique to vertical ridges or teeth; sometimes lower value has a dorsal lobe that encloses the tip of upper value.

Ten genera are recorded under this tribe from Oriental Region. A key to the genera known from Indian subregion is as follows.

Key to the genera of tribe Ceratocryptini

1. Upper 0.3 of temple rather short to quite long, the head in profile with the upper 0.3 of its hind margin some distance from hind margin of eye. Lower tooth of mandible usually almost as long as upper tooth. Clypeus weakly to strongly convex, its apical margin strongly arcuate to truncate, often with a median pair of teeth or a median irregularity 2

– Upper 0.3 of temple so short as to be almost lacking. The head in profit with upper 0.3± of its hind margin the same or almost the same as hind margin

of eye (in *Ceratocryptus*, temple of appreciable width). Lower tooth of mandible definitely shorter than upper tooth (except in *Silsila*). Apical margin of clypeus strongly arcuate, without a median pair of teeth or a median irregularity 4

2. Frons with a median pair of horns. Indo-Papuan area .... 1. ***Cremnocryptus*** Cushman

– Frons without horns 3

3. Prepectus below lower corner of pronotum with a strong vertical carina or lamella. Occipital carina ending at, or slightly above the base of mandible. Lower tooth of mandible a little shorter than upper. Propodeum without transverse apical carina (except for some transverse wrinkles) and apophyses. Areolet about 1.0 to 1.3× as wide as high. Ethiopian region and India .... 2 ***Nematocryptus*** Roman

– Prepectus below lower corner of pronotum with a short, weak, vertical carina. Occipital carina weakly sinuate, joining hypostomal carina a moderate distance above base of mandible. Lower tooth of mandible almost as long as upper tooth. Propodeum rather long, its apical transverse carina represented by a strong tooth-like apophyses. Areolet about 3× as wide as high. Oriental Region. ..... 3. ***Lipoprion*** Townes

4. Upper margin of pronotum not swollen or produced opposite front end of notaulus. Madagascar and Orient Region ..... 4. ***Fitatsia*** Seyrig

– Upper margin of pronotum strongly swollen or projecting opposite front end of notaulus 5

5. Malar space about 0.25× as long as basal width of mandible. Lower tooth of mandible almost as long as upper tooth. Hind tarsal claws of male with a median right angle bend. Indo-Papuan area ..... 5. ***Silsila*** Cameron

– Malar space more than 0.5× as long as basal width of mandible. Lower tooth of mandible distinctly shorter than upper tooth. Hind tarsal claws of male strongly curved or bent 6

6. Epomia extending to upper edge of pronotum, where it gives an angular edge to the swelling of pronotum that is opposite front end of notaulus. Oriental Region ..... 6. ***Acromia*** Townes

– Epomia short, not extending to upper edge of pronotum, the swelling on pronotum opposite front end of notaulus smooth 7

7. Frons with a median pair of acute horns. Propodeum evenly tapered from near middle to a narrow apex. White markings on propodeum, when present, in the form of two lateral triangles that are separated by a median black stripe. Lower edge of mandible without a lobe. Indo-Papuan and Ethiopian Region ..... 7. ***Ceratocryptus*** Cameron

– Frons without horns or with a single median horn. Propodeum broad apically. White marking on propodeum, when present, in the form of a broad, inverted 'T' Lower edge of mandible often with a small preapical lobe. Indo-Papuan area ..... 8. ***Thelodon*** Townes

1. Genus *Cremnocryptus* Cushman (Fig. 120 : a–c)

1945. *Cremnocryptus* Cushman, *Proc. U.S. Natl. Mus.*, **96** : 176. Type-species : *Polyaenus spiniferus* Cameron; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 177. Baltazar, 1966 : 88. Kamath, 1969 : 279. Townes, 1970 : 303. Gauld, 1984 : 152.

Distribution : Indo-Australian Area (Gauld reported one undescribed species from Australia).

Body stout. Frons with a median pair of sharp conical horns that are weakly upcurved. Clypeus rather small, its lower part protuberant and abruptly rounded back to the margin, the margin sharp, moderately convex, with or without median pair of teeth or points. Malar space about 0.5–0.6× the basal width of mandible.

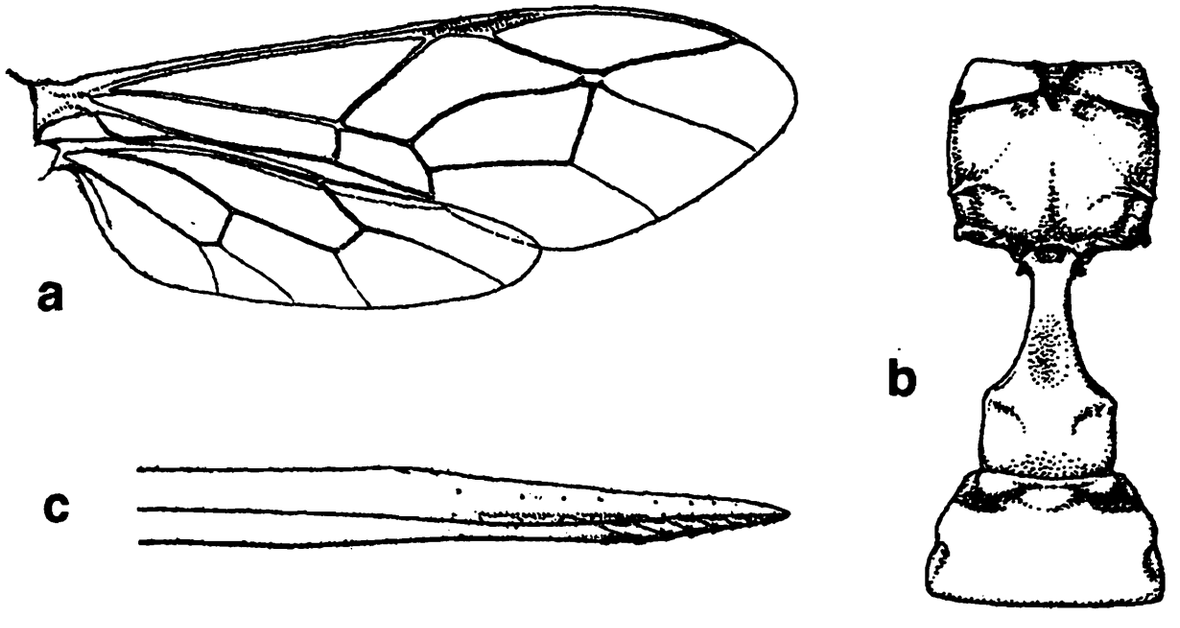

Fig. 120. *Cremnocryptus* Cushman : **a**, fore and hind wing showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Occipital carina strongly sinuate, joining hypostomal carina little above base of mandible. Lower tooth of mandible almost as long as upper tooth. Pronotal tubercle prominent on its upper margin. Epomia absent, short or indistinct. Scutellum weakly convex. Prepectal carina long and strong about 0.8× the height of mesopleurum. Propodeum short, in profile evenly convex, its apical carina represented by widely separated, short, horn-like apophyses. Areolet about 1.5× as wide as high. Nervulus opposite basal vein or distad by as much as its width. Ramellus absent. Mediella weakly arched. Nervellus intercepted at lower 0.25. First abdominal tergite stout, with a strong subbasal lateral tooth. Ovipositor sheath about 0.7× as long as hind tibia.

Cremnocryptus is rather a distinct genus easily distinguished by a pair of sharp, conical, upcurved median frontal horns; ocellar triangle distinctly elevated from the plane of vertex, and apical carina of propodeum absent. Kamath (1969) studied this genus and his findings are largely followed here.

This genus occurs in Indo-Australian region. Three named species and one unnamed species (from Australia) have been reported under this genus. In India, the genus is represented by two species. A key to distinguish these two species is as follows :

Key to the species of *Cremnocryptus*

1. Clypeus with a depression in middle at apical 0.3 and with a median pair of teeth on its margin. Propodeum reticulo-punctate, in profile strongly sloping towards apex. Occipital carina somewhat pointed medially above (Fig. 121 : a). Nervulus just basad or distinctly basad of basal vein. Prescutellar carina with yellowish-white spot. Hind coxa yellowish-brown with a yellowish-white spot above (Fig. 121 : c). India : Maharashtra; Uttaranchal .... 1. *montanus* Kamath

– Clypeus without a depression in middle at apical 0.3 and without a median pair of teeth on its margin. Propodeum coarsely punctate to rugoso-punctate, in profile evenly sloping apex (with distinct basal and apical slopes). Occipital carina evenly curved (Fig. 121 : b). Nervulus interstitial with basal vein. Prescutellar carina without yellow spot. Hind coxa black with yellow spots Myanmar. Java. Kalimantan. Malaya. Philippines. Sabah. Sarawak and Sulawesi ..... 2. *spiniferus* (Cameron)

1. ***Cremnocryptus montanus*** Kamath (Fig. 121 : a, c, e)

1969. *Cremnocryptus montanus* Kamath, *Oriental Ins.*, **3** : 281. Female, key, des., fig. Type : Female, India : Maharashtra : Satpura Hills : Chikalda, 1200m (GUPTA). India : Uttaranchal : Garjia.

1987. *Cremnocryptus montanus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 874.

This species can easily be recognized from *C. spiniferus* (Cam.) by having a distinct depression on clypeus in middle at its apical third. The apical margin of clypeus also has a pair of median teeth and also the characters given in the key.

Female : Face coarsely closely punctate in middle, near antennal sockets obliquely striolated. Clypeus coarsely punctate with a distinct pit (depression) in middle and a pair of median points on apical margin. Lower tooth of mandible almost as long as upper tooth but a little narrower. Malar space 0.5× the basal width of mandible. Temple with scattered punctures. Frons with a distinct groove between horns and median ocellus, on either side of median ocellus rugulose, frontal horns 0.25× the length of antennal scape. Vertex sparsely punctate, smooth and polished in ocellar area, interocellar width equal to ocello-ocular width; occipital carina entire, pointed medially above (Fig. 121 : a). Pronotum strongly punctate below pronotal tubercles, rest trans-striate, pronotal tubercles sparsely, shallowly punctate. Mesoscutum moderately convex and coarsely punctate; notaulus distinctly marked to more than 0.5 the length of mesoscutum. Scutellum with a few shallow punctures medially. Metascutellum smooth and polished. Mesopleurum coarsely punctate in upper half, near speculum trans-striate and close to subtegular ridge rugose, speculum smooth and polished, prepectus ventrally smooth, laterally coarsely punctate to rugose, prepectal carina long and strong, more than 0.5× the height of mesopleurum. Mesosternum on sides with moderately coarse punctures. Metapleurum coarsely punctate. Propodeum reticulo-punctate. Nervulus just basad of basal vein (sometimes it is basad of basal vein by 0.2 its length). Postpetiole moderately wide and medially raised at base, with coarse punctures at base and apex, central area rather mat to smooth without punctures, distance between spiracles nearly 2× the distance between one and apical margin; tergites 2 and 3 coarsely punctate, punctures dense at base and middle, towards apical margin a little apart. Ovipositor tip (Fig. 121 : e) with a notch at nodus. Ovipositor sheath about 0.4 as long as fore wing.

Black. 6–13 antennal segments, white above. The following are yellowish-white : face, clypeus, mandible except its teeth, malar space, temple broadly except near top, a narrow stripe on inner frontal orbits widening a little behind lateral ocelli, a stripe on pronotal collar, pronotal shoulder, a spot on prescutellar carina, scutellum except its extreme base, metascutellum, lateral carinae; basal half of tegula, base of wings, subtegular ridge, an elongate diagonal mark reaching almost the posterior margin of mesopleurum, often a lateral stripe bordering groove of sternaulus, a triangular spot at base of hind wing behind, a broad spot on metapleurum; an inverted V-shaped mark on propodeum including its apico-lateral apophyses. Wings hyaline, stigma and nervures blackish. Fore and middle coxae and trochanters yellowish-white. Fore and middle femora, fore first and

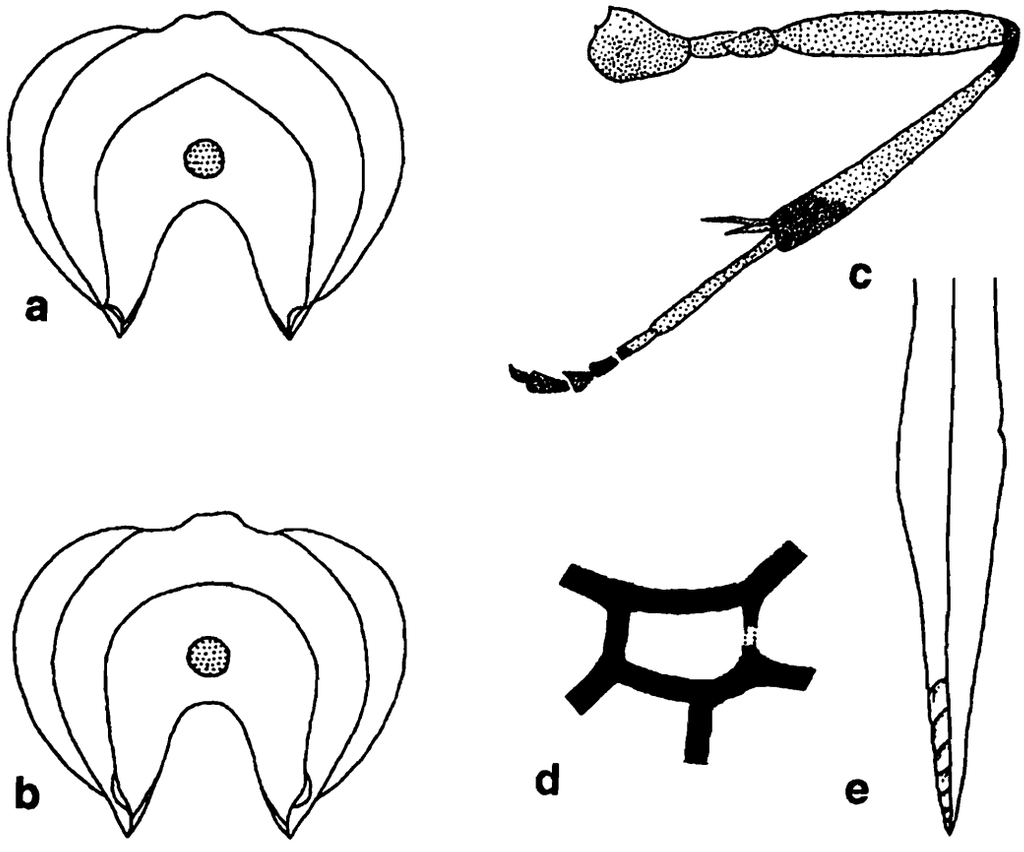

Fig. 121. *Cremnocryptus* : Nature of occipital carina of : **a**, *montanus*; **b**, *spiniferus*. Hind leg : **c**, *monanus*. Areolet of : **d**, *spiniferus*. Ovipositor of : **e**, *montanus*.

second tarsal segments, and middle first tarsal segment, yellowish-brown. Fourth and fifth tarsal segments of fore leg and third to fifth of middle leg dark brown. Hind leg (Fig. 121 : c) yellowish-brown, a dorsal spot at base of hind coxa, yellowish-white, extreme apex of femur, extreme base and apical 0.2 of tibia, hind third to fifth tarsal segments dark-brown. Transverse bands on apical margin of abdominal tergites yellowish-white. Ovipositor sheath blackish and its tip as in figure 121 : e.

Male : Unknown.

Length : Female 10.5–12 mm; fore wing 9–9.5 mm; ovipositor sheath 3.5–4.0 mm.

Distribution : India : Maharashtra (Chikalda, 1200m in Satpura Hills). Uttaranchal (Garjia, 610m).

2. ***Cremnocryptus spiniferus*** (Cameron) (Fig. 121 : b, d)

1906. *Polyaenus spiniferus* Cameron, *J. Straits. Branch Ray. Asiatic Soc.*, **46** : 117, Male, Female, des. Lectotype (Designated by Townes, Townes & Gupta, 1961) : Male, Malaysia : Sarawak : Kuching (LONDON).

1945. *Cremnocryptus spiniferus* : Cushman, *Proc. U.S. Natl. Mus.*, **96** : 176. Male, Female. n. Comb. Borneo [Sarawak]. Philippines : Mindanao. Singapore.

1961. *Cremnocryptus spiniferus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 177. Lectotype design., distr.

1969. *Cremnocryptus spiniferus* : Kamath, *Oriental Ins.*, **3** : 283. Male, Female, key, des., fig. India : Sikkim. Myanmar : Nanhlaing Res. : Shwebo. Malaysia : Malaya : Kedah nr. Jitra Catchment area. Langkawi Is. nr. West Coast of Malaya. Sabah : Kudat. Sarawak : Kuching. Indonesia : Sulawesi : Tolitoli. Java : Radjamandla, Djampang Wetan, 400m.

1987. *Cremnocryptus spiniferus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 875.

This species is distinguished by having the prescutellar carinae black without yellow spots and the hind coxa also black with yellowish-white spots and also the characters given in the key.

Female : Face rugoso-punctate, close to antennal sockets with fine curved wrinkles, inner orbits mat. Clypeus strongly convex, coarsely punctured, without a median depression on its apical 0.3, its extreme margin impressed and moderately convex without median tubercles. Malar space about 0.6× the basal width of mandible. Temple finely punctate. Frons moderately depressed, smooth and shiny, with a pair of median horns, about 0.6 the length of antennal scape, flattened below and strongly compressed above and with a deep groove between their base and median ocellus. Frontal orbits impunctate and mat (sometimes frontal horns are large and strong with a deeper groove in between, region between horn and median ocellus rugose). Vertex with a few broad, shallow punctures in ocellar area, ocelli placed on sides of a very high somewhat triangular elevation, ocello-ocular area mat, behind smooth, shining, interocellar distance 0.8 of ocello-ocular distance; occiput with occipital carina complete, evenly arched above (Fig. 121 : b) (sometimes the occipital carina has a distinct dip in mid-line and very narrowly interrupted). Pronotum above coarsely punctate, punctures somewhat coalescing in middle, below strongly transversely striated, pronotal shoulders sparsely punctate; epomia arises from a prominent ridge, far short of pronotal shoulder, collar with a conspicuous angulation (tooth) at centre below. Mesoscutum in side view moderately convex, densely coarsely punctured throughout, notauli shallow, weakly demarcated, grooves cross-ridged, almost reaching to middle. Scutellum shining, weakly convex and with scattered punctures. Mesopleurum coarsely punctate, below subtegular ridge rugoso-punctate, often near posterior margin transversely striated; prepectal carina, more than 0.75 the height of mesopleurum; prepectus coarsely punctate. Mesosternum coarsely punctate; punctures near middle groove obsolescent or weak and shallow. Metapleurum coarsely, deeply punctate with a distinct juxtacoxal carina. Areolet in fore wing as in figure 121 : d. Nervulus interstitial with basal vein. Propodeum rugoso-

punctate throughout with apico-lateral subacute tooth-like apophyses, apical carina absent, basal horizontal slope 0.8 the apical slope. First abdominal tergite rather stout, postpetiole moderatey wide, medially strongly raised at base, centrally flattened, closely, deeply punctate, punctures rather crowded on the raised hump and on apicolateral corners; second tergite strongly, closely and coarsely punctate, punctures near apical margin sparse; third tergite with punctures as on preceding tergite but smaller and more dense, becoming sparse towards apex, apical margin and following tergites mat, subpolished. Ovipositor subcylindric, its dorsal valve flattened between nodus and apex. Ovipositor tip with 2-3 notches near nodus; ovipositor sheath 0.3 as long as fore wing.

Black. Antenna with scape and flagellum dark brown. The following are yellow : Face, clypeus, mandible except its teeth, malar space, a stripe around orbit, antenna with a stripe on apical 0.5 of segment 4 to 16; pronotal shoulders, scutellum, basal half of tegula, subtegular ridge, a transversely elongate oblong spot on mesopleurum, a spot behind base of hind wing, an almost broadly triangular spot on metapleurum, an inverted V-shaped mark on propodeum. Wings hyaline, stigma and nervures blackish-brown. Fore and middle legs yellowish-brown, their tarsi with a light-brown mixture, their fifth tarsal segment brown; middle tibia below with a light brown stripe. Hind leg with coxa broadly black, with pale yellow spots above and below, spots joined on sides at apex; trochanters yellow except for a dark brown spot above at the base of first trochanter (sometimes the first trochanter is entirely yellow). Hind femur yellowish-brown, its extreme base, and apical 0.25 blackish-brown; hind tibia and tarsus yellow, extreme base and apical 0.2 of tibia blackish-brown and fifth tarsal segment brown. First to seventh tergites with broad, transverse bands at apical margin and a band on eighth laterally, yellow. Ovipositor sheath blackish.

Male : Similar to the female, but thoracic markings smaller.

Length : Female 10–11 mm; fore wing 9–10 mm; ovipositor sheath 3 mm.

Distribution : India : Sikkim. *Elsewhere* : Singapore. Malaysia (Sarawak : Kuching; Malaya : Kedah nr. Jitra Catchment area; Langkawi; Sabah; Kudat). Philippines (Mindano). Myanmar (Nanhlaing Res : Shwebo). Indonesia (Sulawesi : Tolitoli; Java : Radjamandla; Djampang Wetan, 400m).

2. Genus ***Nematocryptus*** Roman (Fig. 122 : a–c)

1945. *Nematocryptus* Roman, *Ent. Tidskr.*, **31** : 178. Type-species : *Mesostenus exitialis* Tosquinet; original designation.

1952. *Betsifia* Seyrig, *Mem. Acad.* Malgache, **19** [39] : 207. Syn. by Townes & Townes, 1962. Type-species : *Betsifia orbitalis* Seyrig; Original designation.

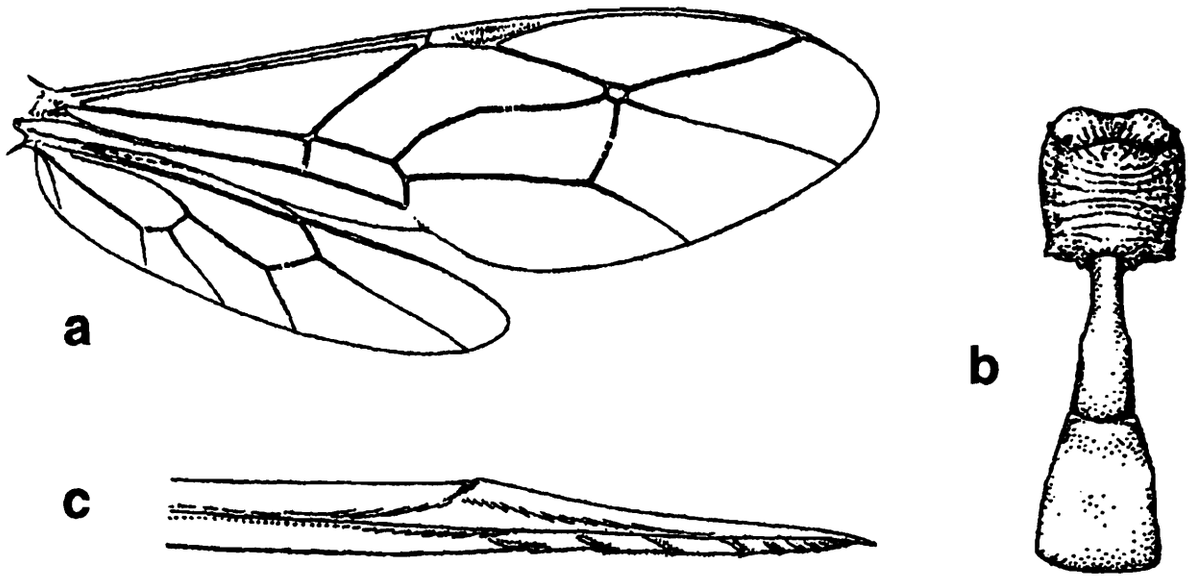

Fig. 122. *Nematocryptus* Roman : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Taxonomy : Jonathan, 1969 : 343. Townes, 1970 : 311.

Distribution : Afrotropical and Oriental region.

Face and clypeus evenly convex, apical margin of clypeus impressed. Antenna thread-like, about as long as body. Malar space moderately wide. Occipital carina joining hypostomal carina at the base of mandible. Epomia moderately strong, turned mesad. Prepectal carina extending more than half the height of mesopleurum, sternaulus shallow. Propodeal spiracles small and round, its apical carina not well defined, broadly interrupted in the middle, basal carina straight, extending well at both the sides or sometimes indistinct at sides, apophyses not strong but crest-like. Wings (Fig. 122 : a) hyaline, areolet small, about 5× or less than that, higher as compared to the width of bordering veins, second intercubitus faint, nervulus basad of basal vein, nervellus intercepted above the middle. 1st abdominal (Fig. 122 : b) tergite longer than the 2nd tergite, usually 2× as long as wide at apex, spiracle present at the middle. Ovipositor (Fig. 122 : c) shorter than abdomen, laterally compressed but dorso-ventrally depressed beyond the nodus. Head and thorax covered with dense suberect white hair.

This is a large genus. Most species are Ethiopian. Jonathan (1969) described two species from India.

1. ***Nematocryptus notialis*** Jonathan (Fig. 123 : a–e)

1969. *Nematocryptus notialis* Jonathan, *Oriental Ins.*, **2** 347 (1968). Female. key, des., fig. Type : Female : Karnataka : Kottegehar, 650m. (GUPTA). India : Karnataka : Mercara, 1220m.

1987. *Nematocryptus notialis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 879.

Table showing Comparison of species of the genus *Nematocryptus*

Character	*notialis*	*aquilonius*
Structure :		
1. Face	rugose	rugose
2. Malar space	0.6× the basal width of mandible.	0.4× the basal width of mandible.
3. Vertex	minutely and sparsely punctate.	reticulo-punctate behind.
4. Pronotum	same as in *N. aquilonius.*	strongly trans-striate in the middle, densely punctate at the upper margin, closely punctate or reticulate at pronotal collar.
5. Mesopleurum	punctate, tending to be finely reticulate, striae also occur near sternaulus and speculum.	reticulo-punctate.
6. Metapleurum	reticulo-punctate.	punctate.
7. Propodeum	rugoso-punctate, without distinct striae at sides, apical carina short, broadly interrupted in the middle, basal carina straight and complete (Fig. 123 : e).	striato-punctate, distinctly striate at sides, apical and basal carinae faint, basal carina present only in the middle, indistinct or faint at sides near spiracles (Fig. 123 : f).
8. 1st abdominal tergite	same as in *n. aquilonius* (Fig. 123 : d).	0.4 as wide as long, spiracle present at the middle, dorso-median carina absent, largely shiny with few scattered shallow punctures laterally between spiracles and apex.
Colour :		
9. Nature of the orbital mark on vertex	completely encircling the whole orbit.	not completely encircling the whole orbit.
10. Hind tarsus	white, with basal 0.75 of 1st segment and 5th segment wholly black.	white, with basal 0.2 of 1st segment and apical 0.5 of 4th and 5th segment black (Fig. 123 : g).

This species is very close to *Nematocryptus aquilonius* Jonathan in its general sculpture of body and colour pattern. The length of malar space, sculpture of vertex, mesopleurum, propodeum, nature of apical and basal carinae of propodeum, orbital mark and colour of hind tarsus, justify its specific identity.

Female : Malar space 0.6× the basal width of mandible. Vertex minutely and sparsely punctate. Mesopleurum punctate, at some places punctures very dense and close, forming a fine reticulation, striae also occur especially below sternaulus and in front of speculum. Metapleurum reticulo-punctate. Propodeum rugoso-

punctate, without distinct striae at sides, apical carina short, broadly interrupted in the middle, basal carina straight and complete, propodeal crest weak. 2nd and 3rd abdominal tergites closely punctate, following tergites subpolished.

Black. Head (Fig. 123 : c) yellow, except as follows : two lines at clypeal fovae region (sometimes various), apical margin of clypeus and a dumb-bell shaped mark in the middle of clypeus, apices of mandibular teeth, frons and vertex in the middle, back of the head, black. Orbital mark encircling the whole orbit, 5–11 antennal segments, mesopleurum with two marks, its anterior mark not broken into two, broad inverted T-shaped (Fig. 123 : e) mark in the middle of

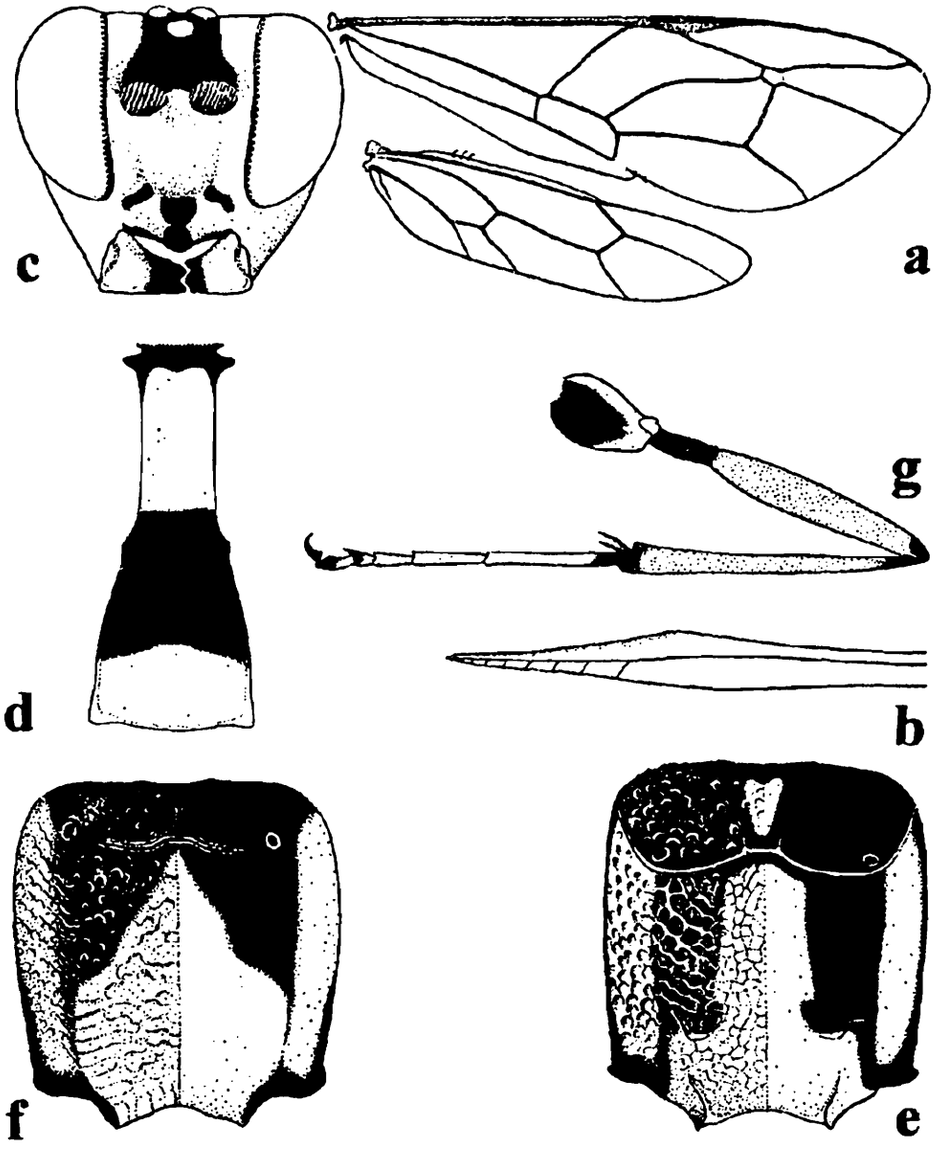

Fig. 123. *Nematocryptus notialis* Jonathan : **a**, fore and hind wings showing venation; **b**, ovipositor tip. Colour pattern : **c**, front view of head; **d**, first abdominal tergite, dorsal view; **e**, dorsal view of propodeum. *Nematocryptus aquilonius* Jonathan : **f**, dorsal view of propodeum; **g**, hind leg.

propodeum, yellow. Black circular mark on upper margin of pronotum and a streak at the side of lateral lobe of mesoscutum absent. Hind tarsus white with basal 0.75 of 1st segment and 5th segment wholly black.

Male : Unknown.

Length : Female 11.5 mm; fore wing 8 mm; ovipositor sheath 3.5 mm.

Distribution : India : Karnataka (Kottegehar, 650m; Mercara 1220m).

2. ***Nematocryptus aquilonius*** Jonathan. (Fig. 123 : f, g)

1969. *Nematocryptus aquilonius* Jonathan, *Oriental Ins.*, **2** : 344 (1968). Male, Female. key, des., fig. Type : Female, India : Assam : Rangapara : Charduar Forest (GUPTA). India : Orissa : Puri : Balukhand.

1987. *Nematocryptus aquilonius* : Gupta, *Mem. Amer Ent. Inst.*, **41** : 879.

This species is distinguished from the other species by having malar space 0.4 the basal width of mandible; vertex behind and mesopleurum largely reticulo-punctate; propodeum (Fig. 123 : f) striato-punctate, striate at sides, basal carina present only in the middle; 1st abdominal tergite smooth and shiny; incomplete orbital marks and the colour of the hind tarsus (Fig. 123 : g).

Female : Face rugose tending to be reticulate below. Clypeus subpolished with a few shallow punctures. Malar space 0.4 the basal width of mandible. Frons with polished depressed areas behind each antennal socket, area below median ocellus with irregular ridges. Vertex reticulo-punctate behind. Malar space moderately wide, punctate, punctures moderately strong, tending to be shallow above near vertex. Pronotum subpolished with strong trans-striae in the middle groove, densely punctate at the upper margin, closely punctate or reticulate at pronotal collar, upper margin of pronotum strongly swollen in front of middle lobe. Mesoscutum coarsely punctate. Mesopleurum reticulo-punctate. Scutellum subpolished with a few shallow punctures. Metascutellum shiny, sides of scutellum and metascutellum with irregular ridges; lateral carina of scutellum confined to its base. Metapleurum punctate above and irregularly reticulate below, juxta-coxal carina absent. Propodeum striato-punctate distinctly striate at sides, apical and basal carinae faint, basal carina present only in the middle, indistinct or faint at sides near spiracles. Hind coxa coarsely punctate. 1st abdominal tergite shiny with a few scattered punctures laterally between spiracles and apex, 2nd and 3rd tergites finely and shallowly punctate, following tergites subpolished.

Black. Antenna with 5–15 segments white. The following are yellow : Face, clypeus (except at the apex), mandible (except the apices), frons with two elongate stripes extending to the antennal sockets, joining with the facial mark, whole of malar space (orbital mark not encircling the whole orbit), pronotum with upper

margin of pronotum (except for a small circular black mark on it), two small spots at the upper and lower corners of pronotal collar, a mark at the middle of propleurae, two thin and long lines along the length of notauli and a streak at the outer margin of lateral lobe of mesoscutum, tegula largely, mesopleurum with three irregular marks, scutellum and metascutellum, bases of scutellar carinae, elongate mark on metapleurum, a broad mark in the middle, a small triangular mark in the middle, basad of basal carina of propodeum and two small marks basad of spiracles, apex and base of 1st abdominal tergite and apices of all the following tergites with apical bands. Fore coxa largely yellow, blackish at the base, 1st trochanteral segment yellow, slightly infuscate, 2nd segment, femur and tibia yellowish-brown, tarsus brown, tending to be darker towards the claws. Middle coxa and trochanter yellow, coxa black at the extreme base, trochanter infuscate, femur and tibia yellowish-brown, except the base of femur and tibia, tarsus dark brown. Hind coxa black, with an oval mark above and a mark below, yellow, trochanter wholly black, femur and tibia yellowish-brown with apex and base of femur, base of tibia, blackish, tarsus white (Fig. 123 : g) with basal 0.2 of 1st segment and apical 0.5 of 4th and 5th segments, black.

Male : Similar to female but slender. Mesopleurum more strongly punctate than reticulate. Metapleurum strongly punctate. Propodeum strongly punctate, punctures little sparse in the middle, finely punctate basad of basal carina. Apex of 1st abdominal tergite with sparse shallow punctures.

Black. Antenna with 8–18 segments white. Clypeus entirely, mesopleurum with two broad irregular marks; mark on propodeum broad and short, yellow. Hind tarsus largely white except the extreme base of 1st segment and extreme apex of 5th segment, black.

Length : Female 14 mm; fore wing 10 mm; ovipositor sheath 3.5 mm. Male, 9.5–10.5 mm; fore wing 7.5–9.5 mm.

Distribution : India : Assam (Rangapara) and Orissa (Balukhanda in Puri).

3. Genus ***Lipoprion*** Townes (Fig. 124 : a–c)

1961. *Amphiprion* Townes, *Mem. Amer. Ent. Inst.*, **1** : 472. Name preocc. by Schneider, 1801. Type-speces : *Buodias rufo-ornatus* Cameron; original designation.

1970. *Lipoprion* Townes, *Mem. Amer. Ent. Inst.*, **12** : 303. New name.

Taxonomy : Townes, 1970 : 303.

Distribution : Oriental region.

Body of moderate proportions. Frons with a median vertical carina and around some wrinkles. Clypeus weakly convex, subapically not impressed, its apical

margin with a median pair of small blunt teeth. Malar space 0.75× as long as basal width of mandible. Occipital carina weakly sinuate, joining hypostomal carina a moderate distance above base of mandible. Lower tooth of mandible almost as long as upper tooth. Epomia strong, reaching upper margin and then turned mesad. Prepectus with a short vertical carina near lower corner of

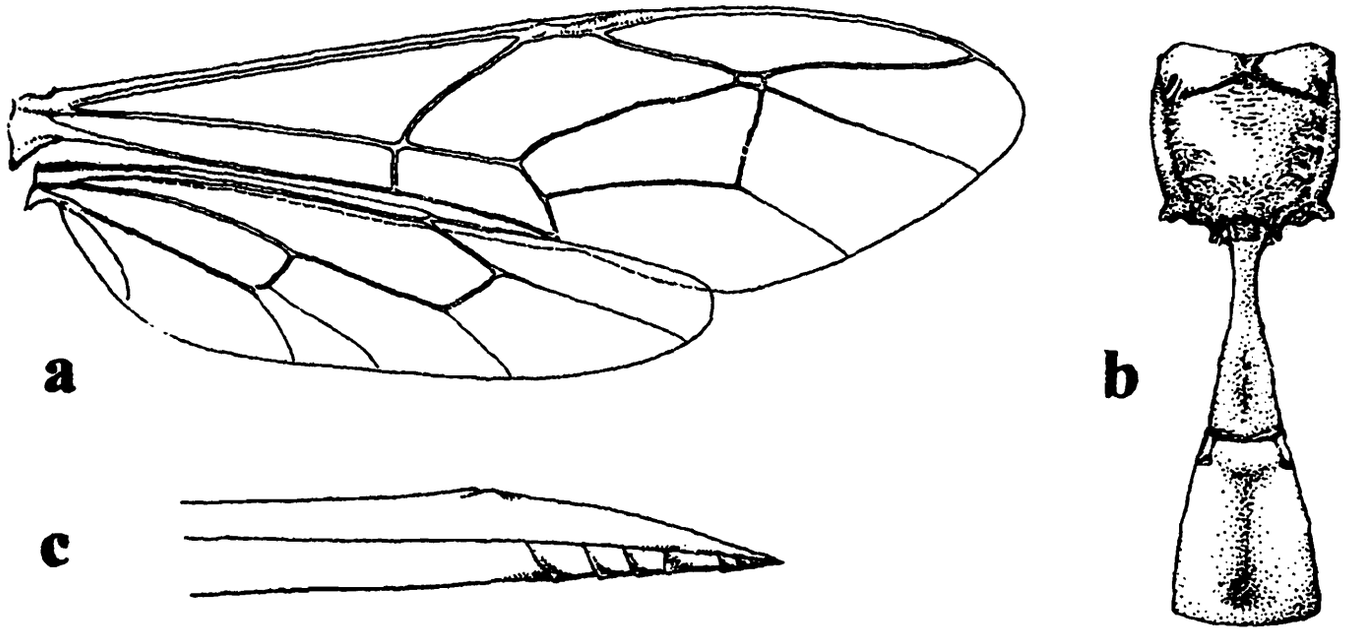

Fig. 124. *Lipoprion* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

pronotum. Notauli sharp and long. Apical carina of propodeum represented by strong tooth-like apophyses. Areolet 3× as wide as high, receiving second recurrent vein at apex. Second intercubitus present. Nervulus basad of basal vain by about 0.28 its length. First abdominal tergite with a lateral triangular tooth, its petiole rounded below. Apex of first sternite opposite the spiracle. Ovipositor sheath about as long as hind tibia; teeth on ovipositor tip arranged in two groups, separated by a gap.

This is small genus of Oriental Region. Two species are known under this genus, viz., *L. carinatus* (Cameron) from Malaya and *L. rufo-ornatus* (Cameron) from India.

1. ***Lipoprion rufo-ornatus*** (Cameron)

1907. *Buodias rufo-ornatus* Cameron, *Tijdschr. v. Ent.*, **50** : 89. Male, des. Type : Male, India : Sikkim (LONDON).

1907. *Buodias rufo-ornatus* : Cameron, *Entomologist*, **40** : 8. Female, des., India : West Bengal : Buxa Duar.

1961. *Amphiprion rufo-ornatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 183. n. Comb. India.

1970. *Lipoprion rufo-ornatus* : Townes, *Mem. Amer. Ent. Inst.*, **12** : 303. n. Comb.

Male : Face strongly punctate in the middle, punctures at sides weak and sparse. Clypeus impunctate. Vertex smooth. Frons above with a median keel and rediating striae at sides. Middle lobe of mesoscutum strongly but not so closely punctate in the center, at sides irregularly striate, lateral lobes strongly reticulate, along the outer miargin closely punctate. Scutellum sparsely punctate. Meso- and metapleurum closely punctate. Propodeum at base smooth, both apical and basal transverse carinae present, forwardly curved, area between the transverse carinae sparsely punctate, intermixed with oblique striae, between apical carina and apex reticulate, lateral apophyses broad at base, narrowed towards the apex. Abdomen smooth. Areolet small, 2× longer than wide.

Black. The following are yellow : Face, clypeus, mandible, orbit narrowly all along the eye margins, pronotal collar, upper shoulder and also at base, scutellum at sides, its apex more broadly, apical slope of propodeum, this mark dialated in the middle above, and apophyses. Lower half of mesopleurum, mesosternum and the metapleurum, except for a triangular black spot at the base above, reddish-yellow. Basal half of 1st abdominal segment and also at apex, and bands on other segments, pale yellow. Fore and middle coxae, trochanters and femora red, their tibiae and tarsi yellowish. Hind leg largely black, its inner side and basal half of coxa below reddish, tibia on the basal half with a broad irregular band of yellow tinged with testaceous, tarsi white. Wings hyaline, stigma and veins black.

Female : Very much similar to male in most of its characters and colour pattern. The only difference of note being that there is a small irregular yellow spot in the center of the base of the second abdominal segment. The basal half of the hind femora is reddish.

Length : Female, 17 mm; ovipositor 6 mm. Male, 16 mm.

Distribution : India : Sikkim. West Bengal (Buxa Duar).

4. Genus ***Fitatsia*** Seyrig (Fig. 125 : a–c)

1952. *Fitatsia* Seyrig, *Mem. Acad. Malgache,* **19**(39) : 185. Type-species : *Fitatsia desperator* Seyrig; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 185. Townes, 1970 : 312. Kamath, 1972 : 232.

Distribution : Afrotropical and Oriental regions.

Body moderately slender. Frons without a horn, but with a weak to strong

median protuberance. Clypeus rather small, rather strongly convex, impressed next to apex, its apical margin weakly convex, sharp without a median tooth or irregularity. Lower tooth of mandible about half as long as upper tooth. Malar space 0.3 to 0.75× as long as basal width of mandible. Occipital carina weakly to moderately sinuate, joining hypostomal carina far above base of mandible. Upper margin of pronotum weakly swollen. Epomia absent or weak. Prepectus without a vertical carina or flange below lower corner of pronotum. Notauli long and sharp, somewhat impressed. Propodeum of moderate length, its apical carina consisting of a pair of rather small, low crests, these sometimes obscurely connected by a weak median section of the carina, or rarely with acute tubercles; transverse furrow at the base of propodeum narrow. Areolet quite small, about 2.0–2.3× as wide as high, receiving second recurrent vein at centre (Fig. 125 : a); second intercubitus present or absent. Nervulus interstitial or basad of basal vein by about 0.2 its length; nervellus intercepted at its lower 0.3–0.4. First abdominal segment subterete to weakly prismatic, often with distinct dorsolateral and ventrolateral corners, but these corners rounded; petiole with a lateral tooth at base. First sternite not separate from tergite by sutures, the apex of sternite opposite spiracle. Ovipositor sheath 0.8-1.5× as long as hind tibia and 0.4-0.7× the length of fore wing. Middle and hind second trochanters with or without a sharp tooth on outer apical margin.

Fitatsia is closely related to *Acromia* Townes in having unequal mandibular teeth, in that the lower tooth is barely 0.5× as long as the upper tooth. Malar space is about 0.4–0.75× the basal width of mandible. The nervellus is intercepted at its lower 0.3. The petiole lacks the dorsolateral and ventrolateral longitudinal carinae

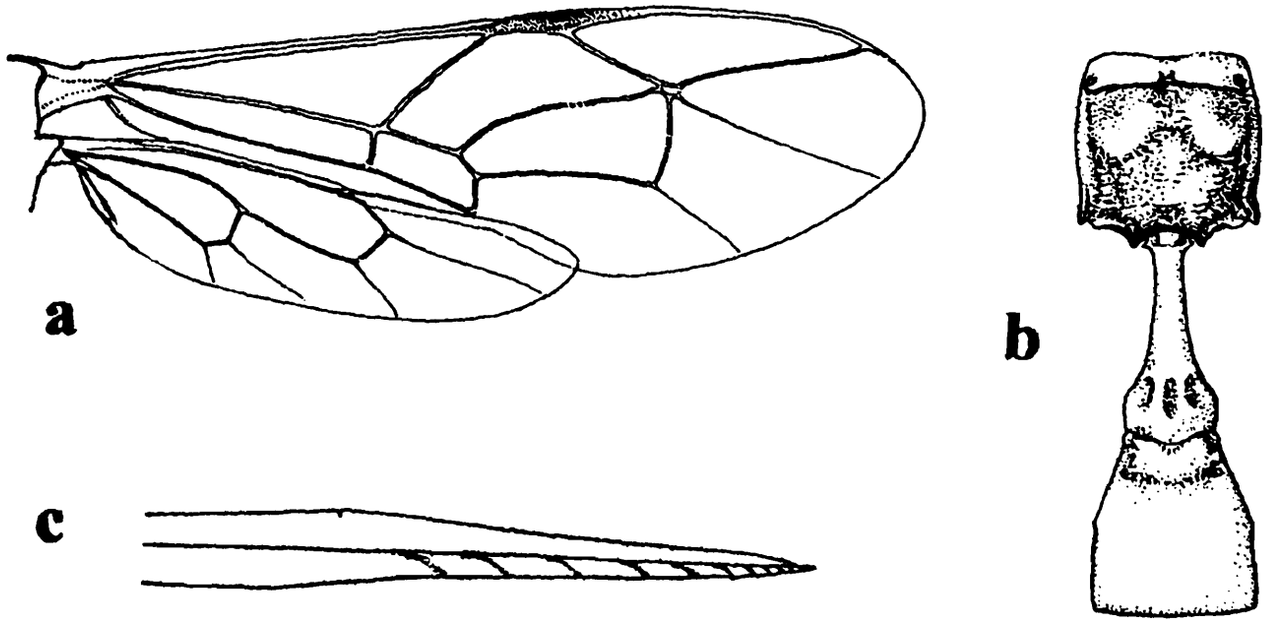

Fig. 125. *Fitatsia* Seyrig : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

and the apex of the first sternite is opposite to the spiracle of its tergite. However, this genus can be readily differentiated from the latter by the weakly swollen pronotal shoulder. The epomia is nearly always absent; if present, it is weak and does not reach the upper margin of the pronotal shoulder. The inner hind tarsal claw of male has a right angle bend, while its outer claw is evenly curved.

This genus is known from Afro-tropical and Oriental regions. Kamath (1972) revised this genus and reported five species from Oriental region. Four species known from India can be distinguished by the following key :

Key to the species of *Fitatsia*

1. Middle and hind second trochanter with a sharp tooth on the outer apical margin. Mesoscutum polished, closely punctate, apical 0.5 finely transstriolate. Ovipositor sheath 1.5× the length of hind tibia. Flagellar segments 15-19 in female marked yellowish-white. (Scutellum entirely and first to fourth hind tarsal segments, yellowish-white. India : Meghalaya; Uttaranchal. Myanmar ..... 4. *hypsipylae* Kamath

– Middle and hind second trochanters simple, without a tooth on outer side at apex. Mesoscutum subpolished, densely punctate to ruguloso-punctate, flagellar segments 15–19 in female not marked with yellowish-white 2

2. Occipital carina interrupted medially above. Frons smooth, shiny and impunctate. First tergite about 2.3× as long as wide at its apex. Propodeum yellowish-white, except basad of basal carina black. India : Karnataka..... .....3. *incompleta* Kamath

– Occipital carina entire medially above. Frons ruguloso-punctate or striato-punctate in distal 0.5. First tergite about 2.7× as long as wide at its apex. Propodeum black with a subtriangular yellowish-white mark on apical slope. 3

3. Frons with a strong median protuberance. Propodeum with apicolateral acute tubercles. Ovipositor tip gradually curved without a nodus and a notch. Speculum without a yellowish-white spot (Fig. 126 : g). Hind leg colour as in figure 126 : i. Body 15 to 16 mm long. India : Meghalaya; Uttaranchal .....2. *tuberculata* Kamath

– Frons normal, without a median protuberance. Propodeum with low, weak, apico-lateral crests (Fig. 126 : d). Ovipositor tip with a distinct nodus and with a notch at nodus. Speculum with a yellowish-white spot (Fig. 126 : c). Hind leg colour as in figure 126 : e. Body 6–11.5 mm long. India : Jharkhand; Maharashtra; Karnataka; Andha Pradesh .....1. *depressa* Kamath

1. ***Fitatsia depressa*** Kamath (Fig. 126 : a–f)

1972. *Fitatsia depressa* Kamath, *Oriental Ins.*, **6** : 235. Male, Female. key, des., fig. Type : Female, India : Jharkhand : Ranchi Dist. : Namkum (GUPTA). India : Jharkhand : Ranchi. Maharashtra : Matheran, 914m; Pratapgarh, 914m; Panhala Fort 914m; Deolapi. Karnataka : Marnard, 609m; Mercara, 1219 m. Andhra Pradesh : Tadvai.

1987. *Fitatsia depressa* : Gupta, *Mem. Amer. Ent. Inst.* **41** : 880.

This species is characterised by the absence of median protuberance on frons. The propodeal crests weak and low and not in the form of tubercles. The ovipositor tip with a prominent nodus and a distinct notch at nodus and speculum with a yellowish-white spot (Fig. 126 : c).

Female : Face moderately convex in middle, ruguloso-punctate in dorsal half, often striolated close to antennal sockets, at centre and below rather finely punctate. Clypeus finely and sparsely punctate. Malar space 0.5× the basal width of mandible. Temple finely punctate. Frons smooth in antennal scrobes, ruguloso-punctate in distal half; inner frontal orbit mat, subpolished with scattered punctures; ocellar triangle with a few scattered punctures, and with a deep median groove. Vertex behind smooth and shiny with fine sparse punctures. Occipital carina (Fig. 126 : a) entire, moderately curved below, joining hypostomal carina at a distance 0.5–0.63 the basal width of mandible. Pronotum trans-striate, striations near shoulder oblique, pronotal collar smooth and shiny, epomia very weak, reaches upper margin of the weakly swollen pronotal shoulder. Mesoscutum subpolished, ruguloso-punctate, its apical 0.25 trans-striate, prescutellar depression smooth, without ridges. Scutellum weakly convex, smooth and shiny. Metascutellum smooth and shiny. Mesopleurum largely striato-punctate, speculum impunctate, smooth and shiny; prepectus punctate ventrally, and on sides striato-punctate, prepectal carina extending 0.6 the height of mesopleurum. Mesosternum densely, punctate, near median longitudinal groove and sternaulus striolated. Metapleurum ruguloso-punctate, sometimes striated near ventral margin. Propodeum rather rugose to reticulate, basad of basal carina moderately punctate, apical slope trans-striate, apical carina obsolescent medially, apicolateral crests very low, propodeal spiracle round. Second segment of middle trochanter along its outer margin without a tooth (Fig. 126 : b). Longer hind tibial spur 0.5× the length of hind first tarsal segment. Nervulus interstitial or basad of basal vein by 0.2 its length. First abdominal tergite 2.5× as long as its apical width. Petiole smooth and shiny, postpetiole gradually curved at base, largely smooth but with sparse, weak, shallow punctures basolaterally, often with a median and a lateral, longitudinal, shallow depressions at base; third tergite punctate, punctures smaller and more crowded; following tergites finely, weakly punctate and with moderate yellowish-brown pubescence. Ovipositor moderately compressed, its tip depressed and flattened, its nodus distinct and with a notch (Fig. 126 : f). Ovipositor sheath 0.5 the fore wing length and 1.1× the length of hind tibia.

Black. The following are whitish-yellow : Face, clypeus, mandible except blackish teeth, palpi, malar space, temple above and below, 7–14 flagellar segments, except rest blackish-brown, pronotal collar, shoulder narrowly, a round spot on mesoscutum, scutellum, scutellar carinae, metascutellum, tegula, subtegular ridge, an elongate spot on speculum, oval spot at lower corner of mesopleurum (Fig. 126 : c), base of hind wing, a broad mark on metapleurum, an inverted U-shaped mark on apical slope of propodeum (Fig. 126 : d). Fore and middle legs is general whitish-yellow; their coxae, trochanters pale yellow, fifth

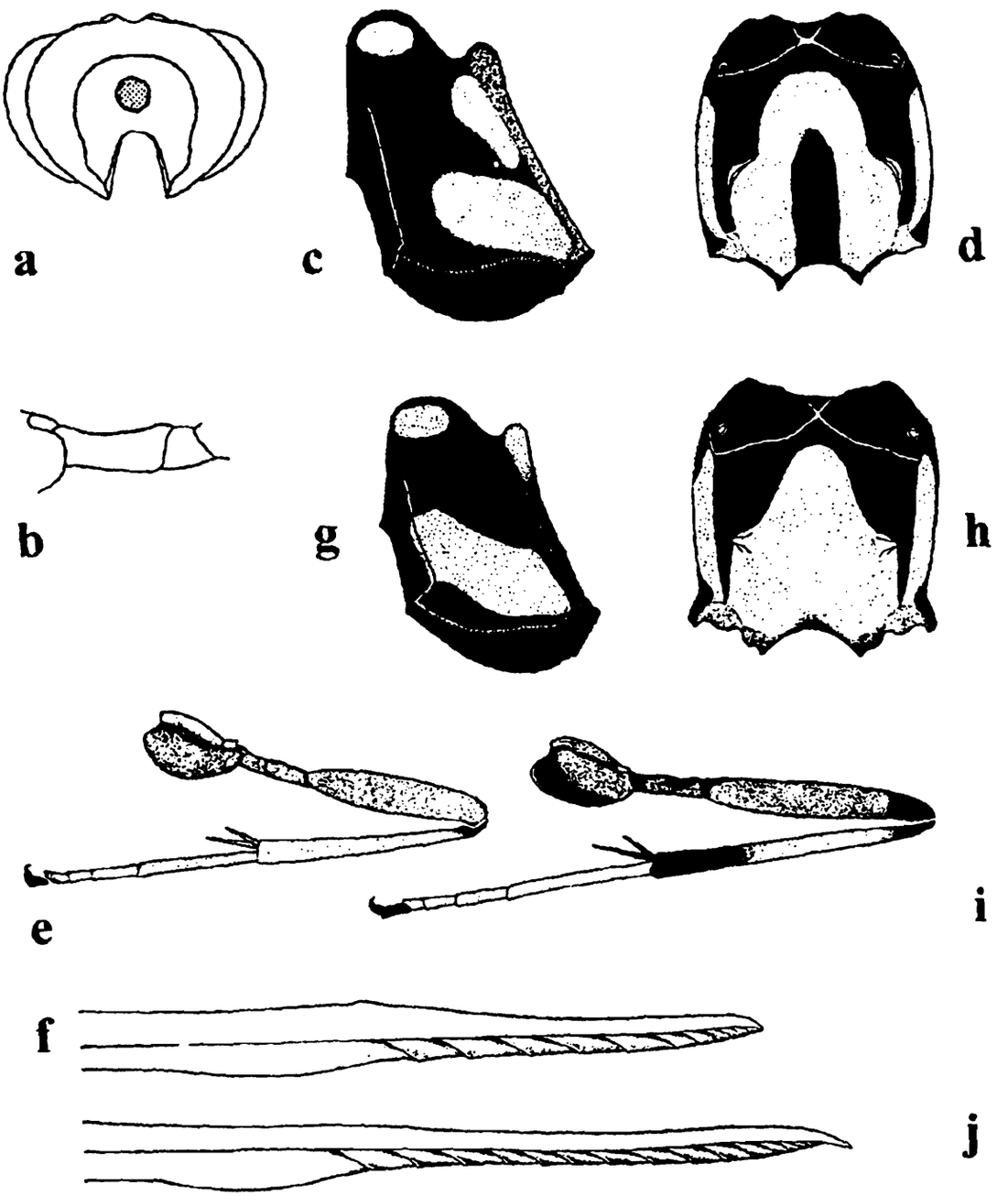

Fig. 126. *Fitatsia depressa* Kamath : **a**, rear view of head; **b**, trochanter of middle leg; colour pattern of : **c**, mesopleurum; **d**, propodeum; **e**, hind leg; **f**, ovipositor tip. *Fitatsia tuberculata* kamath : colour pattern : **g**, mesopleurum; **h**, propodeum; **i**, hind leg; **j**, ovipositor tip. (Source : Kamath, 1972).

tarsal segment brown. Hind leg (Fig. 126 : e) yellowish-brown, with an elongate mark on coxa above yellow, extreme base of tibia blackish, fifth tarsal segment brown. Wings clear hyaline. First abdominal tergite whitish-yellow, apices of second to seventh tergites and eighth wholly, whitish-yellow; fourth to seventh tergites also whitish-yellow along lateral margin.

Male : Essentially similar to the female except as follows : Pronotum largely smooth and shiny; mesopleurum smooth and polished in dorsal half, lower half closely punctate; propodeum rugulose.

Colour similar but more extensive than in female. Antennal flagellum blackish without yellowish-white band. Spots on speculum and lower posterior mark on mesopleurum fused; apical mark on propodeum roughly triangular. Hind first trochanter blackish; femur yellowish-white, extreme apex blackish; hind tibia infuscate, subbasal 0.25 yellow and basal 0.5 light brown; hind tarsus yellowish-white, except basal 0.25 of first segment and apical 0.5 of fifth segment infuscate.

Length : Female 6.5–11.5 mm; fore wing 5.5–6.5 mm; ovipositor sheath 2–3.5 mm. Male, 6–7 mm; fore wing 5–5.5 mm.

Distribution : India : Jharkhand (Ranchi, Namkum). Maharashtra (Matheran, 914m in Western Ghats; Pratapgarh, 900m; Panhala 914m; Deolali orchards). Karnataka (Murnard, 609m, Mercara 1219m). Andhra Pradesh (Tadvi).

2. ***Fitatsia tuberculata*** Kamath (Fig. 126 : g–j)

1972. *Fitatsia tuberculata* Kamath, *Oriental Ins.*, **6** : 238. Female, key, des., fig. India : Meghalaya : Jaintia Hills : Dawki (GUPTA). Uttaranchal : Kumaon Hills : Garjia.

1987. *Fitatsia tuberculata* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 880.

This species is close to *F. depressa* Kamath in having an entire occipital carina; depressed and flattened ovipositor tip and propodeum with a subtriangular yellowish-white mark on apical slope. However, this species is distinguished by having a strong median protuberance on frons and apicolateral tubercles on propodeum.

Female : Face about 0.71× as long as wide, striato-punctate. Clypeus shallowly punctate, punctures dense in middle at base, elsewhere scattered. Malar space mat, about 0.5 the basal width of mandible. Temple finely punctate. Frons medially with a strong triangular protuberance, coarsely punctate and obliquely striated in distal half, in scrobes smooth and shiny. Vertex smooth, shiny with fine scattered punctures. Occipital carina strong and complete, evenly curved dorsally. Pronotum strongly trans-striate medially, pronotal collar smooth, shiny; pronotal shoulders striato-punctate, epomia distinct. Mesoscutum subpolished, densely

coarsely punctate, apically trans-striate; prescutellar depression with 3–5 short, longitudinal ridges. Scutellum sparsely and shallowly punctate. Metascutellum smooth, subpolished. Mesopleurum rugoso-striate, striations transverse and distinct medially, near subtegular ridge with punctures between striations, speculum closely punctate, mesosternum striato-punctate, striations transverse and punctures small and close. Metapleurum striato-rugose. Propodeum closely punctate basad of basal carina, rest reticulo-punctate and on apical slope rugose, apicolateral projections small, acute, apical carina absent, propodeal spiracle oval. Nervulus basad to basal vein. First abdominal tergite 2.7× as long as its apical width and 1.2× longer than second; petiole smooth, subpolished and impunctate, second tergite 1.2× as long as wide at apex, ovipositor moderately compressed, its tip depressed and flattened without a distinct nodus and notch, apex of upper valve weakly decurved (Fig. 126 : j). Ovipositor sheath 0.5× as long as fore wing and about equal to the length of hind tibia.

Black. The yellowish-white markings on the body and coloration of four front legs are similar to *depressa,* except as follows : Ventral 0.6 and dorsal 0.2 of temple broadly, yellowish-white; scape entirely black, flagellar segments 6–12 yellowish-white, except sixth and twelfth below infuscate. Propleurum entirely yellowish-white; mesopleurum with an oblong broad yellowish-white mark in lower half extending between prepectal carina and posterior margin (Fig. 126 : g) and a yellowish-white spot an mesepimeron dorsally. A subtriangular mark on propodeum, yellowish-white (Fig. 126 : h). Middle tarsus light brown, its fifth segment dark brown. Hind coxa yellowish-brown with a blackish-brown irregular mark at its basal 0.6 on outerside below and a yellowish-white stripe extending between base and apex above, hind trochanters, femur and tibia, and its spurs yellowish-brown, except first trochanter basally on outerside and extreme apex of femur infuscate, basal 0.1 and apical 0.25 of tibia blackish, hind tarsus yellowish-white with its fifth segment darker brown (Fig. 126 : i). First abdominal tergite with a yellowish apical band.

Male : Not known.

Length : Female 15–16 mm; fore wing 9.5–10 mm; ovipositor sheath 4.5–5.5 mm.

Distribution : India : Meghalaya (Dawki in Jaintia Hills). Uttaranchal (Garjia in Kumaon Hills).

3. ***Fitatsia incompleta*** Kamath (Fig. 127 : a, c–f)

1972. *Fitatsia incompleta* Kamath, *Oriental Ins.,* **6** : 240. Female, key, des., fig. Type : Female. India : Karnataka : Mercara, 1219m (GUPTA).

1987. *Fitatsia incompleta* : Gupta, *Mem. Amer. Ent. Inst.,* 41 : 880.

This species is readily distinguished from other species by having the occipital carina interrupted medially above; frons smooth, shiny and impunctate; propodeum yellowish-white, and black at base. Hind tibia largely black with a subbasal yellowish-white band.

Female : Face indistinctly punctate, transversely striolate and with a pin-head shaped polished knob in middle. Clypeus smooth and impunctate. Malar space subpolished, 0.7× as long as basal width of the mandible. Temple and vertex behind with fine scattered punctures. Frons impunctate, antennal scrobes weakly depressed. Occipital carina dorsally weak and interrupted (Fig. 127 : a). Pronotal scrobes trans-striates, pronotal collar smooth and shiny. Mesoscutum subpolished, ruguloso-punctate and finely aciculate close to margins and notauli, prescutellar depression cross-ridged. Scutellum and metascutellum smooth and shiny. Mesopleurum trans-striate, prepectal carina 0.7× the height of mesopleurum, prepectus densely and closely punctate. Metapleurum striato-rugose. Propodeum (Fig. 127 : d) with basal carina almost transverse, basad of basal carina weakly punctate and striolate, slope irregularly striated and rather rugose, propodeal spiracle small, circular, apical transverse carina strongly arched and broken at one or two places. Nervulus interstitial. First abdominal tergite smooth, polished and about 2.3× as long as wide at apex and nearly 1.3× longer than second; second tergite as long as wide at its apex, densely, closely punctate, punctures small, third tergite punctate as second, but punctures smaller and finer; following tergites mat with fine setiferous punctures. Ovipositor tip moderately compressed, with a notch at nodus and evenly tapered to apex (Fig. 127 : f). Ovipositor sheath 0.4× as long as fore wing and about 0.8× the length of hind tibia.

Black. The following are yellowish-white : Face, clypeus, mandible except its dark brown teeth, palpi, malar space, extreme lower end of temple, inner frontal orbits broadly and a spot on lower corner of occiput, a stripe on pronotal collar and pronotal shoulders, a roundish spot medially on mesoscutum, scutellum and metascutellum, tegula, subtegular ridge, an irregularly outlined mark in lower half of mesopleurum and dorsal 0.6 of mesepimeron (Fig. 127 : c), a mark behind base of hind wing and metapleurum except its blackish dorsal margin, propodeum (Fig. 127 : d) except basad of basal carina. Fore front legs yellowish-brown with their coxae and trochanters, yellowish-white; middle tarsus dull blackish-brown. Hind leg (Fig. 127 : e) with coxa and femur yellowish-brown, coxa on its outer side at apex and below irregularly infuscate, first trochanter yellowish-white, its second trochanter and apical 0.2 of femur blackish-brown; tibia infuscate at its subbasal 0.2 and tibial spurs, yellowish-white, tarsus yellowish-white with first segment in middle broadly and fourth segment lightly, blackish-brown, fifth tarsal segment including claws blackish. Wings hyaline, stigma and veins dark brown.

First abdominal tergite yellowish-brown with a moderately broad apical band, yellowish-white; a subtriangular, diffused mark at base of postpetiole, a longitudinal stripe laterally on petiole, blackish-brown; second to sixth tergites black with a yellowish-white band at their apical margin; basolateral corner of second tergite including thyridium yellowish-brown; seventh and eighth tergites entirely yellowish-white.

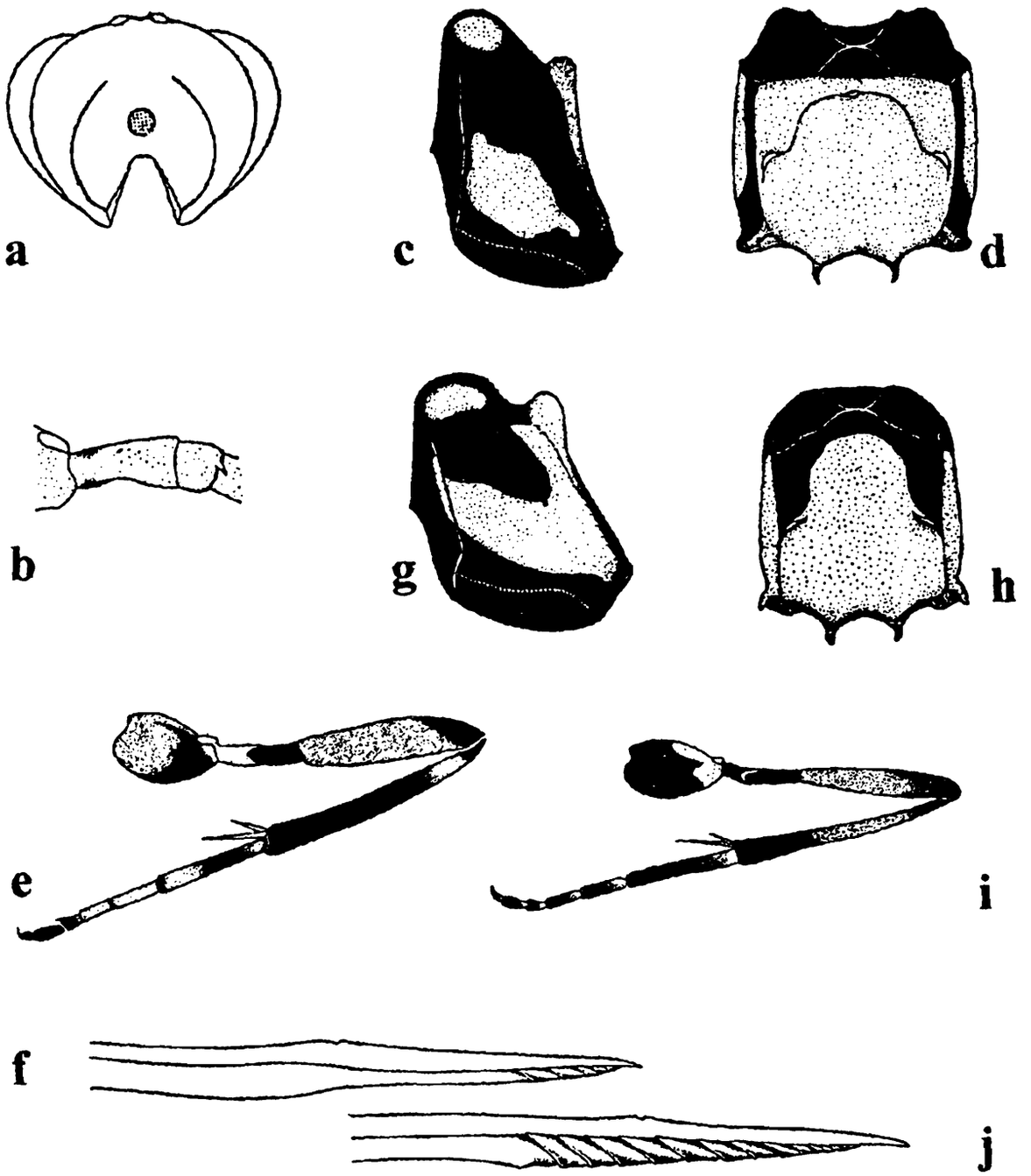

Fig.127. *Fitatsia incompleta* Kamath : **a**, rear view of head; colour pattern of : **c**, mesopleurum; **d**, propodeum; **e**, hind leg; **f**, ovipositor tip. *Fitatsia hypsipylae* Kamath : colour pattern : **g**, mesopleurum; **h**, propodeum; **i**, hind leg; **j**, ovipositor tip; **b**, trochanter of middle leg showing tooth. (Source : Kamath, 1972).

Male : Not known.

Length : Female 7 mm; fore wing 5 mm; ovipositor sheath about 2 mm.

Distribution : India : Karnataka (Mercara, 1219m).

4. ***Fitatsia hypsipylae*** Kamath (Fig. 127 : b, g–j)

1972. *Fitatsia hypsipylae* Kamath, *Oriental Ins.*, **6** : 244. Female, key, des., fig. biol. Type : Female. India : Uttaranchal : Dehra Dun : Kishanpur (CIBC, BANGALORE). Meghalaya : Jaintia Hills : Dawki. Myanmar : Mandalay Dist. Host : *Hypsipyla robusta.*

1987. *Fitatsia hypsipylae* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 880.

This species is easily distinguished from other Indian species by having middle and hind second trochanteral segments with a sharp tooth on outer side apically (Fig. 127 : b).

Female : Face minutely punctate. Clypeus smooth and shiny. Malar space mat, 0.6× the basal width of mandible. Temple smooth and shiny, with fine, scattered punctures. Frons aciculate and shallowly punctate in distal 0.5, aciculations oblique and often with a media carina near median ocellus, antennal scrobes smooth and shiny. Occipital carina entire medially. Pronotum striato-punctate. Pronotal shoulders weakly projected and minutely punctate. Mesoscutum polished with moderately close punctures. Scutellum and metascutellum smooth, impunctate. Mesopleurum with moderately coarse punctures, its dorsal half striato-punctate, striations transverse, speculum largely impunctate; prepectus laterally shallowly closely punctate, ventrally smooth, prepectal carina 0.7× the height of mesopleurum. Mesosternum closely punctate. Metapleurum coarsely punctate. Propodeum, ruguloso-reticulate, reticulations distinct on sides, basad of basal carina shallowly punctate, punctures on basolateral corners crowded, apicad of basal carina in middle rugoso-punctate, apical slope rather transversely wrinkled, apicolateral crests in the form of weakly raised ridges, propodeal spiracle small, round to subovoid. Nervulus basad of basal vein. Second trochanter of middle and hind legs with a sharp tooth on outer side at apical margin (Fig. 127 : b). First abdominal tergite 2.2× as long as wide at apex, about 1× as long as second, smooth, shiny except for sparse punctures dorsolaterally near spiracle and with a shallow median and a pair of lateral depressions at base of postpetiole; second tergite nearly 1.2× as long as wide at apex, thyridium almost round; second and third tergites with dense, crowded punctures; punctures on third rather smaller and dense, following tergites shallowly and weakly punctate. Ovipositor tip (Fig. 127 : j) subcompressed and evenly tapered to apex, with a notch at nodus. Ovipositor sheath 0.6× as long as fore wing and 1.5 the length of hind tibia.

Black. The following are yellowish-white : face, clypeus, mandible except teeth, malar space, lower 0.5 of temple, 6–19 flagellar segments above, frontal orbits, pronotal collar, shoulder, median spot on mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, a broad median mark on mesopleurum (Fig. 127 : g), base of hind wing, metapleurum above, a subtriangular mark on apical slope of propodeum (Fig. 127 : h), fore and middle legs, their coxae and trochanters. Fore and middle femora, tibiae and first four tarsal segments, yellowish-brown; middle trochanter and tarsus light brown. Hind leg (Fig. 127 : i) with coxa yellowish-white, with a dark brown stripe above, trochanter, femur yellowish-brown, tibia and tarsus yellowish-white, fifth tarsal segment dark brown. Wings clear hyaline. Abdomen black, base of petiole and a median spot yellowish-brown, apices of all the tergites with yellowish-brown bands, except for baso-lateral spots on second and eighth wholly yellow to yellowish-brown.

Male : Not known.

Length : Female 9.5–12 mm; fore wing 6.5–8 mm; ovipositor sheath 4.5 mm.

Distribution : India : Meghalaya (Dawki in Jaintia Hills). Uttaranchal (Dehra Dun, Kishanpur). *Elsewhere* : Myanmar (Mandalay).

Host : *Hypsipyla robusta* Moore (Lepidoptera : Phycitidae).

5. Genus ***Silsila*** Cameron (Fig. 128 : a–c)

1903. *Silsila* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 1. Type-species : *Silsila fulvipes* Cameron; designated by Viereck, 1914.

Taxonomy : Cheesman, 1936 : 365. Townes, Townes & Gupta, 1961 : 185. Townes, 1970 : 315. Kamath, 1972 : 252.

Distribution : Oriental Region.

Body elongate, the thorax compressed and elongate. Clypeus small, rather strongly convex, narrowly or not at all impressed next to apex, the apex convex or subtruncate, apical margin sharp, without a tooth or irregularity at centre. Lower tooth of mandible almost as long as upper tooth, both teeth weakly curved backward. Malar space about 0.25–0.3× as long as basal width of mandible. Frons unarmed. Occipital carina strongly curved mesad to join hypostomal carina some distance above base of mandible. Upper margin of pronotum strongly swollen. Epomia absent. Notauli long, sharply impressed. Prepectus with a short, weak vertical carina below lower corner of pronotum. Propodeum very long, its posterodorsal profile evenly convex, the apical carina represented by a pair of low crests or entirely absent (Fig. 128 : b); Hind tarsal claws of male with a median right angle bend. Fore wing 5.2 to 8.5 mm long. Areolet 2–4× as wide as high, receiving second recurrent vein near centre (Fig. 128 : a), second intercubitus

present; nervulus opposite or a little basad of basal vein; nervellus intercepted at 0.25–0.3 below. Petiole of first abdominal tergite terete, without carinae or sutures, at base with a faint to strong lateral tooth; apex of first sternite far behind spiracle. Ovipositor sheath about 1.2–1.5× as long as hind tibia its tip as in figure 128 : c.

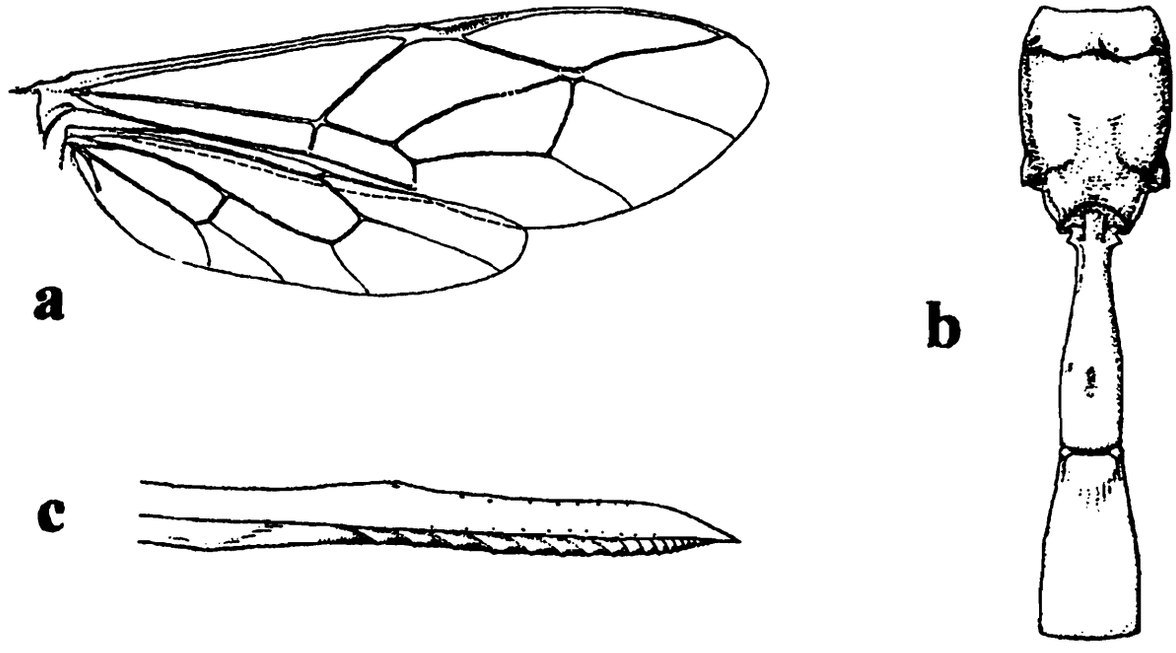

Fig. 128. *Silsila* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

The genus *Silsila* differs from other genera in the character of mandibular teeth, which are almost equal. The malar space is about 0.25× the basal width of mandible. The upper margin of pronotum strongly swollen but does not have an angulate projection at its front end. The epomia is absent and the hind tarsal claws of male have a median right angle bend.

This is a small genus, occuring in Oriental Region. Three species are known from Orient, of these two species are reported from Indian subregion, which are discussed below (Kamath, 197 : 252) :

Key to the species of *Silsila*

1. Ovipositor apically straight, gradually and uniformly pointed towards apical tip, its tip 7–8× as long as deep at nodus, both upper and lower valves equally wide. Hind tarsus of male dark brown. India : Meghalaya; Jharkhand; Uttaranchal; Kerala and Maharashtra ..... 1. *fulvipes* Cameron

– Ovipositor apically curved, not pointed apically, both upper and lower valves wide subapically; its tip 4-5× as long as deep at nodus. Male hind tarsus yellow except apical 0.5 of fifth tarsal segment light brown. India : Maharashtra; Uttaranchal. Sri Lanka. Java ..... 2. *similis* Kamath

1. ***Silsila fulvipes*** Cameron (Fig. 129 : a–d)

1903. *Silsila fulvipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** : (14) : 2. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1914. *Silsila fulvipes* : Morley, *Rec. Indian Mus.*, **8** : 327. Female, des. India : Assam : Dibrugarh.

1961. *Silsila fulvipes* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 185. India.

1972. *Silsila fulvipes* : Kamath, *Oriental Ins.*, **6** : 254. Male, Female, key, des., fig. India : Jharkhan, Ranchi : Namkum. Uttaranchal : Dehra Dun; Garjia, 609m. Maharashtra : Panhala Fort, 915m. Meghalaya : Khasi Hills. Kerala : Walayar Forest.

1987. *Silsila fulvipes* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 883.

This species is extremely similar to *S. similis* Kamath in most of the features, except the characters of ovipositor tip; and hind tarsus of male entirely dark brown.

Female : The brief description is a follows : Face weakly raised in the middle, minutely and shallowly punctate, striolated near antennal base. Clypeus at base with a few punctures. Malar space 0.25× the basal width of mandible. Temple largely smooth and shiny. Frons with a median longitudinal carina. Vertex smooth and shiny. Occipital carina entire. Pronotum striato-punctate, striae short and oblique in scrobe. Mesoscutum subpolished, distinctly punctate. Scutellum sparsely and shallowly punctate. Mesopleurum with coarse deep punctures, speculum shiny smooth; prepectus ruguloso-punctate. Propodeum coarsely punctate, apical transverse carina present as lateral crests only. First abdominal tergite about 3× as long as its apical width, petiole smooth, polished; postpetiole closely and shallowly punctate, following tergites with fine dense punctures, beset with whitish pubescence. Ovipositor tip gradually tapering about 7–8× as long as its depth at nodus, sheath about 1.4× as long as hind tibia and its tip as in figure 129 : d.

Black. 6-13 or sometimes 7-15 flagellar segments whitish. The following are yellow : Face, clypeus, mandible except teeth, malar space, outer and inner orbits, pronotal collar, shoulder, mesoscutum with a spot on middle lobe, tegula, scutellum, metascutellum, lateral carinae, subtegular ridge, mesopleurum with a large oval mark (Fig. 129 : b), a stripe on metapleurum, area behind base of hind wing, an inverted T-shaped mark on propodeum (Fig. 129 : c). Fore and middle legs with their coxae and trochanters, yellowish-white, femora, tibiae and tarsi yellowish-brown. Hind leg with coxa blackish, with a yellowish-white spot dorsally, its trochanter pale to brown, rest of leg yellowish-brown except femur and tibia at exteme apex brown. Abdomen with basal 0.5 of first and apices of all the tergites, yellow.

Male : Extremely similar to female, except as follows : Pronotum smooth and

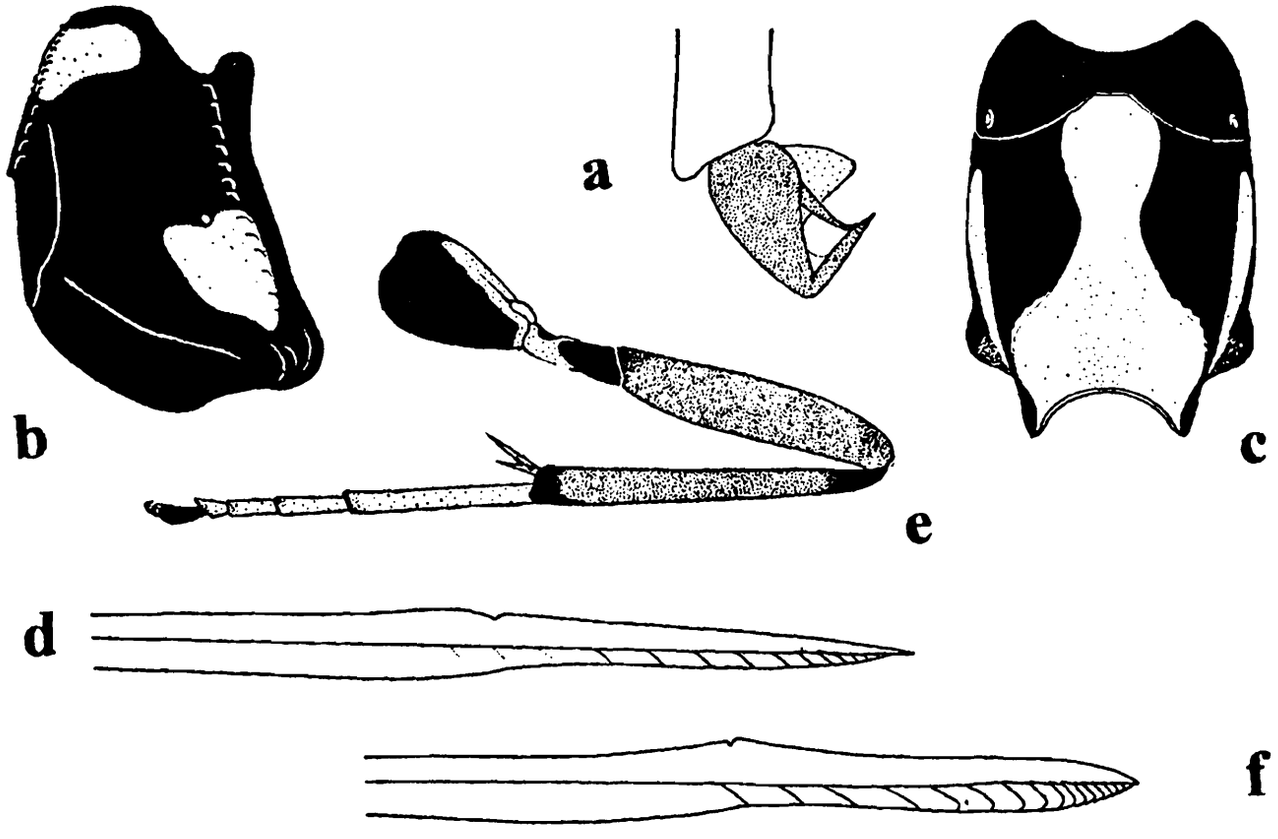

Fig. 129. *Silsila fulvipes* Cameron : **a**, tarsal claw, male; **b**, mesopleurum and **c**, dorsal view of propodeum showing colour pattern; **d**, ovipositor tip. *Silsila similis* Kamath : **e**, Colour pattern of hind leg; **f**, ovipositor tip. (Source : Kamath, 1972).

shiny, sparsely punctate close to shoulders; mesopleurum smooth and shiny; propodeum reticulo-rugose to rugoso-punctate. Tarsal claw as in figure 129 : a.

Black. Middle tarsus light brown; hind tibia basally and apically brownish-black; whole of hind tarsus dark brown, with first to third sub-basally light brown.

Length : Female 10–11 mm; fore wing 6.7 mm; ovipositor sheath 3–4 mm. Male, 8.5–9.5 mm, fore wing 5–6 mm.

Distribution : India : Jharkhand (Ranchi, Namkum). Uttaranchal (Dehra Dun, Garjia, 609m in Kumaon Hills). Maharashtra (Panhala Fort, 915m in Western Ghats). Kerala (Walayar Forest).

2. ***Silsila similis*** Kamath (Fig. 129 : e, f)

1972. *Silsila similis* Kamath, *Oriental Ins.*, **6** : 256. Male, Female, key, des., fig. Type : Female. India : Uttaranchal : Kumaon Hills : Garjia, 609m (GUPTA). India Uttaranchal : Dehra Dun : New Forest, 600m; Herbertpur. Maharashtra : Deolali. Sri Lanka : Colombo. Indonesia : Java : Mt. Bentiang, Djampang Tengah.

1987. *Silsila similis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 883.

This species is extremely similar to *S. fulvipes* Cameron, however, it can be distinguished by the features of ovipositor and hind tarsus.

Female : Thoracic and abdominal sculpture similar to *fulvipes* Cameron, except as follows : Face as long as wide, minutely punctate. Clypeus smooth and shiny. Malar space 0.3× the basal width of mandible. Temple with fine scattered punctures. Frons with median longitudinal carina weak to strong. Ovipositor tip as in figure 129 : f.

Black. Colour pattern similar to *fulvipes* Cameron, except middle tibia yellowish-brown, its tarsus infuscate; hind leg (Fig. 129 : e) with tibia yellowish-brown, its extreme base and apex infuscate, its first to fourth tarsal segments yellow, fifth segment dark brown.

Male : Similar to female except more slender and subpolished. Colour pattern also similar to female except leg mainly the tarsi darker in shade.

Length : Female 9–10 mm; fore wing 6–8 mm; ovipositor sheath 2.5–3.5 mm. Male, 8.5–10.5 mm; fore wing 5.5–7.5 mm.

Distribution : India : Maharashtra (Deolali). Uttaranchal (Garjia, 609m in Kumaon Hills, Herbertpur in Dehra Dun dist; Dehra Dun, New Forest). *Elsewhere* : Sri Lanka (Colombo). Indonesia (Java : Mt. Bentiang, Djampang Tengah).

6. Genus *Acromia* Townes (Fig. 130 : a–c)

1961. *Acromia* Townes, *Mem. Amer. Ent. Inst.*, **1** : 183, 473. Type-species : *Silsila striolata* Cameron; original designation.

Taxonomy : Townes. 1970 : 313. Kamath 1972 : 247.

Distribution : Oriental Region.

Body moderately slender. Frons with a median weak pair of tubercles. Clypeus small, subcircular, strongly convex, impressed subapically and apex convex, with a median tooth or irregularity. Malar space 0.85× as long as the basal width of mandible. Occipital carina strongly sinuate, joining hypostomal carina far above the base of mandible. Lower tooth of mandible half as long as upper tooth. Upper margin of pronotum swollen, angularly produced at its front end. Epomia long extending to upper edge of pronotum where it turns mesad. Notauli long, sharply impressed; prepectus with a vertical carina opposing lower end of pronotum. Transverse furrow at the base of propodeum shallow, rather wide, with short, strong longitudinal ridges; posterodorsal face of propodeum long, in profile weakly arched, apical transverse carina of propodeum represented by a pair of low crests. Hind tarsal claws of male sharply bent in middle, whereas in female they are with a simple curve. Fore wing 6 to 8 mm long. Areolet (Fig. 130 : a) quite small, about 3× as wide as high, receiving second recurrent vein at centre or a little

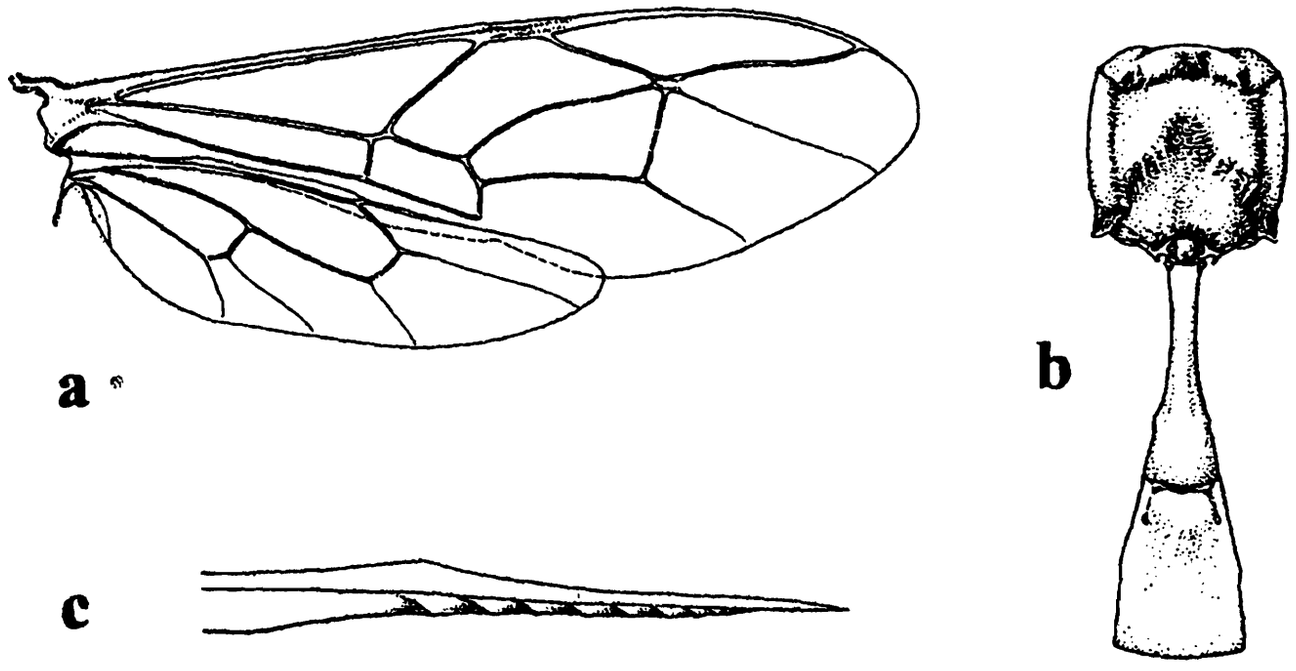

Fig. 130. *Acromia* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

distad of centre, second intercubitus present or absent. Nervulus basad of basal vein by 0.5 its length. Nervellus intercepted at 0.33 below; mediella evenly arched and brachiella present. Petiole (Fig. 130 : b) of first abdominal tergite terete, without longitudinal carinae and without sutures between tergite and sternite, at its base with a weak lateral tooth; apex of first sternite approximately opposite the spiracle. Ovipositor as in figure 130 : c

This genus is represented by two species. One of these viz., *A. punctata* Kamath is wide spread in India, Myanmar and Sri Lanka and other species, *A. striolata* (Cameron) is known from Sumatra, Java and Kalimantan.

The Indian subregion species is discussed below (Kamath, 1970 : 250) :

1. ***Acromia punctata*** Kamath (Fig. 131 : a–c)

1972. *Acromia punctata* Kamath, *Oriental Ins.*, **6** : 250. Male, Female, key, des., fig. Type : Female. India : Kerala : Walayar Forest : Wattapara (GUPTA). India : Jharkhand : Ranchi Dist. : Namkum. Maharashtra : Mahabaleshwar, 1380m; Deolali; Satpura Hills : Chikalda, 1100m; Matheran, 915m. Karnataka : Londa, 670m; Kottegehar, 700m; Bhagmandla, 930m; South Coorg : Tithimati. Tamil Nadu : Palni Hills : Palni; Kodai Hills : Oothu, 1300m; Anamalai Hills : Top Slip. Delhi : Shakli Nagar. Kerala : Nilambur; Thekkady Wild Life Sanctuary; Amarampalam. Uttaranchal : Dehra Dun : Herbertpur. Myanmar : Pyonchaung Res. : N. Toungoo; Yanaungmyin Res. : Pyinmana; Nanhlaing Res. : Shwebo. Mohnyin Res. : Myitkyina; Thitco Res. : Zigon. Sri Lanka : Kandy. Host : *Pyrausta machaeralis.*

1987. *Acromia punctata* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 879.

Female : Face moderately convex medially, closely punctate. Frons with a median pair of small tubercles, antennal scrobes with semicircular aciculations. Occipital carina complete, joining hypostomal carina at a distance 0.4 the basal width of mandible. Pronotum with coarse deep punctures above, middle groove trans-striate, close to collar smooth and shiny, pronotal shoulder striate. Mesoscutum densely punctate. Scutellum, and metascutellum smooth and shiny. Mesopleurum trans-striate, speculum smooth and shiny; prepectal carina 0.7× the height of mesopleurum. Metapleurum striato-rugose, pleural carina absent. Propodeum rugoso-punctate in the centre, basally smooth, apical slope trans-striate, its apical carina almost absent except for lateral crests. Areolet wider than high (2.5× or more), nervulus basad of basal vein by 0.4× its length. First abdominal tergite about 3× as long as wide at apex, tergite largely smooth, second and third tergites with dense punctures, punctures separated by less than their own diameter on basal 0.6, following tergites mat. Ovipositor sheath 0.5 the length of forewing and about 0.9× as long as hind tibia (Fig. 131 : c).

Black. The following are yellowish-white : Face, clypeus, mandible except teeth, malar space, temple below, along inner orbits, 5–15 flagellar segments, pronotal collar, pronotal shoulder, scutellum, metascutellum, lateral carinae, tegula, subtegular ridge, mesopleurum with a broad elongated transverse mark, an inverted V-shaped mark on propodeum (Fig. 131 : a). Fore and middle coxae and trochanters, yellowish-white, their femora, tibia and tarsus yellowish-brown, fifth tarsal segment dark brown. Hind leg (Fig. 131 : b) with coxa black, with an yellow elongate mark above; trochanter, femur, tibia and tarsus yellowish-brown,

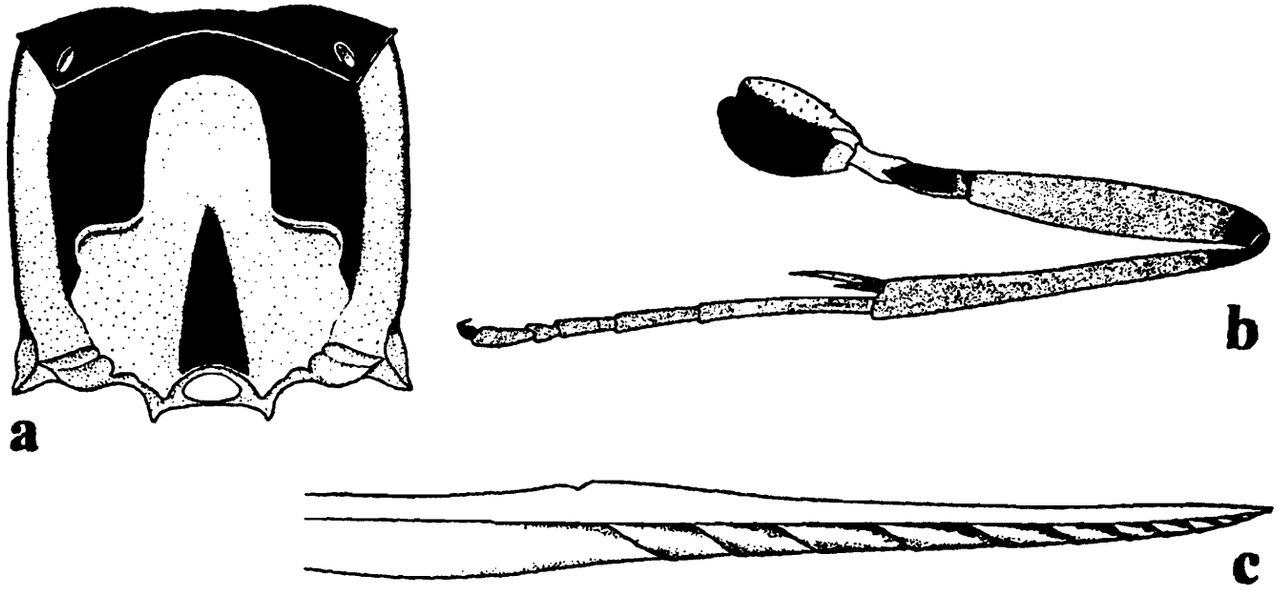

Fig. 131. *Acromia punctata* Kamath : Showing colour pattern : **a**, dorsal view of propodeum; **b**, hind leg; **c**, ovipositor tip. (Source : Kamath, 1972).

except second trochanter joint largely, extreme apex of femur, base of tibia dark brown. Apices of all the abdominal tergites with yellowish bands, band on eight tergites interrupted in middle.

Male : Similar to female in structure and colour, except more slender and polished, and colour little more extensive.

Length : Female, 13 mm; fore wing 8 mm; ovipositor sheath 4 mm. Male, 11 mm; fore wing 8 mm.

Distribution : India : Jharkhand (Ranchi, Namkum, Ambero-Bero). Kerala (Walayar Forest, Wattapara). Maharashtra (Deolali, Chikalda in Satpura Hills, Matheran, 915m). Karnataka (670m, Kottegehar, 700m, Bhagmandla). Tamil Nadu (Palni Hills, Oothu in Kodai Hills, Top Slip in Anamalai Hills). Uttaranchal (Herbertpur nr. Dehra Dun). *Elsewhere* : Myanmar (N. Toungoo, Pyonchaung Res., Pyinmana, Yanaugmyin Res., Shwebo, Nanhlaing Res., Myitkyina, Mohnyin Res., Zigon, Thitcho Res.) and Sri Lanka (Kandy).

Host : *Hapalia machaeralis* Walker (Lepidoptera : Pyralidae).

7 Genus ***Ceratocryptus*** Cameron (Fig. 132 : a–c)

1903. *Ceratocryptus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47(14) : 6. Type-species : *Ceratocryptus bituberculatus* Cameron; designated by Viereck, 1914.

1952. *Pyralophagus* Seyrig, *Mem. Acad. Malgache*, **19**(39) : 198. Syn. by Townes, Townes & Gupta, 1961. Type-species : *Pyralophagus maesac* Seyrig; Original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 184. Townes, 1970 : 313.

Distribution : Afrotropical and Oriental regions.

Body elongate. Frons with a median pair of conical horns. Clypeus strongly convex, apical margin impressed, apical margin without a median tooth or irregularity. Malar space 0.9× as long as basal width of mandible. Occipital carina weakly sinuate to almost straight, joining hypostomal carina above the base of mandible. Lower tooth of mandible about 0.5 as long as upper tooth, upper margin of pronotum strongly swollen, epomia absent. Prepectus with a vertical carina. Notaulus long, sharp and strongly impressed. Propodeum (Fig. 132 : b) very long, its apical carina represented by a pair of low weak crests. Areolet (Fig. 132 : a) 3.5× as wide as high, nervulus basad of basal vein by 0.3 to 0.5 its length. Petiole (Fig. 132 : b) of first abdominal segment terete, without longitudinal carinae and without lateral tooth at base. Ovipositor (Fig. 132 : c) sheath about 1.4× as long as hind tibia.

This is a small genus, occuring in Oriental and Afrotropical regions. In Oriental region this genus is represented by six species. Two species have been recorded

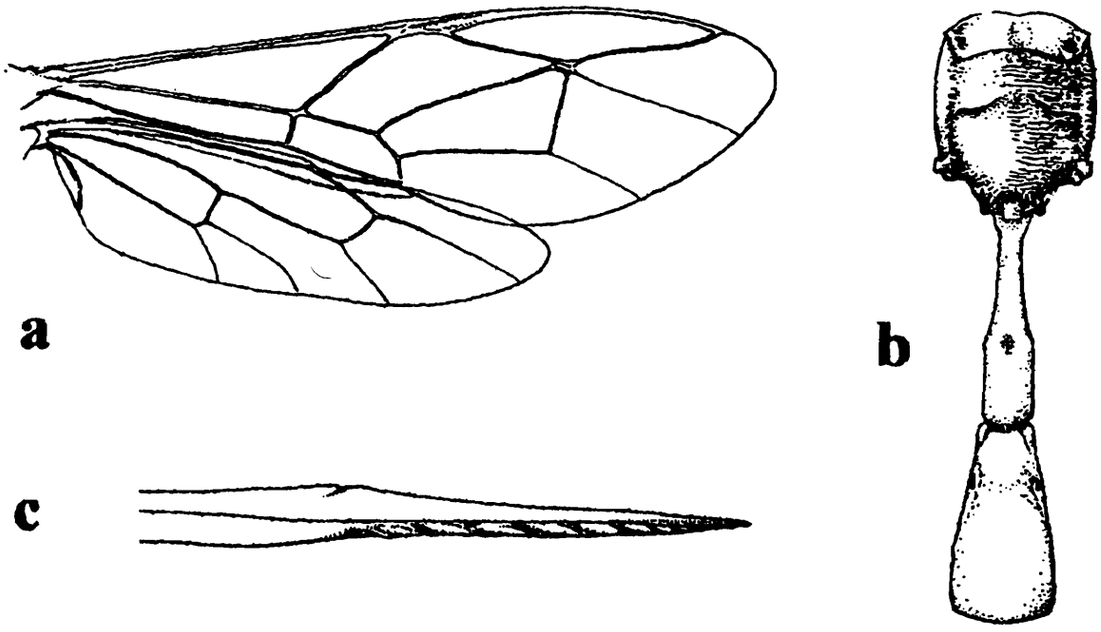

Fig. 132. *Ceratocryptus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

from India and adjacent countries, and these can be distinguished by the following key :

Key to the species of *Ceratocryptus*

1. Face strongly punctate, thickly covered with white hairs. 7th and 8th antennal segments white. Lateral carina of scutellum not marked. Hind coxa yellow, broadly black at base and apex. First abdominal segment black, at base and apex yellow. Apices of second and third tergites, sides of others and apical segment wholly, yellow. India : Meghalaya. Taiwan ..... 1. *bituberculatus* Cameron

– Face smooth, obscurely punctate, sparsely covered with white hairs. 9–14 antennal segments white. Lateral carina of scutellum marked yellow. Hind coxa yellow. Apices of all the abdominal tergites with yellow apical bands. India : Meghalaya. ..... 2. *tibialis* Cameron

1. *Ceratocryptus bituberculatus* Cameron

1903. *Ceratocryptus bituberculatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47(14) : 6. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1903. *Silsila bilineata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47(14) : 4. Male, des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD). Syn. by Uchida, 1932.

1912. *Mesostenus shinshanus* Matsumura, Thousand Insects of Japan, Supplement, 4 : 125. Female, des., fig. Type : Female, Taiwan : Shinsha (SAPPORO?). Syn. by Uchida, 1932.

1916. *Polyaenus striatus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 264. Female, des. Type : Female, Taiwan : Jihyueh Lake (Type Lost). Syn. by Uchida, 1932.

1932. *Ceratocryptus bituberculatus* : Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.,* **33** : 182. Male, Syn. Taiwan : Kankau.

1961. *Ceratocryptus bituberculatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 184. India, Taiwan.

1984. *Ceratocryptus bituberculatus* : Chiu *et al.,* spcl. Publ. Taiwan Agri. Res. Inst., **15** : 20. correction of locality names. Taiwan : Hsinshe; Kangkau; Kueitzuchiao; Sunmoon Lake.

1987. *Ceratocryptus bituberculatus* : Gupta, *Mem. Amer. Ent. Inst.,* 41 : 881.

This species can easily be distinguished by having face strongly punctate, thickly covered with white hair. 7th and 8th antennal segments white; Lateral carina of scutellum not marked (Black). First abdominal tergite as base and apex, apices of second and third and sides of others and last tergite wholly, yellow.

Female : Face strongly punctate, thickly covered with white hair. Clypeus smooth, somewhat projecting. Pronotum with a few scattered punctures above, in scrobe longitudinally striated, rest of pronotum smooth. Mesoscutum somewhat convex, middle lobe distinctly separated from lateral lobes. Scutellum and metascutellum smooth. Mesopleurum in general striated, subtegular ridge in middle and below smooth, sternaulus deep, long and curved. Propodeum at base smooth, rest strongly transversely striated. Metapleurum rugoso-punctate, thickly covered with pale hair. Areolet small, narrow. Petiole long and slender, smooth; second tergite smooth and shiny at base, at apex densely punctate; third and fourth tergites closely punctate.

Black. Scape in middle above and a band on 7 and 8 flagellar segments, white. The following are yellow : Face, clypeus, mandible except teeth, palpi, frons and vertex along the eye margin, temple above along the eye margin, scutellum broadly at base, metascutellum, pronotum at base, mesopleurum with a large curved mark, mark on prepectus, base of hind wing, metapleurum at base, propodeum with two lateral oblique markes at apex, hairs on metapleurum, first abdominal tergite at base and apex, apices of second and third and rest of the tergites laterally and last tergite wholly. Legs in general yellow, coxae and trochanters white. Hind leg with coxa white, broadly black at apex and base, trochanters, apex of femur, base of tibia narrowly and apex broadly, black; its first tarsal segment broadly at base, apex of fourth and fifth wholly, black, rest of tarsus white.

Male : Similar to female in colour and sculpture.

Length : Female, 19 mm; fore wing 11 mm; ovipositor sheath about 7 mm.

Distribution : India : Meghalaya (Khasi Hills). *Elsewhere* : Taiwan (Shinsha; Jihyueh Lake; Kuraru; Kankau; Hsinshe; Kangkou; Kueitzuchio; Sunmoon Lake).

2. *Ceratocryptus tibialis* Cameron

1903. *Ceratocryptus tibialis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47(14) : 8. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Ceratocryptus tibialis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 185. India.

1987. *Ceratocryptus tibialis* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 882. Syn.

This species can be distinguish from *C. bituberculatus* Cameron by having face smooth, sparsely covered with white hair; 9 to 14 antennal segments, white; lateral carina of scutellum marked yellow; hind coxa yellow and apices of all the abdominal tergites with yellow apical bands.

Female : Face smooth, obscurely punctate. Clypeus smooth and shiny, covered with sparse white hair. Frons and vertex shagreened, with sparse blackish hair. Ocellar triangle area raised, with usual median pair of short horns on frons. Pronotum punctate above, in scrobe finely striated. Mesoscutum smooth and shiny, at base and apex covered with sparse long black hairs. Scutellum and metascutellum smooth. Mesopleurum strongly punctate, in the middle and above coarsely and irregularly rugoso-striate, tending to be reticulate. Mesopleurum finely punctate, sternaulus shallow, wide and smooth. Propodeum at base smooth, rest trans-striate.

Black. 9–14 antennal segments white; scape sparsely covered with black hair, flagellum densely covered with short pile. The following are yellow : whole of inner orbits narrowly, temple broadly along the orbit below, face in middle, clypeus except for a central triangular mark, mandible except teeth, labrum, palpi, pronotum with a broad line, scutellar keels, scutellum in middle, metascutellum, mesopleurum with tegula, subtegular ridge, a large mark longer than broad in middle, a curved mark on mesosternum below sternaulus, a mark just above the base of hind coxa on metapleurum, propodeum with two lateral marks, and apices of all the abdominal tergites. Legs in general yellow, except anterior tarsi blackish-brown; hind tibia blackish, tarsi white, except basal half of first tarsal segment and apex of fifth segment black.

Male : Not known.

Length : Female, 19 mm; fore wing 10.5 mm; ovipositor sheath about 0.5 mm.

Distribution : India : Meghalaya (Khasi Hills).

8. Genus ***Thelodon*** Townes (Fig. 133 : a–c)

1961. *Thelodon* Townes, *Mem. Amer. Ent. Inst.*, 1 : 185, 473. Type-species : *Silsila spilonota* Cameron; original designation.

Taxonomy : Townes, 1970 : 314. Gauld, 1984 : 177.

Distribution : Indo-Australian region.

Body slender. Frons without horns or with a single median horn, the median horn sometimes with a tubercle or shoulder on each side. Apical margin of clypeus without a median tooth or irregularity. Malar space 0.65× as long as basal width of mandible. Occipital carina weakly to moderately sinuate, joining hypostomal carina a distance above the base of mandible. Lower tooth of mandible about half as long as upper tooth. Lower edge of mandible often with a small preapical tooth or lobe. Upper margin of pronotum protuberant. Epomia absent. Prepectus with or without a vertical carina. Notaulus long, sharply impressed. Propodeum (Fig. 133 : b) moderately long; its apical carina absent or represented by a small pair of well separated crests. Areolet (Fig. 133 : a) quite small about 3× as wide as high; nervulus distad of basal vein about 0.25 its length. First abdominal tergite without longitudinal carinae, at base with small lateral tooth. Ovipositor tip as in figure 133 : c and its sheath about 1.3× as long as hind tibia. Fore wing 6.5–10mm long.

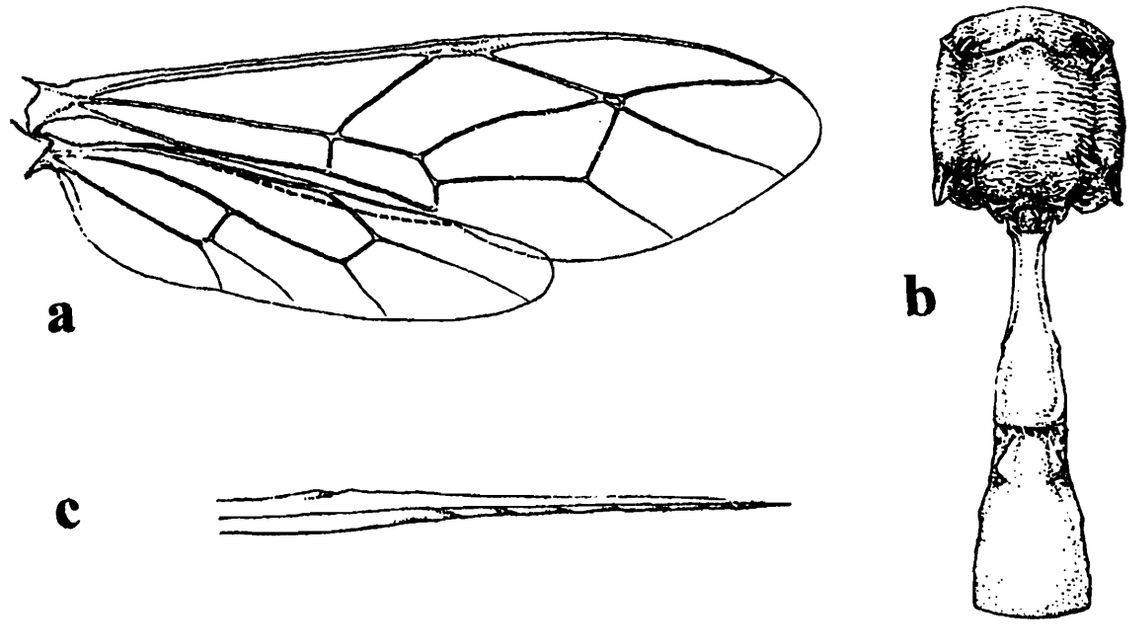

Fig. 133. *Thelodon* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

This is a moderate sized genus, distributed in Indo-Australian region. This genus has not been recorded from India so far, however, one species is known from Myanmar.

1. ***Thelodon spilonota*** (Cameron)

1907. *Silsila spilonota* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **19** : 180. Male. des. Type : Male, Myanmar : Tenasserim : Haundraw Valley (LONDON).

1961. *Thelodon spilonota* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 185. Myanmar.

1987. *Thelodon spilonota* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 882.

Male : Face moderately strongly punctate. Clypeus with a few scattered punctures. Frons and vertex largely smooth, frons with a short median carina and a few striae on frons below. Mesoscutum largely smooth, its outer lobes infront with irregular reticulation. The area at sides of scutellum with irregular striae. Pronotum and mesopleurum longitudinally striated. Mesoplerum below strongly punctate. Metapleurum strongly punctate above, punctures distinctly separated, punctures below coarse and running into reticulation. Propodeum at sides strongly punctate and rest stoutly transversely reticulate. Pronotum and mesoscutum with sparse hair; propodeum much more densely pilose and with long hair.

Black. Antenna with a broad white band in the middle. The following are yellow : face, clypeus, inner orbits and outer orbits on lower third, malar space, mandibles (except the teeth), pronotum below, tegula, an oval mark at the apex of the middle lobe of mesoscutum, scutellum, lateral carina of scutellum, large curved mark at the base of hind wing, apical slope of propodeum (the apex in center with a black line), lower edge of propleurum, mesopleurum with a broad mark below, a curved mark at the apical half of the sternal furrow, a large elongated conical mark on the metapleurae and broad bands on the apices of abdominal segments. Fore and middle legs in general pale-yellow, infuscate above. Hind leg : coxa black, broadly yellow in the middle above, trochanters black, femur yellow, its base narrowly and apex broadly black, tibia yellow tinged with brownish-yellow, its base narrowly and apical 0.25 black, tarsi white except fifth segment black. Wings hyaline, its stigma and veins black.

Female : Not known.

Length : Male, 13–14 mm.

Distribution : Myanmar (Tenasserim : Haundraw Valley).

IX. TRIBE OSPRYNCHOTINI = NEMATOPODIINI

This tribe is mainly distinguished by having mandible about 4.5× as long as its width at the middle, upper tooth much longer than lower tooth, lower tooth sometimes indistinct; first abdominal tergite slender, only a little widened apically.

Body of moderate proportions to slender. Frons without horns or carinae, sometimes with a weak median carina. Clypeus wide, without a median tooth or lobe. Mandible long and narrow (4.5×), its upper tooth much longer than lower tooth, lower tooth short or sometimes absent. Flagellum rather slender, ending in a rounded point. Upper margin of pronotum not swollen to moderately swollen. Epomia moderately long or absent. Notaulus sharp, reaching past centre of mesoscutum. Sternaulus sinute, reaching up to middle coxa, sometimes various. Mesopleural fovea a short distance to far in front of mesopleural suture, sometimes connected with the suture by a groove. Median section of postpectal carina usually long, short or absent. Propodeum long or short, its basal transverse carina sharp and complete, spiracle short, elongate or elliptic; apical transverse carina present or absent, without sublateral teeth or crests. Fourth segment of female tarsi usually weakly bilobed at apex. Ramulus usually absent. Areolet large to very small, when small, open at apex. Nervulus basad, opposite, or distad of second recurrent vein. Brachiella present or absent. Tip of axillus usually converging towards anal margin. First tergite nearly always slender, almost parallel sided, apex only weakly expended apically. Base of first tergite often with a lateral triangular expansion. Ovipositor sheath 0.56 to 5.6× as long as hind tibia. Ovipositor tip various, often with lower valve enclosing upper valve.

Most species are tropical in distribution. In India this tribe is represented by two genera.

Key to genera of tribe Osprynchotini

1. Areolet large, 0.6 to 0.8× as high as the total length of second recurrent vein. Malar space about 0.8× the basal width of mandible. Axillus vein rather long and distant from anal margin of hind wing. Northern Hemisphere.... ..... 1. ***Acroricnus*** Ratzeburg

– Areolet small, less than 0.35× as high as the total length of second recurrent vein. Malar space about 0.4× the basal width of mandible. Axillus vein very short and close to anal margins of hind wing. Oriental & Palaearctic regions. ..... 2. ***Nematopodius*** Gravenhorst

1. Genus *Acroricnus* Ratzeburg (Fig. 134 : a–c)

1852. *Acroricnus* Ratzeburg, *Ichneumoniden der Forstinsection*, **3** : 92. Type-species : (*Acroricnus schaumii* Ratzeburg) = *stylator* Thunberg; monobasic.

1855. *Xenodocon* Foerster, *Verh. Naturh. Ver. Rheinlande,* **12** : 237. Syn. in Dalla Torre, 1902. Type-species : (*Xenodocon ruficornis* Foerster) = *seductor* Scopoli; monobasic.

1855. *Macrobatus* Holmgren, *Svenska Vetensk Akad. Handl.* **75** : 50. Syn. in Dalla Torre, 1902.

1865. *Linoceras* Taschenberg, *Ztschr. Gesam. Naturw. Halle,* **25** : 8, 105. Syn. in Dalla Torre, 1902. Type-species : (*Cryptus macrobatus* Gravenhorst) = *stylator* Thunberg; designated by Viereck, 1914.

1896. *Leptobatides* Buysson, *In* Andre : Species des Hymenopteres d'Europe & d'Algerie, **6** : 678, pl. 3. Type-species : *Leptobatides abeillei* Buysson; monobasic.

1900. *Agathobanchus* Ashmead, *Proc. U.S. Nalt. Mus.,* **23** : 97. Syn. by Cushman & Gahan, 1921. Type-species : (*Banchus aequatus* Say) = *stylator aequatus* Say; original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 190. Townes, 1970 : 323.

Hosts : Nests of Eumenidae.

Distribution : Northern Hemisphere.

This genus can easily be recognised by having areolet large; malar space about 0.8× the basal width of mandible and axillus vein distant from anal margin of hind wing.

Malar space about 0.8× the basal with of mandible. Occipital carina complete, or its lower end not reaching hypostomal carina. Apical transverse carina of propodeum complete, sometimes weak, without sublateral crests. Last segment

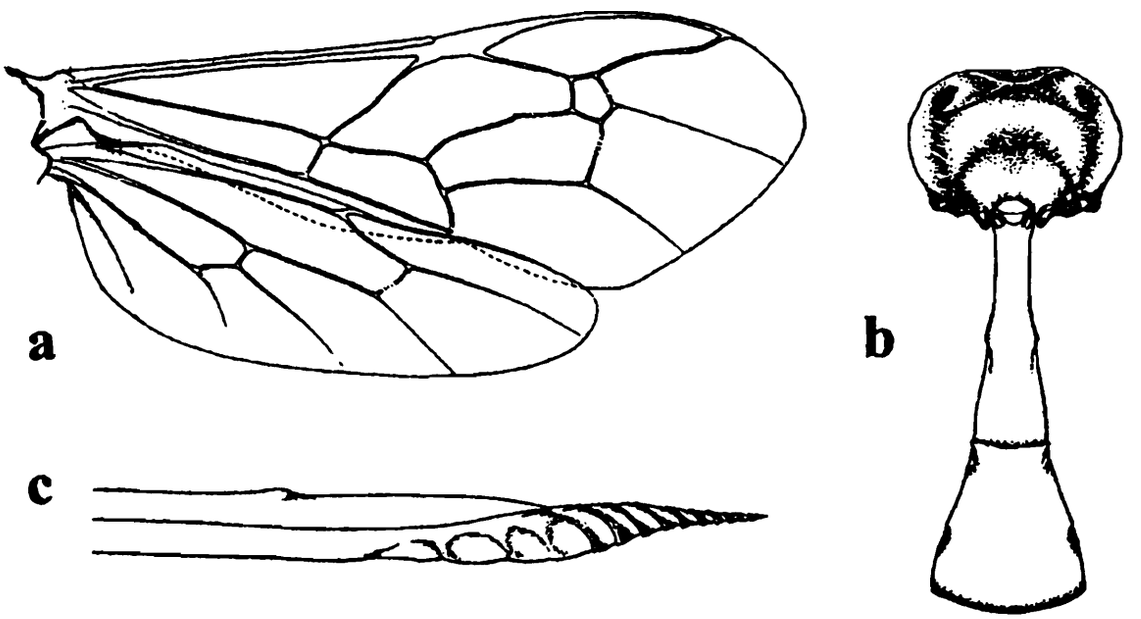

Fig. 134. *Acroricnus* Ratzeburg : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

of hind tarsus with a group of large midventral bristles, usually four in a group. Areolet large 0.6 to 0.8× as high as the total length of second recurrent vein. Nervulus a little distad of basal vein. Nervellus intercepted above the middle. Axillus vein rather long and distant from the anal margin of hind wing. First tergite with its spiracle near the apical 0.46. Ovipositor upcurved, its sheath about 1.3× as long as hind tibia, tip depressed, the lower valve enclosing upper valve; lower valve with vertical ridges, upper valve smooth.

This is a small genus widely distributed in northern hemisphere. Parasites of euminids, especially *Eumenes.*

In India and adjacent countries this genus is represented by a single species.

1. ***Acroricnus peronatus*** (Cameron)

1902. *Osprynchotus peronatus* Cameron, *Entomologist,* **35** : 182. Male, Female. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : Female, India : Meghalaya : Khasi Hills (OXFORD).

1905. *Linnoceras(!) peronatus* : Cameron, *Spolia Zeylanica,* **3** : 97. n. comb.

1908. *Acroricnus peronatus* : Schmiedeknect, *Genera Insectorum,* **75** : 14. n. comb.

1914. *Acroricnus peronatus* : Morley, *Entomologist,* **47** : 23. Syn. des. India : Himachal Pradesh : Kangra Valley; Simla. Meghalaya : Khasi Hills : Shillong; Labatach. Sikkim.

1914. *Acroricnus peronatus* : Morley, *Entomologist,* **47** : 172 key, syn., des. India : Himachal Pradesh : Kangra Valley, 300m; Simla. Uttaranchal : Dehra Dun. Meghalaya : Khasi Hills. Mizoram : Lushai Hills, 1000m. Sikkim, 550 m.

1916. *Acroricnus cingulatus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 242. Female. key, des. Type : Female, Himalayas (BUDAPEST). Syn. by Townes, Townes & Gupta, 1961.

1941. *Linoceras peronatus* : Betrem, *Treubia,* **18** : 55. key.

1961. *Acroricnus peronatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 191. lectotype design., syn. India.

1964. *Acroricnus* sp : Iwata, Nature & life in Southeast Asia, **3** : 342. biol. Thailand : Chiang Mai : Hoi Keo Valley. Host : *Orancistrocerus aterrimus erythropus.*

1968. *Acroricnus peronatus* : Momoi, *Kantyu,* **36** : 340. Male, Female. Syn. notes. Thailand : Chiang Mai : Hoi Keo Valley; Doi Sutep; Naborn; Kao Chong Park. Malaysia : Malaya : Ulu Langat, Selangor, 300-390m. Host : *Orancistrocerus aterrimus erythropus.*

1987. *Acroricnus peronatus,* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 892. Syn.

Female and Male : Face closely and clypeus more coarsely and moderately sparsely punctate. Vertex strongly punctate, and with a few oblique striae below the ocelli. Frons depressed, at sides very smooth and shiny. Mesoscutum closely and strongly punctate, thickly covered with short white hair. Scutellum shiny and also covered with long white hair and sparsely punctate. Metascutellum impunctate. Propodeum at base behind basal transverse carina closely punctate, punctures stronger towards the apex, area between basal and apical carinae coarsely punctate, and apically rugose. Pronotum, propleurae and mesopleurae closely punctate. Metapleurum more strongly punctate, punctures running into striations, and are stronger on the lower side. Areolet a little longer than wide, slightly narrower at the top than at the bottom; recurrent nerve received little beyond the middle, second transverse cubital with bulla on the lower side.

Black. 10th to 15th antennal segments white above, scape yellow below and covered with short white hair. The following are yellow : face, except a triangular mark between the antennal sockets, clypeus, labrum, inner orbit above and outer more broadly below, palpi, mesopleurum broadly, tegula, scutellum except at base, metascutellum, lateral carina of scutellum, propodeum at base and sides, area at the base of hind wing, metapleurum with a large mark, twice longer than broad. Legs in general brownish-yellow, except all the coxae, trochanters, apical half of hind femora and apical 0.33 of middle and hind tibiae black; hind tarsi with more yellowish hue, and more black at the base. Abdomen black with all the tergites with yellow apical bands.

Length : Female & Male, 16 mm; ovipositor 6 mm.

Distribution : India : Himachal Pradesh (Shimla, Kangra Valley). Sikkim. Uttaranchal (Dehra Dun). Assam? Mizoram (Lushai Hills). Meghalaya (Shillong, Khasi Hills, Labatach). *Elsewhere* : Thailand (Hoi Keo Valley : Chiang Mai; Doi Sutep; Naborn; Kaochong Park). Malaysia : Malaya (Ulu Langat, Selangor, 300–390m).

Host : *Orancistrocerus aterrimus erythropus.*

2. Genus ***Nematopodius*** Gravenhorst

This genus is mainly recognised by having very small areolet; malar space about 0.4× the basal width of mandible; axillus very short and close to anal margin of hind wing.

Malar space about 0.4× as long as basal width of mandible. Occipital carina entirely absent, or present only above. Last segment of hind tarsus without enlarged midventral bristles. Areolet very small, the first intercubitus basad of second recurrent vein, second intercubitus absent. Nervulus basad of basal vein.

Nervellus intercepted at, a little below, or usually above the middle. Axillus vein very short and close to anal margin of hind wing. Spiracle of first tergite in the middle. Ovipositor sheath about 0.56 to 1.4× as long as hind tibia, tip straight, compressed, narrowly sagittate, its lower valve with a few weak teeth, without dorsal lobe.

This is a moderate size genus occuring in Oriental and Palaearctic regions. The genus is divisible into 3 subgenera.

Key to the subgenera of *Nematopodius*

1. Occipital carina present dorsally. Apical transverse carina of propodeum represented by lateral vestiges. Oriental Region ..... 2a. Subgenus ***Nematopodius*** Gravenhorst

– Occipital carina entirely absent 2

2. Epomia not reaching upper margin of pronotum and not ending dorsally in a tooth. Male clasper an apically rounded scale. Indo-Papuan area ..... 2b. Subgenus ***Diapetus*** Cameron

– Epomia reaching upper margin of pronotum, where it ends dorsally in a prominent tooth. Male clasper rod-like. Oriental Region ..... 2c. Subgenus ***Microchorus*** Szépligeti (not known from India)

2a. Subgenus *Nematopodius (Nematopodius)* Gravenhorst (Fig. 135 : a–c)

1829. *Nematopodius* Gravenhorst, *Ichneumonologia europea,* **2** : 955. Type-species : *Nematopodeus formosus* Gravenhorst; designated by Viereck, 1914.

1903. *Leptocryptus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc,* **47** (14) : 14. Name preocc. by Thomson, 1873. Syn. by Schmiedeknecht, 1908. Type-species : *Leptocryptus longiventris* Cameron; monobasic.

1911. *Hemiphatnus* Cameron, *Entomologist,* **44** : 63. Syn. by Townes, Townes & Gupta, 1961. Type-species : *Hemiphatnus nigripalpis* Cameron; monobasic.

1939. *Pseudopimpla* Fahringer, *Contbl. f. d. Gesam. Forstw.,* **61** : 147. Name preocc. by Habermehl, 1917. Syn. by Townes, 1970. Type-species : (*Pseudopimpla anisandri Fahringer*) = *Nematopodius formosus* Gravenhorst; monobasic.

Taxonomy : Townes, 1957 : 107. Townes, Townes & Gupta, 1961 : 187. Townes, 1970. 322.

Distribution : Oriental and Palaearctic regions.

Occipital carina present dorsally, absent ventrally. Epomia not reching upper margin of pronotum and not ending dorsally in a tooth. Apical transverse carina of propodeum represented by lateral vestiges. Male clasper an apically rounded scale.

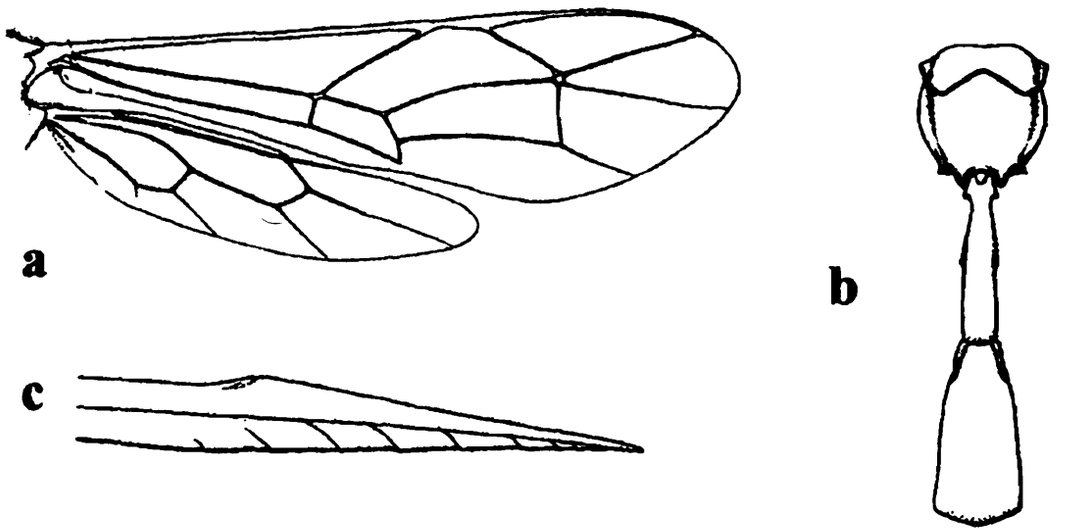

Fig. 135. *Nematopodius* Gravenhorst : **a**, fore and hind wings showing vention; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Townes (1970) reported one species from Europe, three from Japan and three from the Oriental region. Only one species is knwon from Indian subregion.

1. ***Nematopodius (Nematopodius) longiventris*** (Cameron)

1903. *Leptocryptus longiventris* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 15. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1908. *Nematopodius longiventris* : Schmiedeknecht, *Genera Insectorum*, **75** : 49. n. comb.

1961. *Nematopodius (Nematopodius) longiventris* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 187. n. status. India.

1987. *Nematopodius (Nematopodius) longiventris* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 886.

Distribution : India : Meghalaya (Khasi Hills).

Remarks : No details regarding this species were available to the author.

2b. Subgenus ***Nematopodius (Diapetus)*** Cameron

1902. *Diapetus* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, **37** : 53. Type-species : *Diapetus nigroplagiatus* Cameron; monobasic.

1904. *Mesostenopsis* Schmiedeknecht, *Opuscula Ichneumonologica*, **2** : 561. Syn. by Townes, Townes & Gupta, 1961. Type-species : *Earrana lutea* Cameron; designated by Townes, Townes & Gupta, 1961.

1905. *Earrana* Cameron, *Spolia Zeylanica*, **3** : 119. Syn. by Cushman, 1931. Type-species : *Earrana lutea* Cameron; monobasic.

1913. *Parca* Morely, *Revision of the Icheumonidae in the British Museum,* **2** : 102, 133. Name preocc. by Saalmueller, 1891. Syn. by Cushman, 1932. Type-species : (*Parca ocularia* Morley) = *luteus* Cameron; monobasic.

1922. *Esuchonematopodius* Cushman, *Philippine J. Sci,* **20** : 567. Syn. by Townes, 1957. Type-species : *Esuchonematopodius luzonensis* Cushman; original designation.

Taxonomy : Townes, 1957 : 107. Townes, Townes & Gupta, 1961 : 187. Townes, 1970. 322.

Distribution : Indo-Papuan area.

Occipital carina entirely absent. Epomia not reaching upper margin of pronotum and not ending dorsally in a tooth. Apical transverse carina of propodeum complete, incomplete, or absent. Male clasper an apically rounded scale.

Several species are known in Indo-Papuan area. Only two species are reported from India and Sri Lanka.

Key to the species of *Nematopodius (Diapetus)*

1. Body comparatively greenish-yellow with black markings dorsally. Apical transverse carina of propodeum broadly interrupted medially. Metapleurum with rugosities. India : Sikkim ..... 1. *nigromaculatus* (Cameron)

– Body largely reddish-yellow. Apical transverse carina of propodeum almost absent. Metapleurum without rugosities, sparsely and shallowly punctate. Sri Lanka; Malaya; Indonesia; Philippines..... 2. *luteus* (Cameron)

1. *Nematopodius (Diapetus) nigromaculatus* (Cameron)

1907. *Earrana nigromaculata* Cameron, *Tijdschr. v. Ent.,* **50** : 93. Female. des. Type : Female, India : Sikkim? (LONDON).

1932. *Diapetus (Diapetus) nigromaculatus* : Cushman, *Philippine J. Sci.,* **49** : 281. n. comb., key des. India : Sikkim.

1961. *Nematopodius (Diapetus) nigromaculatus* : Townes, Townes & Gupta, 1961, *Mem. Amer. Ent. Inst.,* **1** : 188. n. comb, India.

1987. *Nematopodius (Diapetus) nigromaculatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 888. Syn.

Female : Body smooth and shiny. Mesoscutum at the apex of middle lobe strongly striated, notauli deep with transverse carinae. Propodeum striate basad of basal carina, apical transverse carina interrupted in the middle. Nervellus intercepted slightly above the middle. Spiracle of the first abdominal segment present shortly behind the middle.

Black. Face, clypeus and mandible yellow; vertex largely, base of the middle and greater part of the lateral lobes of the mesoscutum and two broad bands on propodeum, yellowish. Wings highly iridescent, hyaline. Scope of antenna dark yellow, flagellum brownish at base.

Length : Female, 11 mm; fore wing 9 mm; ovipositor sheath 2.5 mm.

Distribution : India : Sikkim.

2. ***Nematopodius (Diapetus) luteus*** (Cameron)

1905. *Earrana luteus* Cameron, *Spolia Zeylanica,* **3** : 120. "Female"= Male. des., fig. Type : Male, Sri Lanka : Kandy (LONDON).

1913. *Parca ocularia* Morley, *Revision of the Ichneumonidae in the British Museum,* **2** : 133. Female. des. Type : Female, Sri Lanka : Kandy (LONDON). Syn. by Cushman, 1932.

1913. *Parca ocularia* : Morley, *Fauna of British India, Hymenoptera,* **3** : 361. Female. des., fig. Sri Lanka : Kandy.

1924. *Earrana ocularia* : Cushman, *Proc. U.S. Natl. Mus.,* **64** (20) : 4. n. comb.

1932. *Diapetus (Diapetus) luteus* : Cushman, *Philippine J. Sci.,* **49** : 283. key. Syn., des.

1932. *Diapetus (Diapetus) dissipus* : Cushman, *Philippine J. Sci.,* **49** : 285. Male, Female. key, des. Type : Female, Philippines : Mindanao : Illigan (WASHINGTON). Philippines : Mindanao : Dapitan; Butuan; Kolambugan; Zamboaga; Basilan. China : Hainan Is. : Nam Cha Chuen, SW Nodoa. Indonesia : Java : Bogor. Malaysia : Penang Is. Syn. by Townes, Townes & Gupta, 1961.

1957. *Nematopodius (Diapetus) dissipus* : Townes, Townes & Gupta, *Proc. Ent. Soc. Washington,* **59** : 106. n. comb.

1961. *Nematopodius (Diapetus) luteus* : Townes, Townes & Gupta, 1961, *Mem. Amer. Ent. Inst.,* **1** : 188. Syn. Sri Lanka. Hainan Is. Java : Penang Is. Philippines.

1987. *Nematopodius (Diapetus) luteus*, Gupta, *Mem. Amer. Ent. Inst.,* **41** : 887. Syn.

Morely (1913) gave the following brief description :

Body polished, slender, largely reddish-yellow in colour; except eyes, ocelli, tip of mandibles, flagellum, ovipositor sheath, hind tarsus, stigma, costa, black. Hind femur and tibia brownish. Metanotum smooth and shiny and mesopleurum punctate.

Body : 11 mm.

Distribution : Sri Lanka (Kandy). Philippines : Mindanao (Dapitan; Butuan; Kolambugan; Zamboanga; Basilan). China : Hainan Is. (Nam Cha Chuen, SW Nodoa). Indonesia : Java (Bogor). Malaysia (Penang Is.).

X. THE TRIBE GABUNIINI

The members of this tribe are recognised by having body small to rather large-sized, usually subcylendric. Head usually swollen and large. Clypeus wide, truncate or subtruncate with a median apical tooth and often with a submarginal transverse ridge. Mandible mostly tapered apically, sometimes short and stout, lower tooth usually longer than the upper, sometimes lower tooth shorter than the upper (eg. *Tanepomidos*). Occipital carina joining hypostomal carina, except in *Microstenus* and *Eurycryptus,* where hypostomal carina absent apically and not joining occipital carina. Frons without a horn-like protuberance. Temple short to moderately long, usually swollen. Thorax elongate with notauli and sternauli distinct and well defined. Pronotal collar normal or swollen. Epomia various. Hind rim of metanotum without an angular projection at each side of metascutellum. Propodeum moderately long, its spiracles circular to elongate. Basal transverse goove of propodeum deep and wide. Basal trnasverse carina of propodeum complete, interrupted medially, or sometimes absent; apical carina present or absent, or represented by sublateral crests. Pleural carina of propodeum between basal transverse carina and hind coxa present or absent. Fore tibia of female moderately to strongly swollen with a constriction at base. Fourth tarsal segment of female not bilobed at apex, with an apical group of stout bristles. Ramulus absent. Areolet in fore wing large to small, outer side sometimes open. Nervulus opposite, basad or far basad of basal vein. Mediella straight to rather strongly arched. Nervellus intercepted. below middle, near middle or sometimes above the middle. Brachiella present; tip of axillus converging towards anal margin except in *Dinocryptus.* Abdomen spindle shaped in female, cylindrical in males. First tergite stout, with or without a basolateral tooth on either side, its spiracle at or near middle, its ventrolateral and dorsolateral carinae various. Second tergite sometimes with a V-shaped impression. Ovipositor long without a distinct node. Tip of lower valve with a dorsal lobe partly or completely enclosing the upper valve, ridges on lower valve vertical or weakly slanted.

Species of this group are parasitic upon lepidopterous and coleopterous larvae in woody stems, tree trunks etc.

A total of 26 genera are known from the World, of which 15 genera occur in the Oriental Region and 12 in India and adjacent countries.

Gupta and Gupta (1983) have revised this tribe and their findings and descriptions are largely followed here.

Key to the Indian genera of tribe Gabuniini

1. Pleural carina of propodeum present between basal transverse carina and the hind coxa 2

– Pleural carina of propodeum absent between basal transverse carina and the hind coxa 6

2. Base of first tergite without a lateral triangular tooth, but in some females with a small rounded lateral flange 3

– Base of first tergite with a lateral triangular tooth, the tooth pointed and acute or subacute in females, blunt and often indistinct in males 5

3. Areolet quite large, about 0.65× as high as the length of second recurrent vein. First tergite with complete dorsolateral carinae. Clypeus with a pair of weak tubercles along its apical margin. Oriental Region ..... 1. ***Apocryptus*** Uchida

– Areolet of moderate size or small, less than 0.45× as high as the length of second recurrent vein. First tergite without a dorso-lateral carina or with an incomplete one. Clypeus with or without a subapical weak to strong ridge; its apical margin with a small weak to almost indistinct tooth 4

4. Areolet of moderate size, 1.6 to 2.0× as wide as high, receiving second recurrent vein near its apical 0.3. Clypeus with a strong transverse ridge just below the center, the ridge with a median transverse tubercle or pair of transverse teeth. Basal transverse carina of propodeum faint. Apical transverse carina forming lateral crests. Indo-Papuan area ..... 2. ***Dinocryptus*** Cameron

– Areolet small, about as wide as high, receiving second recurrent vein near or somewhat distad of the middle. Clypeus with or without a strong transverse ridge, the ridge, when present, without a median tubercle or pair of teeth. Basal transverse carina of propodeum strong. Apical transverse carina not forming lateral crests. (Nervellus intercepted near its upper 0.37). Southern Palaearctic Region and Myanmar. ..... 3. ***Pterocryptus*** Szépligeti

5. Mandible short and stout, its lower tooth shorter than the upper. Epomia long reaching to the upper margin and then turned mesad. Apical carina of propodeum present and first tergite with distinct dorso-median carinae. India..... ..... 4. ***Tanepomidos*** Gupta & Jonathan

– Mandible tapered apically, its lower tooth longer than the upper. Epomia short. Apical carina of propodeum present to obsolescent, forming faint lateral crests and first tergite without dorso-median carinae. Indo-Papuan area..... ..... 5. ***Xoridesopus*** Cameron

6. First tergite without a lateral triangular tooth at base. Clypeus with a strong transverse ridge near its apical 0.35. Sternaulus weak. Oriental and eastern Palaearctic regions ..... 12. ***Torbda*** Cameron

– First tergite with a lateral triangular tooth at base. Clypeus without a transverse ridge. Sternaulus moderately strong 7

7. Upper part of face just below antennal sockets with a median horn-like protuberance. Oriental Region ..... 6. ***Hadrocryptus*** Cameron

– Upper part of face normal, wothout any horn or protuberance 8

8. Clypeus with a median apical tooth 9

– Clypeus without a median apical tooth 10

9. Nervellus intercepted near its lower 0.33. Oriental Region .... 11. ***Dagathia*** Cameron

– Nervellus intercepted near its upper 0.45. Oriental and Australian regions .... 10. ***Arhytis*** Townes

10. Apical transverse carina of propodeum absent. (Clypeus with a median transverse ridge. Areolet small. Propodeum densely reticulo-punctate). Palaearctic, Oriental and Ethiopian regions ..... 9. ***Schreineria*** Schreiner

– Apical transverse carina of propodeum complete 11

11. Propodeum with a median and a sublateral longitudinal groove between its basal and apical carinae. First tergite margined dorsolaterally by a carina between its spiracle and apex. Oriental Region ..... 7. ***Microstenus*** Szépligeti

– Propodeum without such longitudinal grooves. First tergite not margined dorsolaterally by a carina between its spiracle and apex. Oriental and Ethiopian regions ..... 8. ***Eurycryptus*** Cameron

1. Genus ***Apocryptus*** Uchida (Fig. 136 : a–c)

1932. *Apocryptus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 170. Type-species : *Apocryptus Issikii* Uchida; Original designation.

Taxonomy : Townes, Townes & Gupta, 1961 : 197. Townes, 1970 : 329. Gupta & Gupta, 1983 : 15. Chiu *et al.* 1984 : 21.

Distribution : Oriental Region.

Body moderately slender to large. Clypens with apical margin truncate and with a weak pair of tubercle or irregularities at the middle. Mandible with more or less equal teeth. Frons without a horn or median carina. Epomia long and strong. Notaulus deep and long, sternaulus sharp and reaching 0.65 the distance to middle coxa. Juxtacoxal carina present. Pleural carina and basal and apical transverse carinae of propodeum complete and strong; the apical carina forming a weak to moderately strong sublateral crest, carina variable, complete or absent medially (as in *A. tikari*). Propodeal spiracles oval or elongate-oval. Areolet in fore wing approximately square, about 0.65 as high as length of second recurrent vein. Nervulus opposite basal vein. Nervellus intercepted at its lower 0.2 to 0.4. First abdominal tergite moderately long to slender, without baso-lateral tooth, its dorso-lateral carina complete, dorso-median carinae absent. Second tergite mat, finely punctate. Ovipositor sheath 0.9× as long as hind tibia, its tip with 7–10 vertical or weakly oblique teeth.

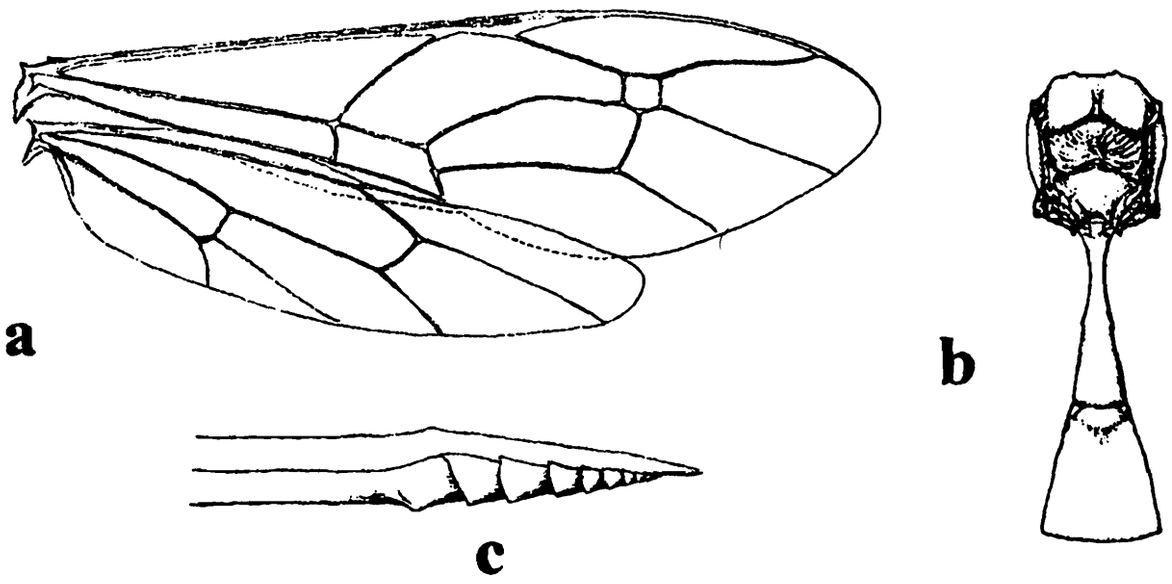

Fig. 136. *Apocryptus* Uchida : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes 1970).

This genus is mainly identified in having a large areolet, nervulus opposite basal vein, apical transverse carina forming weak to moderately strong sublateral crests and apical margin of clypeus with a weak pair of tubercles or irregularities at the middle.

This is a moderate sized genus restricted to Oriental Region, most species are from India. This genus is known by 17 species and one subspecies from India and adjacent countries. Gupta and Gupta (1983 : 15) have revised the Oriental species of this genus. Their key to identification of the species and other details are followed here.

Key to Indian species of *Apocryptus*

1. Propodeum smooth and shiny. Thorax smooth or very finely mat. Face and clypeus always yellow 2

_ Propodeum with punctures basally or striate centrally, never wholly smoth or shiny. Face and clypeus variously marked 10

2. Apical transverse carina of propodeum completely absent but with faint crests. Prepectal carina reaching the base of subtegular ridge. First tergite sparsely to shallowly punctate in the middle. Thorax and propodeum brownish at sides. Scutellum and metascutellum yellow. Face with two black lines. India : Meghalaya ..... 1. *tikari* Gupta & Gupta

– Apical transverse carina of propodeum complete or absent in the middle. Colour of thorax various. Thorax largely black with yellow or brownish marks; or propodeum and metapleurum orange 3

3. Apical transverse carina of propodeum complete or absent medially. Prepectal carina 0.75× the height of mesopleurum. Mesopleurum wholly black. First abdominal tergite smooth and shiny. India : Meghalaya ..... 2. *plumbeus* (Cameron)

_ Apical transverse carina of propodeum present in the middle, either complete or broken submedially 4

4. Thorax wholly red or partly red. Apical transverse carina of propodeum interrupted submedially. Prothorax and mesothorax back. Metathorax red. Second and third tergites granulose. Teeth on ovipositor tip in one group. India : Karnataka ..... 3. *mysorensis* Gupta & Gupta

– Thorax wholly black with yellow marks. Apical transverse carina of propodeum complete 5

5. Speculum always completely black. Apical tansverse carina of propodeum transverse dorsally in the middle and angulate on the sides (more so in the female) 6

– Speculum and mesopleurum yellow in the middle. Apical transverse carina of propodeum evenly arched dorsally and abruptly sloping on sides 7

6. Mesopleurum striate next to speculum. Face convex in the middle, rugulose. Propodeum basad of basal carina minutely sparsely granulose. Mesopleurum black. India : Sikkim; Meghalaya ..... 4. *laevifrons* (Cameron)

– Mesopleurum not striate next to speculum (smooth). Face weakly convex and faintly punctate. Propodeum basad of basal carina more polished and shiny. Mesopleurum with yellow oblong mark. Propodeum as in figure 137 : f. India : Meghalaya ..... 5. *nitidus* Gupta & Gupta

7. Fourth to sixth abdominal tergites completely black. Malar space, lower half of temple, mandible and clypeus at apex, black. Teeth on ovipositor tip in two distinct groups. India : West Bengal; Sikkim and Meghalaya ..... 6. *biserratus* Gupta & Gupta

– Fourth to sixth abdominal tergites either with usual yellow bands, or faintly narrowly banded (bands distinct laterally). Malar space, whole of temple, mandible largely, and clypeus, yellow. Teeth on ovipositor tip in one group (except in *A. erugatus*) 8

8. Upper margin of pronotum yellow. Nervellus intercepted near its lower 0.4. Mesopleurum broadly yellow and largely smooth and shiny. Body smooth and shiny. India : Sikkim; Meghalaya ..... 7. *fusciventris* (Cameron)

– Upper margin of pronotum black. Nervellus intercepted at its lower 0.2 or 0.4. Mesopleurum and metapleurum largely black with yellow spots and granulose 9

9. Teeth on ovipositor tip in one group. Brachiella and discoidella of hind wing black pigmented. Nervellus intercepted at its lower 0.4. India : West Bengal.. ..... 8. *pilosus* Gupta and Gupta

– Teeth on ovipositor tip in two group. Brachiella and discoidella of hind wing unpigmented, light yellow. Nervellus intercepted at its lower 0.2. India : Utteranchal; West Bengal and Sikkim .....9. *erugatus* Gupta & Gupta

10. Propodeum laterally between apical and basal transverse carinae rugose or striate, sometimes with a few punctures along with rugosities and striations 11

– Propodeum laterally between the two transverse carinae punctate or smooth. Basal area of propodeum with punctures 14

11. Apical transverse carina of propodeum interruped submedially. Thorax wholly yellowish-brown. Mesopleurum finely punctate or striate. [Frons and vertex black, except for two yellow marks in the ocello-ocular region (Fig. 138 : d). Malar space 0.85–0.9× the basal width of mandible. Metapleurum minutely punctate to finely puncto-rugose. Pronotum above sparsely punctate. Face evenly convex, with scattered punctures. Propodeum between basal and apical transverse carinae finely striate. First abdominal tergite with a few scattered punctures]. India : Tamil Nadu .....10. *aurantius* Gupta & Gupta

– Apical transverse carina of propodeum complete. Thorax largely or partly black (at least pronotum and mesoscutum black). (Mesopleurum and propodeum wholly reddish-brown in *nathani*) 12

12. Pronotum and mesoscutum black, rest of the thorax yellowish-brown. Middle groove of pronotum smooth. Frons in the middle and vertex largely smooth and shiny. India : Tamil Nadu ..... 11. *nathani* Gupta & Gupta

– Thorax black, with or without yellow marks. Frons and vertex minutely and sparsely punctate. Pronotal scrobe striate 13

13. Metapleurum finely striate. Propodeum laterally between apical and basal transverse carinae strongly obliquely rugose, towards apex smooth. Mesopleurum infront of speculum strongly striate. Hind leg largely black. India : West Bengal ..... 12. *flavofacies* Gupta & Gupta

– Metapleurum shallowly punctate. Propodeum laterally between apical and basal carinae weakly rugose. Area apically with a few longitudinal rugae or ridges. Mesopleurum largely striato-punctate. Hind leg largely dark orange. Myanmar ..... 13. *flavicrus* Gupta & Gupta

14. Propodeum flat dorsally, not evenly slopping, largely smooth and shiny medially. Apical transverse carina broadly absent in the middle, weakly present on sides, forming weak lateral crests. Juxtacoxal carina extending to 0.5 the length of metapleurum. Mesosternum broadly yellow. India : Sikkim. ..... 14. *buddha* Gupta & Gupta

– Propodeum short, slopping, not so smooth and shiny medially. Apical transverse carina present in the middle, laterally forming weak crests. Juxtacoxal carina present or absent. Mesosternum black (brownish in *terebratus*) 15

15. Frons smooth and shiny. Antennal scrobes shallow and shiny, with fine transstriations. Mesopleurum next to speculum without striations. Speculum flat, with scattered punctures. Middle groove of pronotum not striate, coarsely punctate. Dorsolateral carina of first tergite weak and incomplete. Mesosternum brownish. India : West Bengal ..... 15. *terebratus* Gupta & Gupta

– Frons punctate, punctures minute or tending to be granulose. Antennal scrobes a little shallow, dull, without striations. Speculum moderately convex and smooth (area around speculum striate). Middle groove of propodeum distinctly striate. Dorsolateral carina of first tergite complete and distinct. Mesosternum black.....16

16. Propodeum basad of basal carina weakly and sparsely punctate. Area laterally between apical and basal transverse carinae shallowly punctate. First tergite smooth and shiny, centrally with a groove. Teeth on ovipositor tip in two distinct groups. Upper margin of pronotum black. India : Uttranchal ..... 16. *garhwalensis* Gupta & Gupta

– Propodeum basad of basal carina distinctly punctate, area lateraly between basal and apical carinae somewhat ruguloso-punctate. First tergite subpolished, sparsely punctate in middle, without any central groove. Teeth on ovipositor tip in one group. Upper margin of pronotum broadly yellow. India : West Bengal; Himachal Pradesh ..... 17. *flavorbitalis* Gupta & Gupta

1. ***Apocryptus tikari*** Gupta & Gupta (Fig. 137 : a, b)

1983. *Apocryptus tikari* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 20. Female, key, des, fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji 1360m (GUPTA).

1987. *Apocryptus tikari* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 754.

This species is mainly distinguished by the absence of apical transverse carina of propodeum, but with faint lateral crests. Clypeus always yellow; thorax and propodeum brownish at sides; scutellum and metascutellum yellow, and face yellow with two black lines.

Female : Body covered with short hairs. Face finely punctate in the middle tending to be smooth at sides. Malar space granulose, 0.7× the basal width of mandible. Mandible shallowly and sparsely punctate at base. Frons, ocellar triangle vertex and temple almost smooth and impunctate. Upper margin of pronotum finely and closely punctate. Mesoscutum minutely punctate. Scutellum strongly swollen and smooth, its lateral carinae confined to its base. Metascutellum smooth and shiny. Mesopleurum with short sparse ridges along the inner side of prepectal carina and mesopleural suture; prepectal carina strong, extending to the base of subtegular ridge. Metapleurum at base minutely and sparsely punctate. Propodeum basad of basal carina faintly and minutely punctate; apical transverse carina absent in the middle but with low lateral crests. Nervulus opposite basal vein. Nervellus intercepted below the middle. First tergite sparsely and shallowly punctate in middle, smooth at base and apex; following tergites smooth and shiny. Ovipositor tip with 10 teeth in a single group.

Black with brownish tinge. Sixth to tenth flagellar segments white. Face (Fig. 137 : a) yellow with two elongate black lines on sides. The following are yellow : Facial orbits, clypeus, mandiable at base, frons along orbits, temple largely, pronotal collar, a mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, subtegular ridge, mesopleurum in the middle to the base of middle coxa, metapleurum above, apical slope of propodeum, apices of all abdominal tergites (Fig. 137 : b). First and second tergites towards base brown. Legs is general dark orange to reddish-orange, except tarsal segments of middle and hind legs, yellow. Wings yellowish hyaline.

Male : Not known.

Length : Female, 8 mm; fore wing 7 mm; ovipositor sheath 5.75 mm.

Distribution : India : Meghalaya (Cherrapunji, 1360m).

2. ***Apocryptus plumbeus*** (Cameron)

1903. *Etha plumbea* Cameron, *Mem & Proc, Manchester Lit. Phil. Soc.*, **47** (14) : 21. Male, des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Etha plumbea* : Narayanan & Kundan Lal, *Proc. Indian Acad. Sci.*, (B) **53** : 207.

1961. *Apocryptus plumbea* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 98. n. comb. India.

1983. *Apocryptus plumbeus* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 21, Male, Female, key, des. India : Meghalaya : Khasi Hills : Cherrapunji, 1360 m.

1987. *Apocryptus plumbeus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 753.

This species is distinguished by having smooth and shiny propodeum, apical transverse carina of propodeum absent medially, prepectal carina extending 0.75 the hight of mesopleurum, lateral carina of scutellum extending at its basal 0.25 and mesopleuram wholly black.

Female : Body covered with white hairs. Face swollen in the middle, with weak indistinct punctures. Malar space granulose, 0.6× the basal width of mandible. Frons and vertex minutely punctate. Temple smooth. Scrobe of pronotum smooth, epomia present only in the middle. Mesoscutum, scutellum and metascutellum largely smooth with faint minute punctures. Lateral carina of scutellum extending at its basal 0.25. Speculum shiny, with a few short striations along its anterior margin. Prepectal carina extending 0.75 the height of mesopleurum. Apical transverse carina of propodeum broadly absent in the middle, laterally forming moderately strong crests. First tergite largely smooth and shiny. Ovipositor tip with a single group of ten teeth.

Black. Sixth to tenth flagellar segments white. The following are yellow : Face, clypeus, malar space, mandible at base, temple except above, two orbital marks extending from the level of median ocellus, pronotal collar above, scutellum, metascutellum faintly, subtegular ridge, apical slope of propodeum, apices of all abdominal tergites (bands narrow on apical tergites). Fore coxa and trochanter dirty yellow; femur, tibia and tarsus light brownish-yellow; fifth tarsal segments dark brown. Middle coxa yellow; rest of the middle leg brown. Hind coxa yellowish-brown, black above, its trochanter, femur and tibia, brown, with trochanteral segments, femur above, tibia at base and apex, blackish. First hind tarsal segment white in basal 0.25 and black in 0.75, rest of tarsal segment white.

Male : Similar to female, except more slender and subpolished. Propodeum between apical and basal transverse carinae distinctly obliquely striate; area basad of basal carina minutely and weakly punctate laterally; area apicad of apical carina subpolished.

Black. 12–20 flagellar segments, white. Apical bands on abdominal tergites not well defined.

Length : Female, 11 mm; fore wing 8 mm; ovipositor sheath 6.75 mm. Male, 9–11 mm; fore wing 7.5–9 mm.

Distribution : India : Meghalaya (Cherrapunji, 1360m.)

3. ***Apocryptus mysorensis*** Gupta & Gupta (Fig. 137 : c, d)

1983. *Apocryptus mysorensis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 23. Female. key, des., Type : Female, India : Karnataka : Mercara, 1220m (GUPTA).

1987. *Apocryptus mysorensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 753. Syn.

This species is readily recognised by having pro- and mesothorax black; metathorax red and second and third abdominal tergites granulose.

Female : Face moderately swollen in the middle, largely punctate. Clypeus with a few scattered punctures. Malar space about 0.6 as long as the basal width of mandible. Frons smooth, with a few punctures near median ocellus. Vertex and temple sparsely

punctate. Pronotum minutely and sparsely punctate, epomia present only in the middle groove. Scutellum and mesoscutum sparsely and shallowly punctate, lateral carina confined to its base. Metascutellum polished. Mesopleurum in general with sparse and minute punctures, speculum smooth and shiny, prepectal carina extending up to the base of subtegular ridge. Metapleurum minutely punctate above, smooth below. Propodeum in general minutely and sparsely punctate; apical transverse carina interrupted submedially, with weak lateral crests. First abdominal tergite smooth at apex and base and sparsely and shallowly punctate in the middle, following tergites mat and subpolished. Ovipositor tip with eight teeth arranged in one group.

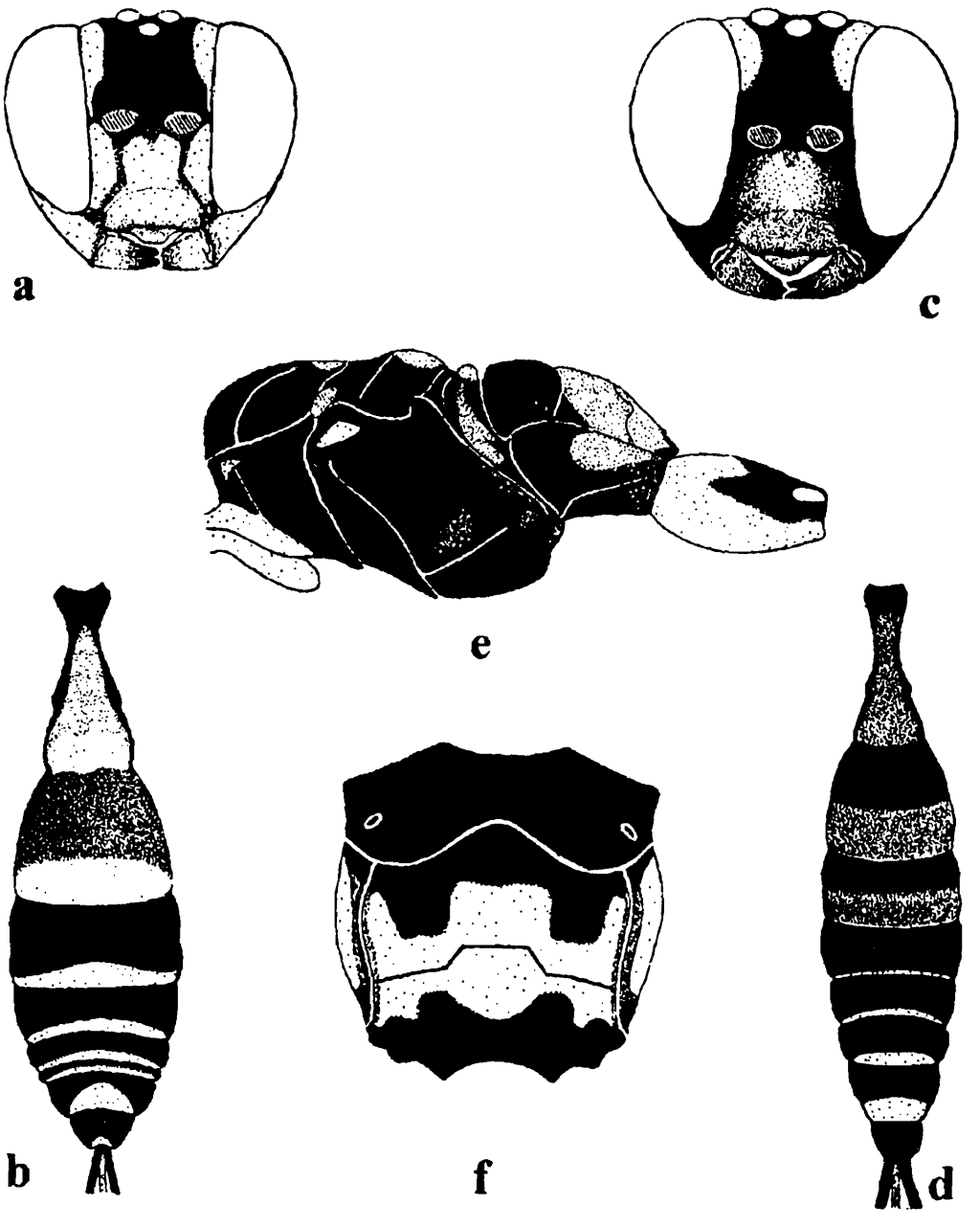

Fig. 137. Colour pattern : *Apocryptus tikari* Gupta & Gupta : **a**, head in front view; **b**, abdomen in dorsal view. *A. mysorensis* G & G : **c**, head in front view; **d**, abdomen in dorsal view. *A. laevifrons* G & G : **e**, thorax in side view. *A. nitidus* G & G : **f**, propodeum in dorsal view. (Source : Gupta & Gupta, 1983).

Black. 5-11 flagellar sigments white. The following are yellow : Face (Fig. 137 : c) medially, frons along eye margin, pronotal callar, tegula, subtegular ridge, scutellum, metascutellum and apices of fourth and the following tergites. The following are black : Face on sides, frons, malar space, temple, vertex, mesoscutum and mesopleurum. Brownish are : base of hind wing, metanotal rim, metapleurum, propodeum, coxae, first tergite (Fig. 137 : d), apices of second and third abdominal tergites broadly. Legs : fore leg largely dark yellow with reddish tinge. Middle and hind legs reddish, tarsus darker in shade. Hind tarsus white except basal half of first and whole of fifth segment blackish.

Male : Not Known.

Length : Female 9 mm; fore wing 7mm; ovipositor sheath 4 mm.

Distribution : India : Karnataka (Mercara, 1220m).

4. ***Apocryptus laevifrons*** (Cameron) (Fig. 137 : e)

1903. *Etha laevifrons* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 20. Female, des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1961. *Apocryptus laevifrons* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 197.

1983. *Apocryptus laevifrons* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 24. Female, key, des., fig. India : Sikkim : Gangtok, 1675m.

1987. *Apocryptus laevifrons* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 753.

This species shows affinities with *A. nitidus* in having apical carina of propodeum complete and straight in the middle. However, it can be distinguished by having mesopleurum wholly black and strongly striate along speculum.

Female : Body is general largely smooth and subpolished. Face convex and rugulose in middle. Clypeus with a few shallow punctures. Malar space 0.6 the basal width of mandible. Pronotal collar weakly punctate above. Epomia strong, reaching up to the upper margin. Scutellum with minute, sparse and shallow punctures, its lateral carina extending to its basal 0.33. Mesopleurum with prepectus and area above sternaulus minutely and sparsely punctate, with short weak to strong striae along the anterior margin of speculum. Prepectal carina extending 0.8 the height of mesopleurum. Metapleurum sparsely and shallowly punctate. Apical and basal transverse carinae of propodeum complete, apical carina straight in the middle. First abdominal tergite with a few punctures in the middle, seceond and third tergites granulose, following tergites subpolished smooth.

Black. 5–11 flagellar segments white. The following are yellow : Face, clypeus, malar space, base of mandible, temple, frons with two orbital stripes, pronotal collar above, scuttellum, metascutellum, tegula faintly, subtegular ridge (Fig. 137 : e) and apices of all the abdominal tergites narrowly, fore and middle legs. Propodeum between

basal carina and apex, metapleurum just above hind coxa, base of hind wing faintly, reddish-yellow. Fore tibia above and its fifth tarsal segment, brown. Middle femur above and its tarsus wholly brownish. Hind coxa black with its base and dorsal surface yellowish, its trochanter, femur and tibia brown; femur broadly above and at apex dark brown to black, tibia at base and apex blackish. Hind tarsus white, basal 0.25 of first segment black. Wings yellowish hyaline.

Male : Not known.

Length : Female, 12–13.5 mm; fore wing 10.5–11 mm; ovipositor sheath 6.75 mm.

Distribution : India : Sikkim (Gangtok, 1675m). Meghalaya (Khasi Hills).

5. ***Apocryptus nitidus*** Gupta & Gupta (Fig. 137 : f)

1983. *Apocryptus nitidus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 25. Female, Male. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Cherrapunji 1360 (GUPTA).

1987. *Apocryptus nitidus* : Gupta, *Mem. Amer. Int. Inst.*, **41** : 753.

This species is close to *A. laevifrons* (Cameron) in having apical transverse carina of propodeum straight in the middle. However, it is distinguished by having mesopleurum largely and propodeum basad of basal carina smooth and shiny. Mesopleurum with a oblique yellow mark.

Female : Body largely smooth and shiny except as follows : face convex in the middle with very weak punctures. Malar space 0.77× the basal width of mandible, scutellum with faint punctures at base, its lateral carina confined to its base. Basal transverse carina of propodeum complete, evenly arched; apical carina straight in the middle. Propodeal spiracle oval. First tergite smooth and shiny, following tergites mat and subpolished. Ovipositor tip without distinct teeth.

Black. 7–11 flagellar segments white. The following are yellow : Face, clypeus, temple, two orbital marks on frons laterally, pronotal collar, middle lobe of mesoscutum at apex, scutellum, metascutellum, subtegular ridge, an oblong mark on mesopleurum, base of hind wing, a line on metapleurum along pleural carina, trilobate mark on apical slope of propodeum (Fig. 137 : f), apices of almost all the abdominal tergites (fourth to seventh band narrow and weak). Legs in general orange to yellowish-brown. Hind coxa orange below, above yellow with an elongate black mark, femur and tibia yellowish-brown, tarsus largely whitish.

Male : Similar to female, except more slender and polished. 13 to 22 flagellar segments white.

Length : Female, 6–8 mm; fore wing 5.5–6.5 mm; ovipositor sheath 2.75 mm. Male, 7 mm; fore wing 6 mm.

Distribution : India : Meghalaya (Cherrapunji, 1360m.).

6. ***Apocryptus biserratus*** Gupta & Gupta (Fig. 138 : a, b)

1983. *Apocryptus biserratus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 27. Male, Female. key, des., fig. Type : Female, India : Meghalaya : Khasi Hills : Shillong, Botanical Garden, 1465m (GUPTA).

1987. *Apocryptus biserratus* Gupta & Gupta, *Mem. Amer. Ent. Inst.*, **41** : 751.

This is a distinct species having fourth to sixth abdominal tergites wholly black. Malar space, lower half of temple and clypeus at apex also black. Teeth on ovipositor tip arranged in two distinct group.

Female : Body covered with short sparse hairs and body largely subpolished. Face and clypeus minutely and shallowly punctate. Clypeus with faint striae at apex and with sparse and shallow punctures at base. Malar space 0.9× the basal width of mandible. Temple minutely and sparsely punctate near the base of mandible. Pronotum minutely punctate, epomia short present in groove. Mesoscutum without distinct punctures. Scutellum convex with minute punctures at base, lateral carina extending at its basal 0.25. Mesopleurum with minute sparse punctures along the prepectal carina and weak striation along speculum. Prepectal carina extending up to the base of subtegular ridge. Area basad of basal carina of propodeum minutely and sparsely punctate; apical carina strong complete and evenly arched, laterally froming weak lateral crests; spiracle oval. First abdominal tergite sparsely and shallowly punctate in the middle, following tergites smooth subpolished. Ovipositor tip with ten teeth arranged in two groups.

Black. 6–10 flagellar segments white. The following are yellowish : Face (Fig. 138 : a) clypeus in the middle, two longish mark on frons laterally, a mark on temple, pronotal collar, subtegular ridge, speculum, a large oblong mark below speculum, scutellum, metascutellum, a mark on metapleurum along pleural carina, propodeum between basal carina and apex, apices of first, second and third tergites and seventh and eighth tergites wholly (Fig. 138 : b). Legs in general yellow to brownish-yellow. Hind leg largely brown, its coxa with a yellow oval mark above, and a broad line on coxa, mark on trochanter, femur above and at apex, tibia at base and apex blackish, its tarsus whitish, except its first and fifth segments largely blackish. Abdominal segments fourth to sixth completely black.

Male : Similar to female. Antennal flagellar segments 10–20 white. Body slender and subpolished.

Length : Female : 8.5 mm; fore wing 7 mm; ovipositor sheath 4.25 mm. Male : 8 mm; fore wing 6.5 mm.

Distribution : India : Meghalaya (Shillong, 1465m, Cherrapunji, 1360m). Sikkim (Gangtok, 1675m). West Bengal (Darjeeling; 1980m).

7. ***Apocryptus fusciventris*** (Cameron)

1903. *Etha fusciventris* Cameron, *Mem. Proc. Manchester Lit. Phli. Soc.*, **47** (14) : 22. Female, des. Type : Female, India : Khasi Hills (OXFORD).

1904. *Etha khasiana* Cameron, *Trans. Ent. Soc.* London, 1904 : 103. Female. des. Type : Female, India : Meghalaya : Khasi Hills (OXFORD). Syn. by Townes, Townes & Gupta, 1961.

1904. *Etha lacteiventris* Cameron, *Trans. Ent. Soc. London,* 1904 : 103. Female. des. Types : Female, India : Meghalaya : Khasi Hills (OXFORD). Syn. by Townes, Townes & Gupta, 1961.

1961. *Apocryptus fusciventris* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 197. Syn.

1983. *Apocryptus fusciventris* : Gupta & Gupta, *Orient Ins. Monogr.*, **10** : 28. Male, Female, key, des. India : Meghalaya : Khasi Hills : Cherrapunji, 1360m; Sikkim : Gangtak, 1700m.

1987. *Apocryptus fusciventris* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 752.

This species is easily distinguished by having upper margin of pronotum and mesopleurum broadly yellow. Nervellus intercepted near its lower 0.4.

Female : Body largely smooth and subpolished. Face moderately punctate. Clypeus with a few punctures, malar space 0.9× as long as the basal width of mandible. Frons near median ocellus with minute sparse punctures. Vertex shallowly punctate along the margins. Epomia strongly reaching to upper margin. Scutellum at base with minute and weak punctures, its lateral carina extending to its basal 0.25. Prepectal carina extending up to the base of subtegular ridge. Propodeum at base minutely punctate, spiracle ovel. Both the transverse carinae complete and evenly arched. First tergite shallowly punctate apicolaterally. Ovipositor tip with seven teeth arranged in one group.

Black. 6–11 flagellar segments white. The following are yellow : Face, clypeus, malar space, mandibles at base, temple, frons with two narrow orbital stripes, pronotal coller, upper margin of propotum, apex of middle lobe of mesocutum, tegula, subtegular ridge, mesopleurum broadly in the middle, including speculum, base of hind wing, scutellum, metascutellum, metapleurum broadly in the middle, apical half of propodeum (sometimes area between basal carina and apex wholly), apices of first to third and seventh to eighth tergites broadly and fourth to sixth faintly and narrowly and laterally. Fore and middle legs is general yellow, except fore tarsus brownish; middle femur and tibia yellowish-brown, tarsus brown. Hind coxa yellow with a broad black line, trochanter, femur and tibia brown and at apex dark brown, hind tarsus except at exterme base and apex dark brown.

Male : Similar to femele except as follows : puncture on face and clypeus more distinct than is female. Lateral carina of scutellum at its basal 0.33. meso- and

metapleurum punctate. Propodeum laterally between basal and apical transverse carinae not smooth, but rough or rugose.

Black. 11 to 19 flagellar segments white. Upper margin of pronotum without any mark. Mesosternum, metapleurum, area between basal transverse carina and apex of propodeum largely yellow. Apices of tergites yellow to brownish.

Length : Female, 7–8 mm; fore wing 5.5–7 mm; ovipositor sheath 3.75 mm. Male, 7 mm; fore wing 6mm.

Distribution : India : Meghalaya (Cherrapunji, 1360m). Sikkim (Gangtok, 1700m).

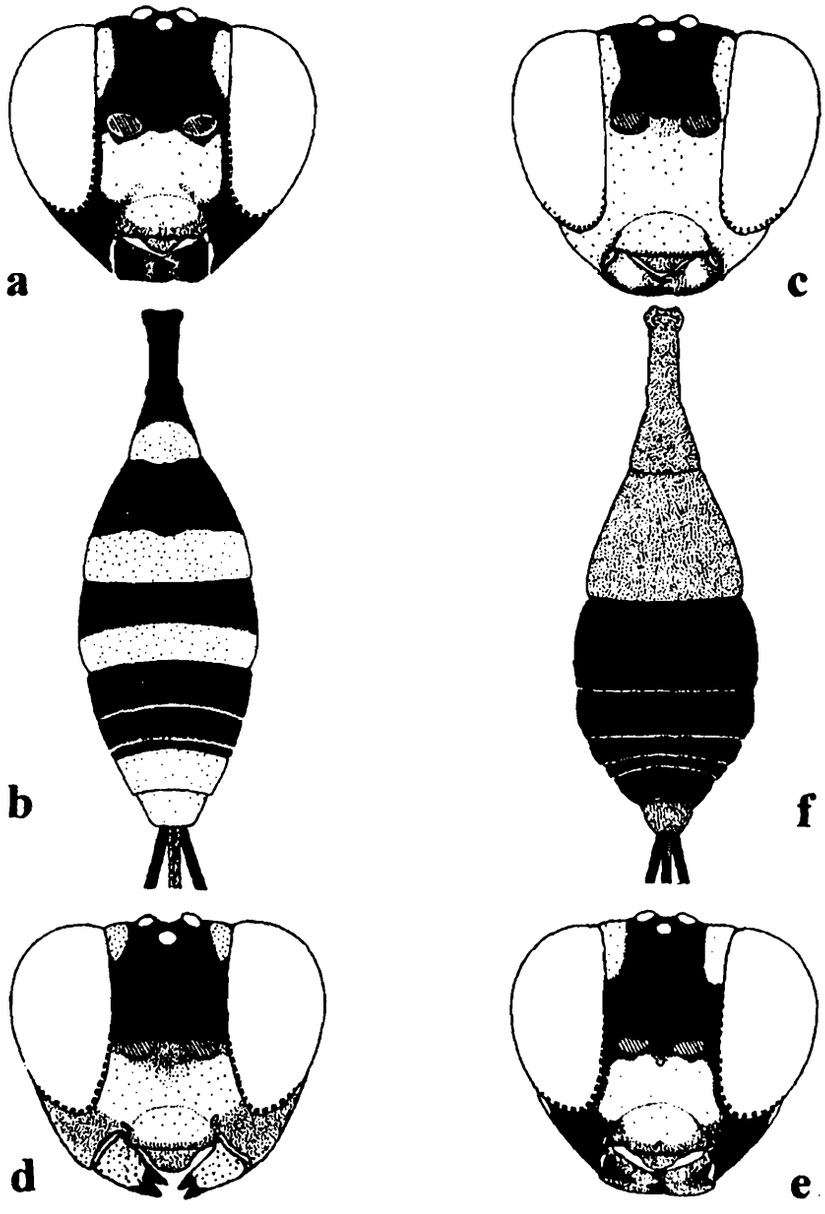

Fig. 138. Colour pattern : *Apocryptus biserratus* Gupta & Gupta : **a**, head in front view; **b**, abdomen in dorsal view. *A. pilosus* G & G : **c**, head in front view. *A. aurantius* G & G : **d**, head in front view. *A. nathani* G & G : **e**, head in front view; **f**, abdomen in dorsal view. (Source : Gupta & Gupta, 1983).

8. ***Apocryptus pilosus*** Gupta & Gupta (Fig. 138 : c)

1983. *Apocryptus pilosus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 30. Male, Female. key, des., fig. Type : Female, India : West Beagal : Darjeeling Hills : Rangiroon, 1910m. (GUPTA). India : West Bengal : Darjeeling : Botanical Garden, 1900m.

1987. *Apocryptus pilosus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 753.

This species is characterized by having teeth on the tip of ovipositor in one group; nervellus intercepted at its lower 0.4, face and mesopleurum finely and sparsely punctate. This species shows similarities to *A. erugatus* in having upper margin of pronotum black and malar space, temple, mandible, clypeus and apices of all abdominal tergites, yellow.

Female : Body dull, smooth, hairy. Face swollen in the middle, punctate. Clypeus with weak scattered punctures. Malar space 0.75× the basal width of mandible. Antennal scrobes with faint trans-striations. Frons sparsely and minutely punctate near median ocellus. Vertex and temple smooth and shiny. Upper margin of pronotum minutely punctate, rest smooth. Epomia short. Mesoscutum smooth dull. Scutellum punctate at base, its lateral carina at its basal 0.2. Prepectal carina extending up to the base of subtegular ridge. Metapleurum with minute sparse punctures. Propodeum smooth, both transverse carinae complete, weakly to strongly arched in the middle. Brachiella and discoidella distinct. Abdomen dorsally dull, with a few punctures. Ovipositor tip with 10 teeth, arranged in a single group.

Black. The following are yellow : 7–12 flagellar segments, face (Fig. 138 : c), clypeus, mandible (except teeth), temple (except above), frons with two narrow orbital stripes, pronotal collar, tegula, subtegular ridge, speculum, an elongated mark just below speculum, scutellum, metascutellum, metapleurum narrowly above, propodeum in apical half and apices of all the abdominal tergites. Fore and middle coxae and trochanters yellowish-brown, rest light brown. Hind coxa brown with an elongate black mark, its trochanter, femur and tibia narrowly at base and broadly at apex, dark brown to blackish, tarsus whitish except at extreme base blackish. Wings yellowish hyaline.

Male : Similar to female except more polished and slender. Scuttellum punctate, its lateral carina extending at its basal 0.45. Mesopleurum above sparsely and minutely punctate, and short striae along prepectal carina and inner margin of speculum. Speculum strongly swollen. Propodeum with apical transverse carina strongly arched and broadly interrupted in the middle.

Body colour similar to female except as follows : 13 to 23 flagellar segments whitish-yellow. No mark on speculum. Marks on propodeum and apices of abdominal tergites faint. Legs colour simler to female except lighter in shade and basal 0.75 of first hind tarsal segment blackish.

Lenght : Female, 7.5–12 mm; fore wing 7–10 mm; ovipositor sheath 2.75 mm. Male, 9 mm; fore wing 8 mm.

Distribution : India : West Bengal (Darjeeling Hills : Rangiroon, 1910m; Botanical Garden, 1900m).

9. ***Apocryptus erugatus*** Gupta & Gupta

1983. *Apocryptus erugatus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 31. Male, Female, key, des. Type : Famale, India : West Bengal : Darjeeling Hills : Rangiroon, 1910m. (GUPTA). India : Uttar Pradesh (now Uttaranchal) : Garhwal Hills : Joshimath, 1524m; Ghangaria, 1828m. West Bengal : Darjeeling, Botanical Garden. Sikkim : Gangtok, 1775m.

1987. *Apocryptus erugatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 751.

This species is easily recognised from its allied species *A. pilosus* by having teeth on ovipositor tip in two groups. Brachiella and discoidella of hind wing not pigmented—light yellow. Nervellus intercepted at its lower 0.2. Epomia extending up to the upper margin of pronotum.

Female : Body largely smooth and subpolished except as follows : Face rugulose in middle, with a few weak punctures. Malar space granulose, 0.75× the basal width of mandible. Mandible with a few punctures at base. Pronotum dull, with weak punctures along upper margin and pronotal collar above, epomia complete. Scuttellum moderately convex, lateral carina confined to its base. Mesopleurum with weak striae along the inner margin of speculum. Prepectal carina extending up to the base of subtegular ridge. Metapleurum with faint minute and sparse punctures. Basal and apical transverse carinae of propodeum complete and evenly arched. Brachiella and discoidella without pigmentation. First tergite smooth, second and third tergites granulose. Teeth on ovipositor ten, arranged is two groups.

Black. 6–11 flagellar segments whitish-yellow. The following are dirty yellow or yellow : Head wholly (except tip of mandible, frons in the middle, and vertex, black), small orbital marks on vertex, pronotal collar, upper margin of pronotum, middle lobe of mesoscutum at apex, scuttellum, metascutellum, subtegular ridge, a broad mark on mesopleurum, base of hind wing, metapleurum in upper half, propodeum between basal transverse carina and apex, apices of all the abdominal tergites (sometimes bands on apical segments not well defined). Fore and middle legs dark yellow, their tibiae and tarsi infuscate. Hind leg largely light brown, with an elongate mark on coxa, trochanter above, femur with a line above, tibia at base and apex, dark brown to blackish. Hind tarsus white with basal half of first segment and apical half of fifth segment, black.

Male : Similar to female but more polished and slender. Colour pattern also like female, except 11–18 flagellar segments, yellow. Mesopleurum and mesosternum

broadly yellow. All abdominal tergites with brownish apical bands. Hind leg darker than in female.

Length : Female, 6–6.5 mm; fore wing 5–5.5 mm; ovipositor sheath 4 mm. Male, 6 mm; fore wing 5 mm.

Distribution : India : Sikkim (Gangtok, 1775m). Uttranchal (Joshimath, 1524m; Ghangaria, 1828m). West Bengal (Darjeeling, 1980m; Botanical Garden).

10. ***Apocryptus aurantius*** Gupta & Gupta (Fig. 138 : d)

1983. *Apocryptus aurantius* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 24 Male, Female, key, des., fig. Type : Female, India : Tamil Nadu : Kodaikanal, 2000 m. (OTTAWA).

1987. *Apocryptus aurantius* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 751.

This is a distinct species, easily recognised by having apical transverse carina of propodeum interrupted submedially. Thorax wholly yellowish-brown, frons and vertex black, except for orbital yellow marks.

Female : Body largely smooth and subpolished, except as follows : clypeus evenly convex; face and mandibles faintly punctate. Malar space 0.85× the basal width of mandible, pronotum largely faintly punctate, epomia strong. Mesoscutum and scuttellum minutely punctate, lateral carina extending to its basal 0.75. Mesopleurum minutely and sparsely punctuate, prepectal carina extending 0.9 the height of mesopleurum. Metapleurum rugoso-punctate, rugosities tending to be transvere. Propodeum between transverse carinae finely striate; apical transverse carina absent submedially, lateral crests moderately strong. First abdominal tergite mat with a few scattered punctures. Following tergites mat and subpolished. Ovipositor tip with ten teeth arranged in one group.

Body is general yellowish-brown. Antenna brownish. The following are yellow : Face, clypeus at base, temple in middle and orbital marks on frons (Fig. 138 : d). The following are black : Frons, ocellar triangle, vertex, temple above, and head behind ocellar triangle. Hind tarsus brownish-yellow, except apical 0.45 of second to fourth segments, yellow.

Male : Similar to female, but more slender and subpolished. Propodeum centrally with short and irregular striae; apical transverse carina strong and complete. Colour almost similar to female, except antenna blackish, its 13–16 segments yellow.

Length : Female, 8–10 mm; fore wing 6.5–8.5 mm; ovipositor sheath 4.25 mm. Male, 9 mm; fore wing 7.5 mm.

Distribution : India : Tamil Nadu (Kodaikanal 2000 m).

11. ***Apocryptus nathani*** Gupta & Gupta (Fig. 138 : e, f)

1983. *Apocryptus nathani* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 35. Female, key, des., fig. Type : Female, India : Tamil Nadu : Nilgiri Hills : Naduvattam, 1830 m. (OTTAWA).

1987. *Apocryptus nathani* Gupta, *Mem. Amer. Ent. Inst.*, **41** : 753. syn.

This species is distinguished by having pronotum and mesoscutum black and rest of thorax yellowish-brown. Mesopleurum and propodeum wholly reddish-brown. Apical and basal transverse carinae of propodeum complete.

Female : Head smooth and shiny. Face rugulose with a few punctures. Malar space 0.75× the basal width of mandible. Mandible punctate with striations. Frons, vertex and temple smooth or shiny. Pronotum at upper margin sparsely and minutely punctate, rest smooth. Scutellum minutely punctate, its lateral carina extending to its basal 0.55. Mesopleurum with weak striations in the middle, prepectal carina extending almost up to the base of subtegular ridge. Metapleurum striato-punctate. Propodeum between apical and basal transverse carinae at sides obliquely striate, rest largely smooth, both transverse carinae complete. First tergite apically granulose and with a few scattered punctures, following tergites mat and subpolished. Ovipositor tip with seven teeth arranged in one group.

Body is general dark yellowish-brown. 6–9 flagellar segments, face broadly, two elongated stripes on frons, and a line on either side of temple on outer margin, yellow (Fig. 138 : e). Pronotum, mesoscutum, 3–7 tergites, black (Fig. 138 : f); rest of the body dark yellowish-brown. Legs mostly reddish-brown to brown; second to fourth hind tarsal segments dark brown.

Male : Not known.

Length : Female, 8.5 mm; fore wing 7.5 mm; ovipositor sheath 2.75 mm.

Distribution : India : Tamil Nadu (Naduvattom, 1830m in Nilgiri Hills).

12. ***Apocryptus flavofacies*** Gupta & Gupta

1983. *Apocryptus flavofacies* Gupta & Gupta. *Oriental Ins. Monogr.*, **10** : 40. Female, key, des. Type : Female, India : West Bengal : Darjeeling Hills : Rangiroon, 1910 m. (GUPTA).

1987. *Apocryptus flavofacies* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 752.

This species can be recognised by having metapleurum finely striate and propodeum laterally between apical and basal transverse carinae strongly obliquely rugose, legs largely dark brown to blackish.

Female : Body covered with white short hair. Face sparsely and shallowly punctate in the middle, sides smooth. Malar space granulose, 0.8× as long as the basal width of mandible. Frons near median ocellus rough and sparsely punctate.Vertex shallowly

and sparsely punctate.Temple shiny, with faint sparse punctures. Middle groove and upper margin of pronotum nearly striate, epomia moderately strong. Mesoscutum mat, subpolished. Scutellum shallowly punctate at base, its lateral carina extending to its basal 0.25. Metascutellum and speculum smooth. Mesopleurum shallowly and sparsely punctate, striate in middle and along the inner margin of speculum, prepectal carina extending up to the base of subtegular ridge. Metapleurum weakly striato-punctate. Propodeum at base with sparse punctures, laterally between apical and basal carinae obliquely rugose, apically smooth, apical transverse carina straight in the middle. First tergite with sparse shallow punctures in the middle, following tergites granulose mat and subpolished. Ovipositor tip with ten teeth arranged in a single group.

Black. The following are yellow : 5–11 flagellar segments, face, clypeus, except apically, malar space, mandible, except the teeth, temple, orbital stripes along the eye margin on frons, pronotal collar, middle lobe of mesoscutum at apex, tegula, subtegular ridge, mesopleurum just above middle coxa, speculum, scutellum, metascutellum above, propodeum at apex and middle, apices of all the abdominal, tergites. Legs also in general yellow, except fore femur above and its fifth tarsal segment, a dark line dorsally on middle femur and its fifth tarsal segment, hind coxa dosally, small marks of trochanters, femur and tibia dorsally, almost dark brown to black. Hind tarsus white except its extreme base blackish.

Male : Not known.

Length : Female, 12 mm; fore wing 10 mm; ovipositor sheath 4.75 mm.

Distribution : India : West Bengal (Rangiroon, 1910 m. near Darjeeling).

13. ***Apocryptus flavicrus*** Gupta & Gupta (Fig. 139 : a, b)

1983. *Apocryptus flavicrus* Gupta & Gupta, *Oriental. Ins. Monogr.*, **10** : 41. Male, Female, key, des., fig. Type : Female, Myanmar : Nanhlaing Res. : Shwebo (DEHRA DUN).

1987. *Apocryptus flavicrus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 751.

This species is close to *A. flavofacies* Gupta & Gupta in having teeth on ovipositor tip in one group and second tergite impunctate. However, it can be distinguished in having propodeum weakly rugose laterally between transverse carinae, towards the apex with longitudinal ridges.

Female : Face reguloso-punctate, at sides smooth and subpolished. Clypeus smooth and polished. Malar space about 0.7× the basal width of mandible. Frons above sparsely punctate, at sides smooth. Vertex sparsely punctate; temple smooth and shiny. Pronotum smooth, its shoulder with a few weak punctures. Epomia short. Mesoscutum and scutellum subpolished with sparse shallow punctures; lateral carina confined to its base. Mesopleurum sparsely and shallowly punctate, speculum smooth

and shiny; prepectal carina extending up to the base of subtegular ridge. Metapleurum moderately strongly punctate, its juxtacoxal carina complete. Propodeum between the transverse carinae rugoso-punctate, at base sparsely punctate, apically with a few longitudinal ridges. Both transverse carinae complete, evenly arched, not forming lateral crests, spiracle oval. First abdominal tergite smooth and shiny, its spiracles protruding, following tergites mat and subpolished. Ovipositor teeth in one group.

Black. 5–9 flagellar segments white above. The following are yellow : Face, clypeus, base of mandible, temple below, orbital marks on frons, lower half of pronotum, and oval mark on the middle lobe of mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, mesopleurum broadly in middle, speculum, metapleurum above, apical slope of propodeum (Fig. 139 : a), band on fifth and sixth tergites narrow. First tergite (Fig. 139 : b) orange except the apical band. Fore and middle legs largely dark yellow, tarsi tending to be darker. Hind leg light brownish-yellow, its coxa with a black mark, tibia apically dark brown, tarsus white, except basal 0.3 of first and fifth segment wholly blackish.

Male : Similar to female is sculpture and colour, except frons largely smooth; area near ocellar triangle minutely and sparsely punctate, vertex shiny with a few scattered punctures. Propodeum between basal carina and apex finely wrinkled.

Length : Female, 9 mm; fore wing 2.5 mm; ovipositor sheath 5 mm. Male, 8 mm; fore wing 6 mm.

Distribution : Myanmar (Shwebo, Nanhlaing Res.).

14. ***Apocryptus buddha*** Gupta & Gupta (Fig. 139 : c)

1983. *Apocryptus buddha* Gupta & Gupta, *Oriental. Ins. Monogr.*, **10** : 42. Male, Female, key, des., fig. Type : Female, India : Sikkim : Gangtok, 1675 m. (GUPTA).

1987. *Apocryptus buddha* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 751.

This species is mainly distinguished by having propodeum dorsally flat, largely smooth and shiny medially, apical transverse carina broadly absent in the middle, laterally with weak crests; malar space about 0.7× the basal width of mandible and lateral carina of scuttellum extending to its basal 0.45.

Female : Body covered with white short hair. Face swollen in middle and closely punctate. Clypeus smooth, punctate at base malar space 0.7× the basal width of mandible. Frons with a few striae near base of antennae, rest smooth and shiny. Vertex sparsely punctate. Temple smooth. Pronotal groove and collar smooth, rest punctate, epomia short. Mesoscutum and scutellum subpolished and sparsely punctate; lateral carina of scuttellum extending to its basal 0.45. Metascutellum shiny, mesopleurum punctate. Speculum smooth, dull, prepectal carina extending up to the base of subtegular ridge. Metapleurum shallowly punctate, juxtacoxal carina 0.5 the

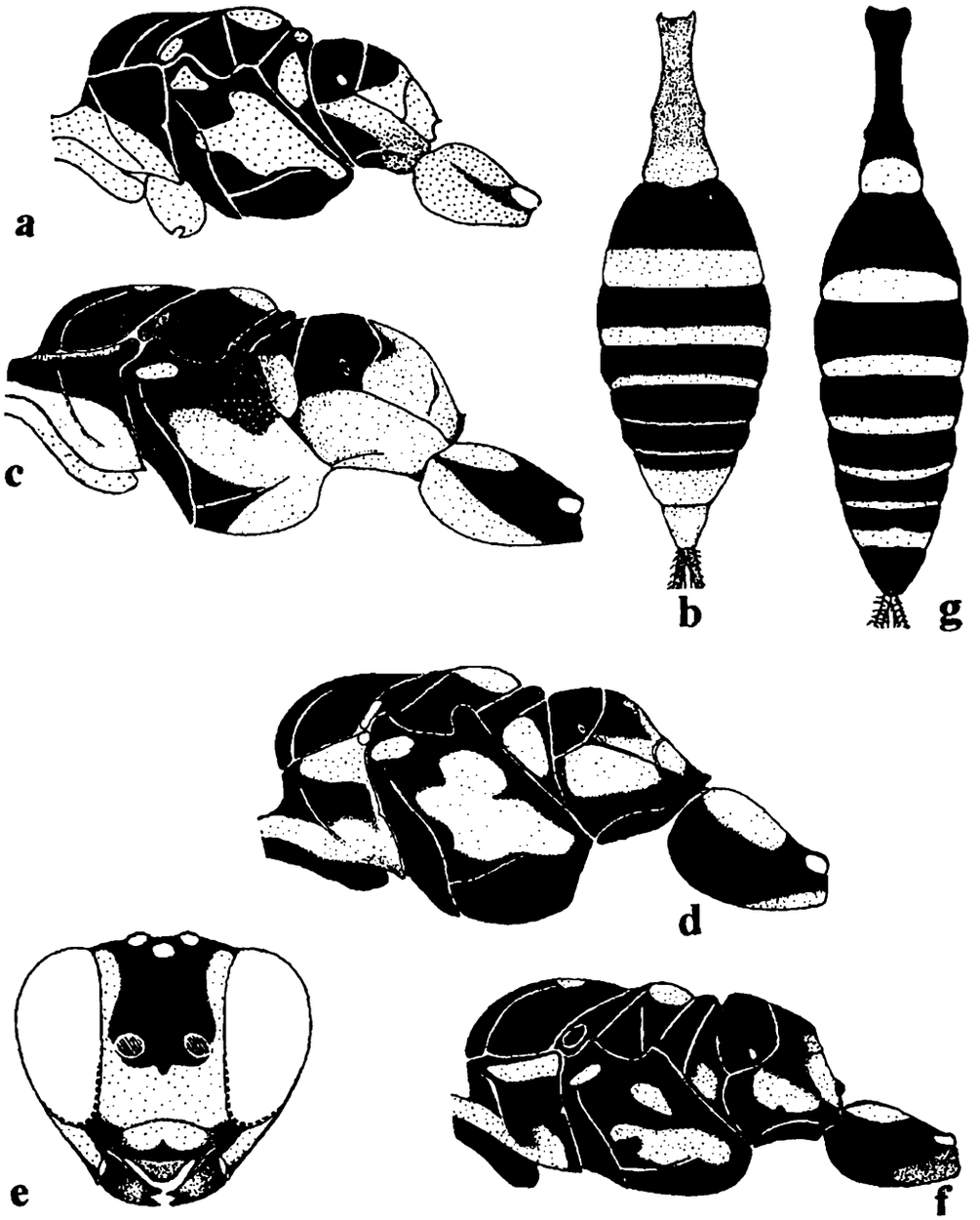

Fig. 139. Colour pattern : *Apocryptus flavicrus* Gupta & Gupta : **a**, thorax in side view; **b**, abdomen in dorsal view. *A. buddha* G & G : **c**, thorax in side view. *A. flavorbitalis flavorbitalis* G & G : **d**, thorax in side view. *A. f. himachalis* G & G : **e**, head in front view; **f**, thorax in side view; **g**, thorax in dorsal view. (Source : Gupta & Gupta, 1983).

length to metapleurm. Propodeum dorsally flat, not evenly slopping, area between apical carina and base largely shallowly and sparsely punctate, apical carina broadly absent in the middle. First abdominal tergite largely smooth, sparsely and shallowly punctate in the middle, following tergites mat and subpolished. Ovipositor tip with ten teeth arranged in two groups.

Black. 7–13 flagellar segments whitish. The following are yellow : Head in general (except mandibular teeth, frons medially and vertex), pronotal collar, upper margin of pronotum, an oval mark on middle lobe of mesoscutum, subtegular ridge,

mesopleurum broadly below, mesosternum largely (Fig. 139 : c), propodeum (except at base) and apices of first to third and sixth to eighth tergites. Fore leg brownish-yellow, its coxa and trochanter yellow. Middle leg largely brown, is tarsus darker and coxa dark orange with a brownish mark above. Hind leg dark brown, coxa orange with an elongate black dorsal mark, tarsus white with first segment blackish.

Male : Similar to female except propodeum with irregular ridges and scattered shallow punctures between basal carina and apex, at base distinctly punctate, both the transverse carinae complete and evenly arched in the middle.

Colour similar to female, except 17–30 flagellar segments whitish; mark on mesopleurum not extending on speculum and mesosternum. Propodeum black. Apical bands on abdominal tergites faint.

Length : Female, 11 mm; fore wing 9 mm; ovipositor sheath 7.75 mm. Male, 9 mm; fore wing 6 mm.

Disbribution : India : Sikkim (Gangtok, 1675 m).

15. ***Apocryptus terebratus*** Gupta & Gupta

1983. *Apocryptus terebratus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 44. Female, key, des. Type : Female, India : West Bengal : Darjeeling Hills : Rangiroon, 1910m (GUPTA).

1987. *Apocryptus terebratus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 754.

This species is distinguished in having antennal scrobes shallow with fine trans-striations, speculum flat with scattered punctures. Pronotal groove coarsely punctate, ovipositor longer than other species.

Female : Body covered with short white hair. Face moderately swollen in the middle closely punctate, clypeus basally punctate, apically smooth and shiny. Malar space granulose, 0.7× the basal width of mandible. Frons shallow, antennal scrobes finely trans-striate and with a median shallow longitudinal groove. Vertex minutely and sparsely punctate. Temple smooth and shiny. Upper margin of pronotum closely and pronotal collar sparsely punctate, rest of pronotum coarsely punctate. Mesoscutum minutely and scutellum at base sparsely punctate; lateral carina of scuttellum extending to its basal 0.33. Mesopleurum minutely punctate. Speculum largely smooth, punctate above. Prepectal carina extending up to the base of subtegular ridge. Metapleurum moderately strongly punctate. Propodeum at base coarsely punctate, between apical and basal carinae laterally shallowly punctuate and with a few oblique rugosities, rest of propodeum smooth and shiny; both the transverse carinae complete and apical carina straight in the middle. First abdominal tergite with a few scattered punctures in the middle, following tergites smooth and subpolished. Ovipositor tip with ten teeth arranged in one group.

Black. 7–13 flagellar segments whitish. The following are yellow : Face, clypeus malar space, mandible except at base, temple except dorsally, orbital mark along the eye margin, pronotal collar, upper margin of pronotum, an oval mark on middle lobe of mesoscutum, subtegular ridge, a broad mark on mesopleurum, scuttellum, base of hind wing, metapleurum largely, apical slope of propodeum, apices of first to third and seventh and eighth tergites wholly. Fore and middle legs brownish to dark brown. Hind leg with coxa and trochanter yellow, except coxa with an elongate blackish mark, femur and tibia brown, femur darker above, tarsus white, its extreme base blackish.

Male : Not known.

Length : Female, 12.8 mm; fore wing 10 mm; ovipositor sheath 8.5 mm.

Distribution : India : West Bengal (Rangiroon, 1910 m. near Darjeeling).

16. ***Apocryptus garhwalensis*** Gupta & Gupta

1983. *Apocryptus garhwalensis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 45. Female, key, des. Type : Female, India : Uttar Pradesh (now Uttaranchal) : Garhwal Hills : Bhyundar, 2450 m. (GUPTA). India : Uttar Pradesh (now Uttaranchal) : Mussoorie, 2286m ; Ranajeet on way to Yamunotri.

1987. *Apocryptus garhwalensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 752.

This and the following species : *A. flavorbitalis* are close to each other in having frons punctate, antennal scrobes without distinct striations, speculum smooth and dorso-lateral carina of first tergite distinct and complete. However, it can be recognised in having propodeum basally sparsely punctate, between apical and basal carinae laterally shallowly punctate. Teeth on ovipositor tip in two groups and upper margin of pronotum black.

Female : Body is general subolished. Face closely punctate in the middle, at sides smooth, along clypeal groove minutely and sparsely puncate. Malar space 0.9× the basal width of mandible. Frons sparsely and minutely punctate, scrobe, vertex and temple smooth and shiny. Pronotal groove and below weakly striate, upper margin weakly punctate. Epomia moderately long. Mesoscutum with sparse shallow punctures. Scutellum faintly punctate, its lateral carina extending to its basal 0.25. Metascutellum and mesopleurum smooth and subpolished with faint striations near speculum, prepectal carina extending up to the base of subtegular ridge. Metapleurum minutely punctate. Propodeum laterally between apical and basal carinae ruguloso-punctate, both the carinae complete and evenly arched in the middle. First abdominal tergite with a median groove, near spiracles sparsely punctate, follwing tergites mat and subpolished. Ovipositor tip with ten teeth arranged in two groups.

Black. 5–10 flagellar segments white. The following are yellow or dirty yellow : Face, clypeus, malar space, mandible, temple (except above), orbital marks on frons, pronotal collar, middle lobe of mesoscutum at apex, scutellum, metascutellum, subtegular ridge, mesopleurum broadly, speculum, base of hind wing, metapleurum above, propodeum between basal carina and apex and apices of almost all the abdominal tergites. Legs is general yellowish-brown to brown; fore coxa and trochanter yellow, and tarsal segments dark brown; middle coxa and trochanter yellowish-brown. Hind coxa above yellow marked also an elougate mark on coxa, two marks of trochanters, apex of tibia blackish, tersus white except first and fifth segment dark blackish-brown.

Male : Not known.

Length : Female, 8 mm; fore wing 7.5 mm; ovipositor sheath 2.75 mm.

Distribution : India : Uttranchal (Bhyundar, 2450m; Mussoorie, 2286 m, Ranajeet near Yamunotri).

17. ***Apocryptus flavorbitalis*** Gupta & Gupta

This species can be easily distinguished by having area basad of basal carina of propodeum distinctly punctate, laterally between apical and basal caarinae ruguloso-punctate and ovipositor tip with ten teeth arranged is a single group.

Female : Body largely covered with short white hair. Face little convex in middle, closely and shallowly punctate. Clypeus with a few punctures; malar space 0.85× the basal width of mandible. Frons sparsely and shallowly punctate, scrobes smooth. Vertex and temple more or less smooth, except sometimes with a few punctures. Pronotum largely smooth, punctate above. Epomia short. Mesoscutum minutely punctate, scuttellum with a few punctures at base, its lateral carina extending to its basal 0.3. Mesopleurum sparsely and shallowly punctate, speculum dull, along inner margin of speculum with short striations. Prepectal carina extending up to the base of subtegular ridge. Metapleurum with close and shallow punctures. Propodeum basally distinctly punctate, except medially, laterally between apical and basal carinae ruguloso-punctate, rest of propodeum smooth and shiny; apical transverse carina straight in the middle. First abdominal tergite sparsely punctate in the middle, without any median groove as in *garhwalensis*. Second tergite with weak and close punctures, following mat and subpolished. Ovipositor tip with ten teeth arranged in one group.

Male : Similar to female except more slender and polished, frons sparsely and minutely punctate in the middle, at side punctures dense; vertex minutely punctate.

Two subspecies are recognised and these can be distinguished by the following key :

Key to the subspecies

1. Malar space brownish-yellow. Mesopleural mark extensive and joining with the mark on speculum (yellow). Propodeum with a W-shaped yellow mark extending up to metapleurum. India : West Bengal .... 17a. *flavorbitalis flavorbitalis* Gupta & Gupta

– Malar space black. Mesopleural mark less extensive, not joining with the mark on speculum (yellow). Propodeal mark not very extensive..... ..... 17b. *flavorbitalis himachalis* Gupta & Gupta

17a. ***Apocryptus flavorbitalis flavorbitalis*** Gupta & Gupta (Fig. 139 : d)

1983. *Apocryptus flavorbitalis flavorbitalis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 48, Male, Female, key, des., fig. Type : Female, India : West Bengal : Darjeeling Hills : Rangiroon, 1910 m (GUPTA).

1987. *Apocryptus flavorbitalis flavorbitalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 752.

Female : Black. 6–10 flagellar segments white. The following are yellow : Face, clypeus except apically, temple except above, frons along eye margin, a mark on pronotal collar, upper margin of pronotum, apex of middle lobe of mesoscutum, scutellum, metascutellum, a broad mark on mesopleurum, joining with the mark on speculum, metapleurum broadly, base of hind wing, a W-shaped mark apically on propodeum (Fig. 139 : d), and apices of almost all the abdominal tergites. Fore and middle legs reddish–brown, except fore tibia and tarsus dark yellow; middle tibia and tarsus a shade darker. Hind coxa black with an oval yellow mark above and brownish below, its trochanter and femur dark brown, tibia at base and apex blackish, tarsus dirty yellow, except basal half of first segment and fifth segment apically dark brown. Wings yellowish hyaline.

Male : Black. 12–19 flagellar segments white. The following are yellow : Pronotum (its middle groove beyond epomia black), mesosternum broadly and fore and middle legs largely, except their fifth tarsal segment blackish. Hind coxa dark yellow with an elongated black mark. Rest of colour more or less similar to female.

Length : Female, Male, 7–10 mm; fore wing 5.5–8.5 mm; ovipositor sheath 4.75 mm.

Distribution : India : West Bengal (Rangiroon, 1910m in Darjeeling Hills).

17b. ***Apocryptus flavorbitalis himachalis*** Gupta & Gupta (Fig. 139 : e–g)

1983. *Apocryptus flavorbitalis himachalis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 48. Male, Female, key, des., fig. Type : Female, India : Himachal Prodesh : Dalhousie Hills : Kalatop, 2438 m (GUPTA). India : Himachal Pradesh : Dalhousie Hills : Khajjiar, 1828 m.

1987. *Apocryptus flavorbitalis himachalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 752.

Male and *Female* : This subspecies is similar to *flavorbitalis flavobitalis* except as follows : Body strongly sculptured, face distinctly punctate in the middle, mesopleurum and abdominal tergites largely granuloso-punctate.

Malar space blackish (Fig. 139 : e), apical margin of clypeus and mandibles, brown. The characteristic yellow mark on mesopleurum is separated from the mark on speculum (Fig. 139 : f), and hind coxa is largely blackish and abdomen as shown in figure 139 : g.

Length : Male, Female, 9–12 mm; fore wing 7–9 mm; ovipositor sheath 3.5–4.5 mm.

Distribution : India : Himachal Pradesh (Kalatop, 2438m; Dalhousie, 2132m; Khajjiar, 1828 m).

2. Genus ***Dinocryptus*** Cameron (Fig. 140 : a–c)

1905. *Dinocryptus* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, **44** : 146. Type-species : *Dinocryptus niger* Cameron; monobasic.

1905. *Dinocryptus* Cameron, *Entomologist*, **38** : 171. Type-species : *Dinocryptus niger* Cameron; monabasic. Syn. by Townes, Townes & Gupta, 1961.

1916. *Megacryptus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 232. Type-species : *Megacryptus bifasciatus* Szépligeti; designated by Townes, Townes & Gupta, 1961. Syn by Townes, Townes & Gupta 1961.

1916. *Dinocryptus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 234. Name preocc. by Cameron, 1905. Type-species : (*Dinocryptus tristis* Szépligeli) = *niger* Cameron; monbasic. Syn. by Townes, Townes & Gupta, 1961,

1917. *Dinocryptiella* Strand, *Intenat. Ent. Ztschr.,* **10** : 137. New name for *Dinocryptus* Szépligeti.

Taxonomy : Townes, Townes & Gupta, 1961 : 198. Townes, 1970 : 331. Gupta & Gupta, 1983 : 52.

Distribution : Oriental Region.

Clypeus with its apical 0.3 to 0.45 impressed and somewhat concave, separated from the rest of clypeus by a transverse ridge, transverse ridge with a median or two transverse teeth. Apex of clypeus truncate with a median tooth. Face evenly convex. Mandible rather short, its lower tooth longer than upper tooth. Epomia strong to weak, long to short. Sternaulus weak to indistinct, usually extending 0.6 the distance to middle coxa, sometimes reaching the entire distance. Prepectal carina extending more than 0.5 the height of mesopleurum. Juxtacoxal carina present or absent. Apical transverse carina of propodeum interrupted in the middle, but laterally forming weak to strong crests. Areolet of fore wing moderately large and high. Nervulus basad of basal vein by 0.2 to 0.6 its length. Nervellus intercepted at or below the middle. First

abdominal tergite short, without basal lateral tooth, its dorso-lateral carina distinct on its basal 0.3±. Ovipositor sheath about 1.6× as long as hind tibia, its tip with about 9 strong vertical teeth.

This genus includes some of the largest species amongst Mesosteninae. This is a moderate sized genus of the Indo-Papuan subregion. Gupta & Gupta (1983) have reported twelve species. Three species are known from India and adjacent countries. These can be recognised by the following key and descriptions, as given by Gupta and Gupta (1983 : 52).

Key to the species of *Dinocryptus*

1. Thorax black with yellow spots; abdomen also black with yellow stripes. First tergite black apically and narrowly at base yellow. Scutellum black, at sides yellow. Propodeum black with a faint brownish spot medially. Basal transverse carina of propodeum complete. India : Meghalaya. Indonesia .... 1. *femoratus* (Cameron)

– Thorax and abdomen largely brown or dark brown with black markings. Scutellum wholly yellow. First abdominal tergite usually brown with a small blackish mark in the middle. Propodeum with a definite yellow or brown spot 2

2. Abdominal tergites 4–8 wholly black, first tergite wholly brownish-orange and apices of second and third tergites dark brown. Mesosternum yellowish-brown. Hind coxa brown. Vertex and ocellar area brownish. India : Meghalaya. .... 2. *apicalis* (Cameron)

– Abdomen largely brown, except bases of first to third and sixth tergites black. Mesosternum wholly brown. Hind coxa brown, at base black. (Pronotal groove smooth and shiny, without any striations. Apical tergite with a small triangular depression in the middle. India : Meghalaya..... 3. *fulgidipennis* (Cameron)

1. ***Dinocryptus femoratus*** (Cameron) (Fig. 140 : d)

1902. *Torbda femoratus* Cameron, *Entomologist*, **35** : 20, Male, key, des. Type : Male, India : Khasi Hills (OXFORD).

1913. *Torbda femoratus* : Morley, *Fauna of British, India, Hymenoptera*, **3** (1) : 63. Male, des., key, fig. India : Khasi Hills.

1961. *Dinocryptus femoratus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 198. Lectotype design, n.comb. India.

1983. *Dinocryptus femoratus* : Gupta & Gupta, *Oriental Ins Monogr.*, **10** : 61. Male, Female, key, des., fig. Indonesia : Sumatra : Sungei Kumbang, Korinchi, 1372m. India : Meghalaya : Khasi Hills.

1987. *Dinocryptus femoratus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 755.

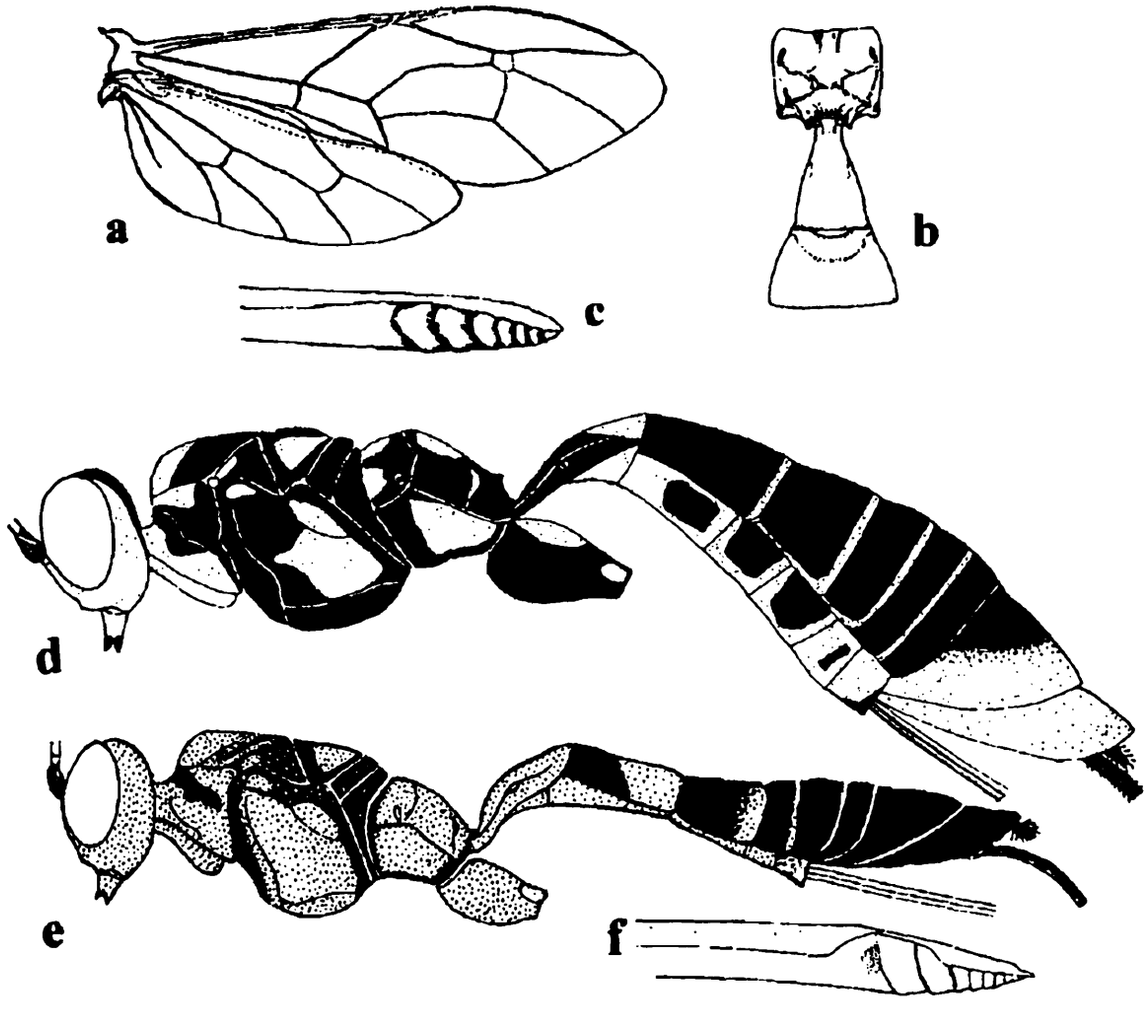

Fig. 140. *Dinocryptus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. Colour pattern : *D. femovatus* (Cameron) : **d**, body in side view. *D. apicalis* (Cameron) : **e**, body in side view; **f**, ovipositor tip. (Source : Gupta & Gupta, 1983).

This species is recognised by having malar space 0.6× the basal width of mandible, antennal scrobes trans-striate; vertex just behind ocellar triangle with strong, deep close punctures, at sides with sparse and shallow punctures. Abdomen with its first to sixth tergites narrowly at apex and seventh and eighth tergites broadly, yellow.

Female : Face smooth in center, rugoso-punctate near antennal sockets, close to eye margin with a few scattered punctures. Clypeus basad of the transverse ridge with undefined punctures, rest smooth. Malar space 0.6× the basal width of mandible. Antennal scrobes trans-striate. Frons above irregularly rugose, at sides with sparse and shallow punctures. Vertex near ocellar triangle with strong deep and close punctures, at side with sparse and shallow punctures. Temple smooth and polished, with a few indistinct punctures. Upper margin of pronotum and pronotal collar sparsely and minutely punctate; epomia strong but not reaching the upper margin. Mesoscutum strongly and closely punctate. Scutellum with sparse and deep punctures. Mesopleurum with close to sparse punctures, a few striations along speculum and below subtegular

ridge; speculum smooth and shiny; prepectal carina extending 0.9× the height of mesopleurum. Metapleurum with moderately strong punctures, punctures running into irregular striations. Juxtacoxal carina absent. Propodeum centrally with raised disc-like structure, apearing like an areola, this area largely rugose, propodeum laterally reticulo-wrinkled, area apicad of apical carina rugose with two strong lateral longitudinal carinae between propodeal crests and apex, at base densely and closely punctate, punctures running into longitudinal striation; apical carina absent medially, laterally forming strong crests, basal carina strongly turned forward in the middle. Nervellus intercepted at its middle. First tergite about 2× as long as wide at apex, its dorso-lateral carinae not well defined apically, second and third tergites closely punctate, following tergites mat and subpolished. Ovipositor as long as abdomen.

Black. Antenna orange, except apical segments black. The following are yellow : head largely (except mandible apically, vertex behind, and frons and ocellar triangle, black), pronotal collar, upper margin of pronotum, middle lobe of mesoscutum, scutellum apically and on sides, tegula, subtegular ridge, speculum, a continuous broad mark below speculum, a triangular mark on metapleurum, propodeum with a rectangular central mark, and area basad of basal carina with an oval median and two lateral marks; a mark at the apex of first tergite, narrow apical bands on second to sixth tergites and seventh and eighth tergites broadly (Fig. 140 : d). Legs is general, except middle coxa at base blackish and extreme apex of its second trochanter and extreme base of femur brown. Hind coxa black with an oval mark above, its trochanter, femur and tibia dark orange except trochanteral segments apically, basal 0.4 and extreme apex of femur blackish, tarsus wholly dark yellow. Wing yellowish hyaline.

Male : Body largely smooth and subpolished except as follows : Face weakly trans-striate in the middle. Malar space 0.85× the basal width of mandible. Frons with antennal scrobes finely trans-striate at sides with minute sparse punctures; area below median ocellus rugulose. Vertex sparsely punctate. Temple smooth with a few punctures below. Upper margin of pronotum and pronotal collar punctate, middle groove with a few short striations. Epomia strong. Mesoscutum and scutellum strongly punctate. Mesopleurum punctate, punctures, dense and coarse, running into striations at some places. Prepectal carina extending 0.85× the height of mesopleurum. Metapleurum somewhat rugoso-punctate. Juxtacoxal carina absent. Propodeum largely strongly rugose, tending to be reticulate; basad of basal carina longitudinally striate with punctures in between the striations. Basal carina absent laterally, deeply arched in the middle; apical carina absent. Nervellus intercepted at the middle. First tergite long and slender, its spiracles projecting, tergite apically sparsely punctate, following tergites mat and subpolished.

Black. 10–20 flagellar segments white. The following are yellow: head largely (except frons medially, vertex and temple dorsally, black), pronotal collar, a triangular mark on upper margin of pronotum, a mark at the apex of middle lobe of mesoscutum, scutellum at sides, subtegular ridge, tegula faintly, speculum, and roundish mark

below speculum, metapleurum above, and extreme base and apex of first tergite. The following tergites dirty yellow. Legs is general yellow and their tibiae and tarsi tending to be infuscate. Hind coxa black, with a yellow oval mark above, trochanter and femur black, tarsus largely white.

Length : Female, 20 mm; fore wing 17.5 mm; ovipositor sheath 15.5 mm. Male, 16 mm; fore wing 14 mm.

Distribution : India : Maghalaya (Khasi Hills). *Elsewhere* : Indonesia : W. Sumatra (Sungei Kumbang; Korinchi, 1372 m).

2. ***Dinocryptus apicalis*** (Cameron) (Fig. 140 e, f)

1902. *Torbda apicalis* Cameron, *Entomologist*, **35** : 19. Famale, key, des. Lectotype : Female, India : Khasi Hills (OXFORD).

1913. *Torbda apicalis* : Morley, *Fauna of British India, Hymenoptera*, **3** : 65. Female, key, des. India : Khasi Hills.

1961. *Dinocryptus apicalis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 198. Lectotype design., n. comb. India.

1983. *Dinocryptus apicalis* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 66. Female, key, des., fig. India : Meghalaya : Khasi Hills : Cherrapunji, 1360 m.

1987. *Dinocryptus apicalis* : Gupta : *Mem. Amer. Ent. Inst.*, **41** : 755.

This species is close to *D. fulgidipennis* (Cameron) in having yellowish hyaline wings, without any brown markings, colour pattern of thorax also very similar. However, this species is distinguished by having abdominal tergites 4–8 wholly black. Hind coxa brown, and vertex and ocellar area brownish.

Female : Face smooth and shiny, at sides with a few scattered punctures, near antennal sockets somewhat finely and weakly trans-striate. Area basad of apical transverse ridge of clypeus sparsely and shallowly punctate, apicad of ridge smooth and shiny. Malar space granulose, 0.7× the basal width of mandible. Frons medially striate to punctate, at sides punctate. Vertex with close distinct punctures. Temple smooth and shiny, with a few scattered punctures. Pronotum largely punctate, groove smooth and mesoscutum and scutellum strongly punctate, scutellar carinae confined to its base. Mesopleurum with moderately strong and close punctures, punctures along prepectus and speculum running into striations. Prepectal carina extending 0.8× the height of mesopleurum. Metapleurum strongly closely punctate, punctures somewhat rugoso-punctate or trans-striate. Propodeum at base strongly punctate and at apex subpolished with two strong longitudinal carinae between the lateral crests on either side, areola open apically, basal transverse carina absent at sides. Nervellus intercepted above the middle. First abdominal tergite about 2.5× as long as wide at apex, tergite punctate except at base and apex; second to fourth tergites closely punctate, following tergite mat. Ovipositar as long as abdomen (Fig. 140 : f).

Dark brown. The black are as follows : tip of antenna, near ocellar triangle, pronotal scrobe, lateral lobes of mesoscutum, area below subtegular ridge to anterior margin of mesopleurum, mesopleural suture, base of hind wing, scutellum at sides, metascutellum and its sides, submetapleural carina up to base of hind coxa, metanotal rim, bases of second and third tergites broadly and the following tergites wholly. First tergite wholly brownish-orange (Fig. 140 : e). Wings yellowish hyaline.

Male : Not known.

Length : Female, 20 mm; fore wing 16 mm; ovipositor sheath 12 mm.

Distribution : India : West Bengal (Cherrapunji, 1360m in Khasi Hills).

3. ***Dinocryptus fulgidipennis*** (Cameron)

1902. *Torbda fulgidipennis* Cameron, *Entomologist,* **35** : 19. Female, key, des. Lectotype : Female, India : Khasi Hills (OXFORD).

1913. *Torbda fulgidipennis* : Morley, *Fauna of British India, Hymenoptera,* **3** : 65. Female, key, des. India : Khasi Hills.

1961. *Dinocryptus fulgidipennis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 199. Lectotype design., n. comb. India.

1983. *Dinocryptus fulgidipennis* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 70. Famale, key, des. India : Meghalaya : Khasi Hills.

1987. *Dinocryptus fulgidipennis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 756.

This species is close to *D. apicalis* (Cameron) is having very similar colour pattern, however, it is distinguished by having pronotum smooth and middle grove punctate; first tergite with a small triangular depression in the middle. Abdomen largely brown, except the bases of first to third and sixth tergites black.

Female : Body subpolished. Face trans-rugose in the middle, ruguloso-punctate at sides. Clypeus shallowly punctate at base. Malar space 0.75× the basal width of mandible. Frons just below ocellar triangle somewhat rugoso-punctate, weakly trans-striate in the scrobes. Vertex punctate. Temple smooth. Pronotum smooth, middle groove with minute punctures. Upper margin of pronotum and pronotal collar minutely and closely punctate. Epomia strong but short. Mesoscutum with deep minute and close punctures Scutellum shiny, with a few minute punctures. Mesoplurum largely distinctly punctate, in the middle area finely rugoso-punctate and along speculum trans-striate. Speculum convex, smooth. Metapleurum finely rugoso-punctate, juxtacoxal carina absent. Area between apical and basal carinae of propodeum strongly rugoso- reticulate, propodeum at apex with a few longitudinal carinae and irregular ridges, at base very closely punctate, punctures running into striations, apical carina absent medially, but latrally forming crests; basal carina present medially, strongly

arched and missing at sides. Nervellus intercepted at its middle. First tergite 2.5× as long as wide at apex, tergite dorsally punctate. Second to fourth tergites minutely and closely punctate, following tergites more or less smooth and subpolished. Ovipositor longer than the length of abdomen.

Brown. The following are black : Pronotum with a mark in the middle groove, each lobe of mesoscutum faintly, mesopleurum along its anterior margin, mesopleural suture, metapleurum at base and above middle coxa, base of hind wing, metanotal rim and bases of first to third and sixth tergites, and hind coxa at base. Wings yellowish hyaline.

Male : Not known.

Legth : Female, 20–40 mm; fore wing 16–20 mm; ovipositor sheath 15–17 mm.

Distribution : India : Megahalaya (Khasi Hills).

3. Genus ***Pterocryptus*** Szépligeti (Fig. 141 : a–c)

1916. *Pterocryptus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 250. Type-species : *Pterocryptus niger* Szépligeti; monobasic.

Taxonony : Townes, Townes & Gupta, 1961 : 199 (as a syn. of *Torbda*). Townes, 1970 : 340. Townes & Townes, 1973 : 119. Gupta & Gupta, 1983 : 76.

Host : Cerambycid larva (in Japan).

Distribution : Palaearctic and Oriental regions.

Body moderately long. Head rectangular when viewed from above. Clypeus weakly convex, its apical 0.35 weakly concave, the apex truncate and with a weak median

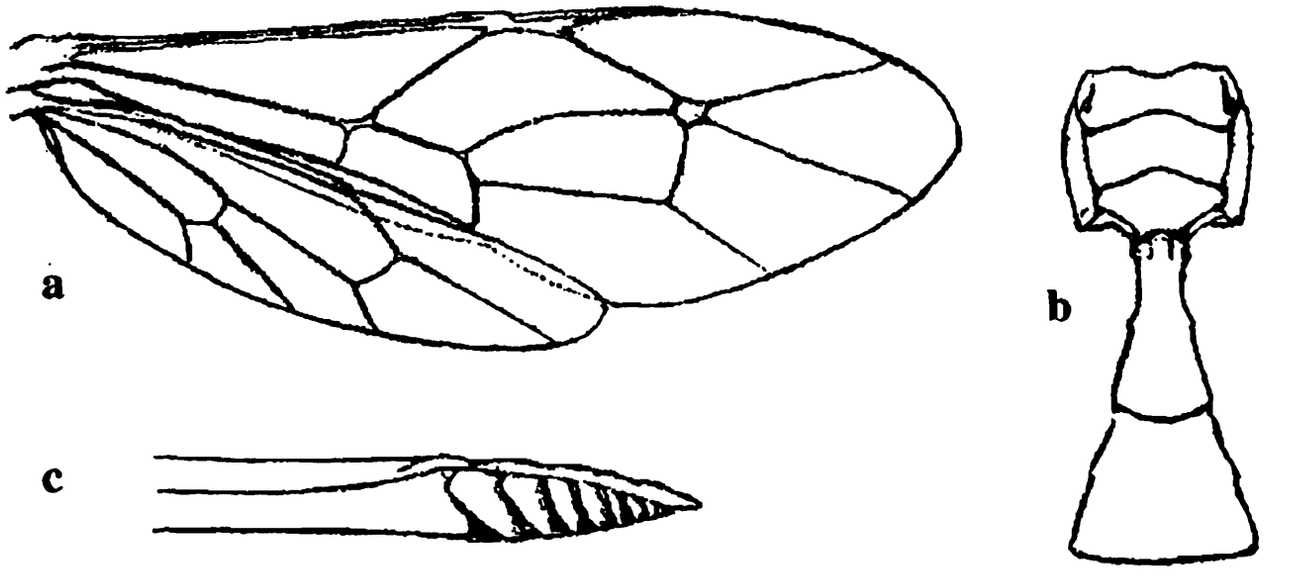

Fig. 141. *Pterocryptus* Szépligeti : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

tooth. Lower mandibular tooth longer than the upper. Occiput and temple slightly convex. Epomia long and strong, reaching up to upper margin. Sternaulus sharp, reaching 0.5 the distance to middle coxa. Pleural carina of propodeum present between basal transverse carina and hind coxa. Apical transverse carina complete or interrupted medially, without sublateral crests, area between transverse carinae irregularly wrinkled. Areolet pentagonal. Nervellus basad of basal vein by about 0.5 its length. Nervellus intercepted near its upper 0.37. First abdominal tergite moderated long and slender, without basal lateral tooth, but with short weak lateral flanges. Ovipositor as long as or longer than abdomen, its tip compressed, with about seven moderately spaced teeth. Tip of lower valve of ovipositor with a dorsal lobe that encloses upper valve.

Pterocryptus shows affinities with *Torbda* and *Dinocryptus*. However, it is distinguished by the presence of pleural carina between basal transverse carina of propodeum and the hind coxa; the transverse ridge on clypeus absent; first abdominal tergite slender, long and narrow, without basal lateral tooth; nervellus intercepted near its upper 0.37.

This genus is mainly known from southern Palaearctic region. Gupta & Gupta (1983 : 77) described a new species from Myanmar, which is discussed below :

1. ***Pterocryptus burmensis*** Gupta & Gupta

1983. *Pterocryptus burmensis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 77. Female, des. Type : Female, Myanmar : Mt. Victoria, 2800m (GAINESVILLE).

1987. *Pterocryptus burmensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 757.

Female : Face convex, polished, finely and sparsely punctate, except in the middle. Clypeus convex, sparsely punctate, with few hairs, its apical margin truncate and with a small faint median apical tooth. Malar space granulose, 0.6× the basal width of mandible. Frons in antennal scrobes smooth, above sparsely punctate. Vertex also finely punctate. Inter-ocellar distance 0.7 the ocello-ocular distance. Temple sprasely punctate. Pronotum with a few fine striations in the upper part of groove. Epomia and notauli well developed. Mesoscutum finely punctate. Scutellum shallowly and sparsely punctate, its lateral carina confined to its base. Metascutellum smooth and shiny. Mesopleurum rugose, punctate below speculum and towards mesosternum. Prepectal carina extending 0.8 the height of mesopleurum. Propodeum rugoso-reticulate, towards apex longitudinally striate. Metapleurum striato-rugose. First tergite sparsely, second and third tergites closely and following tergites mat and subpolished. Ovipositor longer than the abdomen. Areolet pentagonal. Nervulus basad of basal vein. Nervellus intercepted above the middle.

Black. The following are yellow : 7–9 flagellar segments, face with a triangular mark just below antennal sockets, along orbital margin, temple broadly below, clypeus

except the apical margin, propleurum just behind head, upper margin of pronotum, a central spot on mesonotum, a spot on tegula, subtegular ridge, scutellum at base, metascutellum at apex, basal spots on propodeum, apex of propodeum, an oblong spot just above, and a line below the sternaulus. Apical bands on first and second tergites yellowish-brown, following tergites brownish. Fore and middle coxae and trochanters, yellow. Hind coxa brownish-orange. Hind tersus yellow, except first segment basally. Wings clear hyaline.

Male : Not known.

Length : Female, 18 mm; fore wing 14 mm; ovipositor sheath 9.5 mm.

Distribution : Myanmar (Mt. Victoria, 2800m).

4. Genus ***Tanepomidos*** Gupta & Jonathan (Fig. 142 : a–c)

1971. *Tanepomidos* Gupta & Jonathan, *Oriental Ins.*, **5** : 147. Type-species : *Tanepomidos assamensis* Gupta & Jonathan; Original designation.

Distribution : India.

Body slender, subcylindric with thorax long. Head about as wide as long. Clypeus subconvex, truncate, with a small median tooth and somewhat dilated laterally. Mandible stout and short, lower tooth a little shorter than the upper. Frons without a horn, but with a median longitudinal carina; occipital carina joining hypostomal carina at a distance equal to the basal width of mandible. Epomia long, reaching up to upper margin of pronotum and then turning mesad. Mesoscutum weakly convex; notauli deep and long. Scutellum flat. Prepectal carina extending more than 0.5× the height of mesopleurum; sternaulus deep, extending to base of middle coxa; mesopleural pit deep and round, not joining mesopleural suture by any groove. Juxtacoxal carina obscure; pleural carina present. Propodeum long, both the basal and apical transverse carinae present, basal carina rather stronger than the apical carina, apical carina not forming lateral crests; propodeal spiracle large and oval. First abdominal tergite rather short and stout, with a lateral triangular tooth on either side at base, its median-dorsal, dorso-lateral and ventro-lateral carinae present. Areolet small, squarish, about 0.5 as high as the portion of second recurrent vein above bulla, second intercubitus often unpigmented. Nervulus interstitial to slightly basad of basal vein. Nervellus intercepted a little above or below the middle; axillus vein converging towards anal margin of hind wing. Ovipositor long, nearly as long as the length of abdomen.

In the key to genera of Gabunini of Townes (1970 : 327), this genus runs to *Xoridesopus* Cameron. It shows similarities with that genus in having a broadly truncate clypeus with a small median apical tooth, presence of pleural carina, sternaulus reaching to base of middle coxa, small areolet, moderately long propodeum,

position of nervellus and the teeth on ovipositor tip not unusually close. It, however, differs from *Xoridesopus* in having short and stout mandible with the lower tooth shorter than the upper, long epomia reaching to the upper margin and then turning mesad; presence of apical carina of propodeum, absence of lateral crests on propodeum, nervulus almost interstitial, and the first abdominal tergite with distinct median dorsal carinae.

This is a monotypic genus so far known only from India. The type-species is described below :

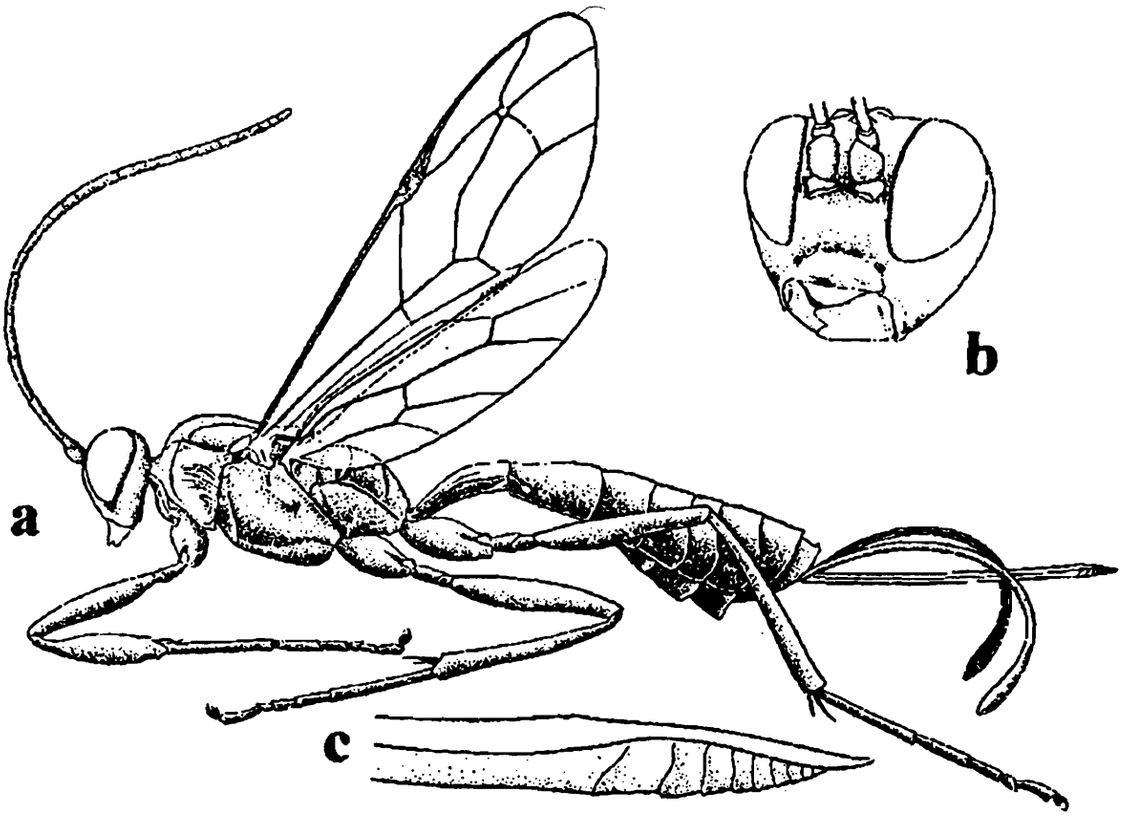

Fig. 142. *Tanepomidos assamensis* Gupta & Jonathan : **a**, side view of whole body; **b**, head in fronto-lateral view; **c**, ovipositor tip.

1. ***Tanepomidos assamensis*** Gupta & Jonathan

1971. *Tanepomidos assamensis* Gupta & Jonathan, *Oriental Ins.*, **5** : 147. Male, Female, des., fig. Type : Female, India : Assam : Rangapara : Charduar Forest (GUPTA).

1987. *Tanepomidos assamensis* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 778.

Female : Body pubescent, particularly the thorax. Face and clypeus subpolished, weakly rugoso-punctate. Clypeus tending to be smooth towards apex. Malar space granulose, 0.66× the basal width of mandible. Frons subpolished, along margins

minutely punctate, rugose around median ocellus. Vertex polished, excavated behind; occipital carina uniformly arched medially above and forming the margin of vertex. Temple wide, more so in the basal half, shiny. Pronotum minutely punctate above, coarsely striate in middle. Mesoscutum minutely punctate. Scutellum subpolished with indistinct punctures, its lateral carina confined to its base. Metascutellum smooth. Mesopleurum punctate along the oblique central area, this area surrounded by rugosities, particularly along prepectal carina and below subtegular ridge; prepectal carina extending to about 0.9 the height of mesopleurum; speculum shiny, sparsely and minutely punctate. Metapleurum rugose. Propodeum between basal carina and apex rugoso-reticulate, basad of basal carina smooth. First abdominal tergite polished, with scattered minute punctures; second and third tergites with densely crowded punctures, those on second smaller; the following tergites mat and subpolished.

Black. 5–12 flagellar segments yellowish-white. The following are yellow : face, clypeus at base, mandible at base, frons narrowly along eye margin, temple, pronotum along anterior margin, tegula, subtegular ridge, scutellum, metascutellum, propodeum between apical carina and apex broadly and in the region of areola, base and apex of first tergite, apex of second tergite broadly, third tergite narrowly and the seventh and eighth tergites broadly. Fore leg with coxa, trochanter and femur yellow except that coxa at base, a line on femur dorsally and tibia and tarsus wholly brown. Middle leg with coxa, trochanter, femur and tibia yellow, except that a line on femur and tibia above (sometimes tibia broadly at apex) brown, its tarsus dark brown. Hind leg largely black except an oval mark on coxa, second trochanteral segment, base of femur basal 0.12-0.6 of tibia, yellow, hind tarsus white except basal 0.45 of its first segment and apical 0.5 of fifth segment, black.

Male : Similar to female, except as follows : Face and clypeus shallowly and sparsely punctate, face rugose above; frons, vertex and temple smooth and shiny with only a few punctures; mesopleurum minutely and sparsely punctate; metapleurum shiny with a few scattered minute punctures; punctures of first tergite coarser than in the female; second to fifth tergites densely punctate.

Black. 7 to 21 flagellar segments yellowish-white. Fore and middle tibia largely and first to fourth tarsal segment of fore leg, yellowish, except a line above on fore tibia and exterme base and apex of middle tibia, brown; hind tarsus yellowish-white, except sometimes extreme base of its first segment and extreme apex of fifth segment and claws blackish; all the abdominal tergites with apical bands, those on first and second a little wider; rest of the colour similar to female.

Length : Female, 16–18 mm; fore wing 13–14 mm; ovipositor sheath 4.5–7.5 mm. Male, 11–19 mm; fore wing 8–13 mm.

Distribution : India : Assam (Rangapara in Charduar Forest).

5. Genus ***Xoridesopus*** Cameron (Fig. 143 : a–c)

1907. *Xoridesopus* Cameron, *J. Straits Branch Roy. Asiat. Soc.*, **48** : 18. Type-species : *Xoridesopus annulicornis* Cameron; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 191 (in part). [*Miophatnus* now placed as a syn. of *Torbda*, cf. Townes, 1970]. Townes, 1970 : 331. Gupta & Gupta 1983 : 84.

Distribution : Oriental Region.

Clypeus weakly convex, its apical 0.2 weakly impressed, apical margin truncate with a small median tooth. Mandibular teeth tapering, its lower tooth longer than upper tooth. Epomia short. Sternaulus and pleural carina of propodeum complete. Propodeum between apical and basal transverse carinae rugose or trans-striate; apical carina complete to obsolesent. Areolet in fore wing small, pentagonal or square. Nervulus basad of basal vein by about 0.55 its length. Nervellus intercepted at its lower 0.45. First abdominal tergite stout, at base with lateral triangular tooth, its dorsolateral carina present, usually complete. Second tergite mat and subpolished. Ovipositor sheath about as long as hind tibia. Ovipositor tip with 7–8 teeth.

Xoridesopus is a rather large genus including moderate sized, yellow and black banded species. Townes, Townes & Gupta (1961) reported nine species. Gupta & Gupta (1983) reported 35 species under this genus from Oriental region. 7 species are reported from India and adjacent countries, these can be distinguished by the following key and the description as given by Gupta and Gupta (1983 : 84).

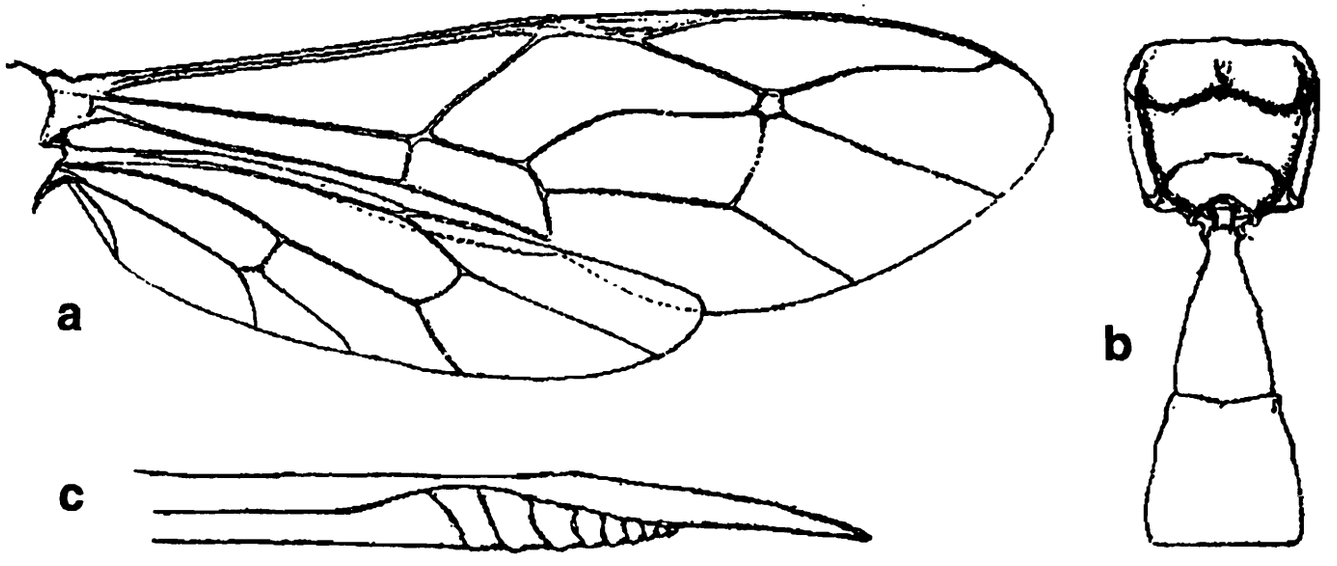

Fig. 143. *Xoridesopus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Key to the species of *Xoridesopus*

1. Lateral carina of scutellum marked with yellow. Scutellum triangular in shape, usually flat and densely punctate, punctures running into striations. Clypeus with a post-median transverse ridge 2

– Leteral carina of scutellum black. Scutellum roundish and usually arched, smooth or with a few shallow punctures, punctures not running is to striations 3

2. Face, upper margin of pronotum, and base of propodeum without any yellow mark. Speculum only partly yellow. India : Meghalaya. Myanmar .... 1. *xanthosema* Gupta & Gupta

– Face with two sublateral longitudinal blackish or brownish lines, they may be short of antennal sockets. Upper margin of pronotum very narrowly yellow. Base of propodeum with two yellow lateral marks. Speculum wholly yellow. India : Uttaranchal; Meghalaya; Sikkim; West Bengal .... 2. *flavispeculum* Gupta & Gupta

3. Mesopleurum with a small oval mark just above middle coxa, rest of mesopleurum usually entirely, black 4

– Mesopleurum with a broad or an elongate mark in the middle or above middle coxa. Speculum and area below sternaulus with or without marks 5

4. Frons, vertex and mesoscutum smooth and subpolished, sometimes with a few weak punctures. Mesopleurum granulose. Abdomen rugulose. Body coloration largely brownish with yellow marks. Body 9–10 mm. India : Maharashtra; Tamil Nadu ..... 4. *notialis* Gupta & Gupta

– Frons rugoso-punctate. Vertex and mesoscutum granulose. Mesopleurum strongly to weakly rugose. Abdomen strongly punctate. Body black with yellow marks. Body 10–15 mm. India : Maharashtra; Karnataka; Tamil Nadu; Kerala. Indonesia : Java; Sumatra; Sulawesi ..... 3. *schuleri* (Dalla Torre)

5. Speculum black. First tergite largely coarsely punctate. Face wholly yellow. Mesopleurum without any yellow line or spot below sternaulus. India : Uttanchal; Assam; Meghalaya; Karnataka; Kerala; Tamil Nadu. Myanmar. Philippines .... 5. *orientalis* Gupta & Gupta

– Speculum black with a yellow mark 6

6. Thorax elongate and narrow. Metapleurum punctate below. Upper margin of pronotum with weak punctures. India : Uttranchal .... 6. *jonathani* Gupta & Gupta

– Thorax normal. Metapleurum striate below. Upper margin of pronotum moderately strongly punctate. India : Meghalaya; Assam; Sikkim...7. *kamathi* Gupta & Gupta

1. ***Xoridesopus xanthosema*** Gupta & Gupta (Fig. 144 : a)

1983. *Xoridesopus xanthosema* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 93. Female, key, des., fig. Type : Female, India : Meghalaya : Cherrapunji, 1365 m. (GUPTA). Myanmar : Mt. Popa, 600-1000 m.

1987. *Xoridesopus xanthosema* : Gupta, *Mem. Amer. Ent Inst.*, **41** : 762. syn.

This and the next species is characterised by having the nervellus intercepted below the middle. Lateral carina of scutellum with a yellow mark. Scutellum flat and densely punctate. Clypeus convex and with a post median transverse ridge. However, this species is recognised by the charecters as given in the key.

Female : Face reguloso-punctate. Clypeus with a transverse ridge, without distinct punctures. Malar space 0.55× the basal with of mandiable. Frons rugulose, with a longitudinal median carina, scrobes shiny. Vertex granulose. Temple smooth. Pronotum largely with weak and close punctures, middle groove and posterior margin striate. Epomia short. Mesoscutum with fine close punctures. Scutellum flat, punctate, its lateral carina confined to its base. Mesospleurum largely rugose, striate near prepectus and speculum; speculum smooth; prepectal carina extending 0.8× the hight of mesopleurum. Metapleurum irregularly striate, juxtacoxal carina present. Propodeum at base rugoso-punctate, between both the transverse carinae strongly rugose, apicad of apical carina striate. Apical carina not well defined submedially. First abdominal tergite strongly and densely punctate, punctures towards base and apex shallow and coalescent, second and third tergites densely punctate, following tergites mat and suboplished.

Black. Apical half of fifth to basal half of tenth flagellar segments, white. The following are yellow : Face, clypeus, malar space, mandible except teeth, whole of orbit, pronotal collar, a mark at the apex of middle lobe of mesoscutum, scutellum and its lateral carinae, subtegular ridge, speculum, an oblique mark on mesopleurum, base of hind wing, a subtriangular mark on metapleurum and a trilobate mark at the apical slope of propodeum, base and apex of first abdominal tergite and apices of the other tergites and legs is general (Fig. 14 : a). Fore femur and tibia with a dorsal brown line; fore tarsus brown with the fifth segment blackish. Middle coxa, trochanter, femur, and tibia, dark brown, except coxa dorsally, tibia with a line and tarsus, blackish. Hind coxa broadly black dorsally, trochanter and femur with a black dorsal line, tibia black above and in its apical 0.5 and fifth segment of tarsus, blackish, rest of tarsus white.

Male : Not Known.

Length : Female, 9.5 mm; fore wing 8.5 mm; ovipositor sheath 4.25 mm.

Distribution : India : Meghalaya (Cherrapunji, 1365m). *Elsewhere* : Myanmar (Mt. popa, 600–1000m).

2. ***Xoridesopus flavispeculum*** Gupta & Gupta (Fig. 144 : b)

1983. *Xoridesopus flavispeculum* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 94. Female, key, des., fig. Type : Female, India : West Bengal : Darjeeling, 1980 m, (GUPTA). India : West Bengal : Darjeeling, Botanical Gardens. 1980m : Rangiroon, 1910m. Meghalaya : Cherrapunji. Sikkim : Gangtok. Uttaranchal : Garhwal Hills : Phata, 1590m.

1987. *Xoridesopus flavispeculum*, Gupta, *Mem, Amer. Ent. Inst.*, **41** : 759.

This species is distinguished by having face with two sublateral longitudinal blackish lines; upper margin of pronotum very narrowly yellow and speculum wholly yellow.

Female : Body largely subpolished. Face granulose, at sides rugose. Clypeus with a submedian transverse ridge. Malar space 0.5× the basal width of mandible. Frons with a median shallow longitudinal groove, near median ocellus rugulose to rugose. Vertex above minutely punctate. Temple smooth without distinct punctures. Pronotum with sparse close punctures, its groove striate. Epomia short. Mesoscutum mat and subpolished. Scutellum flat, punctate, its lateral carina confined to its base. Metapleurum smooth and shiny. Mesopleurum rugose, near subtegular ridge and middle coxa sparsely punctate. Speculum smooth and shiny; prepectal carina extending 0.8× the height of mesopleurum. Metapleurum striate, juxtacoxal carina absent. Propodeum largely rugose; apical transverse carina not well developed medially. First abdominal tergite densely, punctate, smooth basally; second and third tergites minutely and closely punctate to mat.

Colour similar to *X. xanthosema*, except face (Fig. 144 : b) with two sublateral blackish-brown lines; upper margin of pronotal callar, hind corner of pronotum, speculum, and two oblong marks on the base of propodeum, yellow.

Male : Not known.

Length : Female, 10–15 mm; fore wing 7–10 mm; ovipositor sheath 4–6 mm.

Distribution : India : Meghalaya (Cherrapunji, 1365m). Sikkim (Gangtok, 1675m). Uttaranchal (Phata, 1590m in Garhwal Hills). West Bengal (Darjeeling Batanical Garden, 1980m; Rangiroon, 1910m).

3. ***Xoridesopus schuleri*** (Dalla Torre) (Fig. 144 : c)

1876. *Cryptus tibialis* Taschenberg, *Ztschr. f. d. Ges Natuh.*, **48** : 70, Female. Name preocc, by Fonscolombe, 1850. des. Type : Female, Java (HALLE).

1902. *Cryptus schuleri* Dalla Torre, *Catalogus Hymenopterorum*, **3** : 588. New Name.

1910. *Gambrus facialis* Szépligeti, *Notes Leyden Mus.*, **32** : 99. Female, key, des. Lectotype : Female, Java : Jakarta (BUDAPEST). Syn. by Townes, Townes & Gupta, 1961.

1961. *Xoridesopus schuleri* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 191. Lectotype design. of *facialis*, Syn. Java.

1983. *Xoridesopus schuleri* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 98. Male, Female, key, des., fig. India : Maharashtra, 1000m. Karnataka : Mercara, 1200m. Kottegehar, 950m, Bhagmandla, 850m; Gunji 610m; S. Corrg : Ammatti, 935m. Tamil Nadu : Shevaroy Hills : Yercaud, 1370m; Nilgiri Hills : Charangode, 1165m; Naduvattam, 1830m; Anamalai Hills. Cincona, 1050m. Kerala : S. Malabar : Walayar Forest. Myanmar : Mt. Popa, 600–800m. Malaysia : Sarawak : Nanga Pelagus, nr. Kapit, 180m. Indonesia : Sumatra : Sukaranda. W. Java : Djam pangs Tengah; Mt. Gede, 1000m. Sulawesi : Wawa Karang, 1100m.

1987. *Xoridesopus schuleri* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 761.

This species is close to *X. notialis* in having similar colour pattern of mesopleurum. However, it can be distingnished in having body black with yellow markings and abdomen strongly punctate.

Female : Face slightly raised in middle, punctate to finely granulose. Clypeus with an apical median small tooth, without a distinct ridge. Frons rugose in the center, smooth laterally. Vertex minutely punctate. Mesoscutum granuloso-punctate. Pronotum striate in the groove, rest punctate. Mesopleurum largely weakly rugose, striate in the middle. Metapleurum striato-punctate. Propodeum closely punctate in the basal 0.3, between transverse carinae strongly rugose, apically rugoso-striate. Nervellus intercepted below its middle. First and second tergites densely punctate, following tergites minutely punctate, tending to be mat.

Black. The following are yellow : Face (except a black mark along epistomal groove), orbital stripes (except rest of frons, vertex and occiput, black), temple, middle lobe of mesoscutum with an oval mark, pronotal collar broadly above, tegula, subtegular ridge, an oblong mark between speculum and middle coxa, scutellum, metascutellum, base of hind wing, a small to large spot on metapleurum and apical slope of propodeum, apices of all the abdominal tergites, except seventh tergite laterally (Fig. 144 : c). Speculum and lateral carina of scutellum black. Fore and middle legs yellowish-brown, with their coxae yellow and tarsi brownish. Hind legs yellowish-brown, coxa with or without a yellow dorsal spot and black on the outer side. Hind tarsus yellow, except fifth segment black.

Male : Similar to female, except more slender, subpolished. Yellow colour may be more extensive on head and thorax, apical bands on abdomen may not be present on all the segments.

Length : Female, 14 mm; fore wing 10 mm; ovipositor sheath 5.75 mm. Male, 13 mm; fore wing 9 mm.

Distribution : India : Karnataka (Mercera, 1220 m; Kottegehar, 950 m; Bhagmandla, 850m; Gunji, 610m). Tamil Nadu (Yercaud, 1370 m; Cherangode, 1165 m in Nilgiri Hills). Kerala (Walayar Forest, Cincona, 1050m in Anamalai Hills). *Elsewhere* : Myanmar (Mt. Popa, 600–800 m). Malaysia (Sarawak). Indonesia (Sumatra; Java; Sarawak).

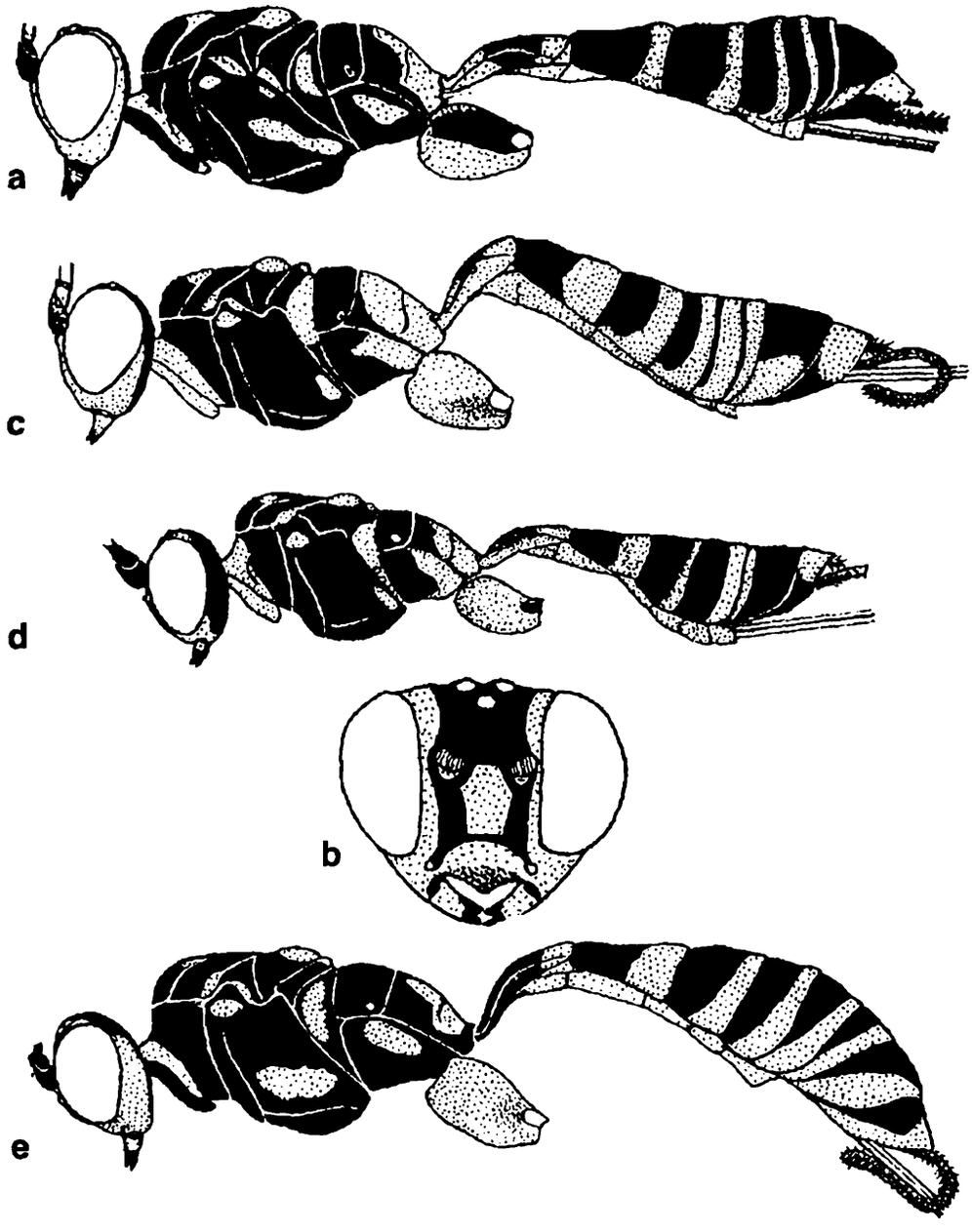

Fig. 144. Colour pattern : *Xoridesopus xanthosema* Gupta & Gupta : **a**, body side view. *X. flavispeculum* G & G : **b**, head in front view. *X. schuleri* (Dalla Torre) : **c**, body side view. *X. notialis* G & G : **d**, body side view. *X. orientalis* G & G : **e**, body side view. (Source : Gupta & Gupta, 1983).

4. ***Xoridesopus notialis*** Gupta & Gupta (Fig. 144 : d)

1983. *Xoridesopus notialis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 100 Female, key, des., fig. Type : Female, India : Maharashtra : Matheran, 915 m. (GUPTA). India : Maharashtra : Mahabaleshwar, 1370m. Tamil Nadu : Nilgiri Hills : Cherangode, 1066 m.

1987. *Xoridesopus notialis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 760.

This species is close to *X. schuleri* (Dalla Torre) in having a small yellow oval mark just above the middle coxa and rest of mesopleurum black. However, this species is recognised by having body in general brownish with yellow markings.

Female : Face and clypeus with shallow and sparse punctures, subpolished. Malar space 0.65× the basal width of mandible. Frons, vertex and temple largely smooth without distinct punctures. Pronotum at its upper margin and pronotal collar with indistinct punctures, groove with weak and sparse striations, epomia weak. Mesoscutum indistinctly punctate. Scutellum convex, with shallow and sparse punctures, lateral carina confined to its base. Mesopleurum along anterior margin of speculum and along prepectal carina rugoso-striate. Prepectal carina extending 0.85× the height of mesopleurum. Metapleurum trans-striate, tending to be wrinkled; juxta coxal carina absent. Propodeum at base closely punctate, punctures strongly running into striations, rest of propodeum rugose to trans-rugose. Apical and basal carinae strong and complete. Nervellus intercepted below the middle. First to third abdominal tergites densely punctate, following tergites mat and subpolished.

Brownish-black. 5–13 flagellar segment white. The following are yellow : face broadly in the middle, clypeus at base, base of mandible, temple near the base of mandible, orbital mark on vertex, pronotal collar, a mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, a small mark on mesopleurum just above middle coxa, a mark on metapleurum, apical slope of propodeum, apices of all the abdominal tergites (Fig. 144 : d) (except fourth and seventh, black and eighth tergite only dorsally, yellow). Speculum and lateral carinae of scutellum black. Legs is general dark yellow, with tarsi brownish. Hind coxa, trochanter and femur orange, tibia, yellow, with its extreme base and apex brown, tarsus whitish, its basal half of first segment and third to fifth segment dark brown.

Male : Not known.

Length : Female, 7.5 mm; fore wing 5.5 mm; ovipositor sheath 3.75 mm.

Distribution : India : Maharashtra (Matheran, 915m; Mahabaleshwar, 1370m). Tamil Nadu (Cherangode, 1066m in Nilgiri Hills).

5. ***Xoridesopus orientalis*** Gupta & Gupta (Fig. 144 : e)

1983. *Xoridesopus orientailis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 114 Male, Female, key, des., fig. Type : Female, India : Uttaranchal : Garjia (GUPTA). India : West Bengal : Tista-Kalimpong route. Assam : Rangapara, Charduar Forest. Meghalaya : Khasi Hills : Burnihat; Shillong Botanical Garden, 1300m. Kerala : Walayar Forest : Watapara. Karnataka : Mysore, Santaverry; Ammathiam, 945m. Tamil Nadu : Shevaroy Hills : Yercaud, 1370m. Myanmar Mt. Popa, 600–1000m. Philippines : Mindoro : Calapan : San Luis.

1987. *Xoridesopus orientalis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 760.

This species is easily distinguished by having speculum black, face wholly yellow and mesopleurum without any mark or spot below sternaulus.

Female : Face and clypeus shallowly punctate. Malar space 0.7× the basal width of mandible. Frons in scrobes smooth, further above strongly punctate, punctures running into striations. Vertex punctate in middle. Temple smooth and shiny. Pronotum with distinct deep punctures, striate in the groove. Mesoscutum and scutellum distinctly punctate, its lateral carina confined to its base. Mesopleurum moderately strongly punctate, speculum smooth, prepectal carina extending 0.8× the height of mesopleurum. Metapleurum largely coarsely striate, at base reticulate, juxtacoxal carina absent. Propodeum basad of basal carina reticulo-punctate, between basal and apical carina reticulate, apically rugose. Both the transverse carinae complete, apical carina not forming lateral crests. First abdominal tergite strongly and coarsely punctate, at base smooth and shiny. Second to fourth and fifth tergites basally densely punctate. Following tergites mat and subplolished.

Black. 6–10 flagellar segments white. The following are yellow : face, clypeus, frontal orbits, temple except below and above, pronotal collar, an oval mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, a mark on mesopleurum above sternaulus, base of hind wing, small mark on metapleurum above, apical slope of propodeum and apices of all the abdominal tergites (Fig. 144 : e). Legs is general orange or reddish. Fore coxa yellow, tarsus brownish, its apical segments dark brown. Middle tarsus dark brown. Apices of hind tibia; its tarsus with 0.5 of first; fourth and fifth segments wholly, dark brown.

Male : Similar to female, except more subpolished and slender. Face ruguloso-punctate; vertex and temple almost smooth and shiny; propodeum largely wrinkled in the center. First abdominal tergite with a few scattered shallow punctures, second densely and following mat and subpolished.

Colour similar to female, except antenna completely black. Hind trochanter, apex of femur, base and apex of tibia, tarsus with first segment and apical 0.5 of fourth and fifth wholly blackish to dark brown.

Length : Female, 8–12.5 mm; fore wing 6.5–10 mm; ovipositor sheath 4.5–5.5 mm. Male, 10 mm; fore wing 8 mm.

Distribution : Assam (Rangapara in Charduar Forest). Karnataka (Mysore, Santaverry, Ammathiam, 945m). Kerala (Watapara, Walayar Forest). Meghalaya (Burnihat; Shillong Botanical Garden, 600m). Tamil Nadu (Shevaroy Hills : Yercaud). Uttaranchal (Garjia). *Elsewhere* : Myanmar (Mt. Popa 200–500m). Philippines (Mindoro : S. Luis, Calapan).

6. ***Xoridesopus jonathani*** Gupta & Gupta

1983. *Xoridesopus jonathani* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 123, Male, Female, key, des. Type : Female, India : Uttaranchal : Kumaon Hills : Jeolikote, 1220m (GUPTA). India : Uttaranchal : Kumaon Hills : Garjia 600m; Nainital 1980m; Sat Tal; Dehra Dun.

1987. *Xoridesopus jonathani* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 759.

This species is close to *X. kamathi*, but it can easily be distinguished by having thorax elongate and narrow; metapleurum punctate below and upper margin of pronotum with weak punctures.

Female : Face and clypeus with indistinct sparse punctures. Malar space 0.5× the basal width of mandible. Frons above rugoso-punctate, at sides smooth and shiny. Vertex and temple largely smooth. Pronotal collar and upper margin sparsely punctate, middle groove rough and striate, epomia indistinct. Mesoscutum and scutellum with faint minute punctures, its lateral carina confined to its base. Metascutellum faintly punctate. Mesospleurum largely smooth, with a few striations, area below sternaulus and subtegular ridge weakly punctate; prepectal carina extending up to the base of subtegular ridge. Metapleurum ruguloso-punctate, juxtacoxal carina not well defined. Propodeum between apical carina and base weakly reticulate, apicad of apical carina moderately strongly rugose. Both the transverse carinae present. Nervellus intercepted below the middle. First abdominal tergite strongly and coarsely punctate, second to fourth tergites densely puncate, following mat and subpolished.

Black. 6–11 or sometime 6–13 flagellar segments white. The following are yellow: Face, clypeus, base of mandible, malar space, eyes along the orbital margin, pronotal collar, upper margin of pronotum just in front of neck, a mark on the middle lobe of mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, a long spindle-shaped mark on mesopleurum, a small mark on speculum, base of hind wing, metapleurum above, apical slope of propodeum, apices of all the abdominal tergites, except seventh, which is only laterally marked. Lateral carina of scutellum black. Fore and middle legs yellow to dark yellow, their tarsi brown. Hind coxa yellow, apico-laterally blackish, trochanter and femur orange, tibia dark yellow, a mark on trochanter, femur at apex, tibia at base and apex, blackish, tarsus white, its fifth segment dark brown.

Male : Similar to female, except more polished and slender. Frons with a few punctures, pronotal groove with a few striations. Metapleurum shallowly and sparsely punctate. Propodeum medially irregularly wrinkled. First tergite with sparse but strong punctures second tergite densely punctate, following mat and subpolished.

Colour similar to female except antenna without a white band; orbital mark extending up to the level of lateral ocellus and metapleurum wholly yellow and hind tarsus white.

Length : Female, 8.5–10 mm; fore wing 6–7 mm; ovipositor sheath 4.25 mm. Male, 8mm; fore wing 6 mm.

Distribution : India : Uttaranchal (Joelikote, 1220m; Garjia, 600m; Nainital, 1980m; Dehra Dum).

7. ***Xoridesopus kamathi*** Gupta & Gupta

1983. *Xoridesopus kamathi* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 125, Male, Female, key , des. Type : Female, India : Assam : Rangapara : Charduar Forest (GUPTA). India : Meghalaya : Jaintia Hills : Dawki. Uttaranchal : Dehra Dun. Sikkim : Gangtok, 1670m.

1987. *Xoridesopus kamathi* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 759.

This species is recognised by having upper margin of pronotum moderately strongly punctate and metapleurum striate below.

Female : Face granulose shallowly punctate medially. Clypeus with a few punctures at base, rest smooth and shiny. Malar space 0.57× the basal width mandible. Frons below median ocellus rugose and with a few punctures, rest smooth. Vertex above minutely and sparsely punctate. Temple smooth and shiny. Pronotal collar and upper margin punctate, middle groove with coarse striations. Mesoscutum and scutellum minutely and shallowly punctate, lateral carina of scutellum confined to its base. Mesopleurum broadly in the middle area coarsely wrinkled, speculum dull, smooth, prepectel carina 0.8× the hight of mesopleurum. Metapleurum striate below and rugose above. Propodeum finely to strongly reticulate, both the transverse carinae complete. Nervellus intercepted below the middle. First tergite with strong coarse punctures, second and third tergites punctate, following mat and subpolished.

Black. 5–15 flagellar segments whitish. The following are yellow : Face, clypeus, malar space, base of mandible, temple, orbital mark on frons extensive and joining the mark of temple, upper margin of propotum, a mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, tegula, subtegular ridge, a broad mark above sternaulus, a mark on speculum, base of hind wing, a large mark on metapleurum, a trilobate mark on the apical slope of propodeum, apices of all the abdominal tergites, seventh tergite at sides only. Lateral carina of scutellum not marked (black). Legs in general yellow or dark yellow, except fore femur above and its tarsus, brown. Middle coxa with a small mark at the base and apex, trochanter, femur and tibia light brown, with femur dorsally with a dark line and tibia at apex brown, and tarsus dark brown. Hind coxa black with an oval yellow darsal mark, brownish-yellow ventrally, hind trochanter, femur and tibia light brown; blackish marks on trochanter, apex of femur and base and apex of tibia; hind tarsus white, its fifth segment dark brown.

Male : Similar to female, except slender and polished. Face, clypeus and frons with a few scattered punctures. Vertex behind ocellar triangle coarsely punctuate. Pronotum striate along posterior margin and groove, rest smooth. Mesopleurum striate along speculum. Propodeum basally with coarse, strong punctures and longitudinally running striations, apicad of apical carina irregularly striate. Abdomen largely shagreened. Colour same as female, except antenna without white band.

Lenght : Female, 8–12 mm; fore wing 6.5–9.5 mm; ovipositor sheath 4–5.5 mm. Male, 9 mm; fore wing 7mm.

Distribution : India : Assam (Rangapara in Charduar Forest). Meghalaya (Dawki in Jaintia Hills). Sikkim (Gangtok, 1670m). Uttaranchal (Dehra Dun).

6. Genus ***Hadrocryptus*** Cameron (Fig. 145 : a–c)

1903. *Hadrocryptus* Cameron, *Mem. & Proc. Manchester lit. Phil. Soc.*, **47** (14) : 11. Type-species : (*Hadrocryptus nasutus* Cameron = *ditissimus* Tosquinet); monobasic.

1916. *Hoplonopsis* Szépligeti, *Ann. Mus. Natl. Hungarici*, **14** : 239. Type-species : *Hoplonopsis cingulatus* Szépligeti; monobasic. Syn. by Townes, Townes & Gupta, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 193. Townes 1970 : 336 Gupta & Gupta, 1983 : 127.

Distribution : Oriental Region.

Face and clypeus weakly convex, apical margin of clypeus with or without a weak median tooth-like angulation. Lower tooth of mandible slightly longer than upper tooth. Face above with a prominent, median, short, stout horn-like protuberance. Epomia short and weak. Sternaulus weak, but reaching middle coxa. Pleural carina of propodeum absent between basal transverse carina and hind coxa. Apical transverse carina of propodeum present as weak lateral crests; propodeum between transverse carinae reticulo-wrinkled. Areolet modreately large, subpentagonal. Nervulus basad of basal vein by about its 0.53 its length. Nervellus intercepted near its lower 0.37. First abdominal tergite slender, at base with lateral tooth, without dorsolateral carina. Second tergite with strong moderate size punctures. Ovipositor sheath 1.1× as long as hind tibia, its tip with about seven teeth, lower value with a dorsal lobe that encloses the upper value.

Hadrocryptus is restricted to the Oriental Region. Gupta & Gupta (1983) reported six species from Oriental Region. Of these, only two species, i.e. *Hadrocryptus trimaculatus* and *H. ditissimus* are known to occur in India. These two species can be distinguished by the following key :

Key to the species of *Hadrocryptus*

1. Yellow orbital ring complete. Base of propodeum with three yellow marks. Basal transverse carina of propodeum interrupted medially. Mesopleurum striate only along the anterior margin of speculum. India : Tamil Nadu .... 1. *trimaculatus* Gupta & Gupta

– Yellow orbital ring incomplete. Base of propodeum without yellow marks. Basal transverse carina of propodeum complete. Mesopleurum striato-punctate. India : Arunachal Pradesh; Sikkim; Meghalaya. Bhutan. Malaysia. Indonesia. .... 2. *ditissimus* (Tosquinet)

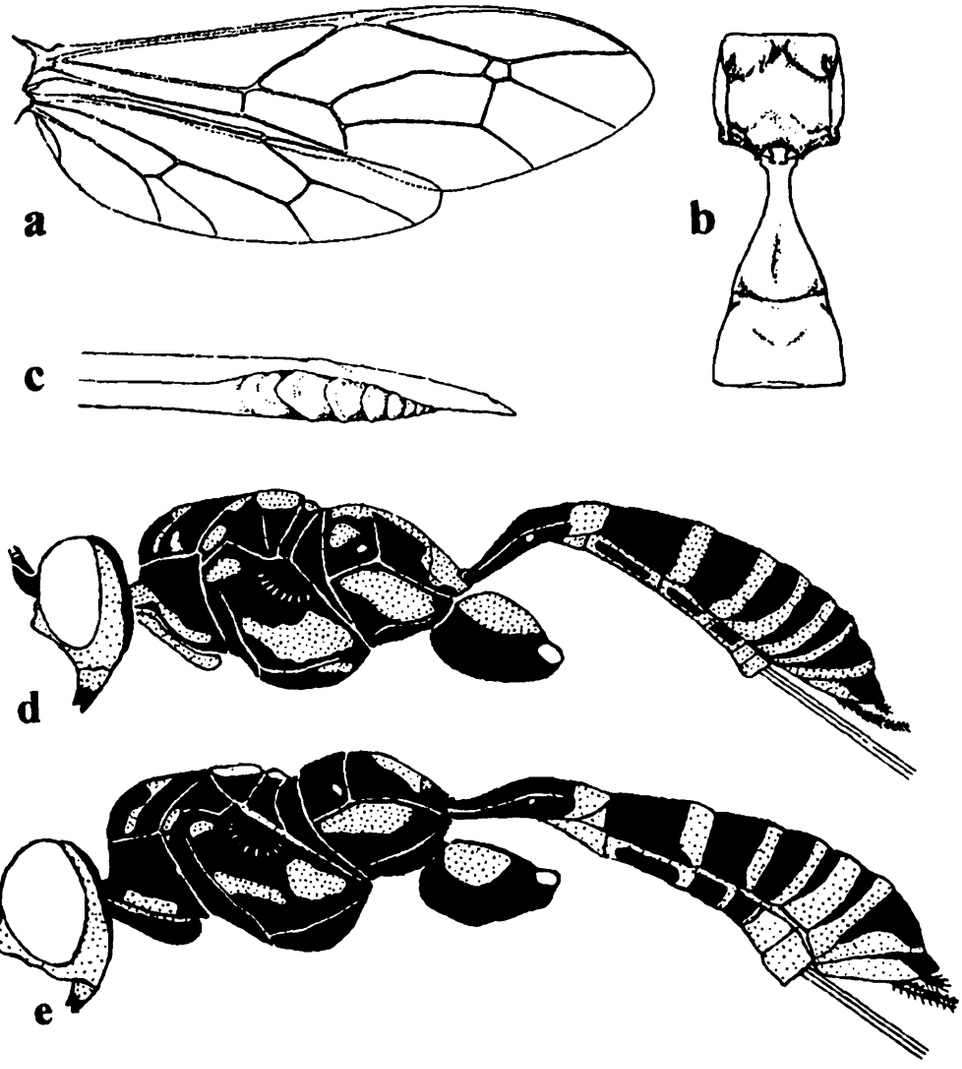

Fig. 145. *Hadrocryptus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970). Colour pattern : *H. trimaculatus* G & G : **d**, side view of body. *H. ditissimus* (Tosquinet) : **e**, side view of body. (Source : Gupta & Gupta, 1983).

1. ***Hadrocryptus trimaculatus*** Gupta & Gupta (Fig. 145 : d)

1983. *Hadrocryptus trimaculatus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 132. Female, key, des., fig Type : Female. India : Tamil Nadu : Coimbatore (GAINESVILLE).

1987. *Hadrocryptus trimaculatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 764.

This species is distinguished from *H. ditissimus* in having orbital yellow mark complete, base of propodeum with three yellow marks and basal transverse carina of propodeum interrupted medially.

Female : Face largely coarsely punctate, puncture sparse, shallow to coalescent and at some places running into striations. Clypeus with strong coalescent punctures. Frons and vertex with moderately deep and sparse punctures. Temple smooth. Malar space 0.5× the basal width of mandible. Pronotum with moderately deep punctures,

in groove striate. Mesoscutum finely punctate. Scutellum sparsely and shallowly punctate. Mesopleurum punctate, striate along speculum; prepectal carina extending 0.75× the height of mesopleurum. Metapleurum largely striato-punctate, juxtacoxal carina present. Propodeum largely rugoso-reticulate, medially transversely striate and basad of basal carina punctate, propodeal spiracles large, slit-like; basal transverse carina interrupted medially. First abdominal tergite without basal lateral teeth, tergite dorsally sparsely punctate, shiny; following tergites mat and subpolished. Ovipositor sheath 1.4× as long as hind tibia.

Black. 5–10 flagellar segments white. The following are yellow : Face except medially, clypeus, mandible, frons along eye margin, temple except narrowly behind, pronotal collar, mark constricted in the middle, apex of middle lobe of mesoscutum and also two marks at the base of middle lobe, which are joined with the apical mark by a line along notauli; scutellum, lateral carina of scutellum, metascutellum, tegula, subtegular ridge, an elongated mark in the middle of mesopleurum, a small crescentic mark on mesosternum and metapleurum largely, three spots at the base of propodeum, middle mark touching the inverted T-shaped mark on the apical slope of propodeum and apices of all the tergites (Fig. 145 : d). Legs is general yellow, except fore tarsus light brown; middle coxa black at base and inner margin of tibia and tarsus wholly brown. Hind coxa black with an oval yellow mark above and narrowly below, yellow; its first trochanter, femur and tibia, yellowish-brown, and second trochanteral segment, extreme apex of femur, base and apex of tibia, dark brown or black. Hind tarsus whitish-yellow, with extreme apex of fifth segment blackish.

Male : Not Known.

Length : Female, 15mm; fore wing 12.5mm; ovipositor sheath 8.5mm.

Distribution : India : Tamil Nadu (Coimbatore).

2. ***Hadrocryptus ditissimus*** (Tosquinet) (Fig. 145 : e)

1903. *Echthrus ditissimus* Tosquinet, *Mem. Soc. Ent. Belgique*, **10** : 252. Female, des. Type : Female, Indonesia : Java : Mt. Gede, 1350 m (BRUSSELS). Indonesia : Java : Sukabumi, 700m. Sulawesi : Tolitoli, 1350m.

1903. *Hadrocryptus nasutus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 12. "Female" = Male. des. Type : Male, India : Meghalaya : Khasi Hills (OXFORD). Syn. by Gupta & Gupta, 1983.

1907. *Hadrocryptus tuberculatus* Cameron, *Entomologist*, **40** : 5. Female, des. Type : Female, Bhutan : Buxa (LONDON). Syn. by Gupta & Gupta, 1983.

1907. *Hadrocryptus dentatus* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, **48** : 21. Female, des. Type : Female, Malaysia : Sarawak : Kuching (LONDON). Syn. by Gupta & Gupta, 1983.

1983. *Hadrocryptus ditissimus* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 129. Male, Female, key, des. Syn., fig. India : Maghalaya : Khasi Hills. Nagaland : Naga Hills. Bhutan : Buxa. Indonesia : Java : Mt. Gede, 1220 m; Sukabumi, 600m; Praenger Residency : Mt. Djampang Tengah; Mt. Malang, 1000–1350m. Malaysia : Sarawak : Kuching.

1987. *Hadrocryptus ditissimus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 763.

This species is distinguished by the absence of yellow mark at the base of propodeum; yellow orbital mark complete and basal transverse carina of propodeum also complete.

Female : Face below median tubercle semicircularly striate, shallowly punctate at sides. Frons, vertex, occiput largely smooth and shiny except for a few scattered punctures. Malar space 0.5× the basal width of mandible. Pronotum granulose, middle groove striate, rest with a few scattered punctures. Mesoscutum and scutellum granulose, with a few scattered punctures. Mesopleurum shallowly and sparsely punctate punctures running into trans-striations; speculum mat and subpolished; prepectal carina extending 0.75× the height of mesopleurum. Metapleurum weakly striato-punctate, juxtacoxal carina strong. Propodeum between basal carina and apex rugoso-striate, basally distinctly punctate, spiracle large slit-like. First abdominal tergite apically sparsely punctate, second and third tergites densely punctate. The following tergites mat and subpolished. Ovipositor sheath 1.3× as long as hind tibia.

Black. 5–10 flagellar segments yellowish-white. The following are yellow : Face except madially, mandible except apically, temple and frons along the eye margin, pronotal collar, middle lobe of mesoscutum with two marks at the base and one at the apex, scutellum at apex, its lateral carinae, metascutellum, tegula, subtegular ridge, mesopleurum with two or one elongate mark, metapleurum above, and an inverted T-shaped mark on the apical slope of propodeum, apices of all the abdominal tergites (Fig. 145 : e) and legs is general. Fore and middle femora and tibia with dorsal lines and their tarsi largely, brown. Hind coxa black, with a large dorsal yellow mark and a smaller one ventrally, trochanter dark brown, femur and tibia yellowish-brown except their extreme base and apex blackish; tarsus yellow, its fifth segment blackish.

Male : Similar to the female in sculpture and colour except more slender and polished; hind femur and tibia apically more extensively marked with black.

Length : Female, 10–14.5 mm; fore wing 9–12 mm; ovipositor sheath 5.5–6.75 mm. Male, 12 mm; fore wing 10 mm.

Distribution : India : Arunachal Pradesh (Naga Hills). Meghalaya (Khasi Hills). Sikkim. *Elsewhere* : Bhutan. Indonesia : Java (Mt. Gedeh, 1220m; Sukabumi, 600m; Wengon; Praenger; Residency; Mt. Djampang Tengah, Mt. Malang, 1000–1300m). Malaysia : Sarawak (Kuching).

7. Genus ***Microstenus*** Szépligeti (Fig. 146 : a–c)

1916. *Microstenus* Szépligeti, *Ann. Mus. Natl. Hungrici*, **14** : 287. Type-species : *Microstenus canaliculatus* Szépligeti; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 192. Townes , 1970 : 338. Gupta & Gupta, 1983 : 137.

Distribution : Oriental Region.

Clypeus wide, moderately convex, its apical 0.4 flattened, its apex weakly concave, without a median tooth. Hypostomal carina absent apically, not joining occipital carina. Lower tooth of mandible longer than the upper. Epomia strong. Sternaulus deep, long reaching middle coxa; pleural carina of propodeum absent between basal carina and hind coxa. Apical transverse carina of propodeum strong evenly arched. Propodeum between the transverse carinae polished, with a few scattered punctures, and with a median and a sublateral longitudinal groove (these grooves not present in other Gabuniini). Areolet very small, somewhat squarish, the second intercubitus very weak. Nervulus basad of basal vein by 0.6 its length. Nervellus intercepted near its middle or little above the middle. First abdominal tergite moderate long, with basal lateral teeth, its dorso-lateral carina present. Ovipositor sheath 1.0× as long as hind tibia, its tip with about 12 oblique teeth, its lower valve with a dorsal lobe that encloses upper value.

This is a small genus of the Oriental Region. Gupta & Gupta (1983) reported four species. Of these, only two species are known from India and adjacent countries. These can be distinguished by the following key : (Gupta & Gupta, 1983 : 138).

Key to the species of *Microstenus*

1 Body largely black, including mesopleurum and metapleurum. Scutellum, metascutellum and apical half of propodeum, yellow. India : Karnataka. .... 1. *mysorensis* Gupta & Gupta

– Body largely orange, or atleast its mesopleurum, metapleurum, scutellum, metascutellum and apical half of propodeum, orange. India : Karala. Myanmar. Singapore. Malaysia. Indonesia ..... 2. *canaliculatus* Szépligeti

1. ***Microstenus mysorensis*** Gupta & Gupta (Fig. 146 : d)

1983. *Microstenus mysorensis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 142. Male, Female, key, des., fig. Type : Female, India : Karnataka : Londa (GUPTA). India : Karnataka : Mercara, 1220 m.

1987. *Microstenus mysorensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 764.

This species is distinguished by its smooth and shiny pronotal groove and anterior margin of speculum not having striations. The hind tibia is largely deep orange.

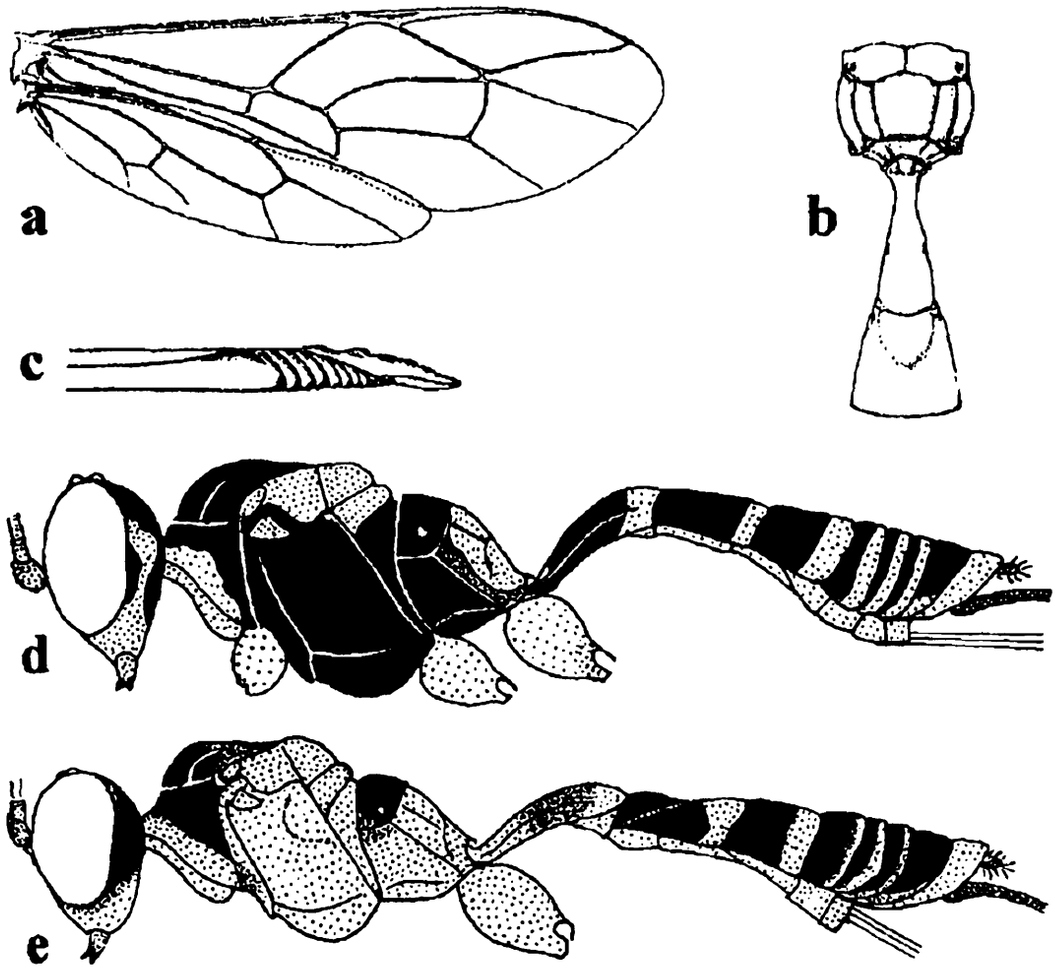

Fig. 146. *Microstenus* Szépligeti : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970). Colour pattern : *M. mysorensis* G & G : **d**, side view of body. *M. canaliculatus* Szépligeti : **e**, side view of body. (Source : Gupta & Gupta, 1983).

Female : Body largely subpolished. Face sparsely and shallowly punctuate. Clypeus, vertex and temple without distinct punctures. Frons sparsely and minutely punctuate. Malar space granulose, 0.25× the basal width of mandible. Pronotum smooth and shiny. Mesoscutum minutely punctate. Scutellum smooth, its lateral carina extending at its basal 0.33. Mesopleurum uniformly minutely punctate. Metapleurum with moderately deep punctures, juxtacoxal carina complete. Propodeum at base and at sides weakly punctate, rest smooth and shiny. First abdominal tergite smooth and shiny, its extreme apex with a few punctures; second, third and fourth basally densely punctuate; following tergites mat and subpolished. Ovipositor sheath about 1.1× as long as hind tibia.

Black 5–11 flagellar segments whitish, The following are yellow : Face, clypeus, mandible except teeth, two orbital stripes on frons, temple except above, pronotal callar, tegula, scutellum, metascutellum, propodeum between basal carina and apex,

apices of all the abdominal tergites, apical band on seventh tergite narrow and eighth tergite wholly (Fig. 146 : d). Fore leg deep yellow, its fourth and fifth tarsal segments dark brown. Middle leg orange, its tarsus dark brown. Hind leg also orange, with a mark at the apex of second trochanteral segment, apices of femur and tibia, extreme base of first tarsal segment and whole of fifth segment, dark brown.

Male : Similar to female, but more slender and polished.

Black. 8–12 flagellar segments white. The following are yellow : Face, clypeus, frontal stripes, temple, pronotal collar, scutellum, speculum, area below sternaulus and above middle coxa, propodeum centrally and apices of all abdominal tergite, base of first tergite. Legs is general yellow : fore tibia above and its fifth tarsal segment dark brown; middle leg with femur and tibia with a dorsal line and fifth tarsal segment, brown. Hind leg yellowish-brown, its coxa, trochanters above, femur at apex and a line above, tibia and basal 0.5 of first and fifth tarsal segment wholly dark brown to black.

Length : Female, 10.5–11.5 mm; fore wing 8.5–9 mm; ovipositor sheath 6 mm. Male, 8–9 mm; fore wings 7–8 mm.

Distribution : India : Karnataka (Londa; Mercara, 1220m).

2. ***Microstenus canaliculatus*** Szépligeti (Fig. 146 : e)

1916. *Microstenus canaliculatus* Szépligeti, *Ann. Mus. Natl. Hungarici,* **14** : 287. Female. des. Type : Female, Singapore (BUDAPEST).

1961. *Microstenus canaliculatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.* **1** ; 193. Singapore.

1964. *Microstenus canaliculatus* : Baltazar, *Pacific Ins.,* **6** : 40. Female. fig. Philippines.

1983. *Microstenus canaliculatus* : Gupta & Gupta, *Oriental Ins. Monogr.,* **10** : 138. Male, Female. key, des., fig. Singapore. Myanmar. India : Kerala : Walayar Forest : Watapara. Malaysia : Malaya : Kuala Lumpur. Kalimantan : Balikpapan.

1987. *Microstenus canaliculatus* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 764.

This species is easily distinguished from other Indian species by having body largely orange and abdomen black with yellow apical bands.

Female : Head largely smooth and shiny. Malar space granulose, about 0.2× the basal width of mandible. Thorax also smooth and shiny, except pronotum with minute weak punctures. Lateral carina of scutellum confined to its base. Prepectal carina extending 0.55 the height of mesopleurum. Juxtacoxal carina complete. Propodeum with both the transverse carinae, carinae strong and evenly arched. First abdominal tergite smooth and shiny; second and third tergites with densely crowded punctures; following tergite mat and subpolished. Ovipositor sheath 0.8× as long as hind tibia.

Body in general orange, with yellow and black markings. 5–12 antennal segments brown. The following are yellow : face, clypeus, lower half of temple, vertex along eye margin, pronotal collar and fore legs. The black are : frons, ocellar area, vertex behind, occiput, upper temple, pronotum and mesoscutum. Abdomen black with yellow apical bands, bands on 4–6 narrow, and on 7 and 8 broad (Fig. 146 : e). Middle legs yellowish-brown, with tarsi brownish. Hind leg yellowish-brown, with trochanter, apices of femur, tibia, and tarsal segments, brownish-black; tarsus otherwise yellow.

Male : Similar to female, except more polished and slender. First tergite largely black. Hind femur blackish.

Length : Female, Male, 9–10 mm; fore wing 6–7 mm; ovipositor sheath 3.5–4.5 mm.

Distribution : India : Kerala (Watapara). *Elsewhere* : Myanmar. Malaya (Kuala Lumpur). Indonesia : Kalimantan (Balikpapan).

8. Genus ***Eurycryptus*** Cameron (Fig. 147 : a–c)

1901. *Eurycryptus* Cameron, *Proc. Zool. Soc.* London, 1901 : 231. Type-species : *Eurycryptus laticeps* Cameron; monobasic.

1911. *Alriada* Cameron, *Ann. Transvaal Mus.*, 2 : 17b. Type-species : *Alriada spilocephala* Cameron; monobasic. Syn. by Townes, Townes & Gupta, 1961.

1932. *Neotorbda* Uchida, *Insecta Matsumurana*, **6** : 153. Type-species : *Torbda (Neotorbda) sakaguchii* Uchida; Original designation. Syn. by Townes, Townes & Gupta, 1961.

1952. *Didiaspis* Seyrig, *Mem. Acad. Melgache,* **19** (39) : 189.Type-species : *Didiaspis fondamentalis* Seyrig; Original designation. Syn. by Townes, Townes & Gupta, 1961.

Taxonony : Townes, Townes & Gupta, 1961 : 193. Townes, 1970 : 339. Townes, Momoi & Townes, 1965 : 201. Gupta & Gupta 1983 : 144. Gauld, 1984a : 154.

Hosts : Sphecoidea larvae (in Japan).

Distribution : Indo-Australian, Afrotropical and Eastern Palaearctic regions.

Head large, wider than thorax; eyes large projecting beyoud temple. Basal 0.4 of clypeus weakly convex, rest concave, apical margin without a median tooth. Lower tooth of mandible much longer than the upper. Hypostomal carina incomplete not joining occipital carina. Epomia strong. Sternaulus sharp, reaching up to the middle. Pleural carina of propodeum absent between basal carina and hind coxa. Propodeum with apical carina strong, complete and evenly arched, between transverse carinae polished with medium sized punctures. Areolet small, pentagonal. Nervulus basad of basal vein by 0.5 its length. Nervellus intercepted near its middle or a little below. First abdominal tergite without a dorso-lateral carina and with a lateral triangular projection at the base; second tergite with moderately dense and strong punctures. Ovipositor sheath about 1.2× as long as hind tibia. Ovipositor tip with seven oblique teeth, lower value with a dorsal lobe that encloses upper valve.

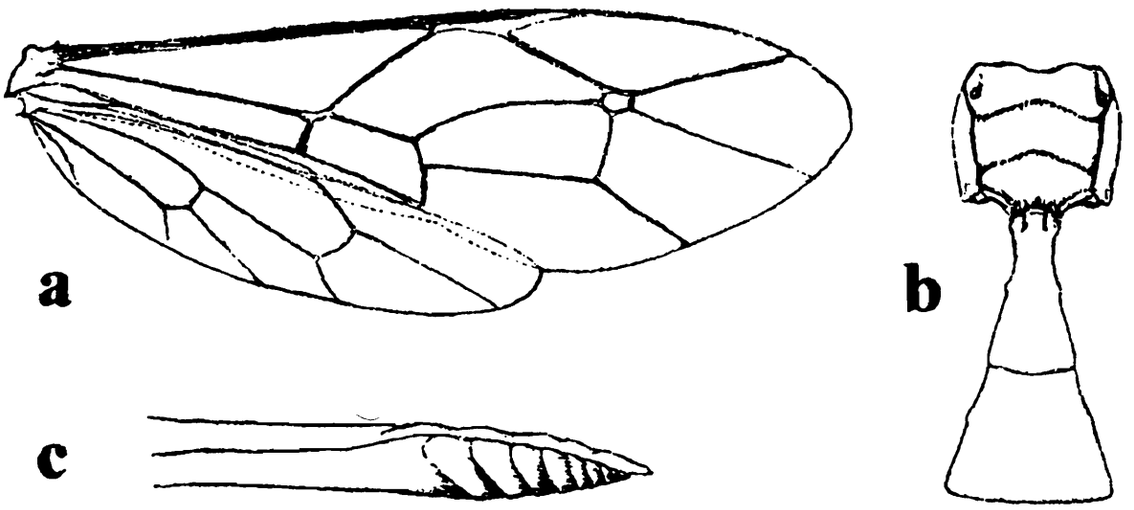

Fig. 147. *Eurycryptus* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

This genus is known from Indo-Australian, Afrotropical and Eastern Palaearctic regions. Gupta & Gupta (1983) reported five species from Oriental Region. Of these, only one species has been recorded from India, which is discussed below :

1. ***Erycryptus decoratus*** (Smith)

This species is known from Indonesia : Halmahera Island and mainly distinguished by having head wide; face convex, sparsely punctuate, tending to be finely striate above, lower tooth of mandible about 3× as long as upper tooth. Malar space 0.4× the basal width of mandible. Temple and pronotum smooth and shiny. Mesoscutum and scutellum smooth and polished, with a few sparse shallow punctures. Mesopleurum, metapleurum and propodeum largely smooth and subpolished, with a few scattered shallow punctures. Prepectal carina reaching the base of subtegular ridge. First tergite smooth. Nervulus basad of basal vein. Nervellus intercepted a little below the middle.

In Oriental Region this species is known by four subspecies. *Eurycryptus decoratus indicus* Gupta & Gupta is the only subspecies known from India, which is discussed below :

1a. ***Eurycryptus decoratus indicus*** Gupta & Gupta.

1983. *Eurycryptus decoratus indicus* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 148. Female, key, des. Type : Female, India : Bihar (Now Jharkhand) : Ranchi : Namkum (GUPTA).

1987. *Eurycryptus decoratus indicus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 765.

Female : Face wholly yellow. Maxillary and labial palpi brown. Pronotal collar, upper margin of pronotum narrowly, yellow. Metapleurum with a black line along

juxtacoxal carina. Black mark on middle coxa extending up to outer side. Black mark on hind coxa extending more ventrally. Hind femur orange. Basal hind trochanteral segment wholly yellow and apical segment black. First tergite at base black.

Male : Not Known.

Lenght : Female, 10 mm; fore wing 8 mm; ovipositor sheath 4.75 mm.

Distribution : India : Jharkhand (Ranchi : Namkum).

9. Genus ***Schreineria*** Schreiner (Fig. 148 : a–c)

1905. *Schreineria* Schreiner, *Trudy Byuro. Ent. Uchen. Kom. Min. Zeml. Gosud. Imuschchestu.*, **6** : 15. Type-species : *Schreineria zeuzerae* Schreiner; monobasic.

1919. *Sycophrurus* Picard, *Bull. Soc. Ent. France,* 1919 : 77. Type-species : (*Sycophrurus hesperophanis* Picard) = *annulata* Brischke; monobasic. Syn. by Townes, Townes & Gupta, 1961.

1932. *Pseudotorbda* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **33** : 195. Type-species : *Pseudotorbda geniculata* Uchida; original designation. Syn. by Townes, Townes & Gupta, 1961.

1952. *Pygidites* Seyrig, *Mem. Acad. Malgache,* **19**(39) : 190. Type-species : *Pygidites regulator* Seyrig; Original designation. Syn. by Townes, Townes & Gupta, 1961.

Taxonomy : Townes, Townes & Gupta, 1961 : 192. Baltazar, 1966 : 92. Gupta & Jonathan, 1966 : 485. Townes, 1970 : 337. Gupta & Gupta, 1983 : 154.

Hosts : Cossid, aegeritid and cerambycid borers.

Distribution : Palaearctic, Afrotropical and Oriental regions.

Face moderately convex. Clypens with a postmedian transverse ridge, area basad of the ridge strongly sculptured and apical area concave, smooth and dull, apex of clypeus concave, without a median tooth. Lower tooth of mandible narrow and longer than the upper tooth. Epomia short, weak or absent. Sternaulus weak, shallow, reaching 0.6 the distance to middle coxa, pleural and apical transverse carinae of propodeum absent. Propodeum basally reticulo-trans-wrinkled or puncto-rugulose. Areolet small and pentagonal, second intercubitus sometimes lacking. Nervulus basad of basal vein by about 0.8 its length. Nervellus intercepted near its upper 0.38. First abdominal tergite stout, with a strong basolateral tooth and another weaker tooth at the base of its ventro-lateral carina, second tergite with coarse dense punctures. Ovipositor sheath 1.0× as long as hind tibia. Ovipositor tip with about 6 strong vertical teeth, lower valve with dorsal lobe that encloses upper valve.

Schreineria is a small genus of Palaearctic, Oriental and Ethiopian regions. It is mostly parasitic upon wood borers. Gupta & Gupta (1983) reported nine species from Oriental Region. Of these, four species are known to occur in India. These can be distinguished by the following key.

Key to the species of *Schreineria*

1. Frons and vertex punctate; punctures also present between median ocellus and eye margin 2

– Frons and vertex smooth and shiny or with a few scattered punctures. Area between median ocellus and eye margin shiny 3

2. Pronotal yellow mark complete. Mesoscutum with two yellow stripes laterally on middle lobe and one stripe on each side of the lateral lobe. Face yellow with a faint brown central spot. Propodeum with a faint brown spot in the middle of the basal area. India : Uttaranchal ..... 1. *flavocollaris* Gupta & Gupta

– Pronotal yellow mark broken into two. Mesoscutum without yellow stripes. Face with a large black central mark. Propodeum without any mark. India : Himachal Pradesh; Uttaranchal ..... 2. *himalayana* Gupta & Jonathan

3. Nervellus intercepted distinctly below the middle. First abdominal tergite with scattered punctures medially and apically. Face rugose and bulging in the center, with a pentagonal mark above clypeus; this mark absent in males. Propodeum striate at base. Hind basitarsus black. Pronotal collar with a continuous yellow mark. India : Rajasthan; Tamil Nadu. Philippines .....
..... 3. *dholpurensis* Gupta & Jonathan

– Nervellus intercepted at the middle. First tergite granulose, with a median depression. Face somewhat shiny and granuloso-punctate, with an oblong black mark, which is absent is males. Propodeum smooth basally, striations faint. Hind basitarsus black only at base. Yellow mark on pronotal collar interrupted medially. India : Uttaranchal ..... 4. *dunensis* Gupta & Gupta

1. ***Schreineria flavocollaris*** Gupta & Gupta (Fig. 148 : d)

1983. *Schreineria flavocollaris* Gupta & Gupta, *Oriental Ins. monogr.*, **10** : 164. Female, Key, des., fig. Type : Female, Uttaranchal : Garjia, 610m (GUPTA).

1987. *Schreineria flavocollaris* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 767.

This species can be recognised by having two yellow lines on lateral lobes of mesoscutum and two at the base of the middle lobe, orbital mark not extending on vertex. Vertex behind ocellar triangle strongly punctate. Areolet large, about 7× as high as the width of the veins, and nervellus intercepted at the middle.

Female : Vertex behind occllar triangle moderately strongly punctate. Mesoscutum strongly punctate, without striations along notauli; scutellum shiny, with faint punctures. Mesopleurum largely rugoso-punctate, finely striate near speculum and

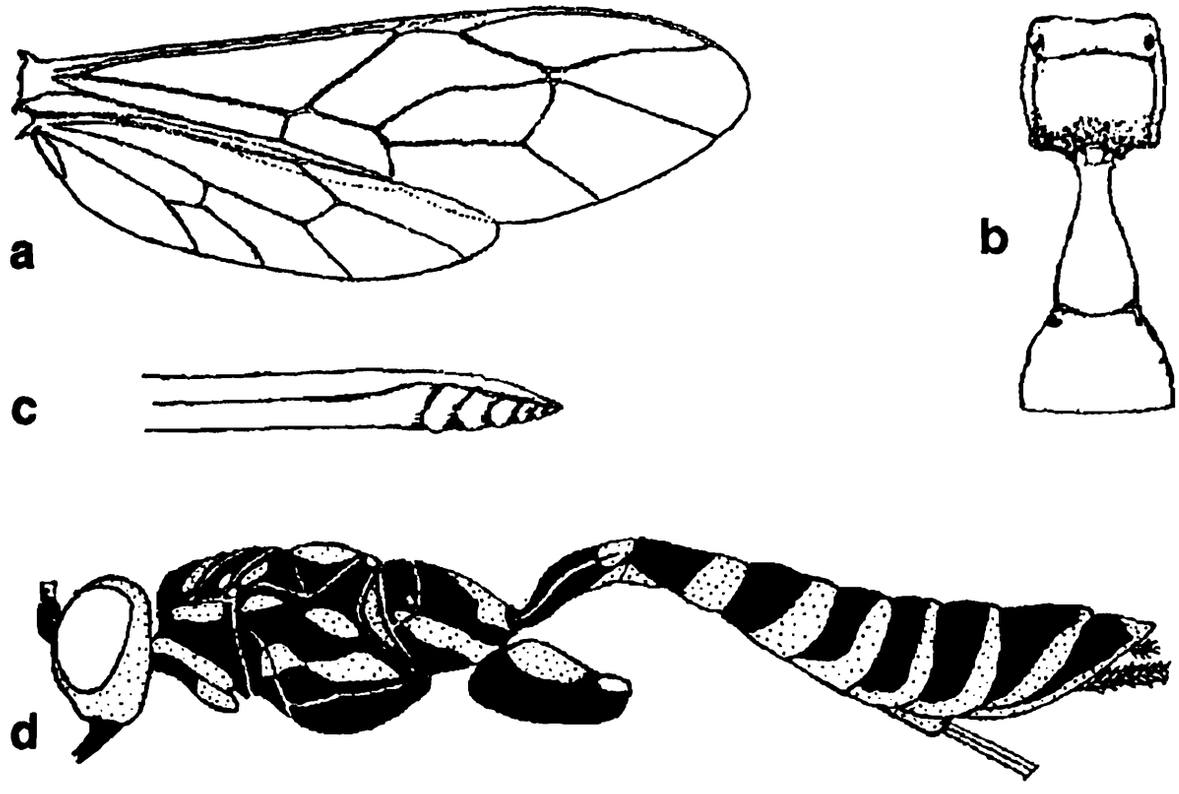

Fig. 148. *Schreineria* Schreiner : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970). *S. flavocollaris* G & G : **d**, side view of body showing colour pattern. (Source : Gupta & Gupta, 1983).

above the oblong yellow mark. Propodeum weakly rugoso-striate medially and laterally tending to be rugose, and apically reticulate; basad of basal carina finely striate in the middle, at sides near spiracle closely and strongly punctate. First abdominal tergite sparsely punctate at sides and at apex, granulose in the middle, following tergites closely punctate, punctures tending to be dense and weak in the succeeding tergites, apical tergites mat and subpolished. Areolet rhombic, about 7× as high as the width of the bordering veins. Nervellus intercepted at the middle. Ovipostor about as long as abdomen.

Black. Colour similar to *S. dholpurensis* Gupta & Jonathan, except that orbital mark not extending on vertex, mesoscutum with two lines on lateral lobes and two on middle lobe at base. Hind tarsus white, except basal 0.33 of first segment and fifth segment wholly blackish. Propodeum with a small yellow spot at base. Rest of colour as shown figure 148 : d.

Male : Not known.

Length : Female, 9.5 mm; fore wing 8 mm; ovipositor sheath 3.5 mm.

Distribution : India : Uttranchal (Garjia, 610m).

2. ***Schreineria himalayana*** Gupta & Jonathan (Fig. 149 : a–c)

1966. *Schreineria himalayana* Gupta & Jonathan, *Ann. & Mag. Nat. Hist.*, (13) **9** : 486. Female, key, des., fig. Type : Female, India : Uttaranchal : Mussoorie, 2100m (GUPTA). India : Himachal Pradesh : Dalhousie Hills : Khajjiar, 1800m (GUPTA).

1983. *Schreineria himalayana* : Gupta & Gupta, *Oriental Ins. monogr.*, **10** : 161. Male, Female, key, des., fig., India : Uttaranchal : Garjia, 609m; Barkot, 1220m; Mussoorie, 2100m; Phata, 1524. Assam.

1987. *Schreineria himalayana* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 767.

This species can easily be distinguished from other Indian species in having fine punctures between median ocellus and the margin of the eye. The mark on the pronotal collar is broken into two spots (Fig. 149 : a); the longer hind tibial spur is 0.37 the length of the first hind tarsal segment.

Female : Face dull, transversely rugose, slightly less so near the eye margin. Clypeus convex, apical margin concave, transversely rugose. Vertex shiny, punctation sparse and minute. Pronotum finely punctate at its upper margin, lower margin somewhat dull, trans-striate in the middle. Mesoscutum subpolished with strong punctures. Scutellum flat with shallow large punctures. Metascutellum almost smooth and shiny. Mesopleurum rugoso-punctate, prepectal carina ending at its middle. Propodeum strongly trans-striate below the basal carina, rugose above. Nervellus intercepted slightly above the middle, wings otherwise as in figure 149 : c. Postpetiole smooth basally and at its apical margin, otherwise punctate; rest of abdominal tergites with shallow and small punctures, their baso-lateral areas smooth. Ovipositor with ankylous teeth on the lower valve.

Black. Face yellow with an elongated black spot in the middle. Clypeus with a triangular blackish spot in the middle. Mandibles black, except in the middle redddish-brown. Vertex black, area surrounding the eyes pale yellow. Antenna black, with a whitish-yellow band on 7–13 segments. Thorax black with whitish-yellow spot as in figure 149 : a. Pronotum with two marks on pronotal collar and one on upper margin whitish-yellow. Mesoscutum with a pentagonal spot in its centre, tegula. scutellum and metascutellum, mesopleurum with four marks, two at the bases of fore and hind wings, one at its anterior lower margin and another big spot at its posterior lower margin; a triangular mark on the side of metanotum, an inverted Y-shaped mark in the middle of propodeum and an elongated spot on the metapleurum, whitish-yellow. Fore coxa yellowish-white, blackish along its basal margin and in the basal region of its inner side, a black spot at its extreme apical region, rest of the fore leg light brown with the fifth tarsal segment fuscous. Middle coxa whitish-yellow, basal half of its inner side and basal and apical margin on its outer side fuscous; trochanters, femur, tibia and tarsus light brown, except for the blackish fifth tarsal segment and claws. Hind coxa black with a white oval spot on its upper side, trochanters, femur and tibia

light brown, apex of femur and base and apex of tibia fuscous, fifth tarsal segment completely and first segment in its basal half (Fig. 149 : b) fuscous, rest of tarsus whitish-yellow. Abdomen with complete pale yellow transverse bands at the apices of all segments, these bands narrow in the middle, broader at the side.

Male : Face trans-rugose. Vertex subpolished, behind occellar triangle closely punctate. Pronotum trans-striate in the scrobe, finely punctate above. Mesoscutum strongly punctate. Scutellum with a few scattered shallow punctures. Metascutellum smooth and shiny. Mesopleurum rugoso-punctate. Propodeum trans-striate in the middle, reticulate at sides and mat basally. First tergite in middle rugoso-punctate, second tergite punctate. Nervellus intercepted little above the middle.

Black. The following are yellow : face except an elongate black mark in the middle, clypeus except for a triangular black mark, orbits, pronotal collar with two marks,

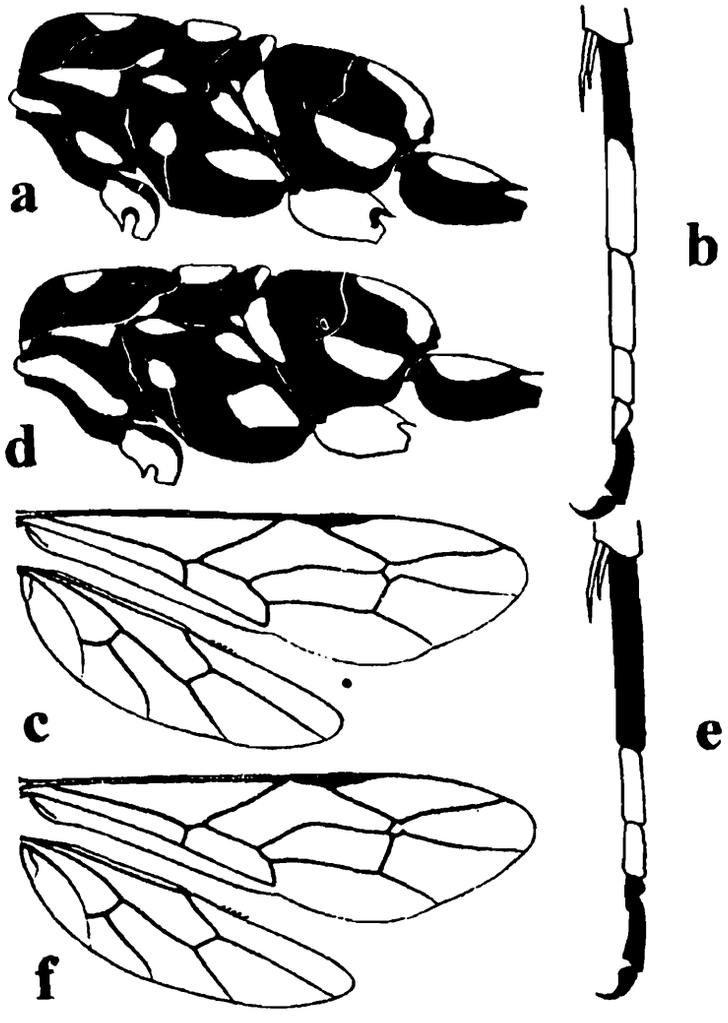

Fig. 149. *Schreineria himalayana* Gupta & Jonathan : **a**, side view of thorax and **b**, hind tarsus showing colour pattern; **c**, fore and hind wings showing venation. *S. dholpurensis* G & J : **d**, side view of thorax and **e**, hind tarsus showing colour pattern; **f**, fore and hind wings showing venation.

upper shoulder of pronotum, middle lobe of mesoscutum with an oval mark in the middle, tegula, scutellum, metascutellum, mesopleurum with four marks, propodeum with an inverted Y-shaped, mark on apical slope, fore and middle legs in general. Hind leg coxa black with an oval spot above; trochanter, femur, tibia and first tarsal segment brown, rest of hind leg yellow.

Length : Female, 12–13 mm; fore wing 9–10 mm; ovipositor sheath 5–6 mm. Male, 10.5 mm; fore wing 9 mm.

Distribution : India : Uttranchal (Mussoorie). Himachal Pradesh (Khajjiar; Dalhousie Hills).

3. ***Schreineria dholpurensis*** Gupta & Jonathan (Fig. 149 : d–f)

1966. *Schreineria dholpurense* Gupta & Jonathan, *Ann. & Mag. Nat. Hist.*, (13) **9** : 488. Female, key, des., Fig. Type : Female, India : Rajasthan : Dholpur : Van Vihar Game Sanctuary (GUPTA). India : Tamil Nadu : Coimbatore.

1983. *Schreineria dholpurensis* : Gupta & Gupta, *Oriental Ins. monogr.*, **10** : 165. Male, Female, key, des., fig., India : Rajasthan : Dholpur; Van Vihar Game Sanctuary. Tamil Nadu : Coimbatore. Philippines : Palawan : 3 km NE of Tinabog.

1987. *Schreineria dholpurensis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 767.

This species is without fine punctures between the median ocellus and the margin of eye. The mark on the pronotal collar is not broken into spots and there is also a single median spot on pronotum just in front of the middle lobe of mesoscutum (Fig. 149 : d). The longer hind tibial spur is 0.45 the length of the first hind tarsal segment. The shape of the areolet and the position of the subdiscoideus in fore wing and nervellus in hind wing (Fig. 149 : f) differ from other species.

Female : Face convex, dull, rugose, slightly less so than in *S. himalayana.* Clypeus convex, its apical margin concave, transversely rugose. Vertex polished, shiny, sparsely punctate. Frons just below median ocellus without distinct punctures. Temple moderately large, convex, shiny and impunctate. Pronotum punctate along its upper margin, finely striate and with small punctures along its anterior margin, trans-striate in the middle. Mesoscutum subpolished, with deep, large punctures, with its middle yellow spot more shiny and impunctate. Scutellum and metascutellum polished and almost impunctate. Prepectal carina complete, extending almost to the subtegular ridge. Mesopleurum rugoso-punctate, the area below hind wing much polished and impunctate. Propodeum strongly trans-striate in the middle below the basal carina, rugose above and irregularly striate at the sides, punctate near the spiracles. Longer hind tibial spur 0.45 as long as first hind tarsal segment; mid and hind coxae punctate. Nervellus intercepted slightly below the middle. Postpetiole coarsely punctate, less so at its centre and apex, smoother than in *S. himalayana;* rest of the abdominal tergites

with small shallow punctures, their basolateral areas smooth, their apical margins less punctate; last abdominal segment with a triangular depression. Ovipositor with ankylous teeth on the lower valve.

Black. Face yellow with a blackish spot in the middle; a round blackish spot in the middle of clypeus; mandible black, middle reddish-brown. Frons black; vertex black, area surrounding the eyes pale yellow. Antenna black, 7-12 segments white. Pronotal collar and upper margin of pronotum broadly, pronotum just in front of the middle lobe of mesoscutum with a small spot, mesoscutum with a broad triangular spot in its centre, tegula, whitish-yellow; colouration of mesopleurum, metapleurum, propodeum and abdomen similar to that of *S. himalayana;* colour of legs also similar except as follows : fore and middle coxae without a black spot at their apices (Fig.) second trochanteral segment fuscous; middle coxa almost completely pale yellow, trochanter with a fuscous mark and tarsus blackish; hind tarsus with the first, fourth and fifth segments completely fuscous (Fig. 149 : e), rest of the segments whitish-yellow.

Male : Not known.

Length : Female, 11 mm; fore wing 8 mm; ovipositor sheath 5.5 mm.

Distribution : India : Rajasthan (Dholpur Game Sanctuary). Tamil Nadu (Coimbatore). *Elsewhere* : Philippines (Palawan).

4. ***Schreineria dunensis*** Gupta & Gupta

1983. *Schreineria dunensis* Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 166. Male, Female, key, des., Type : Female, India : Uttaranchal : Dehra Dun (DEHARADUN)

1987. *Schreineria dunensis* : Gupta, *Mem. Amer. Ent. Inst.*, 41 : 467.

This species is similar to *S. himalayana* Gupta & Jonathan by having similar colour pattern, however, it is distinguished by having the second and third tergites largely and fourth at sides punctate.

Female : Face granulose, with a few scattered punctures. Clypeus strongly rugose. Malar spece 0.6× the basal width of mandible, lower tooth of mandible longer than the upper. Pronotum largely punctate, scrobe striate. Mesoscutum strongly punctate. Scutellum sparsely and shallowly punctate, metascutellum smooth and shiny. Mesopleurum sparsely and shallowly punctate, area above tending to be wrinkled. Prepectal carina extending 0.5 the height of mesopleurum. Metapleurum striato-punctate; juxtacoxal carina absent. Propodeum between basal carina and apex finely striate; basad of basal carina rough and laterally finely striate; area around spiracles somewhat reticulate. First tergite with a median depressed area, granulose with a few scattered punctures; second to fourth tergites closely punctate, following mat and subpolished. Areolet pentagonal, longer than high, 5× as high as the bordering veins; nervellus intercepted at the middle.

Black. The following are yellow : Face, orbital ring, temple, malar spece, apex of middle lobe of mesoscutum, upper margin of pronotum, pronotal collar with two marks, tegula, subtegular ridge, scutellum metascutellum, mesopleurum with two marks, base of hind wing, metapleurum towards metapleural fold, an inverted V-shaped mark on the apical slope of propodeum, all abdominal tergites apically, hind tibia basally and apically, and hind basitarsus at base. Clypeus, mandibles, frons medially, and vertex, black.

Male : Similar to female, except more polished and slender. Face and clypeus rugulose. Frons smooth and shiny. Vertex sparsely punctate. Pronotum largely smooth and shiny; its extreme upper margin and collar faintly punctate. Mesopleurum and mesosternum shiny, sparsely punctate, rugose above. Metapleurum puncto-wrinkled. Propodeum largely coarsely wrinked, basad of basal carina smooth, near spiracles rugose, its apical carina present. Abdominal tergites largely smooth and subpolished except first tergite with a few punctures laterally.

Black. The following are yellow : Face, clypeus, whole of orbit, pronotal collar above, upper margin of pronotum, an oval mark at the apex of middle lobe of mesoscutum, scutellum, metascutellum, subtegular ridge, a mark below subtegular ridge, a mark above the base of middle coxa, base of hind wing, a small mark on metapleurum a trilobate mark at the apex of propodeum, all tergites narrowly at apex. Antennal flagellum with a white band. Fore and middle legs largely yellow, except fore coxa with a yellow spot above. Hind femur yellow, tibia brownish-yellow, apical 0.3 of femur, apex and base of tibia, and whole of tarsus dark brown.

Length : Male, Female, 7–8 mm; fore wing 6 mm; ovipositor sheath 3.75 mm.

Distribution : India : Uttaranchal (Dehra Dun, Nakronda Vill.)

10. Genus ***Arhytis*** Townes (Fig. 150 : a–c)

1970. *Arhytis* Townes, *Mem. Amer. Ent. Inst.*, **12** : 335. Type-species : *Echthrus maculiscutis* Cameron; monobasic.

Taxonomy : Gupta & Jonathan, 1970 : 389. Gupta & Gupta, 1983 : 167. Gauld, 1984a : 179 [The *Novazealandicus* species group of Townes transferred to *Xanthocryptus* by Gauld. *Arhytis*, therefore, does not occur in Australia.]

Distribution : Oriental Regions.

Clypeus weakly convex, apically weakly impressed, apex truncate and with a median tooth. Mandible narrow apically, its lower tooth longer than upper tooth. Occipital carina complete. Epomia strong over the collar. Notauli short and shallow. lateral carina of scutellum confined to its base. Sternaulus usually sharp and reaching middle coxa, sometimes obsolescent. Prepectal carina extending 0.4 to 1.0× the hight of mesopleurum. Pleural carina of propodeum absent between basal carina and hind

coxa. Basal transverse carina of propodeum complete. Apical carina present or absent or not well defined. Areolet 5.0× as high as the width of bordering veins, longer than high, intercubiti convergent. Nervulus basad of basal vain by about 0.53 its length; nervellus intercepted near its lower 0.37. First abdominal tergite with a lateral triangular projection at the base, without a dorso-lateral carina; second tergite moderately strongly closely punctate, tergite with a V-shaped groove. Ovipositor tip with 7–13 vertical teeth.

Arhytis is close to *Amrapalia* Gupta & Jonathan and *Dagathia* Cameron. These three genera share certain characters such as the absence of plaural carina of propodeum between basal transverse carina and hind coxa, presence of median apical tooth on clypeus, lower tooth of mandible little longer than the upper and the base of first tergite having laterally projected teeth. The three genera have been discussed by Gupta & Jonathan (1970 : 389-393).

This genus is known from Oriental Region. Gupta & Gupta (1983) reported seven species from this region. Only two species are known to occur in India and adjacent countries. These can be distinguished by the following key.

Key to the species of *Arhytis*

1. Apical transverse carina of propodeum absent. Prepectal carina (incomplete better developed in males). Vertex smooth with a few minute punctures. Colour of propodeum as in Fig. 150 : e. India : Himachal Pradesh; Uttaranchal; Assam; Meghalaya; Sikkim; Maharashtra; Tamil Nadu; Karnataka. Philippines. Myanmar ..... 1. *maculiscutis* (Cameron)

– Apical transverse carina of propodeum distinct. Prepectal carina extending 0.4× the height of mesopleurum. Vertex strongly punctate. Colour of propodeum as in Fig. 150 : f. India : Tamil Nadu ..... 2. *dravida* Gupta & Gupta

1. ***Arhytis maculiscutis*** (Cameron) (Fig. 150 : d, e)

1907. *Echthrus maculiscutis* Cameron, *Tijdschr. V. Ent.*, **50** : 94. Female, des. Type : Female, India : Sikkim (LONDON).

1913. *Echthrus maculiscutis* : Morley, *Fauna of British India, Hymenoptera*, **3** : 60. Female, des. India : Sikkim.

1961. *Dagathia maculiscutis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 192. n. comb. India.

1970. *Arhytis maculiscutis* : Townes, *Mem. Amer. Ent. Inst.*, **12** : 336. n. comb.

1970. *Arhytis maculiscutis* : Gupta & Janathan, *Oriental Ins.*, **3**(4) : 389. des. fig. India.

1983. *Arhytis maculiscutis* : Gupta & Gupta, *Oriental Ins., Monogr.*, **10** : 170. Male, Female,

key, des., fig. India : Himachal Pradesh: Palampur, 1220m. Uttaranchal : Garjia, 610m; Dehra Dun : New Forest. Meghalaya : Shillong, 1460m. Assam : Rangapara : Charduar Forest. Sikkim. Maharashtra : Bombay, Chikalda, 1970m. Tamil Nadu : Coimbatore. Karnataka : Anmod. Philippines : Mindora : Calapan : San Luis. Myanmar : Palwe Res. : Pyinmana. Host : *Prionus* sp. (Cerambycidae).

1987. *Arhytis maculiscutis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 769.

This species can easily be distinguished by the absence of apical transverse carina of the propodeum; mesopleurum strongly punctate. Vertex smooth with a few minute punctures.

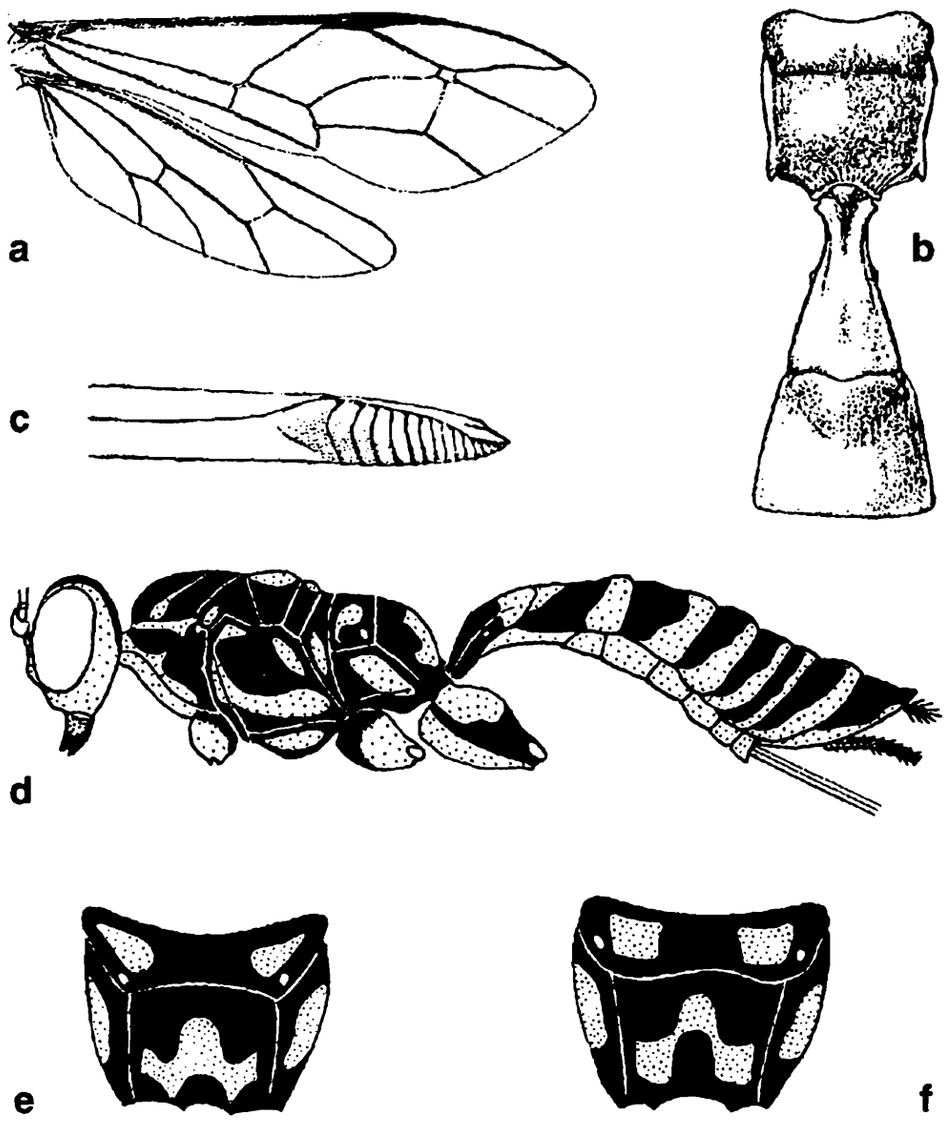

Fig. 150. *Arhytis* Townes : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970). *A. maculiscutis* (Cameron) : **d**, side view of body and **e**, dorsal view of propodeum showing colour pattern. *A. dravida* G & G : **f**, dorsal view of propodeum showing colour (Source : Gupta & Gupta, 1983).

Female : Face convex, dull and rugose, at sides smooth. Clypeus sparsely and shollowly punctate. Malar space 0.6× the basal width of mandible. Area along ocellar triangle distinctly punctate, sometimes rough. Vertex sparsely punctate. Temple largely smooth. Pronotal scrobe trans-striate, above punctate. Mesoscutum strongly and closely punctate. Scutellum sparsely and shallowly punctate; its lateral carina confined to its base. Mesopleurum and area below starnaulus moderately strongly punctate, punctures tending to be coalescent. Speculum shiny. Prepectal carina incomplete, short. Metapleurum punctate. with fine striations. Propodeum largely rugoso-punctate to reticulate; area apicad of apical carina rugoso-striate; basally shiny with sparse shallow punctures; centrally rugose. Apical transverse carina absent, basal carina slightly arched, spiracle oval. Areolet pentagonal, 0.5× as high as width of bordering veins. Nervulus basad of basal vein. Nervellus intercepted above the middle. First abdominal tergite about 2× as long as wide at apex, apically sparsely punctate, rest smooth and shiny. Second to fourth tergites strongly and densely punctate, following mat and subpolished.

Black. 6 to 15 flagellar segments white. The following are yellow : Face (except a rectangular black mark above clypeal groove); pronotal collar, upper margin of pronotum, two small oval marks at the base and a large mark at the apex of middle lobe of mesoscutum, scutellum (except a black vertical line in the middle), lateral carinae of scutellum, metascutellum, tegula, subtegular ridge, speculum, two irregular spots in the middle of mesopleurum, mesosternum mostly (all three marks united with each other), metapleurum largely above, propodeum (Fig. 150 : e) with two lateral marks at base, another trilobate mark at the apical slope, apices of all the abdominal tergites, yellow or dark yellow (Fig. 150 : d). Legs in general yellow, except fore coxa at base black, tibia and tarsus dorsally and fifth tarsal segment wholly, dark brown. Middle leg similar to fore leg. Hind coxa with a line above, trochanters with two marks, extreme apex of femur, base and apex of hind tibia and tarsus, black. Wings hyaline, stigma black.

Male : Similar to female, its prepectal carina better developed. 9–16 flagellar segments white. Face with a black mark, yellow mark on mesopleurum small and divided into two.

Length : Female, 12–14 mm; fore wing 10–12 mm; ovipositor sheath 7.5 mm. Male, 13 mm; fore wing 11 mm.

Distribution : India : Assam (Rangapara, Charduar Forest). Bihar (Chapra). Himachal Pradesh (Palampur, 1220m). Uttranchal (Garjia, 610m; Dehra Dun New Forest). Meghalaya (Shillong, 1460m). Sikkim. Maharashtra (Bombay, Chikalda, 1070m). Karnataka (Anmod). Tamil Nadu (Coimbatore). *Elsewhere* : Philippines (San Luis, Calapan, Mindoro). Myanmar (Palwe Res., Pyinmana).

2. ***Arhytis dravida*** Gupta & Gupta (Fig. 150 : f)

1983. *Arhytis dravida* : Gupta & Gupta, *Oriental Ins., Monogr.*, **10** : 176. Female, Key, des., fig. Type : Female, India : Tamil Nadu : Anamalai Hills (DEHRA DUN). Tamil Nadu : Nilgiri Hills : Cherangode, 1000m.

1987. *Arhytis dravida* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 769.

This species is close to *A. maculiscutis,* but can be distinguished by having the apical transverse carina of propodeum complete; mesoscutum puncto-rugose and vertex strongly punctate.

Female : Face convex, rugose in the middle and sparsely punctate at sides. Apical margin of clypeus impressed, sparsely and shallowly punctate. Frons above strongly rugose, at sides sparsely and shallowly punctate. Vertex strongly punctate. Temple largely smooth. Pronotum is middle groove striate, above punctate and at lower margin smooth; collar sparsely punctate. Mesoscutum and scutellum strongly punctate, its lateral carina confined to its base. Mesopleurum strongly punctate, striato-punctate along speculum. Speculum smooth and shiny. Prepectal carina extending up to 0.4 the height of mesopleurum. Metapleurum strongly striato-punctate, juxtacoxal carina complete. Both the transverse carinae of propodeum complete, propodeum between apical and basal carinae rugoso-reticulate, extreme basal area smooth; apical propodeal area laterally striato-punctate, in the middle puncto-striate, spiracle oval. Areolet 5× as high as the width of the bordering veins. Nervulus basad of basal vein. Nervellus intercepted near its 0.4. First tergite 2× as long as wide at apex, its dorso-lateral carina absent between spiracle and apex, tergite granuloso-rugose medially and shallowly punctate at apex, base smooth. Second and third tergites punctate, following mat and subpolished.

The colour pattern is almost similar to *A. maculiscutis,* except the marks on propodeum as shown in figure 150 : f.

Male : Not known.

Length : Female, 13 mm; fore wing 10 mm; ovipositor sheath 8.5 mm.

Distribution : India : Tamil Nadu (Annamalai Hills, Cherangode, 1000m in Nilgiri Hills).

11. Genus ***Dagathia*** Cameron (Fig. 151 : a–c)

1903. *Dagathia* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 29. Type-species : *Dagathia brunnea* Cameron; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 192. Gupta & Jonathan, 1970 : 390. Townes, 1970 : 335. Gupta & Gupta, 1983 : 180.

Distribution : Oriental Regions.

Clypeus evenly convex, somewhat truncate, laterally dilated, apical margin impressed, with a distinct median tooth. Face evenly arched; malar space about 0.6× the basal width of mandible, lower tooth a little longer than the upper tooth. Occipital carina complete. Epomia moderately strong. Mesoscutum convex, notauli deep and well developed. Scutellum flat, its lateral carina confined to its base. Prepectal carina extending almost up to the base of subtegular ridge; sternaulus deep, extending 0.5 the distance to middle coxa. Juxtacoxal carina complete or sometimes incomplete. Both the transverse carinae of propodeum complete, pleural carina absent. Areolet large, longer than wide, rectangular, second recurrent vein received distinctly basad of basal vein. Nervellus intercepted at its basal 0.33. First abdominal tergite slender, more than 2× as long as its apical width, almost circular in cross-section at its basal 0.25, tergite with a lateral triangular projection at base, the dorso-lateral carina present or absent. Ovipositor tip with 12 oblique teeth; ovipositor sheath 1.1× as long as the hind tibia.

This genus is close to *Amrapalia* Gupta & Jonathan and *Arhytis* Townes. However, this genus is characterised chiefly by its slender and rounded first abdominal tergite, large rectangular areolet, its second recurrent vein received beyond the middle, nervellus intercepted below the middle, sternaulus short, and elongate propodeal spiracles.

This genus is known from Oriental Region. Gupta & Gupta (1983) reported two species from India and the Philippines. The species from India is discussed below :

1. ***Dagathia brunnea*** Cameron (Fig. 151 : a–c)

1903. *Dagathia brunnea* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **47**(14) : 29. Female, des. Type : Female, India : Khasi Hills (OXFORD).

1961. *Dagathia brunnea* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 192.

1970. *Dagathia brunnea* : Gupta & Janathan, *Oriental Ins.*, **3** : 389-393. des. fig.

1983. *Dagathia brunnea* : Gupta & Gupta, *Oriental Ins., Monogr.*, **10** : 182. Female, key, des., fig. India : Meghalaya.

1987. *Dagathia brunnea* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 770. Syn.

This species is chiefly recognised by having face rough, vertex closely rugose. Propodeum basad of basal carina rugoso-punctate. Thorax dark rufous. Pronotal collar and upper margin, base of hind wing, and speculum wholly, yellow. Hind coxa, femur, and tarsus, black. Abdomen brown, except for the apex of the first tergite.

Male : Not known.

Distribution : India : Meghalaya (Khasi Hills).

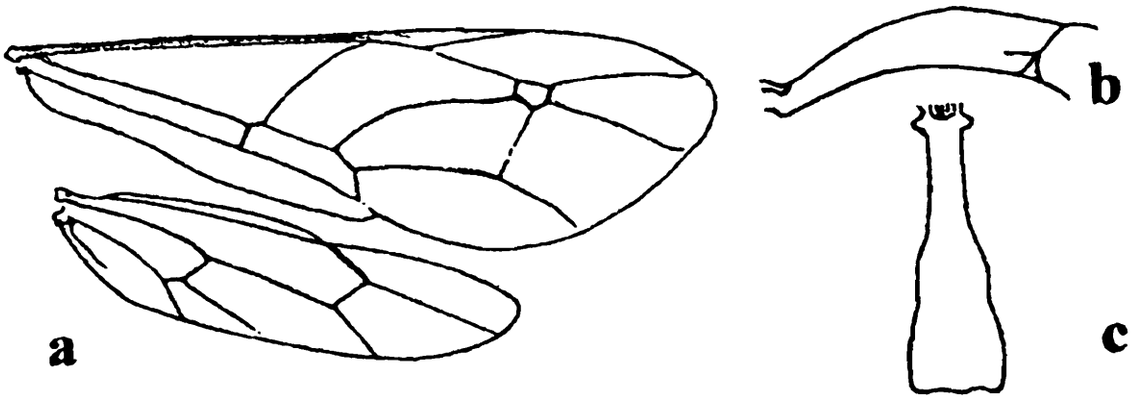

Fig. 151. *Dagathia brunnea* Cameron : **a**, fore and hind wings showing venation; **b**, side view of first tergite; **c**, dorsal view of first tergite.

12. Genus ***Torbda*** Cameron (Fig. 152 : a–c)

1902. *Torbda* Cameron, *Entomologist,* **35** : 18. Type-species : *Torbda geniculata* Cameron; designated by Morley, 1913.

1907. *Miophatnus* Cameron, *Tijdschr. V. Ent.,* **50** : 105. Syn. by Townes, 1970. Type-species : *Miophatnus nigromaculatus* Cameron; monobasic.

Taxonomy : Townes, Townes & Gupta, 1961 : 199. Townes, 1970 : 341. Gupta & Gupta, 1983 : 194.

Distribution : Oriental Region.

Head somewhat swollen behind the eyes. Clypeus weakly convex; with a strong transverse ridge near its apical 0.35, below the ridge concave, ridge with a median transverse tooth or a pair of teeth. Apical margin of clypeus truncate, usually with a weak median tooth. Lower tooth of mandible longer than the upper. Malar space 0.5–0.8 the basal width of mandible. Epomia weak to strong. Notauli deep and extending beyond the middle. Lateral carina of scutellum confined to its base. Prepectal carina extending 0.5–0.8× the height of mesopleurum. Sternaulus short and weak. Juxtacoxal carina absent. Pleural and apical transverse carinae of propodeum lacking. Propodeum basad of basal carina strongly punctate or reticulate. Areolet moderately small, wider than high; intercubiti parallel or almost so. Nervulus basad of basal vein by about 0.25 to 0.6 its length. Nervellus intercepted above the middle. First abdominal tergite stout, wthout basal lateral tooth, with dorso-lateral carina on the basal 0.2 to 0.7. Second tergite with coarse, closely spaced punctures. Ovipositor sheath about 1.2× as long as hind tibia. Ovipositor tip with about 7 strong teeth; lower valve with a dorsal lobe that encloses upper valve.

Torbda is confined to Original Region. Gupta & Gupta (1983) reported 13 species from Oriental Region. Only six species occur in India and adjacent countries. These are discussed below (Gupta & Gupta, 1983 : 194).

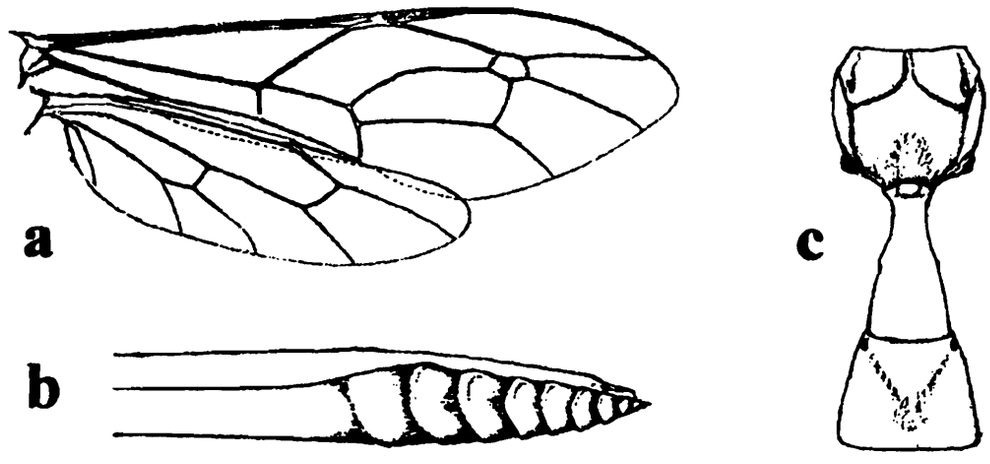

Fig. 152. *Torbda* Cameron : **a**, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergite; **c**, ovipositor tip. (Source : Townes, 1970).

Key to the Indian species of *Torbda*

1. Pronotal shoulders strongly projecting. Apical transverse carina of propodeum almost absent. Propodeum strongly rugoso-reticulate and without any mark along the basal margins. A. THE GENICULATA GROUP 2

– Pronotal shoulders not projecting. Apical transverse carina weakly present. Propodeum largely rugoso-striate and with a single or two marks along the basal margin. B. THE MACULIPENNIS GROUP 3

2. First tergite with sparse punctures laterally. Hind coxa largelly black. Wings yellowish-brown. Mesopleurum with an oval mark. Propodeum with an elongate mark. Orbital yellow mark complete. India : Meghalaya .... 2. *violaceipennis* Cameron

– First tergite strongly punctate. Hind coxa broadly yellow. Wings hyaline. Propodeum with a dagger-shaped mark. Mesopleurum with a large elongate mark. Orbital yellow stripe usually interrupted. India : Assam; Meghalaya; Sikkim. China : Laos ..... 1. *geniculata* Cameron

3. Body reddish-brown, with pale markings. Frons smooth and shiny. Vertex finely and sparsely punctate. Apices of all the abdominal tergites yellow. Pronotum smooth and shiny. India : Assam; Meghalaya; Sikkim; Kerala. Myanmar..... .....3. *nigromaculata* (Cameron)

– Body black, with yellow spots or stripes 4

4. Occiput with two yellow oblong-oval marks (Fig. 153 : c). Propodeum with a wide irregular basal mark and a characteristic apical yellow mark (Fig. 153 : d). Lateral carina of scutellum black. India : Meghalaya; Sikkim. Myanmar .... 4. *maculipennis* Cameron

– Occiput without any yellow mark (black). Propodeum with a comparatively smaller basal mark and a trilobate apical mark. Lateral carina of scutellum yellow. 5

5. Face and mesopleurum with dense punctures. Propodeum striate. Apical carina of propodeum not well defined. First abdominal tergite 2.0× as wide at apex as at base. Malar space 0.7× the basal width of mandible. India : Tamil Nadu; Kerala ..... 5. *notialis* Gupta & Gupta

– Face and mesopleurum shallowly punctate. Apical carina well defined. First abdominal tergite 1.5× as wide at apex as at base. Malar space 0.8× the basal width of mandible. Myanmar ..... 6. *erugans* Gupta & Gupta

A. The Geniculata Group

1. *Torbda geniculata* Cameron (Fig. 153 : a)

1902. *Torbda geniculata* Cameron, *Entomologist,* **35** : 19. [Female]. key, des. Lectotype : Female, India : Khase Hills (OXFORD).

1913. *Torbda geniculata* : Morely, *Fauna of British India, Hymenoptera,* **3** : 63. Female, key, des. India : Meghalaya : Khasi Hills.

1940. *Torbda geniculata* : Uchida, *Insecta Matsumurana* **14** : 119. China : Guangdong (=Kwangtung) : Canton.

1961. *Torbda geniculata* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.,* **1** : 99. China, India.

1983. *Torbda geniculata* : Gupta & Gupta, *Oriental Ins. Monogr.,* **10** : 198. Female, key, des., fig. India : Meghalaya : Khasi Hills. Sikkim. Assam : Rangapara : Charduar Forest. China : Sichuan : Kuan. Laos : Luang Prabang.

1987. *Torbda geniculata* : Gupta, *Mem. Amer. Ent. Inst.,* **41** : 771.

Female : Face coarsely punctate, tending to be rugoso-punctate. Clypeus with coarse and sparse punctures, with a median subapical lamella-like projection, apical margin with a distinct but small median tooth. Malar space with weak sparse punctures, 0.6–0.7× the basal width of mandible. Antennal scrobes trans-wrinkled. Frons smooth, rugose medially. Vertex coarsely punctate. Temple shiny, with a few punctures near the base of mandible. Pronotal shoulders projecting. Pronotal collar and upper margin punctate, groove with a few striations; epomia distinet and long. Mesoscutum, scutellum rugoso-punctate. Mesopleurum strongly punctate, below subtegular ridge to speculum reticulate. Speculum smooth and shiny, except for a few punctures above. Prepectal carina not extending 0.5 the height of mesopleurum; sternaulus not well defined. Metapleurum punctate, punctures below running into striations. Propodeum medially between basal carina and apex rugose, at sides strongly reticulate, basally rugoso-reticulate. Apical transverse carina almost absent. First

abdominal tergite short, less than 2.0× as long as broad at apex, dorsally punctate, at base smooth and shiny. The following tergites punctate, second and third tergites with oblique depressions. Ovipositer as long as abdomen.

Black. 5–11 flagellar segments white. The following are black on yellow back ground : apical half of mandible, a mark in the center of face, frons medially, vertex and back of head. The following are yellow : Head largely, orbital stripe, upper margin of pronotum, pronotal collar with two marks, a mark at the apex of middle lobe of mesoscutum, scutellum at apex and its lateral carinae, metascutellum, tegula, subtegular ridge; a large mark in the middle of mesopleurum, mesosternum medially, base of hind wing, a dagger-shaped mark on propodeum, extending up to the basal carina, an oval mark on metapleurum and apices of all the abdominal tergites narrowly; apical bands on tergites 4 to 6 interrupted medially and at sides; mark on tergite 7 divided into two semicircular lateral marks (Fig. 153 : a); fore coxa and first trochanteral segment. Fore coxa blackish at base and apex, rest light orange and its tarsus brown. Middle leg in general light brown to dark brownish-black. Hind coxa broadly yellow; femur, tibia and tarsus dark yellow, except their apices blackish.

Male : Not known.

Length : Female, 17–25 mm; fore wing 15–18 mm; ovipositor sheath 9 mm.

Distribution : India : Assam (Rangapara in Charduar Forest). Meghalaya (Khasi Hells). Sikkim. *Elsewhere* : China (Szechwan Prov., Kwan). Laos (Luang Prabang).

2. ***Torbda violaceipennis*** Cameron

1902. *Torbda violaceipennis* Cameron, *Entomologist,* **35** : 20. Female, key, des. Lectotype (designated by Gupta & Gupta, 1983) : Female, India : Meghalaya : Khasi Hills (OXFORD).

1913. *Torbda violaceipennis* : Morely, *Fauna of British India, Hymenoptera*, **3** : 63. Female, key, des. India : Meghalaya : Kashi Hills.

1961. *Torbda violaceipennis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 200. India.

1983. *Torbda violaceipennis* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 202. Female. Lectotype design, key, des., India : Meghalaya : Khasi Hills.

1987. *Torbda violaceipennis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 773.

This species is very close to *T. geniculata,* essentially in sculpture and colour pattern. However, it differs as follows :

First abdominal tergite smooth, with sparse punctures laterally. Vertex more marked with yellow. Yellow orbital mark encircling the whole orbit. Mesopleurum with a yellow spot rather than an elongate mark. Hind coxa largely black. Apical

bands on abdomen narrow. Legs yellow on sides. Hind leg almost yellowish-brown, except coxa. Propodeum with an elongate median mark, which is not expanded apically. Wings yellowish-brown.

Male : Not known.

Length : Female, 25 mm; fore wing 15 mm; ovipositor sheath 9.5 mm.

Distribution : India : Meghalaya (Khasi Hills).

B. The Maculipennis Group

3. *Torbda nigromaculata* (Cameron) (Fig. 153 : b)

1907. *Miophatnus nigromaculatus* Cameron, *Tijdschr. V. Ent.*, 50 : 105. Male, des. Type : Male, India : Sikkim (LONDON).

1913. *Miophatnus nigromaculatus* : Morley, *Fauna of British India, Hymenoptera*, **3** : 205. Male, des.

1961. *Xoridesopus nigromaculatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 191. n. Comb.

1970. *Torbda nigromaculatus* : Townes, *Mem. Amer. Ent. Inst.*, **12** : 341. n. Comb.

1983. *Torbda nigromaculatus* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 214. Male, key, des., fig., India : Assam : Charduar Forest. Meghalaya : Jaintia Hills. Kerala : Walayar Forest. Myanmar : Mt. Victoria, 500m.

1987. *Torbda nigromaculatus* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 772.

This species is known by its male, which is described below :

Male : Body finely pilose. Face distinctly punctate, clypeus sparsely punctate, with a median subapical projection, its apical margin concave and with a distinct median tooth. Malar space 0.8× the basal width of mandible. Frons smooth and shiny. Vertex with sparse, moderately deep punctures. Temple and pronotum smooth and shiny. Upper margin of pronotal shoulder not projecting. Epomia distinct. Mesoscutum closely and deeply punctate; scutellum sparsely and shallowly punctate. Mesopleurum sparsely and shallowly punctate. Both the transverse carinae of propodeum distinct, area between them trans-rugoso-striate, at side reticulate. First tergite 3× as long as wide at apex, smooth and shiny; second and third tergites closely punctate. Nervulus basad of basal vein. Nervellus intercepted above the middle.

Body (Fig. 153 : b) dark yellow with black marking. The following area black : Upper part of antennal scape, flagellum, apex of mandible, frons from middle to vertex, upper part of occiput broadly, base and sides of mesoscutum broadly, apex of scutellum, metascutellum, a broad transverse band on middle of propodeum, and a

small spot below the subtegular ridge, first, second and third tergites broadly and following narrowly at apex. Hind coxa broadly black, tarsus brownish-black. Wings yellowish hyaline.

Female : Not known.

Length : Male, 10–13.5 mm; fore wing 8–10 mm.

Distribution : India : Assam (Charduar Forest). Meghalaya (Jaintia Hills). Kerala (Walayar Forest). Sikkim. *Elsewhere* : Myanmar.

4. ***Torbda maculipennis*** Cameron (Fig. 153 : c, d)

1902. *Torbda maculipennis* Cameron, *Entomologist,* **35** : 20. Female, key, des. Lectotype (design. by Townes, Townes & Gupta, 1961) : Female, India : Meghalaya : Khasi Hills (OXFORD).

1913. *Torbda maculipennis* : Morley, *Fauna of British India, Hymenoptera*, **3** : 64. Female, key, des. India : Meghalaya : Khasi Hills.

1916. *Torbda maculipennis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 199. Lectotype design : India, ?China.

1983. *Torbda maculipennis* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 202. Female, key, des., fig. India : Meghalaya : Khasi Hills. Sikkim. Myanmar : Gwethe Res. North Toungoo; Mt. Popa 600–1000m; Mt. Victoria, 1400m.

1987. *Torbda maculipennis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 771.

This species is mainly distinguished by having two oblong-oval mark on occiput; propodeum with a wide irregular basal mark and a characteristic apical yellow mark and lateral carinia of scutellum black.

Female : Face and clypeus with minute scattered punctures; clypeus with a median transverse ridge and a blunt tooth in the middle, its apical margin with a weak median tooth. Malar space 0.7× the basal width a mandible. Frons in the antennal scrobe area weakly trans-striate, sparsely punctate at sides. Vertex and temple smooth and shiny with a few scattered punctures. Pronotum subpolished, sparsely punctate, upper shoulders not swollen. Epomia strong but short. Mesoscutum and scutellum moderately strongly and closely punctate. Metascutellum smooth and shiny. Mesopleurum largely punctate, below subtegular ridge trans-rugoso-punctate, prepectal carina 0.85× the hight of mesopleurum, sternaulus weak, speculum smooth and shiny. Metapleurum with moderately coarse punctures; juxtacoxal carina absent. Propodeum largely rogoso-striate, around basal carina closely punctate, at base smooth. Apical transverse carina absent in middle, present laterally; basal carina sharply arched medially, spiracle long and linear. First abdominal tergite less than 2× as long as its apical width, dorsally sparsely punctate. Second to fourth tergites strongly and closely punctate, following mat and subpolished. Areolet rectangular, 1.5× as wide as high. Ovipositor as long as abdomen.

Black. The following are yellow : Face, clypeus, lower temple, orbital stripes completely, occiput with two oblong mark (Fig. 153 : c), pronotal neck, upper and lower margins, a squarish mark in the center of mesoscutum, scutellum, tegula, subtegular ridge, a small mark on speculum, a large oblong mark on mesopleurum, this mark faintly extending along sternaulus, mesosternum centrally and a large mark on metapleurum, propodeum (Fig. 153 : d) with a broad irregular basal mark, a characteristic apical mark, all the abdominal tergites apically, band on third to

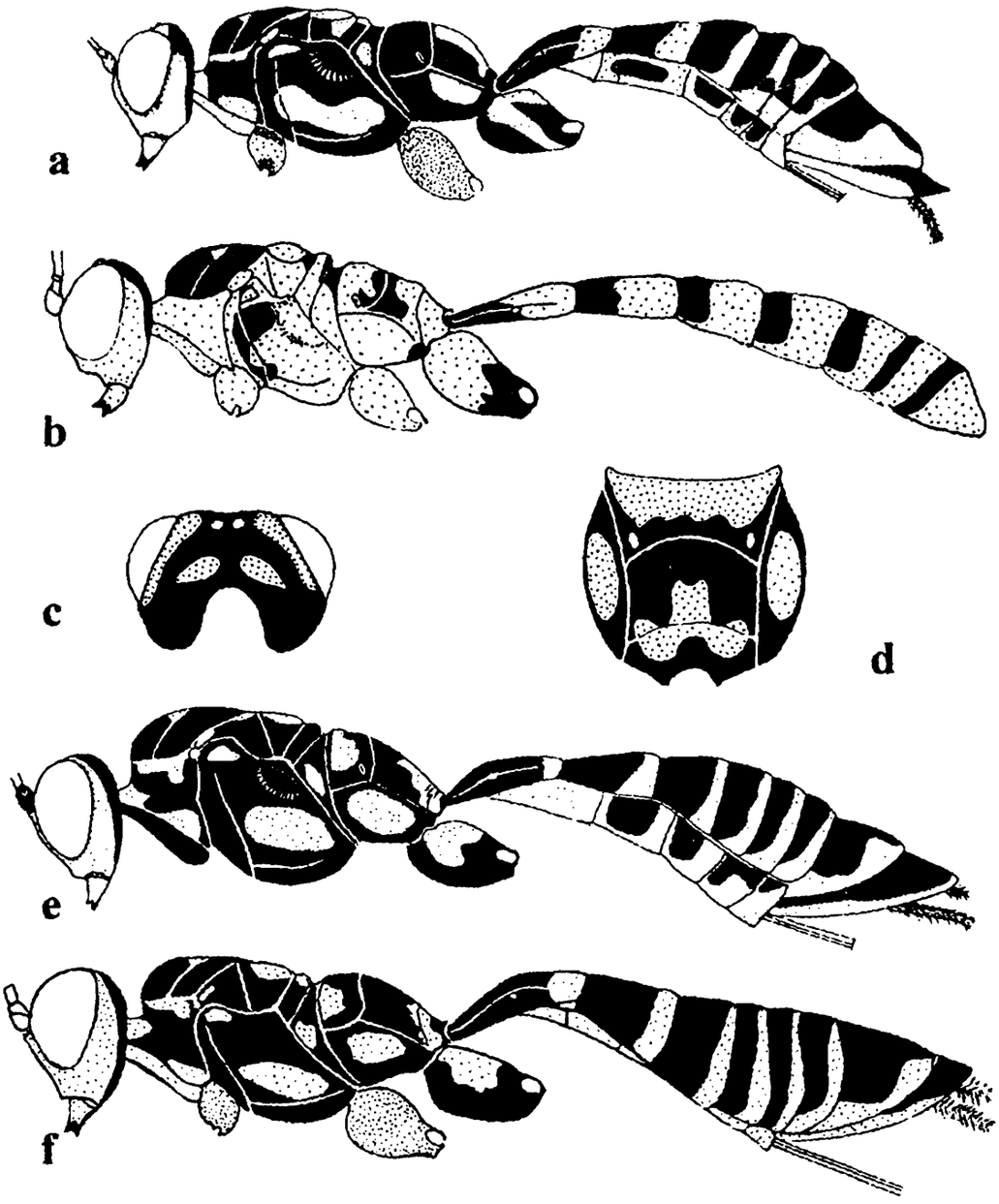

Fig. 153. Colour pattern : *Torbda geniculata* Cameron : **a**, body side view. *T. nigromaculata* (Cameron) : **b**, body side view (male). *T. maculipennis* Cameron : **c**, rear view of head; **d**, dorsal view of propodeum. *T. notialis* G & G : **e**, body side view. *T. erugans* G & G : **f**, body side view (Source : Gupta & Gupta, 1983).

sixth tergites narrow, seventh tergite also with large marks dorso-laterally. Legs in general also yellow with their femora and tibiae orange and their apices dark brown, apical tersal segments also dark brown or blackish.

Male : Not known.

Length : Female, 17 mm; fore wing 12 mm; ovipositor sheath 8.5 mm.

Distribution : India : Meghalaya (Khasi Hills). Sikkim. *Elsewhere* : Myanmar (North Toungoo, Gwethe Res.; Mt. Popa 600-1000m; Mt. Victoria, 1400m).

5. ***Torbda notialis*** Gupta & Gupta (Fig. 153 : e)

1983. *Torbda notialis* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 208. Female, key, des., fig. India : Tamil Nadu : Nilgiri Hills, 1036m (OTTAWA). India : Kerala : Walayar Forest.

1987. *Torbda notialis* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 772.

This species is distinguished from other Indian species by having lateral carina of scutellum yellow; occiput without any yellow mark and propodeum with a small basal mark and a trilobate apical mark.

Female : Face with moderately deep punctures in middle, at sides punctures shallow and close. Clypeus with weak transverse ridge, basally punctate. Malar space 0.7× the basal width of mandible. Frons minutely and sparsely punctate, with a weak median longitudinal carina. Vertex minutely and sparsely punctate, at sides smooth. Pronotal groove smooth and subpolished, except for a few scattered minute punctures, upper margin and collar closely punctate. Epomia indistinct. Mesoscutum and scutellum with sparse and shallow punctures; metascutellum smooth and shiny. Mesopleurum densely punctate, between speculum and base of subtegular ridge striate. Speculum smooth and shiny, with a few deep punctures; prepectal carina extending up to the base of subtegular ridge. Metapleurum with sparse but strong punctures below, rugoso-punctate above. Propodeum along the yellow apical mark striate, medially striate and at sides rugoso-striate, basally smooth in the middle, but punctate around spiracles. Apical transverse carina not well defined. First abdominal tergite 2× as wide at apex as at base, rugoso-punctate laterally, second to seventh tergites closely punctate. Ovipositor as long as abdomen.

Black. The following are yellow : Head including orbits, upper margin of pronotum, pronotal collar with two marks, an oval mark in the center of mesoscutum, scutellum, lateral carina of scutellum, tegula apically, subtegular ridge, an oval mark on mesopleurum in the center, base of hind wing, an oval mark on metapleurum, trilobate mark on the apical slope of propodeum, base of propodeum with two broad marks close to each other, apices of all the abdominal tergites (Fig. 153 : e). Legs in general orange-yellow, fore coxa with a blackish mark below and fourth and fifth tarsal

segments dark brown; hind coxa largely black, with a broad yellow mark in the middle, trochanters, base of tibia, and fourth and fifth tarsal segments, dark brown to blackish. Wings hyaline with fuscous marks along apical margin and postnervulus.

Male : Not known.

Length : Female, 20 mm; fore wing 14 mm; ovipositor sheath 10.5 mm.

Distribution : India : Kerala (Walayar Forest). Tamil Nadu (Nilgiri Hills, 1036m).

6. ***Torbda erugans*** Gupta & Gupta (Fig. 153 : f)

1983. *Torbda erugans* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10** : 209. Female, key, des., fig. Type : Female, Myanmar : Mt. Popa, 600-1000m (GAINESVILLE).

1987. *Torbda erugans* : Gupta, *Mem. Amer. Ent. Inst.*, **41** : 771.

This species is very similar to *T. notialis* Gupta & Gupta. The distinguishing characters are as follows :

Female : Body smooth and shiny. Face with shallow punctures. Mesopleurum also shallowly punctate. Propodeum striate at sides, in the middle rugose. Apical transverse carina of propodeum well defined among the striations. First abdominal tergite largely smooth, punctate laterally, tergite about 1.5× as wide at apex as at base.

Body colour pattern and propodeal mark as in figure 153 : f. Hind coxa ventrally black. Rest of the colour similar to *T. notialis*.

Male : Not known.

Length : Female, 12.5–17 mm; fore wing 10–13.5 mm; ovipositor sheath 5.5–7.5 mm.

Distribution : Myanmar (Mt. Popa, 600–1000m).

XI. THE TRIBE SPHECOPHAGINI

This tribe is easily distinguished by having ovipositor short, not surpassing apex of abdomen; female subgenital plate broad, rhomboidal, weakly convex; second intercubital vein completely absent and tergites 3 and 4 with a pair of rounded impressions; impressions sometimes weak.

Body very stout to slender. Apex of clypeus truncate or concave, without a median tooth or irregularity. Mandible about 1.6× as long as its width in the middle, the lower tooth a little shorter than upper tooth. Occipital carina joining hypostomal carina. Notaulus various. Sternaulus reaching 0.4 to 0.6 the length of mesopleurum, often weak. Mesopleural fovea represented by a short horizontal groove next to mesopleural sature. Median section of postpectal carina absent. Propodeum short, its basal carina present, indistinct or absent, its spiracle circular

or elliptic. Apical carina of propodeum present or absent, without distinct sublateral crests. Apex of female fourth tarsal segment with a few weak bristles, not bilobed. Ramulus absent. Areolet absent, without a trace of second intercubitus. Nervulus opposite basal vein or nearly so. Nervellus intercepted below middle or sometimes at middle. Brachiella present. Tip of axillus converging towards anal margin. First tergite stout to slender, its spiracle behind the middle, ventrolateral carina present, dorsolateral carina present or absent, median dorsal carinae absent. Tergites 3-5 often with paired median impression. Female subgenital plate large. Ovipositor sheath very short, tip not surpassing abdomen.

This tribe is represented by three genera. One genus is Holaractic, one Palaearctic and Oriental and third occurs in Indo-Papuan area and Southern Japan.

1. Genus ***Arthula*** Cameron (Fig. 154 : a–c)

1900. *Arthula* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 44(15) : 110. Type-species : *Arthula brunneocornis* Cameron; monobasic.

1931. *Orientocryptus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 174. Type-species : *Orientocryptus formosanus* Uchida; original designation. Syn. by Uchida, 1940.

1937. *Kuniocryptus* Sonan, *Trans. Nat. Hist. Soc. Formosa*, **27** : 172. Type-species : *Orientocryptus flavofasciatus* Uchida; original designation. Syn. by Uchida, 1940.

Taxonomy : Townes, Townes & Gupta, 1961 : 200. Townes, Momoi & Townes, 1965 : 205. Townes, 1970 : 345. Gauld, 1984a : 149.

Hosts : Vespid (*Polistes* and *Rhopalidia*).

Distribution : Indo-Australian Area and Japan. Gauld recorded 2 undescribed species from Australia.

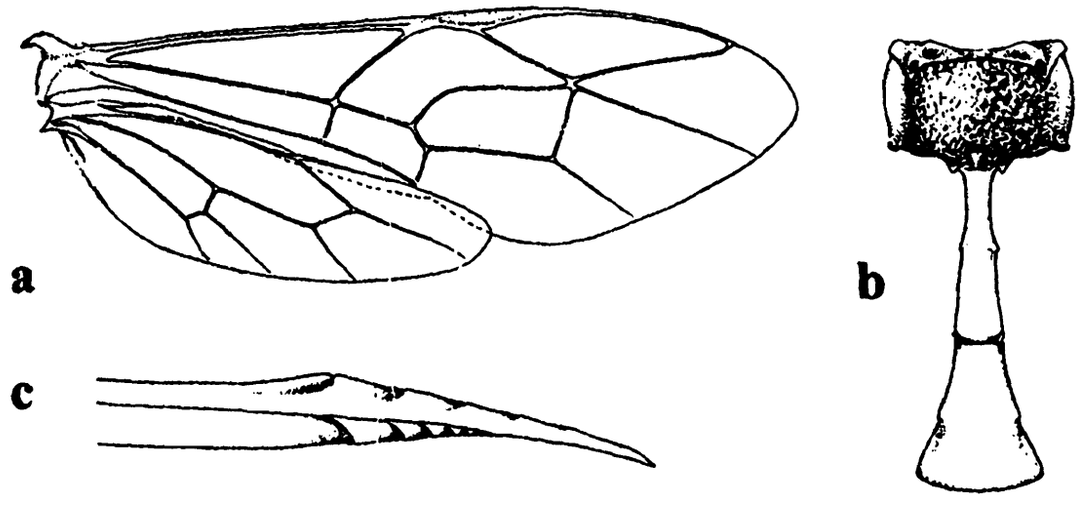

Fig. 154. *Arthula* Cameron : a, fore and hind wings showing venation; **b**, dorsal view of propodeum, first and second tergites; **c**, ovipositor tip. (Source : Townes, 1970).

Body slender, first abdominal tergite more than 3× as long as wide. Nataulus sharp, reaching about 0.4 the distance to scutellum. Basal transverse carina of propodeum strong and complete; the apical transverse carina absent. Intercubitus short, opposite or a little basad of second recurrent vein. Tergites 2-5 with a median pair of impressions.

This is a moderate sized genus occuring in the Indo-Australian area and Southern Japan. Only one species has been recorded from India.

1. ***Arthula brunneocornis*** Cameron

1900. *Arthula brunneocornis* Cameron, *Mem & Proc. Manchester Lit. Phil. Soc.*, **44**(5) : 112. Female, des., Type : Female, India : Meghalaya : Khasi Hills (OXFORD).

1913. *Arthula brunneocornis* : Morley, *Fauna of British India, Hymenoptera*, **3** : 38. Male des., fig. India : Maghalaya : Khasi Hills.

1915. *Arthula brunneocornis* : Morley, *Ann. & Mag. Nat. Hist.*, (8) **16** : 338. n. comb.

1961. *Arthula brunneocornis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 200. India.

1987. *Arthula brunneocornis*, Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **41** : 893. Syn.

Male : Face flat and closely punctate; clypeus apically obliquely impressed. Vertex and frons closely punctate. Antenna as long as the abdomen, stout and not gradually pointed apically. Mesoscutum closely punctate, notaulus extending up to the centre. Pronotum strongly and irregularly strigose in the middle. Scutellum closely punctate. Propodeum strongly punctate and striate, basally finely and closely punctate.

Black. Labrum and entire orbit yellow. Antennae dark brown, with scape bright yellow. Thorax black except pronotal collar, a mark at the middle lobe of mesoscutum, scutellum in the middle, lateral carina, metascutellum, tegula, a transverse band at the base of mesopleurum, a large mark on either side of mesosterum, large triangular mark at the propodeum, yellow. Abdomen reddish, with petiole centrally, and base of all the segments, black. Fore and middle legs largely light yellow, with coxa at base black. Hind legs dark yellow, coxae and tarsi yellowish; hind coxa broadly at the inner basal area, their trochanters and femur above and at base broadly black. Wings clear hyaline.

Female : No details were available to the author.

Length : Male, 11–12 mm; fore wing 10 mm.

Distribution : India : Meghalaya (Khasi Hills).

DISTRIBUTION TABLE OF THE SPECIES AND SUBSPECIES OF FAMILY MESOSTENINAE IN INDIA AND ADJACENT COUNTRIES

Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
Family ICHNEUMONIDAE																
Subfamily MESOSTENINAE																
I. Tribe **Agrothereutini**																
1. Genus ***Ammauromorpha*** Ashmead																
1. *Ammauromorpha accepta* (Tosquenet)	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
(a) *A. accepta schoenobii* (Viereck)	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
2. *Ammauromorpha tricolor* (Morley)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2. Genus ***Agrothereutes*** Foerster																
3. *Agrothereutes pilosus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4. *Agrothereutes rufofemoratus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3. Genus ***Idiolispa*** Foerster																
5. *Idiolispa analis* (Gravenhorst)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4. Genus ***Trychosis*** Foerster																
6. *Trychosis striata* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
II. Tribe **Ischnini**																
5. Genus ***Neodontocryptus*** Uchida																
7. *Neodontocryptus brillantus* (Uchida)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6. Genus ***Etha*** Cameron																
8. *Etha flavofaciata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
9. *Etha longipetiolata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
10. *Etha flavocoxata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+
11. *Etha striatifrons* Cameron	–	–	–	+	–	–	–	–	–	+	–	–	–	–	–	–
12. *Etha flaviorbita* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
13. *Etha burmensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
14. *Etha nigromaculata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere																	
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
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–	+	–	–	–	–	+	–	–	+	+	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
–	+	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–	–	–	–
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–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
7. Genus ***Caenocryptoides*** Uchida																
15. *Caenocryptoides rugosus* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
16. *Caenocryptoides tarsalis* (Matsumura)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
17. *Caenocryptoides maai* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
18. *Caenocryptoides nigrifacies* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
19. *Caenocrypoides flavescens* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
8. Genus ***Ischnus*** Gravenhorst																
20. *Ischnus striatifrons* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
21. *Ischnus curvimaculatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*22. *Ischnus bimaculatus,* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*23. *Ischnus emaculatus,* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+
9. Genus ***Glabridorsum*** Townes																
24. *Glabridorsum varibalteatum* Jonathan	–	–	–	–	–	+	–	–	–	–	–	+	–	–	–	–
25. *Glabridorsum punctatum* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
26. *Glabridorsum glabrosum* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
27. *Glabridorsum nepalensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
28. *Glabridorsum similis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
29. *Glabridorsum orbitalis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
30. *Glabridorsum semilunatum* Jonathan	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
31. *Glabridorsum simulatum* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
10. Genus ***Caenocryptus*** Thomson																
32. *Caenocryptus rugosus* Jonathan	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
33. *Caenocryptus reticulatus* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
34. *Caenocryptus striatus* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
35. *Caenocryptus burmensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA											Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
11. Genus ***Nippocryptus*** Uchida																
36. *Nippocryptus vittatorius* Jurine	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
37. *Nippocryptus misippus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
38. *Nippocryptus himalayensis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
39. *Nippocryptus rufofemoratus* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
40. *Nippocryptus granulosus* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
12. Genus ***Myrmeleonostenus*** Uchida																
41. *Myrmeleonostenus longipetiolatus* Jonathan	–	–	–	+	–	–	–	–	–	+	–	+	+	–	–	+
42. *Myrmeleonostenus flavomaculatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
43. *Myrmeleonostenus nigrimaculatus* Jonathan	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
13. Genus ***Buathra*** Cameron																
1. Subgenus ***Buathra*** Cameron																
44. *Buathra (B.) excavata* (Cameron)	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
*45. *Buathra (B.) narkandensis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*46. *Buathra (B.) nigripilosa* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*47. *Buathra (B.) rufifemorata* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
48. *Buathra (B.) rufiventris* Cameron	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*49. *Buathra (B.) similis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*50. *Buathra (B.) heinrichi* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*51. *Buathra (B.) kumaonensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
52. *Buathra (B.) violaceotincta* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*2. Subgenus ***Mandibulathra*** Jonathan																
53. *Buathra (M.) albimandibularis* Uchida	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere															
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
*54. *Buathra (M.) indica* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
*55. *Buathra (M.) burmensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*3. Subgenus ***Maringothra*** Jonathan																
*56. *Buathra (M.) nigriterga* Jonathan	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
*57. *Buathra (M.) rufiterga* Jonathan	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
58. *Buathra (M.) luculanta* (Cameron)	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
59. *Buathra (M.) insidiator* (Smith)	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
60. *Buathra (M.) suspicabilis* (Kukujev)	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
14. Genus ***Itamoplex*** Foerster																
61. *Itamoplex carinifrons* (Cameron)	–	–	–	–	–	–	–	–	–	+	+	–	–	–	–	–
62. *Itamoplex lanceolatum* Jonathan	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
63. *Itamoplex longiterebratum* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
64. *Itamoplex indicum* Jonathan	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
65. *Itamoplex kashmirensis* Jonathan	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–
66. *Itamoplex himalayensis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
15. Genus ***Hedycryptus*** Cameron																
67. *Hedycryptus tenuiabdominalis* (Uchida)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*68. *Hedycryptus javensis,* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*69. *Hedycryptus sulawesensis,* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*70. *Hedycryptus flavotarsatus,* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*71. *Hedycryptus chinensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
72. *Hedycryptus orientalis* (Cameron)	–	–	–	+	–	–	–	–	–	+	–	–	–	–	–	–
*73. *Hedycryptus philippinus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
74. *Hedycryptus rufopetiolatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
16. Genus ***Dihelus*** Townes																
75. *Dihelus fulvus* Townes	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–

INDIA												Elsewhere															
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
76. *Dihelus kumaonensis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
77. *Dihelus granulosus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
78. *Dihelus burmensis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
79. *Dihelus orientalis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	+
80. *Dihelus flavosternum* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
17. Genus ***Enclisis*** Townes																
81. *Enclisis nigricoxis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
82. *Enclisis ruficoxis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
18. Genus ***Gyropyga*** Townes																
83. *Gyropyga leucops* Townes	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
III. Tribe **Baryceratini**																
19. Genus ***Buysmania*** Cheesman																
84. *Buysmania oxymora* (Tosq.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(a) *B. oxymora annulitarsis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
20. Genus ***Jonathania*** Gupta																
85. *Jonathania multimaculata* (Jonathan)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
21. Genus ***Chlorocryptus*** Cameron																
86. *Chlorocryptus coeruleus* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87. *Chlorocryptus metallicus* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
IV. Tribe **Mesostenini**																
22. Genus ***Gotra*** Cameron																
88. *Gotra acutilineata* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
89. *Gotra carinifrons* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
90. *Gotra cyclosiae* (Cameron)	–	–	–	+	–	–	–	–	–	–	–	+	–	–	+	+
91. *Gotra erythropus* (Cameron)	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
92. *Gotra hapaliae* (Rao)	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	+

INDIA												Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
93. *Gotra latispina* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
94. *Gotra longicornis* Cameron	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–
95. *Gotra marginata* (Brullé)	–	–	–	+	+	–	+	–	–	–	–	–	–	+	–	+
96. *Gotra serendiva* (Fernando)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
23. Genus ***Anupama*** Jonathan																
97. *Anupama himalayensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
24. Genus ***Mesostenus*** Gravenhorst																
98. *Mesostenus penetralis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
99. *Mesostenus tricarinatus* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
V. Tribe **Goryphini**																
25. Genus ***Necolio*** Cheesman																
100. *Necolio rugifrons* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
101. *Necolio testaceipes* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
102. *Necolio indicus* (Rao)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
26. Genus ***Allophatnus*** Cameron																
103. *Allophatnus fulviturgus* (Tosquinet)	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	+
104. *Allophatnus abdominalis* (Szépligeti)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
27. Genus ***Neobuodias*** Rao & Nikam																
105. *Neobuodias indicus* Rao & Nikam	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
28. Genus ***Takastenus*** Uchida																
106. *Takastenus bituberculatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
107. *Takastenus octobalteatus* (Camerton)	–	–	–	–	+	–	–	–	–	–	–	+	–	–	–	+
29. Genus ***Menaforia*** Seyrig																
108. *Menaforia indica* Gupta & Saxena	–	+	–	+	–	+	+	–	–	–	–	+	–	–	–	+
30. Genus ***Friona*** Cameron																
109. *Friona rufipes* Cameron	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–

INDIA											Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA																
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
*110. *Friona kamathi* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
*111. *Friona rahuli* Jonathan	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
*112. *Friona bhagmandlensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
113. *Friona frontella* Cameron	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
114. *Friona didymata* Morley	–	–	–	+	+	–	–	–	–	–	–	+	–	–	–	+
115. *Friona fensus* (Tosquinet)	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
*116. *Friona similis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
*117. *Friona nigrifacies* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
*118. *Friona nigriterga* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
119. *Friona curvicarinata* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
31. Genus ***Listrognathus*** Tschek																
4. Subgenus ***Listrognathus*** Tschek																
120. *Listrognathus (L.) spinifrons* (Cameron)	–	–	–	–	–	–	–	–	–	+	–	+	+	+		+
121. *Listrognathus (L.) laevifrons* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
122. *Listrognathus (L.) pallidinerva* (Cam.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
123. *Listrognathus (L.) heinrichi* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
124. *Listrognathus (L.) rugifrons* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
125. *Listrognathus (L.) rufipes* (Cameron)	–	–	–	–	–	–	–	–	–	+	–	+	–	–	–	+
126. *Listrognathus (L.) confracta* Gupta & Kamath	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
127. *Listrognathus (L.) acuminata* G & K	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–
(a) *L. (L.) acuminata acuminata* G&K	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–
(b) *L. (L.) acuminata burmensis* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
128. *Listrognathus (L.) assamensis* G & K	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
129. *Listrognathus (L.) nigriabdominalis* G & K	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal		Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
5. Subgenus ***Stivadens*** Townes																
130. *Listrognathus (S.) flavopetiolata* G & K	–	–	–	–	–	–	–	–	–	–	–	+	+	+	–	–
131. *Listrognathus (S.) annulipes* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	+
132. *Listrognathus (S.) tirkyi* G & K	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–
32. Genus ***Goryphus*** Holmgren																
133. *Goryphus sikkimensis* J & G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
134. *Goryphus madhulikae* J & G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
135. *Goryphus cestus* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	+	–	–	+	–	–	–
(a) *Goryphus cestus cestus* J & G	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
(b) *Gonyphus cestus mysorensis* J & G	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
136. *Goryphus dravidus* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
137. *Goryphus gibbosus* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	–
138. *Goryphus rufobasalis* Betrem	–	–	+	–	–	–	–	–	–	–	–	+	+	+	–	–
139. *Goryphus flavorbitalis* J & G	–	–	–	–	–	–	+	–	–	–	–	+	–	–	–	–
(a) *Goryphus flavorbitalis flavorbitalis* J & G	–	–	–	–	–	–	+	–	–	–	–	+	–	–	–	–
(b) *Goryphus flavorbitalis burmensis* J & G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
140. *Goryphus difficilis* Jonathan & Gupta	–	–	–	+	–	–	–	–	–	+	–	+	–	–	–	+
141. *Goryphus lunatus* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
142. *Goryphus mesoxanthus* (Brullé)	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(a) *Goryphus mesoxanthus mesoxanthus* (Brullé)	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–
143. *Goryphus basilaris* Holmgren	–	–	–	+	–	–	–	–	–	–	–	–	+	–	–	–
144. *Goryphus distinctus* J & G	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
145. *Goryphus apicalis* Holmgren	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
146. *Goryphus hyalinoides* (Uchida)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
147. *Goryphus varibalteatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–

INDIA												Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
148. *Goryphus nursei* (Cameron)	–	–	–	–	+	–	+	+	+	–	–	+	–	–	–	+
149. *Goryphus gandhii* J & G	–	–	–	+	–	–	–	–	–	–	–	+	–	–	–	–
150. *Goryphus nilgiricus* J & G	–	–	–	–	–			–	–	–	–	–	–	–	–	+
151. *Goryphus rangaparensis* J & G	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
152. *Goryphus apollonis* J & G	–	–	–	+	–	–	–	–	–	–	–	–	+	+	–	–
153. *Goryphus cinctipes* (Cameron)	–	+	–	+	+	–	+	–	–	–	–	+	+	+	–	+
154. *Goryphus brahminus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	+
155. *Goryphus albomaculatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
156. *Goryphus vinodi* J & G	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–
157. *Goryphus salutator* J & G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
158. *Goryphus villosus* J & G	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	+
159. *Goryphus ochropus* J & G	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–	–
160. *Goryphus cameroni* (Betrem)	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
161. *Goryphus parallelus* J & G	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
162. *Goryphus tirkyi* J & G	–	–	–	–	–	–	–	–	–	–	–	+	+	+	–	+
163. *Goryphus interceptus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
164. *Goryphus ornatipennis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
33. Genus ***Skeatia*** Cameron																
165. *Skeatia cariniscuta* (Cameron)	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
166. *Skeatia infernalis* (Cameron)	–	+	–	+	–	–	–	–	–	–	–	–	–	–	+	+
167. *Skeatia simulator* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+
168. *Skeatia fuscinervis* (Cameron)	–	–	–	+	+	–	–	–	–	–	–	–	–	–	–	–
169. *Skeatia rubricata* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	+
170. *Skeatia versatilis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
171. *Skeatia maculifrons* J & G	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
172. *Skeatia maculiceps* (Cameron)	–	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere																	
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal		Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet	
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
173. *Skeatia theodorai* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
174. *Skeatia rothneyi* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
175. *Skeatia cameroni* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
176. *Skeatia doonense* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
177. *Skeatia rugosa* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
178. *Skeatia mysorensis* Jonathan & Gupta	–	–	+	–	–	–	–	–	–	–	–	+	+	+	–	+
179. *Skeatia onusta* (Walker)	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
180. *Skeatia nigropetiolata* J & G	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
34. Genus ***Perjiva*** Jonathan & Gupta																
181. *Perjiva namkumense* J & G	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
182. *Perjiva geminata* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
183. *Perjiva kamathi* Jonathan & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
35. Genus ***Fotsiforia*** Seyrig																
184. *Fotsiforia mysorense* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
185. *Fotsiforia assamense* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
186. *Fotsiforia sundrica* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
36. Genus ***Gambroides*** Betrem																
187. *Gambroides rangaparensis* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
188. *Gambroides javensis* (Rohwer)	–	+	–	+	+	–	+	–	+	–	–	–	+	–	–	+
37. Genus ***Isotima*** Foerster																
189. *Isotima bicarinata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
190. *Isotima rufipleuralis* Jonathan	–	–	–	–	–	–	+	–	–	–	–	–	+	+	–	+
191. *Isotima kamathi* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–
192. *Isotima punctata* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	+	–	–	–
193. *Isotima annulata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA											Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
194. *Isotima ruficollis* (Holmgren)	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
195. *Isotima panhalensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
196. *Isotima emaculata* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
197. *Isotima andamanensis* Jonathan	+	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
198. *Isotima rufithorax* (Szépligeti)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
199. *Isotima pusilla* (Szépligeti)	–	–	–	+	–	–	+	–	–	–	–	+	–	+	–	+
200. *Isotima difficilis* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
201. *Isotima quadrata* (Szépligeti)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
202. *Isotima tricolor* (Brullé)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
203. *Isotima semirufa* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
204. *Isotima tripartita* (Brullé)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
38. Genus ***Formostenus*** Uchida																
6. Subgenus ***Indostenus*** Jonathan																
205. *Formostenus (I.) nigrus* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
7. Subgenus ***Formostenus*** Uchida																
206. *Formostenus (F.) cherraensis* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
207. *Formostenus (F.) rugosus* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
208. *Formostenus (F.) flavofasciatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
209. *Formostenus (F.) flavorbitalis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
210. *Formostenus (F.) bidentatus* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
211. *Formostenus (F.) striatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
212. *Formostenus (F.) rugipectus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
213. *Formostenus (F.) malaisei* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
214. *Formostenus (F.) aciculatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
215. *Formostenus (F.) rufiscens* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere																	
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal		Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet	
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
216. *Formostenus (F.) burmensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
217. *Formostenus (F.) tanypetiolatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
218. *Formostenus (F.) kambaitiensis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
39. Genus ***Melcha*** Cameron																
219. *Melcha varipes* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
220. *Melcha annulitarsis* (Cameron)	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
40. Genus ***Euchalinus*** Townes																
221. *Euchalinus pedalis* Townes *et al.*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
222. *Euchalinus reticulatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
223. *Euchalinus respondens* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
224. *Euchalinus pugnatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
41. Genus ***Baltazaria*** Townes																
225. *Baltazaria caligata* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
42. Genus ***Colaulus*** Townes																
226. *Colaulus lucidus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
227. *Colaulus erugus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
228. *Colaulus punctatus* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	+	–	–
229. *Calaulus septentrionalis* Jonathan	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
230. *Colaulus flavofaciatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
231. *Colaulus carinatus* Townes	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(a) *C. carinatus typhodes* Townes	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
43. Genus ***Pseudotricapus*** Jonathan																
232. *Pseudotricapus longipetiolatus* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VI. Tribe **Coesulini**																
44. Genus ***Coesula*** Cameron																
233. *Coesula fulvipes* Cameron	–	–	–	+	–	–	–	–	–	–	–	–	+	–	+	–

INDIA											Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
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(a) *Coesula fulvipes septentrionalis* Gupta & Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	+	–
(b) *Coesula fulvipes burmensis* G & J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(c) *Coesula fulvipes mysorensis* G & J	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
234. *Coesula simulator* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
235. *Coesula lucida* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
236. *Coesula gibberosa* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
237. *Coesula heinrichi* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238. *Coesula erugens* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
239. *Coesula flavorbitalis* G & J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(a) *Coesula flavorbitalis flavorbitalis* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(b) *Coesula flavorbitalis victoriae* G&J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
240. *Coesula varuna* Gupta & Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VII. Tribe **Vagenathini**																
45. Genus ***Stetholophus*** Townes																
241. *Stetholophus axillaris* Townes	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VIII. Tribe **Ceratocryptini**																
46. Genus ***Cremnocryptus*** Cushman																
242. *Cremnocryptus montanus* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
243. *Cremnocryptus spiniferus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
47. Genus ***Nematocryptus*** Roman																
244. *Nematocryptus notialis* Jonathan	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
245. *Nematocryptus aquilonius* Jonathan	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
48. Genus ***Lipoprion*** Townes																
246. *Lipoprion rufo-ornatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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49. Genus ***Fitatsia*** Seyrig																
247. *Fitatsia depressa* Kamath	–	+	–	–	–	–	–	–	–	–	–	+	+	–	–	+
248. *Fitatsia tuberculata* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
249. *Fitatsia incompleta* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
250. *Fitatsia hypsipylae* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
50. Genus ***Silsila*** Cameron																
251. *Silsila fulvipes* Cameron	–	–	–	–	–	–	–	–	–	–	–	+	–	+	–	+
252. *Silsila similis* Kamath	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
51. Genus ***Acromia*** Townes																
253. *Acromia punctata* Kamath	–	–	–	–	–	–	–	–	–	–	–	+	+	+	–	+
52. Genus ***Ceratocryptus*** Camerron																
254. *Ceratocryptus bituberculatus* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
255. *Ceratocryptus tibialis* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
53. Genus ***Thelodon*** Townes																
256. *Thelodon spilonota* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IX. Tribe **Osprynchotini**																
54. Genus ***Acroricnus*** Ratzeburg																
257. *Acroricnus peronatus* (Cameron)	–	–	–	+	–	–	–	–	–	+	–	–	–	–	–	–
55. Genus ***Nematopodius*** Gravenhorst																
8. Subgenus ***Nematopodius (Nematopodius)*** Gravenhorst																
258. *Nematopodius (N.) longiventris* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
9. Subgenus ***Diapetus*** Cameron																
259. *Nematopodius (D.) nigromaculatus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
260. *Nematopodius (D.) luteus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA											Elsewhere															
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
X. Tribe **Gabuniini**																
56. Genus ***Apocryptus*** Uchida																
261. *Apocryptus tikari*, Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
262. *Apocryptus plumbeus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
263. *Apocryptus mysorensis*, Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
264. *Apocryptus laevifrons* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
265. *Apocryptus nitidus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
266. *Apocryptus biserratus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
267. *Apocryptus fuscinervis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
268. *Apocryptus pilosus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
269. *Apocryptus erugatus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
270 *Apocryptus aurantius* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
271. *Apocryptus nathani* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272. *Apocryptus flavofacies* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
273. *Apocryptus flavicrus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
274. *Apocryptus buddha* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
275. *Apocryptus terebratus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
276. *Apocryptus garhwalensis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
277. *Apocryptus flavorbitalis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
(a) *Apocryptus flavorbitalis flavorbitalis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(b) *Apocryptus flavorbitalis himachalis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–
57. Genus ***Dinocryptus*** Cameron																
278. *Dinocryptus femoratus* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
279. *Dinocryptus apicalis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA												Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
280. *Dinocryptus fulgidipennis* (Cameron)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
58. Genus ***Pterocryptus*** Szépligeti																
281. *Pterocryptus burmensis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
59. Genus ***Tanepomidos*** G & J																
282. *Tanepomidos assamensis* G & J	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
60. Genus ***Xoridesopus*** Cameron																
283. *Xoridesopus xanthosema* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
284. *Xoridesopus flavispeculum* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
285. *Xoridesopus schuleri* (Dalla Torre)	–	–	–	–	–	–	–	–	–	–	–	–	+	+	–	–
286. *Xoridesopus notialis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	+
287. *Xeridesopus orientalis* Gupta & Gupta	–	–	–	+	–	–	–	–	–	–	–	–	+	+	–	–
288. *Xoridesopus jonathani* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
289. *Xoridesopus kamathi* Gupta & Gupta	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
61. Genus ***Hadrocryptus*** Cameron																
290. *Hadrocryptus trimaculatus* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
291. *Hadrocryptus ditissimus* (Tosquinet)	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–	–
62. Genus ***Microstenus*** Szépligeti																
292. *Microstenus mysorensis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–
293. *Micostenus canaliculatus* Szépligeti	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
63. Genus ***Eurycryptus*** Cameron																
294. *Eurycryptus decoratus* (Smith)	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
(a) *E. decoratus indicus* (Smith)	–	–	–	–	–	–	–	–	–	–	–	+	–	–	–	–
64. Genus ***Schreineria*** Schreiner																
295. *Schreineria flavocollaris* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
296. *Schreineria himalayana* G & J	–	–	–	–	–	–	–	–	–	+	–	–	–	–	–	–

INDIA											Elsewhere															
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bhutan	China	Hong Kong	Indonesia	Japan	Korea	Malaysia	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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Name of the Taxa	INDIA															
	Andaman & Nicobar Is.	Andhra Pradesh	Arunachal Pradesh	Assam	Bihar	Chattisgarh	Delhi	Gujarat	Haryana	Himachal Pradesh	Jammu & Kashmir	Jharkhand	Karnataka	Kerala	Madhya Pradesh	Maharashtra
297. *Schreineria dholpurensis* G & J	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298. *Schreineria dunensis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
65. Genus ***Arhytis*** Townes																
299. *Arhytis maculiscutis* (Cameron)	–	–	–	+	+	–	–	–	–	+	–	–	+	–	–	+
300 *Arhytis dravida* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
66. Genus ***Dagathia*** Cameron																
301. *Dagathia brunnea* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
67. Genus ***Torbda*** Cameron																
302. *Torbda geniculata* Cameron	–	–	–	+	–	–	–	–	–	–	–	–	–	–	–	–
303. *Torbda violaceipennis* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
304. *Torbda nigromaculata* (Cameron)	–	–	–	+	–	–	–	–	–	–	–	–	–	+	–	–
305. *Torbda maculipennis* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
306. *Torbda notialis* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	+	–	–
307. *Torbda erugans* Gupta & Gupta	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XI. Tribe **Sphecophagini**																
68. Genus ***Arthula*** Cameron																
308. *Arthula brunneocornis* Cameron	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

INDIA											Elsewhere																
Manipur	Meghalaya	Mizoram	Orissa	Punjab	Rajasthan	Sikkim	Tamil Nadu	Uttaranchal	Uttar Pradesh	West Bengal	Bangla Desh	China	Hong Kong	Indonesia	Japan	Korea	Laos	Myanmar	Nepal	Pakistan	Philippines	Russia	Singapore	Sri Lanka	Taiwan	Thailand	Tibet
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