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**Indian Chalcidoid Parasitoids  
of the Tetrastichinae**  
(HYMENOPTERA : EULOPHIDAE)

T. C. NARENDRAN



ZOOLOGICAL SURVEY OF INDIA

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**Indian Chalcidoid Parasitoids of the  
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**Zoological Survey of India  
Kolkata**

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## INTRODUCTION

This is the sixth in a series of monographs on Hymenoptera prepared by me. The earlier monographs include on Oriental *Brachymeria* Westwood (K. J. Joseph; T. C. Narendran & P. J. Joy, 1973), Oriental Chalcididae (Narendran, 1989), Torymidae & Eurytomidae of Indian subcontinent (Narendran, 1994), Indo-Australian Ormyridae (Narendran, 1999) and on Indian Ants (K. A. Karmaly and T. C. Narendran, 2006). The taxonomy of Eulophidae and particularly subfamily Tetrastichinae was in the most confused state in the Indian subcontinent, which include India, Pakistan, Sri Lanka, Nepal, Bhutan and Myanmar. The fauna of Tetrastichinae has not been extensively worked out so far. Whatever has been published was only a fragment of the total fauna available in the subcontinent. Besides many species were described very poorly and often misplaced under wrong genera. No comprehensive keys to species and genera were available for easy identification of taxa of Tetrastichinae of this subcontinent. Hence, this work was undertaken to provide a taxonomic review of Tetrastichinae of Indian subcontinent in the light of recent changes (Graham, 1987; Bouček, 1988; La Salle, 1994) which took place in this family, to place all Tetrastichinae species of Indian subcontinent in their correct genera and to bring out new synonymy that existed and to clear the doubts on their identity and variations. Apart from these objectives it is also intended to provide descriptions of several new taxa discovered and useful diagnoses and redescriptions of little known taxa. So far no workable keys are available for the identification of the species and genera of Tetrastichinae of Indian subcontinent. Hence, it was another major objective of this monograph, to provide such workable keys to species and genera of this subcontinent. This was not an easy task. While available descriptions of many species were extremely inadequate and examination of types was a necessity. Unfortunately this was not possible in many cases, especially of specimens deposited in India. Neither the authors of the species nor the authorities of some institutes ever answered my enquiries regarding loan of the types. In some cases I had to struggle hard to obtain the recently published papers by workers of my own country while most of the West European and North American depositories and scientists readily cooperated with me. Although, in this work 34 genera and 272 species are treated, I am sure much more than this will be found out in future years by more extensive and intensive taxonomic surveys. This work is only a beginning and a preliminary frame work of a revision of Tetrastichinae.

The subfamily Tetrastichinae is one of the largest groups of Chalcidoidea. They are very widely distributed in all terrestrial ecosystems. They are biologically and morphologically very diverse. They attack a wide variety of hosts of about 100 families of Insecta comprising 10 different orders. Besides the insects they also attack spider eggs, mites and nematodes (La Salle, 1994). Some species are phytophagous, inquilines or gall formers. Many species are widely used as biological control agents against several insect pests all over the world.

I sincerely hope this monograph will provide a basis for future accomplishments by those who follow to study this interesting, and marvelous (but also difficult to study taxonomically) group of insects.

### HISTORICAL RESUMÉ

The study of the family Tetrastichinae may be said to have began well before 150 years ago when Förster, 1856 proposed Tetrastichoidae as a family name for the group now regarded as the subfamily Tetrastichinae though some non alien elements were included in the Tetrastichoidae. Two decades before Förster proposed Tetrastichoidae, Fonscolombe (1832) described a species of Tetrastichinae under the name *Pteromalus gallerucae* which forms the type species of *Oomyzus* Rondani and Westwood (1833) described *Aprostocetus caudatus*. The name *Tetrastichus* was first erected by Walker (1842) but the type species belonged to *Aprostocetus* Westwood. Walker in 1846 transferred these species of *Aprostocetus* to *Tetrastichus* Haliday. Haliday (1844) proposed this genus with the type species *Cirrospilus attaulus* described by Walker in 1839. (In 1965, The Commission on Zoological Nomenclature accepted *Tetrastichus* Haliday as the valid genus name and rejected *Tetrastichus* Walker as invalid). Walker in 1848 synonymised *attaulus* with *miser* Nees which is the senior synonym of the species. Other workers of 19th century who stand prominent in the study of Tetrastichinae are Westwood (1833), Nees (1834), Ashmead (1894) and Thomson (1878). In the first half of last century, Rondani (1867), Kurdjumov (1913), Girault (1913-1936) and Burks (1943) contributed a great deal to the study of Tetrastichinae. In second half of last century the main contributors to the knowledge on the taxonomy of Tetrastichinae were Erdős (1954), Graham (1961, 1987, 1988 & 1991), Domenichini (1966), Kostjukov(1977), Bouček (1977, 1988), Burks (1952, 1967), and La Salle (1994).

The main contributors to the study of Indian Tetrastichinae were made by Mani and his students (1939, 1941, 1942, 1972, 1973, 1974, 1989), Kurian (1952, 1953), Ranaweera (1950), Saraswat (1975), Khan, M. Y. and Shafee (1979, 1981), Khan *et al.*, (2005), Hayat & Shahi (2004) and Narendran (2001-2006).

### BIOLOGY

The subfamily Tetrastichinae consists of mostly entomophagous species. A few species are phytophagous (including gall inducers). These entomophagous ones are primary or secondary parasitoids and a few are predatory in behaviour. They may be solitary or gregarious species. The entomophagous species may be endoparasitic or ectoparasitic in behaviour. There are host specific and polyphagous species in the subfamily. There are also specialists and generalists. The behaviour and reproduction of some species of *Melittobia* Westwood was a subject of study by Assem, Narendran & Sudheendrakumar (1987). Their observations on the crossbreeding experiments posed certain pertinent questions on the biological species concept since neighboring populations of *Melittobia assemi* Dahms produced fertile individuals whereas widely separated populations only

sterile ones. The consequence of such a situation would be that a static species concept does not apply atleast to some species of *Melittobia* and instead, a relative concept should be applied, though only after more detailed studies one can arrive at sound conclusions (Assem, Narendran & Sudheendrakumar, 1987).

## DISTRIBUTION

(Figs. 314-316)

The genus *Aprostocetus* and *Tetrastichus* were found to have a wider distribution in the Indian subcontinent followed by *Neotrichoporoides*, *Quadrastichus* and *Oomyzus*. Some other genera have scattered and restricted distributions. The distribution of the remaining mainly small genera is not sufficiently well known for generalization. In the data on distribution under each known taxa detailed information is provided only in the case of Indian subcontinent.

## ECONOMIC IMPORTANCE

Many species of *Tetrastichus* are used for biological control of noxious insect pests all over the world. Primarily they are used against Coleoptera, Diptera, Lepidoptera and Thysanoptera (La Salle, 1994). Graham gave a brief account of Tetrastichinae used in biological control projects throughout the world. *Tetrastichus howardi* (Olliff) is widely used as biocontrol agent against the Black-headed Caterpillar Pest *Opisina arenosella* Walker of coconut in India (Narendran, 2001a). *Tetrastichus pyrillae* Crawford is used against sugarcane leaf hopper *Pyrilla perpusilla* Walker in Punjab (India). *T. inferens* Yoshimoto is a Taiwanese parasitoid introduced in India for the control of *Sesamia inferens* Walker a serious pest of rice and millets (Narendran, 2001b). The phytophagous forms include serious pests such a *Quadrastichus erythrinae* Kim which has become a serious menace to *Erythrina* trees in Kerala (South India) and other parts of South East Asia (Kim *et al.*, 2004, Faizal *et al.*, 2006). It is possible that *Kiggaella oryzae* Narendran is a potential natural enemy of some moth pests of rice in Peninsular India. The host -parasite index given at the end of this monograph shows the wide range of pests attacked by Tetrastichinae of the Indian subcontinent and elsewhere.

## PHYLOGENY OF TETRASTICHINAE

According to Domenichini (1966) Tetrastichinae show greater development than Eulophinae (in the present sense) and Euderinae. They are closely related to Entedoninae. The research of Graham (1987) indicates that Tetrastichinae could be the sister group of Euderinae. Tetrastichinae and Euderinae appear to be more closely related to each other than to any other subfamilies of Eulophidae. Graham (loc. cit.) states that possibly Entedoninae, Euderinae and Tetrastichinae originated from some ancestral stock in the neighbourhood of the genus group *Aulogymnus* of the subfamily Eulophinae. Graham (1987) listed 70 characters and their states, but did not provide an analysis. He however

noted a number of different morphological trends in Tetrastichinae although their phylogenetic significance is doubtful (Gibson, *et al.*, 1999). Although Tetrastichinae appears to represent a monophyletic group there is no real evidence for its monophyly (La Salle, 1994). Nothing is known of the fossil history of Tetrastichinae and this subfamily may be relatively a young group which may be in a state of rapid evolution (Graham, 1987).

## MATERIALS AND METHODS

For collecting specimens of Tetrastichinae a sweep net as illustrated by Noyes (1982) is used. The preparation of materials is done as per the recommendations of Noyes (1982) and Graham (1987). Besides field collection, several specimens were reared in the laboratory from plant galls and seeds collected from various localities in India. Besides, several specimens were secured on loan from in and outside India for my studies. This include types of several species. All new names proposed herein must be treated as arbitrary combination of letters or nouns in apposition, except otherwise specified under each new taxa. New taxa described in this work are deposited in the DZUC but eventually will be transferred to Western Ghat Regional Station, Zoological Survey of India, Kozhikode, Kerala, India or Indian Agricultural Research Institute, New Delhi except otherwise specified under each new taxa.

## TERMS AND MEASUREMENTS

The terminologies used are illustrated in the figures 1-6. However, the following points need to be noted. Radicle is not counted while considering the antennal formula. The general abbreviations for the terms are as follows :

CL <sub>1</sub> -CL <sub>3</sub>	=	Claval segments 1 to 3
CC	=	Costal cell
F1-F4	=	Funicular segments 1 to 4
gen. nov.	=	New genus
MS	=	Malar sulcus
MV	=	Marginal vein
ML	=	Median line, groove or sulcus
OD	=	Major diameter of hind ocellus
OOL	=	Ocellocular line
PMV	=	Postmarginal vein
POL	=	Postocellar line
SLG	=	Sublateral groove (or grooves) or sulcus (or sulci) or line (or lines)
SMG	=	Submedian groove (or grooves) or sulcus (or sulci) or line (or lines)
SMV	=	Submarginal vein

STV	=	Stigmal vein
T <sub>1</sub> - T <sub>7</sub>	=	Gastral tergites 1-7
sp. nov.	=	Species nova or new species
comb. nov.	=	New combinations
nom. nov.	=	New name
syn. nov.	=	New synonym

#### ACRONYMS FOR MUSEUMS AND DEPOSITORIES

AMS	=	Australian Museum, Sydney, NSW, Australia
ANIC	=	Australian National Insect Collection, CSIRO, Canberra, Australia
BMNH	=	The Natural History Museum, London SW7 5BD, England
BPBM	=	Bernice Pauahi Bishop Museum, Honolulu, Hawaii
CNC	=	Canadian National Collection, Agriculture Canada, Biosystematic Research Institute, Ottawa, Ontario, Canada
CPCRI	=	Central Plantation Crops Research Institute
CSIRO	=	Commonwealth Scientific and Industrial Research organization, Division of Entomology, Australia (Canberra City, ACT)
DST	=	Department of Science and Technology, Government of India, New Delhi
DZUC	=	Department of Zoology, University of Calicut, Kerala.
EIHU	=	Entomological Laboratory, Hokkaido University, Japan
FRI	=	Forest Research Institute, Dehradun, India
HNHM	=	Hungarian Natural History Museum, Budapest, Hungary
IARI	=	Indian Agricultural Research Institute, New Delhi, India
ICZN	=	International Commission on Zoological Nomenclature
IEA	=	Instituto di Entomologia agraria, Portici.
IZAS	=	Institute of Zoology, Academy of Sciences, Beijing 100080, China
JXAU	=	Jinagxi Agricultural University, Nanchang 330045, China
MHNG	=	Muséum d'Histoire Naturelle, Geneva, Switzerland
MoEF	=	Ministry of Environment and Forest, Government of India, New Delhi
NHMV	=	Naturhistorisches Museum, Vienna, Austria
NIAES	=	National Institute of Agro-environmental Sciences, Ibaraki, Japan
NM	=	Naturhistorisches Museum, Vienna
NMI	=	National Museum of Ireland, Dublin
NWCF	=	Northwestern College of Forestry, Yangling 712100, Shaanxi, China

PUA	=	Pantnagar University of Agriculture , Pantnagar, India.
QLD	=	Queensland, Australia
QM	=	Queensland Museum, South Brisbane, QLD, Australia
SEA	=	School of Entomology, St. Johns College, Agra, India
TBGRI	=	Tropical Botanical Garden and Research Institute, Karimancode, Pacha-Palode, Thrunavanthapuram, Kerala, India
TM	=	Természettudományi Muzeum, Budapest
UCDC	=	Bohart Museum, University of California, USA
UCDS	=	Unisersita cattolica del cureore, Italy
UM	=	University Museum, Oxford.
UMO	=	University Museum, Oxford, U. K.
USNM	=	United States National Museum, Washington, D. C., USA
ZAMU	=	Zoological Museum, Aligarh Muslim University, Uttar Pradesh, India.
ZIL	=	Zoological Institute, Academy of Sciences, Leningrad
ZISP	=	Zoological Institute, St Petersburg, Russia
ZMMS	=	Moscow State university Museum, Moscow, USSR
ZSIC	=	Zoological Survey of India, Calcutta (= Kolkatta), India
ZSIK	=	Western Ghats Regional Station, Zoological Survey of India, Kozhikode, Kerala, India

### DIAGNOSTIC CHARACTERS OF TETRASTICHINAE

*Length* : Varies from less than 1mm to 3mm (rarely exceeding 3mm). Colour black, or yellow or brown, with or without metallic green or blue or bronze refringence, or wholly or partly metallic green or blue. Often yellow with black or brown or metallic markings or vice versa.

*Head* (Figs. 1 & 2) : Often tends to collapse when dead; sides of scrobe ecarinate; MS may or may not be present; antennae inserted above, at or below level of lower eye margin; scape may or may not exceed level of vertex; antenna (Fig. 5) with anelli variable from 1 to 4, funicle usually 3 or 4 segmented; clava 3 or 2 segmented with or without an apical spicula and a seta on spicula; funicular segments with or without long sensillae, or plumose (in many males); funicular segments often petiolate (mostly in males); antennal scape of male with sensory plaque; occipital carina may or may not be present.

*Mesosoma* (Fig. 3) : Notauli clearly visible, complete; pronotum with or without a cross ridge or carina; mid lobe of mesoscutum with 1 or 2 longitudinal rows of adnotaular setae or scattered setae forming not definite rows. ML may or may not be present on mesoscutum; axillae strongly and angulately advanced along the posterior part of the notauli. If axillae only moderately advanced, then the anterior pair of 4 setae on scutellum near to middle

or behind middle of scutellum. Forewing (Fig. 4) with SMV usually not smoothly continuous with parastigma; PMV absent or rudimentary. Propodeum variable.

*Gaster* (Fig. 6) : Sessile, subsessile or with a relatively short petiole. The nature of cercal seta, position of the tip of hypopygium, shape of gaster etc. vary in different species.

**Key to genera of Tetrastichinae of Indian subcontinent**

1. Males apterous or brachypterous; wings not reaching beyond half of gaster; eye slightly to greatly reduced, scape strongly swollen ..... 2
- Wings present and of normal size in both males and females; eyes and scape not as above ..... 3
2. Frontofacial fork absent; head somewhat enlarged .....  
 ..... (in part) *Melittobia* Westwood
- Frontofacial fork present; head not enlarged ..... (in part) *Tachinobia* Bouček
3. Lower face with conspicuous striae (Fig. 86 ) radiating from the mouth; apex of vein in hind wing swollen or knobbed; petiole conspicuous ..... *Ceratoneura* Ashmead
- Lower face without striae; apex of hind wing vein not as above; petiole different, not conspicuous as in above alternate ..... 4
4. Pronotum with a cross carina or ridge at middle or near posterior margin ..... 5
- Pronotum without a cross carina or ridge at middle or near posterior margin ..... 7
5. Female antennal formula 11142; petiole distinct, coarsely sculptured; axillae relatively little advanced, their interior corners obtuse angular ..... *Mestocharella* Girault
- Female antennal formula not as above; petiole absent; axillae well advanced ..... 6
6. Antennal formula 11332; flagellar segments (Fig. 114) relatively short; mesosoma pale brownish yellow with metallic green patches on dorsum .....  
 ..... *Neomestocharella* Narendran & Fousi
- Antennal formula 11033; flagellar segments very long (Fig. 85) with long hairs; mesosoma blackish brown, without any metallic green patches on dorsum .....  
 ..... *Lasalleola* Narendran
7. Scutellum without SMG ..... 8
- Scutellum with SMG ..... 13
8. Female : MS absent; body usually somewhat flattened; frontal rami diverging widely as deep lines towards outer side of hind ocelli ..... (in part) *Tachinobia* Bouček
- Females and males : MS present; body may or may not flattened; frontal rami not as above ..... 9

9. Middle lobe of mesoscutum abundantly and regularly pilose; hairs generally placed on tubercles; vertex with abrupt edge behind ocelli; anterior setae of scutellum near to front margin; antenna short with funicular segments mostly transverse .....  
.....*Nesolynx* Ashmead
- Middle lobe of mesoscutum with pilosity reduced to adnotaular strip; hairs not on tubercles; vertex without sharp ridge or carina; anterior setae of scutellum removed from front margin; antenna not so short ..... 10
10. Mesoscutum and scutellum with distinct engraved reticulations; scutellum usually with 3 pairs of inconspicuous setae; apex of scutellum with fine admarginal grooves and projecting out a little over steep propodeum; female antenna not bristly .....  
..... *Goethella* Girault
- Mesoscutum and scutellum mostly shiny, sometimes dorsally somewhat depressed; scutellum with 2 or 3 pairs of setae; apex of scutellum not projecting over propodeum; antenna may or may not bristly ..... 11
11. Hypopygium not reaching middle of gaster; one cercal seta on each side longer than others and sinuate; body metallic green, not flattened .....*Kiggaella* Narendran
- Hypopygium exceeding middle of gaster; cercal seta variable; body not metallic green, flattened ..... 12
12. Frontofacial grooves very close to each other; MS weak or hardly distinct, not curved if distinct; gaster in dorsal view obtuse apically; clava with apical seta 2x as long as apical spicula..... (in part) *Aceratoneuromyia* Girault
- Frontofacial grooves well separated (Fig. 79) from each other; MS weak, not curved; gaster in dorsal view not obtuse apically, more or less ovate; flagellum with small, not very bristly setae (Fig. 78); clava without apical seta .....  
..... *Kostjurixia* Narendran gen. nov.
13. Mid lobe of mesoscutum with setae scattered over its whole surface; median area of frons wedge shaped; head length as long as or a little longer than its width in front view; male antennal scape (Fig. 161) greatly enlarged; parasitic on Aculeata .....  
.....(in part) *Melittobia* Westwood
- Characters not as above ..... 14
14. Mesosoma shiny, without ML, dorsally somewhat depressed; propodeum subhorizontal; scutellum with SMG faintly indicated (careful observation under proper lighting is necessary to see this character); antennal clava with apical seta of terminal spicula about 2x as long as spicula; flagellum with long, scattered, erect or semierect setae; funicular segments quadrate to transverse; ovipositor sheath not visible; pronotum, in dorsal view, often with usually raised spiracle.....  
..... (in part) *Aceratoneuromyia* Girault

- Mesosoma different, apical seta of clava if present distinctly shorter than 2x length of apical spicula; other characters partly or completely different or in different combination ..... 15
- 15. MS usually distinctly curved; propodeal spiracle with the entire rim exposed .... 16
  - MS not as above; propodeal spiracle variable ..... 18
- 16. Cercal setae subequal in length (without one seta longer than rest and often sinuate and not visibly longer than setae of last tergite); SMV usually with 2 or more dorsal setae; mesosternum generally convex in front of trochantal lobe without distinct precoxal suture; body black, brown or metallic, without yellow markings ..... 17
  - Somehow differing from above; either one of the cercal setae distinctly longer than others and sinuate or rim of propodeal spiracle not fully exposed or body with some yellow markings ..... (in part) *Aprostocetus* Westwood
- 17. Propodeum with a raised lobe of callus that partially overhangs the outer rim of spiracle; spiracular depression open to anterior margin of propodeum (Fig. 282); head with weakened area around ocellar triangle; gall inducer on *Eucalyptus*; invasive sp. .... *Leptocybe* Fisher and La Salle
  - Propodeum with entire rim of spiracle exposed, anterior rim of spiracle not open to anterior margin of propodeum; head without weakened area around ocellar triangle, not so far reported from galls of *Eucalyptus* ..... *Baryscapus* Förster
- 18. Propodeum with an inverted 'Y'- shaped paraspiracular carina on either side; surface usually reticulate; SMV with one (rarely 2) dorsal seta ..... 19
  - Propodeum without such inverted 'Y'- shaped paraspiracular carinae; a single paraspiracular carina may be present which does not have a distinct branch directed posteromedially ..... 21
- 19. Propodeum long with median carina in posterior half diverging anteriorly with a median pit; petiole longer than broad with irregular wrinkles or carinae on dorsal side; pronotum long, narrowly produced anteriorly (Fig. 6, Narendran *et al.*, 2004) ..... *Iniostichus* Kamijo & Ikeda
  - Characters not as above ..... 20
- 20. Gaster very long; its length 2.6x or a little more than 2x length of mesosoma; lower clypeal margin with 3 teeth ..... *Neogasterichus* Narendran
  - Gaster distinctly shorter than above; lower clypeal margin bidentate ..... *Tetrastichus* Haliday
- 21. First segment of mid and hind tarsi much shorter than second; antennae with 3 anelli, first two discoid, the third large and quadrate, only slightly transverse, usually with a few setae; MS with oblong or sublinear fovea below eye, Pakistan ..... *Kolopterna* Graham

- First segment of mid and hind tarsi not shorter than second; other characters mostly variable ..... 22
22. MV shorter than CC; scutellum with SLG forming deep broad grooves (Fig. 113) which are margined externally and have strong costulae; lower margin of clypeus subtruncate without distinct teeth ..... *Holcotetrastichus* Graham
- Characters not as in above combination; partly or completely different ..... 23
23. Vertex with a sharp transverse carina (Fig. 91) behind ocelli; scutellum with crenulate or alveolate groove along apical margin; first segment of mid and hind tarsi slightly to somewhat shorter than second; MS most often with subtriangular or oblong fovea just below eye ..... *Sigmophora* Rondani
- Vertex without transverse carina behind ocelli; scutellum usually without crenulate groove along apical margin; other characters not in above combination ..... 24
24. Midlobe of mesoscutum with conspicuous coarse longitudinal striae (Fig. 155 ) or strong raised ridges with deep channels in between (Fig. 155) ..... 25
- Midlobe of mesoscutum without longitudinal carinae or raised ridges ..... 26
25. Midlobe of mesoscutum with median longitudinal ridges (Fig. 155) and relatively deep channels in between; scutellum with SMG ..... *Narendrania* Fousi
- Midlobe of mesoscutum with striae (Fig. 75) or carinae, without deep channels in between; scutellum without SMG ..... *Parachrysocharis* Girault
26. MV 6-9.5x as long as STV; scutellum with anterior setae usually before middle and nearer to SLG; often with 3 pairs of setae; propodeum usually long and horizontal or sub-horizontal with sculpture stronger than sculpture on scutellum and mesoscutum; MS expanding to a subocular fovea below eyes in most species .....  
..... *Neotrichoporides* Girault
- MV shorter than 6x length of STV; other characters not in combination with above features or partly or completely different ..... 27
27. Gaster distinctly narrowed (Fig. 109) at base, with a subbasal pale spot; ovipositor sheath concealed; propodeum large, smooth without a median carina; SMV always with 2 dorsal setae which are fairly close to each other and nearer to the middle of the vein; parasitic on thrips ..... *Thripastichus* Graham
- Gaster and propodeum differ from above or not in above combination; SMV with dorsal setae variable from 1-5; ovipositor sheath variable ..... 28
28. Pronotum large and bell shaped (Fig. 278), distinctly reticulate, evenly pubescent, longer than mesoscutum; scutellum longer than mesoscutum; a fovea running anteriorly and posteriorly from the inner margin of propodeal spiracle on either side; antennal formula 11433; MS with a basal fovea; SMV with 3 dorsal setae .....  
..... *Idukkiella* Narendran gen. nov.

- Pronotum not as above; other characters variable .....29
- 29. Lower clypeal margin truncate or nearly so or slightly produced, rarely with 2 very minute teeth .....30
- Lower clypeal margin distinctly bidentate or well bilobed .....32
- 30. Body yellow with metallic markings or metallic with yellow markings; propodeal spiracle relatively very small or minute with rim fully exposed; two longer setae on each cercus usually subequal in length (rarely unequal as in two European species) .....*Minotetrastichus* Kostjukov
- Characters not as in above combination ..... 31
- 31. Occiput unusually large, granulate, exposed; occipital foramen situated much nearer to mouth than to hind ocelli; median carina of propodeum placed in a groove ..... *Citrostichus* Bouček
- Occiput not large, not granulate, not exposed as above; occipital foramen situated above centre of back of head; median carina of propodeum not placed in a groove ..... *Tamarixia* Mercet
- 32. SMV with 1 dorsal seta .....33
- SMV with more than 1 dorsal seta .....36
- 33. All funicular segments longer than broad; mesosoma with distinct metallic refringence; mesoscutum with atleast 2 adnotaular setae..... (in part) *Aprostocetus* Westwood
- Somehow differing from above; if all funicular segments longer than broad then either mesosoma with metallic colouration or mesoscutum with ML or with one adnotaular seta on either side ..... 34
- 34. Body dorsoventrally flattened with relatively long pronotum and propodeum; propodeal spiracle small, circular and separated from anterior margin of propodeum by more than its own diameter; terminal spine of clava as long as apical seta; antenna with long erect setae; ML of mesoscutum present (often faint); foramen magnum situated slightly to distinctly above centre of head ..... *Kostjukovius* Graham
- Body not flattened as above, other characters partly or completely different ..... 35
- 35. All funicular segments longer than wide; atleast F3 with long curved sensillae; mesoscutum with 1 adnotaular seta (occasionally with 2-4 setae) gaster usually elongate ..... *Quadrastichus* Girault
- Atleast F3 and often others, quadrate or wider than long; funicular segments (Fig. 134) without long curved sensillae; mesoscutum with 2-5 adnotaular setae on each side; gaster usually shorter and more ovate ..... *Oomyzus* Rondani
- 36. Hindcoxa with a carina (Fig. 80) extending length of dorsal margin; propodeum with strong margin; propodeum with strong curved paraspiracular carinae ..... *Anaprostocetus* Graham

- Hindcoxa without carina; propodeum without such curved paraspiracular carinae ..... 37
- 37. Lateral panel of pronotum deeply concave; prepectus raised; MS with a deep pit below eye; body including propodeum mostly smooth and shiny [with bright metallic green colour] ..... *Aprostoporoides* Narendran
- Lateral panel of pronotum not deeply concave; prepectus normal; MS usually without a basal pit below eyes; body not extremely smooth and shiny, colour variable ..... (in part) *Aprostocetus* Westwood

[Note : In the following account all taxa are treated in alphabetic succession]

### Genus *Aceratoneuromyia* Girault

1917. *Aceratoneuromyia* Girault, [334] : 151. Type species : *Aceratoneuromyia australia* Girault 1917, by original designation (= *A. indica* Silvestri 1920) (La Salle, 1994).

**Diagnosis :** Antenna with apical seta of terminal spine very long, about 2x as long as apical spine itself and with long, scattered erect or semierect setae; funicular segments quadrate to transverse; MS weakly represented, not always easily visible; mesosoma somewhat flattened, with scattered erect or semierect setae; elongate pronotum and propodeum; SMG usually indistinct, rarely or indicated weakly; SLG distinct and carinate; gaster rounded or obtuse apically in dorsal view.

**Host :** Parasitic on Diptera (Tephritidae, Calliphoridae, Sarcophagidae and Muscidae).

**Distribution :** Asia, Africa, Australia, Fiji, America.

### Key to Oriental species of *Aceratoneuromyia* Girault

1. Forewing with CC 21x as long as wide; propodeum distinctly longer than scutellum; F3 longer than wide (Fig. 74); marginal cilia of hind wing 0.5x width of wing; cilia of forewing 0.6-0.7x as long as STV ..... *wayanadensis* Narendran & Santhosh
- Forewing with CC 8-10 x as long as wide; propodeum at most as long as scutellum; other characters partly or completely different ..... 2
2. Forewing with CC 8-9x as long as broad; slightly longer than MV; POL 1.6-2x OD; F2 and F3 broader than (or somewhat broader than) long (Fig. 73); body length 1.5-2mm; scutellum without SMG ..... *indica* (Silvestri)
- Forewing with CC 13-14x as long as broad; sometimes shorter than MV; POL 2.5x OD (median ocellus); F2 about as long as wide; body length 1.2-1.7mm; SMG weakly represented (extralimital : Thailand & Japan) ..... *atherigonae* Ferrière

### 1. *Aceratoneuromyia atherigonae* Ferrière

1960a. *Aceratoneuromyia atherigonae* Ferrière, : 106-108. Lectotype, Female, Japan (MHNG) Switzerland.

**Diagnosis** : This species comes near to *A. wayanadensis* Narendran & Santhosh in general appearance but differs from it mainly in having : 1) POL about 3x OOL (in *A. wayanadensis* POL 1.2x OOL; 2) Scape 2.3x as long as wide (in *A. wayanadensis* 3.8x as long as wide); 3) F3 about as long as wide (in *A. wayanadensis* F3 distinctly longer than wide); 4) F3 about as long as F2 (in *A. wayanadensis* F3 distinctly longer than F2); 5) Scutellum distinctly longer than propodeum (in *A. wayanadensis* scutellum distinctly shorter than propodeum).

**Male** : Unknown.

**Host** : *Atherigona* sp. (Diptera : Muscidae) (Ferrière, 1960).

**Distribution** : Japan (Hokkaido, Honshu, Kyushu) and Thailand.

**Type locality** : Japan, Honshu and Gifu.

**Remarks** : The diagnosis of this extralimital species is included here for easy identification of this species if encountered in the Indian Subcontinent in future.

### 2. *Aceratoneuromyia indica* (Silvestri)

(Fig. 73)

1910. *Syntomosphyrum indicum* Silvestri, : 230-244. Syntypes, India, Bangalore, reared 21.iv.1909 (Silvestri) (?IEA; USNM).

1917. *Aceratoneuromyia australia* Girault, [334] : 151. Syntypes, Western Australia (USNM) [Synonymised with *indicum* by Gahan, 1938 : 221].

1960a. *Aceratoneuromyia indica* (Silvestri) Ferrière, : 105-106.

**Diagnosis** : This species differs from *A. wayanadensis* Narendran & Santhosh in having : 1) POL as long as OOL (in *A. wayanadensis* POL 1.2x OOL); 2) F3 not longer than wide (in *A. wayanadensis* F3 longer than wide); 3) Propodeum shorter than scutellum (in *A. wayanadensis* propodeum longer than scutellum); 4) Dorsellum clearly separated from propodeum by metanotum as in Fig. 91 of La Salle 1994 (in *A. wayanadensis* dorsellum attached to propodeum concealing median part of metanotum (Fig. 12 Narendran *et al.*, 2005); 5) Forewing with CC 8-9x as long as broad (in *A. wayanadensis* forewing with CC 21-22x as long as broad); 6) T2 longer than T3 (in *A. wayanadensis* T2 subequal in length to T3);

**Male** : Unknown.

**Host** : *Ceratitis capitata* (Wiedemann), *Dacus caudatus* Fab., *Bactrocera dorsalis* Hendel (Diptera : Tephritidae), *Notodacus xanthodes* (Broun) (Diptera : Tephritidae) (Graham, 1991).

**Distribution** : India : Karnataka; Sri Lanka. According to La Salle, 1991 this species is widely spread throughout the world including Central and South America.

*Type locality* : India : Bangalore

*Remarks* : The figure of antenna of this species given in this work is a modified figure from the electron scan photograph of the species given by La Salle (courtesy La Salle, 1991).

*Material examined* : 2 Females present in USNM; 2 Females, Punjab, Pathankot, Sujampur, 10.vii.2006, coll. S.M.A. Badruddin & I.R. Khan. 2 Females, India. Tamilnadu, Kanyakumari, 31.01.2007, B.V. David.

### 3. *Aceratoneuromyia wayanadensis* Narendran & Santhosh (Fig. 74)

2005a. *Aceratoneuromyia wayanadensis* Narendran & Santhosh in Narendran *et al.*, 118-120. Female, India (ZSIK)

*Redescription* : *Female* : Length 1.51 mm. Black; eye blackish brown; ocelli black; antenna brown with scape and lower half of pedicellus paler; fore and hindcoxae concolorous with body; mid coxae pale brown; femora black with apical part pale yellow; tibiae and tarsi pale yellow; wings hyaline, veins pale brown; pilosity of forewing brown. Pubescence on body dirty white.

*Head* : Width in anterior view 1.09x length, as wide as mesoscutum, collapsing from front to back; scrobal groove joining and running upwards to meet frontal fork; frons, vertex and occiput with minute reticulations; clypeus not clearly demarcated on upper and lateral sides, lower margin bilobed; antennal toruli slightly below lower ocular line; distance between toruli less than that between toruli and eyes, lower face with a subtransverse ridge above clypeus; head and eye pilose with relatively longer hairs; POL 1.2x OOL; MS fine, weak and straight, 0.833x length of eye in profile. Antennal formula 11133; scape 1.33x length of eye, 3.8x as long as broad, not reaching front ocellus; pedicellus plus flagellum somewhat less than width of mesoscutum; pedicellus about 1.8x as long as broad; clearly longer than F1; funicle distinctly clavate; F2 shorter than F1; F3 longer than F2 and subequal to F1; F1 and F3 longer than broad; F2 length subequal to its width; clava distinctly broader than F3, about 1.9x as long as broad; CL<sub>1</sub> length a trifle less than its width; CL<sub>2</sub> shorter than CL<sub>1</sub>; CL<sub>3</sub> distinctly shorter than CL<sub>2</sub>; CL<sub>3</sub> with an apical seta and spine.

*Mesosoma* : Flattened with scattered semierect setae. Median dorsal length of pronotum 0.8x length of mesoscutum; hind margin of pronotum slightly arcuate, surface with micro scūlptures, with 5 strong setae on each side on posterior half and a few on anterior half. Midlobe of mesoscutum broader than long, with fine longitudinal striate-reticulate sculpture; 2 adnotaular setae on each side; scutellum 0.64x length of mesoscutum, shiny but weakly and longitudinally striate-reticulate; dorsellum crescentic, lying over metanotum in middle region, not separated from propodeum as in *A. indica* (Fig. 91 of La Salle 1994)

where dorsellum is clearly separated from propodeum by metanotum. Propodeum distinctly longer than scutellum; median carina thin at base but gradually broadening to form a large subtriangular smooth plate in posterior half, submedian area of propodeum distinctly reticulate in anterior half, weakly on posterior half; hindcoxa weakly reticulate on dorsal side; hind femur 3.6x as long as broad; spur of midtibia a little longer than basitarsus; basitarsus of midleg subequal in length to fourth midtarsal segment. Forewing length (excluding marginal fringe) 3.12x its maximum width; CC subequal in length to MV, a decolourised break between parastigma and base of MV present; front edge of MV with 11 long setae, longest seta distinctly shorter than STV; length of marginal fringe about 0.3x length of hind tibia; marginal cilia of hind wing 0.5x width of wing.

*Gaster* : Distinctly shorter than mesosoma; 1.73x as long as broad, obtuse apically, ovipositor sheath not visible; hypopygium extending distinctly more than half of gaster; tergites shiny with very fine delicate alutaceous sculpture except T1; a basal fovea on T1 present; longest cercal seta very slightly curved.

*Male* : Unknown.

*Host* : Unknown.

*Type locality* : India : Kerala : Wayanad Dt., Thonikadavu.

*Material examined* : Holotype.

### Genus *Anaprostocetus* Graham

1987. *Anaprostocetus* Graham, 84-88. Type species : *Anaprostocetus dehraensis* Graham, by original designation.

2005b. *Anaprostocetus* Graham; Narendran *et al.* : 273-280.

*Diagnosis* : Hindcoxa with a curved subdorsal carina on its outer surface; propodeum with sharp paraspiracular carinae; area from paraspiracular carina to median carina with distinct reticulations, area from paraspiracular carina to spiracle somewhat recessed and smooth; ocelli enclosed by a shallow line; vertex with a large shallow fovea outside each hind ocellus; body bright metallic blue to green.

*Host* : One species attacks a species of Tenthredenidae (Hymenoptera) (Graham, 1987).

*Distribution* : India, China, Canada & Europe.

### Key to World species of *Anaprostocetus* Graham

1. Clava as long as or longer than combined length of F1 plus F2 ..... 2
- Clava distinctly shorter than combined length of F1 plus F2 ..... 4
2. Clava as long as F2 plus F3; gaster 3.1x as long as broad; forewing 2.45x as long as broad. China ..... *cenxiensis* Sheng

- Clava distinctly longer than F2 plus F3; other characters partly or completely different ..... 3
- 3. Clava nearly 3x as long as broad; CL<sub>1</sub> and CL<sub>2</sub> not or hardly longer than broad; pedicellus 2.2x as long as broad; MS slightly curved, 0.66x as long as length of eye; OOL about 2x OD. Holarctic ..... *acuminatus* (Ratzeburg)
- Clava 3.7x as long as broad (Fig. 82); CL<sub>1</sub> and CL<sub>2</sub> distinctly longer than broad; pedicellus 2.5x as long as broad; MS not curved, 0.39x as long as length of eye; OOL 1.25x OD, India ..... *sringeriensis* Narendran & Santhosh
- 4. F1 distinctly shorter than F2; malar space 0.33x length of eye; pronotum 0.4x as long as mesoscutum; forewing 2.18x as long as broad; speculum closed behind by cubital line of setae; MV 3.62x STV; gaster 3.32x as long as broad; 1.33x combined length of head plus mesosoma; last tergite 1.22x as long as broad (Fig. 81), India ..... *areos* Narendran & Fousi
- F1 distinctly longer than or as long as F2; other characters partly or completely different ..... 5
- 5. Clava 3.5x as long as broad; claval length 0.77x combined length of F2 plus F3; pedicellus 0.54x as long as F1; forewing 2.51x as long as broad; gaster 3.6x as long as broad; last tergite 2.8x as long as broad (Fig. 80). India ..... *keralicus* Narendran & Girish Kumar
- Clava 2.8x as long as broad; claval length 0.66x combined length of F2 plus F3; pedicellus 0.45x as long as F1; forewing 2.35x as long as broad; gaster 4.2x as long as broad; last tergite 2x as long as broad ..... *dehraensis* Graham

### 1. *Anaprostocetus acuminatus* (Ratzeurg)

1848. *Entedon acuminatus* Ratzeburg, : 169. Syntype. Female. Germany (destroyed).

1987. *Anaprostocetus acuminatus* (Ratzeburg); Graham, : 84-85.

**Diagnosis :** Body strongly metallic green to blue green (often with bronze or golden areas); antennae brown with scape and pedicellus pale brownish yellow; legs with coxae concolorous with mesosoma; femora dark brown with bases and apices pale yellow; tibiae pale brownish yellow; tarsi yellow; pretarsi dark brown; wings hyaline with veins pale brownish yellow. Head about 2.5x as broad as long; malar space about 0.66x length of eye; MS slightly curved; antennal scape shorter than eye, reaching level of median ocellus; pedicellus plus flagellum about 1.2x width of mesoscutum; pedicellus shorter than F1; clava about 3x as long as broad, longer than F2 plus F3, bluntly pointed; midlobe of mesoscutum with distinct ML; with 4-6 adnotaular setae on either side; SMG enclosing a space 2.2x as long as broad; callus with 5-7 setae; forewing 2.25x as long as broad; SMV with 4-5 dorsal setae; MV 4x as long as STV; gaster longer than head plus mesosoma.

**Male :** The diagnosis by Graham (1987) may be referred.

*Host* : *Euura atra* (L.). and *E. laeta* Fallen (Graham, 1987, LaSalle 1994).

*Distribution* : Europe, Canada & India.

*Type locality* : Germany, Mecklenburg.

*Material examined* : 1Female, India, Andhra Pradesh, Tenali (16° 14' N 80° 39' E), 28.ix.1986, coll. T. C. Narendran & Party.

## 2. *Anaprostocetus areos* Narendran & Fousi

(Fig. 81)

2005b. *Anaprostocetus areos* Narendran & Fousi : 275-276. Female, India (ZSIK).

*Redescription* : *Female* : Length 1.91mm. Dark metallic bluish green. Antenna brown with scape, pedicellus and anelli paler; eyes brick red; ocelli reflecting yellowish brown; fore coxae dark brown with apex paler; fore femur brown on outer side with apex and inner side paler; all tibiae and all tarsi pale yellow; mid femur and hind femur pale yellow with basal half slightly darker; tegula pale yellow. Wings hyaline; forewing veins pale brownish yellow.

*Head* : As broad as mesoscutum, 3.8x as broad as its maximum length in dorsal view; POL 1.58x OOL; OOL 1.28x OD; ocellar triangle delimited by a distinct grooved line; each lateral ocellus connected to adjacent eye by a grooved line which expands just outside ocellus to form a subtriangular fovea. Head in front view 1.02x as wide as long, sparsely clothed with extremely short pubescence; malar space 0.33x length of eye in profile; MS not curved; head moderately shiny with fine reticulation. Antenna with scape distinctly shorter than eye, reaching front ocellus, 4.3x as long as broad; pedicellus plus flagellum 1.33x width of mesoscutum; pedicellus 1.6x as long as broad; 0.61x as long as F1; anelli 3, quite distinctly visible in some angles of illumination; F1 shorter than F2; F1-2.25x, F2-2.5x, F3-1.7x as long as broad; clava 3x as long as broad, distinctly shorter than combined length of F2 and F3; sensillae moderately dense.

*Mesosoma* : 1.47x as long as broad; pronotum 0.4x length of mesoscutum; midlobe of mesoscutum as broad as long, moderately convex, shiny with fine engraved reticulation, ML distinct throughout, strong, 6-7 adnotaular setae on each side. Scutellum 1.33x as broad as its median length, 0.75x length of mesoscutum; SMG nearer to SLG than to each other, enclosing a space 2.5x as long as broad; anterior pair of setae slightly behind the middle. Dorsellum 3.5x as broad as long, dull, reticulate; propodeum distinctly longer than dorsellum, slightly emarginate just before petiole; surface between paraspiracular carina with strong, raised reticulations; median carina raised, not thin, slightly expanding posteriorly; paraspiracular carina curved, not very strong; space between carina and spiracle smooth but not very shiny; spiracle round, separated from metanotum with a distance lesser than half diameter of spiracle; callus with 3 setae; metapleuron with sculpture slightly raised; hindcoxa 1.88x as long as its width, with a distinct curved dorsal carina, outer surface with distinct raised reticulation, rather finer than that of propodeum; hind

femur 4.5x as long as broad; spur of mid tibiae 0.75x length of basitarsus; fourth segment of mid and hind tarsi shorter than basitarsus; forewing 2.15x as long as broad; CC slightly shorter than MV, 13.5x as long as broad; SMV with 4 dorsal setae; MV 3.6x as long as STV, its front edge with 16-18 dorsal setae; speculum closed behind by cubital line of setae.

*Gaster* : 3.32x as long as broad; 1.33x as long as head plus mesosoma, acute and acuminate posteriorly; last tergite 1.22x as long as broad; tip of hypopygium a little after middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Distribution* : India : Kerala.

*Material examined* : Holotype and Paratypes (Narendran *et al.*, 2005)

### 3. *Anaprostocetus dehraensis* Graham

1987. *Anaprostocetus dehraensis* Graham : 86. Female, India (BMNH).

*Diagnosis* : Body bright greenish blue; antennal scape, legs (except coxae) testaceous. POL 1.4x OOL; antenna with pedicellus 0.45x length of F1; F2 shorter than F1; F3 shorter than F2; clava about 2.8x as long as broad; as long as F3 plus half length of F2; mid lobe of mesoscutum with 7-9 adnotaular setae on each side; SMG enclosing a space almost 2.5x as long as broad; forewing 2.35x as long as broad; SMV with 6-7 dorsal setae; MV 5.2x length of STV; speculum open below; hind femur 3.7x as long as broad; gaster 4.2x as long as broad; 1.6x as long as head plus mesosoma.

*Male* : Unknown.

*Host* : Unknown.

*Distribution* : India : Uttaranchal.

*Type locality* : India : Uttaranchal : Dehra Dun.

*Remarks* : The above diagnosis is based on Graham (1987) and other available literature.

### 4. *Anaprostocetus keralicus* Narendran & Girish Kumar (Fig. 80)

2005b. *Anaprostocetus keralicus* Narendran & Girish Kumar, : 274-275 Female, INDIA (ZSIK).

*Redescription* : *Female* : Length 3.63 mm. Bright metallic green. Antenna brown with scape, basal part of pedicellus and anelli paler; eyes dark red, ocelli black; coxae (except their paler tips) concolorous with mesosoma; fore femur testaceous with outer side of basal part darker; fore tibia and tarsi testaceous; hind femur light brown with apex paler; hind tibia and tarsi pale yellow; all pretarsi dark brown; tegula pale yellow; wings hyaline; forewing veins yellow with its border brown.

*Head* : About as broad as mesoscutum, 2.53x as broad as its maximum length in dorsal view; POL 1.5x OOL; OOL 1.33x OD; ocellar triangle delimited by grooved lines; each lateral ocellus connected to adjacent eye by a grooved line which expands just outside the ocellus to form a subtriangular fovea. Head in front view 1.14x its length, sparsely clothed with extremely short pubescence; malar space 0.58x length of eye in profile; MS slightly curved; head moderately shiny with extremely fine reticulations. Antenna with scape distinctly shorter than eye, reaching median ocellus, 4.28x as long as broad; pedicellus plus flagellum 1.14x width of mesoscutum; pedicellus 2.4x as long as broad; 0.54x as long as F1; anelli 3, distinctly visible; funicular segments decreasing in length; F1-3x, F2-2.85x, F3-2.28x, as long as broad, clava 3.5x as long as broad; CL<sub>1</sub> and CL<sub>2</sub> little longer than broad; sensillae of flagellum moderately dense.

*Mesosoma* : 1.5x as long as broad; pronotum 0.75x length of mesoscutum; midlobe of mesoscutum as broad as or slightly broader than long, moderately convex, shiny with fine engraved reticulations; MS distinctly strong, slightly broadening towards posterior end; mesoscutum with 9 adnotaular setae on each side; scutellum 1.28x as broad as long; SMG slightly nearer to SLG than to each other, enclosing a space 2.62x as long as broad; scutellum 0.55x length of mesoscutum; space between SMG nearly equal to the length of a posterior seta of scutellum; anterior pair of setae slightly behind the middle; dorsellum 4.66x as broad as long, moderately shiny, with fine engraved reticulation. Propodeum slightly longer than dorsellum, very narrowly emarginate before petiole; surface between paraspiracular carinae with strong, raised reticulation; median carina raised, rather thin and sharp and slightly expanding posteriorly; paraspiracular carinae strong and curved; areas between these and spiracles moderately shiny with delicate, alutaceous sculpture; spiracles round, separated by their own diameter; callus with 5-6 setae; metapleuron with slightly raised sculpture; hindcoxa 2x as long as wide, with a distinct curved dorsal carina, outer surface with slightly raised reticulations, rather finer than those on propodeum; hind femur 4x as long as broad; spur of midtibia 0.71x length of basitarsus. Forewing length 2.51x its maximum width, hardly reaching tip of gaster; CC distinctly shorter than MV (23 : 30), about 9x as long as broad, SMV with 7 dorsal setae, MV 4.5x as long as STV, its anterior dorsal side with 32 setae; speculum open below, disc beyond it sparsely setose.

*Gaster* : 3.68x as long as broad, 1.4x as long as head plus mesosoma, acute and acuminate posteriorly; last tergite 2.8x as long as broad; tip of hypopygium a little before half of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Distribution* : India : Kerala.

*Material examined* : Holotype and Paratypes (Narendran *et al.*, 2005)

*Variation* : In paratypes metallic colour is more bluish.

5. *Anaprostocetus sringeriensis* Narendran & Santhosh  
(Figs. 82, 83)

2005b. *Anaprostocetus sringeriensis* Narendran & Santhosh : 276-277, Female, India (ZSIK).

*Redescription : Female* : Length 2.36 mm. Metallic blue with violet and green reflections. Antenna brown with scape, pedicellus and anelli pale yellowish brown; eyes brick red; ocelli dark brown; coxae except their tips concolorous with mesosoma; fore femur pale yellow with dark brown on outer three fourth from base and half from base on inner side; fore tibiae and tarsi pale yellow; mid femur, tibia and tarsi pale yellow with basal one third of tibia darker; hind femur pale yellow with basal half dark brown; hind tibia and tarsi pale yellow; tegula pale yellow. Wings hyaline; forewing veins pale brownish yellow.

*Head* : As broad as mesoscutum; 2.57x as broad as length in dorsal view; POL 1.2x OOL; OOL 1.25x OD; ocellar triangle delimited by a distinct grooved line; each lateral ocellus connected to adjacent eye by a grooved line which expands just outside ocellus to form a subtriangular fovea. Head in front view 1.08x as wide as its length; sparsely clothed with extremely short pubescence; malar space 0.39x length of eye in profile; MS not curved; head moderately shiny with fine reticulation. Antenna (Fig. 82) with scape distinctly shorter than eye, reaching front ocellus; 3.22x as long as broad; pedicellus plus flagellum 1.5x width of mesoscutum; pedicellus 2.5x as long as broad; 0.75x as long as F1; anelli 3, distinctly visible; funicular segments decreasing in length, F1 = 2.83x, F2 = 2.25x, F3 = 2x as long as broad; clava 3.7x as long as broad; distinctly longer than combined length of F2 plus F3; sensillae of flagellum dense.

*Mesosoma* : 1.66x as long as broad; pronotum 0.5x length of mesoscutum; midlobe of mesoscutum as broad as long, moderately convex, shiny with fine engraved reticulation; ML distinct throughout, strong, 7 adnotaular setae on each side; scutellum 1.6x as broad as its median length, 0.6x length of mesoscutum, SMG slightly nearer to SLG than to each other; enclosing a space 2.8x as long as broad; space between the SMG nearly equal to a posterior seta of scutellum; anterior pair of setae slightly behind the middle. Dorsellum 4x as broad as long, dull, reticulate; propodeum distinctly longer than dorsellum (3 : 2), distinctly emarginate just before petiole; surface between paraspircular carinae with strong, raised reticulations; median carina raised, rather thin, sharp and slightly expanding posteriorly; paraspircular carinae strong and curved; areas between carinae and spiracles moderately shiny with delicate, not raised, alutaceous sculpture; spiracle round, separated from metanotum with less distance than half diameter of spiracle; callus with 3 setae; metapleuron with sculpture slightly raised; hindcoxa 1.63x as long as its width, with a distinct curved dorsal carina; outer surface with distinct raised reticulations, rather finer than that of propodeum; hind femur 3.6x as long as broad; spur of mid tibiae 0.71x length of basitarsus; fourth segment of mid and hind tarsi shorter than basitarsus; forewing length (95 : 39) 2.43x its maximum width; CC (28 : 33) distinctly shorter than MV, 9x as long as broad; SMV with 4 dorsal setae; MV 5.3x as long as STV, its front edge with 20 dorsal setae; speculum partly closed by cubital line of setae.

*Gaster* : 2.82x as long as broad; 1.08x as long as head plus mesosoma, acute and acuminate posteriorly; last tergite 1.44x as long as broad; tip of hypopygium a little before half of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Distribution* : India : Karnataka.

*Material examined* : Holotype and paratypes. (Narendran *et al.*, 2005).

### Genus *Aprostocetus* Westwood

- 1833b. *Aprostocetus* Westwood, : 444. Type species : *Aprostocetus caudatus* Westwood, by monotypy.
1842. *Tetrastichus* Walker, : 10 : 116. Type species : *Cirrospilus lycidas* Walker, by designation of Peck, 1951. Suppressed by the ICZN, Opinion 720, 1965.
1844. *Trichoceras* Ratzeburg. Type species : *taichoceras erythrophthalmus* /Ratzeburg, by monotypy.
1873. 296. *Exurus* Philippi, Type species : *Exurus colliguayae* Philippi, by monotypy. (LaSalle, 1994 synonymised)
- 1877b. *Myiomisa* Rondani : 39 Type species : *Myiomisa microscopica* Rondani by monotypy.
1878. *Syntomosphyrum* Förster, 60. Type species : *Syntomosphyrum fulvipes* Förster, by monotypy.
1887. *Tetrastichodes*, Ashmead, : 203. Type species : *Tetrastichus floridanus* Ashmead, by monotypy.
1906. *Ootetrastichus* Perkins, : 263. Type species : *Ootetrastichus beatus* Perkins, by monotypy.
1913. *Neomphaloides* Girault, [145] : 103-104. Type species : *Neomphaloides cinctiventris* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Selitrichodes* Girault, [145] : 104-105. Type species : *Selitrichodes fasciiventris* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Zagrammosomoides* Girault, [146] : 177. Type species : *Zagrammosomoides fasciatus* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Epomphaloides* Girault, [156] : 49. Type species : *Epomphaloides flavus* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Aprostocerella* Girault, [158] : 71. Type species : *Aprostocerella kelloggi* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Asyntomosphyrum* Girault, [158] : 71, also [167] : 249-250. Type species : *Asyntomosphyrum pax* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Ootetrastichella* Girault, [167] : 223. Type species : *Ootetrastichella longiventris* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Selitrichodella* Girault, [167] : 225. Type species : *Selitrichodella mira* Girault, by original designation. (Bouček, 1988 synonymised).

1913. *Neotetrastichodes* Girault, [167] : 228, 250 (*Neotetrastichodes*) and 1913 [172] : 44. Type species : *Neotetrastichodes flavus* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Epitetrastichus* Girault, [167] : 229 (& 205), and 1913 [172] : 45. Type species : *Tetrastichus speciosissimus* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Neomphaloidella* Girault, [167] : 234 and 1913 [175] : 69. Type species : *Neomphaloidella fasciativentris* Girault, by original designation.
1913. *Tetrastichella* Girault, [167] : 237 and 1913 [175] : 108. Type species : *Tetrastichella fuscipennis* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Epentastichus* Girault, [167] : 241. Type species : *Epentastichus nugatorius* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Syntomosphyrella* Girault, [167] : 244. Type species : *Syntomosphyrella fuscipennis* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Selitrichodelia* Girault, [167] : 245. Type species : *Selitrichodelia aenea* Girault, by original designation. (Bouček, 1988 synonymised).
1913. *Trichaporoides* Girault, [171] : 104. Type species : *Trichaporoides fasciativentris* Girault, by original designation. The type species transferred to *Ootetrastichus* by Girault, 1913 [167] : 217, ie., before actual publication of the description of *Trichaporoides*. (Bouček, 1988 synonymised)
1915. *Duotrastichus* Dodd, in Girault, [230] : 257. Type species : *Duotrastichus monticola* Dodd, by original designation. (Bouček, 1988 synonymised).
1915. *Proceratoneura* Girault, [230] : 262. Type species : *Ootetrastichus lustris* Girault, by original designation. (Bouček, 1988 synonymised).
1917. *Paromphaloidomyiia* Girault, [309] : 1. Type species : *Paromphaloidomyiia homeri* Girault, by original designation. (LaSalle, 1994 synonymised).
1917. *Prothymus* Girault, [309] : 1. Type species : *Prothymus novus* Girault, by original designation. (LaSalle, 1994 synonymised).
1917. *Blattotetrastichus* Girault, [319] : 257. Type species : *Entedon hagenowii* Ratzeburg, by original designation. (Graham, 1991a synonymised).
1917. *Omphalomopsis* Girault, [336] : 88. Type species : *Omphalomopsis marilandia* Girault, by original designation. (LaSalle, 1994 synonymised).
1917. *Neomphaloidomyia* Girault, [338] : 118. Type species : *Hyperteles polynemae* Ashmead, by original designation. (Peak, 1991 synonymised).
1977. *Chrysotetrastichus* Kosjtukov, : 189 (as subgenus of *Tetrastichus*). Type species : *Tetrastichus oreophilus* Förster, by original designation. (Kosglukor, 2004 synonymised).
1985. *Terebratella* Shafee & Rizvi, : 377-378. Type species : *Terebratella indica* Shafee & Rizvi, by original designation. (Bouček, 1988 synonymised).
1993. *Turktichus* Doğanlar, : 174-175. Type species *Turktichus ghananensis* Doğanlar. (LaSalle, 1994 synonymised).

**Diagnosis** : MS present and complete; lower margin of clypeus bilobed or bidentate; antenna with 3 or 4 funicular segments; anelli usually 3 or 4, rarely 1-2; midlobe of mesoscutum with 1 row of adnotaular setae, rarely 2 or 3 rows; scutellum with 2 pairs of setae (very rarely 3 pairs in aberrant forms) which are almost always nearer to SMG than to SLG; SMV with 2 or more dorsal setae (rarely with one seta); in subgenera *Tetrastichodes* and *Quercastichus* mesoscutum evenly covered with setae.

Graham (1987) and LaSalle (1994) divided the genus *Aprostocetus* into several subgenera. Since I find much difficulty in separating many species on clear cut characters to different subgenera, atleast in the case of Indian species, I have not followed the subgeneric classification here in this work.

**Host** : Found associated with a variety of hosts, often insects inhabiting plant galls.

### Key to species of *Aprostocetus* Westwood of Indian Subcontinent

1. Clava as long as or longer than F2 plus F3 ..... 2
- Clava shorter than F2 plus F3 ..... 44
2. Pedicellus as long as or longer than F1 ..... 3
- Pedicellus shorter than F1 ..... 27
3. Mesoscutum with ML (often faintly represented and in some cases seen only in posterior half of mesoscutum) ..... 4
- Mesoscutum without ML ..... 22
4. F1 equal to or longer than F2 ..... 5
- F1 shorter than F2 ..... 17
5. Scape as long as or longer than clava ..... 6
- Scape shorter than clava ..... 16
6. Antenna with one anellus; body black with purplish and greenish reflections; gaster at base and legs yellow; base of coxae, strip above and below femora brown; pedicellus and 3 funicular segments subequal, about 2x as long as width; SMV with 4 dorsal setae; MV 2.33x STV; Host : *Tachardia lacca*; *T. albizziae*; *Aonidiella orientalis* .....  
..... *purpureus* (Cameron)
- Antenna with more than one anellus; other characters partly or completely different ..... 7
7. Antenna with 2 anelli ..... 8
- Antenna with 3 or 4 anelli ..... 12
8. Mesoscutum with 3 adnotaular setae on either side; MV less than 3x as long as STV ..... 9

- Mesoscutum with more than 3 adnotaular setae; MV more than 3x as long as STV ..... 10
- 9. SMV with 5 dorsal setae; MV 2.71x as long as STV; body black with metallic reflections; legs black or dark brown with tibiae and first 3 tarsal segments yellow; Host : *Nipaeococcus* sp. .... *nigricornis* (Khan & Shafee)
- SMV with 3 dorsal setae; MV 2.83x as long as STV; body dark brown with lower frons, mesopleura, metapleura, coxae, gastral tergites light brown; legs (except dark brown coxae) pale yellow with fourth tarsal segment and pretarsi brown; Host : Coccids on *Euphorbia* ..... *vatiata* Narendran sp. nov.
- 10. Gaster black with T1 and sides of T2 pale brown; mesoscutum with 4 adnotaular setae; pedicellus plus flagellum 0.88x width of mesosoma; MV 3.15x as long as STV; gaster 1.16x as long as mesosoma; mainly black with slight metallic refringence on head and mesosoma; legs pale brownish yellow with coxa dark brown; Host : Lac insect on Sandal wood ..... *bangaloricus* Narendran
- Gaster without pale colour at base; other characters partly or completely different or in different combination ..... 11
- 11. Propodeum without any carina on lateral part; forewing distinctly shorter than 2x its maximum width; SMV with 4 dorsal setae; midcoxa yellow (general body colour black with slight metallic green reflection). Host : *Nipaeococcus viridis*, India. .... *rajai* Narendran sp. nov.
- Propodeum with a carina on either side; forewing distinctly longer than 2x its maximum width; SMV with 5 dorsal setae (in the type); midcoxa dark [general body colour as in above alternate]. Host : Hyperparasitic on *Homona coffearia* through eulophid or braconid parasites. Sri Lanka ..... *versicolor* (Ranaweera)
- 12(7). Antenna with 3 anelli; MV 3x as long as STV; mesoscutum with 5 adnotaular setae on each side; SMV with 4 dorsal setae; head yellow with dorsum brown; mesosoma yellowish brown; legs yellow except fore coxa brown; gaster dark brown with basal one-third yellow; Host : *Coccidohystrix insolitus* (Green) ..... *annulicornis* (Khan & Shafee)
- Antenna with 4 anelli; other characters partly or completely different ..... 13
- 13. Gaster more than 1.3x as long as mesosoma; head and mesosoma yellow; pedicellus plus flagellum distinctly longer than width of mesosoma ..... 14
- Gaster shorter or at the most 1.3x as long as mesosoma; pedicellus plus flagellum as long as or shorter than width of mesosoma ..... 15
- 14. Gaster shorter than 1.5x mesosoma; MV 4.6x as long as STV; spur of midtibia as long as metatarsus; (Head and mesosoma yellow; pedicellus and flagellum dark brown; scape pale yellow; propodeum and gaster black; mesopleura and metapleura blackish brown; legs yellow with base of hindcoxa slightly darkish) ..... *retura* Narendran sp. nov.

- Gaster longer than 1.5x mesosoma; MV 3x as long as STV; spur of midtibia 0.66 x as long as metatarsus; (Body yellow; funicle and clava yellowish brown; sides of gaster partly black or blackish brown) ..... *manja* Narendran sp. nov.
15. Pedicellus plus flagellum as long as width of mesosoma; mesoscutum with 5 adnotaular setae on each side; gaster above 1.25x as long as mesosoma; MV 3.8x as long as STV ..... *dellus* Narendran sp. nov.
- Pedicellus plus flagellum a little shorter (at the most equal to) width of mesosoma; mesoscutum with 6 adnotaular setae on each side; gaster below 1.25x as long as mesosoma; MV 4.24x as long as STV ..... *taruna* Narendran sp. nov.
- 16(5). Antenna with 4 anelli (Fig. 54); SMV with 3 dorsal setae; MV 4.14x as long as STV; pedicellus plus flagellum 1.27x mesosoma; gaster completely black .....  
..... *angus* Narendran sp. nov.
- Antenna with 2 anelli; SMV with 4 dorsal setae; MV 3.2x as long as STV; pedicellus plus flagellum 0.81x mesosoma; T1&T2 pale brownish yellow; hypopygium pale yellow with apical dorsal part darker ..... *obtusae* Narendran
- 17(4). SMV with 2 dorsal setae ..... 18
- SMV with more than 2 dorsal setae ..... 20
18. Antenna with 2 anelli; gaster 1.12x as long as mesosoma; MV 3.5x as long as STV (Fig. 33); scape shorter (0.71x) than clava; colour : general colour brownish yellow; antenna and legs pale yellow with base of hindcoxa slightly brownish; basal sides of gaster pale yellow ..... *decatius* Narendran sp. nov.
- Antenna with more than 2 anelli; other characters variable ..... 19
19. Antenna with 3 anelli; gaster 2x as long as mesosoma; MV 4x as long as STV; scape shorter than (0.72x) clava; body pale brownish yellow, clava subequal in length to F1+F3 (Fig. 43) ..... *karicus* Narendran sp. nov.
- Antenna with 4 anelli; gaster 1.73x as long as mesosoma; MV 2.51x as long as STV; scape as long as clava; head and mesosoma brownish black with metallic green reflection, antenna brown with scape and pedicellus immaculate yellow; legs maculate yellow; gaster dark brown with sides and ventral side paler at basal half, dorsal side with metallic green reflection, clava much shorter than F1+F3 (Fig. 36) .....  
..... *hanti* Narendran sp. nov.
- 20(17). SMV with 3 dorsal setae; antenna with 2 anelli; MV 3.5x STV; antenna pale yellow; mesosoma pale brown; legs pale brown, except coxae and femora brown; gaster pale brown except base yellow. Host : ex. *Coccidohystrix insolitus* (Green) .....  
..... *ajmerensis* Khan & Shafee
- SMV with 4 dorsal setae; antenna with 1 or 3 anelli; MV less than 3.3x STV; colour variable ..... 21

21. Antenna with 1 anellus; scape shorter than clava; body black with metallic refringence; flagellum dark brown; scape, pedicellus, base and apex of femur, trochanter, tibia, tarsus pale yellow; coxa dark brown; gaster black with slight metallic refringence; T1 and T2 without paler colour, Host : *Ceroplastes actiniformis* on Sandalwood .....  
 .....*santalinus* Narendran
- Antenna with 3 anelli; scape as long as clava; head completely yellowish brown; antenna yellowish brown, except scape yellow; mesosoma completely yellowish brown; gaster yellow. Host : ex. Coccids on weed plant .....*flavidus* Khan & Shafee
- Mandible normal, not falcate as above; MS straight; general body colour as not above, almost completely black; mesoscutum with 2 adnotaular setae on either side; MV 3.25x as long as STV; antenna with 2 anelli ..... *serycus* Narendran sp. nov.
- 22(3) Scape shorter than clava ..... 23
- Scape equal to or longer than clava ..... 24
23. Large mandibles with falcate inner margins; MS slightly curved anteriorly, mesosoma brown with 'U' shaped band on scutellum completely yellow; mesoscutum with 4 adnotaular setae on either side; MV 4.2x as long as STV; head yellow with occipital region dark; gaster yellow with 5 transverse dark bands on dorsum; antenna with 1 anether, Host : *Ferrisia virgata* (Cockerell) ..... *maculatus* (Khan Shafee)
24. SMV with 2 dorsal setae; MV 4x as long as STV; antenna with 4 anelli; black with blue reflection; lower frons, lower part of posterior orbit, lateral margins of pronotum, sides of scutum narrowly (broadening into a transverse spot posteriorly), posterior part of scutellum, metanotum, sides of pronotum, posterior margin of tegulae and dorsal margin of mesepimeron lemon yellow; legs white, with tarsi dusky, Host : Gallfly ..... *coimbatorensis* (Rohwer)
- Characters not as above ..... 25
25. Antenna with 1 anellus; SMV with 4 dorsal setae; F1 longer than F2; mesosoma without dark brown patch on anterior part of scutum ..... 26
- Antenna with 3 anelli; SMV with 5 dorsal setae; F1 equal to F2; mesosoma golden yellow with dark brown patch on anterior part of scutum, Host : ex. *Tropicomyia atomella* (Malloch) ..... *atomelli* (Khan)
26. Mesoscutum with 2 adnotaular setae; legs uniformly pale yellow; clava unsegmented; pedicellus 1.16x as long as F1; general body colour pale yellow; Host : ex. Gall maker, *Phylloplecta hirsuta* ..... *bouceki* Khan, Agnihotri & Sushil
- Mesoscutum with 6 adnotaular setae; legs with coxae brown, femora brown with apices paler, tibiae and tarsi pale yellow; clava 3 segmented; pedicellus 1.23x .... as long as F1; general body colour pale brown; Host : *Contarania sorghicola* on Sorghum ..... *diplosidis* Crawford (= *okavus* (Rohwer))

- 27(2). Mesoscutum with ML distinct ..... 28
- Mesoscutum with ML indistinct or absent ..... 42
28. F1 shorter than F2; MV 4x STV; antenna with 1 anellus; pedicellus 0.92x as long as F1; mesoscutum with 3 adnotaular setae on either side; SMV with 4 dorsal setae; head and mesosoma dark brown, non iridescent with clypeal region yellow; legs uniformly yellow except coxae, trochanter and almost distal three-fourths of femora dark brown; gaster brown with light green reflection .....  
 ..... *yoshimotoi* Khan, Agnihotri & Sushil
- F1 longer than or equal to F2; other characters may or may not be as above..... 29
29. Scape as long as or longer than clava ..... 30
- Scape shorter than clava ..... 40
30. Antenna with one or two anelli ..... 31
- Antenna with more than two anelli ..... 34
31. Antenna with 1 anellus ..... 32
- Antenna with 2 anelli ..... 33
32. SMV with 2 dorsal setae; general body colour black with metallic blue reflection; legs yellow with coxa and basal half of femur dark brown or black; gaster metallic brown; midlobe of mesoscutum with 2 short, white adnotaular setae on either side, slightly behind middle; MV 4.5x as long as STV; mesoscutum without raised .. reticulation; Host : ex. Plant gall of *Castanopsis indica* ..... *akhrulensis* Ranjit *et al.*
- SMV with 3-4 dorsal setae; body black non-metallic; mouth edge usually narrowly reddish; dorsellum and upper edge of mesopleuron yellow; tips of femora yellow; tibiae yellowish-testaceous; hind tibiae sometimes infusate medially; adnotaular setae short and weak, not easy to observe, rather irregularly arranged in 2 or 3 rows, outer row with 6-7 setae, second row with 3-5 setae and rarely third row with a single seta; MV 3.3x as long as STV; mesoscutum with slightly raised reticulation ..... *granulatus* Ashmead
- 33(31). Pronotum with an anterior carina bearing 4pairs of setae, anterior margin concave in the middle (Plate xxxv; Fig. 7 Khan *et al.*, 2005); MV 2.71x as long as STV; mesoscutum with 6 adnotaular setae; SMV with 3 dorsal setae; body dark brown with yellow reflections; gaster dark brown with yellow patch on anterior region; Host : ex. Coccids on Guava ..... *lasallei* Khan *et al.*
- Pronotum without an anterior carina; MV 3x as long as STV; mesoscutum with 2 rows of setae (each row with 3 setae) on either side; general body colour black with slight metallic reflection ..... *diclus* Narendran sp. nov.
- 34(30). Antenna with 3 anelli; pedicellus plus flagellum as long as width of mesosoma; mesoscutum with 12-14 setae in 2 or 3 longitudinal rows on either side; space between

- SMG 1.33x as long as broad; hind femur 3.16x as long as broad; SMV with 3-4 dorsal setae; MV 4.14x as long as STV; speculum very large extending up to STV below MV, partly open below; general body colour yellow with transverse bands on dorsum of gaster (Fig. 19) ..... *neogala* Narendran sp. nov.
- Antenna with 4 anelli; other characters partly or completely differ ..... 35
35. Mesoscutum with 7 adnotaular setae; SMV with 5 dorsal setae; fourth tarsal segment of midleg 1.18x as long as metatarsus; MV 5.26x as long as STV; body pale yellow tinged with brown; flagellum brown ..... *fasciatus* (= *shencottensis*) Ashmead
- Mesoscutum with fewer than 7 setae, other characters partly or completely variable ..... 36
36. MV 6.2x as long as STV; pedicellus plus flagellum as long as width of mesosoma; SMV with 3 dorsal setae; MV 6.25x as long as STV; body black with slight metallic green reflection; antenna pale brown with scape and pedicellus slightly paler; fore and mid coxae pale brown; hind coxa dark brown with slight metallic reflection; all femora pale brown with their bases and apices paler; trochanter, tibia, first three tarsal segments of all legs yellow; fourth tarsal segments slightly brown; pretarsi brown; scutellum (Fig. 47) unusually transverse ..... *amalius* Narendran sp. nov.
- MV distinctly shorter than 6x STV; other characters not in same combination as above ..... 37
37. Mesoscutum (Fig. 25) with 2 adnotaular setae on either side; SMV with 2 dorsal setae; MV 3.4x as long as STV; pedicellus plus flagellum 1.86x as long as width of mesosoma; head yellow with the brown patch between hind ocelli with slight metallic green reflection; antenna pale brown with anelli, pedicellus and scape paler; dorsal side of gaster dark metallic green; lateral panel of pronotum, prepectus, tegulae, and upper part of mesopleura yellow; remaining part of mesopleura and metapleura brown; legs yellow with base of hindcoxa brown with metallic green reflection; pretarsus brown; gaster yellow with brown patches laterally on dorsal side ..... *silenti* Narendran sp. nov.
- Mesoscutum with more than 2 adnotaular setae; other characters partly or completely variable ..... 38
38. Mesoscutum with 5 adnotaular setae; MV 3.7x as long as STV; space between SMG of scutellum 3.7x as long as broad; marginal fringe of forewing 0.44x as long as STV; general colour dark brown mixed with paler patches; head dark brown with lower frons and gena slightly paler; antenna (Fig. 56) brown with scape, pedicellus and anelli pale yellow; mesosoma dark brown on dorsal side, slightly paler on pleural side; legs yellow with fore and hindcoxa and hind femur yellowish brown basally *shimlicus* Narendran sp. nov.
- Mesoscutum with fewer than 5 adnotaular setae; other characters not in the above combination, partly or completely different ..... 39

39. Body brownish yellow with brown to dark brown markings on mesosoma and gaster (on gaster brown markings form transverse bands); head reddish yellow; faint metallic green reflections anteriorly on mesoscutum and in the middle of metanotum; MV 5x as long as STV; forewing 2.76x as long as broad; front edge of MV with 14 setae; F1 1.5x as long as F2; gaster long and pointed, longer than mesosoma .....  
..... *tritrichia* Saraswat
- Black with very weak bluish tinge, mainly on head and mesosoma; antennal scape and pedicellus black or fuscous; flagellum brown; trochanters partly , tips of femora narrowly and tibiae testaceous; the mid tibiae often darkened medially; hind tibiae brown to fuscous with bases and tips pale; tarsi testaceous, gradually darkening to fuscous distally; MV 4.2x as long as STV; forewing about twice as long as broad; front edge of MV with 10-12 setae; F1 equal or subequal (occasionally shorter) to F2; gaster short, ovate, rather flat, slightly shorter than or as long as mesosoma .....  
..... *neglectus* (Domenichini)
- 40(29) Antenna (Fig. 51) with 4 anelli; mesoscutum with 3 adnotaular setae on either side; SMV with 2 dorsal setae; MV 4.5x as long as STV; forewing 2.6x as long as broad; dark metallic green; flagellum pale brown; pedicellus and scape pale yellow; tegula pale yellow; legs yellow with coxae pale brown; pretarsi pale brown; mesosoma pale yellow ..... *calasmus* Narendran sp. nov.
- Antenna with 2 anelli; mesoscutum with either 4 or 2 adnotaular setae on either side; SMV with 3 dorsal setae; MV much shorter than 4.5x as long as STV; forewing less than 2.1x as long as broad; colour variable ..... 41
41. Mesoscutum with 4 adnotaular setae; MV as long as STV; scutellum with 3 pairs of setae; head pale yellowish brown; antenna (Fig. 62) pale yellowish brown with scape and pedicellus pale yellow; tegula pale brown; legs including coxae pale yellow; dorsellum and propodeum pale yellow; gaster brown with hypopygium and base pale yellow ..... *licalis* Narendran sp. nov.
- Mesoscutum with 2 adnotaular setae; MV 2.1x as long as STV; scutellum with 2 pairs of setae; head, mesosoma & gaster black with metallic reflections except a small yellow patch in front of median ocellus; antenna yellow. ....  
..... *nainitalensis* (Khan & Shafee)
- 42(27). Antenna with 1 anellus; SMV with 1 dorsal seta; mesoscutum with 2 adnotaular setae on either side; body pale yellow with following parts brown : a dot on pronotum just above spiracle (with short vertical line), two small dots on either side of base of forewing, a conspicuous cross band on fourth tergite; Host : ex galls on mango leaf ..... *sankarani* Boucek
- Antenna with 3 anelli; SMV with more than 1 dorsal setae; mesoscutum with more than 3 adnotaular setae on either side; colour partly or completely different from above..... 43

43. Mesoscutum with 8 adnotaular setae on either side; SMV with 7 dorsal setae; MV 4.8x as long as STV; general body colour yellow (not as in alternate); Host : ex Psyllids in leaf galls of *Grewia asiatica* Linn. .... *psyllidis* (Khan & Shafee)
- Mesoscutum with 4 adnotaular setae on either side; SMV with 2 dorsal setae; MV 4x as long as STV; head and mesosoma dark metallic green; gaster dark metallic green with basal half mostly yellowish; antenna brown with scape and pedicellus yellow; tegula and adjacent area pale yellow; all legs whitish yellow except dark brown basal half of hindcoxa; pretarsus brown ..... *uthonia* Narendran sp. nov.
- 44(1). Mesoscutum with ML ..... 45
- Mesoscutum without ML ..... 67
45. F1 equal to or longer than F2 ..... 46
- F1 shorter than F2 ..... 64
46. Antenna with 1 anellus; POL 1.5x OOL; forewing 2.4x as long as broad; MV 3.05x as long as STV; hind femur 1.25x as long as wide; gaster 1.5x as long as mesosoma, laterally compressed; ovipositor long exerted from ventrally far ahead of abdominal tip; body dark reddish brown to black with metallic green blue lustre; legs yellowish brown, with hindcoxa dorsally black; Host : Eggs of *Schoenobius* sp .....  
..... *kuriani* (Husain & Khan)
- Antenna with more than 1 anellus; other characters partly or completely different ..... 47
47. Antenna with 2 anelli ..... 48
- Antenna with 3 or 4 anelli ..... 52
48. Mesoscutum with 2 rows of longitudinal setae, each row with 6-10 setae ..... 49
- Mesoscutum with single row of adnotaular setae, each row containing 4 or 5 setae ..... 50
49. SMV with 5 dorsal setae; mesoscutum with 6 or 7 setae on each side; MV 3.21x as long as STV; gaster 1.66x as long as mesosoma; body yellow with brownish black markings as follows : area surrounded by ocelli, apical half of pronotum; median patch on mesoscutum (Fig. 13), patch on anterior part of scapula, axilla, anterior part of scutellum and on sides of propodeum and gaster ; antenna brown with sides and ventral part of scape paler; legs including all coxae completely yellow .....  
..... *narius* Narendran sp. nov.
- SMV with 4 dorsal setae; mesoscutum with 2 rows of setae near each notauli, total 10-12 setae on each side; MV 3.4x as long as STV; gaster 1.47x as long as mesosoma; black, lower margin of gena and mandible pale brown; antenna including pedicellus and scape brownish black; legs black with the following parts yellow : trochanters, apices of femora, base and apex of hind tibia, fore tibiae completely, mid tibia largely (with a small median brown band), first 2 tarsal segments ..... *ille* Narendran sp. nov.

- 50(48). SMV with one dorsal seta, body dark metallic green; ovipositor sheath (Fig. 66) about 0.7x as long as body; mesoscutum with 3 adnotaular setae on either side; antenna with 2 anelli ..... *cauperdatus* Narendran sp. nov.
- SMV with more than 2 dorsal setae; other characters partly or completely different ..... 51
51. SMV with 4 dorsal setae; mesoscutum with 5 adnotaular setae on either side; yellow with following parts dark brown : antenna (with scape paler), upper part of scrobe, area near ocelli, on vertex, apical corners of scapula and axilla, notauli and anterior corners of propodeum transverse bands on gaster (Fig. 70) ..... *gala* (Walker)
- SMV with 3 dorsal setae; mesoscutum with 4 adnotaular setae on either side; head brownish yellow; antenna brown with scape paler; tegula, legs including coxae pale yellow; mesosoma black; gaster black with basolateral region brownish yellow ..... *nagri* Narendran sp. nov.
- 52(47). Antenna with 3 anelli ..... 53
- Antenna with 4 anelli ..... 55
53. SMV with 3 dorsal setae; mesoscutum with 11-15 scattered setae arranged in rows on either side with 1 long seta posteriorly on each side; MV 3.5x as long as STV; body nonmetallic, brownish yellow with black markings on head, mesosoma and gaster; head brownish yellow with a pair of median black patches in front; ocellar triangle black; a broad horse-shoe shaped mark touching occipital foramen in posterior view; middle coxa brown; hindcoxa basally dark brown ..... *malabarensis* (Saraswat)
- SMV with more than 3 dorsal setae; mesoscutum with a single row of 4-6 adnotaular setae on either side; MV more than 3.5x as long as STV; colour partly or completely different from above ..... 54
54. SMV with 4 or 5 dorsal setae; mesoscutum with 4 adnotaular setae on either side; MV 5.3-5.55x as long as STV; body black with metallic bluish green reflection; hindcoxa basally above dark brown; otherwise legs brown ..... *travancorensis* (Saraswat)
- SMV with 6-8 dorsal setae; mesoscutum with 6 adnotaular setae on either side; MV 3.57-4.4x as long as STV; body nonmetallic yellowish brown with very dark brown to black markings; head very dark brown; all legs brownish yellow with hindcoxa black on basodorsal part; gaster yellow on basal part, remaining part darker ..... *satpurensis* (Saraswat)
- 55(52). SMV with 2 dorsal setae ..... 56
- SMV with more than 2 dorsal setae ..... 58
56. Mesoscutum (Fig. 16) with 3 adnotaular setae; MV 3.73x as long as STV; gaster 2x as long as mesosoma; enclosed space between SMG 2.3x as long as broad; body yellow with following markings : POL area black, posterior part of pronotum, anterior median part of mesoscutum, a spot on the anterior part of scapula, a spot on anterior part of

axilla and scutellum (except on the extreme side of scutellum behind the SLG) blackish brown with metallic green reflections; dorsellum brown with slight metallic green reflections; propodeum with submedian area pale brown and median carina black; gaster with blackish brown markings with slight metallic green reflections; antenna brown with pedicellus and scape paler; legs including coxae yellow, pretarsi blackish brown ..... *dala* Narendran sp. nov.

— Mesoscutum with 2 dorsal setae; other characters variable ..... 57

57. Pedicellus plus flagellum 1.57x as long as width of mesosoma; mandible bidentate; eye bare, 1.3x as long as broad, 2.16x as long as MS; scape a little shorter than eye; middle lobe of mesoscutum 1.59x as long as its posterior width, a little shorter than its anterior width; space between SMG 2.1x as long as broad, with 2 pairs of stout setae (Fig. 27); propodeum 6.17x as broad as its median length; spiracle relatively small, hardly covered by callus, separated from posterior margin of metanotum by less than its diameter; MV 5.63x as long as STV; gaster 1.44x as long as mesosoma; hypopygium reaching a little beyond middle of gaster; head pale yellow, with dark brown patch on upper part of frons and posterior part of head; pronotum pale brown; mesoscutum pale yellow with anterior half pale brown; scutellum pale yellow with pale brown tinge on area between SMG; propodeum and lower half of metapleuron pale brown; legs yellow with basodorsal part of hindcoxa, fore and mid tarsi slightly brown; gaster pale yellow with pale brown patches or bands on sides ..... *vimania* Narendran sp. nov.

— Pedicellus plus flagellum 2.05x as long as width of mesosoma; mandible tridentate; eye minutely pubescent, a little longer than broad; a little longer than 2x MS; scape almost reaching level of vertex, as long as eye length in profile; middle lobe of mesoscutum 2.14x as long as its posterior width, 1.15x as long as its anterior width; space between SMG 1.8x as long as broad; propodeum 11x as broad as its median length; rim of spiracle covered by callus, almost touching posterior margin; MV 4x as long as STV; gaster 2.08x as long as mesosoma; hypopygium (Fig. 40) not reaching middle of gaster; dark metallic green with the following parts as follows: antenna dark brown with scape and pedicellus pale yellow; tegula and upper part of mesopleuron pale brownish yellow; legs yellow with basodorsal part of hindcoxa metallic green; fore tarsal segments slightly brownish yellow; pretarsi brown; sternites pale brown ..... *harithus* Narendran sp. nov.

58 (55). Mesoscutum with scattered setae or with 3 rows of longitudinal setae ..... 59

— Mesoscutum with a single longitudinal row of adnotaular setae on either side ..... 60

59. Mesoscutum with 3 rows of setae; first row (adnotaular setae) with 7-8 setae; second row with 3-4 setae and third row with 1-2 setae; body black, without metallic reflections; gaster with basodorsal part partly brown; antenna brown with scape and pedicellus yellow ..... *calius* Narendran sp. nov.

- Mesoscutum with scattered setae (not in longitudinal rows); body dark brown with metallic blue green reflections; gaster concolorous with mesosoma; antenna completely brown ..... *dhireni* (Saraswat)
- 60(58). Mesoscutum with 5 or 6 adnotaular setae on either side ..... 61
- Mesoscutum with fewer than 5 adnotaular setae ..... 62
61. Enclosed space between SMG a little over 1.72x as long as broad; hind femur 2.33x as long as broad; MS slightly bent; scape slightly exceeding level of vertex; pedicellus plus flagellum 1.66x as long as width of mesosoma; midlobe of mesoscutum 2.33x as long as its posterior width, a little shorter than its anterior width; mesoscutum with 6 adnotaular setae'; propodeum 5x as broad as its median length; SMV with 4 dorsal setae; gaster 1.62x mesosoma; hypopygium reaching beyond middle of gaster; head and mesosoma yellow with brownish tinge and with following black markings (Fig. 11) : a patch on middle of pronotum, anterior median half of mesoscutum, a spot on anterior part of scapula and another on axilla black; upper part of frons and scrobe, mesopleura brown; propodeum black; dorsellum yellow; enclosed space between SMG blackish brown; legs yellow with pale brown tinge, hindcoxa pale brown; Gaster yellow with sides of tergites 1-5 dark brown; a dark brown patch on T4 middle anteriorly, T5 dark brown with median dorsal part paler, T6 and epipygium yellow ..... *malcis* Narendran sp.nov.
- Enclosed space between SMG 2.75x as long as wide; hind femur 3.8x as long as broad; MS straight; scape reaching level of vertex; pedicellus plus flagellum 1.9x as long as width of mesosoma; midlobe of mesoscutum 2.8x as long as its posterior width, 1.2x as long as its anterior width; mesoscutum with 5 adnotaular setae; propodeum 9x as broad as its median length; SMV with 6 dorsal setae; gaster 2.03x as long as mesosoma; hypopygium not reaching middle of gaster; black; lower frons brownish yellow; mesoscutum with area near posterior margin pale brownish yellow (in some specimens mesoscutum completely black); tegula, dorsellum and visible part of petiole pale yellow; legs yellow; pretarsus brown ..... *nadicus* Narendran sp. nov.
- 62(60). Mesoscutum with 3 adnotaular setae on either side; SMV with 4 dorsal setae; MV 4.5x as long as STV; gaster (Fig. 38) 1.8x as long as mesosoma; enclosed space between SMG a little over 1.5x as long as broad; head yellow, with vertex, post occiput and upper part of gena dark metallic green; pronotum yellow with anterior marginal area brown; mesoscutum, scapula, scutellum, axilla, dorsellum, propodeum, mesopleuron, metapleuron, three-fourths of prepectus brownish metallic green; legs including coxa completely yellow with pretarsus slightly brown; gaster dark brown, with slight metallic refringence ..... *kodei* Narendran sp. nov.
- mesoscutum with 4 adnotaular setae; SMV with 6 dorsal setae; MV 4.6x as long as STV; gaster lesser than 1.5x as long as mesosoma; enclosed space between SMG more than 1.5x as long as broad; colour variable ..... 63

63. Gaster 0.87x as long as mesosoma; space between SMG 2x as long as broad; MS straight; pedicellus plus flagellum 1.6x as long as width of mesosoma; rim of spiracle partly covered by callus; forewing 2.4x as long as broad; head and mesosoma brown with lower frons and gena, propleura and mesopleura pale brown; tegula yellow; area adjacent to tegula pale brownish yellow; posterior extensions of scapula and anterior corners of mesoscutum yellow; gaster blackish brown with base and ventral side pale brownish yellow; coxae brown with apices paler; femora pale brown with apices pale yellow; tibia and first three tarsi of each leg pale brown; fourth tarsus and pretarsi dark brown ..... *yesica* Narendran sp. nov.
- Gaster 1.53x as long as mesosoma; space between SMG 1.77x as long as broad; MS slightly curved; pedicellus plus flagellum 1.27x as long as width of mesosoma; rim of spiracle fully exposed; forewing 2.13x as long as broad; head yellow with POL area and surrounding area of ocelli black with metallic green reflection; mesosoma with metallic green reflection on pronotum, 3/4 of mesoscutum from anterior end except area near notauli and anterior half scapula, axilla completely and a spot on the anterior side of mesoscutum (Fig. 30), propodeum and lower half of mesopleura and metapleura; a striae on the notauli, posterior half of scapula, tegula, prepectus, lateral panel of pronotum and most of scutellum yellow; legs yellow with basodorsal part of hindcoxa dark brown with metallic green reflection; gaster with dark green reflection ..... *hayati* Narendran sp. nov.
- 64(45) Pedicellus longer than (1.7x) F1; antenna with 3 anelli; enclosed space between SMG 1.4x as long as broad; spur of midtibia 0.57x metatarsus; hind femur 4x as long as broad; forewing 2.48x as long as broad; marginal fringe 0.75x length of STV; hypopygium (Fig. 42) reaching middle of gaster; body dark metallic green with following parts as follows : tegula and upper part of mesopleuron pale brownish yellow; legs yellow with basodorsal part of hindcoxa brown, with slight metallic reflection ..... *ashotus* Narendran sp. nov.
- Pedicellus shorter than F1; antenna with 4 anelli; other characters partly or completely different ..... 65
65. Mesoscutum with 6-7 adnotaular setae on either side; forewing with speculum open below, extends anteriorly below MV; body black without metallic refringence; antenna with F3 longest; host : lives in leaf galls of *Calicopteris* ..... *calycopteridis* Narendran sp. nov.
- Mesoscutum with fewer than 4 adnotaular setae on each side; speculum closed behind, not extending anteriorly below MV; antennal funicular segments different; body with metallic refringence ..... 66
66. Mesoscutum with 3 adnotaular setae on either side; midlobe of mesoscutum 1.5x as long as its posterior width; space between SMG a little over 2.4x as long as broad; rim of spiracle exposed; MV 5.66x as long as STV; marginal fringe 0.66x length of

- STV; hind femur about 5x as long as broad; head and mesosoma brownish black with metallic green reflections; gaster dark brown with sides and ventral part paler at basal half, dorsum with metallic green reflection (Sri Lanka) .....  
 ..... *aruna* Narendran sp. nov.
- Mesoscutum with 2 relatively long adnotaular setae on either side; midlobe of mesoscutum 2.16x as long as its posterior width; space between SMG 2x as long as broad; rim of spiracle partly covered by callus; MV 4.9x as long as STV; marginal fringe 0.57x length of STV; hind femur 3.7x as long as broad; head and mesosoma dark metallic green; gaster dark brown with basal half pale yellow; legs yellow with basodorsal part of hindcoxa and pretarsi dark brown ..... *kaya* Narendran sp. nov.
- 67(44). Ovipositor sheath far exerted their projecting part 0.7x length of gaster, but usually longer, sometimes longer than whole body, 2.5-5x length of hind tibia; epipygium shorter than half of preceding segment; SMV usually with 3-5 dorsal setae; MV 6x as long as STV; antenna with 4 anelli, mesoscutum with 3-4 adnotaular setae; pedicellus plus flagellum 2-2.15x width of mesosoma; space between SMG 2.5x as long as broad; spur of midtibia 0.33x length of metatarsus; head yellow with ocellar area and a spot above clypeus black with green tinge; hind part of gena, temple and occipital surface more or less fuscous; mesosoma and gaster bright green to blue green; hindcoxa coloured like mesosoma, legs otherwise yellow; Host : *Ocecanthus pellucens* (Scopoli)  
 ..... *percaudatus* (Silvestri)
- Ovipositor sheath much shorter than above, usually at most half as long as hind tibia; other characters variable ..... 68
68. Antenna with 3 anelli; SMV with 3 dorsal setae; MV 4.1x as long as STV; gaster 1.07x as long as mesosoma; general body colour black with metallic blue reflection; Host : ex. Twig gall on *Rubus calycinus* ..... *denticularis* Ranjit *et al.*,
- Antenna with 4 anelli; SMV with different numbers of dorsal setae; other characters different from above ..... 69
69. Mesoscutum with 25-30 scattered setae ..... 70
- Mesoscutum with 2-4 adnotaular setae on either side ..... 71
70. SMG of scutellum distinct, about 2x as far from each other as from SLG, enclosing a space 1.62-1.85x as long as broad; mesosoma moderately arched dorsally, propodeum sloping at about 30° relative to plane of mesoscutum and scutellum. Host : Cockroach eggs ..... *hagenowii* (Ratzeburg)
- SMG of scutellum tending to be weak or obsolescent, much more than 2x as far from each other as from SLG, enclosing a space almost 1.2x as long as broad; mesosoma flattened dorsoventrally. Host : Cockroach eggs ..... *asthenogmus* (Waterston)
71. Mesoscutum with 2 adnotaular setae on either side; pedicellus plus flagellum about 3x as long as width of mesosoma ..... 72

- Mesoscutum with 3 or 4 adnotaular setae on either side; pedicellus plus flagellum at the most 2.1x maximum width of mesosoma ..... 73
72. Hypopygium reaching beyond middle of gaster; F2 (Fig. 34) much longer than F1; space between SMG 1.8x as long as broad; gaster 2x as long as mesosoma; MV 4.25x as long as STV; head and mesosoma black with metallic green reflection; gaster yellow with dorsal side partly brown on sides; apical part with slight metallic green reflection; legs yellow with base of hindcoxa brown (Sri Lanka) .....  
.....*selonus* Narendran sp. nov.
- Hypopygium not reaching beyond middle of gaster; F2 (Fig. 48) shorter than F1; space between SMG 2.9x as long as broad; gaster 3x as long as mesosoma; MV 5.3x as long as STV; yellowish brown with metallic green reflection on mesosoma and slightly on gaster; legs yellow with basodorsal part of hindcoxa brown; Host : Leaf webber of Vanilla .....  
.....*vanillae* Narendran sp. nov.
- 73(71). SMV with 2 adnotaular setae (Fig. 68); MV 3.4x as long as STV; pedicellus plus flagellum 2.1x width of mesosoma; head and mesosoma completely bright metallic green .....  
.....*sringeriensis* Narendran sp. nov.
- SMV with 5 dorsal setae; other characters not as above ..... 74
74. MV 6x as long as STV; mesoscutum with 3 stout adnotaular setae on either side; pedicellus plus flagellum 1.4x as long as width of mesosoma; rim of spiracle fully exposed; yellow with following exceptions : space between ocelli, median part of pronotum, a patch on the mesoscutum anteriorly (Fig. 9), a spot on anterior part of scapula, anterior part of axilla and on scutellum black, with metallic green reflection on spot of scutellum and mesoscutum; gaster yellow with black brown patches on sides dorsally .....  
.....*ricosus* Narendran sp. nov.
- MV 4.8x as long as STV; mesoscutum with 4 adnotaular setae on either side; pedicellus plus flagellum 1.6x as long as width of mesosoma; rim of spiracle partly covered; head black, pronotum (Fig. 21) yellow with median region and posterior end near scapula black; pronotal spiracle pale yellow; mesoscutum and scapula yellow; axilla yellow with brown patch at apex; scutellum black with pale brownish yellow sides; prepectus and tegula yellow; mesopleuron and metapleuron black with upper part of mesopleuron pale brownish yellow; propodeum black; legs yellow with basal upper part, near the propodeum of hindcoxa slightly brown; gaster black with yellow base .....  
.....*benazeer* Narendran sp. nov.

Species not placed in the key for want of details :

*A. artemesia* (Narendran) nom. nov.

1. *Aprostocetus ajmerensis* (Khan & Shafee)

1981a. *Tetrastichus ajmerensis* Khan & Shafee, 78 : 339. Female. India. (ZDAMU)

2004. *Aprostocetus ajmerensis* (Khan & Shafee), Hayay & shahi : 304.

*Diagnosis : Female* : Length 0.91mm. Scape 3.5x as long as wide; enclosed space between SMG as long as wide. Other characters as in key given above.

*Type locality* : India : Rajasthan, Jaipur.

*Host* : ex *Coccidohystrix insolitus* (Green) on *Solanum melongena* Linn.

*Material Examined* : 1Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), October 1978, Coll. M. Hayat; 1Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), Dehra Dun (30°18' N 78°3' E), 24.viii.1979, coll. M. Verma.

## 2. *Aprostocetus akhrulensis* Ranjit, Misra, Mohendro & Prasad

2003. *Aprostocetus akhrulensis* Ranjit, Misra, Mohendro & Prasad, 24 : 27-28. Female. India (? Manipur University).

*Diagnosis : Female* : Length 2.25mm. Characters as in the key.

*Remarks* : The description and the figures do not tally with each other. In the description it is stated that midlobe of mesoscutum is without ML, whereas in the figure it is shown to be with ML. Antennal formula does not include anellus or anelli. Fig. No. B showing mesosoma shows extremely small scutellum (0.22x as long as mesoscutum). This must be unusual and probably a mistake. Antenna shows only 1 funicular segment. The tibial spur of foreleg is drawn as wide as metatarsus. This is also probably a mistake. The type depository is not mentioned, except in the abbreviation AMSL (expansion not provided but may be Life Science Department of Manipur University)

*Type locality* : India : Manipur.

*Host* : ex. Plant gall of *Castanopsis indica*.

## 3. *Aprostocetus amalius* Narendran sp. nov. (Figs. 46-47)

*Holotype : female* : Length 1.39mm. Black with slight metallic green reflection; left eye brownish red with grayish yellow patch in the middle, right eye completely grayish yellow; ocelli dark brown; antenna pale brown with scape and pedicellus slightly paler; fore and mid coxa pale brown; hindcoxa dark brown with slight metallic reflection; all femora pale brown with their bases and apices paler; trochanter, tibiae and first three tarsal segments of all legs pale yellow; fourth tarsal segment slightly brown, pretarsi brown; tegula pale yellow; wings hyaline with margins of veins and pilosity brown; setae on mesoscutum and scutellum pale brown.

*Head* : Not collapsing, anterior width 1.28x anterior median length; head width in dorsal view 2.44x its length; ocelli surrounded by a groove, connecting ocular groove by a cross groove; POL 2x OOL; OOL 1.33x OD; lower margin of clypeus bilobed; mandible bidentate; eye bare, 1.3x as long as its length on side view, 2.6x as long as MS. MS straight with a basal fovea. Antennal formula 11433; scape not quite reaching level of vertex, a little shorter than eye (11 : 13) in side view; pedicellus plus flagellum as long as width of mesosoma; antennal segments as in figure 46.

*Mesosoma* : 1.13x as long as wide in dorsal view; midlobe of mesoscutum 1.5x as long as its posterior width, 0.82x as long as its anterior width; surface distinctly and longitudinally reticulate; ML distinct; mesoscutum with 4 adnotaular setae on either side (Fig. 47); scutellum 1.54x as broad as long; space between SMG 1.3x as long as broad, SMG a little nearer to SLG than to each other. Dorsellum slightly visible from above, about as long as median length of propodeum; propodeum 17x as broad as its median length, with a broad median carina; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by 1.5x its diameter; surface moderately reticulate; callus with 5 setae on each side; spur of midtibia as long as length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4.2x as long as broad. Forewing 2.25x as long as broad; CC shorter than MV; SMV with 3 dorsal setae; MV 6.25x as long as STV; marginal fringe as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile, 1.54x as long as mesosoma, 1.25x as long as combined length of head and mesosoma in side view; 6x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate, partly collapsed; hypopygium reaching middle of gaster, two cercal seta on each side slightly longer than others.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Idukki Dt., Adimali (10° 2' N 76° 59' E), 3.xii.1988, coll. T. C. Narendran & Party.

*Remarks* : This species shows some unique characters such as : unusually transverse scutellum and mesoscutum, pedicellus plus flagellum as long as width of mesosoma. It shows resemblances to *Neotrichoporoides* Girault in having MS with basal fovea and MV 6.25x STV. However, it differs from *Neotrichoporoides* in having very short propodeum, besides the above mentioned characters. This may be an undescribed genus but this can be confirmed only after studying more specimens.

#### 4. *Aprostocetus angus* Narendran sp. nov.

(Fig. 54)

*Holotype* : *Female* : Length 1.7mm. Head dark brown; mesosoma and gaster black; eyes grey with black patch in the middle on the left eye and brick red patch on the middle of right eye; ocelli pale reflecting yellow; antenna brown with scape and ventral side of pedicellus pale yellow; tegula pale brownish yellow; legs yellow with light brown patch on ventral side anteriorly on forecoxa and a faint brownish patch on the middle of hind femur, and completely brown coxa, fourth tarsal segment and pretarsi brown; wings hyaline with veins pale yellowish brown; pilosity of wings brown; pubescence on body dirty white.

*Head* : 1.2x as broad as long in anterior view; 4.3x as broad as median length in dorsal view; clypeal margin bilobed; mandible bidentate; POL 1.3x OOL; OOL 1.7x OD; ocelli

surrounded by a groove with a cross groove connecting the ocular sulcus on either side; eye bare, as long as broad, 2.16x as long as MS; MS slightly bent forwards; antennal formula 11432; scape not reaching level of vertex, scape little shorter than eye (11 : 13); pedicellus plus flagellum 1.27x as long as width of mesosoma; antennal segments as in figure 54.

*Mesosoma* : 1.28x as long as broad; midlobe of mesoscutum 1.71x as long as its posterior width, slightly shorter than its anterior width (12 : 13); surface longitudinally reticulate; ML present but weak; mesoscutum with 4 adnotaular setae on either side; scutellum 1.36x as wide as long; enclosed space between SMG 1.83x as long as broad; SMG little nearer to SLG than to each other; dorsellum visible from dorsal side, 0.4x as long as median length of propodeum; propodeum 3.7x as broad as its median length; median carina distinct, surface weakly reticulate; rim of spiracle partly covered by callus, separated from hind margin of metanotum by its own diameter; callus with 1 or 2 setae; spur of midtibia 0.8x as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 3.83x as long as broad; forewing 2.26x as long as broad; CC shorter than MV; SMV with 3 dorsal setae; MV 4.14x STV; marginal fringe 0.57x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile; 1.4x as long as mesosoma; a little longer than combined length of head and mesosoma in side view (38 : 37); 25x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate; hypopygium hardly reaching middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Wayanad Dt., Western Ghats, Muthanga (11° 44' N 76° 29' E), 10.x.2000, Coll. T. C. Narendran & Party.

*Paratypes* : 1Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 30.x.1993, Coll. M. Hayat; 2Females, India : Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9.xii.2004, Coll. T. C. Narendran & Party; 1Female, India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 17.ii.2003, Coll. T. C. Narendran & Party; 2Females, India : Tamil Nadu, Mahabalipuram, 16.ii.1993, coll. S. I. Kazmi.

*Remarks* : This species resembles *A. obtusae* in general appearance but can be separated from it by using the key given in this work.

##### 5. *Aprostocetus annulicornis* (Khan & Shafee)

1981a. *Tetrastichus annulicornis* Khan & Shafee, 341-342. Female. India (ZDAMU).

2004. *Aprostocetus annulicornis* (Khan & Shafee); Hayat & Shahi. : 304.

*Diagnosis* : *Female* : Length 1.07mm. Forewing twice as long as wide; middle tibial spur as long as basitarsus; other characters as given in the key.

*Type locality* : India : Rajasthan, Jaipur.

*Host* : ex *Coccidohystrix insolitus* (Green).

#### 6. *Aprostocetus artemesiae* (Narendran) nom. nov.

1905. *Hyperteles longicauda* Kieffer, 29 : 195. Female. India

2003. *Aprostocetus longicauda* (Kieffer) : Noyes. www.universal chalcidoidea database.

According to the website, universal chalcidoidea database of Noyes (2003), the name *Aprostocetus longicauda* is preoccupied by *Aprostocetus longicauda* Thomson (1878). Hence a new name *Aprostocetus artemesiae* nom. nov. is given here as replacement name to the junior homonym (named after the plant host *Artemesia*). Since the available description is inadequate to identify the species and the type could not be examined, the species could not be included in the key in this work. The following is the available descriptions taken from Mani (1989).

*Female* : Length 3.00 mm. Black; mandibles red; scape and legs yellow.

*Head* : Smooth, mandibles tridentate; maxillary palpi uniarticulate, the segment 5x longer than wide; labial palpi uniarticulate, segment 2x as long as wide; antennal formula 11233; apical segment of clava a little longer than wide; "fourth antennal segment" (F2?) a little longer than pedicellus, "fifth" (F3?) slightly longer than fourth (F2?); scape equal to the following segments combined.

*Mesosoma* : Pronotum transverse, not conical or subquadrate or rounded anteriorly; mesoscutum without ML; notauli deep and complete; scutellum with SMG and SLG; forewing with a short marginal fringe; hind wing not acutely pointed at apex; SMV reaching to 0.50 of wing; propodeum usually short, with a 'V' shaped median carina, each fork diverging towards the lateral hind angle, more rarely with a straight median carina.

*Gaster* : Conical, very long, 2x or more longer than head and mesosoma combined, tergites not subequal.

*Host* : Cecidomyiid of *Artemesia* galls.

*Type locality* : India : Bengal : Kulseung.

#### 7. *Aprostocetus aruna* Narendran sp. nov.

(Fig. 35)

*Holotype* : *Female* : Length 1.75mm. Head and mesosoma brownish black with metallic green reflection; eye pale yellow; ocelli pale reflecting yellow; antenna pale brown with scape paler, legs yellow with three fourth from base of hindcoxa brown. Gaster dark brown with sides and ventral part paler at basal half, dorsum with metallic green reflection; wings hyaline with veins pale brown, pilosity brown; setae on mesoscutum and scutellum pale yellow.

**Head** : (Not collapsed). width in anterior view 1.14x as broad as long, 3.16x as broad as long in dorsal view; POL 2x OOL; OOL as long as OD; eye bare, 1.27x as long as its width in side view; 2.33x as long as MS in side view; MS straight. Antennal formula 11442; scape reaching about level of vertex, scape a little shorter than eye length (14 : 16); pedicellus plus flagellum 2x as long as width of mesoscutum; antennal segments as in figure 35.

**Mesosoma** : 1.18x as long as wide; midlobe of mesoscutum 1.5x as long as its posterior width, 0.85x as long as its anterior width; surface finely and longitudinally reticulate; ML indicated; mesoscutum with 3 pairs of stout adnotaular setae on each side; scutellum 1.27x as broad as long; space between SMG a little over 2.4x as long as broad, with 2 pairs of stout setae, SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, almost as long as median length of propodeum; propodeum a little less than 7x as broad as its median length, with a short median carina, rim of spiracle exposed, separated from posterior margin of metanotum by its own diameter; surface smooth and shiny, callus with 2 setae on each side; spur of midtibia 0.66x length of metatarsus, fourth tarsomere much shorter than metatarsus; hind femur 5x as long as broad, dorsal margin with 7-9 stout setae and ventral margin with 4-5 setae. Forewing 2.6x as long as broad; CC shorter than MV; SMV with 2 stout dorsal setae; MV 5.66x as long as STV; marginal fringe 0.66x length of STV; speculum closed behind by cubital line of setae.

**Gaster** : Sessile, 1.73x as long as mesosoma; 1.26x as long as combined length of head and mesosoma in side view; 10.66x as long as dorsal visible part of ovipositor sheath; tergites smooth and sparsely pubescent, partly collapsing; hypopygium reaching beyond middle of gaster.

**Male** : Similar to female except for differences in antennal segments.

**Host** : Unknown.

**Holotype** : Female, SRI LANKA, Central Candy District, Univ. Peradeniya, Hantana (Mt. 7° 15' N 80° 17'E), 10-14. viii.1999, Coll. M & J. Wasbauer, MT (UC DC)

**Paratypes** : Male, SRI LANKA, Central Candy District, Katalu Oya Estate, Obase of Kandasami ( 7° 24' N 80° 07'E), 1. ix.1999, Coll. M & J. Wasbauer, MT. (UC DC)

**Remarks** : This new species resembles *A. kaya* Narendran but can be separated by using the key given in this work.

**8. *Aprostocetus ashotus* Narendran sp. nov.**  
(Figs. 41-42)

**Holotype** : *Female* : Length 1.54mm. Dark metallic green with the following parts as follows : antenna dark brown with scape and pedicellus pale yellow; eye reddish brown; ocelli pale reflecting yellow; tegula and upper part of mesopleuron pale brownish yellow; legs yellow with basodorsal part of hindcoxa brown with slight metallic reflections; pretarsi brown; sternites pale brown; ovipositor brown; wings hyaline with veins pale brown, pilosity pale yellow; setae on mesoscutum and scutellum pale yellow.

*Head* : Partly collapsing; lower margin of clypeus bidentate; mandible tridentate; POL 2.94x OOL; OOL 0.85x OD; eye bare, 1.1x as long as broad. 2.5x as long as MS; MS straight. Antennal formula 11334. Scape not quite reaching level of vertex, little shorter than eye length in profile; pedicellus plus flagellum 1.9x as long as width of mesosoma; antennal segments as in figure 41.

*Mesosoma* : 1.42x as long as wide; midlobe of mesoscutum 2x as long as its posterior width, as long as its anterior width; surface weakly reticulate; ML faint; mesoscutum with 2 adnotaular setae on either side; scutellum 1.71x as broad as long; space between SMG 1.4x as long as broad; posterior pair of scutellar setae stronger and longer than anterior pair, SMG little nearer to SLG than to each other; dorsellum distinctly visible in dorsal view, half as long as median length of propodeum; propodeum 6x as broad as its median length, with a short median carina; rim of spiracle partly covered by callus, separated from metanotum by its own diameter; callus with 2 setae, surface weakly reticulate, mostly smooth; spur of midtibia 0.57x length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4x as long as broad. forewing 2.48x as long as broad; CC shorter than MV; SMV with 2 stout dorsal setae; MV 5x as long as STV; marginal fringe 0.75x length of STV; speculum closed behind by cubital line of setae.

*Gaster* : (Fig. 42) Sessile, 1.66x as long as mesosoma; 1.15x as long as combined length of head and mesosoma in side view; 11.5x as long as dorsal visible part of ovipositor sheath; tergites shriveled, moderately reticulate; hypopygium reaching middle of gaster; one cercal seta longer than others and sinuate.

*Male* : Similar to female except for the following differences : antennal formula 11343, adnotaular setae 4 on each side.

*Host* : Unknown.

*Holotype* : Female, India : Karnataka, Nagarhole (12°1' N 76°10' E), 16.viii.2002, Coll. P. A. Sinu (ZSIC).

*Paratypes* : 4 Females & 1 Male, India : Karnataka, Nagarhole (12°1' N 76°10' E), 26.vii.2002, Coll. P. A. Sinu.

*Remarks* : This new species belong to a group having pedicel shorter than F2. It can be distinguished by a combination of characters given in the key of this work.

### 9. *Aprostocetus asthenogmus* (Waterston)

1915a. *Tetrastichodes asthenogmus* Waterston : 340. Female. Sri Lanka : Lectotype (BMNH), designated by Bouček (1979 : 96), transferred to *Aprostocetus* by Graham (1987 : 91).

1917. *Tetrastichus metalliferus* Masi, : 220. Female. Lectotype, Seychelles : Mahe (H. Scott) (BMNH) Graham (1987) synonymized.

1979. *Tetrastichus asthenogmus* (Waterston) Bouček, : 96.

*Redescription* : Length 1.5mm. Head a little broader than deep. Eyes in front view

rather narrow and wide apart, the intervening space  $2 \times$  OD. Funicular segments cylindrical, decreasing in length and almost exactly in the ratio  $5 : 4 : 3$ , but of equal width, F1 about  $2.5 \times$  as long as broad; clava 3 segmented; first claval segment slightly shorter than F3. Forewings over  $2 \times$  as long as broad; long and narrow, evenly ciliated, fringe short. SMV : MV : STV =  $3 : 5 : 1$ ; SMV with 4 bristles and MV with 13.

*Mesosoma* : Mesonotum considerably longer than broad; notauli wide apart; midlobe with 25-30 short hairs, of which pair at sides of apex are stronger; scutellum oblong quadrate. The reticulation is comparatively even, all the cells being drawn out and pointed. The scutellum, though densely reticulate like rest of mesosoma is comparatively smooth, the pattern on lateral lobes being extremely finely drawn out. Propodeum more than  $2 \times$  as broad as long, sides nearly parallel; edge between pleura and sternum defined, smooth and very flat; central keel short and not distinct. Spiracle oval, as far from centre as length of segment. Below the spiracle are 3 hairs on metapleurae. Posterior edge of propodeum considerably excavated in middle to receive abdomen.

*Gaster* : Sessile, brown, slightly shining, petiole minute; tergites subequal in length; medially smooth and faintly reticulate on the overlapping sides.

*Type locality* : Sri Lanka

*Distribution* : Sri Lanka, Seychelles.

*Host* : Eggs of unidentified cockroach.

*Remarks* : The above diagnosis is based on the original description by Waterston (1915).

#### 10. *Aprostocetus atomelli* (Khan) comb. nov.

1982. *Tetrastichus atomelli* Khan, : 79(2) : 375-378. F. India (PUA).

*Diagnosis : Female* : Length 1.15mm. Posterior scutellar seta  $3.75 \times$  as long as posteriormost adnotaular seta of mesoscutum,  $2.5 \times$  as long as median length of SMG.

*Remarks* : Absence of paraspiracular carina (as seen in the figure 6 of Khan 1982) and SMV with 5 dorsal setae indicates this species belongs to *Aprostocetus* Westwood.

*Type locality* : India : Uttar Pradesh, Garhwal (PUA).

*Host* : *Tropicomyia atomella* (Malloch).

#### 11. *Aprostocetus bangaloricus* Narendran (in Hayat *et al.*)

2003. *Aprostocetus bangaloricus* Narendran, (in Hayat *et al.*) 323-324. Female. India. (ZSIK)

*Redescription : Female* : Length 1.22-1.25 mm. Mainly black with slight metallic refringence on head and mesosoma; flagellum brown; scape, pedicellus, femora, trochanters, tibiae, tarsi and tegulae pale brownish yellow; coxa dark brown; T1 and sides of T2 pale yellowish brown; wings hyaline, veins pale whitish yellow.

*Head* : As long as broad in anterior view, subequal in width to mesosoma in dorsal view; dorsally (if not collapsed) 2.76x its maximum length, nearly smooth; lateral ocellus slightly nearer to median ocellus than to eye; POL: OOL = 10 : 6; eye subcircular, asetose; gena not very convex; MS simple, not arcuate; toruli at level of ventral margin of eye; clypeal margin bilobate; antennal flagellum plus pedicellus subequal to width of head; scape slender, slightly shorter than eye, and not exceeding vertex, on dorsomesal surface vaguely reticulate; pedicellus 2x as long as wide, subequal to F1 segment, slightly shorter than F2; clava 2.4x length of F3; flagellum slightly widening towards apex, 2.5x as long as scape, with 2 anelli, first very small; clava apparently 2 segmented and with a pointed apex; spicula not very distinct.

*Mesosoma* : 1.5x as long as broad, dorsally with silky gloss due to microscopic and superficial longitudinal reticulations; median lobe of mesoscutum with complete ML and with 4 short adnotaular setae on each side; scutellum 1.5x as broad as long, convex, with 2 pairs of bristles, anterior ones long and erect, slightly behind middle, posterior ones moved laterad; SMG hardly diverging forward, median area 1.5x as long as broad; SLG slightly converging forward, not carinate on outside, well visible dorsally; dorsellum 4x as broad as long. Propodeum medially distinctly longer than dorsellum and with a broad median carina; submedian area reticulate; plical carina indistinct or absent; spiracle round, separated by its own diameter from metanotum, spiracular rim wholly exposed, with one bristle on either side near spiracle. Hindcoxa on dorso-lateral surface shiny. Forewing with relative lengths of CC = 27; MV = 41; STV = 13; PMV indistinct. SMV with 4 dorsal bristles.

*Male* : Length 0.9 -1 mm. darkish colour more extensive including base of gaster than in female; antenna longer than that of female; scape with rather short ventral carina situated in distal half; all funicular segments and clava with long, sparse hairs; F1 subequal (or a trifle shorter) to pedicellus; claval apex with a narrow, short spicula.

*Type locality* : India: Karnataka, Bangalore.

*Host* : Lac insect on sandal wood.

*Material examined* : Type only.

## 12. *Aprostocetus benazeer* Narendran sp. nov. (Fig. 20-22)

*Holotype* : *Female* : Length 1.63mm. Flagellum brownish black; pedicellus and scape yellow, head black, eyes reddish brown, ocelli pale reflecting yellow; pronotum yellow with median region and posterior part near scapula black; pronotal spiracle pale yellow; mesoscutum and scapula yellow; axilla yellow with brown patch at apex; scutellum black with pale brownish yellow on sides; prepectus and tegula yellow; mesopleuron and metapleuron black with upper part of mesopleuron pale brownish yellow; propodeum black; legs yellow with basal upper part near propodeum of hindcoxa slightly brown and slight brownish tinge on outer and middle femora; all pretarsi dark brown; gaster black with base yellow; wings hyaline with veins pale brown, pilosity of wings pale brown.

**Head** : Slightly collapsing from posterior side; width in anterior view 1.06x as broad as long; lower clypeal margin entire; mandible tridentate; POL 1.25x OOL; OOL 1.6x OD; eyes bare, 1.22x as long as its width in side view; 2.75x as long as MS in side view; MS straight. Antennal formula 11433; scape a little shorter than eye length (9.75: 11); pedicellus plus flagellum 1.58x width of mesosoma; antennal segments as in Fig. 20.

**Mesosoma** : (Fig. 21) 1.32x as long as wide; midlobe of mesoscutum 2.19x as long as its posterior width, about as long as its anterior width, surface reticulate; ML absent; mesoscutum with 4 adnotaular rows of setae on either side; scutellum 1.1x as broad as long; space between SMG 1.8x as long as broad, SMG little nearer to SLG than to each other. Dorsellum clearly visible in dorsal view; propodeum with median length 1.4x median length of dorsellum, width 6x as broad as long; median carina distinct and slightly raised; spiracle partly covered by callus, separated from posterior margin of metanotum by less than half its diameter; submedian area reticulate moderately, callus with 2-3 setae on each side. Spur of midtibia 0.75x length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4.16 x as long as long as broad. Forewing 1.85x as long as broad; CC shorter than MV; SMV with 5 dorsal setae; MV 4.8x as long as STV; marginal fringe 0.4x length of STV; speculum extremely small, closed behind by cubital line of setae.

**Gaster** : (Fig. 22) Sessile, 1.66x as long as mesosoma, 1.15x as long as combined length of head and mesosoma in side view; 14.66x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate and partly shriveled on dorsum; hypopygium not reaching middle of gaster, one of the cercal setae longer than others and sinuate.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, India: Kerala, Palghat Dt., Pattambi (10° 49' N 76° 12' E), 12.viii.2003, Coll. T.C. Narendran & Party (ZSIC).

**Paratypes** : 20 Females, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 17.v.2003, 8.vii.2003, 10.vi.2003, Feb 1987, 29.x.1986, 29.ix.1988, 20.vii.2001, 20.v.2003, 29.viii.2002, 29.x.2002, 17.v.2003, 2.xii.2001, 12.v.2001, Coll. T.C. Narendran & Party; 4 Females, India: Kerala, Malappuram Dt., Calicut University Campus (11°7' N 75° 5' E), 30.viii.1988, 17.x.1988, 18.viii.1988, Coll. Surekha; 7 Females, India: Kerala, Malappuram Dt., Manjeri (11°7' N 76°7' E), 17.viii.2003, 13.ix.2003, 30.ix.2003, 4.x.2003, 17.viii.2003, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Palghat Dt., Koottanad (10°49' N 76°11' E), 11.viii.2003, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Palghat Dt., Pattambi (10°49' N 76°12' E), 12.viii.2003, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Palghat Dt., Valloor, Pattambi (10°49' N 76°12' E), 13.viii.2003, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Thrissur Dt., Vellanikkara (10° 31' N 76° 13' E), 1.vii.2003, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Idukki Dt., Cheruthoni (9°51' N 76°58' E), 10.i.2004, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Thrissur Dt., Pechi (10° 31' N 76° 13' E), 2.vii.2003, Coll. T.C. Narendran & Party;

2 Females, India: Kerala, Kannur Dt., Vannathimala (11°51' N 75° 41' E), 10.v.2005, Coll. Rajmohana; 1 Female, India: Kerala, Kozhikode Dt., Mavur (11° 16' N 75° 55' E), 19.v.1988, Coll. T.C. Narendran & Party; 1 Female, India: Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 26.ix. 1979, Coll. M. Verma; 1 Female, India: Kerala, Thiruvananthapuram, Palode (8° 42' N 77° 2' E), 10.xii.2004, Coll. T.C. Narendran & Party; 1 Female, India: Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 26.ix. 1979, Coll. Hayat and S.I. Kazmi.

*Remarks* : This species comes near *A. ricosus* in having SMV with 5 dorsal setae but differs from *A. ricosus* by the characters mentioned in couplet 74 of the key given in this work.

### 13. *Aprostocetus bouceki* Khan, Agnihotri & Sushil

2005. *Aprostocetus bouceki* Khan, Agnihotri & Sushil, : 144. F. India (?IARI).

*Diagnosis* : *Female*: Length 1.34 mm. Enclosed space between SMG 1.4x as long as broad; forewing a little more than 2.4x as long as wide (excluding marginal fringe).

*Remarks* : This species probably belongs to the genus *Quadrastichus* Girault.

*Type locality* : India : Uttaranchal, Lalkuan (Nainital).

*Host* : ex gall maker, *Phylloplecta hirsuta* on Arjun leaves.

### 14. *Aprostocetus calasmus* Narendran sp. nov

(Fig. 51)

*Holotype* : *Female* : Length 1.6 mm. Dark metallic green; eye grey; ocelli pale reflecting yellow; flagellum pale brown; pedicellus and scape pale yellow; tegula pale yellow; legs yellow with coxae pale brown; pretarsi pale brown; wings hyaline, veins pale whitish hyaline; pilosity of wings brown; mesosoma pale yellow.

*Head* : Partly collapsing; lower margin of clypeus bilobed; mandible bidentate; POL 3x OOL; OOL as long as OD; eye bare, 1.4x as long as broad in side view, 2.8x as long as MS; MS straight; antennal formula 11433; scape not exceeding level of vertex, distinctly shorter than eye length (10 : 14); pedicellus plus flagellum 2.18x as long as width of mesosoma; antennal segments as in figure 51.

*Mesosoma* : 1.6x as long as wide; midlobe of mesoscutum 1.5x as long as its posterior width, a little shorter than its anterior width (13 : 14); surface mostly smooth and shiny with slight reticulations; ML present but faint; mesoscutum with 3 adnotaular setae on either side; scutellum 1.2x as broad as long; space between SMG 2.2x as long as broad; SMG a little nearer to SLG than to each other; dorsellum clearly visible in dorsal view, as long as median length of propodeum; propodeum 5x as broad as its median length; median carina distinct; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by half its diameter; surface weakly reticulate; callus with 2 setae

on each side; spur of midtibia 0.7x as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4.5x as long as broad; forewing 2.6x as long as broad; CC shorter than MV; SMV with 2 dorsal setae ; MV 4.5x as long as STV; marginal fringe 0.7x as long as STV; speculum narrow and closed behind by cubital line of setae.

*Gaster* : Sessile; 1.73x as long as mesosoma; 1.3x as long as combined length of head and mesosoma in side view; 16x as long as dorsal visible part of ovipositor sheath; tergites moderately reticulate; hypopygium not reaching middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Kozhikode Dt., Thiruvannur (11° 16' N 75° 47' E), 23.xi.1996, Coll. R. Mohana (ZSIC).

*Paratypes* : 5 Females India: Kerala, Kozhikode Dt., Thiruvannur (11° 16' N 75° 47' E), 23.xi.1996, 25.ii.1997, Coll. R. Mohana; Female, India: Uttaranchal, Dehra Dun, FRI area (30° 18' N 78° 3' E), 8.iv.1978, Coll. M. Verma.

#### 15. *Aprostocetus calius* Narendran sp. nov.

(Figs. 55)

*Holotype* : *Female* : Length 1.64 mm. Body black; gaster with basodorsal part partly brown; eye blackish brown; ocelli pale reflecting yellow; antenna brown with scape and pedicellus yellow; coxae and femora dark brown with apices paler; tibiae and tarsal segments pale yellow; pretarsi dark brown; wings hyaline, veins whitish hyaline; pilosity of wings pale brown; setae on mesoscutum and scutellum pale yellow.

*Head* : Partly collapsed; lower margin of clypeus bilobed; mandible bidentate; POL 2x OOL; OOL as long as OD; eye bare, 1.43x as long as broad in side view; 2.5x as long as MS; MS straight. Antennal formula 11433; scape not exceeding level of vertex; distinctly shorter than eye length (12 : 17); pedicellus plus flagellum 1.2x as long as width of mesosoma; antennal segments as in figure 55.

*Mesosoma* : 1.3x as long as wide; midlobe of mesoscutum 2.1x as long as its posterior width; as long as its anterior width; surface with strong longitudinal reticulations; ML distinct and complete; mesoscutum with 3 rows of setae, first row of 7-8 adnotaular setae, second row of 3-4 and third row of 1-2 setae on each side; scutellum about 2x as broad as long; space between SMG 1.7x as long as broad; SMG little nearer to SLG than to each other; dorsellum not visible in dorsal view, as long as median length of median carina of propodeum; propodeum 11x as broad as its median length, median carina very short; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by less than half its diameter; surface weakly reticulate; callus with 3 setae on each side; spur of midtibia 0.72x as long as length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 3.25x as long as broad; forewing 2.23x as long as broad; CC shorter than MV;

SMV with 5 dorsal setae ; MV 4.2x as long as STV; marginal fringe 0.33x as long as STV; speculum large and open below.

*Gaster* : Sessile; 1.73x as long as mesosoma; 1.53x as long as combined length of head and mesosoma in side view; 30x as long as dorsal visible part of ovipositor sheath; tergites moderately reticulate; hypopygium little exceeding middle of gaster; one cercal seta longer than others on either side and sinuate.

*Male* : Unknown.

*Host* : Emerged from leaf gall of *Calycopteris floribunda* (Roxb.) Lamark.

*Holotype* : Female, India : Kerala, Malappuarm Dt., Calicut University Campus (11° 7' N 75° 5' E), 12.v.2004, Coll. T. C. Narendran & Party (ZSIC).

*Paratypes* : 37 Females, India : Kerala, Calicut University Campus (11° 7' N 75° 5' E), 11.x.1986, 28.xi.1986, 30.x.1986, 23.vii.1987, 10.viii.1988, 24.iv.1988, 16.iv.1988, iv.1989, 4.vii.2001, 10.iv.2003, 12.v.2004, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode Dt., Pookad (11° 23' N 75° 44' E), 9.xii.2003, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuarm Dt., Calicut University Campus (11° 7' N 75° 5' E), 21.i.2003, Coll. K. Fousi; 2 Females, India : Kerala, Calicut University Campus (11° 7' N 75° 5' E), 6.v.2004, Coll. M. Vijayalakshmi.

*Remarks* : This new species resembles *A. dhireni* (Saraswat) in general appearance but differs in having characters mentioned in the couplet 59 of the key given in this work.

#### 16. *Aprostocetus calycopteridis* Narendran sp. nov.

(Fig. 154)

*Holotype* : *Female* : Length 1.6mm. Black with following parts as follows: antennal flagellum dark brown (excluding anelli); anelli, pedicellus and scape pale yellow; all coxae concolorous with mesosoma; all femora dark brown with pale apices; trochanters, tibiae and tarsi pale yellow; pretarsi black. Wings hyaline, veins pale brown; pilosity pale yellow.

*Head* : Slightly collapsing; POL 2.8x OOL; OOL subequal to OD, lower clypeal margin bidentate, mandibles bidentate; eye bare, 1.31x as long as broad in side view, 1.9x as long as malar space; MS straight; antennal formula 11433; scape reaching front ocellus but not reaching level of vertex, distinctly shorter than eye in profile, a little shorter than clava (23 : 24); pedicellus shorter than F1 (12 : 13); F1 a little longer than F2 (13 : 12); F3 longer than F1 (13.5 : 13); clava shorter than F3 plus F2 (24 : 25.5); apical spicula and seta absent. Antennal segments as in Fig. 154.

*Mesosoma* : With distinct well marked longitudinal reticulations and slightly raised margins, with 6-7 adnotaular setae on each side; ML present, deeply grooved; scutellum a little wider than long (13: 9), enclosed space of SMG 1.8x as long as wide; dorsellum not visible in dorsal view, as long as median length of propodeum, propodeum with a short

broad median carina; propodeal spiracle almost touching metanotum, rim not fully exposed; callus with 2 distinct stout setae, surface reticulate; hindcoxa reticulate dorsally; hind femur 3.86x as long as broad; midtibial spur a little shorter than midmetatarsus (4 : 5). Forewing 1.46x as long as wide (excluding fringe); relative length of forewing: CC and veins: CC = 20; SMV = 18; MV = 32; STV = 7; length of marginal fringe 0.43x length of STV; speculum open behind, extends anteriorly below MV.

*Gaster* : Sessile, longer than head plus mesosoma (76 : 45); each cercus with a long and sinuate seta; hypopygium exceeding middle level of gaster.

*Male* : Length 1-1.1mm. Similar to female except: antennal formula 11443, F1 shortest, all funicular segments with relatively very long hairs. Gaster often shorter than mesosoma.

*Host* : Emerged from leaf galls of *Calycopteris floribunda* (Roxb.) Lamark (Combretaceae).

*Holotype* : Female, India, Kerala, Malappuram Dt., Nilambur, Chaliyarmukku (11° 16' N 76° 14' E), ex. *Calycopteris* gall, 17. xi. 2005, coll. Shibu, M. (ZSIC).

*Paratypes* : 2 Females, and 6 Males. Collection data same as that of holotype.

*Etymology* : Named after the plant *Calycopteris* from which the species was collected.

#### 17. *Aprostocetus cauperdatus* Narendran sp. nov.

(Fig. 65-67)

*Holotype : Female* : Length 3.1 mm. Dark metallic green with following parts as follows: eye pinkish brown, ocelli pale reflecting yellow, antenna brown with pedicellus and scape yellow; tegula pale brown; legs with coxae concolorous with body, remaining segments yellow with dark brown pretarsi; wings hyaline with veins and pilosity pale brownish yellow.

*Head* : Partly collapsing; width subequal to length between vertex and lower clypeal margin in anterior view, width in dorsal view 4.33x as broad as long; POL 3x OOL; OOL subequal to OD; eye bare, 1.56x as long as its width in side view, 2.33x as long as MS in side view; MS slightly curved, gena swollen behind MS. Antennal formula 11233; scape about reaching level of vertex, slightly shorter than eye in profile; pedicellus plus flagellum 1.2x as long as width of mesosoma; pedicellus much longer than half length of F1 (Pedicellus =12; F1=15); clava shorter than scape. Antennal segments as in Fig. 65

*Mesosoma* : 1.3x as long as wide; midlobe of mesoscutum 1.5x as long as its posterior width; 0.6x as long as its anterior width; surface with strong longitudinal reticulations; scutellum 1.43x as wide as its length; enclosed space between SMG 1.4x as long as wide; dorsellum distinctly visible in dorsal view, slightly longer than propodeum in median length, propodeum (Fig. 67) without a median carina; rim of spiracle exposed, touching posterior margin of metanotum; a deep groove running from spiracle to posterior side (Fig. 67); surface finely reticulate, callus with 2 setae; spur of midtibia 0.8x length of

metatarsus; hind femur 4.8x as long as broad. forewing 2.32x as long as broad; CC distinctly shorter than MV; SMV with one dorsal seta; MV 3.4x as long as STV; marginal fringe 0.6x as long as STV; speculum present, closed behind by cubital line of setae.

*Gaster* : (Fig. 66) Sessile, length of gaster (excluding ovipositor sheath) 2.13x as long as combined length of head plus mesosoma; ovipositor sheath about 0.7x as long as body, hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Collected from lemon grass.

*Holotype* : Female, India: Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T. C. Narendran & Party (ZSIC).

*Paratypes* : 21 Females, India: Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T. C. Narendran & Party; 2 Females, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 10.iii.1983, 24.iv.1989, Coll. Surekha; 1 Female, India: Kerala, Malappuram Dt., Nilambur (11°16' N 76°13' E), 30.i.2003, Coll. T. C. Narendran & Party.

*Remarks* : This species resembles *Aprostocetus percaudatus* (Silvestri) in general appearance of having a long ovipositor sheath. However, *A. percaudatus* differs from this new species in having 1) Antenna with 4 anelli (in *A. cauperdatus* 2 anelli); 2) pedicellus plus flagellum 2-2.15x width of mesoscutum (in *A. cauperdatus* pedicellus plus flagellum 1.2x width of mesoscutum); 3) pedicellus about or hardly more than half length of F1 (in *A. cauperdatus* pedicellus 0.9x as long as F1); 4) propodeum with a median carina (in *A. cauperdatus* without a median carina); 5) SMV with 3-5 dorsal setae (in *A. cauperdatus* SMV with a single dorsal seta); 6) speculum extending below MV as a narrow strip (in *A. cauperdatus* speculum not extending as a narrow strip below MV); 7) MV about 6x as long as STV (in *A. cauperdatus* 3.4x as long as STV).

*Etymology* : The species name is an anagram of *A. percaudatus* (Silvestri)

### 18. *Aprostocetus coimbatorensis* (Rohwer)

1921. *Tetrastichus coimbatorensis* Rohwer, 7 : 133. Female. India (USNM).

2003. *Aprostocetus coimbatorensis* (Rohwer), Noyes, J. S. [www.nhm.ac.uk/entomology/Chalcidoids](http://www.nhm.ac.uk/entomology/Chalcidoids).

*Diagnosis* : *Female* : Length 1.3mm. Besides the characters given in the key above the following may be of use: Head without distinct sculpture; mesoscutum shiny, without ML, faintly reticulate; SMG slightly converging posteriorly; propodeum short, shining, without distinct sculpture, median carina weak.

*Type locality* : India: Tamil Nadu, Coimbatore.

*Host* : Gall fly of *Sorghum vulgare*.

*Remarks* : The diagnosis given above is based on available published information.

19. *Aprostocetus dala* Narendran sp. nov.  
(Fig. 15-17)

*Holotype : Female* : Length 2.14 mm. Body yellow with the following markings: POL area black, posterior part of pronotum, anterior median part of mesoscutum, a spot on the anterior part of scapula, a spot on anterior part of axilla and scutellum (except on the extreme sides of scutellum behind SLG) blackish brown with metallic green reflections; dorsellum brown with slight metallic green reflections; propodeum with submedian area pale brown and median carina black, gaster with blackish brown markings and with slight metallic green reflections (Fig. 17); antenna brown with pedicellus and scape paler; eyes blackish grey; ocelli pale reflecting yellow; wings hyaline with veins pale brownish yellow, pilosity of wing brown; legs including coxae yellow, pretarsi blackish brown; ovipositor sheath black.

*Head* : Partly collapsed; clypeal margin slightly sinuate medially; POL 3.5x OOL; OOL as long as OD; eye bare, 1.5x as long as width in side view; 2.2x as long as MS in side view; MS straight. Antennal formula 11433; scape little shorter than eye length (7 : 9); pedicellus plus flagellum about 2x as long as width of mesosoma; antennal segments as in figure 15.

*Mesosoma* : (Fig. 16) Median length of mesosoma 1.47x its width; midlobe of mesoscutum about 2.34x as long as its posterior width, almost as long as its anterior width, surface with weak longitudinal striate-reticulations; ML faint but distinct; mesoscutum with 3 adnotaular setae on each side; scutellum a little wider than long (26 : 23); space between SMG 2.3x as long as its width; SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, about 2x as long as median length of propodeum; propodeum 15x as broad as its median length (30 : 2), with short median carina, spiracle partly covered by callus, separated from posterior margin of metanotum by less than half its diameter; submedian area reticulate moderately; callus with 2-3 setae on each side. Spur of midtibia 0.66x length of metatarsus, fourth tarsomere shorter than metatarsus; hind femur 1.07x as long as broad. Forewing 2.57x as long as broad; CC shorter than MV; SMV with 2 dorsal setae; MV 3.73x as long as STV, marginal fringe 0.3x length of STV; speculum present, closed behind by cubital line of setae.

*Gaster* : (Fig. 17) Sessile, 2x as long as mesosoma; 1.5x as long as combined length of head and mesosoma in side view; 8.63x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate and partly shriveled on dorsal side; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown

*Holotype* : Female, India : Kerala, Idukki Dt., Appapara (9° 58' N 77° 9' E), 13.xii.1988, Coll. T.C. Narendran & Party (ZSIC).

*Paratypes* : 1 Female, India: Kerala, Palghat Dt., Malampuzha (10° 53' N 76° 46' E), June

1986, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Thiruvananthapuram Dt., Palode (8° 42' N 77° 2' E), 10.x.2000, Coll. Rajmohana; 1 Female, India: Uttaranchal, Dehra Dun (30° 18' N 78° 3' E), 19.v.1978, Coll. M. Verma.

*Remarks* : This species comes near *A. vimana* in general features but can be separated by the key given in this work.

20. *Aprostocetus decatus* Narendran sp. nov.  
(Fig. 31-33)

*Holotype* : *Female* : Length 1.11 mm. Brownish yellow; eyes pale reddish brown; ocelli pale reflecting yellow; antenna and legs pale yellow with base of hindcoxa slightly brownish; basal area of gaster pale yellow; wings hyaline, veins pale yellowish brown, pilosity of wing pale yellowish brown; setae on mesoscutum pale yellow; setae on scutellum brown.

*Head* : Not collapsing, 1.13x as broad as long in anterior view; POL 2x OOL; OOL 1.5x OD; lower margin of clypeus slightly bilobed; mandible tridentate with inner tooth smaller; eye sparsely pubescent; 1.21x as long as broad in side view; 2.83x as long as MS in side view; MS straight. Antennal formula 11233; scape little shorter than eye (10: 12); pedicellus plus flagellum 1.76x as long as width of mesoscutum; antennal segments as in figure 31.

*Mesosoma* : 1.52x as long as broad; midlobe of mesoscutum 1.66x as long as its posterior width, as long as its anterior width; surface smooth and shiny with weak reticulations; ML distinct on posterior half, faint on anterior half; mesoscutum with 3 adnotaular setae on either side; scutellum 1.89x as broad as long; space between SMG 2.1x as long as broad; SMG nearer to SLG than to each other. Dorsellum clearly visible from dorsal above, about as long as median length of propodeum; width of propodeum 8x its median length; median carina distinct; spiracle rim exposed, almost touching posterior margin of metanotum; submedian area moderately reticulate; callus with 3 setae on either side, one anteriorly followed by one slightly on outer side and posteriorly, one slightly on inner side; spur of midtibia 0.83x length of metatarsus, fourth tarsal segment a trifle shorter than metatarsus; hind femur 4x as long as broad. Forewing (Fig. 33) 2.26x as long as broad; CC a little longer than MV; SMV with 2 dorsal setae; MV 3.5x as long as STV; marginal fringe 0.66x length of STV; speculum closed behind by cubital line of setae.

*Gaster* : (Fig. 32) Sessile, 1.12x as long as mesosoma; 0.74x as long as combined length of head and mesosoma in side view; 14.5x as long as dorsal visible part of ovipositor sheath; tergites moderately reticulate and shriveled, hypopygium reaching beyond middle of gaster, two cercal setae subequal in length on each side.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Karnataka, M. M. Hills, viii.2001, P. A. Sinu.

*Remarks* : This species comes near *A. karicus* Narendran in general body colour but differs from *karicus* mainly in having antenna with 2 anelli and gaster 1.12x as long as mesosoma.

21. *Aprostocetus dellus* Narendran sp. nov.  
(Figs. 60)

*Holotype* : *Female* : Length 1.11mm. Dark brown, head brownish yellow; eyes brick red; ocelli red; antenna brown with scape and pedicellus pale; legs yellow with fore and hindcoxae pale brown; wings hyaline, veins pale brown, pilosity of wings brown, setae on mesoscutum pale yellow and on scutellum pale brown.

*Head* : Width in anterior view 1.11x as broad as long; lower margin of clypeus bidentate, mandibles bidentate; POL 2.7x OOL; OOL as long as OD; eye bare, 1.33x as long as its width, 2x as long as MS; MS straight; antennal formula 11433; scape not reaching front ocellus, shorter than eye length (10: 12); pedicellus plus flagellum as long as width of mesosoma; antennal segments as in figure 60.

*Mesosoma* : 1.13x as long as wide; midlobe of mesoscutum 1.8x as long as its posterior width, a little shorter than its anterior width (18: 20), surface longitudinally and moderately reticulate; ML present, mesoscutum with 5 adnotaular setae on either side; scutellum 1.8x as wide as long, enclosed space between SMG 1.7x as long as its width; SMG little nearer to SLG than to each other; dorsellum not visible in dorsal view, dorsellum visible only as a narrow strip in posterior view; propodeum 10.5x its median length, median carina broad and distinct, rim of spiracle partly covered by callus, touching the posterior margin of metanotum, surface faintly reticulate; callus with 2 setae; spur of midtibia 0.8x length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 5.75x as long as broad. Forewing 2.21x as long as broad; CC shorter than MV; SMV with 5 dorsal setae; MV 3.8x as long as STV; marginal fringe 0.6x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile, 1.26x as long as mesosoma, and a little longer than combined length of head and mesosoma in side view (24: 23); 17.5x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate, mostly smooth; hypopygium exceeding middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India: Kerala, Western Ghats, Wayanad Dt., Thariyod, 22.ii.1998, Coll. T. C. Narendran & Party.

*Paratypes* : 1 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 28.viii.1989, Coll. Surekha; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), July 1994, Coll. M. Hayat & S. I. Kazmi; 1 Female, India : Tamil Nadu, Mahabalipuram, 16.ii.1993, Coll. S. I. Kazmi; 1 Female, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 1978, Coll. T. C. Narendran & Party.

*Remarks* : *A. dellus* comes near *A. taruna* Narendran in general features but differs from *taruna* in having pedicellus plus flagellum as long as width of mesosoma, mesoscutum with 5 adnotaular setae on each side, gaster above 1.25x as long as mesosoma and MV 3.8x as long as STV.

## 22. *Aprostocetus denticularis* Ranjit, Misra, Mohendro & Prasad

2003. *Aprostocetus denticularis* Ranjit, Misra, Mohendro & Prasad. 24 (1&2) : 26-29. Female. India. AMSL (?).

The description and figures do not agree. Mesosoma dorsal view is probably drawn wrongly. The description is misleading and also inadequate to identify the species. The type depository is not clearly indicated except in abbreviation AMSL (expansion not provided). This may be the Life Science Department of Manipur University.

*Type locality* : India: Manipur, Leingangching (870m).

*Host* : ex-twig gall on *Rubus calycinus* and *Kanglatongbi*.

## 23. *Aprostocetus dhireni* (Saraswat) comb. nov.

1978. *Tetrastichus dhireni* Saraswat, 5 : 99. Female. India. (ZSIC).

*Redescription* : *Female* : Length 2.22 mm. Body dark brown with metallic blue-green reflections. Head concolorous with body; eyes and ocelli red, except for yellow scape and pedicellus, antenna brown. Gaster concolorous with mesosoma. Except for dark brown coxa, all legs pale yellow. Wings hyaline, veins brownish.

*Head* : In front view 1.11x as wide as long, distinctly concave in middle, face finely longitudinally reticulate with scattered setigerous punctae; lower clypeal margin in the middle with a pair of conspicuous, widely separated tooth-like projections; OOL 2.25x OD; front ocellar space about equal to OD, POL 4.50x OD; eyes finely pubescent, eye length to head length 59: 100. Antenna to body 52: 100; antennal formula 11433; antennal sockets very close to lower orbital border; scape 5x longer than wide; pedicellus 2.80x longer than wide, 0.46x of scape; anelli as wide as funicle, second anellus minute; F1 longest, 3.27x longer than wide and 1.28x pedicellus; F2 2.16x longer than wide and 0.72x of the F1; F3 1.57x longer than wide and 0.84x of the F2; clava stouter than funicle, distinctly 3 segmented, 2.37x longer than wide, slightly less than 1.75x preceding funicular segments combined, terminal segment with a conspicuous slender spicule, spicule about 0.75x of the preceding claval segment, first segment of clava nearly as long as wide and 0.63x of the preceding segment, second 1.33x wider than long and 0.85x of the first, third shortly conical, only slightly wider than long and 0.70x of the second.

*Mesosoma* : Pronotum, metanotum and propodeum finely reticulate; mesoscutum and scutellum finely, longitudinally reticulate; pronotum moderately, densely with setigerous punctae; mesoscutum with 17 bristles, scattered between the ML and notauli, ML complete;

propodeum with strongly developed median carina, paraspircular carinae absent, 7 scattered bristles near the lateral margin; spiracle touching the lateral margin and separated from the anterior margin by about 0.33x of its own diameter; forewing length to width 100 : 45; SMV with 5 dorsal setae directed towards front margin; MV with 13 setae, stump of PMV with a single long seta; SMV : MV : STV = 88 : 100 : 24; hind wing to forewing length = 87 : 100; forecoxa about 2x as long as wide; femur 4.60x longer than wide, 1.53x coxa; tibia very slightly longer than femur, about 9.60x longer than wide; tarsus 0.75x of third equal to metatarsus, fourth equal to the second; middle coxa 1.33x longer than wide; femur 5.77x longer than wide, slightly longer than fore tibia, 2.60x coxa; tibia long, slender, about 13.60x longer than wide; 1.30x femur, tibial spur 0.22x of tibia and 0.75x of metatarsus; tarsus subequal to femur, about 0.80x of tibia, metatarsus about 0.30x of tibia and 0.37x of tarsus; second segment 0.70x of metatarsus, third 0.70x of the second and 0.50x of metatarsus, fourth equal to the third, third and fourth combined equal to metatarsus; hindcoxa 1.80x longer than wide; femur subequal to tarsus, 4x longer than wide, 1.60x coxa; tibia long, widened apically, subequal to middle tibia, about 9x longer than wide, 1.20x femur, tibial spur 0.14x of tibia and 0.50x of metatarsus; tarsus subequal to middle tarsus, 0.80x of tibia, metatarsus 0.28x of tibia and 0.35x of tarsus, second segment 0.75x of metatarsus, third 0.66x of the second, 0.50x of the second and 0.50x of metatarsus, fourth only slightly longer than third.

*Gaster* : With fine, reticulate microsculpture, 0.50x of body; ovipositor only slightly exerted.

*Type locality* : India: West Bengal, Kolkatta.

*Distribution* : India: Kerala, Malappuram & Calicut Dts., West Bengal.

*Host* : Unknown.

*Material Examined* : 1 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 30. xi. 2001, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode Dt., Cheruvannur (11° 16' N 75° 47' E), 29.i.2002, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 14.ii.2004, coll. T. C. Narendran & Party.

*Remarks* : This species shows resemblances to *A. calius* Narendran but differs from it in having mesoscutum with scattered setae, body dark brown with metallic green reflections and gaster concolorous with mesosoma.

#### 24. *Aprostocetus diclus* Narendran sp. nov.

(Fig. 52)

*Holotype* : *Female* : Length 1.52mm. Black with slight metallic reflections; head yellowish brown; eyes brick red; ocelli brown with paler margin; antenna brown with scape and pedicellus paler; legs yellow with fore and hindcoxa pale brown; wings hyaline, with

slight brownish tinge; veins pale brown, pilosity of wing brown; setae on mesoscutum and scutellum pale yellowish brown.

*Head* : Width in anterior view subequal to its length; width in dorsal view 4.5x its maximum length; lower margin of clypeus bilobed; mandible tridentate; POL 2x OOL; OOL 1.33x OD; eye bare, as long as its width, 1.7x as long as MS; MS straight; antennal formula 11233; scape not reaching level of vertex, distinctly shorter than eye length (6: 7); pedicellus plus flagellum 1.12x as long as width of mesosoma; antennal segments as in figure 52.

*Mesosoma* : 1.24x as long as wide; midlobe of mesoscutum 1.92x as long as its posterior width, a little longer than its anterior width; surface with weak longitudinal reticulations; ML present but faint; mesoscutum with 2 rows of setae near each notauli, total 6 setae on either side; scutellum 1.42x as wide as long; enclosed space between SMG 1.5x as long as broad; SMG little nearer to SLG than to each other; dorsellum not visible in dorsal view, in posterior view median length of dorsellum one-third median length of propodeum; propodeum 5.3x as broad as its median length; median carina distinct; rim of spiracle partly covered by callus, almost touching the posterior margin of metanotum; surface weakly reticulate; callus with 2 setae on each side; spur of midtibia almost as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 3.71x as long as broad; forewing 2.3x as long as broad; CC shorter than MV; SMV with 4 dorsal setae ; MV 3x as long as STV; marginal fringe 0.63x as long as STV; speculum narrow and closed behind by cubital line of setae.

*Gaster* : Sessile; 1.1x as long as mesosoma; 0.88x as long as combined length of head and mesosoma in side view; 14.5x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate; hypopygium exceeding middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown

*Host* : Unknown.

*Holotype* : Female, India : Karnataka, Bangalore (12° 58' N 77° 35' E), 8.iii.1993, Coll. S. B. Zeya 7S. I. Kazmi.

*Paratypes* : 4Females India: Maharashtra, Buldana Dt., Lonar Crater Wild Life Sanctuary (19° 59' N 76° 31' E), North of Forest Rest House, 17.ii.2003, Coll. D. B. Bastawade & Party.

*Remarks* : *A. lasallei* Khan *et al.*, resembles this new species in having scape not shorter than clava and antenna with 2 anelli. However, *lasallei* differs from this new species by the characters mentioned in the key given in this work.

## 25. *Aprostocetus diplosidis* Crawford

1907. *Aprostocetus diplosidis* Crawford, : 15 : 177-183. Female. Louisiana, U. S. A. (USNM) examined.

1921. *Tetrastichus okawus* Rohwer, 7 : 128. Female. India (USNM) examined. Syn. nov.

**Redescription : Lectotype : Female :** Length 1.91 mm. Brown, without distinct metallic reflection; antenna pale yellowish brown with pedicellus yellow. Legs: coxae concolorous with mesosoma, femora brown with apices pale; tibia and tarsi pale yellow, pretarsus brown; wings hyaline, veins pale brownish yellow, pubescence pale white.

**Head :** (Collapsed) Eye height in profile subequal to MS; antennal formula 11133; antenna with pedicellus plus flagellum equal to or slightly greater than width of mesoscutum; pedicellus 2x as long as broad, a little longer than F1; F1 2.0-2.5x, F2 1.5-1.7x, F3 1.0-1.4x as long as broad, clava slightly broader than F3, 2.3-2.5x as long as broad, about as long as F2 plus F3.

**Mesosoma :** Midlobe of mesoscutum with fine longitudinal engraved reticulations, each side with 5 adnotaular setae on outer side and one on inner side; scutellum with reticulations as on that of mesoscutum, scutellar setal length equal to distance between SMG. Propodeum distinctly reticulate on submedian area; median length subequal to that of dorsellum, median carina not distinctly indicated, callus with only 2 setae; forewing not reaching tip of gaster, 2.25x as long as wide; speculum closed below; SMV with 4 dorsal setae; wing beyond speculum rather widely pilose. Hindcoxa weakly reticulate on dorsal side.

**Gaster :** 2.2x as long as head plus mesosoma, 6x as long as broad, very strongly acuminate. Last tergite a little more than 2x as long as broad; ovipositor sheath well exerted to a length nearly or quite equal to length of postcercal; hypopygium 0.42x length of gaster.

**Type locality :** (Lectotype) U. S. A. : Louisiana.

**Distribution :** India (Noyes, 2003. universalchalcidoidea. www. nhm. uk /entomology /chalcidoids).

**Host :** *Contarania sorghicola* (Coquebert) on Sorghum.

**Material examined :** Lectotype of *A. diplosidis* and *T. okawus*.

**Remarks :** The lectotype *okawus* is in poor condition and without head; however from the original description and the details of the type the synonymy is evident.

## 26. *Aprostocetus fasciatus* Ashmead

1894. *Tetrastichus fasciatus* Ashmead, 25 : 187. Male, Female West Indies : St. Vincent Lectotype Female (BMNH) (La Salle & Schauff, 1992).

2003. *Aprostocetus faciatus* (Ashmead), Noyes Universal chalcidoidea. www. nhm. uk /entomology / Chalcidoids.

1975. *Tetrastichus shencottensis* Saraswat, 4 : 24. Female, Male. (SEA?) syn. nov.

**Diagnosis : Female :** Length 2.56mm. Body non-metallic brown, eyes red; antennae except yellowish brown scape, dark brown; legs pale brown; wings hyaline, veins transparent or faintly yellowish; ovipositor tip black.

*Head* : In front view, length to width 79 : 100; smooth, finely longitudinally reticulate, with a few scattered shallow punctae on vertex and face; clypeal margin in the middle with a pair of tooth-like projections; OOL 2.5x OD; POL 3.25x OD; eyes very sparsely pubescent; mandibles tridentate, inner tooth truncate; antennal formula 11433; antennal sockets almost in the middle of frons; scape moderately long, equal to pedicellus, anelli and F1 combined, very slightly more than 4x as long as wide; pedicellus 2x longer than wide, 0.38x of scape, anelli narrower than funicle, fourth anellus widest, first and second subequal, the second narrow, strip-like; F1 equal to F2, 2.36x longer than wide; clava stouter than funicle, distinctly 3 segmented, about 3.30x longer than wide, including spicule equal to F2 + F3 combined; terminal segment with a short spicule, about 0.50x of preceding claval segment; first claval segment 1.57x longer than wide and 0.91x of the preceding segment, second as long as wide and 0.63x of the first, third shortly conical, nearly as long as wide and 0.71x of the second.

*Mesosoma* : Mesoscutum with 7 bristles in a row near notauli on each side, ML distinct; propodeum with strongly developed median carina; paraspicular carinae absent; 2 bristles in a row near the lateral margin; spiracle separated from anterior margin by 0.5x of its own diameter; forewing length to width = 100 : 44; SMV with 5 setae pointed towards front margin, 3 setae directed behind; MV with 15 long setae; veins SMV: MV : STV = 75 : 100 : 19.

*Gaster* : With fine microreticulations; gaster : mesosoma = 54 : 100; ovipositor not exerted.

*Host* : Gall midge *Contarania caudata* Felt.

*Type locality* : West Indies: (St. Vincent) Grenada.

*Distribution* : West Indies, India: Karnataka, Tamil Nadu, and Kerala (New record from Kerala).

*Remarks* : The above diagnosis is based on the original descriptions of Ashmead (1894) and Saraswat (1975). The species *shencottensis* may be a variety of *fasciatus* Ashmead.

### 27. *Aprostocetus flavidus* (Khan & Shafee)

1981a. *Tetrastichus flavidus* Khan & Shafee, : 343. Female. India. (ZDAMU).

2004. *Aprostocetus flavidus* (Khan & Shafee), Hayat & Shahi, : 305.

*Diagnosis* : *female* : Length 1.57mm. Midlobe of mesoscutum with ML, with 4 adnotaular setae on each side (Hayat, 2004). In the original description Khan & Shafee (1981) erroneously stated that mesoscutum is with 5 adnotaular setae.

*Type locality* : India: Andhra Pradesh, Guntur.

*Host* : ex Coccids on Weed plant.

**28. *Aprostocetus gala* (Walker)**  
(Figs. 69-72)

1847. *Tetrastichus gala* Walker, : 28, Female. USA : Florida : Lectotype, BMNH, (examined)  
1988. designated by Burks, transferred to *Aprostocetus* by Bouček (1988a: 681). See Bouček for extralimital synonymies.

*Redescription* : *Lectotype* : *Female* : Length 1.71 mm. Yellow with following parts dark brown: antenna (with scape paler); upper part of scrobe, area near ocelli on vertex, apical corners of scapula, and axilla, notauli, anterior corners of propleuron and transverse bands on gaster. Wings hyaline with pale brown veins; pubescence dirty white.

*Head* : Collapsing, a little longer than wide; POL 2x OOL; eye height in profile 2.3x malar space. Antennal formula 11233 (Fig. 69). Relative measurements: length : width, scape = 24 : 5; pedicellus = 10 : 5; F1 = 14 : 6; F2 = 14 : 6; F3 = 14 : 6; clava = 22 : 7, (clava apparently 4 segmented). Scape not exceeding front ocellus.

*Mesosoma* : Pronotum with a row of 10-12 setae on posterior margin; mesoscutum with 5 adnotaular setae on either side, a little longer than 1.4x scutellum; ML weak but complete; mesoscutum and scutellum faintly reticulate. Propodeum a little shorter than dorsellum, 6x as broad as long, with a short median carina (Fig. 70), spiracle rim not fully exposed, separated from metanotum by less than its own diameter; submedian areas weakly reticulate. Forewing (Fig. 71) length 1.91x its maximum width; ratio of CC : MV : PMV : STV as 27 : 30 : 0 : 9.5. SMV with 4 dorsal setae; speculum closed behind by cubital line of setae. Hindcoxa not distinctly reticulate, mostly smooth and shiny; hind tibial spur slightly longer than hind metatarsus.

*Gaster* : Slightly longer than head plus mesosoma, with black cross bands; tergites smooth; one of the cercal setae longer than others and sinuate. Ovipositor sheath (Fig. 70) longer than half length of preceding tergite.

*Type locality* : Australia, Queensland.

*Distribution* : North America, Europe, India, Australia.

*Hosts* : *Contarinia sorghicola* (Coq.); *Diaprepes abbreviatus* (L.); *Diaprepes famelicus* (Oliver); *Erosomyia mangiferae* Felt.; *Exophthalmus* sp. (Noyes, 2003)

*Material Examined* : Lectotype, BM TYPE HYM.5. 1412.

**29. *Aprostocetus granulatus* Ashmead**

1888. *Aprostocetus granulatus* Ashmead, : 105. Female. Florida (USNM).  
1917. *Tetrastichus microcosmus* Girault, [316]: 22. Unnecessarily proposed new name for *granulatus* Ashmead (nec *granulatus* Walker).  
1981. *Tetrastichus asperulus* Graham, : 2-5 (UMO).

*Diagnosis : Female* : Length 1.9-2.45 mm. Mesosoma moderately arched dorsally, with propodeum slopping at 45° to 50°, midlobe of mesoscutum very slightly longer than broad; dull with moderately fine, slightly raised reticulation; scutellum slightly more than half as long as mesoscutum, reticulation like that of mesoscutum but finer; enclosed space between SMG slightly less than 2x as long as broad; gaster lanceolate, about 3.5x as long as broad, nearly 1.5x as long as head plus mesosoma but slightly narrower than mesosoma, strongly acute, slightly acuminate, longest setae of each cercus 2x length of next one, sinuate.

*Type locality* : Florida.

*Distribution* : India: Widely distributed.

*Host* : *Hyparrhenia hirta* (L.)

*Material examined* : 1 Female, India : Kerala, Idukki Dt., Manjumalai, Vandiperiyar, Cardamom Plantations (11°17' N 75°51' E), 8.i.2004, Coll. T. C. Narendran & Party; 2 Females, India: Kerala, Idukki Dt., Vandiperiyar (11°17' N 75° 51' E), 8.i.2004, Coll. T. C. Narendran & Party; 7 Females, India : Kerala, Palghat Dt., Chindaki (10° 39' N 76° 40' E), 13.xii.1987, 13.xii.1988, Coll. T. C. Narendran & Party; 11 Females, India : Kerala, Wayanad Dt., Thariyodu (11°40' N 75°57' E), 22.ii.1988, Coll. T. C. Narendran & Party; 17 Females, India : Kerala, Palghat Dt., Kalkandi (11°1' N 76°28' E), 13.xii.1987, Coll. T. C. Narendran & Party; 5 Females, India: Kerala, Idukki Dt., Adimali (10° 2' N 76° 59' E), 3.xii.1988, Coll. T. C. Narendran & Party; 2 Females, India : Tamil Nadu, Coimbatore, UPASI (11°0' N 76°58' E), 29.v.1991, Coll. T. C. Narendran & Party; 2 Females, India: Tamil Nadu, Coimbatore, UPASI (11°0' N 76° 58' E), September 1987, Coll. T. C. Narendran & Party; 13 Females, India : Kerala, Wayanad Dt., Mananthavady (11° 48' N 76° 1' E), 22.ii.1988, Coll. T. C. Narendran & Party; 2 Females, India: Kerala, Wayanad Dt., Kalpetta, Thonikadavu (11°36' N 76°6' E), 7.ii.2003, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Muthanga (11°44' N 76°29' E), 10.x.2000, Coll. T. C. Narendran & Party; 3 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 22.viii.1988, 22.iv.1989, 26.iv.1989, Coll. Surekha; 3 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11°7' N 75°5' E), 2.vii.1986, January 1987, 28.iv.1988, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Malampuzha (10°53' N 76° 46' E), 1.x.1988 Coll. Surekha; 1 Female, India: Kerala, Maliankara, 16.xii.1989, Coll. T. C. Narendran & Party; 1 Female, India : Jharkhand, Ranchi (23°21' N 85°20' E), 27.ii.1994, Coll. S. B. Zeya & S. I. Kazmi.

### 30. *Aprostocetus hagenowii* (Ratzeburg)

1852. *Entedon hagenowii* Ratzeburg, 211. Lectotype Female Seychelles (NM), transferred to *Aprostocetus* by Graham (1987).
1872. *Elachistus aequalis* Walker, 124. Lectotype Male, MADEIRA (Wollaston) (BMNH), designated by Graham (1979 : 284).
1887. *Tetrastichodes floridanus* Ashmead, 203. Syntypes, U.S.A. (Florida) (USNM).

1898. *Elachistus aequatus* Dalla Torre, 77. (Unnecessary replacement name for *Elachistus aequalis* Walker).
- 1905b. *Tetrastichodes browni* Ashmead, 113. Holotype F, PHILIPPINE Is (USNM, Cat. No.8446) (Synonymized by Burks, 1943: 554).
1913. *Geniocerus hagenowi* (Ratzeburg) Kurdjumov, 249; Crawford, 1915 : 584 [Invalid emendation].
1917. *Blattotetrastichus hagenowi* (Ratzeburg); Girault, : 257.
1917. *Blattotetrastichus hagenowi* (Ratzeburg) Masi, : 213, 219-220; Timberlake, 1924 : 442; Klein, 1933 : 102-122; Burks, 1943 : 554-555; Peck, 1951 : 446; Roth & Willis, 1954 : 53-69; 1960 : 249, Peck, 1963 : 135; Domenichini, 1966a : 185; 1966b : 34; Bouèek, 1977c : 117; Burks, 1979 : 996.
1938. *Tetrastichus cesirae* Russo, 237-239 in part, Fig. CXXVI (F only).
- 1977 *Tetrastichodes hagenowii* (Ratzeburg) Bouèek, 28.

**Diagnosis : Female** : Length 1.60-2.1mm. body coppery red, Gaster above, at base and tip dark violet, with a yellowish brown spot at base, flagellum yellowish brown, scape, pedicellus, petiole, legs yellow; fore coxae brown, tarsi black at tip, forewing faintly clouded.

**Head** : Minutely reticulate, eyes finely hairy, pedicellus 3x as long as wide, anelli 4, funicular segments with long hairs, F1 elongate, F2 and F3 subequal, about 0.80x of F1. Mesosoma reticulate; scutellum less conspicuously punctate, propodeum carinate, the carinae behind forming a triangular area; forewing width to length ratio = 21 : 50; SMV : MV = 7 : 6; STV short; legs long; hind metatarsus long; second segment 0.50x of the first; 3 and 4 subequal. Gaster oblong, and ovate, acutely pointed, reticulately sulcate, equal to head and mesosoma.

**Type locality** : Seychelles.

**Distribution** : India (Kerala (new record), South India), Cosmopolitan.

**Host** : A gregarious endophagous parasite of eggs of *Blatta orientalis* L., *Blattella germanica* (L.), *Periplaneta americana* (L.), *P. australasiae* (F.), *P. fuliginosa* (Serville). Occasionally as a secondary parasite through *Evania appendigaster* L. (Noyes, 2003).

**Material examined** : 2 Females, India, Kerala, Malappuram Dt., 13.xi.2006, coll. M. Gokuldas.

**Remarks** : The colour varies from coppery red to black in Kerala specimens.

### 31. *Aprostocetus hanti* Narendran sp. nov. (Fig. 36)

**Holotype : Female** : Length 1.67 mm. Head and mesosoma brownish black with metallic green reflections; eye pale yellow; ocelli pale reflecting yellow; antenna brown with scape and pedicellus immaculate yellow; gaster dark brown with sides and ventral part paler at basal half, dorsum with metallic green reflection; wings hyaline with SMV and MV

pale yellow, STV slightly darker, pilosity brown; setae on mesoscutum and scutellum pale yellow.

*Head* : (Not collapsed) width in anterior view 1.15x as broad as long and 3.4x as broad as long in dorsal view; POL 3.5x OOL; OOL as long as OD; ocelli inside a semicircle anteriorly; interantennal ridge reaching anterior margin of scrobe; mandible tridentate with inner tooth smallest; lower clypeal margin bilobed; eyes bare, 1.1x as long as broad in side view and 2.4x as long as MS in side view; MS straight. Antennal formula 11433; scape shorter than eye length (11 : 12); pedicellus plus flagellum 1.53x as long as width of mesoscutum; antennal segments as in figure 36.

*Mesosoma* : 1.83x as long as wide; midlobe of mesoscutum 2.34x as long as its posterior width, 1.15x as long as its anterior width; surface finely and longitudinally reticulate; ML indicated; mesoscutum with 3 pairs of adnotaular setae on each side, with posterior pair stouter than others; scutellum 1.28x as broad as long; space between SMG a little over 1.7x as long as broad, with 2 pairs of stout setae, SMG little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, almost as long as median length of propodeum; propodeum a little less than 5.5x as broad as its median length, with a short median carina, rim of spiracle exposed, separated from posterior margin of metanotum by its own diameter; surface smooth and shiny, callus with 4 setae on each side; spur of midtibia 0.8x length of metatarsus, fourth tarsomere much shorter than metatarsus; hind femur 3.5x as long as broad. Forewing 2.03x as long as broad; CC slightly longer than MV; SMV with 2 weak dorsal setae; MV 2.57x as long as STV; marginal fringe 0.4x length of STV; speculum absent.

*Gaster* : Sessile, about 1.73x as long as mesosoma; 1.19x as long as combined length of head and mesosoma in side view; 16x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate and partly shriveled on dorsum; hypopygium reaching beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, Sri Lanka, Central Candy District, Peradeniya, Hantana Mt. 7° 15' N 80° 37' E, 10-14. viii.1999, Coll. M & J. Wasbauer, MT. (UC DC).

*Remarks* : *A. karicus* resembles this species in having antenna with more than 2 anelli, SMV with 2 dorsal setae and F1 shorter than F2. It can be separated from *hanti* by using the key given in this work.

### 32. *Aprostocetus harithus* Narendran sp. nov.

(Figs. 39-40)

*Holotype* : *Female* : Length 1.89mm. Dark metallic green with the following parts as follows: antenna dark brown with scape and pedicellus pale yellow; eye brownish grey; ocelli pale reflecting yellow; tegula and upper part of mesopleuron pale brownish yellow;

legs yellow with basodorsal part of hindcoxa metallic green; fore tarsal segment slightly brownish yellow; pretarsi brown; sternites pale brown; ovipositor brown; wings hyaline, with veins pale brownish hyaline, pilosity brown; setae on mesoscutum and scutellum pale yellow.

**Head** : Partly collapsing. Lower margin of clypeus bidentate; mandible tridentate; POL 2x OOL; OOL 1.5x OD; eye minutely pubescent, a little longer than broad; a little longer than 2x MS; MS straight. Antennal formula 11433; scape almost reaching level of vertex, as long as eye length in profile; pedicellus plus flagellum 2.05x as long as width of mesosoma; antennal segments as in figure 39.

**Mesosoma** : 1.44x as long as wide; midlobe of mesoscutum 2.14x as long as its posterior width, 1.15x as long as its anterior width; surface weakly reticulate; ML distinct on posterior half, faint on anterior half; mesoscutum with 2 pairs of adnotaular setae on either side; scutellum 1.16x as broad as long; space between SMG 1.8x as long as broad, with 2 pairs of stout setae, SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, almost as long as median length of propodeum; propodeum 11x as broad as its median length, with a short median carina, rim of spiracle covered by callus, almost touching posterior margin; surface smooth and shiny; callus with 2 setae on each side; spur of midtibia 0.66x length of metatarsus, fourth tarsomere shorter than metatarsus; hind femur 4.22x as long as broad. Forewing 2.77x as long as broad; CC shorter than MV; SMV with 2 stout dorsal setae; MV 4x as long as STV; marginal fringe 0.75x length of STV; speculum closed behind by cubital line of setae.

**Gaster** (Fig. 40) : Sessile, 2.08x as long as mesosoma; 1.56x as long as combined length of head and mesosoma in side view; 7.5x as long as dorsal visible part of ovipositor sheath; tergites moderately reticulate, shiny, moderately pubescent on sides; hypopygium not reaching beyond middle of gaster; one cercal seta longer than others on either side.

**Male** : Essentially similar to female except for antenna and gaster.

**Host** : Unknown.

**Holotype** : Female, India: Kerala, Kannur Dt., Kottiyoor forest (10° 7' N 78° 49' E), 17. ii. 2003, Coll. T. C. Narendran & Party.

**Paratypes** : 14 Females, India : Kerala, Kannur Dt., Kottiyoor forest (10° 7' N 78° 49' E), 17. ii. 2003, 19. ii. 2003, Coll. T. C. Narendran & Party; 3 Females, India : Kerala, Kannur Dt., Kavinissery (11° 55' N 75° 22' E), 16. ii. 2003, Coll. T. C. Narendran & Party; 7 Females, India : Kerala, Wayanad Dt., Thonikadavu (11°36' N 76°6' E), 7. ii. 2003, Coll. T. C. Narendran & Party; 4 Females, India : Kerala, Kannur Dt., Cherukunnu, 16. ii. 2003, Coll. T. C. Narendran & Party; 2 Females, India : Kerala, Idukki Dt., Manjumalai, Vandiperiyar (11° 17' N 75°51' E), Cardamom Plantations, 8. i. 2004, Coll. T. C. Narendran & Party; 2 Females, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 1980, 20.x.1979, Coll. M. Hayat; 1 Female, India : Kerala, Malappuram Dt., Manjeri (11°7' N 76° 7' E), 23.x.2004, Coll. T. C. Narendran & Party; 7 Females, India : Kerala, Wayanad Dt., Pookode Lake (11°

36' N 76° 6' E), 8.ii.2003, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 18. ii. 2002, Coll. K. Sudheer & Divakaran; 1Female, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 4.xii. 1993, Coll. C. G. Rema; 1Female, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 19.iv.1989, Coll. Surekha; 7Females, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), January 1986, October 1987, 12.v.2001, 14.v.2001, 17.x.2002, 30.xi.2003, 14.xi.2001, 5.xii.2001, Coll. T. C. Narendran & Party; 3Females, India: Kerala, Wayanad Dt., Muthanga (11° 44' N 76° 29' E), 7.x.1985 Coll. T. C. Narendran & Party; 6Females, India: Kerala, Kozhikode, Dt., Chaliyam (11° 9' N 75° 49' E), 14. iii. 2003, Coll. T. C. Narendran & Party; 14Females, India: Kerala, Kozhikode, Dt., Pookad (11° 23' N 75° 44' E), 31.viii.2001, 14. xi. 2001, 5. viii. 2001, Coll. T. C. Narendran & Party; 6Females, India: Kerala, Malappuram Dt., Nilambur (11°16' N 76°13' E), 30. i. 2003, Coll. T. C. Narendran & Party; 6Females, India: Kerala, Kozhikode Dt., Thiruvannur (11° 16' N 75°47' E), 12.x.1996, 26.x.1995, 28.xi.1994, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Thiruvananthapuram Dt., Vithura (8°40' N 77°7' E), 8. iii. 2000, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Thiruvananthapuram Dt., Palode (8° 42' N 77°2' E), TBGRI, 8.xii.2004, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Thiruvananthapuram Dt., Kappil, 26.ii.1989, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Thiruvananthapuram Dt., Mannamkonam (8°25' N 77°1' E), 16.iv.2003, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Thiruvananthapuram Dt., Neyyar Dam (8°37' N 77°7' E), 24.ii.1987, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Malappuram Dt., Devathiyal, near Calicut University Campus (11° 7' N 75° 5' E), 16.xii.2003, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Ernakulam Dt., Nedumbasseri (10°1' N 76°18' E), 12.i.2004, Coll. T. C. Narendran & Party; 17Females, India: Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 14.ii.2004, 10.x.2003, 16.xi.2003, 9.xi.2003, 30.viii.2002, 22.viii.2004, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Palakkad Dt., Malampuzha (10°53' N 76°46' E), 11.xiii.1987, 19.i.1988, Coll. T. C. Narendran & Party; 7Females, India: Kerala, Palakkad Dt., Pattambi, Valloor (10° 49' N 76° 12' E), 13.viii.2003, 12.viii.2003 Coll. T. C. Narendran & Party; 4Females, India: Kerala, Kasaragod Dt., Chowki (12°31' N 74°59' E), 23.i.2003 Coll. T. C. Narendran & Party; 1Female, India: Kerala, Kasaragod Dt., CPCRI (12°30' N 74°59' E), 21.i.2003 Coll. T. C. Narendran & Party; 1Female, India: Kerala, Kasaragod Dt., Karanthakkad (12°30' N 74°59' E), 21.i.2003 Coll. T. C. Narendran & Party; 1Female, India: Kerala, Alapuzha Dt., Chethy, Sherthallai (9°41' N 76°20' E), 27.ii.1989 Coll. T. C. Narendran & Party; 7Females, India: Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9.xii.2004, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Kottayam Dt., Kumarakom (9°36' N 76°26' E), 17.iv.2004, Coll. T. C. Narendran & Party; 1Female, India: Tamil Nadu, Coimbatore, (11° 0' N 76° 58' E), 27.ix.1987, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Kollam Dt., Sasthamkotta (9°3' N 76°38' E), 12.xii.2004, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Thrissur Dt., Vellanikkara (10° 31' N 76° 13' E) , 1.vii.2003 Coll. T. C. Narendran & Party; 1Female, India: Kerala, Thrissur Dt., Vadakkancheri (10°35' N 76°29' E), 17.i.2006, Coll. T. C. Narendran & Party; 1Female, India: Karnataka, Sringeri,

Kumbonodu (13°25' N 75°15' E), 3.xii.2002, Coll. P. A. Sinu; 1Female, India: Kerala, Palghat Dt., Siruvani, 26.ix.1987, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Kottayam Dtr., Kumarakom (9° 36' N 76° 26' E), 17.iv.2003, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Ernakulam Dt., Nedumbassery (10°1' N 76° 18' E), 12.i.2004, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Palghat Dt., Pattambi (10° 49' N 76° 12' E), 12.viii.2003, 13.viii.2003, Coll. T. C. Narendran & Party; 1Female, India: Tamil Nadu, Mahabalipuram, 16.ii.1993, Coll. S. I. Kazmi; 1 Female, India : Kerala, Kozhikode Dt., Pookad (11° 23' N 75° 44' E), 14.xi.2001, Coll. T. C. Narendran & Party; 1Female, India: Karnataka, Sringeri (13°25' N 75°15' E), RF/Melhotta, 22.v.2003, Coll. P. A. Sinu.; 1Female, India: Kerala, Palghat Dt., Kalkandi (11° 1' N 76° 28' E), 13.xii.1987, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19.ii.2003, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Waynad Dt., Muthanga (11° 44' N 76° 29' E), 10.x.2000, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Palghat Dt., Chindaki (10° 39' N 76° 40' E), 13.xii.1988, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Kasaragod Dt., CPCRI (12°30' N 74°59' E), 21.i.2003, Coll. T. C. Narendran & Party; 3Females, India: Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 30.viii.2002, 10.x.2003, Coll. T. C. Narendran & Party; 4Females, India: Kerala, Malappuram Dt., C. U. Campus, 9.x.2002, 6.i.2004, 29.xi.2002, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Malappuram Dt., C. U. Campus, 4.iii.1992, Coll. Bindu, V. C.; 2Females, India: Kerala, Kozhikode Dt., Chaliyam (11° 9' N 75° 49' E), 14.iii.2003, Coll. T. C. Narendran & Party; 1Female, India : Karnataka, Vittal, CPCRI (12°56' N 77°32' E), 16.xii.1988, Coll. P. A. Sinu.; 1Female, India: Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9.xii.2004, Coll. T. C. Narendran & Party; 6Females, India: Kerala, Kozhikode Dt., Thiruvannur (11° 16' N 75° 47' E), 28.xi.1994, Coll. T. C. Narendran & Party; 4Females, India: Kerala, Malappuram Dt., Nilambur (11° 16' N 76° 13' E), 30.i.2003, Coll. T. C. Narendran & Party; 1Female, India: Uttar Pradesh, Dehradun (30° 18' N 78° 3' E), 17.xii.1991, Coll. S. B. Zeya; 2 Females, India : Kerala, Wayanad Dt., Thonikadavu (11° 36' N 76° 6' E), 7.ii.2003, Coll. T. C. Narendran & Party; 4 Females, India : Kerala, Malappuram Dt., Nilambur, Manimooly forest (11° 16' N 76° 13' E), 29.i.2003, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), 4.x.2003, Coll. T. C. Narendran & Party; 1 Male, Karnataka, Sringeri, Vatia, 15.v.2003, Coll. P. A. Sinu.

*Variation* : Length varies from 1.89-2mm; colour varies from dark metallic green to dark brown with metallic green reflections; OOL 1.5–1.7x OD; pedicellus plus Flagellum 1.8–2.05x as long as width of mesosoma; mesosoma 1.44–1.56x as long as its width; midlobe of mesoscutum 1.75–2.14x as long as its posterior width; space between SMG 1.8–2.4x as long as broad; spur of midtibia 0.66–0.8x length of metatarsus; gaster 2.08–2.42x as long as mesosoma, 1.56–1.7x as long as combined length of head and mesosoma; in some paratypes hypopygium reaching middle of gaster.

*Remarks* : This new species resembles *A. vimania* Narendran in having mesoscutum with 2 dorsal setae and antenna with 4 anelli but can be separated from *vimania* by the characters mentioned in the key given in this work.

33. *Aprostocetus hayati* Narendran sp. nov.  
(Figs. 29-30)

*Holotype : Female* : Length 1.63mm. Head yellow with POL area and surrounding area of ocelli black with metallic green reflection; eye and ocelli reddish brown; antenna brown with anelli, apex of pedicellus and scape paler; mesosoma with metallic green reflection on pronotum, on three-fourth of mesoscutum from anterior end except area near notauli and anterior half of scapula, axilla completely and a spot on the anterior side of mesoscutum, propodeum, lower half of mesopleura and metapleura. A strip near notauli, posterior half of scapula, tegula, prepectus, lateral panel of pronotum, most of scutellum yellow; legs yellow with basodorsal part of hindcoxa dark brown with metallic green reflection; gaster with dark metallic green reflection; wings hyaline with veins pale and brownish hyaline; pilosity pale brown; setae on mesoscutum and scutellum pale yellow.

*Head* : Slightly collapsing; lower margin of clypeus bilobed; mandibles bidentate; POL 3x OOL; OOL subequal to OD; eye bare, 1.1x as long as its width; 1.83x as long as MS in-side view; MS slightly curved anteriorly. Antennal formula 11433; scape a little shorter than eye length (9: 10); pedicellus plus flagellum 1.27x width of mesosoma; antennal segments as in figure 29.

*Mesosoma* : (Fig. 30) 1.55x as long as wide; middle lobe of mesoscutum 1.7x as long as its posterior width, a little shorter than its anterior width; surface cross reticulate on anterior one third of mesoscutum, rest longitudinally reticulate; ML present; mesoscutum with 4 adnotaular setae and one inner seta on each side; scutellum 1.22x as broad as long; space between SMG 1.77x as long as its maximum width; SMG a little nearer to SLG than to each other. Dorsellum well visible in dorsal view, its median length equal to median length of propodeum; width of propodeum 7.8x its median length; spiracle rim fully exposed, separated from posterior margin of metanotum by its own diameter; submedian area moderately reticulate; callus with 3 setae on each side; spur of midtibia 0.57x length of metatarsus, fourth tarsomere shorter than metatarsus; hind femur 4x as long as broad. Forewing 2.13x as long as broad; CC shorter than MV; SMV with 6 weak dorsal setae; MV 4.6x as long as STV; marginal fringe 0.67x length of STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile, 1.53x as long as mesosoma, 1.1x as long as combined length of head and mesosoma in side view, 19.33x as long as dorsal visible part of ovipositor sheath; tergites moderately reticulate and shriveled, hypopygium reaching a little beyond middle of gaster, one cercal seta longer than others on either side and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India: Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 10.x.1993, Coll. M. Hayat.

*Etymology* : Named after Prof. M. Hayat, who collected the species.

**Remarks :** *A. yesica* resembles this new species in having mesoscutum with 4 adnotaular setae and SMV with 6 dorsal setae. However, the two species can be separated by the characters mentioned in the key given this work.

34. *Aprostocetus ille* Narendran sp. nov.

(Fig. 53)

**Holotype : Female :** Length 1.97mm. Black; eye partly grey and partly brown; ocelli pale reflecting yellow; lower margin of gena and mandible pale brown; antenna including pedicellus and scape brownish black; legs black with the following parts yellow: trochanters, apices of femora, base and apex of hind tibia, fore tibia completely, midtibia largely (with a small median brown band) first 2 tarsal segments. Wings hyaline with a brownish tinge; veins pale brownish yellow; STV with a decolorized area between stigma and MV.

**Head :** Width in anterior view 0.93x its length; width in dorsal view 6.14x its median length; lower margin of clypeus bilobed; mandible tridentate; POL 2.7x OOL; OOL 1.33x OD; eye bare, 1.33x as long as wide, 2.3x as long as MS; MS straight; antennal formula 11233; scape distinctly rugoso-punctate on dorsal side (but no raised rasp like sculpture on inner surface as in *Quadrastichodella*); scape not reaching level of vertex, little shorter than eye (14 : 16); pedicellus plus flagellum 0.93x as long as width of mesosoma; antennal segments as in figure 53.

**Mesosoma :** 1.13x as long as wide; midlobe of mesoscutum 1.9x as long as its posterior width, as long as its anterior width; surface with strong raised longitudinal reticulations; ML distinct and complete; mesoscutum with 2 rows of setae near each notauli, total 10-12 setae on either side; scutellum 1.31x as wide as long; enclosed space between SMG 1.86x as long as broad; SMG little nearer to SLG than to each other; dorsellum almost completely hidden by scutellum; propodeum 0.05x as long as wide; median carina hardly distinct, instead a broad raised area 0.33x its length is present in the middle, surface with distinct raised reticulations; rim of spiracle partly covered by callus, almost touching posterior margin of metanotum; callus with 3 setae; spur of midtibia 0.86x as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4x as long as broad; forewing 2x as long as broad; CC shorter than MV; SMV with 4 dorsal setae; MV 3.4x STV; marginal fringe absent; speculum partly open behind.

**Gaster :** Sessile; 1.47x as long as mesosoma; 1.22x as long as combined length of head and mesosoma in side view; 20x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate; hypopygium reaching middle of gaster; one of the cercal seta on either side longer than others and sinuate.

**Male :** Unknown

**Host :** Unknown.

**Holotype :** Female, India: Kerala, Idukki Dt., Eravikulam, Turners Hill (10° 8' N 77° 4' E), 2.iii.1993, Coll. T. C. Narendran & Party.

*Paratypes* : 2 Females, India: Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 28.iv.1988, 20.viii.2001 Coll. T. C. Narendran & Party; 1 Female India: Himachal Pradesh, Simla (31°6' N 77°10' E), 12.iii.2004, Coll. S. Chakrabarti.

*Remarks* : This species is unique in having scape rugoso-punctate on inner dorsal side; STV with a decolourised area between stigma and MV; pedicellus plus flagellum 0.93x as long as width of mesosoma; propodeum with median carina hardly distinct, instead a broad raised area of 0.33x its length is present in the middle and in having marginal fringe absent.

35. *Aprostocetus karicus* Narendran sp. nov.  
(Figs. 43-44)

*Holotype* : *Female* : Length 0.9mm. Pale brownish yellow; eye and ocelli red; ovipositor sheath dark brown; wings hyaline, veins pale brownish hyaline; pilosity pale yellow.

*Head* : Partly collapsing; mandible bidentate; POL 3x OOL; OOL as long as OD; eye bare; eye 1.16x longer than broad, 1.7x as long as MS; MS straight. Antennal formula 11333; scape reaching level of vertex, a little shorter than eye length in profile; pedicellus plus flagellum 2x as long as width of mesosoma; antennal segments as in figure 43.

*Mesosoma* : 2x as long as wide; midlobe of mesoscutum collapsed from dorsal side, surface faintly reticulate; ML distinct, mesoscutum with 2 adnotaular setae on either side; scutellum as broad as long; space between SMG 2.5x as long as broad; SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, almost as long as median length of propodeum; propodeum 7x as broad as its median length, with a faint median carina; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by its own diameter; surface smooth and shiny, callus with one seta on each side; hind femur 3x as long as broad. Forewing 3.9x as long as broad. CC shorter than MV; SMV with 2 dorsal setae; MV 4x as long as STV; marginal fringe 1.7x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* (Fig. 44) : Sessile; 2x as long as mesosoma and about 1.5x as long as combined length of head and mesosoma in side view; 11x as long as dorsal visible part of ovipositor sheath; tergites slightly shriveled and moderately reticulate; hypopygium not reaching middle of gaster; one cercal seta longer than others on either side and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India: Kerala, Alapetty Dt., Onattukara (9°10' N 76°30' E), 19.iv.2004, Coll. T. C. Narendran & Party.

*Paratype* : 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 20.x.1979, Coll. M. Hayat.

*Remarks* : This species resemble *Quadrastichus* in general appearance, but differs from it in the absence of long curved setae on F3 and presence of 2 dorsal setae on SMV.

36. *Aprostocetus kaya* Narendran sp. nov.  
(Fig. 49)

*Holotype : Female* : Length 1.84mm. Head and mesosoma dark metallic green; gaster dark brown with basal half pale yellow; eye brownish red; antenna dark brown with pedicellus and scape pale yellow; tegula yellow, legs yellow with basodorsal part of hindcoxa and pretarsi dark brown; wings hyaline with veins pale brown; pilosity of wings pale brown; setae on mesoscutum and scutellum pale yellow.

*Head* : Partly collapsing; lower margin of clypeus slightly bilobed, mandible tridentate; POL 1.86x OOL; OOL 2.3x OD; eye bare, 1.2x as long as broad, 1.83x as long as MS; MS straight. Antennal formula 11433; scape not reaching level of vertex, a little shorter than eye length in profile (10: 11); pedicellus plus flagellum 2.1x as long as width of mesosoma; antennal segments as in figure 49.

*Mesosoma* : 1.47x as long as wide; midlobe of mesoscutum 2.16x as long as its posterior width, as long as its anterior width; surface longitudinally and moderately reticulate; ML distinct; mesoscutum with 2 relatively long adnotaular setae on each side; scutellum 1.25x as broad as its length; space between SMG 2x as long as broad, SMG a little nearer to SLG than to each other. dorsellum distinctly visible in dorsal view, about as long as median length of propodeum; propodeum 7x as broad as its median length, with a moderate median carina; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by less than half its diameter; surface smooth and shiny with traces of reticulations; callus with 2 setae on each side; spur of midtibia 0.63x as long as length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 3.7x as long as broad. forewing 2.65x as long as broad; CC shorter than MV; SMV with 2 dorsal setae; MV 4.9x as long as STV; marginal fringe 0.57x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile; 1.71x as long as mesosoma, 1.41x as long as combined length of head and mesosoma in side view; 11.5x as long as dorsal visible part of ovipositor sheath; tergites with moderate reticulations; hypopygium slightly exceeding middle of gaster; one cercal seta on each side longer than others in side view.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Alapetty Dt., Kayamkulam (9°10' N 76°30' E), 20.iv.2004, Coll. T. C. Narendran & Party (ZSIC).

*Paratypes* : 2 Females, India : Kerala, Alapetty Dt., Kayamkulam (9°10' N 76°30' E), 19.iv.2004, 20.iv.2004, Coll. T. C. Narendran & Party.

*Remarks* : This species comes near *A. aruna* Narendran but can be separated by the characters given in the key to species given in this work.

37. *Aprostocetus kodei* Narendran sp. nov.

(Figs. 37-38)

*Holotype : Female* : Length 2.25 mm. Head yellow with vertex, postocciput and upper part of gena dark metallic green; eyes yellowish brown; ocelli pale reflecting yellow; funicle and clava dark brown; anelli and pedicellus pale brownish yellow; scape pale yellow; tip of mandible brown; pronotum yellow with anterior marginal area brown; mesoscutum, scapula, scutellum, axilla, dorsellum, propodeum, meso and metapleuron, three fourth of prepectus brownish metallic green, legs including coxae completely yellow with pretarsus slightly brown; gaster dark brown with slight metallic refringence; ovipositor sheath yellowish brown; wings hyaline with veins pale yellowish hyaline; pilosity of wings brown; pubescence on mesoscutum and scutellum pale white.

*Head* : Partly collapsing; POL 1.66x OOL; OOL 1.5x OD; lower margin of clypeus bilobed; mandibles bidentate; eye bare, 1.3x as long as wide in side view and 1.7x as long as MS in side view; MS straight. Antennal formula 11443; scape distinctly exceeding level of vertex, scape as long as eye length; pedicellus plus Flagellum 2.12x as long as width of mesoscutum; antennal segments as in figure 37.

*Mesosoma* : 1.5x as long as broad; pronotum large and somewhat bell shaped in dorsal view, 0.62x as long as median length of mesoscutum; midlobe of mesoscutum 2x as long as its posterior width, a little shorter than its anterior width (8 : 9); surface strongly reticulate; ML present; mesoscutum with 3 adnotaular setae on each side; scutellum 1.16x as broad as its length; space between SMG a little over 1.5x as long as broad, SMG little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, almost as long as median length of propodeum; propodeum 6.66x as broad as its median length, with a short median flat carina, rim of spiracle partly covered by callus, separated from posterior margin of metanotum by its diameter; submedian area distinctly reticulate; callus with 3 setae on its posterior half; propodeum and dorsellum lying in a sub-horizontal plane with scutellum; spur of midtibia 0.37x length of metatarsus, fourth tarsomere much shorter than metatarsus; hind femur 3.71x as long as broad. Forewing 3.33x as long as broad; CC shorter than MV; SMV with 4 dorsal setae; MV 4.5x as long as STV; marginal fringe 0.75x length of STV; speculum mostly setose.

*Gaster* : (Fig. 38) Sessile, 1.8x as long as mesosoma; 1.4x as long as combined length of head and mesosoma in side view; 10x as long as dorsal visible part of ovipositor sheath; tergites smooth and weakly reticulate; hypopygium not reaching middle of gaster; one cercal seta longer than others on either side.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India: Kerala, Kannur Dt., Azheekode (11° 53' N 75° 24' E), 16. xi. 2003, Coll. T. C. Narendran & Party.

*Paratype* : 1 Female. Collection data same as that of holotype.

**Remarks :** This is a unique species which does not resemble any other species closely. It can be separated from other species by using the key given in this work.

### 38. *Aprostocetus kuriani* (Husain & Khan)

1954. *Syntomosphyrum israeli* Kurian, : 3: 131. Male & Female, India: Cuttak (SEA?). Preoccupied by Mani & Kurian (1953).
1986. *Tetrastichus kuriani* Husain & Khan, : 20 : 239.
2003. *Aprostocetus kuriani* (Husain & Khan) Noyes (updated) universalchalcidoidea database.

**Redescription : Female :** Length 1.50mm. body dark reddish brown to black with metallic-green or blue hue; head black with metallic-blue lustre; vertex indistinctly shagreened, emarginate, with a few scattered silvery-white pubescence; ocelli prominent, reddish-brown; eyes reddish-brown, bare; clypeus brown; mandibles reddish-brown, tridentate; scape brown; tegulae yellow; legs yellowish-brown; hindcoxa dorsally black.

**Head :** Head from above transverse, 3x as wide as long; interorbital distance very slightly over 0.67x width of head; POL 1.5x OOL, latter 1.33x front ocellus; length of gena slightly more than 0.50x length of eyes; face slightly convex, smooth and shiny; antennae inserted slightly above middle of face; scrobes distinct, separate, not reaching front ocellus, antennal formula 11133; scape nearly reaching front ocellus, slightly less than 4x as long as wide, slightly over 2.50x pedicellus; anellus 0.12x of pedicellus; F1 nearly 2x pedicellus; F2 and F3 subequal to F1; first segment of clava 0.75x of F3; second nearly 0.83x of first claval segment; terminal segment very slightly over 0.50x of second, with a nipple like process apically; clava 0.87x of scape, pedicellus and anellus combined.

**Mesosoma :** Pronotum short, narrow, finely and indistinctly shagreened; mesoscutum longitudinally coriaceously sculptured, much broader than pronotum with very distinct and deep notauli and faint median furrow somewhat distinct posteriorly; scutellum sculpture same as on mesonotum, divided by 2 parallel grooves into 3 areas; propodeum short, rugose, with a median longitudinal carina, which bifurcates posteriorly and extends as basal carina; mesopleura impressed, divided by a longitudinal carina, upper area being indistinctly transversely striate; hind femur nearly 2.50x coxa, tibia 1.25x femur; tarsi 4 segmented, all tarsal segments together slightly over 0.75x of tibia, claw simple; forewing slightly less than 2.50x as long as wide; SMV slightly more than MV; MV with 12 strong setae; STV 0.25x of MV; PMV absent.

**Gaster :** Gaster 1.50x mesosoma, laterally somewhat compressed; 7 tergites visible; first tergite largest, rest gradually becoming shorter, last small and conical; ovipositor long, exerted from ventrally far ahead of the gaster tip.

**Type locality :** India: Orissa, Cuttak.

**Host :** Eggs of *Schoenobius*.

**Remarks :** The above redescription is based on available literature (Courtesy to Mani, 1989).

39. *Aprostocetus lasallei* Khan, Agnihotri & Sushil

2005. *Aprostocetus lasallei* Khan, Agnihotri & Sushil, : 144. Female. India (?IARI or?PUA).

*Diagnosis : Female:* Length 1.34 mm. The species can be identified using the key given above and from the original description.

*Type locality :* India: Uttaranchal, Bhujan (Bhintal).

*Host :* Ex. Coccid on Guava, *Psidium guajava* (Khan *et al.*, 2005).

*Remarks :* In the original description it is stated that paraspiracular carina is present and pronotum is provided with anterior carina. This species may belong to some other genera. A request for loan of type remained unanswered.

40. *Aprostocetus licalis* Narendran sp. nov.

(Fig. 62)

*Holotype : Female :* Length 1.07mm. Head pale yellowish brown; eye pale reflecting yellow; ocelli reddish brown; antenna pale yellowish brown with scape and pedicellus pale yellow; tegula pale brown; legs including coxae pale yellow; setae on mesoscutum and scutellum pale brownish yellow; gaster brown with hypopygium and base pale yellow; ovipositor pale brownish yellow; dorsellum and propodeum pale yellow; wings hyaline, veins pale yellowish brown, pilosity of wings brown.

*Head :* Width in anterior view as wide as long; lower margin of clypeus slightly bilobed, mandibles bidentate; POL 1.33x OOL; OOL 1.2x OD; eye bare, about 1.1x as long as broad, 0.18x as long as MS; MS slightly bent anteriorly; antennal formula 11233; scape not reaching level of vertex a little shorter than eye length in profile (7: 9); pedicellus plus flagellum as long as width of mesosoma; antennal segments as in figure 62.

*Mesosoma :* As long as wide; midlobe of mesoscutum 2x as long as its posterior width, as long as anterior width, surface weakly reticulate; ML distinct, mesoscutum with 4 relatively long and stout adnotaular setae on either side; scutellum with 3 pairs of setae, 1.5x as broad as long; space between SMG 3x as long as broad; SMG slightly nearer to SLG in anterior half of scutellum, but nearer to each other in the posterior half of scutellum; dorsellum not visible in dorsal view, in posterior view dorsellum as long as propodeum; propodeum 6x as broad as its median length, with a moderate median carina; rim of spiracle slightly covered by callus, almost touching posterior margin, surface weakly reticulate, callus with 3 setae on each side; spur of midtibia as long as metatarsus; fourth tarsomere as long as metatarsus; hind femur 3.6x as long as broad; forewing 1.9x as long as broad; SMV with 3 dorsal setae; MV as long as STV; speculum closed behind by cubital line of setae.

*Gaster :* Sessile 1.25x as long as mesosoma; 0.95x as long as combined length of head and mesosoma in side view; 17.5x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate, mostly smooth; hypopygium reaching middle of gaster, one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 11.v.2000, Coll. T. C. Narendran & Party.

*Remarks* : *A. nainitalensis* (Khan & Shafee) resembles this new species in having antenna with 2 anelli and SMV with 3 dorsal setae. Both species can be separated using the key in this work.

#### 41. *Aprostocetus maculatus* (Khan & Shafee)

1988. *Tetrastichus maculatus* Khan & Shafee, : 44-45. Female. India.

2004. *Aprostocetus maculatus* (Khan & Shafee), Hayat & Shahi, : 306.

*Diagnosis: Female*: Length 1.35mm. This is a distinctive species characterized by large mandibles with falcate inner (ventral) tooth; MS slightly curved; SMV with 3 dorsal setae (Hayat & Shahi, 2004).

*Type locality* : India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), Sasni.

*Host* : ex *Ferrisia virgata* (Cockerell) on *Ficus glomerata* Roxb.

#### 42. *Aprostocetus malabarensis* (Saraswat) comb. nov.

1975. *Tetrastichus malabarensis* Saraswat, 4 : 10. Female. India (SEA).

*Diagnosis : Female*: Length 2-3 mm. Body nonmetallic brownish yellow with black markings on head, mesosoma and gaster. Head width 1.11x its length in anterior view; eyes sparsely pubescent; mandibles tridentate. For other diagnostic characters see key given above.

*Host* : Unknown.

*Type locality* : India: Kerala, Moozhiar- Thekkady Road.

*Distribution* : India (Kerala & Tamil Nadu)

*Remarks* : The original description clearly shows that this species belongs to *Aprostocetus*.

#### 43. *Aprostocetus malcis* Narendran sp. nov.

(Figs. 10-11)

*Holotype : Female* : Length 2.5 mm. Head and mesosoma yellow with brownish tinge and with the following black markings : a patch on the middle of pronotum, anterior median half of mesoscutum (Fig. 11), a spot on anterior part of scapula and another on axilla black; upper part of frons and scrobe blackish brown; antenna brownish black with scape pale yellow; eyes pale reddish brown; ocelli pale reflecting yellow, ocelli and POL area on a black transverse area; mandibles brown with apices of teeth black; mesopleura

brown; propodeum black; dorsellum yellow; enclosed space between SMG of scutellum blackish brown; legs yellow with pale brown tinge, hindcoxa pale brown; Gaster yellow with sides of tergites 1-5 dark brown, a dark brown patch on T4 middle anteriorly, T5 dark brown with median dorsal part paler, T6 and epipygium yellow; wings hyaline with veins pale brown, pilosity of wing brown; setae on mesoscutum and scutellum brown.

*Head* : (Not collapsed) width in anterior view 1.37x as broad as long; 3.3x as broad as long in dorsal view; POL 1.2x OOL; OOL 1.66x OD; eye bare, 1.44x as long as its width in side view; 2.6x as long as MS in side view; MS slightly bent. Antennal formula 11433; scape slightly exceeding level of vertex, little shorter than eye (11 : 13); pedicellus plus Flagellum 1.66x as long as width of mesosoma; antennal segments as in Fig. 10.

*Mesosoma* : (Fig. 11) Median length of mesosoma 1.36x its width; midlobe of mesoscutum 2.33x as long as its posterior width, a little shorter than its anterior width; surface with weak longitudinal reticulations; ML present but weak; mesoscutum with 6, adnotaular setae on each side; scutellum 1.1x as broad as long; space between SMG a little over 1.72x as long as broad; SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, half as long as length of propodeum; propodeum 5x as broad as its median length, with a short median carina, rim of spiracle partly covered by callus, separated from posterior margin by half its diameter, surface smooth and shiny with faint reticulations, callus with 1 or 2 setae; spur of midtibia 0.7x length of metatarsus; fourth tarsomere shorter than metatarsus, hind femur 2.33x as long as broad. Forewing 2.85x as long as broad; CC distinctly shorter than MV; SMV with 4 stout dorsal setae; MV 4.5x as long as STV; marginal fringe 0.5x length of STV; speculum absent.

*Gaster* : Sessile, 1.62x as long as mesosoma; 1.08x as long as combined length of head plus mesosoma in side view; 19x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth, slightly collapsing on dorsal side medially; hypopygium reaching beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown

*Holotype* : Female, India : Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 8.iv.2001, Coll. T.C. Narendran & Party.

*Paratypes* : 18 Females, India: Kerala, Nanminda (11° 26' N 75° 50' E), 14.ii.2004, 4.iv.2004, 8.iv. 2001, 16.xi.2003, 18.vii.2004, 11.vi.2004, 28.iv.2001, 2.ii.2004 Coll. T.C. Narendran & Party; 36 Females, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 9.x.1985, 18.x.1988, 10.viii.1988, 4.x.1988, 19.viii.1988, 18.viii.1988, i. 1988, 20.ix.1988, 1.x.1986, 2.xii.2003, 5.xi.1988, 11.ix.2002, 3.iii.1985, 16.ix.2002, 4.x.2001, 17.v.2003, 30.x.1986, 6.x.1986, 28.x.1986, 4.x.2001, 20.iv.2001, 9.viii.2001, 11.ix.2002, 27.iv.2001, 29.viii.2002, 27.iv.2001, 25.x.2003, 13.xii.1991, 30.viii.1988, 1.ix.2001, 29.viii.2002, 13.xii. 1991, 20.xi.2001, Coll. Surekha & T. C. Narendran; 1 Female, Kerala, Kozhikode Dt., R.E.C., 28.xi.1985, Coll. T.C. Narendran & Party; 1 Female, Waynad Dt., Muthanga (11° 44' N 76° 29' E), 7.x.1995, Coll. T.C.

Narendran & Party; 1 Female, Malappuram Dt., Nilambur (11° 16' N 76° 13' E), 11.xii.1987, Coll. T.C. Narendran & Party; 3 Females, Palghat, Malampuzha (10° 53' N 76° 46' E), 19.i.1988, i.1986, Coll. T.C. Narendran & Party; 1 Female, Malappuram, Parappanangadi (11° 3' N 75° 52' E), 28.vii.1987, Coll. T.C. Narendran & Party; 1 Female, Malappuram, Edakkara, 24.iv.1989; 2 Females, Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T.C. Narendran & Party; 1 Female, Malappuram, Tanur (10° 59' N 75° 52' E), 8.vi.2002, Coll. T.C. Narendran & Party; 3 Females, Kozhikode, Thiruvannur (11° 16' N 75° 47' E), 12.x.1996, 25.xi.1995, 26.x.1995, Coll. T.C. Narendran & Party; 2 Females, Palghat, Thrithala (10° 48' N 76° 8' E), 14.viii.2003, Coll. T.C. Narendran & Party; 1 Female, Palghat, Muttikulangara, 11.xi.1987, Coll. T.C. Narendran & Party; 1 Female, Kannur Dt., Kudiyanmala, 24.xii.1999, Coll. T.C. Narendran & Party; 1 Female, Kannur, Aralam (11° 58' N 75° 40' E), 16.xii.1995, Coll. T.C. Narendran & Party; 1 Female, Kannur, Kavinissery (11° 55' N 75° 22' E), 16.ii.2003, Coll. T.C. Narendran & Party; 1 Female, Kannur, Kottiyoor (10° 7' N 78° 49' E), 17.ii.2003, Coll. T.C. Narendran & Party; 3 Females, Malappuram, Manjeri (11° 7' N 76° 7' E), 30.ix.2003, , 17.viii.2003, Coll. T.C. Narendran & Party; 1 Female, Palghat, Pattambi, Valloor (10° 49' N 76° 12' E), 13.viii.2003, Coll. T.C. Narendran & Party; 1 Female, Kozhikode Dt., Pookad (11° 23' N 75° 44' E), 31.viii.2001, Coll. T.C. Narendran & Party; 1 Female, Malappuram Dt., Vallikkunnu (11° 8' N 75° 50' E), 30.viii.2001, Coll. T.C. Narendran & Party; 1 Female, Kozhikode, Thiruvannur (11° 16' N 75° 47' E), 23.xi.1996, Coll. Rajmohana; 1 Female, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), vii.1994, M. Hayat.

*Remarks* : This species comes near *A. nadicus* Narendran in having mesoscutum with 5 or 6 adnotaular setae on either side but can be separated by the characters mentioned in the key in this work.

#### 44. *Aprostocetus manja* Narendran sp. nov.

(Fig. 7)

*Holotype* : *Female* : Length 1.56 mm. Yellow with following exceptions: eye pink; ocelli pale reflecting yellow; funicle and clava yellowish brown; sides of gaster partly black or blackish brown; ovipositor sheath black; wings hyaline and veins pale brown; pubescence pale yellow.

*Head* : Collapsed so that vertex appears transversely linear; POL 4x OOL; OOL 1.4x OD; eye bare, 1.18x as long as its width in side view; 1.86x as long as MS in side view; MS straight. Antennal formula 11433; scape not reaching level of vertex, as long as eye; pedicellus plus flagellum 1.2x as long as width of mesosoma; antennal segments as in figure 7.

*Mesosoma* : A little over 1.2x as long as wide, midlobe of mesoscutum a little over 1.2x its anterior width, 2.2x as long as its minimum posterior width; surface mostly smooth, ML distinct; mesoscutum with 5-6 weak adnotaular setae on either side (one seta not in row), scutellum a little over 1.46x as broad as its length; space between SMG a little over 1.4x as long as broad, SMG a little nearer to SLG than to each other; dorsellum not visible in dorsal view; propodeum 8x as broad as its median length (2 : 16), with a short median

carina, spiracle partly covered by propodeum, separated from posterior margin of metanotum by less than half its diameter; surface smooth and shiny, callus with 2-3 setae on each side. Spur of mid tibia 0.66x length of metatarsus, fourth tarsomere much shorter than metatarsus; hind femur 3.33x as long as broad. Forewing 2.45x as long as broad; CC shorter than MV; SMV with 4 dorsal setae; MV 3x as long as STV; marginal fringe 0.25x length of STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile, 1.8x as long as mesosoma, 1.42x as long as combined length of head and mesosoma in side view, 9.5x as long as dorsal visible part of ovipositor sheath; tergites smooth and sparsely pubescent; hypopygium reaching beyond middle.

*Male* : Unknown.

*Host* : *Jasminum multiflorum*.

*Holotype* : Female, India: Kerala, Calicut University Campus (11° 7' N 75° 5' E), 28. iii. 1989, Coll. T.C. Narendran & Party (ZSIC).

*Paratypes* : 6 Females India: Kerala, Calicut University Campus (11° 7' N 75° 5' E), May 1987, 28. iii. 1989, 19. ix. 2002, 31.x.2002, 8. iii. 2003, 14.iii. 1988, Coll. T.C. Narendran & Party; 3 Females, India: Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), November 1990, 27.xiii.1984, 9.xiii.1979, Coll. M. Hayat; 4 Females, Kerala, Idukki, Cheruthoni (9° 51' N 76° 58' E), 10. i. 2004, T. C. Narendran & Party; 1 Female, Kerala, Kozhikode, Thiruvannur (11° 16' N 75° 47' E), 28.xi.1994, Coll. T. C. Narendran & Party; 4 Females, Calicut University Campus (11° 7' N 75° 5' E), 20.iv.1989, Surekha; 1 Female, Malappuram, Nilambur (11° 16' N 76° 13' E), 11.viii.1987, Coll. T. C. Narendran & Party; 1 Female, Idukki, Eravikulam, Turner's Hill (10° 8' N 77° 4' E), 2.iii.1993, Coll. T. C. Narendran & Party; 1 Female, Idukki, Vandiperiyar (11° 17' N 75° 51' E), 8.i.2004, Coll. T. C. Narendran & Party; 2 Females, Tamil Nadu, Padappai, 5.viii.1992, B. V. David; 1 Female, Palghat, Pattambi (10° 49' N 76° 12' E), 13.viii. 2003, Coll.T. C. Narendran & Party; 2 Females, Tamil Nadu, Villupuram, 19.ii.1999, Coll. S. B. Zeya & S. I. Kazmi, 1 Female, Calicut University Campus (11° 7' N 75° 5' E), 20.i.1992, Bindu. V.C.; 1 Female, Idukki, Adimali (10° 2' N 76° 59' E), 3.xii.1988, Coll.T. C. Narendran & Party; 2 Females, Maharashtra, Buldana District, Lonar Crates Wild Life sanctuary, North of Rest House (19° 59' N 76° 31' E), 17.ii.2003, Coll. P. M. Sureshan; 1 Female, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), iv.1979, Coll. M. Hayat, & M. Verma.

*Remarks* : This new species resembles *A. retura* Narendran in having head and mesosoma mostly yellow. Both these species can be separated by using the key given in this work.

#### 45. *Aprostocetus nadicus* Narendran sp. nov.

(Figs. 57)

*Holotype* : *Female* : Length 2.53mm. Black; lower frons brownish yellow; eye brick red; ocelli pale reflecting yellow or brown; antenna brown with scape paler; mesoscutum with area near posterior margin pale brownish yellow (in some specimens mesoscutum

completely black); tegula, dorsellum and visible part of petiole pale yellow; legs yellow; pretarsus brown; wings hyaline, veins pale brown, pilosity of wings brown.

*Head* : Slightly collapsed; lower margin of clypeus bilobed, mandibles trilobed; POL 1.5x OOL; OOL 1.7x OD; eye bare, 1.16x as long as its width, 2.2x as long as MS; MS straight; antennal formula 11433; scape reaching level of vertex, little shorter than eye (9: 11); pedicellus plus flagellum 1.9x as long as width of mesosoma; antennal segments as in figure 57.

*Mesosoma* : 1.38x as long as broad; midlobe of mesoscutum 2.8x as long as its posterior width, 1.2x as long as its anterior width, surface with weak longitudinal reticulations; ML distinct, mesoscutum with 5 adnotaular setae on either side; scutellum 1.04x as wide as long, enclosed space between SMG 2.75x as long as wide; SMG a little nearer to SLG than to each other; dorsellum clearly visible in dorsal view, as long as median length of propodeum; dorsellum and propodeum lying subhorizontal to scutellum; propodeum 9x as broad as its median length, median carina distinct, surface reticulate; rim of spiracle partly covered by callus, touching posterior margin of metanotum; callus with 2 setae; spur of midtibia 0.83x as long as length of metatarsus; fourth tarsomere slightly shorter than metatarsus; hind femur 3.8x as long as broad. Forewing about 2.3x as long as broad; CC shorter than MV ; SMV with 6 dorsal setae; MV 4.4x as long as STV; marginal fringe 0.36x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Subsessile, with a small transverse petiole visible in dorsal view, 2.03x as long as mesosoma, 1.6x as long as combined length of head and mesosoma in side view; 26.5x as long as dorsal visible part of ovipositor sheath; 3.25x as long as broad in dorsal view; tergites weakly reticulate; hypopygium not reaching middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India: Kerala, Western Ghats, Wayanad Dt., Pookode Lake (11° 36' N 76° 6' E), 8.ii.2003, Coll. T. C. Narendran & Party.

*Paratypes* : 1Female, India: Kerala, Western Ghats, Wayanad Dt., Muthanga (11° 44' N 76° 29' E), 7.ix.1999, Coll. T. C. Narendran & Party; 3Females, India: Kerala, Malappuram Dt., Nilambur, Manimooly Forest (11° 16' N 76° 13' E), 29.i.2003, Coll. T. C. Narendran & Party; 1Female, India: Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T. C. Narendran & Party; 2Females, India: Kerala, Thiruvananthapuram (8° 40' N 77° 4' E), 8.xii.2004, Coll. T. C. Narendran & Party; 4Females, India: Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 30.i.2003, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Nilambur (11° 16' N 76° 13' E), 30.i.2003, Coll. T. C. Narendran & Party.

*Remarks* : The comment given under *malcis* is applicable to this species also.

46. *Aprostocetus nagri* Narendran sp. nov.  
(Fig. 61)

*Holotype : Female* : Length 1.18mm. Head brownish yellow; eye grayish yellow; ocelli brownish red; antenna brown with scape paler; tegula, legs including coxae pale yellow; mesosoma black; gaster black with basolateral region brownish yellow; wings hyaline with brownish tinge; veins and pilosity brown; setae on mesoscutum and scutellum pale yellow.

*Head* : Width in anterior view 1.05x its length; width in dorsal view 2.7x its median length; lower margin of clypeus entire, mandibles bidentate; POL 1.75x OOL; OOL 1.6x OD; occiput with moderately dense pilosity; eye bare, 1.3x as long as its width in side view, 2.25x as long as MS; MS curved anteriorly; antennal formula 11233; scape almost reaching front ocellus, shorter than eye length (7: 9); pedicellus plus flagellum 1.75x as long as width of mesosoma; antennal segments as in figure 61.

*Mesosoma* : 1.2x as long as wide; midlobe of mesoscutum 2x as long as its posterior width, as long as its anterior width, surface smooth and shiny without distinct reticulation; ML present, mesoscutum with 4 adnotaular setae on either side; scutellum 1.63x as wide as long, enclosed space between SMG 1.83x as long as broad; SMG a little nearer to SLG than to each other; scutellum with 3 pairs of dorsal setae, anterior pair in the middle of the proximal half of scutellum, middle pair approximately in the middle of scutellum; dorsellum clearly visible in dorsal view, about as long as median length of propodeum; propodeum 8x as broad as its median length; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by its own diameter, surface faintly reticulate; callus with 3 setae; spur of midtibia 0.6x as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4.4x as long as broad. Forewing 2x as long as broad; CC shorter than MV ; SMV with 3 dorsal setae; MV 3.9x as long as STV; marginal fringe 0.5x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sub sessile with a very short transverse petiole, shorter than mesosoma (18: 19), 0.7x as long as combined length of head and mesosoma in side view; 19.3x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate, mostly smooth; hypopygium exceeding middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Karnataka, Nagarhole (12° 1' N 76° 10' E), 16.viii.2001, Coll. P. A. Sinu.

47. *Aprostocetus nainitalensis* (Khan & Shafee)

1988. *Tetrastichus nainitalensis* Khan & Shafee; : 40-41. Female. India, Nainital (ZDAMU)

2004. *Aprostocetus nainitalensis* (Khan & Shafee); Hayat (2004) transferred.

The specimens can be identified using the characters mentioned in the key given above.

*Type locality* : India : Uttaranchal (Nainital, Pantnagar).

*Host* : *ex. Kerria lacca* (Kerr.) on *Mangifera indica* Linn.

48. *Aprostocetus narius* Narendran sp. nov.

(Fig. 12-14)

*Holotype* : *Female* : Length 2.42mm. Body yellow with brownish black markings as follows: area surrounding ocelli, apical half of pronotum (Fig. 13), median patch on mesoscutum, patch on anterior part of scapula, axilla, anterior part of scutellum and on sides of propodeum and gaster (Fig. 13); antenna brown with sides and ventral part of scape paler; eye reddish brown, ocelli pale reflecting yellow; apex of epipygium and ovipositor sheath black; legs including all coxae completely yellow; wings hyaline, veins and pilosity pale yellowish white.

*Head* : Partly collapsing; clypeal margin entire; POL 4.5x OOL; OOL 1.5x OD; mandible bidentate; eye bare, eye a little longer than broad (12: 10), 1.5x as long as MS in side view; MS straight. Antennal formula 11233; scape as long as eye length; pedicellus plus flagellum 1.15x as long as width of mesosoma; antennal segments as in Fig. 12.

*Mesosoma* : (Fig. 13) 1.4x as long as wide; midlobe of mesoscutum 2.2x as long as its posterior width, about as long as its anterior width; surface weakly, longitudinally reticulate. ML present; mesoscutum with 2 longitudinal row of setae near the notauli on either side; each row with 6-7 setae; scutellum 1.3x as broad as long; space between SMG 1.83x (22/12) as long as broad, SMG a little nearer to SLG than to each other. Dorsellum not visible in dorsal view; propodeum with median length extremely short, median carina absent, rim of spiracle fully exposed, almost touching posterior margin of metanotum; surface smooth and shiny with faint reticulations; callus with 2 setae on each side; spur of midtibia 0.71x length of metatarsus, fourth tarsomere little shorter than metatarsus (4: 7), hind femur 3.1x as long as broad. Forewing 2.43x as long as broad; CC shorter than MV; SMV with 5 dorsal setae; MV 3.27x as long as STV; Marginal fringe 0.25x length of STV; speculum closed behind by cubital line of setae (slightly extending to anterior side below MV).

*Gaster* (Fig. 14) : Sessile, 1.66x as long as mesosoma, 1.33x as long as combined length of head and mesosoma in side view; 15x as long as dorsal visible part of ovipositor sheath; tergites smooth, sparsely pubescent, partly collapsing from dorsal side, one cercal seta longer than others on either side; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown

*Holotype* : Female, India: Kerala, Palghat Dt., Kalkandi (11° 1' N 76° 28' E), 13.xii.1987, Coll. T.C. Narendran & Party.

*Paratypes* : 2 Females, India : Kerala, Palghat Dt., Siruvani forest, 26.ix.1987, Coll. T.C. Narendran & Party; 5 Females, India: Kerala, Palghat Dt., Kalkandi (11° 1' N 76° 28' E), 13.xii.1987, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Kannur Dt., Azheekode (11° 53' N 75° 24' E), 16.ii.2003, Coll. T.C. Narendran & Party; 2 Females. India: Kerala, Palghat Dt., Chindaki (10° 39' N 76° 40' E), 13.xii.1987, 13.xii.1988, Coll. T.C. Narendran & Party; 2 Females. India: Kerala, Palghat Dt., Muttikulangara, 12.xii.1987, 11.xii.1987, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Kannur Dt., Payyannur (12° 6' N 75° 12' E), 12.xii.1987, 26.xii.1988, Coll. T.C. Narendran & Party; 9 Females. India: Kerala, Wayanad Dt., Mananthody (11° 48' N 76° 1' E), 22.ii.1988, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Thrissur Dt., Peechi (10° 31' N 76° 13' E), 5.ii.1989, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Eranakulam Dt., Nedumbassery (10°1' N 76° 18' E), 12.i.2004, Coll. T.C. Narendran & Party; 2 Females. India: Kerala, Idukki Dt., Agali (11°9' N 76° 40' E), 12.xii.1987, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Idukki Dt., Vandiperiyar (11° 17' N 75° 51' E), 8.i.2004, Coll. T.C. Narendran & Party; 1 Female, INDIA: Kerala, Idukki Dt., Adimali (10° 2' N 76° 59' E), 3.xii.1988, Coll. T.C. Narendran & Party; 15 Females. India: Kerala, Wayanad Dt., Thariyod, 22.ii.1988, Coll. T.C. Narendran & Party; 2 Females, India: Kerala, Palghat Dt., Silent valley (10°51' N 76° 37' E), 30.xii.1988, Coll. M. Hayat; 1 Female, India: Kerala, Alapuzha Dt., CPCRI, Kayamkulam (9°10' N 76°30' E), 20.ii.1989, 19.ii.1989, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Thiruvananthapuram, Dt., Attingal (8° 41' N 76° 50' E), 22.ii.1989, Coll. T.C. Narendran & Party; 2 Females, India: Kerala, Waynad, Dt., Thonikadavu (11° 36' N 76° 6' E), 7.ii.2003, Coll. T.C. Narendran & Party; 1 Female, India: Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 14.xii.1978, Coll. M. Verma; 1 Female, India: Jharkhand, Ranchi (23° 21' N 85° 20' E), 27.ii.1994, Coll. S. B. Zeya & S. I. Kazmi; 1 Female, India: Uttaranchal, Dehradun (30° 18' N 78° 3' E), 14.xii.1978, Coll. M. Verma; 1 Female, India: Kerala, Kozhikode, Dt., Peruvannamuzhi, 21.ii.1989, Coll. T.C. Narendran & Party; 1 Female, India: Kerala, Malappuram, Dt., Calicut University Campus (11° 7' N 75° 5' E), 31.xii.1985, Coll. T.C. Narendran & Party; 9 Females, India : Kerala, Malappuram, Dt., Calicut University Campus (11° 7' N 75° 5' E), 26.iv.1989, 27.iv.1989, 30.iii.1989, 13.iii.1989. 15.iv.1989, 4.v.1989, 28.ix.1988, Coll. Surekha. K.

*Remarks* : This new species resembles *A. ille* Narendran in having mesoscutum with 2 rows of longitudinal setae, each row with 6-10 setae. However, both can be separated by using the key given in this work.

#### 49. *Aprostocetus neglectus* (Domenichini)

1907. [*Tetrastichus epilachnae* Giard; Marchal, : 14-16; Martelli, 1908 : 270-271; Masi, 1909 : 136-137. Misidentifications]
1954. [*Geniocerus epilachnae* Giard; Erdös, : 356. Misidentification.]
1957. *Tetrastichus neglectus* Domenichini, : Syntypes F. & M. 227-229. (?UCDS)
- 1961a. *Aprostocetus neglectus* (Domenichini) Graham, : 59; 1987 : 292.

The species can be distinguished by the good redescription provided by Graham (1987).

*Type locality* : Europe.

*Distribution* : Europe, Iran, India (Kashmir & Morocco).

*Hosts* : *Chilocorus bipustulatus* L., *C. bijugus* Mulsant, *Coccinella septempunctata* L., *Exochomus quadripustulatus* L., *Scymnus subvillosus* Gueze, *Adalia bipunctata*; *Chilocorus kuwanae* Silvestri (Graham, 1987).

50. *Aprostocetus neogala* Narendran sp. nov.

(Figs. 18-19)

*Holotype : Female* : Length 1.79mm. Yellow with the following parts otherwise : antenna, pretarsi, and (fourth tarsal segment partly) brown with scape paler; eyes reddish brown; ocelli pale reflecting yellow; black marks around ocelli, posterior side of head and median anterior part of pronotum. Area near base of hind wing, area around propodeal spiracle, transverse bands on gaster, distal end of epipygium and ovipositor sheath completely black or brownish black; wings hyaline, veins pale yellow, pilosity of wings pale brown; spines on mesoscutum and scutellum blackish brown, legs completely yellow including coxae except fourth tarsal segment and pretarsus.

*Head* : Partly collapsed; clypeal margin slightly sinuate medially; POL 3.16x OOL; OOL as long as OD; mandible tridentate, with inner tooth smaller; eye bare; 1.42x as long as its width in side view; 1.6x as long as MS in side view; MS straight. Antennal formula 11333; scape little shorter than eye length (8 : 10); pedicellus plus flagellum as long as width of mesosoma; antennal segments as in Fig. 18.

*Mesosoma* : 1.28x as long as wide; midlobe of mesoscutum 1.66x as long as its posterior width, about as long as its anterior width; surface reticulate. ML present; mesoscutum with 2-3 longitudinal rows of 12-14 setae near the notauli on either side; scutellum 1.5x as broad as its length; space between SMG 1.33x as long as broad; SMG a little nearer to SLG than to each other. Dorsellum not visible in dorsal view; propodeum with median length extremely short, as broad as 14x its median length; median carina absent; rim of spiracle partly covered by callus, separated from posterior margin by less than half its diameter, surface smooth and shiny with faint reticulations, callus with 2 or 3 setae on each side; spur of midtibia 0.75x length of metatarsus; hind femur 3.16x as long as broad. Forewing 2.21x as long as broad; CC shorter than MV; SMV with 3-4 dorsal setae; MV 4.14x as long as STV; marginal fringe 0.1x length of STV; speculum very large, extending up to STV below MV, partly open below.

*Gaster* : (Fig. 19) Sessile, 1.5x as long as mesosoma, 1.28x as long as combined length of head and mesosoma in side view, 11.57x as long as dorsal visible part of ovipositor sheath in dorsal view; tergites smooth, sparsely pubescent, slightly collapsing from above, one cercal seta longer than others on either side, sinuate; hypopygium exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown

*Holotype* : Female, India : Kerala, Kasaragod Dt., Chowki (12°31' N 74°59' E), 23.i.2003, Coll. T.C. Narendran & Party (ZSIC).

*Paratypes* : 1 Female, India : Kerala, Trivandrum Dt., (8°37' N 77°7' E) dam area, 24.ii.1989, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Pookode lake (11° 36' N 76° 6' E), 8.ii.2003, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Alappuzha Dt., Kayamkulam (9°10' N 76°30' E), 19.iv.2004, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Alappuzha Dt., Kayamkulam, CPCRI (9°10' N 76°30' E), 19.ii.1989, Coll. T.C. Narendran & Party; 4 Females, India : Kerala, Ernakulam Dt., Turner's hill, 2.iii.1993, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Kottayam Dt., Kumarakam (9°36' N 76°26' E), 17.iv.2004, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), 13.ix.2003, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 1989, Coll. T.C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 4.iv.1989, Coll. Surekha; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 5-6. x. 1984, Coll. M. Hayat; 1 Female, India : Kerala, Palghat Dt., Walayar forest, 4.iii.1999, Coll. S. B. Zeya & S. I. Kazmi.

*Remarks* : This species comes near *A. gala* in general appearance of gaster but *gala* differs from this new species by several characters as mentioned in the key given in this work.

### 51. *Aprostocetus nigricornis* (Khan & Shafee)

1988. *Tetrastichus nigricornis* Khan & Shafee. : 41-42. Female. India : Uttar Pradesh (ZDAMU).

2004. *Aprostocetus nigricornis* (Khan & Shafee). Hayat & Shahi : 306.

*Diagnosis* : *Female* : Length 1.6mm. Besides the characters given in the key following may be noted : antennal scape 4.5x as long as wide; forewing slightly more than 2x as long as wide.

*Type locality* : India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E).

*Host* : ex *Nipaeococcus* spp. on citrus.

### 52. *Aprostocetus obtusae* Narendran & David

2005. *Aprostocetus obtusae* Narendran & David. : 222-223. Female. India (ZSIC).

*Redescription* : *Female* : Length 1.17mm. Black (without metallic refringence) with the following parts as follows : antenna pale brown with scape and pedicellus pale yellow; tegula pale brownish yellow, fore coxa black with other segments of foreleg pale yellow, apex of fourth tarsal segment and pretarsus darker, mid coxa dark brown, remaining segments of midleg as in foreleg; hindcoxa dark brown with pale apex, remaining segments

of hindleg as in midleg; T1 and T2 pale brownish yellow; hypopygium except apical dorsal darker part pale brownish yellow, remaining parts of gaster black; forewing hyaline with veins brown; pubescence pale yellow.

**Head** : Collapsing, width in anterior view subequal to its length, a little less than width of mesosoma in dorsal view, nearly smooth; lateral ocellus slightly nearer to median ocellus than to eye; POL : OOL = 6 : 4; eye not subcircular, asetose; gena not convex; MS simple, not arcuate; toruli distinctly below lower ocular line; lower clypeal margin bilobate; antennal flagellum plus pedicellus 0.81x width of head; scape slender, distinctly shorter than eye to reaching vertex; pedicellus 2x as long as wide, subequal to F1 in length, slightly longer than F2, clava 3x as long as F3; flagellum slightly widening towards apex, 2.43x as long as scape, with two anelli; clava apparently two segmented with pointed apex, spicula not very distinct.

**Mesosoma** : 1.24x as long as broad, with longitudinal striation on mesoscutum; median lobe of mesoscutum with ML, with 5 adnotaular setae on either side, one of them situated slightly away towards innerside from the longitudinal row; scutellum 1.54x as broad as long, convex with pairs of setae, anterior ones slightly behind middle; SMG parallel, median area 2.16x as long as broad; slightly broader than area between SMG and SLG on either side; dorsellum 6x as broad as long. Propodeum as long as dorsellum with a broad median carina, submedian areas faintly reticulate; plical carina indistinct; spiracle almost touching metanotum, its rim not fully exposed, partly covered by overlapping propodeum. Hindcoxa weakly reticulate on its dorsolateral surface. Forewing 2.2x as long as wide, exceeding apex of gaster. Relative lengths of CC = 30; MV = 29; STV = 9; PMV hardly distinct; SMV with 4 dorsal setae; speculum closed behind by cubital line of setae.

**Gaster** : A little shorter than mesosoma; 1.27x as wide as maximum width of midlobe of mesoscutum, apex strongly tilted upwards; one of the cercal setae longer than others.

**Male** : Similar to Female except for the following characters : all funicular segments and clava with longer hairs; F1 distinctly shorter than pedicellus; claval apex with a narrow short spicule; gaster not as broad as that of Female, about 0.85x as broad as maximum width of middle of mesoscutum; gaster slightly longer than mesosoma.

**Type locality** : India : Tamil Nadu, Chennai.

**Host** : *Melanagromyza obtusa* (Malloch) (Diptera : Agromyzidae).

**Material examined** : Holotype and Paratypes.

### 53. *Aprostocetus percaudatus* (Silvestri)

1920. *Tetrastichus (Geniocerus) percaudatus* Silvestri. : 241. Syntype. Female. Italy. Piedimonte d'Alif (Caserta), 10.vi.1920; Bevagna, 5.xi.1920, from stems of *Melissa* (IEA).

1966a. *Tetrastichus percaudatus* Silvestri; Domenichini, : 136; 1966 :44; Kostjukov, 1978 :455.

1985. ?*Terebratella indica* Shafee & Rizvi, : 377-378. Holotype. Female. India : Bihar, Muzaffarpur, Jhapa, 5.xi.1969 (S. Adam Shafee) (ZMA). Bouček (1988) synonymised.

*Redescription : Female* : Length 1.6-2.1mm (excluding ovipositor) and ovipositor 2.8-3.8mm. Head yellowish with ocellar area and a spot above clypeus black with green tinge; hinder part of genae and temples, and occipital surface more or less, fuscous. Mesosoma bright green to blue-green; scapular flanges and upper angle of mesopleuron yellow. Gaster green to blue-green, sides with a row of yellowish spots which are sometimes joined; occasionally the tergites are crossed by obscure testaceous bands. Antennae brown to fuscous with scape and pedicellus sometimes paler beneath. Hindcoxae coloured like Mesosoma, legs otherwise yellow with fore tarsi brownish, mid and hind tarsi becoming brownish distally; extreme tips of tibiae sometimes faintly brownish. Tegulae yellow, hind edge sometimes brown. Wings hyaline, venation yellowish or pale testaceous.

*Head* : 1.25-1.30x as broad as mesoscutum, slightly more than 2x as broad as long; POL 1.6-1.7x OOL; OOL about 1.5x OD; eyes 1.25x as long as broad. Malar space about 0.6x length of eye, MS nearly straight. Mouth 1.1x malar space. Antenna with scape nearly as long as eye, reaching slightly above vertex; pedicellus plus flagellum 2-2.15x width of mesoscutum; pedicellus nearly or quite 2x as long as broad, about or hardly more than half length of F1; funicle proximally hardly stouter than pedicellus and hardly widening distad; F1 3.2-3.8x, F2 3-4.8x, F3 2.8-3.7x as long as broad; clava hardly broader than F3, somewhat shorter than F2 plus F3, 3.7-4.8x as long as broad.

*Mesosoma* : 2x as long as broad; propodeal slope about 45°. Pronotum subconical, atleast 0.33x length of mesoscutum. Midlobe of mesoscutum usually a little longer than broad, convex, shiny, with extremely fine and delicately engraved reticulation having elongate areoles; 3-4 adnotaular setae on each side, subequal in length and nearly as long as scutellum. Scutellum about 0.66x length of mesoscutum, about as long as broad, strongly convex, rather more finely and delicately sculptured than mesoscutum; SMG about equidistant from each other and from SLG, enclosing a space about 2.5x as long as broad; setae fine, their length slightly less than distance between SMG, anterior pair in or a little in front of middle. Dorsellum almost semicircular, 2-2.2x as broad as long. Propodeum long at sides, even medially as long as or slightly longer than dorsellum, shiny, with fine hardly raised reticulation; median carina distinct, broadening posteriorly; callus with 3-4 setae. Legs long and slender, especially tibiae and tarsi; spur of midtibia only about 0.33x length of basitarsus which is 7-8x as long as broad, remaining tarsomeres decreasing in length but all quite elongate, fourth about 4x as long as broad. Forewing 2.6-3x as long as broad; CC 18-20x as long as broad, distinctly shorter than MV; SMV with 3-5 dorsal setae; MV thin, about 6x length of STV, its front edge with 13-15 fine setae which are shorter than STV; STV at 40°, very thin proximally but expanding gradually into the small stigma; PMV rudimentary or a short stub; speculum small, extending as a narrow strip a little way below MV; wing beyond it moderately widely pilose; cilia 0.5-0.6 length of STV; hindwing bluntly to sharply pointed; cilia 0.33-0.40x width of wing.

*Gaster* : Gaster proper sub-linear, somewhat longer than head plus mesosoma, slightly narrower than mesosoma, acute but hardly acuminate; last tergite about as long as broad; post-cercal shorter than cerci, which are placed about middle of length of the tergite;

projecting part of ovipositor sheaths varying from about 0.7 length of gaster to longer than the whole body, and from 2.05 to 5x length of hind tibia.

*Type locality* : Italy : Piedimonte d'Alif (Caserta), Bevgana.

*Distribution* : Europe, India.

*Host* : *Oecanthus pellucens* (Scopoli).

*Material examined* : 6 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 29.iii.1989, Coll. K. Surekha; 10 Females, India : Kerala, Palghat Dt., Thoonakkadavu (Near Parambikulam) (10° 26' N 76° 49' E), 5.v.1989, Coll. T. C. Narendran & Party; Pathanamthitta Dt., Erumeli, 25.xi.1988, Coll. T. C. Narendran & Party; Alapuzha Dt., Central Plantation Crops and Research Institute (CPCRI), Kayamkulam (9°10' N 76°30' E), 20.ii.1989, Coll. T. C. Narendran & Party; Malappuram Dt., Nilambur, Kerala Forest Research Institute (KFRI) (11° 16' N 76° 13' E), 23.iv.1989, Coll. T. C. Narendran & Party; Palghat Dt., Malampuzha (10° 53' N 76° 46' E), 16.i.1986, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Kalpetta, 6.ii.2003, Coll. T. C. Narendran & Party; 3 Females, India : Kerala, Malappuram Dt., Nilambur Forest (11° 16' N 76° 13' E), 30.i.2003, Coll. T. C. Narendran & Party; 2 Females, India : Kerala, Alapuzha Dt., Onattukara (Near Kayamkulam) (9°10' N 76°30' E), 19.iv.2004, Coll. T. C. Narendran & Party; 1 Female, India : Bihar, Ramgurh, 1.iii.1994, Coll. S. B. Zeya & S. I. Kasmi.

#### 54. *Aprostocetus psyllidis* (Khan & Shafee)

1981. *Tetrastichus psyllidis* Khan & Shafee, 341-343. Female. India (ZDAMU).

*Aprostocetus psyllidis* (Khan & Shafee) Hayat and Shahi (2004) transferred.

The specimen can be identified using the characters mentioned in the key above and in the original description. Graham (1991) believed that *psyllidis* belong to the genus *Tamarixia* Mercet, but according to Hayat (2004), who examined the type, this species belongs to *Aprostocetus*.

*Type locality* : India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E).

*Host* : ex. Psyllids in leaf galls of *Grewia asiatica* Linn.

#### 55. *Aprostocetus purpureus* (Cameron)

1913. *Hadrothrix purpurea* Cameron, 4 : 103. Female. India : Dehradun (BMNH).

1923. *Tetrastichus immisii* Mahdihassan, 1 : 47. (Ferriere, 1928 synonymised).

1928. *Tetrastichus purpureus* (Cameron) Ferriere, 19 : 174.

1987. *Aprostocetus purpureus* (Cameron) Graham, : 353.

*Diagnosis* : *Female* : Length 1.50-1.80 mm. Scape reaching beyond front ocellus; gaster longer than mesosoma; other characters as given in the key above.

*Type locality* : India : Jharkhand : Ranchi.

*Distribution* : India : Bihar, Karnataka, Uttar Pradesh, West Bengal, Jharkhand.

*Host* : *Aonidiella orientalis*; *Coccoidea* (coccoid); *Coccophagus tschirchii*; *Icerya zimmermanni*; Kerriidae (lacciferid); *Laccifer*; *Laccifer chinensis*; *Laccifer javanus*; *Laccifer lacca*; *Laccifer sindica*; *Leptomastix dactylopii*; *Planococcus citri*; *Pseudococcus lilacinus*; *Tachardiaephagus tachardiae* (Noyes, 2003)

*Material examined* : 8 Females India : Jharkhand : Ranchi (23° 21' N 85° 20' E), 5.ii.1999, Coll. K. K. Kumar.

56. *Aprostocetus rajai* Narendran sp. nov.  
(Fig. 50)

*Holotype* : *Female* : Length 1.11mm. Black with slight metallic green reflections; eye and ocelli brownish red; antenna brown with scape and pedicellus yellow; legs yellow with fore coxa completely, hindcoxa basodorsally black; wings hyaline, veins pale brown, pilosity brown.

*Head* : Collapsing; lower margin of clypeus bilobed; mandible tridentate; POL 2x OOL; OOL as long as OD; eye bare, 1.3x as long as broad; 2.2x as long as MS; MS straight. Antennal formula 11233; scape not reaching level of vertex; a little shorter than eye length in profile; pedicellus plus flagellum as long as width of mesosoma; antennal segments as in figure 50.

*Mesosoma* : 1.23x as long as broad; midlobe of mesoscutum 1.5x as long as its posterior width; 0.75x as long as its anterior width; surface longitudinally and moderately reticulate; ML distinct; mesoscutum with 6 adnotaular setae on each side; scutellum 1.5x as broad as long; space between SMG 2.8x as long as broad; SMG a little nearer to SLG than to each other. Dorsellum not visible in dorsal view, about as long as median length of propodeum; propodeum 5.6x as broad as its median length, with a moderate median carina; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by half its diameter; surface smooth and shiny with traces of reticulations; callus with 2 setae on each side; spur of midtibia 0.83x as long as length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 3.7x as long as broad; forewing 1.94x as long as broad; CC shorter than MV; SMV with 4 dorsal setae ; MV 3.7x as long as STV; marginal fringe 0.33x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile; 1.4x as long as mesosoma, 1.17x as long as combined length of head and mesosoma in side view and 18x as long as dorsal visible part of ovipositor sheath; tergites usually smooth and shiny, slightly reticulate; hypopygium reaching beyond middle of gaster; one cercal seta on each side, slightly longer than others, not sinuate.

*Male* : Unknown.

*Host* : ex. *Nipaeococcus viridis*.

*Holotype* : Female, India : Karnataka, Bangalore (12° 58' N 77° 35' E), 12.vii.2005, Coll. Karibasavaraja (ZSIC).

*Paratype* : 1 Female, India : Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 16.xi.2003, Coll. T C. Narendran & Party.

*Remarks* : *A. versicolor* (Ranaweera) resembles this new species in the general body colour but can be separated from this new species by the characters mentioned in the key in this work.

57. *Aprostocetus retura* Narendran sp. nov.

(Fig. 23)

*Holotype* : Female : Length 1.46 mm. Head and mesosoma yellow with the following parts otherwise : pedicellus and flagellum dark brown, scape pale yellow, eye red, ocelli pale reflecting yellow, mandibles brownish black, occipital area black, propodeum and gaster black, mesopleura and metapleura blackish brown, legs yellow with base of hindcoxa slightly darkish; wings hyaline with veins pale brownish hyaline, pilosity of wings brown, setae on mesoscutum and scutellum brown, pubescence on gaster and propodeum pale yellow.

*Head* : Collapsing; clypeal margin bilobed, mandibles bidentate, POL 2.33x OOL, OOL 1.5x OD, eye bare, 1.18x as long as its width in side view; 2.16x as long as MS in side view; MS straight. Antennal formula 11433; scape a little shorter than eye length (11 : 13); pedicellus plus flagellum 1.25x width of mesosoma; antennal segments as in fig. 23

*Mesosoma* : 2.33x as long as wide; midlobe of mesoscutum 1.75x as long as its posterior width, as long as its anterior width, surface reticulate; ML present; mesoscutum with 5 adnotaular rows of setae on either side; scutellum 1.66x as broad as long; space between SMG 2x as long as broad, SMG a little nearer to SLG than to each other. Dorsellum clearly visible in dorsal view. Propodeum with median length subequal to median length of dorsellum, 8.5x as broad as long; median carina distinct and slightly raised; spiracle partly covered by callus, separated from posterior margin of metanotum by half its diameter; submedian area weakly reticulate; callus with 2 setae on each side. Spur of midtibia as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 3.33x as long as broad. Forewing 2.06x as long as broad; CC shorter than MV; SMV with 4-5 dorsal setae; MV 4.6x as long as STV; marginal fringe 0.4x length of STV; speculum closed behind by cubital line of setae, slightly extending anteriorly to below MV, but not reaching beyond MV.

*Gaster* : Sessile, 1.41x as long as mesosoma, 1.2x as long as combined length of head and mesosoma in side view and 15.33x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth, partly collapsed from dorsum; hypopygium reaching beyond middle of gaster, one cercal seta longer than others on either side and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Idukki Dt., Vandiperiyar, Manjumalai (11° 17' N 75° 51' E), 8.i.2004, Coll. T.C. Narendran & Party.

*Paratype* : 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 30.xi.1993, Coll. M. Hayat.

*Remarks* : The remarks given under *A.manja* is applicable here.

58. *Aprostocetus ricosus* Narendran sp. nov.

(Fig. 8-9)

*Holotype* : *Female* : Length 2mm. Yellow with following exceptions : eye brick red; ocelli reflecting yellow; pedicellus and flagellum dark brown; scape pale yellow with anterior dorsal side slightly darker; space between ocelli, median part of pronotum, a large patch from anterior margin to three-fourth region extending to posterior margin (but not reaching it) of mesoscutum, a spot on the anterior part of scapula (Fig. 9), anterior part of axilla and on scutellum, black. Scutellar spot and mesoscutal spot with slight metallic green reflections when viewed at certain angles of light; propodeum with median carina and a patch in between spiracle and median carina dark brown. Gaster with dark brown patches on sides dorsally; ovipositor sheath black; wings hyaline with veins pale brown, pilosity brown.

*Head* Partly collapsed; POL 1.44x OOL; OOL 2x OD; head width in anterior view 1.08x its length; mandible tridentate, inner tooth smaller than others; ocelli inside a semicircle connected to ocular sulcus by a cross sulcus, eyes with short sparse pubescence, eye little broader than long, 1.5x as long as MS in side view; MS straight. Antennal formula 11433; scape as long as eye length; pedicellus plus flagellum 1.38x as long as width of mesosoma; antennal segments as in fig. 8.

*Mesosoma* : (Fig. 9) 1.4x as long as wide, midlobe of mesoscutum 2x as long as its posterior width, as long as its anterior width; surface finely and longitudinally reticulate. ML absent; mesoscutum with 3 stout adnotaular setae on either side; setal pits distinct and raised; scutellum with ML weak and fading; a little over 1.5x as broad as long; space between SMG 1.9x as long as broad, SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, as long as median length of propodeum; propodeum 7.4x as broad as its median length, with a short median carina, rim of spiracle fully exposed, separated from metanotum by less than half its diameter, surface weakly reticulate, mostly smooth; callus with 5 setae on each side. Spur of midtibia 0.8x length of metatarsus, fourth tarsomere a little shorter than metatarsus; hind femur 4.5x as long as broad; forewing 2.6x as long as broad; CC shorter than MV; SMV with 5 dorsal setae; MV 6x as long as STV; marginal fringe 0.5x length of STV; speculum very small, closed behind by cubital line of setae.

*Gaster* : Sessile, 1.7x as long as mesosoma, 1.3x as long as combined length of head and

mesosoma in side view and 8.75x as long as dorsal visible part of ovipositor sheath in dorsal view; tergites smooth, sparsely pubescent, partly collapsing, one cercal seta longer than others on either side; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown

*Holotype* : Female, India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19.ii.2003, Coll. T.C. Narendran & Party (ZSIC).

*Paratypes* : 1 Female, India : Kerala, Kasargode, Karanthakad (12°31' N 74° 58' E), 21.i.2003, Coll. T.C. Narendran & Party; 1 Female, Orissa, Puri (19°45' N 85° 49' E), Sakigopal, 20.ii.1994, Coll. S. B. Zeya; 1 Female, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 13.xi.1979, Coll. M. Hayat; 1 Female, Kerala, Silent Valley (10°51' N 76° 37' E), 30.xii.1988, Coll. M. Hayat.

*Remarks* : The comments given under *A. benazeer* is applicable here.

#### 59. *Aprostocetus sankarani* Bouček

1986. *Aprostocetus sankarani* Bouček, 76 : 401-402. Female. India, Bangalore (BMNH).

*Redescription* : *Female* : Length : 0.9-1.3 mm. Mainly pale yellow; flagellum brownish, following parts brown : a dot on pronotum just above spiracle (with short vertical line), two small dots on either side of base of forewing, a conspicuous cross-band on T4 (on gaster). Tips of ovipositor sheaths black. Wings hyaline.

*Head* : About 1.1x as broad as mesoscutum, dorsally if not collapsed, almost 2x as broad as long, nearly smooth, dorsally with sparse white hairs, these only as long as longer diameter of ocellus. Lateral ocellus slightly nearer to the median than to eye, POL : OOL as 5.8 : 4; eye oval, sparsely pilose; gena convex, MS simple, arcuate (curving forward in middle). Scrobal sulci converging but reaching separately the transverse frontal sulcus; toruli about level with lower third of eyes; clypeal margin shortly bilobate. Mandibles with strong lower tooth separated by deep emargination from 2 small upper teeth. Antenna with flagellum plus pedicellus combined about 1.3x as long as width of head; scape slender, slightly longer than eye, by one-fifth exceeding the vertex level, on dorso-mesal surface vaguely reticulate; pedicellus fully 2x as long as broad, slightly shorter than F3, this about 2.5x, F1 fully 3x as long as broad, F2 intermediate; flagellum hardly widening towards apex, about 2.5x as long as the scapus, with one anellus; clava apparently two-segmented and with conspicuous apical spicula.

*Mesosoma* : About 1.3x as long as broad, dorsally with silky gloss due to microscopic and superficial longitudinal reticulation (almost smooth). Midlobe of mesoscutum without ML, with two short white adnotaular setae, anterior seta at middle of notaulus. Scutellum fully 1.5x as broad as long, convex, with two pairs of bristles : anterior ones long and erect, slightly behind middle, posterior ones less than half as long and moved strongly

laterad; SMG hardly diverging forward, median area about 1.7x as long as broad; SLG slightly converging forward, not carinate on outside, well visible dorsally. Dorsellum fully 3x as broad as long. Propodeum medially slightly longer than dorsellum, with narrow median carina ending at wide-angled and carinate adpetiolar margin; submedian areas raised-reticulate, especially laterally, there with plical carina curved in semicircle towards hind corner of propodeum but straight inner branch hardly noticeable; spiracle round, separated by its diameter from metanotum, spiracular rim wholly exposed, with one bristle on a small tubercle just above spiracle and one seta postero-laterally. Hindcoxa on dorso-lateral surface shiny, only vaguely finely reticulate. Forewing with relative length of CC =17; MV =20; STV = 4.5; PMV indistinct, about half as long as STV; SMV with one dorsal bristle.

*Gaster* : Petiole almost completely concealed. Gaster lanceolate, narrower than but almost 1.5x as long as mesosoma. Basal fovea on T1 almost semicircular, apparently finely carinate on margin.

*Male* : Length 0.6-1.1 mm. Brownish colour more extensive than in Female : it includes ocellar area, most of dorsal pronotum with narrow horizontal dark line anterior to black supraspiracular dot (but pale area above the line), broad macula anteriorly on mesoscutum, sometimes also axilla in anterior corner, then propodeum with adjacent part of posterior thoracic pleura, T1 along anterior and lateral border, sides of T2 and T3 and rest of gastral dorsum from hind margin of T3 on. Antenna longer than in Female, scape with rather short ventral carina situated in distal half; all four funicular segments and three claval segments with very long whorl-hairs, these gradually decreasing in length; claval apex with only narrow, inconspicuous spicula. Aedeagus with digital spine not continuous with inner margin of digitus. (Bouček, 1986).

*Type locality* : India : Karnataka (Bangalore), West Bengal (New record), Kerala (New record).

*Host* : ex. Galls on mango leaf.

*Material examined* : 2 Females, India : West Bengal, 2001, Coll. B. K. Das; 2 Females, India : Kerala, Malappuram Dt., March 1998, Coll. T. C. Narendran & Party.

#### 60. *Aprostocetus santalinus* Narendran

2003. *Aprostocetus santalinus* Narendran, (in Hayat *et al.*) 37 : 324-325. Female. India. (ZSIK).

*Redescription* : *Female* : Length 0.94-1.10mm. Black with metallic refringence; flagellum dark brown; scape, pedicellus, base and apex of femur, trochanter, tibia, tarsus pale yellow; tegula pale brownish yellow; coxa dark brown; gaster black with slight metallic refringence; T1 and T2 without paler colour; wings hyaline, veins pale whitish yellow.

*Head* : As long as broad in anterior view; subequal in width to mesosoma in dorsal view; dorsally (if not collapsed) 2.7x its maximum length, nearly smooth; lateral ocellus slightly nearer to median ocellus than to eye; POL : OOL = 13 : 8; eye subcircular, aetose,

gena not very convex; MS deep, not arcuate; toruli at level of ventral margin of eye; clypeal margin bilobate. Antennal flagellum plus pedicellus subequal to width of head; scape slender, slightly shorter than eye, not exceeding vertex, dorsomesal surface faintly reticulate; pedicellus a little less than 2x as long as wide, slightly longer than F1 but shorter than F2, which is subequal in length to F3; clava a little less than 2.4x length of F3; flagellum slightly widening towards apex, about 2.6x as long as scape, with one anellus; clava apparently 3 segmented and with short spicula at apex.

*Mesosoma* : 1.3x as long as broad, dorsally with silky gloss due to microscopic and superficial longitudinal reticulations; midlobe of mesoscutum with complete ML and four short adnotaular setae on each side; scutellum 1.4x as broad as long, convex, with 2 pairs of bristles; anterior scutellar bristles erect, slightly behind middle, posterior ones moved laterad; SMG hardly diverging forward; median area 1.72x as long as broad; SLG slightly converging forward, not carinate on outside, well visible dorsally. Propodeum medially distinctly longer than dorsellum, with a median carina, submedian areas subreticulate, plical carina indistinct or absent; spiracle subcircular, separated by its own diameter from metanotum; spiracular rim wholly exposed, with one bristle on either side near spiracle. Hindcoxa on dorsolateral side vaguely and finely reticulate. Forewing with relative lengths : CC = 31; MV = 37; STV = 12; PMV indistinct; SMV with 4 bristles.

*Gaster* : Petiole indistinct; gaster oval, narrower than mesosoma, about 1.7x as long as wide; basal fovea on T1 with sides partly carinate; cercus with one long and two short hairs.

*Male* : Length 0.75–0.83 mm. Antenna slightly longer than that of Female; scape with a short ventral carina on dorsal half; all four funicular segments and clava with long, sparse hairs; F1 a trifle shorter than pedicellus; claval apex with a narrow long spicula.

*Type locality* : India : Karnataka, Bangalore.

*Host* : ex *Ceroplastes actiniformis* on sandal wood.

*Material examined* : Types only.

#### 61. *Aprostocetus satpurensis* (Saraswat) comb.nov.

1978. *Tetrastichus satpurensis* Saraswat, 5 : 102. Female. India (SEA).

The original description and figures clearly indicate that the species belongs to the genus *Aprostocetus*.

*Redescription* : *Female* : Length 2.6 mm. body non-metallic, yellowish-brown with very dark brown to black markings; head very dark brown; eyes red; antennae very dark brown, scape and pedicellus yellowish-brown, except black basodorsal 0.50 of hindcoxa, all legs brownish-yellow; wings hyaline, veins light brownish; Gaster bright yellowish in the basal 0.33 and rest of the area blackish-brown.

*Head* : Viewed in front length : width = 72 : 100, concave in the middle, face finely reticulate with fine scattered setae; clypeal margin in the middle deeply notched with a pair of tooth-like projections close together; OOL 3x OD; front ocellar space equal to diameter of lateral ocellus; POL 3.50x OD; eyes obscurely, finely, sparsely pubescent, eye length : head length = 65 : 100; antenna : body = 46 : 100, antennal formula 11333; antennal sockets in the middle of face, well above level of lower orbital margins; scape moderately long, cylindrical, about 4.83x longer than wide; pedicellus 1.83x longer than wide, 0.37x of scape; F1 longest, 3.33x longer than wide and 1.80x pedicellus; F2 2.70x longer than wide and 0.80x of F1; F3 2x longer than wide and 0.87x of F2; clava stouter than funicle, distinctly 3 segmented, excluding terminal spicule 2.75x longer than wide, slightly more than 1.50x preceding funicular segments combined, terminal segment with a pointed spicule, 0.60x preceding claval segment, first segment of clava 1.25x longer than wide and 0.71x of the preceding funicular segment, second nearly as long as wide and 0.70x of the first, third shortly conical, only slightly wider than long and 0.71x of the second.

*Mesosoma* : Pronotum and propodeum largely but finely reticulate, mesoscutum and scutellum finely, longitudinally reticulate, reticulations more prominent in darker areas; pronotum with sparse, scattered fine hairs; mesoscutum with 6 bristles, in a row near notauli on each side, ML distinct and complete; scutellum with 2 pairs of very prominent longitudinal grooves, 2 bristles one behind other on either side of the inner grooves, one longer bristle posteriorly near margin on either side of inner grooves; propodeum with strongly developed median carina, narrowly forked in front from middle before meeting anterior margin of propodeum, paraspircular carinae moderately developed, not bifurcate; spiracle touching lateral margin and separated from anterior margin by about 0.50 of its own diameter; forewing length : width = 100 : 41; SMV with 8 setae directed forwards, 6 setae directed behind; MV with 12 long setae, stump of PMV with a single seta; SMV : MV : STV = 84 : 100 : 28; hind wing : forewing length = 82 : 100.

*Host* : Unknown.

*Type locality* : India : Madhya Pradesh, Pachmarhi, Panarpani.

*Remarks* : The above redescription is based on the original description by Saraswat (Courtesy to Saraswat, 1978).

## 62. *Aprostocetus selonus* Narendran sp. nov.

(Fig. 34)

*Holotype* : *Female* : Length 1.71 mm. Head and mesosoma brownish black with metallic green reflection; eye pale yellow with darkish tinge; ocelli pale reflecting yellow; antenna pale brown with scape paler; legs yellow with base of hindcoxa brown; gaster yellow with dorsum partly brown at sides, apical part with slight metallic green reflection. Wings hyaline with veins and pilosity brown; setae on mesoscutum and scutellum pale yellow.

**Head** : (Not collapsed) Width in anterior view 1.1x as broad as long, 3.4x as broad as long in dorsal view; POL 1.5x OOL; OOL 1.33x OD; eye with sparse minute pubescence, 1.25x as long as wide in side view; 3.12x as long as MS in side view; MS straight. Antennal formula 11443; scape distinctly exceeding level of vertex, almost as long as eye; pedicellus plus flagellum 2.95x as long as width of mesoscutum; antennal segments as in figure 34.

**Mesosoma** : 1.4x as long as wide; midlobe of mesoscutum 2.33x as long as its posterior width, 1.07x as long as its anterior width; surface mostly smooth and shiny with faint reticulations; ML absent; mesoscutum with 2 adnotaular setae on each side; scutellum a little over 1.1x as broad as long; space between SMG a little over 1.8x as long as broad, SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, as long as median length of propodeum; propodeum 8x as broad as its median length (2 : 16), with a short median carina, spiracle partly covered by callus, touching posterior margin of metanotum; surface weakly reticulate, callus with 2-3 setae on each side; spur of midtibia 0.62x length of metatarsus, fourth tarsomere much shorter than metatarsus; hind femur 4.66x as long as broad. Forewing 2.7x as long as broad; CC shorter than MV; SMV with 2 dorsal setae; MV 4.25x as long as STV; marginal fringe 0.5x length of STV; speculum closed behind by cubital line of setae.

**Gaster** : Sessile, 2x as long as mesosoma; 1.42x as long as combined length of head and mesosoma in side view; 5.83x as long as dorsal visible part of ovipositor sheath in dorsal view; tergites smooth and sparsely pubescent, partly collapsing; hypopygium reaching beyond middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, Sri Lanka, Central Candy District, Ganoruwa Forest area, near Peradeniya (7°17' N 80° 36'E), 13-14. viii.1999, Coll. M & J. Wasbauer, MT. (UC DC)

**Paratypes** : 2 Females, Sri Lanka, Central Candy District, Univ. Peradeniya, Hantana Mt. (7° 15' N 8° 37'E), 10-14. viii.1999, Coll. M & J. Wasbauer, MT. (UC DC)

**Remarks** : This new species comes near *A. vanillae* Narendran in having mesoscutum with 2 adnotaular setae on either side, but differs from each other by the characters mentioned in the key given in this work.

### 63. *Aprostocetus serycus* Narendran sp. nov.

(Fig. 63)

**Holotype** : Female : Length 0.8mm. Black; eyes grayish yellow; ocelli pale reflecting yellow, mandible brown; antenna black with pedicellus and scape blackish brown; tegula pale brown, coxae brown, trochanters pale yellow, fore and mid femora pale yellow, hind femora brown with base and apex paler, all tibiae and all tarsi pale yellow, pretarsi brown; wings hyaline with veins and pilosity brown.

*Head* : As long as its width in anterior view; lower margin of clypeus bilobed, mandibles bidentate; POL 1.7x OOL; OOL 1.5x OD; eye bare, 1.1x as long as wide in side view, 1.8x as long as MS; MS straight; antennal formula 11233; scape almost reaching ocellus, shorter than eye length (6 :9); pedicellus plus flagellum 1.4x as long as width of mesosoma; antennal segments as in figure 63.

*Mesosoma* : 1.8x as long as wide; midlobe of mesoscutum 1.6x as long as wide, 0.8x as long as its anterior width, surface smooth and shiny without distinct reticulation; ML absent; mesoscutum with 2 adnotaular setae on either side; scutellum 1.14x as broad as long; enclosed space between SMG 2.33x as long as broad; SMG little nearer to SLG than to each other; dorsellum slightly visible in dorsal view, about as long as median length of propodeum; propodeum 4.5x as broad as its median length; rim of spiracle partly covered by callus, touching posterior margin of metanotum, surface smooth and shiny, callus with 1 seta; spur of midtibia as long as metatarsus, fourth tarsomere as long as metatarsus; hind femur 4.8x as long as broad; forewing 2.13x as long as broad; CC shorter than MV; SMV with 3 dorsal setae; MV 3.25x as long as STV; marginal fringe 0.75x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile 1.1x as long as mesosoma; 0.73x as long as combined length of head and mesosoma in side view; 21x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth; hypopygium exceeding middle of gaster, one of the cercal setae on either side longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Ernakulam Dt., Nedumbassery (10°1' N 76° 18' E), 12.i.2004, Coll. T. C. Narendran & Party.

*Paratypes* : 1 Female collection data same as that of holotype; 1 Female, India : Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 7.xii.2003, Coll. T. C. Narendran & Party.

*Remarks* : This species does not resemble closely to any other species of Oriental Region. It can be separated from all other species by the characters mentioned in the key in this work.

**64. *Aprostocetus shimlicus* Narendran sp. nov.**  
(Figs. 56)

*Holotype* : *Female* : Length 1.53 mm. General colour dark brown mixed with paler patches; head dark brown with lower frons and gena slightly paler; eyes brick red; ocelli pale reflecting yellow; antenna brown with scape, pedicellus and anelli pale yellow; mesosoma dark brown on dorsal side, slightly paler on pleural side; legs yellow with fore and hindcoxa and hind femur yellowish brown basally; tegula pale yellow; wings hyaline with veins pale yellowish white, pilosity of wings brown; setae on mesoscutum and scutellum pale yellowish brown; gaster dark brown with paler bands.

**Head** : Not collapsed; width in anterior view 1.19x its length; width in dorsal view 4.14x its length; lower margin of clypeus bilobed; mandible bidentate; POL 1.6x OOL; OOL 1.33x OD; eye bare, 1.3x as long as broad in side view, 1.75x as long as MS; MS straight; antennal formula 11433; scape not exceeding level of vertex, almost as long as eye length; pedicellus plus flagellum 1.33x as long as width of mesosoma; antennal segments as in figure 56.

**Mesosoma** : 1.21x as long as wide; midlobe of mesoscutum 2.2x as long as its posterior width, 1.1x as long as its anterior width; surface longitudinally reticulate; ML distinct and complete; mesoscutum with 5 adnotaular setae on either side; scutellum 1.83x as broad as long; space between SMG 3.7x as long as broad; SMG little nearer to SLG than to each other; dorsellum slightly visible in dorsal view, weakly punctate, 0.8x as long as median length of propodeum; propodeum 9.14x as broad as its median length; median carina present; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by less than half its diameter; surface weakly reticulate; callus with 3 setae on each side; spur of midtibia as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 5.6x as long as broad; forewing 2x as long as broad; CC shorter than MV; SMV with 4 dorsal setae ; MV 3.7x as long as STV; marginal fringe 0.44x as long as STV; speculum closed behind by cubital line of setae.

**Gaster** : Sessile; 1.7x as long as mesosoma; 1.5x as long as combined length of head and mesosoma in side view; 11x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate; hypopygium not reaching middle of gaster; one of the cercal seta longer than others but not sinuate.

**Male** : Similar to Female, except gaster relatively shorter, antennal segments longer with longer hairs, clava with a long spine at apex.

**Host** : Emerged from leaf galls on Oak (*Quercus leucotrichophora*)

**Holotype** : Female, India : Himachal Pradesh, Shimla (31°6' N 77°10' E), 5.vi.2004, Coll. R. M. Sharma.

**Paratypes** : 2 Females and 2 Males. Collection data same as that of holotype.

**Etymology** : Species name is after the locality Shimla, from where the specimens were collected.

**Remarks** : This species resembles *A. tritrichia* Saraswat in the general colour of gaster but can be very clearly separated from that species by the characters mentioned in the key in this work.

#### 65. *Aprostocetus sringeriensis* Narendran sp. nov.

(Fig. 68)

**Holotype** : Female : Length 1.64 mm. Bright metallic green with the following parts as follows : eye dark and reflecting yellow; ocelli reflecting pale yellow; antennal flagellum

dark brown with scape pale yellow; tegula and adjacent a small area below tegula yellow; legs whitish yellow with following parts otherwise : hindcoxa concolorous with mesosoma; pretarsi complete; third and fourth tarsal segments of mid and hind tarsi brown; pretarsi dark brown; one-third of gaster from anterior end yellow; remaining two-third of gaster dark metallic green; wings hyaline; veins pale yellowish brown; pilosity of wings brown; pilosity of mesosoma pale yellow.

*Head* : Not collapsed; width in anterior view equal to its length; width in dorsal view 3.1x its median length; POL 2x OOL; 1.5x OD; eye bare, its length subequal to its width in side view, 1.4x as long as MS in side view; MS straight. Antennal formula 11433; scape slightly exceeding level of vertex, as long as eye; pedicellus plus flagellum 2.1x width of mesosoma; antennal segments as in figure 68.

*Mesosoma* : 1.46x as long as broad; pronotum smooth and shiny with a slightly raised ridge like cross area (not forming a carina) near posterior margin; with a strong admarginal seta and two or three smaller admarginal setae on either side; midlobe of mesoscutum smooth and shiny without distinct reticulations, 1.4x as long as its posterior width, a little shorter than its anterior width (7 : 8), ML absent, 3 adnotaular setae on each side, posterior pair stronger and longer; scutellum a little wider than long; enclosed space between SMG a little over 2x as long as its maximum width; SMG a little nearer to SLG than to each other and slightly diverging posteriorly; dorsellum clearly visible in dorsal view; propodeum 1.5x as long as dorsellum; propodeal spiracle almost exposed, separated from metanotum by about its own diameter; median carina present, surface of propodeum smooth and shiny; each callus with 4 setae; spur of midtibia 0.44x as long as midmetatarsus; hind femur 5x as long as broad; forewing (excluding fringe) 2.85x as long as wide; CC shorter than MV; SMV with 2 dorsal setae; MV 3.4x as long as STV; marginal fringe as long as STV; speculum absent, setose.

*Gaster* : Sessile; 1.58x as long as mesosoma; a little more than 6x length of dorsal visible part of ovipositor sheath; hypopygium not reaching middle of gaster, each cercus with one seta longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Karnataka, Sringeri, Marikebelu (13°25' N 75°15' E), 14.x.2003, coll. P. A. Sinu (ZSIC).

*Paratypes* : 4 Females collection data same as that of holotype; 1 Female, India : Kerala, Calicut Dt., Chaliyam (11° 9' N 75° 49' E), 14.iii.2003, coll. T. C. Narendran & Party.

*Etymology* : Species name is after the locality Sringeri, from where the specimen was collected.

*Remarks* : This species can be separated from its related species by the characters mentioned in the key in this work.

66. *Aprostocetus silenti* Narendran sp. nov.  
(Fig. 24-25)

*Holotype : Female* : Length 1.14mm. Head yellow with brown patch between hind ocelli with slight metallic green reflection; eyes grayish yellow; ocelli reflecting pale brownish yellow; mandibles brown with apex darker; antenna pale brown with anelli, pedicellus and scape paler; dorsum of gaster dark metallic green; lateral panel of pronotum, prepectus, tegula and upper part of mesopleura yellow; remaining part of mesopleura and metapleura brown; legs yellow with base of hindcoxa brown with metallic green reflection; pretarsus brown; gaster yellow with brown patches at sides on dorsum; ovipositor sheath black; setae on mesoscutum and scutellum pale white; wings hyaline with veins pale yellowish hyaline, pilosity pale brownish yellow.

*Head* : Partly collapsing; lower clypeal margin minutely sinuate medially; mandibles bidentate; POL 3.33x OOL; OOL 1.5x OD; eye minutely pubescent, 1.37x as long as broad in side view, 2.7x as long as MS in side view; MS straight. Antennal formula 11433; scape a little shorter than eye (9 : 10); pedicellus plus flagellum 1.8x maximum width of mesosoma; antennal segments as in fig. 24.

*Mesosoma* : (Fig. 25) 1.88x as long as its maximum width; midlobe of mesoscutum 1.94x as long as its posterior width, as long as its anterior width, surface distinctly and longitudinally reticulate; ML faint; mesoscutum with 2 adnotaular rows of setae on either side; scutellum 1.30x as broad as long,; space between SMG 2x as long as broad, SMG nearer to SLG than to each other. Dorsellum clearly visible in dorsal view. Propodeum subequal to dorsal median length of dorsellum, width 5.33x its median length; median carina raised; spiracle relatively small, almost touching posterior margin of metanotum, partly covered by callus; surface of propodeum reticulate; callus with 2 setae, one placed anteriorly and another posteriorly. Spur of midtibia 0.75x length of metatarsus; fourth tarsal segment of midleg as long as metatarsus; hind femur 3.4x as long as wide. Forewing 2.83x as long as its maximum width; CC shorter than MV; SMV with 2 dorsal setae; MV 3.4x as long as STV; marginal fringe as long as STV; speculum very small, closed behind by cubital line of setae.

*Gaster* : sessile, 1.5x as long as mesosoma, 1.2x as long as head plus mesosoma, 17.7x as long as visible part of ovipositor sheath in dorsal view, tergites mostly smooth, collapsed from dorsal side, hypopygium well exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Palghat Dt., Mukkali (Near Silent Valley) (10°51' N 76° 37' E) 30.xii.1988, Coll. M. Hayat.

*Paratypes* : Female, India : Kerala, Trivandrum Dt., Vithura (8°40' N 77°7 E), 8.iii.2000, Coll. T. C. Narendran & Party.

*Remarks* : This species does not come near any other Oriental species and can be easily separated from all other species by the characters given in the key in this work.

67. *Aprostocetus taruna* Narendran sp. nov.  
(Fig. 59)

*Holotype* : *Female* : Length 1.94mm. Black with the following parts pale yellow : trochanter, apices of femora, bases and apices of tibiae, first tarsal segment basally; wings hyaline; veins pale yellowish white; pilosity on wings pale brown; setae on mesoscutum pale white, setae on scutellum dark brown.

*Head* : Width in anterior view 1.21x as broad as long, width in dorsal view 7x its median length; lower margin of clypeus bilobed, mandibles bidentate; POL 1.44x OOL; OOL 2x OD; eye bare, 1.33x as long as broad, 2.4x as long as MS; MS straight; antennal formula 11433; scape not reaching front ocellus, 0.67x as long as eye; pedicellus plus flagellum a little shorter than (at the most equal to) width of mesosoma; antennal segments as in figure 59.

*Mesosoma* : 1.3x as long as broad; midlobe of mesoscutum 1.55x as long as its posterior width, a little shorter than its anterior width (14 :15), surface with distinct longitudinal reticulations; ML distinct, mesoscutum with 6 adnotaular setae on either side; scutellum 1.5x as wide as long, enclosed space between SMG 2.6x as long as its width; SMG a little nearer to SLG than to each other; dorsellum clearly visible in dorsal view, as long as median length of propodeum; propodeum 7x as broad as its median length, with a short median carina, surface distinctly reticulate; rim of spiracle partly covered by callus, touching posterior margin of metanotum; callus with 6 setae; spur of midtibia 0.75x as long as length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4.4x as long as broad. Forewing about 2x as long as broad; CC shorter than MV ; SMV with 6 dorsal setae; MV 4.2x as long as STV; marginal fringe 0.3x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile; 1.24x as long as mesosoma and as long as combined length of head and mesosoma in side view; 20.3x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate; hypopygium exceeding middle of gaster; one of the cercal setae on either side longer than others and sinuate.

*Male* : Essentially similar to Female except for antenna and gaster.

*Host* : Button galls on Oak leaves.

*Holotype* : Female, India : Arunachal Pradesh, Bomdila, W.Kameng Dt., 500 ft. 24.iv.2001, Coll. S. Sheela.

*Paratypes* : 9 Females, India : Himachal Pradesh, Korgu, Sarahan Dt., Shimla (31°6' N 77°10' E), 20.v.2004, 18.iv.2004, Coll. S. Chakrabarti; 8 collection data same as that of holotype.

*Variation* : Paratypes are black with slight metallic green reflection.

*Remarks* : The remarks given under *A. dellus* is applicable here.

68. *Aprostocetus travancorensis* (Saraswat) comb. nov.

1975. *Tetrastichus travancorensis* Saraswat, 4 : 26. F. India (SEA).

*Redescription* : *Female* : Length 2.60–2.64 mm. body black, with metallic bluish green reflections; eyes and mandibles reddish brown, antennae dark brown, scape and pedicellus brown; ateroidorsal part of hindcoxa basally dark brown, otherwise legs brown; wings hyaline, veins brown.

*Head* : In front view length : width = 80 : 100; eyes sparsely pubescent; mandibles tridentate; antennal formula 11333; antennal sockets slightly above lower orbital border; scape long, about 6x longer than wide; pedicellus 2x longer than wide and 0.40x as long as scape; F1 longest, 2.80x longer than wide, 1.40x pedicellus; F2 only very slightly shorter than F1, about 2.60-2.70x longer than wide; F3 shortest, 0.90x F2, 2x as long as wide; clava stouter than funicle including terminal spicule about 3x longer than wide, slightly shorter than F2 plus F3; first claval segment 1.12x longer than wide and about 0.75x of F3; second 1.14x wider than long and about 0.80x of the first; third with a short pointed spicule, including spicule 1.33x longer than wide and subequal to second claval segment.

*Mesosoma* : Mesoscutum and scutellum very finely, longitudinally reticulately striate; mesoscutum with ML faint, 3 bristles along the notauli on each side and a pair along posterior margin; propodeum with a median carina, a short carina from anterior margin extending laterally to spiracle, paraspircular carinae absent; spiracle touching lateral margin and separated from anterior margin by 0.75x of its diameter; forewing length : width = 100 : 40; SMV, MV and PMV with 4-5, 13-14, and 1-2 long setae respectively; SMV : MV : PMV : STV = 73 : 100 : 3 : 18.

*Gaster* : Reticulate, only very slightly longer than 0.50x length of body; ovipositor a little exerted.

*Distribution* : India.

*Type locality* : India : Kerala, Travancore.

*Host* : Unknown.

*Material examined* : 1 Female, India : Kerala, Palghat Dt., Agali (11°9' N 76° 40' E), 12.xii.1987, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Parappanangadi (11° 3' N 75° 52' E), 7.vii.1987, Coll. T. C. Narendran & Party.

69. *Aprostocetus tritrichia* (Saraswat) comb. nov.

1975. *Tetrastichus tritrichia* Saraswat, 4 : 29. [SEA] India.

*Redescription* : *Female* : Length 2.22 mm. Body non-metallic, except for faint metallic

green reflections anteriorly on mesoscutum and middle of metanotum, otherwise body brownish yellow with brown to dark brown markings on mesosoma and gaster; head reddish yellow; eyes red; ocelli dark brown to black; mandibles reddish brown; antennae except yellowish brown scape and pedicellus black; legs brownish yellow; wings hyaline, veins brownish.

*Head* : In front view, 1.37x as wide as long; clypeal margin in the middle with a pair of tooth like projections; OOL about 1.75x OD; eyes very sparsely pubescent; mandibles tridentate, inner tooth truncate; antennal formula 11433, antennal sockets almost in the centre of frons; scape moderately long, slightly curved ventrally, slightly widened in the middle, including radicle subequal to F1, 4x longer than wide; pedicellus 2.25x longer than wide, 0.41x of scape; anelli narrower than funicle, first anellus widest, second and third subequal and shorter than fourth, fourth a little shorter than first; funicular segments slender, cylindrical, F1 longest, about 7x longer than wide, and about 2.70x pedicellus; F2 4.60x longer than wide, 0.66x of F1; F3 shortest, 3.50x longer than wide, 0.80x of F2; clava stouter than funicle, indistinctly 3 segmented, 3.33x longer than wide and about 1.33x preceding funicular segment combined, terminal segment with a short mucro.

*Mesosoma* : Pronotum, metanotum and propodeum finely reticulate, mesoscutum and scutellum very finely longitudinally reticulate; pronotum also with sparse, scattered, deep punctae; mesoscutum with 3 bristles near notauli on each side, ML faint; scutellum with 2 pairs of prominent longitudinal grooves, 2 bristles posteriorly, one behind the other on either side of inner grooves, one bristle on posterior margin on either side of the inner grooves; one pair of short bristles on metanotum; propodeum with strongly developed median carina, paraspiracular carinae absent, one bristle laterally behind anterior margin and one bristle laterally in front of the posterior margin on each side, spiracle separated from anterior and from the lateral margins by its own diameter and 0.50x of its diameter respectively; forewing length to width 100 : 38; SMV with 7 long dorsal setae directed towards front margin; MV with 13 long setae, SMV : MV : STV = 70 : 100 : 20; hind wing to forewing length = 78 : 100; hindcoxa about 2x longer than wide; femur 4x longer than wide, 1.43x coxa, with a single long seta subapically below; tibia long, slender, slightly widened apically, 11.30x longer than wide; 1.40x femur, spur 0.14x of tibia; tarsus 0.82x of tibia, metatarsus 0.23x about 0.28x of tarsus, second segment equal to metatarsus, third 0.84x of metatarsus or the second, fourth subequal to the third.

*Gaster* : Gaster with fine, reticulate micro-sculpture, 0.58x as long as body; ovipositor well exerted beyond the tip of gaster.

*Distribution* : India.

*Type locality* : India : Kerala, Moozhiyar, Cardamom Hills.

*Material examined* : 1 Female, India : Kerala, Malappuram, Parappanangady (11°4' N 76°4' E), 28.vii.1987, Coll. T C. Narendran & Party; 3 Females, India : Kerala, Palghat Dt., Malampuzha (10° 53' N 76° 46' E), 11.xii.1987, Coll. T C. Narendran & Party.

70. *Aprostocetus uthonia* Narendran sp. nov.

(Fig. 45)

**Holotype : Female :** Length 2 mm. Head and mesosoma dark metallic green, gaster dark metallic green with basal half mostly yellowish; eyes red; ocelli pale reflecting yellow; antenna brown with scape and pedicellus yellow; mandibles brown; tegula and adjacent area pale yellow; all legs whitish yellow except for dark brown basal half of hindcoxa; pretarsus brown; wings hyaline with veins pale brown, pilosity brown; setae on mesoscutum and scutellum pale yellow.

**Head :** Partly collapsing; lower margin of clypeus bidentate, mandible tridentate; POL 1.5x OOL; OOL 2x OD; eye bare, 1.5x as long as broad; 2.25x as long as MS; MS straight. Antennal formula 11333; scape not reaching level of vertex, a little shorter than eye length in profile; pedicellus plus flagellum 2x as long as width of mesosoma; antennal segments as in figure 45.

**Mesosoma :** 2x as long as wide; midlobe of mesoscutum 2.5x as long as its posterior width, 1.1x as long as its anterior width; surface (with weak reticulations) mostly smooth and shiny; ML absent; mesoscutum with 4 adnotaular setae on either side; scutellum 1.25x as broad as long; space between SMG 2x as long as broad, SMG little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, about half as long as median length of propodeum; propodeum 4x as broad as its median length, with a moderate median carina; rim of spiracle partly covered by callus, separated from posterior margin by its own diameter; surface faintly reticulate, mostly smooth and shiny; callus with 2 setae on each side; spur of midtibia as long as metatarsus; fourth tarsomere shorter than metatarsus; hind femur 5x as long as broad. Forewing 2.5x as long as broad; CC shorter than MV; SMV with 2 stout dorsal setae; MV 4x as long as STV; marginal fringe 0.8x as long as length of STV; speculum setose.

**Gaster :** Sessile; 1.81x as long as mesosoma, 1.18x as long as combined length of head and mesosoma in side view and 8.8x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth and shiny; slightly collapsed from dorsal side, hypopygium reaching middle of gaster, one cercal seta on each side longer and sinuate.

**Male :** Unknown.

**Host :** ex. *Paratachardia lobata*, and ex. Leaf gall of *Ficus bengalensis* L.

**Holotype :** Female, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T. C. Narendran & Party (ZSIC).

**Paratypes :** 5 Females, India : Kerala, Wayanad Dt., Thonikadavu (Kalpetta) (11° 36' N 76° 6' E), 7.ii.2003, Coll. T. C. Narendran & Party; 7 Females, India : Kerala, Kottayam Dt., Kumarakam (9°36' N 76°26' E) , 17.iv.2004, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Idukki Dt., Vandiperiyar, Manjumalai, Cardamom Plantations (11° 17' N 75° 51' E), 8.i.2004, Coll. T. C. Narendran & Party; 4 Females, India : Kerala, Alapppy Dt., Onattukara (9°10' N 76°30' E), 19.iv.2004, Coll. T. C. Narendran & Party; 2 Females, India

: Kerala, Malappuram Dt., C. U. campus, 3.ii.2001, 5.xii.2002, Coll. T. C. Narendran & Party; 3 Females, India : Kerala, Malappuram Dt., C. U. campus, 21.xi.1993, 2.vii.1994, 3.vii.1994, Coll. S. Sheela & T. C. Narendran; 2 Females, India : Kerala, Wayanad Dt., Thariyodu (11° 40' N 75° 57' E), 22.ii.1988, Coll. T. C. Narendran & Party; 3 Females, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, Coll. T. C. Narendran & Party; 3 Females, India : Kerala, Kannur Dt., Kavinissery (11° 55' N 75° 22' E), 16.ii.2003, Coll. T. C. Narendran & Party; 3 Females, India : Tamil Nadu, Coimbatore (11° 0' N 76° 58' E), 3.iii.1993, Coll. S. I. Kazmi; 1 Female, India : Kerala, Kozhikode Dt., Chaliyam (11° 9' N 75° 49' E), 14.iii.2003, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Nilambur, Manimooly Forest (11° 16' N 76° 13' E), 29.i.2003, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kasaragod Dt., CPCRI (12°30' N 74°59' E), 23.i.2003 Coll. T. C. Narendran & Party; 2 Females, India : Kerala, Kozhikode Dt., Cheruvannur, 29.i.2002, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19.ii.2003, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Thrissur Dt., Peechi (10° 31' N 76° 13' E), 10.v.2002, Coll. Sudheer, K; 3 Females, India : Kerala, Alappay Dt., Kayamkulam, CPCRI (9°10' N 76°30' E), 20.iv.2004, Coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode Dt., Anakampoyil, 17.x.1995, Coll. Sudheer, K; 1 Female, India : Karnataka, Bangalore, Gottipura (12° 58' N 77° 35' E), 8.ix.2005, Karibasaraaja; 1 Female, India : Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 14.ii.2004, Coll. T. C. Narendran & Party; 1 Female, India : Karnataka, Hosmotta, 17.ii.1988, Coll. T. C. Narendran & Party; 2 Females, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), iv.1979, 20.x.1979, Coll. M. Hayat & M. Verma; 1 Female, India : Kerala, Kasaragod (12°30' N 74°59' E), 22.i.2003, Coll. T. C. Narendran & Party.

*Remarks* : This new species comes near *A. travancorensis* (Saraswat) in having somewhat similar colouration but can be separated by the characters mentioned in the key in this work.

#### 71. *Aprostocetus vanillae* Narendran sp. nov.

(Fig. 48)

*Holotype* : *Female* : Length 2.1 mm. Yellowish brown with metallic green reflections on mesosoma and slightly on gaster; eyes reddish brown; lower frons brownish yellow; teeth of mandible brown; antenna dark brown with scape and pedicellus slightly paler; dorsum of mesosoma dark metallic green; sides of mesosoma brownish yellow, with ventral half of meso and metapleuron darkish; legs yellow with basodorsal part of hindcoxa brown; gaster pale brownish yellow with sides brownish black, with slight metallic green reflections; ovipositor sheath black; wings hyaline, with veins pale brown, pilosity of wings brown.

*Head* : Collapsing and appears lenticular; lower margin of clypeus bilobed, mandible tridentate; POL 2.6x OOL; OOL 1.5x OD; eye bare, 2.6x as long as broad, 1.9x as long as MS; MS straight. Antennal formula 11433; scape slightly exceeding level of vertex, a little shorter than eye in profile; pedicellus plus flagellum 2.9x as long as width of mesosoma; antennal segments as in figure 48.

**Mesosoma** : 2x as long as wide; midlobe of mesoscutum 2x as long as its posterior width, as long as its anterior width; surface strongly and longitudinally reticulate; ML absent; mesoscutum with 2 adnotaular setae on either side; scutellum as broad as long; space between SMG 2.9x as long as broad, SMG a little nearer to SLG than to each other. Dorsellum distinctly visible in dorsal view, as long as propodeum; propodeum 6x as broad as its median length, with a flat median carina; rim of spiracle partly covered by callus, separated from posterior margin by less than half its diameter; surface distinctly reticulate; callus with 2 dorsal setae on each side; spur of midtibia 0.4x length of metatarsus; fourth tarsomere shorter than metatarsus; hind femur 4.3x as long as broad. Forewing 3x as long as broad; CC shorter than MV; SMV with 2 dorsal setae; MV 5.3x as long as STV; marginal fringe 0.6x as long as length of STV; speculum small, closed behind by cubital line of setae.

**Gaster** : Sessile; 3x as long as mesosoma, 2.4x as long as combined length of head and mesosoma in side view; 7.1x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth and shiny, slightly reticulate; hypopygium not reaching middle of gaster, one cercal seta on each side longer than others and sinuate.

**Male** : Unknown.

**Host** : Emerged from larvae of leaf webber of Vanilla plant.

**Holotype** : Female, India : Tamil Nadu, Coimbatore (11° 0' N 76° 58' E), 11.i.2000, Coll. T. C. Narendran & Party (ZSIC).

**Paratypes** : 2 Females, collection data same as that of holotype; 2 Females, India, West Bengal, Mandauri, 12.vii.1995, Coll. Majundar; 1 Female, India : Kerala, Malappuram Dt., Nilambur, Manimooly Forest (11° 16' N 76° 13' E), 29.i.2003, Coll. T. C. Narendran & Party.

## 72. *Aprostocetus vatiata* Narendran sp. nov.

(Figs. 58)

**Holotype : Female** : Length 1mm. Dark brown with lower frons, mesopleura, metapleura, coxae and gastral tergites light brown; eyes grey; ocelli brown; antenna pale brownish yellow with scape, pedicellus, anelli and F1 pale yellow; tegula pale yellow; legs except for coxae pale yellow with fourth tarsal segment and pretarsi brown, wings hyaline with yellowish veins, pilosity pale brownish yellow.

**Head** : Partly collapsing; lower margin of clypeus entire, mandibles bidentate; POL 2.5x OOL; OOL as long as OD; eye bare, 1.17x as long as wide, 1.75x as long as MS; MS straight; antennal formula 11233; scape not reaching level of vertex, a little shorter than eye (6 : 7); pedicellus plus flagellum 0.83x as long as width of mesosoma; antennal segments as in figure 58.

**Mesosoma** : A little longer than wide (14 : 13); midlobe of mesoscutum 1.5x as long as its posterior width, as long as its anterior width, surface with longitudinal reticulations;

ML distinct and complete; mesoscutum with 3 adnotaular setae on each side; scutellum twice as wide as long; enclosed space between SMG 1.5x as long as wide; SMG a little nearer to SLG than to each other; dorsellum not visible in dorsal view, in posterior view length of dorsellum subequal to median length of propodeum; propodeum about 9x as broad as its median length; median carina weakly distinct; rim of spiracle partly covered by callus, touching posterior margin of metanotum, surface weakly reticulate; callus with 1 or 2 setae; spur of midtibia 0.8x as long as metatarsus; fourth tarsomere slightly shorter than metatarsus; hind femur 3.25x as long as broad; forewing 2.33x as long as broad; CC shorter than MV; SMV with 3 dorsal setae; MV 2.83x as long as STV; marginal fringe 0.33x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile; 1.36x as long as mesosoma, as long as combined length of head and mesosoma in side view, 20x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate; hypopygium exceeding middle of gaster; one of the cercal setae on either side longer than others.

*Male* : Unknown

*Host* : Coccids on Euphorbia.

*Holotype* : Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 19.viii.1979, Coll. M. Verma (ZSIC).

*Paratypes* : 1 Female, India : Kerala, Kottayam Dt., Kumarakam, 25.ii.1992, Coll. S. B. Zeya; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), August 1983, Coll. S. S. Islam.

*Remarks* : This new species comes near *A. nigricornis* (Khan & Shafee) in having mesoscutum with 3 adnotaular setae on either side and MV 3x as long as STV. However both species can be separated by the characters mentioned in the key in this work.

### 73. *Aprostocetus versicolor* (Ranaweera)

1950. *Tetrastichus versicolor* Ranaweera, (1947) 9(1) : 7, Female, IARI, Pusa, New Delhi.

2003. *Aprostocetus versicolor* (Ranaweera); Narendran (in Hayat *et al.*) 323.

*Diagnosis : Female* : Length : 1.7-2.2 mm. Metallic blue with greenish refringence; scape testaceous, rest of antenna dark brown to black; coxae and femora concolorous with body; rest of legs pale yellow to yellowish brown.

*Head* : OOL shorter than OD; malar space subequal to eye diameter; antennal formula 11233; scape reaching front ocellus; pedicellus a little shorter than half of scape; F1 slightly longer than F2; F3 subequal in length to F2; clava equal to F2 + F3 combined.

*Mesosoma* : ML obscure; SMV with 5 dorsal setae; MV 3.6x as long as STV.

*Gaster* : A little longer than head plus mesosoma; ovipositor not protruding.

*Hosts* : Hyperparasitic on *Apanteles taragamae*, parasitic on larva of Lasiocampid, hyperparasitic on *Elasmus homonae* Ferriere and *Macrocentrus homonae*, parasitic on *Homona coffearia*; hyperparasitic on *Phytodietus capuae* parasitic on *Homona coffearia*; hyperparasitic on *Goniozus montanus*, parasitic on *Homona coffearia*. (Courtesy : Mani, 1988)

*Type locality* : Sri Lanka (Talawakelle).

74. *Aprostocetus vimana* Narendran sp. nov.

(Figs. 26-28)

*Holotype* : *Female* : Length 1.27 mm. Head pale yellow, with dark brown patch on upper part of frons, posterior side of head; eye pale yellowish brown, with reflecting yellow facets; ocelli pale brown; antenna brown with anelli, pedicellus and scape pale yellow; apices of mandible black; pronotum pale brown; mesoscutum pale yellow with anterior half pale brown; scutellum pale yellow with pale brown tinge on area between SMG; propodeum and lower half of metapleuron pale brown; legs yellow with basodorsal part of hindcoxa, fore and mid tarsi slightly brown; gaster pale yellow with pale brown patches or bands on sides; wings hyaline, with pale white veins, pilosity of wings pale brown; setae on mesoscutum and scutellum brown.

*Head* : Collapsing; lower margin of clypeus slightly bilobed; mandible bidentate; POL 2x OOL; OOL subequal to OD; eye bare, 1.3x as long as broad in side view; 2.16x as long as MS in side view. MS straight. Antennal formula 11433; scape a little shorter than eye (12 : 13); pedicellus plus flagellum 1.57x as long as width of mesoscutum; antennal segments as in figure 26.

*Mesosoma* : (Fig. 27) 1.56x as long as broad; middle lobe of mesoscutum 1.59x as long as its posterior width, a little shorter than its anterior width (27 : 32), surface weakly reticulate; ML faint; mesoscutum with 2 adnotaular setae on either side. Scutellum 1.32x as broad as long; space between SMG 2.1x as long as broad; SMG nearer to SLG than to each other. Dorsellum clearly visible from dorsal side, as long as propodeum in its median length; width of propodeum 6.17x its median length; median carina distinct; spiracle relatively small, hardly covered by callus, separated from posterior margin of metanotum by less than its diameter; submedian area moderately reticulate; callus with 2 setae on either side, one on anterior part and the other on posterior part; spur of midtibia 0.64x length of metatarsus; hind femur 5x as long as broad. Forewing (Fig. 28) 3.07x as long as broad; CC shorter than MV; SMV with 2 dorsal setae; MV 5.63x as long as STV; marginal fringe 0.88x length of STV; speculum extremely small, closed behind by cubital line of setae.

*Gaster* : Sessile, 1.44x as long as mesosoma, 1.15x as long as combined length of head and mesosoma in side view, 8x as long as dorsal visible part of ovipositor sheath; tergites weakly reticulate and weakly collapsed from dorsum; hypopygium reaching a little beyond middle of gaster; one of the cercal seta longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Wayanad Dt., Thonikadavu (Kalpetta) (11° 36' N 76° 6' E), 7.ii.2003, Coll. T. C. Narendran & Party.

*Paratypes* : 1 Female, India : Tamil Nadu, Annamalai University, R. Kakaraj, 10.x.2000; 1 Female, INDIA : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 5-9. i. 1989, Coll. M. Hayat; 1 Female, INDIA : Kerala, Wayanad Dt., (11° 36' N 76° 6' E), (Kalpetta), 16.ii.2003, Coll. T. C. Narendran & Party; 1 Female, INDIA : Kerala, Kannur Dt., Kavinissery (11° 55' N 75° 22' E), 16.ii.2003, Coll. T. C. Narendran & Party; 1 Female, INDIA : Kerala, Ernakulam Dt., Nedumbassery (10°1' N 76° 18' E), 12.i.2004, Coll. T. C. Narendran & Party; 1 Female, INDIA : Kerala, Wayanad, 7.iv.2002, Coll. T. C. Narendran & Party.

75. *Aprostocetus yesica* Narendran sp. nov.

(Fig. 64)

*Holotype* : *Female* : Length 2.73 mm. Head and mesosoma brown with lower frons, gena, propleura and mesopleura pale brown; tegula yellow; area adjacent to tegula below pale brownish yellow; posterior extension of scapula and anterior corners of mesoscutum yellow; gaster blackish brown with base and ventral side pale brownish yellow; antenna brown with bases of scape pale; coxae brown with pale apices; femora pale brown with apices pale yellow; tibia and first three tarsi of each leg pale brown; fourth tarsus and pretarsi dark brown; wings hyaline with veins and pilosity pale yellowish brown; setae on mesoscutum and scutellum pale brownish yellow.

*Head* : Width in anterior view 1.13x as broad as long, width in dorsal view 6x as broad as its median length; lower margin of clypeus bilobed, mandibles tridentate; POL 1.25x OOL; OOL 2x OD; eye bare, about 1.13x as long as its width in side view, 2.25 as long as MS; MS straight; antennal formula 11433; scape reaching level of vertex, shorter than eye length (8 : 9); pedicellus plus flagellum 1.6x as long as width of mesosoma; antennal segments as in figure 64.

*Mesosoma* : 1.3x as long as wide; midlobe of mesoscutum 1.7x as long as its posterior width, a little shorter than its anterior width (15 :16), surface mostly smooth, shiny and with faint reticulations; ML faintly indicated; mesoscutum with 4 adnotaular setae and one inner seta on either side; notauli relatively deep and broad; scutellum 1.6x as wide as long, enclosed space between SMG 2x as long as broad; SMG little nearer to SLG than to each other; scutellum with 2 pairs of dorsal setae; dorsellum slightly visible from dorsal end, 0.6x as long as median length of propodeum; propodeum about 6x as broad as its median length; rim of spiracle partly covered by callus, separated from posterior margin of metanotum by half its diameter, a deep spiracular fovea running from spiracle to posterior margin of spiracle present, surface of propodeum with oblique reticulation; callus with 3 setae; spur of midtibia 0.7x as long as metatarsus, fourth tarsomere shorter than metatarsus; hind femur 3.4x as long as broad; forewing 2.4x as long as broad; CC shorter than MV; SMV with 6 dorsal setae; MV 4.6x as long as STV; marginal fringe 0.6x as long as STV; speculum closed behind by cubital line of setae.

**Gaster** : Sessile, with a 'V' shaped pit basodorsally, 0.87x as long as mesosoma, 1.4x as long as combined length of head and mesosoma in side view, 20.5x as long as dorsal visible part of ovipositor sheath; tergites smooth with faint reticulations; hypopygium exceeding middle of gaster (31 : 56); one of the cercal setae on either side longer than others and sinuate.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, India : Uttaranchal, Dehradun (30° 18' N 78° 3' E), 7.iv.1978, Coll. M. Verma.

**Paratypes** : 2 Females India : Uttaranchal, Dehradun (30° 18' N 78° 3' E), 17.xii.1991, coll. Zeya; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), Dehradun (30° 18' N 78° 3' E), 9.xii.1979, coll. M. Hayat & M. Verma.

**Remarks** : The remarks given under *A. hayati* is applicable here.

#### 76. *Aprostocetus yoshimotoi* Khan, Agnihotri & Sushil

2005. *Aprostocetus yoshimotoi* Khan, Agnihotri & Sushil, 146-147. F. India (? IARI or PUA).

**Diagnosis** : **Female** : Length 1.89 mm. The species can be identified from the key above.

**Host** : Unknown.

**Type locality** : India : Uttar Pradesh, Rampur.

**Remarks** : A request for loan of type remained unanswered. From the description and figures it appears that this species may belong to the genus *Tetrastichus*.

#### Genus *Aprostoporoides* Narendran

2004. *Aprostoporoides* Narendran, 19(6) : 1498-1500. Type species *Aprostoporoides curiosus* Narendran by original designation.

**Diagnosis** : Head, mesosoma and gaster bright metallic green; head not collapsing, with distinct relatively large well separated setigerous pits on frons and vertex; lower margin of clypeus distinctly bilobed; scrobe large; ocelli enclosed in a circle of groove; front ocellus in a subtriangular groove; each lateral ocellus connected to adjacent eye by a grooved line which slightly expands, just outside the ocellus to form a fovea; antennal formula 11433; F1 nearly 4x as long as broad; MS straight with a triangular deep fovea below eye; lateral panel of pronotum unusually deep and concave; occipital carina absent. Mesosoma shiny with weak reticulations; midlobe of mesoscutum with 3-4 pairs of admarginal setae; a weak ML on mesoscutum distinct; prepectus large, raised, shiny, with faint reticulations; axillae moderately advanced anteriorly; scutellum wider than long with three pairs of setae; anterior pair nearer to sublateral line; middle pair much shorter than anterior setae (needs careful focussing and lighting to see the middle pair of setae

though the setal pits can be detected); dorsellum 4.3-4.5x as broad as long. Propodeum with a deep fovea connecting spiracle and posterior margin of propodeum; spiracle partly masked by a part of side of propodeum.

*Remarks* : This genus resembles *Neotrichoporoides* Girault and *Aprostocetus* Westwood in general appearance very closely, but differs from them in some characteristic features. It differs from *Neotrichoporoides* in having : 1) MV shorter than 6x STV; 2) Propodeum with weak mostly faint sculpture, shiny and relatively shorter than that of *Neotrichoporoides*; 3) Prepectus relatively large, raised and shiny and 4) Lateral panel of pronotum sunken or concave strongly.

It differs from *Aprostocetus* in having : 1) Prepectus raised and shiny 2) Lateral panel of propodeum strongly concave; 3) scutellum with 3 pairs of setae, anterior pair well before middle of scutellum, and in other combination of characters.

This genus appears to connect *Neotrichoporoides* and *Aprostocetus* and both *Neotrichoporoides* and *Aprostocetus* may be specialised groups of *Aprostocetus* but before synonymising them a deeper study is necessary for analyzing the characters. Hence, pending further study, they are retained as separate genera as understood at present.

*Host* : Unknown.

*Distribution* : India (Kerala, Karnataka, Maharashtra & Delhi)

#### Key to species of *Aprostoporoides* (Based on Females)

1. SMV with 2 dorsal setae; forewing less than 3x as long as wide; speculum not extending posteriorly below MV ..... *manjericus* Narendran
- SMV with 3-5 dorsal setae; forewing more than 3x as long as broad; speculum extending below the single line of setae below MV ..... *curiosus* Narendran

#### 1. *Aprostoporoides curiosus* Narendran (Fig. 287)

2004. *Aprostoporoides curiosus* Narendran, 19(6) : 1498-1499. Holotype : Female, India (ZSIC).

*Redescription* : *Female* : Length 2.09-2.35 mm. Bright metallic green; scape yellow with dorsal apical part brown; pedicellus dark brown with apical ventral part pale; flagellum dark brown; eyes brownish red (in some Paratypes pale red or pale yellowish red). Legs whitish yellow with following parts as follows : anterior basal part of forecoxa pale brown with metallic green; foretarsi brown; mid coxa pale brown; hindcoxa concolorous with body, fourth hind tarsal segment and pretarsus dark brown; pubescence white; wings hyaline with veins pale yellowish brown; pilosity of wings brown.

*Head* : With scattered large setigerous pits; ocellar triangle delimited by a distinct grooved line which slightly expands just outside hind ocellus to form a fovea. Eyes bare, its maximum diameter in profile 1.92x length of MS; mandibles tridentate. Antennal

scape shorter than eye, reaching level of front ocellus, nearly 4x as long as broad; pedicellus plus flagellum 1.15x width of mesosoma; pedicellus 2.5x as long as broad, half length of F1; F2 a little shorter than F1 and about 2x as long as F3; claval length subequal to F1, bluntly pointed; sensillae on flagellum moderately numerous.

*Mesosoma* : About 1.2x as long as broad; propodeal slope 60°; pronotum 0.44x length of mesoscutum; midlobe of mesoscutum slightly broader than long anteriorly; ML of mesoscutum weak but distinct, with three to four adnotaular setae on either side. Propodeum with paraspiracular carina absent but a deep fovea connects spiracle and posterior margin of propodeum; submedian areas mostly shiny with weak and faint reticulation; median carina slightly raised; forewing 3.26x as long as broad, a little exceeding tip of gaster; CC slightly shorter than MV, 9-10.5x as long as broad; SMV with 3 dorsal setae; MV 5.75x as long as STV; PMV rudimentary; speculum closed below by cubital line of setae.

*Gaster* : Petiole indistinct; gaster collapsing on dorsal side, 1.32x as long as head plus mesosoma combined, acuminate; ovipositor sheath exerted; one of the cercal setae longer than others, slightly sinuate; tip of hypopygium reaches a little before half length of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Material examined* : Holotype and all paratypes (10 Numbers).

*Additional material examined* : 2 Females, India : Maharashtra, Buldana Dt., Lonar Crater Wild Life Sanctuary, North of Forest Rest House (19° 59' N 76° 31' E), 17.ii.2003, coll. D. B. Bastawade & Party (DZUC); 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 11.vii.1984 (DZIC); 4 Females, India : Karnataka, Sringeri (13°25' N 75°15' E), 24.xi.2005, coll. P. A. Sinu (DZUC); 2 Females, India : Delhi, Airport, 24.xi.1990, coll. T. C. Narendran & Party; 4 Females, India : Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9.xii.2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Waynad Dt., Puthurvayal, 6.ii.2003 coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Parambikulam (10° 26' N 76° 49' E), 22.xii.1985, coll. T. C. Narendran & Party; 1 Female, India : West Bengal, Kolkatta, Salt Lake, 17.x.1988, coll. S. K. Gupta (DZUC); 2 Females, India : Kerala, Kannur, Kavinissery (11° 55' N 75° 22' E), 16.ii.2003, coll. T. C. Narendran & Party; 6 Females, India : Kerala, Malappuram, Calicut University Campus (11° 7' N 75° 5' E), 20.iv.2001, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kannur, Azheekode (11° 53' N 75° 24' E), 16.ii.2003, coll. T. C. Narendran & Party; 3 Females, India : Kerala, Idukki, Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Waynad Dt., Kalpetta, Thonikadavu (11° 36' N 76° 6' E), 7.ii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Thiruvananthapuram, Kerala Agricultural University Campus (8° 40' N 77° 4' E), 30.x.1985, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode, Nanminda (11° 26' N 75° 50' E), 4.iv.2004, coll. T. C. Narendran & Party; 1 Female, India : Tamil Nadu, Siruvani, 26.ix.1987, coll. T. C. Narendran & Party;

1 Female, India : Kerala, Thiruvananthapuram (8° 40' N 77° 4' E), 8.iii.2000, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode Dt., Chaliyam (11° 9' N 75° 49' E), 14.iii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Malampuzha (10° 53' N 76° 46' E), 14.i.1986, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Chindaki (10° 39' N 76° 40' E), 14.xii.1987, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Alapppy Dt., Kanjikuzhi, 27.viii.1989, coll. T. C. Narendran & Party.

## 2. *Aprostoporoides manjericus* Narendran (Fig. 288)

2004. *Aprostoporoides manjericus* Narendran, : 19(6) : 1499-1500 Holotype : Female India (DZUC).

*Diagnosis* : This species very clearly resembles *A. curiosus* in most features except in having : 1) SMV with 2 dorsal setae; 2) Forewing less than 3x as long as wide; 3) Speculum not extending posteriorly; 4) Head width in dorsal view 4.16x its median length; 5) POL 3x OOL; 6) Pedicellus plus flagellum 1.47x width of mesosoma; and 7) Gaster 1.17x as long as head plus mesosoma.

*Male* : Unknown.

*Host* : Unknown.

*Material examined* : Besides holotype and paratype the following additional materials are examined : 1 Female, India : Kerala, Kasaragod (12°30' N 74°59' E), 23.i.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Waynad Dt., Kalpetta, Puthurvayal, 6.ii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Alapppy Dt., Kayamkulam, Central Plantation Crops Research Institute (CPCRI) (9°10' N 76°30' E), 19.ii.1989, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Alapppy Dt., Kanjikuzhi, 27.ii.1989, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19.ii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Ernakulam Dt, Kaladi, 12.i.2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 14.ii.2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala Idukki Dt., Adimali (10° 2' N 76° 59' E), 3.xii.1988, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Waynad Dt., Kalpetta, Thonikadavu (11° 36' N 76° 6' E), 7.ii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat, Agali (11°9' N 76° 40' E), 12.xii.1987, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt, Silent Valley (10°51' N 76° 37' E), 15.v.1985, coll. T. C. Narendran & Party;

*Remarks* : The length of F1 in a few cases is subequal to F2.

## Genus *Baryscapus* Förster

1856. *Baryscapus* Förster, 84, 86. Type species : *Baryscapus centricolae* Ashmead, 1887, by subsequent monotypy.

1887. *Baryscapus* Förster, Ashmead, 202; La Salle & Graham, 1990 : 122.

1913. *Thriposoma* Crawford, 255. Type species : *Thriposoma grafi* Crawford, 1913, by original designation. [Synonymised with *Baryscapus* by La Salle & Graham, 1990 : 122.]
1916. *Tetrastichopsis* Girault, [289] : 132. Type species : *Tetrastichopsis prionomeri* Girault, 1916, by original designation. [Synonymised with *Baryscapus* by La Salle & Graham, 1990 : 122.]
1952. [*Syntomosphyrum* Förster; Burks, 258-264. Misidentification.]
1977. *Eutetrastichus* Kostjukov, 189 (as subgenus of *Tetrastichus*). Type species : *Eulophus evonymellae* Bouché, 1834, by original designation. [Synonymised with *Baryscapus* by La Salle & Graham, 1990 : 122.]

**Diagnosis** : Body and tegula dark, varying from black to bright metallic blue or green, but without pale markings. Propodeal spiracle with entire rim exposed (without an overhanging raised lobe of the callus). Cercal setae subequal in length (without one seta which is distinctly longer than the rest and often sinuate), and often not visibly longer than setae on last tergite. MS usually distinctly curved. SMV with 2 or more than 2 dorsal setae; often a decolourised area between the parastigma and MV. Scutellum with SMG, although sometimes faint. Mesosternum usually convex just anterior to trochantal lobes, and mesepisternum in most species with precoxal suture absent or virtually obsolete. Propodeal callus nearly always with 3 or more than 3 setae. POL at least 2x OOL. Midlobe of mesoscutum often with more than a single row of adnotaular setae. STV usually at a slightly larger angle to the foremargin of wing (up to 45°) than in related genera, and somewhat longer in relation to length of MV (often up to half the length of MV). Male funicle and clava often without whorls of long, dark setae; whorls if present they are relatively short and only reach about halfway along the segment following the one which bears them. (Courtesy La Salle 1994).

**Host** : Species of *Baryscapus* attack a wide variety of insect hosts (Lepidoptera, Coleoptera, Hymenoptera, Diptera, Neuroptera), as well as spider egg sacs. They often act as hyperparasitoids.

**Distribution** : Cosmopolitan.

The identity of *Baryscapus* and of its type species has been discussed by La Salle & Graham (1990).

#### Key to species of Oriental species of *Baryscapus* Förster (Based on Females)

1. SMG of scutellum nearer to SLG than to each other; body without metallic refringence ..... 2
- SMG nearer to each other than to SLG or at the most equidistant; body with or without metallic refringence ..... 3
2. MV about 4x as long as STV; SMV with 4 dorsal setae; marginal fringe 0.5x as long as STV; hind femur 4.16x as long as broad; eye 1.33x as long as broad in side view; mesosoma about 1.3x as long as its maximum width; gena and lower frons pale yellow; all femora yellow ..... *jicus* Narendran sp. nov.

- MV distinctly less than 4x as long as STV; SMV with 3 dorsal setae; marginal fringe 0.8x as long as STV; hind femur 5x as long as broad in side view; mesosoma as long as wide; gena and lower frons black, femora brown with bases and apices pale yellow ..... *barica* Narendran sp. nov.
3. Clava as long as or slightly longer than F2 plus F3 combined (always below 2.5x F2 and F3 combined); gaster longer than mesosoma, ovate; antenna completely black; body usually deep blue or blue green, occasionally with some bronze reflections; host : *Apanteles* sp. .... *galactopus* (Ratzeberg)
- Clava always longer than 2.5 to 3 funicular segments combined; gaster not longer than mesosoma; subcircular or very short oval body, black usually with metallic reflections ..... 4
4. Propodeal spiracle relatively large, two thirds as large as mesal length of propodeum, close (almost contiguous) with anterior margin of propodeum; hind femur and tibiae dark brown with pale apices; host : *Chrysopa* sp ..... *Chrysopae* (Crawford)
- Propodeal spiracle of moderate size, (0.5x as long as mesal length of propodeum), separated from anterior margin of propodeum by 0.5-0.75x diameter of spiracle; hind femora slightly or strongly infusate with pale apex ..... *impeditus* (Nees)

1. *Baryscapus barica* Narendran sp. nov  
(Fig. 88)

*Holotype : Female* : Length 1.25 mm. Black; eyes dark grey; ocelli reflecting brown; antenna pale brownish yellow with pale scape and pedicellus; tegula and nearby area of mesopleuron pale yellow; dorsellum dull yellow; coxae dark brown; femora brown with pale bases and apices; tibiae and first three tarsal segments pale yellow; fourth tarsal segment and pretarsi dark brown; wings hyaline, veins pale brown; pilosity of wings pale brownish yellow; setae on mesoscutum and scutellum pale white.

*Head* : Partly collapsing; lower margin of clypeus bilobed; mandible tridentate; POL 1.7x OOL; OOL 1.5x OD; eye bare, 1.14x as long as broad; 2x as long as MS; MS straight; antennal formula 11233; scape not exceeding level of vertex; as long as eye length in profile; pedicellus plus flagellum as long as width of mesosoma; antennal segments as in figure 88.

*Mesosoma* : As long as wide; midlobe of mesoscutum 2x as long as its posterior width, as long as its anterior width, surface longitudinally reticulate; ML distinct and complete; mesoscutum with 5 adnotaular setae on either side; scutellum 1.5x as broad as long; space between SMG twice as long as broad; SMG a little nearer to SLG than to each other; dorsellum distinctly visible in dorsal view, slightly longer than median length of propodeum; propodeum 6x as broad as its median length, with a flat median carina; rim of spiracle fully exposed, separated from posterior margin by a distance equal to its diameter, surface weakly reticulate; callus with 2 setae; spur of midtibia as long as

metatarsus; fourth tarsomere as long as metatarsus; hind femur 5x as long as broad; forewing 2.21x as long as broad; CC about as long as MV; SMV with 3 dorsal setae; MV about 3.4x as long as STV; marginal fringe 0.8x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile, 1.63x as long as mesosoma, 1.37x as long as combined length of head and mesosoma in side view; 38x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth and shiny, slightly reticulate; hypopygium little exceeding middle of gaster; longest two cercal setae subequal in length.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Tamil Nadu, Chidambaram (11°24' N 79° 41' E), 2.xii.2003, coll. T.C.Narendran & Party (ZSIC).

*Paratypes* : 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), Aug. 1983, coll. S.S.Islam; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 24.viii.1979, coll. M. Verma; 1 Female, India : Tamil Nadu, Mahabalipuram, 16.ii.1993, coll. S. I. Kazmi; 3 Females, India : Tamil Nadu, Chidambaram (11°24' N 79° 41' E), 2.xii.2003 coll. T. C. Narendran & Party; 2 Females, India : Kerala, Palghat, Siruvani Forest, 26.ix.1987, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat, Malampuzha (10° 53' N 76° 46' E), 15.i.1986, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kannur, Kottiyoor (10° 7' N 78° 49' E), 17.ii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode, Nanminda (11° 26' N 75° 50' E), 22.vii.2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kannur, Kavinissery (11° 55' N 75° 22' E), 16.iv.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat, Pattambi (10° 49' N 76° 12' E), 13.vii.2003, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Malappuram, Manjeri (11° 7' N 76° 7' E), 13.ix.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat, Adimali (10° 2' N 76° 59' E), 11.i.2004, coll. T. C. Narendran & Party.

*Remarks* : *Baryscapus jicus* sp. nov. comes very close to this new species, but differs from it in having : 1. Mesosoma 1.29x as long as its width; 2. Hind femur 4.16x as long as broad; 3. SMV with 4 dorsal setae; 4. MV about 4x as long as STV; 5. Scape a little shorter than eye in profile; 6. Gena and lower frons pale yellow; 7. All femora yellow. It differs from all other known species of *Baryscapus* described from the Oriental Region in having a straight MS and in many other characters.

## 2. *Baryscapus chrysopae* (Crawford)

1915. *Geniocerus chrysopae* Crawford, 584-585. Holotype : Female USA. (USNM).

1943. *Tetrastichus chrysopae* (Crawford) Burks, 525.

1991b. *Baryscapus chrysopae* (Crawford) Graham, 101.

*Diagnosis* : *Female* : Length 1-1.2 mm. Black or dark brown with almost weak bronze or greenish metallic tinge; coxae usually coloured like body; hind femur broadly fuscous

with pale apex; antennae inserted at level of ventral margin of eye; mesoscutum with one row of 4-6 short adnotaular setae; median carina of propodeum absent; gaster subcircular, to slightly ovate, shorter than mesosoma.

*Male* : Length 1.0 mm. Differs from Female in having broader scape with ventral plaque 0.6-0.7x as long as scape; other antennal segments slightly different.

*Host* : *Chrysopa rufilabris* Burmeister, *C. oculata* Say (Burks, 1943), *C. californica* (La Salle 1994), *C. cubana*, *C. flavifrons*, *C. lantana*, *C. plorabunda* Fitch, (Noyes, 2003).

*Type locality* : USA : South Carobina.

*Distribution* : Carribbean, Holarctic, Mesoamerica, Nearctic, Neotropics, Oceanic, Oriental (India : Sharma *et al.*, 1985) (Noyes, 2003 Website).

*Remarks* : This species reported from India by Sharma *et al.*, is likely to be *Baryscapus impeditus* (Nees) since the former is mainly confined to the new world. The diagnosis given above is based on Cameron (1915), Burks (1943) and Graham (1991).

### 3. *Baryscapus galactopus* (Ratzeburg)

1844. *Eulophus galactopus* Ratzeburg, 169. Syntypes, Germany (lost). Neotype Female : Germany, Graham 1991 designated.

1991. *Eulophus vinulae* Ratzeburg, 1844 : 169. Germany (lost) Neotype Female, Germany, Graham designated.

1886. *Tetrastichus lissonotus* Möller, 83-84. Syntypes, Sweden (Synonymised with *galactopus* by Domenichini 1966).

1990. *Baryscapus galactopus* (Ratzeburg) LaSalle & Graham, 124.

*Diagnosis : Female* : Length : 1.2–2.0 mm. Deep blue to blue green; rarely with bronze reflections; antenna black; coxae concolorous with mesosoma; femora concolorous with mesosoma with apex pale yellow or testaceous; tibiae white, yellow or testaceous (rarely infuscate medially).

*Male* : Differs from Female in proportion of antennal segments (see Graham 1991).

*Type locality* : Germany.

*Distribution* : All continents, Rawat U. S. *et al.* (1990) and Thakur *et al.* (1992) reported this species from India.

*Remarks* : The above account is based on available literature.

### 4. *Baryscapus impeditus* (Nees)

(Fig. 89)

1834. *Eulophus impeditus* Nees, 178. Lectotype, Male, Germany (UM) designated by Graham, 1988 : 27.

1961a. *Aprostocetus impeditus* (Nees) Graham, 47.

- 1966a. *Tetrastichus impeditus* (Nees) Domenichini, 120 ["Female" in error].
- 1966a. *Tetrastichus principiae* Domenichini, 125, Holotype : Female, France (Synonymised with *impeditus* by Graham 1988)
1988. *Eutetrastichus impeditus* (Nees) Graham, 27.
- 1991b. *Baryscapus impeditus* (Nees), Graham, 99-100.
1981. *Tetrastichus aligarhensis* Khan & Shafee, 339. syn. nov.

**Remarks :** Khan & Shafee (1981) described this species from Aligarh, India under the name *Tetrastichus aligarhensis*. The description although not very adequate for identification of the species, almost agrees with the redescription of *impeditus* by Graham (1991). Professor Hayat sent me a specimen collected from Aligarh (from where the type of *aligarhensis* was collected originally) which agreed with the original description of Khan & Shafee (1981) and the redescription of *impeditus* (Nees) by Graham. Hence though I could not see the relevant types, the synonym is clearly evident from the good redescription of Graham (1991) and from the specimen sent by Dr. Hayat. In the Indian form the colour is not very bright metallic green but dark metallic green and this I consider only a variation). Hence I hereby place *aligarhensis* Khan & Shafee as a junior synonym (Syn. nov.) of *Baryscapus impeditus* (Nees).

The redescription provided by Graham (1991) is adequate for identification of this species.

**Type locality :** of *B. impeditus* : Germany (Sickershusen).

**Type locality :** of *T. aligarhensis* : India : Aligarh.

**Distribution :** Europe, Pakistan, India.

**Host :** *Chrysopa* sp. (According to Khan & Shafee, 1981, *B. aligarhensis* is reported as ex. *Pulvinaria* sp. on *Azadirachta indica*).

##### 5. *Baryscapus jicus* Narendran sp. nov.

(Fig. 87)

**Holotype :** Female : Length 1.7mm. Black; gena and lower frons pale yellow; eyes greyish yellow; ocelli pale reflecting yellow; antenna brown with scape and ventral half of pedicellus pale brownish yellow; tegula yellow; mesopleura and prepectus brown; legs yellow with hindcoxa dark brown on basodorsal and basolateral parts; pretarsus dark brown; gaster black with brownish tinge on basolateral and ventral sides; wings hyaline, veins pale whitish hyaline, pilosity of wings pale brown, setae on mesoscutum and scutellum pale yellowish white.

**Head :** Partly collapsing; lower margin of clypeus bilobed; mandible bidentate; POL twice OOL; OOL 1.33x OD; eye bare, 1.33x as long as broad; 2x as long as MS; MS straight; antennal formula 11233; scape not exceeding level of vertex, a little shorter than eye length in profile; pedicellus plus flagellum subequal to width of mesosoma; antennal segments as in figure 87.

*Mesosoma* : 1.29x as long as wide; midlobe of mesoscutum 2x as long as its posterior width, as long as its anterior width, surface longitudinally reticulate; ML distinct and complete; mesoscutum with 5 adnotaular setae on either side; scutellum 1.71x as broad as long; space between SMG 1.86x as long as broad; SMG little nearer to SLG than to each other; dorsellum distinctly visible in dorsal view, slightly longer than median length of propodeum; propodeum 5.3x as broad as its median length, with a flat median carina; rim of spiracle fully exposed (without an overhanging raised lobe of callus), separated from posterior margin by less than half its diameter, surface distinctly reticulate; callus with 3 setae; spur of midtibia a little longer than metatarsus (5 : 4); fourth tarsomere as long as metatarsus; hind femur 4.16x as long as broad; forewing 2.2x as long as broad; CC shorter than MV; SMV with 4 dorsal setae; MV about 4x as long as STV; marginal fringe 0.5x as long as STV; speculum closed behind by cubital line of setae.

*Gaster* : Sessile, 1.6x as long as mesosoma, 1.23x as long as combined length of head and mesosoma in side view; 20.7x as long as dorsal visible part of ovipositor sheath; tergites mostly smooth and shiny, slightly reticulate; hypopygium exceeding middle of gaster; longest two cercal setae subequal in length.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Malappuram, Manjeri (11° 7' N 76° 7' E), 4.x.2003, coll. T. C. Narendran & Party (ZSIC).

*Paratypes* : 2 Females, India : Kerala, Kottayam, Kumarakom (9°36' N 76°26' E), 18.iv.2004, coll. T. C. Narendran & Party; 1 Female, Andhra Pradesh, Tenali (16° 14' N 80° 39' E), 28.ix.1986, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram, Calicut University Campus (11° 7' N 75° 5' E), 31.iii.1989, coll. Surekha; 2 Female, India : Kerala, Malappuram, Thenjipalam, 31.xii.2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Idukki, Agali (11°9' N 76° 40' E), 12.xii.1987, coll. T. C. Narendran & Party; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 30.x.1992, coll. M. Hayat; 2 Females, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 19.viii.1979, 9.xii.1979, coll. M. Verma; 2 Females, India : Kerala, Kozhikode, Kalipoyka (11°16' N 75° 48' E), 27.xi.2003, coll. T. C. Narendran & Party; 2 Females, India : West Bengal, Chandaneswar , 28.1983, coll. S. S. Islam; 1 Female, India : Kerala, Palghat, Malampuzha (10° 53' N 76° 46' E), Jan.1986, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kozhikode, Nanminda (11° 26' N 75° 50' E), 22.viii.2004, coll. T. C. Narendran & Party; 1 Female, India : Tamil Nadu, Girumbakkom Rice ecosystem, 2.v.2003, coll. J. Diravium; 1 Female, India : Tamil Nadu, Chidambaram (11°24' N 79° 41' E), 2.xii.2003, coll. T. C. Narendran & Party; 1 Female, India : Tamil Nadu, Mahabalipuram, 16.ii.1993, coll. S. I. Kazmi; 8 Females, India : Kerala, Palghat, Pattambi (10° 49' N 76° 12' E), 12.viii.2003 coll. T. C. Narendran & Party; 6 Females, India : Kerala, Malappuram, Manjeri (11° 7' N 76° 7' E), 13.i.2003, 4.x.2003, 23.x.2004, coll. T. C. Narendran & Party; 3 Females, India : Kerala, Alapetty, CPCRI,

Kayamkulam (9°10' N 76°30' E), 24.ix.1991, 19.ii.1989, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Alapey, Kayamkulam (9°10' N 76°30' E), 24.ix.1991, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Thiruvananthapuram, Neyyar (8°37' N 77°7' E), 24.ii.1989, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat, Thrithala (10° 48' N 76° 8' E), 14.vii.2003, coll. T. C. Narendran & Party; 6 Females, India : Kerala, Thiruvananthapuram, Palode (8° 42' N 77° 2' E), 8.xii.2004, coll. T. C. Narendran & Party.

*Remarks* : *Baryscapus chrysopae* (Crawford, 1915) differs from this new species in having : antennal clava equal in length to funicle; SMV with 2 dorsal setae; gaster slightly shorter than mesosoma; propodeal spiracle almost contiguous with posterior margin of metanotum; diameter of spiracle two-thirds as large as median length of propodeum and body black with almost weak metallic tinge and hind femora brown with yellow apex. *Baryscapus aligarhensis* (Khan & Shafee, 1981) differs from this new species in having : body with dark metallic reflections; SMV with 2 dorsal setae; clava including spicula as long as F1 plus F2 plus F3; lower frons and gena not yellow. *Baryscapus bruchophagi* (Gahan) differs from this new species in having : spur of midtibia 0.6x to 0.65x length of basitarsus; body bright blue to greenish blue; antennal scape black with distal 0.1-0.3, sometimes also ventral edge testaceous; enclosed space between SMG 2.42-3x as long as broad; MV slightly more than twice as long as STV; gaster almost twice as long as mesosoma. *Baryscapus galactopus* (Ratzeburg) differs from this new species in having : midlobe of mesoscutum with 2 rows of setae on either side; gaster hardly longer than head plus mesosoma; body usually deep blue to green; antenna black; coxae and femora concolourous with body with tips of femora testaceous. This new species differs from all the above mentioned species in having MS straight and not curved.

#### Genus *Ceratoneura* Ashmead

894. *Ceratoneura* Ashmead, 1178. Type species : *Ceratoneura petiolata* Ashmead (subsequent designation by Ashmead, 1904a : 347, 369).
1915. *Paraceratoneura* Girault, [230] : 260. Type species *Paraceratoneura goethei* Girault, by original designation (Bouček synonymised, 1988).
1917. *Ceratotetrastichodes* Girault, [305] : 2. Type species *Ceratoneura pretiosa* Gahan (Original designation). (Gatram, 1921 synonymised).

*Diagnosis* : Lower face with conspicuous striae radiating from the mouth margin (Fig. 86); antennal toruli inserted high on frons (Fig. 86); apex of scape reaching above level of vertex; body fairly strongly sclerotised, non collapsing; petiole usually conspicuous.

*Hosts* : LaSalle (2005) states that it appears that atleast in one instance *Ceratoneura* can be a gall inducer, while in others the biology is still not accurately known. Species of this genus emerged from galls on a variety of plants, Bouček (1977, 1988) Narendran & Krishnakumar (1995) reported on the host plants.

*Distribution* : America, Africa, South and South East Asia and Australia.

1. *Ceratoneura indi* Girault  
(Fig. 86)

1917. *Ceratoneura indi* Girault, [330] : 10. Female India (USNM).  
 1921. *Ceratoneura indica* Rohwer, : 127, Female, India, Coimbatore (USNM). Bouček (1988) synonymised.  
 1995. *Ceratoneura indi* Girault, redescribed by Narendran and Krishnakumar.

**Diagnosis** : Length 2.0 mm. Head, mesosoma and gaster black; scape, pedicellus and anelli brownish yellow; funicular segments and clava brownish black; all legs except coxae pale brownish yellow; apices of femora paler; wings hyaline; veins pale yellowish white.

**Head** : Wider than mesosoma; mandibles tridentate; occipital ridge behind ocelli distinctly carinate; POL a little more than 1.5x OOL; eyes bare; scape reaching front ocellus, a little longer than clava; antennal formula 11433; pedicellus length subequal to length of F1; F2 and F3 subequal or equal in length.

**Mesosoma** : Shagreened on pronotum, mesoscutum and scutellum; mesoscutum with 4-5 pairs of bristles; mesoscutum as long as scutellum; propodeum with a ML, or carina; wings sparsely pubescent; SMV 1.9x MV with 2 dorsal setae; MV 1.9x STV; PMV absent.

**Gaster** : Petiole broader than long; little broader at posterior part; gaster longer than mesosoma.

**Male** : Length 1.7-2 mm. Scape with a small ventral plaque; funicle 4 segmented and with stouter and longer whorls of dorsal bristles; which reach beginning of next whorl (Fig. 6, Narendran and Krishnakumar, 1995).

**Host** : Galls in flower buds of *Sesbania aegyptica* and *Capsicum*. The species is phytophagous causing galls and damaging flowers and fruits of sweet pepper and brinjal in Karnataka.

**Distribution** : India (Maharashtra, Madhya Pradesh & Karnataka), Australia.

**Material examined** : 13 Females and 2 Males, India, Karnataka, Bangalore (12° 58' N 77° 35' E), 1993, coll. N. K. Krishnakumar.

Genus *Citrostichus* Bouček

- 1988a. *Citrostichus* Bouček, 696. Type species *Cirrospilus phyllocnistoides* Narayanan.

**Diagnosis** : Occiput unusually large; occipital foramen located much nearer to mouth than to ocelli; clypeus with lower margin entire or slightly arcuate; mesosomal dorsum without conspicuous setae; lower face with large tentorial pits; antennal toruli above lower ocular line; face directed ventrally; pronotum large; propodeum with distinct median carina in a groove; prepectus as part of broad ventral crossbar; SMV with 1 dorsal seta; petiole conspicuous, transverse or slightly longer than broad; gaster flat and, short or ovate or lanceolate.

*Host* : Parasitic on Lepidopterous leaf miners.

*Distribution* : South Asia to Taiwan and Indonesia (Bouček, 1988).

1. *Citrostichus phyllocnistoides* (Narayanan)  
(Fig. 289)

1960. *Cirrospilus phyllocnistoides* Narayanan, 119. Female. India. (IARI?).

1988a. *Citrostichus phyllocnistoides* (Narayanan) Bouček, 696.

*Holotype* : Female : Length 1.15-1.4mm. Brown to black; non metallic; flagellum brown; pedicellus and scape testaceous; legs including coxae testaceous; gaster light brown with a clear hyaline patch occupying most of the tergal area of T1, T2 and T3; wings pale yellowish, veins testaceous to brown; head almost as wide as mesosoma; eyes moderately pilose; POL 1.4-1.6x OOL; antennal formula 11133 (from the figures of Narayanan, 1960); scape long and more than twice as long as pedicellus; pedicellus shorter than F1; F2 longer than F1; F3 subequal to F2; pedicellus plus flagellum about 1.3x width of mesoscutum; mesoscutum with a strong ML; propodeum shiny with reticulations weak; forewing with MV 2.4-2.7x STV; gastral petiole with indication of lateral and median carinae.

*Male* : Length 0.98 mm, almost similar to Female except for stronger bristles of antenna.

*Host* : *Phyllocnistis citrella* Stinton

*Type locality* : India (Delhi).

*Remarks* : The above account is based on the original description and from the redescriptions of authors such as Kamijo and Ikeda (1997) and Bouček (1988) (Courtesy to Kamijo & Ikeda and Bouček).

Genus *Goethella* Girault

1928. *Goethella* Girault, [424] : 4. Type species *Goethella asulcata* Girault by monotypy.

*Diagnosis* : Body black and with metallic gloss. Head with face collapsing more or less along the median line of weakness and with a broadly angulate frontal fork; branches of frontal fork end outside of lateral ocelli. Antennal formula 11333 in the Female. Mesosoma with posterior margin of pronotum concave, with a row of dark setae on posterior margin; mesoscutum with one row of 5 adnotaular setae on each side; scutellum with SMG absent but the SLG distinct; apex of scutellum jutting over dorsellum; propodeum vertical and short with a median ridge.

*Host* : The type was associated with *Atriplex*. In India (Maharashtra & Madhya Pradesh) this genus was recorded from galled flowers of *Capsicum annuum* and from Karnataka from *Solanum indicum* (Bouček, 1988).

*Distribution* : Australia & India.

1. *Goethella asulcata* Girault  
(Fig. 151)

1928. *Goethella asulcata* Girault, [424] : 4 "South Australia" (Q.M)

*Diagnosis : Female* : Length 1.3–1.4 mm. Black with slight metallic gloss; eyes dull grey; ocelli pale reflecting yellow; antenna pale brownish yellow; apices of coxae, trochanters completely, apices of femora, tibiae completely and tarsi except apex, pale yellow; wings hyaline, veins pale brown. Head with POL 1.5-1.6x OOL; mesoscutum a little shorter than its maximum width (22 : 27); scutellum shorter than mesoscutum (19 : 22), 1.1x as wide as long; propodeum 0.21x as long as scutellum; propodeal spiracular rim partly interrupted by lobe of callus, separated from metanotum by less than its diameter, each callus with 2-3 setae. Forewing about 2x as long as wide; MV a little more than 3x as long as STV. Gaster sessile, ovate, longer than head plus mesosoma; cercal setae subequal in length; hypopygium not reaching middle of gaster.

*Male* : Similar to Female except : Length 1.3 mm; antenna with basal rows of long whorl of bristles on flagellar segments; gaster relatively shorter than that of Female.

*Host* : ex. Brinjal flower galls, flower galls of *Capsicum annuum*, and *Solanum indicum*.

*Distribution* : India : Maharashtra, Madhya Pradesh, Karnataka & Kerala (New record).

*Type locality* : "South Australia"

*Material examined* : 8 Females & 5 Males, India : Karnataka, Bangalore (12° 58' N 77° 35' E), from flowers of *Capsicum*, 5.iii.2000, coll. Nagaraju; 3 Females, same data except date 25.iii.1999; 5 Females, from Brinjal flowers, Bangalore (12° 58' N 77° 35' E), 5.x.2000, 1 Female, India, Kerala, Turner's Hill, Eravikulam (10° 8' N 77° 4' E), 2.iii.1993, coll. T. C. Narendran & Party.

Genus *Holcotetrastichus* Graham  
(Fig. 113)

1987. *Holcotetrastichus* Graham, 23-24, 30-37. Type species : *Cirrospilus rhosaces* Walker by original designation.

*Diagnosis* : Lower margin of clypeus subtruncate, without distinct teeth; SMG deep with some strong costulae; SMV with 2 or 3 dorsal setae; first segment of mid and hind tarsi shorter than second; propodeum with rim of spiracle fully exposed, pilose indicated posteriorly; body black, non-metallic; gastral petiole distinct, not more than 1.6x as broad as long; hypopygium reaching near apex of gaster.

*Host* : Parasitic on many species of Cassidae (Coleoptera : Chrysomelidae).

*Distribution* : India, Europe.

*Remarks* : The nature of SLG of this genus has been observed in some species of *Tetrastichus* I have studied. In a few Bornean specimens of *Tetrastichus* both SLG and SMG are found with deep depression with and without costulae.

### 1. *Holcotetrastichus manaliensis* Graham

1991. *Holcotetrastichus manaliensis* Graham, 274. Female, India (BMNH).

*Diagnosis : Female* : Length 1.2-1.4 mm. Black, non metallic; flagellum brown; pedicellus, scape and legs including mid and hindcoxae testaceous; wing venation pale yellow, tegula black; head with POL 1.4 or a little more than 1.4x OOL; antenna with pedicellus plus flagellum a little longer than width of mesoscutum; ML of mesoscutum strong and complete; propodeum shiny with weak reticulations; forewing with MV 2.4-2.7x STV; gastral petiole with indication of lateral and median carinae.

*Male* : Unknown.

*Host* : Unknown.

*Distribution* : India (Himachal Pradesh : Manali).

*Remarks* : The above account is based on the original description of Graham (1991). (Courtesy to Graham).

### Genus *Idukkiella* Narendran gen. nov.

Type species : *Idukkiella elattariae* Narendran sp. nov.

*Diagnosis* : Pronotum large and bell shaped, distinctly reticulate and evenly pubescent, longer than mesoscutum; mesoscutum shorter than scutellum; dorsellum distinctly reticulate punctate; propodeum 3.84x as broad as its median length with a raised median carina; rim of spiracle fully exposed, separated from posterior margin by more than half its diameter, a fovea running anteriorly and postero-laterally from the inner margin of spiracle of propodeum; antennal formula 11433; MS with basal fovea.

*Distribution* : India : Kerala (Idukki : Vandiperiyar)

*Remarks* : This new genus resembles *Aprostocetus* Westwood in general appearance but differs from it in having : characteristic pronotum, mesoscutum and in having large propodeum with distinct spiracular fovea and reticulo-punctate surface and with reticulate dorsellum. It resembles *Neotrichoporoides* Girault in having subocular fovea and large reticulate propodeum. It differs from *Neotrichoporoides* in having MV only 3.1x as long as STV and in different type of pronotum and mesoscutum. It also differs from *Neotrichoporoides* with distinctly reticulate gastral tergites with more or less smooth T1.

*Etymology* : Named after the locality Idukki, from where the specimens are collected.

### 1. *Idukkiella elattariae* Narendran sp. nov.

(Fig. 277-278)

*Holotype : Female* : Length 1.83 mm. Bright metallic green; eyes yellowish grey; ocelli pale reflecting yellow; antenna light brown, with scape and pedicellus bright yellow; tegula pale brown; legs bright yellow with hindcoxa concolorous with mesosoma, except pale brownish yellow ventral and apical parts; tarsi brown; wings hyaline with pale yellowish veins; pilosity and setae on dorsum of mesosoma pale yellow.

*Head* : Partly collapsing; lower margin of clypeus bilobed; mandibles bidentate; POL 2.14x OOL; OOL 1.17x OD; eye minutely pubescent, 1.3x as long as broad; 2.7x as long as MS; MS straight with a basal fovea; fovea not reaching half of gaster; antennal formula 11433; toruli at level of lower margin of eye; scape not reaching level of vertex, little shorter than eye length in profile; pedicellus plus flagellum 1.32x as long as width of mesoscutum; relative length : width of antennal segments as in figure 277.

*Mesosoma* : 1.83x as long as broad; pronotum large and bell shaped (Fig. 278), 1.23x as broad as long; midlobe of mesoscutum a little shorter than pronotum; 1.64x as long as its posterior width; 0.76x as long as its anterior width; surface strongly reticulate; ML distinct and deeply grooved; mesoscutum with 5 setae on either side near notauli (Fig. 278); scutellum 1.1x as broad as long; space between SMG 2.6x as long as broad; SMG a little nearer to SLG than to each other; dorsellum distinctly visible in dorsal view, distinctly reticulately punctate; length of dorsellum a little more than half median length of propodeum; propodeum 3.8x as broad as its median length, with a raised median carina; rim of spiracle fully exposed, separated from posterior margin by more than half its diameter, a fovea running anteriorly and posterolaterally from inner margin of spiracle of propodeum, surface distinctly punctate-reticulate; callus with 2 dorsal setae on each side; hindcoxa with distinct raised characteristic punctae on dorsolateral region; spur of midtibia 0.64x length of metatarsus; fourth tarsomere shorter than metatarsus; hindfemur 3x as long as broad. Forewing 2.52x as long as broad; CC shorter than MV; SMV with 4 weak dorsal setae; MV 3.14x as long as STV; marginal fringe 0.43x as long as STV; speculum closed behind by cubital line of setae; precercal suture unusually deep on mesepisternum.

*Gaster* : Sessile, 1.26x as long as mesosoma, as long as combined length of head and mesosoma, 22.5x as long as dorsal visible part of ovipositor sheath; T1 metallic green, smooth and shiny with weak reticulations, remaining tergites black with strong reticulations; hypopygium not reaching middle of gaster; one cercal seta longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown (collected from Cardamom plantation).

*Holotype* : Female, India, Kerala, Idukki Dt., Vandiperiyar, (11°17' N 75°51' E) (Cardamom plantations), 8.i.2004, coll. T. C. Narendran & Party (ZSIC).

*Paratype* : 3 Females. Collection data same as that of holotype.

### Genus *Iniostichus* Kamijo & Ikeda

1997. *Iniostichus* kamijo & Ikeda : 576. Type species : *Iniostichus kumatai* Kamijo & Ikeda.

*Diagnosis* : Body black, non metallic, strongly sclerotized, not collapsed when air dried; lower margin of clypeus truncate, or slightly and roundly produced; MS almost straight; antennal scape with faint or raised reticulations; clava with a long spine at apex. Pronotum long, narrowly produced anteriorly; mesoscutum with ML usually restricted posteriorly. Propodeum long, with median carina in posterior half strongly expanded (Fig. 6 Narendran

*et al.*, 2004) backwards and replaced by a pit or groove anteriorly; paraspiracular carinae inverted and Y shaped; forewing with SMV with 1 dorsal seta; petiole longer than broad, and irregularly wrinkled; one of the cercal setae strongly curved.

*Host* : Lepidoptera : Gracillaridae.

*Distribution* : Nepal : Godavari, Nepal valley (Kamijo & Ikeda, 1997); Borneo (Narendran *et al.*, 2004), Japan, Korea (Kamijo & Ikeda, 1997).

***Iniostichus longipetiolatus* Kamijo & Ikeda**  
(Figs. 290-291)

1997. *Iniostichus longipetiolatus* Kamijo & Ikeda, 580. Female. Nepal (EIHU)

*Diagnosis* : Female : Length 2mm. Black; antennae brown with dark clava; legs yellowish brown with forecoxae often infusate; wings weakly infusate; head 2.3x as broad as long; scape reaching level of vertex; F1 distinctly longer than pedicellus, as long as F3; axillae moderately advanced; propodeum with paraspiracular carinae very weak; petiole 2.3x as long as broad with strong median carina.

*Host* : Unknown.

*Distribution* : Nepal : Godavari, Nepal valley

*Remarks* : The above account is based on Kamijo & Ikeda (Courtesy to Kamijo & Ikeda, 1997).

**Genus *Kiggaella* Narendran**

2005. *Kiggaella* Narendran (in Narendran *et al.*) : 1915-1916. Type species : *Kiggaella oryzae* Narendran

*Diagnosis* : Head partly collapsing; eye converging to inner side; antennal toruli situated above lower ocular line, nearer to eye than to each other; frontal fork absent; antennal formula 11233; scape not exceeding vertex; clava without apical spine or spicule; occiput not margined; clypeus not delimited; lower clypeal margin clearly bilobed; mandibles bidentate; MS distinct; dorsum of mesosoma smooth and shiny; mesoscutum with 3 pairs of adnotaular setae; axillae advanced anteriorly; scutellum without SMG, with 3 pairs of setae (median pair worn out but pits distinct); scutellum a little shorter than mesoscutum; forewing a little more than 3x as long as broad; SMV with 2 dorsal setae; propodeum smooth with median carina; propodeal spiracle exposed, separated from hind margin of metanotum by less than its diameter; one of the cercal setae very long and not subequal to any other cercal setae. Body metallic green with lower part of head, posterior marginal area of lateral panel of pronotum and legs (except hindcoxae) pale whitish yellow.

*Host* : Unknown.

*Distribution* : India (Karnataka, Kerala). Probably rice pests.

*Discussion* : This genus comes near to *Minotetrastichus* Graham in the key to species of Graham (1991), but clearly differs from it in having : 1) Scutellum without SMG

(in *Minotetrastichus* scutellum with SMG); 2) Scutellum with 3 pairs of setae (2 pairs only in *Minotetrastichus*); 3) Forewing clearly more than 3x as long as broad (in *Minotetrastichus* forewing never 3x as long as broad); 4) One of the cercal setae very long, sinuate and not subequal to any of the other cercal setae (in *Minotetrastichus* cercal setae are not so lengthy). Graham (1991) states that in some groups of *Aprostocetus* Westwood SMG on scutellum is absent but in such cases body is black and non metallic and clava with apical seta and tip of hypopygium situated at not more than 0.6x length of gaster. Though in the nature of cercal setae, lower clypeal margin and antenna, this genus comes near *Aprostocetus*, yet it differs from *Aprostocetus* in the combination of characters mentioned under diagnosis of the genus given above.

1. *Kiggaella oryzae* Narendran  
(Fig. 292)

2005. *Kiggaella oryzae* Narendran (in Narendran *et al.*), 1915-1916, Female, India (ZSIC).

*Diagnosis : Female* : Length 1.2 mm. Metallic green with slight darkish tinge; lower frons, gena and all legs pale yellow with basodorsal part of hindcoxa concolorous with mesosoma; eye and ocelli dark brown; wings hyaline with yellow veins, pubescence pale white.

*Head* : Partly collapsing; width in anterior view a little more than its length (69 : 64); width in dorsal view 1.42x its maximum length; eye convergent towards frons; eye height in profile 2.1x length of malar space; MS distinct, not curved, without a basal fovea below eye; occiput not margined but yellow colour separates head in to upper and lower halves; POL a little more than 1.6x OOL. Relative length : width of antennal segments : scape = 19 : 6; pedicellus = 15 : 7; F1 = 16 : 7; F2 = 12 : 8.5; F3 = 12 : 10; clava = 29 : 9; mandible weakly bidentate.

*Mesosoma* : Smooth and shiny; pronotum conical; without a cross ridge or carina; mesoscutum with 3 pairs of adnotaular setae; axillae a little advanced anteriorly; scutellum longer than wide; dorsellum not medially divided; propodeum without plicae or costula; prepectus longer than tegula; weakly reticulate; metanotum reaching hind wing base; forewing with relative lengths of veins : SMV = 21; MV = 36; PMV absent; STV = 11; hind wing with a basal stalk.

*Gaster* : Petiole hardly visible; gaster a little longer than mesosoma, with a basal fovea on T1; one of the cercal setae much longer than the remaining ones, sinuate.

*Male* : Similar to Female except antennal formula 11241, funicular segments yellowish - white with side margins and apical margins pale brown; ventral part of scape with a distinct ventral plaque on anterior half.

*Host* : Probably rice pests, since this species was collected from the rice fields.

*Distribution* : India (Karnataka, Kerala).

*Material examined* : Holotype and paratypes.

### Genus *Kolopterna* Graham

1987. *Kolopterna* Graham, 80-83. Type species : *Kolopterna salina* Graham.

**Diagnosis** : Body black and yellow or mainly yellow, without metallic refringence; first segment of mid and hind tarsi much shorter than second segment (Fig. 82 of Graham, 1987); forewing with MV shorter than or at the most as long as CC; antenna with 3 anelli, F1 and F2 discoid, F3 large and quadrate or slightly transverse usually with 3 setae; MS (Fig. 40 of Graham, 1987) oblong or sublinear fovea below eye. (Courtesy to Graham, 1987).

**Host** : Unknown.

**Distribution** : Europe & Pakistan.

### *Kolopterna kohatensis* Graham

1987. *Kolopterna kohatensis* Graham, 82, Female, Pakistan (BMNH)

**Diagnosis** : *Female* : Length 1.5mm. Yellow with a fuscous dot above each prothoracic spiracle and a transverse fuscous band on hind edge of each gastral tergite; tips of ovipositor sheath fuscous. A pair of large spots on front part of mid lobe of mesoscutum, and a small spot on the front of each scapula and axilla are tanned; forewing slightly infusate. Head with POL 1.3x OOL; antennal scape as long as eye, not reaching level of vertex; forewing with CC about 1.7x as long as MV; SMV with 4 dorsal setae; MV 3.3x as long as STV; PMV nearly half as long as STV; gaster about 1.7x as long as mesosoma. (Courtesy : Graham, 1987).

For further details Graham, 1987 may be referred.

**Host** : Leaf galls on *Kochia* sp. (Chenopodiaceae)

**Distribution** : Pakistan (Kohat).

### Genus *Kostjukovius* Graham

1991. *Kostjukovius* Graham, 18, 167-168. Type species : *Cratnapiella platycephalae* Kostjukov (in Dyurich and Kostjukov, 1978) (By original designation)

**Diagnosis** : Frontofacial sulci either narrowly or widely separated from each other dorsally. Antenna with long erect or semierrect setae, and clava with apical spicula and terminal seta or hair; terminal seta as long as spicula. Body dorsoventrally flattened, with relatively long pronotum and propodeum; dorsellum and propodeum in the same plane as mesoscutum and scutellum. ML of mesoscutum present, faint or well marked (as in *K. keralensis* sp. nov.); SMG present or absent; SMV with 1 dorsal seta; propodeal spiracle small, circular, separated distinctly by more than its own diameter from anterior margin of propodeum. MS complete; occipital foramen situated slightly to distinctly above centre of head.

*Male* : Unknown.

*Host* : Parasitoid (*K. platycephalae*) of *Platycephala umbreculata* F. (Chloropidae) and *K. grahami* LaSalle is perhaps a parasitoid of *Dioryctria* (Pyralidae) or Cecidomyiidae (La Salle, 1994).

*Distribution* : Europe, North America, India (new record from the Oriental Region).

1. *Kostjukovius keralensis* Narendran sp. nov.  
(Fig. 286)

*Holotype* : *Female* : Length 1.04 mm. Head, antenna, mesosoma and gaster black; coxae black, femora dark brown with apex paler; tibiae and tarsi pale yellow, except for brown last tarsal segment. Wings hyaline, veins light brown; setae on mesosoma light brown.

*Head* : Frontofacial sulci widely separated dorsally with outer arms extending to lateral ocelli; antenna with relative length : width of antennal segments : scape = 29 : 9; pedicel = 12 : 7; F1 = 5 : 6; F2 = 8 : 8; F3 = 4 : 10; clava (excluding spicula and seta) 18 : 14 (Anelli could not be seen in the dry specimen).

*Mesosoma* : Pronotum subequal in length to mesoscutum; mesoscutum with distinct ML; 2-3 adnotaular setae on either side in a row; scutellum a little shorter than mesoscutum; scutellum 1.33x as broad as long, SMG distinct, enclosed space between SMG 1.5x as long as wide; dorsellum half as long as propodeum; forewing 2.35x as long as broad; CC subequal to MV; MV 2.1x as long as STV; speculum setose.

*Gaster* : As long as mesosoma, somewhat narrower towards apex.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Himachal Pradesh, Hamirpur, Anukalan, 1.vii.2006, Coll. S. M.A. Badruddin & F. R. Khan.

*Remarks* : This species differs from the other two known species viz. *K. platycephalae* Kostjukov (European) and *K. grahami* LaSalle (USA) mainly in the proportions of antennal segments. It differs from *K. platycephalae* also in having SMG which is absent in *platycephalae*.

Genus *Kostjurixia* Narendran gen. nov.

Type species : *Kostjurixia ootiyensis* Narendran sp. nov.

*Diagnosis* : Antennal toruli below level of ventral margin of eyes; MS present and curved; fronto-facial sutures (Fig. 79) distinctly and moderately separated from each other; antennal clava without apical spine but with a seta; SMV with 1 dorsal seta; mesoscutum with 3 adnotaular setae on each side, each seta of anterior pair at anterior corner of mesoscutum, second pair in the middle and third pair (worn out but pits are visible); ML of mesoscutum absent; SMG absent; foramen magnum situated distinctly above centre of

head; body dorsoventrally flattened; lower margin of clypeus truncate; body without metallic colouration, pale brown.

*Host* : Unknown.

*Distribution* : India (Tamil Nadu)

*Remarks* : This new genus shows resemblance to genera such as *Kostjukovius* Graham, *Tamarixia* Mercet, *Aceratoneuromyia* Girault and *Oomyzus* Rondani. It resembles *Kostjukovius* in having : 1) SMV with one dorsal seta; 2) Fronto-facial sutures separated from each other; 3) Body dorsoventrally flattened; 4) Dorsellum and propodeum lying in the same plane as mesoscutum and scutellum and 5) in having foramen magnum situated distinctly above centre of head. However, it differs from *Kostjukovius* in having : 1) Propodeal spiracle separated from anterior margin of propodeum by its own diameter (in *Kostjukovius* spiracle is separated by more than the diameter of spiracle); 2) Antenna without long setae and apical spine on clava (in *Kostjukovius* antenna with long erect setae and clava with terminal spine); 3) Mesoscutum with three pairs of setae (in *Kostjukovius* only 2 pairs of setae).

This new genus resembles *Tamarixia* Mercet in having : 1) SMV with single dorsal seta; 2) Anterior margin of clypeus truncate; 3) Body relatively short and squat and 4) Body without metallic colouration. However, it differs from *Tamarixia* in having 1) Midlobe of mesoscutum with 3 pairs of nonstout setae (in *Tamarixia* mid lobe of mesoscutum with 2 strong adnotaular setae, one on either side); 2) Mesosoma pale brown (in *Tamarixia* mesosoma black); 3) SMG absent (in *Tamarixia* SMG distinct); 4) Propodeum long as in *Aceratoneuromyia* (in *Tamarixia* propodeum not as above); 5) Scutellum and dorsellum very similar to that of *Aceratoneuromyia* (in *Tamarixia* scutellum and dorsellum not similar to that of *Aceratoneuromyia*); 6) Gaster pale brown (in *Tamarixia* gaster black and may have yellow markings).

This genus resembles *Aceratoneuromyia* Girault in having similar type of mesoscutum, scutellum and propodeum, but differs in having fronto-facial grooves well separated from each other and in not having clava with long pilosity and without distinct apical spine. It also differs from *Aceratoneuromyia* in not having gaster with obtuse apical end in dorsal view and curved MS.

This new genus differs from *Oomyzus* Rondani in having dorso-ventrally flattened body, occipital foramen situated distinctly above centre of head and in its curved MS.

*Etymology* : Generic name is a combination of letters taken from *Kostjukovius* and *Tamarixia*, feminine gender.

1. *Kostjurixia ootiyensis* Narendran sp. nov.  
(Figs. 77-79)

*Holotype* : *Female* : Length 1 mm. Head and mesosoma light brown; gaster dark brown; eye grayish reflecting yellow; ocelli pale yellow; legs : coxae and femora brown; trochanter

pale brown; tibia and tarsi pale yellow; wings hyaline with veins and pilosity pale yellowish brown.

**Head** : Anterio-posteriorly compressed, width in anterior view 1.1x its length; width in dorsal view 5x its median dorsal length; POL 1.7x OOL; OOL 3x OD; occiput sharply sub-vertical, but not distinctly forming an occipital carina; frontofacial suture (Fig. 79) separated running to sides of front ocellus; lower margin of clypeus truncate or entire; mandibles bidentate; eye pilose, 1.72x as long as MS; 1.55x as long as wide in side view; MS curved, without a basal fovea; antennal formula 11233 (Fig. 78); scape not reaching front ocellus, a little shorter than eye height in profile, 2.5x as long as wide; pedicellus subequal in length and width, longer than F1 (12 : 9); F1 slightly wider than long (10 : 9); F2 shorter than F1, a little wider than long (11 : 8); F3 subequal in length to F2, wider than long (12 : 8); clava 1.7x as long as wide, as long as funicle, a little shorter than scape (25 : 30).

**Mesosoma** : Flattened, with 3 adnotaular setae (posterior most third pair worn out but setal pits can be seen on careful observation under proper illumination) on each side; pronotum as long as mesoscutum, minutely reticulate; mesoscutum 2.1x as broad as long; scutellum 0.72x as long as mesoscutum, 1.23x as broad as long, surface mostly smooth, SMG distinct but weak; two pairs of setae (anterior pair worn out but setal pits distinct) on posterior half of scutellum as in *Aceratoneuromyia*; dorsellum lying over metanotum medially, touching propodeum, propodeum with median carina and surface as in *Aceratoneuromyia*, as long as scutellum; propodeal spiracle small separated from metanotum by its own diameter; hindcoxa finely reticulate; hind femur about 3x as long as wide; spur of midtibia a little shorter than metatarsus; forewing (Fig. 77) about 2.8x as long as broad (excluding marginal fringe); CC a little shorter than MV (25 : 28); MV a little more than 3x as long as STV; marginal fringe about 0.8x length of STV; speculum closed behind by cubital line of setae, not extending below MV apical end.

**Gaster** : Longer than mesosoma; subequal in length to head plus mesosoma; hypopygium exceeding middle of gaster, cercal setae short and subequal.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female India : Tamil Nadu, Ooty, Dodabetta, 6.iii.1993, coll. S. B. Zeya.

### Genus *Lasalleola* Narendran

2003. *Lasalleola* Narendran in Narendran *et al.*, 113-116. Type species : *Lasalleola obsona* Narendran.

**Diagnosis** : Head slender but not collapsing; vertex raised; occipital carina present; MS distinct; antenna inserted near middle of frons; antennal formula 11033; flagellar segments very long with long hairs; scape exceeding vertex; pronotum with very distinct cross carina in its posterior half; mesoscutum with two pairs of setae and a ML; scutellum with two pairs of setae and a pair of SMG; forewing with three dorsal setae on SMV; STV linear; marginal fringe long; propodeum with a median carina and without paraspiracular carinae; gaster sessile, collapsing; hypopygium not reaching near apex of gaster.

This genus comes near *Mestocharella* Girault and *Aprostocetus* Westwood in the key to genera of Australasian Eulophidae by Bouček (1988). However, it differs from all the known genera of Eulophidae in the following combination of characters : 1) Flagellar segments unusually long; 2) Scape exceeding vertex; 3) Vertex raised; 4) Pronotum with a cross carina; 5) STV linear; 6) Gaster sessile.

*Host* : Unknown.

*Distribution* : India (Karnataka).

*Lasalleola obsona* Narendran  
(Fig. 85)

2003. *Lasalleola obsona* Narendran, 113-116. Female, India, Karnataka. ZSIC.

*Redescription* : *Female* : Length 1.3mm. Blackish brown; eye grey with blackish patch; ocelli dark brown; lower marginal area of clypeus and frons paler; antenna pale brown; mouth parts pale yellow; legs pale yellow; pit at gaster pale brown; wings hyaline; veins and pilosity pale brown.

*Head* : Slender but not collapsing; width in anterior view a little more than 1.2x its length; width in dorsal view a little more than 3x distance between front ocellus and occipital foramen; vertex mostly smooth; raised and narrow, sides with irregular reticulation; part behind occipital carina vertical, not sloping; MS distinct and straight; maximum diameter of eye in profile a little more than 4x malar space; clypeus faint but distinct; lower margin of clypeus entire, not bilobed or incised : (mandible teeth not detectable); frons faintly reticulate. Antenna inserted near middle; antennal formula 11033; scape exceeding level of vertex; flagellar segments very long, with long hairs; F1 longest. Relative lengths of segments : scape = 18; pedicellus = 7; F1 = 30; F2 = 24; F3 = 22; clava = 35, with an apical long spicule.

*Mesosoma* : Pronotum with a weak but very distinct cross ridge on its posterior half, posterior margin of pronotum subtriangular; sides with two sublongitudinal pits; mesoscutum weakly reticulate, with 2 pairs of setae, with a distinct ML, inside the groove punctate and reticulate; notauli complete; axillae advanced forward; scutellar surface weakly and not longitudinally reticulate; scutellum with two pairs of setae on posterior half, with a pair of distinct SMG, surface of scutellum weakly and longitudinally reticulate; scutellum a little shorter than mesoscutum (32 : 36), its width subequal to its length; dorsellum faintly rugulose; prepectus subtriangular and faintly reticulate. Propodeum with faint reticulation, mostly smooth, with a median carina; paraspircular carina absent; nucha absent; forewing length (excluding marginal fringe) about 2.6x its width; SMV with 3 dorsal setae; PMV absent; STV linear. Relative lengths of forewing veins and CC as follows : CC = 30; MV = 62; PMV = 39; STV = 14; speculum setose and closed behind by cubital line of setae; maximum length of marginal fringe about 0.1x length of forewing.

*Gaster* : Ovate; collapsing, with a deep pit at base; one cercal seta slightly longer than remaining cercal setae; hypopygium extending beyond middle of gaster but not reaching near apex of gaster.

*Host* : Unknown.

*Distribution* : India (Karnataka).

*Type locality* : Karnataka, Nagarhole.

*Material examined* : Type only.

### Genus *Leptocybe* Fisher & La Salle

2004. *Leptocybe* Fisher & LaSalle, (in Mendel *et al.*) : 43, 101-113. Type species : *Leptocybe invasa* Fisher & LaSalle

*Diagnosis* : Head collapsing when dried, with distinct groove and weak area around ocellar triangle; propodeum with a raised lobe of callus that partially overhangs the outer rim of spiracle; spiracle open to anterior margin of propodeum; forewing with PMV less than 0.25x length of STV; MS distinctly curved; mesoscutum without a ML; scutellum with SMG and SLG; dorsellum long, medially as long as propodeum.

*Host* : Gall inducer on leaves of *Eucalyptus*.

*Distribution* : India (new record), Middle East, Mediterranean & Africa. Dr. John La Salle (per. comm. 2006) informs that this species is present in South East Asia extending to Vietnam and Thailand.

### *Leptocybe invasa* Fisher & LaSalle (Figs. 280-283)

2004. *Leptocybe invasa* Fisher & LaSalle, (in Mendel *et al.*) 43 : 101-113. Female, Male, Israel, Syria.

*Diagnosis : Female* : Length 1.1-1.4 mm. Head and body brown with blue to green metallic refringence; mouth margin light brown to yellow; forecoxa yellow, middle and hindcoxae concolorous with body; legs including tarsi yellow except for brown apical part of last tarsal segment; antenna with scape yellow, but darkened apically; funicle and clava light brown; wings hyaline.

*Head* : (Fig. 280) Strongly collapsing; a groove running from each torulus towards clypeal region; antennal torulus inserted about half way between clypeal margin and median ocellus, and above level of ventral margin of eyes; scrobe with a ML; antennal formula 11433; pedicellus longer than half length of scape (Fig. 281).

*Mesosoma* : Midlobe of mesoscutum without a ML, with 2-3 weak, short adnotaular setae at lateral margin; propodeum (Fig. 282) without ML or plicae; surface smooth. Forewing 2 or a little over 2x as long as wide; SMV usually with 3-4 dorsal setae (rarely 2 or 5, LaSalle, 2004); venation as in figure 283.

*Gaster* : A little or hardly longer than mesosoma; hypopygium exceeding half of gaster; ovipositor sheath not reaching apex of gaster.

*Male* : Unknown.

**Host** : Gall inducer on leaves of *Eucalyptus* seedlings and trees up to two years of age.

**Material examined** : 103 Females, India, Karnataka, Bagepally, coll. R. Sundararaj, 12.x.2006.

**Remarks** : The Indian specimens are more darkish with more greenish metallic refringence after drying. This is a serious pest of *Eucalyptus* and has affected 20,000 hectares of *Eucalyptus* plantations in Tamil Nadu, Andhra Pradesh, Karnataka and Kerala. The best solution to control this pest is to use biological control. Two species of *Aprostocetus* and one species of *Megastigmus* are reported to be good biocontrol agents in Israel (Courtesy to Prof. Zevi Mendel)

### Genus *Melittobia* Westwood

1848. *Melittobia* Westwood, XVIII. Type species : *Melittobia audouinii* Westwood, 1848, by monotypy.

1849. *Melittobia* Westwood, 1xv.

1849. *Anthophorabia* Newport, 183. Type species : *Anthophorabia retusa* Newport, 1849, by monotypy. [Synonymised with *Melittobia* by Smith, 1854].

1908. *Philopison* Cameron, 559. Type species : *Philopison clavicornis* Cameron, 1908, by monotypy. [Synonymised by Ferrière, 1933 : 103].

1910. *Sphecophagus* Brèthes, 208. Type species : *Sphecophagus sceliphronidis* Brèthes, 1910, by monotypy. [Synonymised by De Santis, 1949 : 276].

1910. *Sphecophilus* Brèthes, 310. [Unnecessary replacement name for *Sphecophagus*] [Synonymised by De Santis, 1949 : 276].

1984a. *Melittobia* Westwood; Dahms, 271-336, 1984b : 337-360, 1984c : 361-385; Graham, 1987 : 27, 34; Bouèek, 1988a : 594, 698; Graham, 1991b : 180-182.

**Diagnosis : Female** : MS absent; frontofacial sutures narrowly separated dorsally; vertex elevated above eyes; lower margin of clypeus usually bilobed; rarely truncate or emarginate; mandibles tridentate; antennal formula 11133; antenna inserted below lower ocular line; flagellum dorsoventrally flattened, with multiporous sensillae on all segments; body usually somewhat flattened; pronotum elongate; mesoscutum without ML; mid lobe of mesoscutum with several scattered setae; scutellum with 2 pairs of setae; dorsellum well defined in noncollapsed specimens; propodeum without median longitudinal carina; spiracle freely exposed; legs normal; gaster elongate; sides subparallel; segments somewhat of equal size; ovipositor not exerted.

**Male** : Apterous or brachypterous; head enlarged; without MS or frontofacial sutures, ocelli absent; eye reduced to a single facet; scape enlarged and swollen.

**Host** : Parasitic or hyperparasitic on mostly aculeate Hymenoptera, but also may attack other insect orders such as Lepidoptera, Coleoptera or Diptera.

**Distribution** : Cosmopolitan.

### 1. *Melittobia acasta* (Walker)

- 1839d. *Cirrospilus acasta* (Walker), : 328. Lectotype Female Great Britain (BMNH).
1848. *Melittobia audouinii* Westwood, xviii. Lectotype Male France (UM), Smith 1854 synonymised.
1849. *Anthophorabia retusa* Newport, 183. Neotype Male Great Britain (BMNH) Smith, 1854 synonymised.
1852. *Anthophorabia fasciata* Newport, 81, Neotype Male Great Britain (BMNH) Dahms (1984) synonymised.
1878. *Melittobia osmiae* Thomson, 204. Lectotype Male Sweden. Synonymised by Bouček & Graham, 1978.
1878. *Tetrastichus melittobius* (sic) Thomson, 298 (as *melittobius*, 1878) Lectotype Female, Sweden. Synonymised by Bouček & Graham, 1978.
1921. *Melittobia strandi* Wolff & Krausse, 16-21. Syntypes, Germany (not located) synonymised by Dahms (1984).

*Diagnosis : Female* : Length 1.3-1.5 mm. Head, scape, pedicellus, flagellum, mesosoma, coxae, trochanters, femora (except apices), mesosoma dark brown, remainder of legs yellowish brown. Facial grooves running separately to scrobes; lower clypeal margin bilobed; eyes relatively bare with a few scattered setae. For other characters see Dahms (1984).

*Male* : Length 1.4–1.7 mm. Head, antennae, mesosoma, legs and gaster pale brown except flagellum darker; mesoscutum and axillae pale; vertex, pronotum, scutellum, coxae, trochanters, femora (except tip) and gaster light brown. In dried specimens uniform brown to dark brown. For other characters see Dahms (1984).

*Hosts* : Polyphagous. It is primarily or secondarily parasitic on larvae and pupae of various solitary or social wasps and bees, Lepidoptera and Coleoptera and pupae of parasitic Diptera (Graham, 1991). The more important hosts recorded by Domenichini (1966), Dahms (1984) and Noyes (2003) are : *Laspeyresia pomonella* L. (Lepidoptera : Tortricidae), *Donacia* sp. (Coleoptera : Chrysomelidae), *Musca domestica* L. (Diptera : Muscidae), *Compsilura concinnata* Meigen, *Campoplex alcae* (Hymenoptera : Ichneumonidae), *Leucospis intermedia* (Hymenoptera : Leucospidae), *Monodotomerus obsoletus* Fab. (Hymenoptera : Torymidae), *Formica fusca* L., *F. pratensis* Rezius, *F. sanguinea* Latreille (Hymenoptera : Formicidae), *Gymnomerus laevipes* Shuckard (Hymenoptera : Eumenidae), *Trypoxylon figulus* L. (Hymenoptera : Sphecidae), *Prosopis* sp. (Hymenoptera : Colletidae), *Anthidium* sp., *Eriades* sp., *Lydella grisescens* Robineau-Desvoidy (Diptera : Larvaevoridae), *Eriades* sp., *Megachile muraria* Latreille, *Osmia adunca* Latreille, *O. leucomelaena* Kaltebach, *Stelis nasuta* Latreille (Hymenoptera : Megachilidae), *Anthophora abrupts* Say, *Bombus* sp. (Hymenoptera : Apidae); *Eulimneria alcae* (Hymenoptera : Ichneumonidae).

*Distribution* : India, Sri Lanka, other parts of Oriental Region, Palaeartic, Nearctic, Neotropic, Oceanic, North Africa, Australia.

*Type locality* : Great Britain (South Gate?).

*Remarks* : This species differs mainly from *M. assemi* in having 1) frontofacial groove running separately to scrobes (in *M. assemi* frontofacial groove meeting just above middle of eyes then proceeding as a line to scrobes, upper arm slightly wider than POL); 2) relative measurements of antennal segments differ.

The above account is based on Dahms (1984) and Graham (1991) (Courtesy to Dahms & Graham).

## 2. *Melittobia assemi* Dahms (Fig. 152-153)

1984a. *Melittobia assemi* Dahms, 301-302. Female, Male. Seychelles (BMNH) examined.

*Diagnosis : Female* : Length 1.3mm. Head, flagellum, mesosoma, coxae dark brown; femora brown with pale apices; scape, pedicellus, remainder of legs pale yellow; dorsal part of scape and pedicellus slightly darker; eyes densely pubescent with long setae; frontofacial grooves converging to meet just above middle of eyes where linearly proceeding to scrobes; upper arms of facial grooves wider than POL; clypeus bilobed.

*Male* : Similar to females except for head, body and legs pale golden brown; antenna pale golden brown with F4 and clava infuscated; forewing apex acute; mid femoral fringe sparse; head more or less rectangular; scape ventrally with a longitudinal groove. For other details see Dahms (1984).

*Hosts* : *Chalybion bengalense*; pupa of *Delta conoides*. For the breeding and biology see van den Assem, Narendran & Sudheendra Kumar (1987) and Sudheendrakumar & Narendran (1984).

*Distribution* : India (Kerala) and probably other parts of India also, Seychelles.

*Type locality* : Seychelles.

*Material examined* : 84 Females & 75 Males India, Kerala, Malappuram Dt., Nilambur (11° 16' N 76° 13' E), Feb. 1980, coll. V. V. Sudheendrakumar and T. C. Narendran; 2 Females & 3 Males India, Malappuram Dt, Calicut University Campus (11° 7' N 75° 5' E), March, 1980-1981, coll. T. C. Narendran.

## Genus *Mestocharella* Girault

1913[167]. *Mestocharella* Girault, 2 : 269. Type species : *Mestocharella feralis* Girault by original designation.

*Diagnosis* : Lower margin of clypeus bilobed; frons without ML; MS present; antennal toruli situated about middle of frons; antennal formula 11142 (except in *indica* and *deltoids* with 3 and 4 anelli); pronotum with a cross carina; mesoscutum with a longitudinal irregular depression posteriorly, with 3-5 adnotaular setae on each side; axilla not advanced,

scutellum with SMG and SLG rather deep, often with costae, with 2 pairs of setae; dorsellum with a median carina, rarely longitudinally rugose; propodeum long, strongly carinate, with a large sub pentagonal area (except in *indica* and *deltoids*); propodeal spiracle separated from metanotum by more than its diameter (except in *indica* and *deltoids*); SMV with several dorsal setae; PMV half as long as STV; body black and yellowish brown, non metallic.

*Host* : Parasitic on Lepidoptera, mainly leaf mining species.

*Distribution* : South Asia to Java, Japan, Solomon Islands & Australia.

### Key to Indian species of *Mestocharella* Girault

(Modified from Kamijo, 1994)

1. Propodeum with large subpentagonal area delimited by strong carinae (Fig.111); pronotal collar with cross carina anteriorly ..... 2
- Propodeum not as above (Fig. 6, Singh & Khan 1995 and; page 151, Fig. 6, Khan, Agnihotri & Sushil 2005); pronotal collar with cross carina posteriorly ..... 4
2. Scutellum depressed posteriorly between SMG which are unusually broad; prepectus with a few irregular cross carinae; dorsellum longitudinally rugulose; female basal tergite with hind margin slightly emarginate; extralimital : Malaysia .....  
..... *latistriata* Kamijo
- Scutellum and other characters not as above ..... 3
3. Female funicle stout (Fig. 112) with F1 2.2x as long as broad; flagellum covered with sparse decumbent setae; antennal toruli situated nearer to lower margin of clypeus than level of vertex, Oriental region including India & Indonesia .....  
..... *javensis* Gahan
- Female funicle usually slender, with F1 2.25x as long as broad; flagellum covered with more dense, less decumbent setae; antennal toruli situated nearer to level of vertex than to lower margin of clypeus; extralimital : Taiwan .....  
..... *formosana* Kamijo
4. Antenna with 3 anelli; SMV with 4 dorsal setae; gaster shorter than mesosoma; antennal toruli located almost near middle of frons; PMV 0.33x as long as STV; F1 to F3 decreasing in length; India ..... *indica* Singh & Khan
- Antenna with 4 anelli; SMV with 4 dorsal setae; gaster longer than mesosoma; antennal toruli located below centre of frons; PMV 0.25x as long as STV; India .....  
..... *deltoids* Khan, Agnihotri & Sushil

#### 1. *Mestocharella deltoids* Khan, Agnihotri & Sushil

2005. *Mestocharella deltoids* Khan, Agnihotri & Sushil, 150-151, Female, India (IARI?).

This species probably does not belong to *Mestocharella* since the figure 6 of the original description is clearly different from the propodeum of the genus. The antenna is also with 4 anelli here. This may belong to *Baryscapus* or *Aprostocetus*. Request for the type remained unanswered. The species name is also differently spelt in page 150 and 151 in the original description.

*Host* : Unidentified egg mass of bug on poplar *Populus deltoids*.

*Type locality* : India : Uttaranchal (Pantnagar).

## 2. *Mestocharella indica* Jaikishan Singh & Khan

1995. *Mestocharella indica* Jaikishan Singh & Khan, 23-26. Female, India (IARI?).

This species may not belong to *Mestocharella* since the propodeum shown in figure 6 of Jaikishan Singh and Khan (1995) is not at all likely that of *Mestocharella*. Antenna is provided with more than one anellus; SMG and SLG are not provided with costulae in figure 6 in the original paper. This may be *Aprostocetus* or *Baryscapus*.

*Host* : Eggs of Reduviid *Sycanus collaris* Fabr. on *Terminalia chebula* (Arjun leaves) (Jaikishan Singh & Khan 1995).

*Type locality* : India :Uttaranchal (Matkola, Pantnagar)

## 3. *Mestocharella javensis* Gahan

(Fig. 111-112)

1922. *Mestocharella javensis* Gahan, 48. Female, Java (USNM) (examined)

1977. *Mestocharella javensis* Gahan; Bouček 24.

*Diagnosis : Female* : Length 1.7-1.85mm. Black or blackish brown; face and clypeus pale brown; antennae and legs pale yellow; fore and hindcoxae brownish; pretarsi infusate; in holotype flagellum darker apically; wings hyaline. Head in dorsal view 2.1x as broad as long; 1.2x as broad as long in front view; eye 1.43x as long as MS; antennal scape a little shorter than eye height, reaching slightly above level of vertex; mesoscutum with 3 adnotaular setae on each side; dorsellum weakly sculptured with a strong median carina; SMV with 4-5 dorsal setae; speculum large, closed behind cubital line of setae; MV 8.33x STV; PMV about 0.5x length of STV. Gaster a little longer than mesosoma.

*Male* : Similar to female except for scape broader.

*Host* : *Caloptilia theivora* (Wasingam) on tea. Bouček (1977) recorded this species from Pakistan from an undetermined leaf miner on *Eugenia cumini* (Myrtaceae). Kamijo (1994) states that this latter case needs confirmation.

*Type locality* : Indonesia (Java).

*Distribution* : India (Assam), Pakistan, Indonesia.

*Remarks* : The above account is based on notes I had prepared while at USNM and on the descriptions of Kamiyo (1994), Gahan (1922) and Bouček (1988).

### Genus *Minotetrastichus* Kostjukov

1977. *Minotetrastichus* Kostjukov, : 190 (as subgenus of *Tetrastichus*) Type species *Eulophus* [recte *Cirrospilus*] *ecus* Walker [= *M. frontalis* (Nees)] (Original designation)

1987. *Minotetrastichus* Kostjukov, as valid name Graham

*Diagnosis* : Lower margin of clypeus truncate or weakly bilobed; propodeal spiracle rim fully exposed and separated from metanotum by atleast its own diameter, callus with 2-3 setae; MS present; SMV with 2 or more dorsal setae; mesoscutum without ML (SMG); mesosternum convex; body metallic with yellow markings or yellow with dark metallic markings; the two longest cercal setae subequal in length, straight or only slightly curved.

*Host* : Primary or secondary parasitoids of leaf mining Lepidoptera, Coleoptera, and Hymenoptera.

*Distribution* : Holarctic with one species known from India (Narendran, 2001 new record) and from the Carribbean (LaSalle, 1994).

#### 1. *Minotetrastichus frontalis* (Nees)

1834. *Eulophus frontalis* Nees, 161 (NHMV) transferred to *Minotetrastichus* by Graham and LaSalle (1991 : 89).

1838. *Cirrospilus ecus* Walker, 204. Lectotype Female, Great Britain (BMNH) designated by Graham (1961) and synonymized by Graham & LaSalle (1991).

1844. *Eulophus cyclogaster* Ratzeburg, 167. Female, Germany (destroyed) (Graham, 1987).

1877a. *Entedon rivillellae* Rondani, 291. Lectotype Female, Italy, designated by Bouček (1974) [Synonymized with *Tetrastichus ecus* (Walker) by Bouček ].

1844. *Eulophus cyclogaster* Ratzeburg, 167. Germany.

1848. *Eulophus xanthops* Ratzeburg, 167?

1954. *Geniocerus budensis* Erdös, 355, Lectotype, Female, Hungary (HNHM) synonymized with *ecus* by Domenichini, 1966.

1976. *Tetrastichus cimbicis* Kostjukov, 89-92, Female, USSR, Graham (1987) synonymized.

*Diagnosis* : *Female* : Black or black with yellow markings; head and mesosoma mainly on dorsum with weak to strong metallic tints which vary from bronze to bronze green or golden green and green to blue; gaster bronze to purplish bronze, its apical segments and sometimes the base more or less green or blue; gaster with yellowish parts may be present in some cases. For detailed variation of colour see Graham (1987) on *ecus*.

*Male* : Black with metallic tint; atleast upper angle of mesopleuron yellow; antenna with scape provided with a ventral plaque; gaster as long as mesosoma. For detailed description see Graham (1987).

**Host** : Many species of leaf mining Lepidoptera, Coleoptera and Hymenoptera. For detailed list of hosts reference should be made to Graham (1987) and Domenichini (1966).

**Distribution** : Europe, North America and Pakistan.

**Discussion** : This species differ from *M. zeasmi* sp. nov. in having : 1) Eyes separated by their own length (in *ziasmi* eyes separated from each other by more than the length of each eye); 2) MS strongly curved (in *zeasmi* MS straight); 3) Antennal scape distinctly shorter than eye (in *ziasmi* scape as long as eye); 4) Clava with apical spicula and apical seta present (Spicula and apical seta indistinct in *zeasmi*); 5) Funicular segments subequal in length (in *ziasmi* F1 distinctly shorter than F2); 6) Midlobe of mesoscutum with 3-4 adnotaular setae on each side (in *zeasmi* midlobe of mesoscutum with 6-7 irregularly arranged setae near each notauli); 7) Propodeal spiracle separated from metanotum by 0.5-0.9x diameter of spiracle (in *ziasmi* spiracle separated from metanotum by 1.5x its diameter); 8) MV 2.6-3.1x length of STV (in *zeasmi* MV 4.2x length of STV); besides the above differences, the colour patterns also differ in the two species.

2. *Minotetrastichus ziasmi* Narendran sp. nov.  
(Figs. 115-117)

**Holotype : Female** : Length 1.57 mm. Head yellow with ocellar area dark brown; eye pale reflecting yellow; ocelli pale brownish yellow; antenna brown with scape and ventrolateral part of pedicellus yellow; mandibles brown with dark apex. Pronotum yellow with median part dark metallic green; mesoscutum yellow with a broad median dark metallic green patch extending from anterior margin to near posterior margin of midlobe of mesoscutum, dorsellum dark metallic green; metanotum and median broad part of propodeum brown with slight metallic greenish tinge; all the remaining parts of mesoscutum and legs yellow except for brown pretarsi. Gaster yellow with T4 almost completely (except anterior median part) and a patch in the middle of T5 black; wings hyaline, veins and pilosity pale yellow.

**Head** : Width in anterior view 1.1x as wide as long; width in dorsal view (Fig. 116) 3.48x as wide as its median length; POL 1.33x OOL; OOL 1.5x OD (front ocellus); eye bare, 1.63x as long as MS in side view, MS straight; antennal formula 11133 (Fig. 117); scape as long as eye height in side view, 2.82x as long as wide; pedicellus shorter than F1; F2 longest funicular segment; F3 longer than F1; clava subequal in length to combined length of F2 plus F3, without apical spicula or seta; funicular segments and clava with sensillae; length of funicle plus pedicellus about 1.2x width of mesosoma.

**Mesosoma** : About 1.6x as long as wide; midlobe of mesoscutum with 6-7 irregularly arranged setae on either side; scapula with single seta, without a ML; scutellum 0.30x length of mesoscutum, as wide as 2x its length; dorsellum clearly visible from above; 0.63x median length of propodeum, surface of propodeum mostly smooth and shiny with faint reticulations, spiracle relatively small, rim fully exposed, separated from metanotum by 1.5x diameter of spiracle; callus with 2-3 setae. Forewing (Fig. 115) 3.2x as long as

broad; CC shorter than MV; relative lengths : CC = 42; SMV = 50; STV = 12; speculum closed behind.

*Gaster* : With a very short transverse petiole; gaster longer than mesosoma, shorter than head plus mesosoma, 1.75x as long as broad in dorsal view; hypopygium exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female India : Jharkhand, Ranchi (23° 21' N 85° 20' E), 27.ii.1994, coll. S. B. Zeya and S. I. Kazmi (ZSI).

*Paratypes* : 3 Females, of the same data of holotype.

*Etymology* : The species name is a combination of letters taken from the names of collectors Zeya and Kazmi.

*Remarks* : This new species does not quite agree with the descriptions of any of the species so far described. It also does not fit in to the key by Graham (1987).

#### Genus *Narendrania* Fousi

2004. *Narendrania* Fousi, in Mohana *et al.*, : 598-600. Type species *Narendrania keralensis* Fousi.

*Diagnosis* : Mesoscutum with longitudinal carinae and deep channels in between; head densely setose with large setal pits; mesoscutum with ML, with 12 setae arranged in two rows (8 + 4) near each notauli; each scapula with 16 setae; scutellum with SMG and SLG; SMV with 5 dorsal setae; each cercus with one seta longer than others and sinuate.

*Host* : Unknown.

*Distribution* : India (Kerala, Malappuram Dt.)

#### 1. *Narendrania keralensis* Fousi

2004. *Narendrania keralensis* Fousi, in Mohana *et al.*, : 598-600, Female, India, Kerala (ZSIC).

*Diagnosis* : *Female* : Length 2.87mm. black with slight metallic green tinge on head; lower part of face pale brown; eyes and ocelli coppery red; flagellum dark brown; pedicellus light brown; scape pale yellow; legs lemon yellow with coxa and two third of femora from base and pretarsi dark brown; dorsellum and metanotum yellow; wings hyaline with veins pale brown. Head with characteristic large scattered setigerous punctae; occiput concave, excavate; eye minutely pubescent; hind ocellus connected to eye by a cross groove; MS straight, without a basal fovea, below eye; toruli situated at or slightly above level of ocular margin; each toruli connected to each other by an inverted subtriangular depression; antennal formula 11333; scape reaching front ocellus but not level of vertex; ocelli enclosed in a surrounding groove in front; scutellum with a median longitudinal depression in anterior half, with 2 pairs of setae, anterior pair slightly beyond level of

middle of scutellum; propodeum with spiracle separated; median carina shorter than dorsellum; wings hyaline; SMV with 5 dorsal setae; relative lengths of veins : CC = 33, SMV = 22, MV = 46, STV = 7, PMV hardly noticeable; fringe distinctly shorter than half length of STV; gaster sessile, longer than head plus mesosoma (39 :26); hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Type locality* : India : Kerala : Malappuram Dt., Calicut University Campus.

*Material examined* : Holotype & paratype.

### Genus *Neogasterichus* Narendran

2003. *Neogasterichus* Narendran, (in Narendran *et al.*,) 223-228. Type species *Neogasterichus longigastris* Narendran.

*Diagnosis* : Head non-collapsing. Vertex very broad but short, not elevated, without transverse carina; shortly behind lateral ocelli steeply falling into excavated occiput; no temples; eye virtually bare, large, prominent, almost hemispherical. Genae strongly convergent; MS distinct throughout (not replaced by straight ridge); occipital carina or ridge absent; lower face submedially depressed, resembling shallow foveae, tentorial pits absent; clypeal area elevated dorsally with broadly divergent ridges towards outer ridges of toruli full diameter apart, situated at lower ocular line. Female antennal funicle with 3 proximal segments, more separated than 3 segmented clava; all hispid with dense short decumbent sensillae and dense suberect pilosity; apex of clava with spicula partly concealed by sensilla.

*Mesosoma* : Pronotum moderately short, dull with very dense raised reticulation at sides with conspicuous pale spiracular tubercles. Mesoscutum with distinct ML. Notauli very deep with 6 adnotaular thin hairs. Scutellum with SMG uniformly deep. Propodeum densely reticulate with distinct well marked median and paraspiracular carinae; legs not unusually slender; hindcoxa deeply and coarsely reticulate on dorsum; spur of hind tibia about 1.5x as long as width of tibia; basitarsus a little longer than second segment. MV longer than CC; the latter bare; SMV with one dorsal seta.

*Gaster* : Petiole absent; gaster very long, not laterally compressed; T1 a little shorter than combined length of T2 and T3; cercal setae short. Hypopygium ending before anterior one-fourth; ovipositor sheath distinctly produced beyond epipygium.

*Host* : Unknown.

*Distribution* : India (Kerala).

#### 1. *Neogasterichus dulciculus* Narendran

2003. *Neogasterichus dulciculus* Narendran (in Narendran *et al.*,) 226-227. Female, India (ZSI).

**Redescription : Female :** Length 2.91 mm. Black with metallic blue refringence; antenna brown with scape and pedicellus pale brown; eye brownish red; ocelli dark brown; legs pale brownish yellow, hindcoxa concolorous with body; fore and mid coxae dark brown; tegula dark brown. Wings hyaline, veins and pilosity brown.

**Head :** Width in dorsal view 1.11x width of mesosoma; in anterior view width a little more than 1.11x its length; vertex and occiput with scattered setigerous pits; interstices smooth. POL 1.7x OOL; frons and face distinctly reticulate; scrobe shallow; margin ecarinate; area below toruli with oblique ridges connecting toruli and lower clypeal margin at sides; lower clypeal margin with 3 teeth; MS distinct; maximum diameter of eye a little more than 1.17x that of MS. Antenna inserted at lower ocular line; antennal formula 11233. Relative length : width of antennal segments : scape = 34 : 8; pedicellus = 12 : 7; F1 = 21 : 9; F2 = 24 : 9; F3 = 26 : 9; clava = 35 : 13. Clava with small spicula, partially covered by sensillae.

**Mesosoma :** Pronotum reticulate with a posterior transverse row of setae; mesoscutum with complete ML and dense raised reticulation; mesoscutum slightly longer than scutellum, with row of 6 admarginal hairs near notauli on either side. Scutellum a little wider than long with raised reticulation and 2 pairs of setae. Propodeum with distinct median and paraspiracular carinae; submedian area reticulate. Forewing length 2.33x its width; relative length of CC = 39; MV = 43; PMV = 2.8; STV = 9; SMV with a single seta.

**Gaster :** Petiole absent; length 1.56x length of mesosoma, T1 with a median shallow pit like area; gaster pubescent mainly at sides; hypopygium slightly exceeding T3.

**Host :** Unknown.

**Distribution :** India (Kerala).

**Type locality :** Kerala : Calicut University Campus.

**Material examined :** Holotype.

## 2. *Neogasterichus longigastris* Narendran (Fig. 84)

2003. *Neogasterichus longigastris* Narendran (in Narendran *et al.*) 224-226. Female, India (ZSI).

**Redescription : Female :** Length 2.81-3.26mm. Bright metallic green; antenna brown with scape pale yellow; eye brick red; ocelli pale yellowish brown; legs immaculate yellow except basal half of hindcoxa which is concolorous with body; tegula pale yellowish brown. Wings hyaline, veins pale brown, pilosity on wings pale brown; pilosity on body white.

**Head :** Width in dorsal view subequal to that of mesosoma; in anterior view 1.15x its length; vertex and occiput with scattered setigerous pits, interstices smooth. POL about 2x OOL; occipital carina indistinct, longitudinal ML on occipital region clearly distinct; frons and face (area below toruli) distinctly reticulate; scrobe shallow; margins ecarinate;

face with oblique ridge on either side connecting toruli and lower clypeal margin; the latter with 3 median teeth; MS distinct; maximum diameter of eye in profile 2.3x as long as MS. Antenna inserted at lower ocular line; antennal formula 11233. Relative length : width of antennal segments : scape = 40 : 7; pedicellus = 17 : 7; F1 = 30 : 9; F2 = 32 : 10; F3 = 29 : 10; clava = 46 : 12 with a light coloured spicula at apex partly hidden by sensillae.

*Mesosoma* : Pronotum with raised dense reticulations, and a line of setae at posterior end; mesoscutum with a complete ML and raised longitudinal reticulation, slightly longer than scutellum, with a row of 6 admarginal thin hairs near notauli on either side; scutellum length subequal to its width, with raised reticulation and two pairs of setae. Propodeum with distinct median and paraspiracular carinae, submedian areas densely reticulate. Forewing length 2.15x its width, relative lengths of CC = 28; MV = 33;; PMV = 4; STV = 8; speculum asetose, closed behind.

*Gaster* : About 2.5x as long as mesosoma; T1 with a median basal pit; tergites with setae at sides; hypopygium ending below T3.

*Host* : Unknown.

*Distribution* : India (Kerala).

*Type locality* : Kerala : Calicut University Campus.

*Material examined* : Holotype and paratype.

#### Genus *Neomestocharella* Narendran & Fousi

2002. *Neomestocharella* Narendran & Fousi, 137-141. Type species : *Neomestocharella keralensis* Narendran & Fousi.

*Diagnosis* : Length 1.1 - 1.3mm. Head collapsing; lower clypeal margin weakly bilobed; MS present, without basal fovea; gena somewhat swollen; antennal formula of female 11332, of male 11343; male antennal scape 1.85x as long as wide; pronotum with distinct raised cross carina (visible only under accurate focussing and illumination); mesoscutum with 2 adnotaular setae on each side; ML absent; notauli complete; scutellum with 2 pairs of setae, anterior pair near middle level; SMG nearer to SLG than to each other; dorsellum bulging posteriorly; propodeum mostly smooth with faint reticulations, and an inverted 'Y' shaped median carina and without paraspiracular carinae; propodeal spiracle relatively very small, separated from metanotum by about its own diameter (in Fig. 3 of Narendran & Fousi 2002, spiracle is wrongly shown touching anterior margin of propodeum); SMV with 2 dorsal setae, marginal fringe almost as long as STV; gaster with one cercal seta on each side longer than others, slightly sinuate or almost straight.

*Host* : Unknown, probably rice pests in Kerala or other cereals in other regions.

*Distribution* : India : Kerala, Uttar Pradesh (new record), Tamil Nadu (new record) and Karnataka (new record).

1. *Neomestocharella keralensis* Narendran & Fousi  
(Fig. 114)

2002. *Neomestocharella keralensis* Narendran & Fousi, 139-141, Female, India (ZSIK).

*Redescription : Female* : Length 1.1mm. Head pale brownish yellow; eyes and ocelli black; POL and OOL area black with metallic green reflection; antenna pale brown; mandibles pale brown; mesosoma pale brownish yellow with metallic green patches on dorsum of pronotum, anterior part of mesoscutum, part of scapula and at sides of axilla and median part of scutellum and whole of propodeum. Legs pale whitish yellow with pretarsus darker. Gaster pale brownish yellow with sides dark brown mingled with metallic green reflection. Ovipositor sheath black, wings hyaline with veins pale yellowish brown; pilosity of wings pale brown.

*Head* : Collapsing, broader than mesosoma in dorsal view, smooth with sparse pilosity; in anterior view head width a little more than its length (10 : 9); POL a little more than 2.5x OOL; each mandible bidentate; MS distinct and complete without a basal fovea; height of eye in profile about 2x length of malar surface; eye length in side view a little more than 1.6x its maximum width; eye bare; antennal toruli situated a little above lower ocular line; each torulus nearer to eye than to each other. Antennal formula 11332. Scape length a little more than 4x its width, as long as eye length in profile; scape slightly exceeding level of vertex; F1 nearly 2x as long as pedicellus and a little more than 1.6x length of F2; F3 subequal in length to F2; clava with apical spicule, claval length (including spicule) a little more than 2x length of F3.

*Mesosoma* : Pronotum with a distinct cross carina near its posterior margin; faintly reticulate, mostly smooth, with weak and sparse setae on posterior border; mesoscutum with notauli complete, with two pairs of setae, surface with faint reticulation, axilla advanced forward. Scutellum with 2 pairs of setae, with a pair of SMG and another pair of SLG, surface faintly reticulate. Dorsellum slightly bulging over propodeum, faintly reticulate. Propodeum with an inverted "Y" - shaped median carina, surface mostly smooth and shiny with faint reticulations; paraspicular carina absent; callus not pubescent; spiracle large, rounded with distance from anterior margin less than its diameter. Forewing length about 3x its maximum width, with distinct and long fringe; speculum setose. SMV with 2 dorsal setae. Relative length of veins : SMV = 36; MV = 52; STV = 16; PMV absent.

*Gaster* : Sessile, oval, collapsing from dorsum, a little longer than 1.3x mesosoma, with a distinct cercal seta.

*Male* : Length 1.34 mm. Similar to female except in having antennal formula 11343, scape swollen, its length 1.85x its width.

*Host* : Unknown. Probably Lepidopteran pests of rice or other cereals.

*Remarks* : In the original description of Narendran & Fousi, 2002, propodeal spiracle is described as "large" This is a mistake; it is relatively small.

**Material examined** : Besides Holotype and Paratype the following additional material examined : 3 Females, India, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 13.xi.1979, 24.xi.1985 coll. M. Hayat; 3 Females, India, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 20.x.1979, 3.xi.1991, coll. S. B. Zeya; 2 Females & 8 Males India, Bihar, Gaya Division, 24.x.1992, coll. S. B. Zeya; 1 Female, 3 Males India, Bihar, Gaya Division, 21.x.1992, coll. S. B. Zeya; 2 Females, India, Bihar, Gaya Division, 4.i.1992, coll. S. B. Zeya; 1 Female & 8 Males India, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), April 1979, coll. M. Hayat & M. Verma; 6 Females, India, Tamil Nadu, 3. iii.1993, coll. S. I. Kazmi; 1 Female, India, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 26.ix.1979, coll. M. Verma; 1 Female, India, Kerala, Kozhikode Dt., Cheruvannur, 23. i.2002, coll. Divakaran; 4 Females, India : Kerala, Kozhikode Dt., Azheekode (11° 53' N 75° 24' E), 16.ii.2003, coll T. C. Narendran & Party; 1 Female, India, Kerala, Kannur Dt., Kavinissery (11° 55' N 75° 22' E), 16.ii.2003; coll T. C. Narendran & Party; 1 Female, India, Kerala, Kottayam Dt., Kumarakom (9°36' N 76°26' E), 17.iv.2004; coll T. C. Narendran & Party.

### Genus *Neotrichoporoides* Girault

1913. *Neotrichoporoides* Girault, [156] : 50. Type species *Neotrichoporoides uniguttatus* Girault; by original designation.
1913. *Neotrichaporoides* Girault, [167] : 241, 250. Unnecessary emendation.
1913. *Trichaporoidella* Girault, [167] : 223 and 1913 [171] : 105. Type species *Trichaporoidella aenea* Girault; by original designation.
1913. *Tetrastichomorpha* Girault, [167] : 227 and 1913 [172] : 38. Type species *Tetrastichomorpha flava* Girault; by original designation.
1913. *Aprostoceroloides* Girault, [167] : 243. Type species *Aprostoceroloides speciosus* Girault; by original designation.
1915. *Paraprostocetus* Girault, [230] : 257. Type species *Paraprostocetus purpureithorax* Girault; by original designation.
1915. *Epiquadrastichus* Girault, 258. Type species *Epiquadrastichus emersoni* Girault; by monotypy.
1955. *Burksia* Fullaway, 409. Type species *Burksia viridimaculata* Fullaway; by original designation.
2005. *Neogaleopsomyia* Narendran, 269-274. Type species *Neogaleopsomyia idukkiensis* Narendran; by original designation. (ZSIK) syn. nov.

The generic synonymy was fully discussed by Bouček (1988) in his revision of the Australasian Chalcidoidea.

**Diagnosis** : Length 1.7-3.3 mm; forewing with MV 6-9.5x longer than STV; axillae not very strongly advanced; MS usually foveate below eye; sculpture on propodeum stronger than sculpture on scutellum; anterior pair of scutellar setae at least slightly in front of middle and equidistant from SMG and SLG or near the latter occasionally; propodeum with the raised lobe of callus partially covering outer rim of spiracle; one of the cercal setae longer than others, often sinuate.

**Comments :** The genus *Neogaleopsomyia* Narendran is found to be an extreme variation of the genus *Neotrichoporoides* as some species studied later have shown intermediate characters of both the two genera. Hence, I place the genus *Neogaleopsomyia* as a junior synonym of *Neotrichoporoides*. This genus comes very near to *Aprostocetus* Westwood in having one of the cercal setae longer than others; rim of callus partially covering propodeal spiracle and SMV with 4 or more dorsal setae. It differs from *Aprostocetus* in the combination of characters given above under diagnosis, mainly in the long MV and in having relatively stronger sculpture on propodeum than on scutellum.

**Distribution :** Mainly Old World tropics and subtropics with one widespread species *Neotrichoporoides viridimaculatus* (Fullaway) also known from North and South America (LaSalle, 1994).

**Biology and Hosts :** Parasitoids of Diptera (e.g., Diopsidae, Lonchaeidae and Muscidae) in stems of grasses (Bouèek, 1988; La Salle, 1994).

### **Key to species of *Neotrichoporoides* Girault of India (Based on Females)**

1. Body yellow with characteristic patterns of metallic green or black markings (Fig. 131) which tend to form broken longitudinal stripes; scape as long as or longer than eye, exceeding level of vertex; F1 at least 2x as long as pedicellus, MV 8-9.5x length of STV; speculum closed below; propodeum 1.5-2x as long as dorsellum; MS with fovea below eye not reaching half length of MS ..... *viridimaculatus* (Fullaway)
- Body not marked yellow or with quite different pattern; other characters partly or completely different ..... 2
2. Midlobe of mesoscutum with at least 2 longitudinal rows of adnotaular setae on either side (second row with one seta is considered in this clause), forewing with speculum open behind ..... 3
- Mid lobe of mesoscutum with a single longitudinal row of adnotaular setae (if ever with a second row on inner side present then the second row is always with a single seta and speculum almost open behind) ..... 8
3. Gaster black with base yellow (Fig. 118); body not wholly dark metallic green, forewing (excluding fringe) about 3.7x as long as wide ..... *beonus* Narendran
- Gaster not as above, body mostly dark metallic green; forewing not more than 3.5x as long as broad ..... 4
4. Scape not exceeding level of vertex; F1 not more than 1.7x length of pedicellus; head dark metallic green ..... 5
- Scape exceeding level of vertex; F1 2x or more than the length of pedicellus; head may or may not be with dark metallic green all over, often with yellow or brown colour on ventral half ..... 7

5. Pedicellus (Fig. 128) 1.83x as long as broad, as long as F1; F3 as long as broad; enclosed space between SMG of scutellum 1.6x as long as broad .....  
 ..... *yoopi* Narendran sp. nov.
- Characters not as above ..... 6
6. Head width equal to mesoscutum, 2.43x as broad as long in dorsal view; POL 1.8x OOL; OOL 2.5x OD; eye length 1.22x its width in side view; pedicellus 3x as long as wide; pronotum 0.85x length of mesoscutum; maximum width of midlobe of mesoscutum about 1.5x its length; hind femur 4x as long as broad; forewing (excluding fringe) 3.14x as long as broad; MV 6.8-7x as long as STV ..... *crinius* Narendran
- Head slightly broader than mesoscutum, 2.1-2.2x as broad as long, POL equal to or slightly greater than OOL, about 2x OD; eye about 1.3x as long as broad in profile; pedicellus 2.2-2.6x as long as wide; pronotum about 0.5x length of mesoscutum; maximum width of midlobe of mesoscutum about 2x its length; hind femur 3.3-3.5x as long as broad, forewing 2.6-2.85x as long as broad; MV 8-9.3x as long as STV .....  
 ..... *mediterraneus* Graham
7. Pedicellus plus flagellum (Fig. 123) 1.6x width of mesoscutum; forewing 3.47x as long as broad; lower frons and gena metallic green, tip of hypopygium situated 0.5x length of gaster .....  
 ..... *galia* Narendran & Santhosh
- Pedicellus plus flagellum (Fig. 133) 1.7-1.75x width of mesoscutum; forewing 3x as long as broad; lower frons and gena yellow or yellowish brown; tip of hypopygium situated 0.35-0.40x length of gaster .....  
 ..... *nyemitawus* (Rohwer)
8. Head yellow or atleast partly yellow ..... 9
- Head dark metallic green, dark brown or brown with metallic green refringence ..  
 ..... 12
9. Gaster (Fig.126) 1.73x as long as head plus mesosoma, 5x as long as wide in dorsal view; mesoscutum with 3 adnotaular setae on either side; fovea below eye not reaching half its length; F1 1.7-1.8x as long as pedicellus (Fig. 125) .....  
 ..... *mohanae* Narendran sp. nov.
- Characters not as above ..... 10
10. Clava as long as F1; F1 1.43x as long as pedicellus; forewing (excluding fringe) less than 3x as long as wide; SMV with 7 and MV with 16 setae on dorsum .....  
 ..... *delhiensis* (Shafee, Fatma & Kishore)
- Clava distinctly longer than F1; F1 1.5-1.83x as long as pedicellus; other characters different from above ..... 11
11. Dorsum of mesosoma metallic green with lateral panel of pronotum yellow; hindcoxa dark brown; scape slightly exceeding level of vertex; forewing more than 3x as long as broad; SMV with 4 dorsal setae; speculum absent .....  
 ..... *tonimus* Narendran

- Dorsum of mesosoma mostly brown, with very slight metallic reflection (hardly noticeable in holotype, gaster dark brown with base yellow) hindcoxa yellow; scape not exceeding level of vertex; forewing 2.5x as long as broad; SMV with 5 dorsal setae; speculum relatively small ..... *doproides* Narendran sp. nov.
- 12. MS without a fovea below eye; SMV with 2 dorsal setae; MV 6.3x as long as STV, with 8 dorsal setae; length of gaster about 1.4x head plus mesosoma; hypopygium not reaching middle of gaster, 0.33x length of gaster from base (extralimital- Borneo) ..... *budaensis* (Narendran)
- MS with a fovea below eye; other characters different from above ..... 13
- 13. Scape exceeding a little above level of vertex; scutellum with 2 pairs of setae; pronotum 0.62x as long as mesoscutum; body mostly metallic green ..... *idukkiensis* (Narendran)
- Scape not exceeding above level of vertex, other characters partly or completely different ..... 14
- 14. Scutellum with 2 pairs of setae ..... 15
- Scutellum with 3 pairs of setae ..... 16
- 15. Anterior pair of scutellar setae placed a little beyond middle of scutellum; eye length 1.35x its maximum width in profile; F1 as long as pedicellus; pedicellus plus flagellum about 1.5x width of mesoscutum; hindcoxa 1.4x as long as broad; CC a little longer than MV; head pale brown with metallic green refringence ..... *stom* Narendran
- Anterior pair of scutellar setae placed a little before middle of scutellum; eye length 1.06x its maximum width in profile; F1 nearly 2x as long as pedicellus; pedicellus plus flagellum about 1.8x width of mesoscutum; hindcoxa 2x as long as broad; CC 0.74x as long as MV; head dark metallic green with mouth slightly pale ..... *curiosus* Narendran
- 16. SMV with 4 dorsal setae, MV 6.6x as long as STV; fovea of MS reaching half length of sulcus; pedicellus 2x as long as broad; hypopygium exceeding middle of gaster; antennal flagellum with dense sensillae (Fig.130) ..... *dunicus* Narendran sp. nov.
- SMV with 5 dorsal setae; MV 8.5x as long as STV; fovea of MS not reaching half length of MS; pedicellus 3x as long as broad; hypopygium not reaching middle of gaster; antenna (Fig.129) not as above ..... *arunima* Narendran sp. nov.

1. *Neotrichoporoides arunima* Narendran sp. nov.

(Fig. 129)

*Holotype : Female* : Length 1.64 mm. Head and mesosoma mostly brilliant metallic green; gaster dark metallic green; eye reflecting pale yellow with black tinge; ocelli pale

reflecting yellow; flagellum and pedicellus brown with dorsum of pedicellus dark, scape pale yellow with apical one-third dorsally dark; tegula pale whitish yellow; legs pale whitish yellow, with coxae concolorous with mesosoma; except that third and fourth tarsal segments are pale brown and pretarsi dark brown; wings hyaline with veins and pilosity pale brown.

*Head* : Width in anterior view subequal to its length, 4.6x as broad as its median length in dorsal view; POL 1.25x OOL; OOL 1.66x OD; eye length 1.5x its width in side view, 2.4x as long as MS; MS with a triangular fovea below eye, fovea not reaching half length of MS; mouth 2x malar space; antennal formula 11433; toruli situated slightly above level of lower eye margin; scape a little shorter than eye height, not reaching level of vertex; pedicellus plus flagellum 1.44x width of mesoscutum; pedicellus 3x as long as broad, 0.65x as long as F1; relative length : width of antennal segments : scape = 20 : 6; pedicellus = 15 : 5; F1 = 23 : 6; F2 = 19 : 7; F3 = 16 : 7; clava = 23 : 8; antennal segments as in figure 129.

*Mesosoma* : Not very convex; propodeal slope gently declining posteriorly; pronotum 0.53x as long as mesoscutum, hind margin arched; midlobe of mesoscutum 1.3x as long as its posterior width, a little shorter than its anterior width (8 : 12), distinctly reticulate, without ML, with one row of 3 adnotaular setae on either side; scutellum a little wider than long (10 : 9); SMG not diverging posteriorly, enclosing a space 2.25x as long as broad; scutellum with 3 pairs of setae, all setae situated nearer to SLG than to SMG; scutellum a little longer than mesoscutum (9 : 8); dorsellum 7x as broad as long, 0.25x as long as median length of propodeum; propodeum reticulate; propodeal spiracle rim fully exposed, separated from metanotum by its own diameter, callus with 4 setae on each side of propodeum; hindcoxa 2x as long as broad, reticulate; hind femur 3.4x as long as broad; spur of mid tibia 0.7x as long as metatarsus; forewing excluding marginal fringe 2.5x as long as broad; CC 0.47x as long as MV; SMV with 5 dorsal setae; MV 8.5x as long as STV; front edge of MV with 11 dorsal setae; PMV 0.75x as long as STV; speculum setose.

*Gaster* : A little longer than head plus mesosoma (18 : 17), 2.25x as long as broad in dorsal view; cercus with one seta longer than others; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 8.xii.1992, Coll. M. Hayat (ZSIC).

*Paratypes* : 1 Female, India, Kerala, Wayanad Dt., Sulthan Batheri, 7.v.2000, coll. T. C. Narendran & Party (ZSIK); 1 Female, India, Kerala, Alapetty, Kayamkulam (9°10' N 76°30' E), 19.ii.1989, coll. T. C. Narendran & Party (ZSIC).

*Remarks* : This new species resembles *N. crinius* in having metallic green refringence on body but can be separated by the characters mentioned in the key in this work.

## 2. *Neotrichoporoides beonus* Narendran (Fig. 118)

2006. *Neotrichoporoides beonus* Narendran, 40 :5-7. Female, India (ZSIC).

**Redescription : Female :** Length 2.45 mm. Upper half of head dark brown with metallic green reflections; a line adjacent to eye brownish yellow; lower half of frons, gena, and temples brownish yellow; eyes brownish red; ocelli reflecting yellow; antenna dark brown with scape and under side of pedicellus pale yellow. Pronotum, mesoscutum, scutellum and propodeum metallic green; pronotal panel, meso and metapleuron pale brownish yellow; axilla pale brownish yellow with middle part metallic green; sides of lateral lines of scutellum pale brownish yellow; legs pale yellow with hindcoxa and basal half of mid coxa pale yellowish brown and hind femur with pale brownish tinge medially; pretarsi and fourth tarsal segment of all legs dark brown. Gaster black with T1 and T2 pale brownish yellow with sides and dorsum separated by dark reflecting green. Wings hyaline with veins pale brownish yellow; pubescence of wings pale brown; pubescence on body yellowish white.

**Head (Fig.118) :** Wider than mesoscutum, 2.73x as wide as long in dorsal view; head width in anterior view 1.1x its length; POL 1.6x OOL, 1.67x OD; eye length 1.22x its width in side view, MS with triangular fovea extending half its length; mouth 1.2 x malar space; most setae on head short and pale. Antenna with scape 0.91x length of eye, exceeding level of vertex; pedicellus plus flagellum 1.35x width of mesoscutum; pedicellus 3x as long as wide, about 0.67x length of F1. Relative length : width of antennal segments : scape = 25 : 6; pedicellus = 12 : 4; F1 = 18 : 4; F2 = 18 : 4; F3 = 14 : 4; CL<sub>1</sub> = 8 : 6; CL<sub>2</sub> = 5 : 6; CL<sub>3</sub> = 3 : 4; CL<sub>4</sub> (spine) = 3 : 3.5.

**Mesosoma (Fig.118) :** Rather weakly arched; propodeal slope 40°; pronotum 0.93x as long as mesoscutum, hind margin slightly arched; mid lobe of mesoscutum 1.46x as long as broad, moderately shiny with a median longitudinal depression on posterior half with distinct reticulations, with 2 rows of adnotaular setae, outer row of 6 and inner row of 3 setae; posterior pair longer than other pairs. Scutellum a little shorter than mesoscutum (14 : 15), a little longer than wide, sculptured as mesoscutum; SMG nearer to SLG than to each other, not diverging posteriorly, enclosing a maximum space 2.8x as long as its width; anterior setae placed about middle, nearer to SMG, posterior pair slightly longer than anterior pair. Dorsellum 4.5x as broad as long; propodeum 4x as long as dorsellum, with dense raised reticulations; median carina distinctly raised; spiracle small, its maximum diameter larger than distance between it and metanotum; callus with 3 distinct setae; hindcoxa 2.25x and hind femur 3x as long as wide; spur of mid tibia 0.45x length of basitarsus; fourth tarsomere distinctly shorter than basitarsus in midleg. Forewing about 3.69x as long as its maximum width; CC 0.72x length of MV; SMV with 6 dorsal setae; MV 8.3x length of STV, front edge of MV with 16 setae; PMV absent; speculum asetose, open below, cubital line of setae not reaching behind speculum; hind wing bluntly pointed at apex.

**Gaster** (Fig. 118) : Ovate, acuminate, as long as head plus mesosoma, 2.1x as long as wide in dorsal view; tip of hypopygium ending beyond middle of gaster.

**Male** : Similar to Female except for relatively longer antennal flagellum and shorter gaster.

**Hosts** : Unknown.

**Type locality** : India : Kerala, Malappuram dt., Kohinoor.

**Distribution** : India (Kerala, Tamil Nadu, New Delhi).

**Material examined** : India : Kerala : Malappuram Dt. : Kohinoor, near Calicut University Campus, (11°7' N 75°5' E), 13 Females, 10.vi.2001, 1.i.1982, 1.xi.1986, 26.ix.1988, 24.x.1988, 1.i.1989, 31.i.1989, 26-29.iv.1989, 9.viii.2001, coll. T.C. Narendran; Palghat Dt., Parambikulam (10°49' N 76°12' E), 1, 22.xii.1985, coll. T.C. Narendran; Malappuram Dt., ??Nilambur (11°16' N 76°13' E), 3 Females, 11.viii.1987, 30.1.2003, coll. T.C. Narendran; Kollam Dt., Neendakara (8°56' N 76°32' E), 1 Female, 22.ii.1989, coll. T.C. Narendran; Kasargode Dt., Chowki (12°31' N 74°59' E), 4 Females, 23.i.2005, coll. T.C. Narendran; Palghat Dt., Pattambi (10°49' N 76°12' E), 1 Female, 12.viii.2003, coll. T.C. Narendran & Party; Idukki Dt., Vandiperiyar, Manjumalai (9°35' N 77°5' E), 1 Female, 8.i.2004, coll. T.C. Narendran & Party; Palghat Dt., Siruvani forests (10°58' N 76°42' E), 2 Female, 26.ix.1987, coll. T.C. Narendran & Party; Malappuram Dt., Manjeri (11°7' N 76°7' E), 5 Females, 13.ix.2003, 30.ix.2003, 4.x.2003, coll. T.C. Narendran & Party; Alappuzha Dt., Kayamkulam (9°10' N 76°30' E), 7 Females, 19.iv.2004, coll. T.C. Narendran & Party; Palghat Dt., Malampuzha (10°53' N 76°46' E), 5 Females, 1.i.1986, 14.i.1986, 5.vi.1986, 19.i.1988, coll. T.C. Narendran; Malappuram Dt., Parappanangadi (11°3' N 75°52' E), 1 Female, 28.viii.1987, coll. T.C. Narendran; Waynad Dt., Kalpetta, Puthurvayal (11°37' N 76°6' E), 2 Females, 6.ii.2003, coll. T.C. Narendran & Party; Kozhikode Dt., Chaliyam (11°9' N 75°49' E), 3 Females, 14.iii.2003, coll. T.C. Narendran & Party; Kozhikode Dt., Pookad (11° 23' N 75° 44' E) (75°44' N 11°23' E), 1 Female, 31.viii.2001, coll. T.C. Narendran & Party; Kottayam Dt., Thekkadi, (9°36' N 77°12' E), 8 Females, 10.v.1986, coll. T.C. Narendran; Kannur Dt., Kottiyoor (10°7' N 78°49' E), 2 Females, 17-19.ii.2003, coll. T.C. Narendran & Party; Kannur Dt., Cherukunnu (11°54' N 75°21' E), 1 Female, 16.ii.2003, coll. T.C. Narendran & Party; Thiruvananthapuram Dt., Neyyar dam (8°37' N 77°7' E), 1 Female, 24.i.1989, coll. T.C. Narendran; Kozhikode Dt., Moodadi (11°28' N 75°38' E), 1 Female, 30.x.1988, coll. T.C. Narendran & Party; Palghat Dt., Thrithala (10°48' N 76° 8' E), 1 Female, 14.viii.2003, coll. T.C. Narendran & Party; Malappuram Dt., Thenjipalam (11°8' N 75°6' E), 1 Female, 15.v.2004, coll. T.C. Narendran & Party; Ernakulam Dt., Kaladi (10°10' N 76°27' E), 1?, 12.i.2004, coll. T.C. Narendran & Party; Trichur Dt., Vellanikkara (76°13' N 10°31' E), 1 Female, 1.vii.1986, coll. T.C. Narendran & Party; Tamil Nadu, Annamalai University Campus (12°18' N 79°4' E), 1 Female, 10.x.2000, coll. R. Kanakaraj; Tamil Nadu, Coimbatore (11°1' N 76°50' E), 8 Females, 4-9.ix.1987, coll. T.C. Narendran; New Delhi, Pusa, IARI (28° 40' N 77° 11' E), 1 Female, 6.viii.1986, coll. T.C. Narendran (DZUC).

**Variation** : In some specimens scape is just reaching level of vertex and not clearly exceeding it.

### 3. *Neotrichoporoides crinius* Narendran (Figs. 119)

2006. *Neotrichoporoides crinius* Narendran, 40 : 7-8. Female, India (ZSIC)

*Redescription : Female* : Length 2-2.3 mm. Dark metallic green with following exceptions antenna brown with pale scape; eye brown; ocelli reflecting brown; mouth slightly pale; foreleg pale brownish yellow with bases and apices of femur and tibia paler; mid and hindlegs with coxae concolorous with mesosoma, mid and hind femora pale brown with bases and apices paler; mid and hind tibia pale yellow, all tarsi pale yellow with fourth tarsal segment and pretarsi dark brown; wings hyaline with veins pale brown; pubescence dirty white.

*Head* : (Fig. 119) : Width equal to mesoscutum; about 2.43 x as broad as long in dorsal view; head width in anterior view about 1.1x its length; POL 1.8x OOL; OOL 2.5x OD; eye length 1.22x its width in profile; malar space about 0.52x its eye length in profile; MS with triangular fovea extending half its length; mouth 1.5x malar space; most setae on head very short and pale. Antenna (Fig. 119) with scape 0.73x length of eye, reaching front ocellus but not exceeding level of vertex; pedicellus plus flagellum 1.7x width of mesoscutum; pedicellus as long as broad, 0.6x length of F1; funicle slender proximally, distinctly stouter than pedicellus, its segments decreasing gradually in length. Relative length : width of antennal segments : scape = 17 : 3; pedicellus = 9 : 3; F1 = 15 : 4; F2 = 14 : 5; F3 = 12 : 5; clava = 19 : 6.

*Mesosoma* : Rather weakly arched; propodeal slope 40°. Pronotum 0.85x length of mesoscutum, hind margin evenly curved. Mid lobe of mesoscutum 1.2 to 1.5x as long as broad; moderately shiny with fine reticulations; six adnotaular setae in irregular double rows, posterior most pair longer than others. Scutellum length subequal to length of mesoscutum, subequal to its own width, sculptured as mesoscutum; SMG well grooved, slightly nearer to SLG than to each other, enclosing a space 2.44x as long as broad; anterior setae placed well before middle, about equidistant from SMG and SLG; posterior setae slightly longer, near to SMG. Dorsellum 4x as broad as long; propodeum distinctly longer than (2x) dorsellum, densely reticulate; reticulations raised, median carina distinctly raised; spiracles small, sub oval, its maximum diameter lesser than the distance between it and metanotum; callus with 4 setae; legs of median length; hindcoxa oblique about twice as long as broad; hind femur 4x as long as broad; spur of mid tibia 0.44x length of basitarsus; fourth tarsomere a little shorter than basitarsus. Forewing 3.14x as long as broad; CC much shorter than MV, 16x as long as broad; SMV with 4 dorsal setae; MV thin distally but widening gradually basad, 6.8 to 7x as long as STV, its front edge with 16 to 18 setae; PMV rudimentary; speculum asetose, open behind; cubital line of setae ending somewhat distad of distal edge of speculum; hind wing pointed at apex.

*Gaster* : Ovate, acuminate at apex, a little shorter than head plus mesosoma; about 1.93x as long as broad, tip of hypopygium reaching almost half length of gaster.

*Male* : Unknown

*Host* : Unknown.

*Type locality* : India : Kerala, Kasaragode.

*Distribution* : India (Kerala, TamilNadu).

*Material examined* : 1 Female, India, Kerala, Kasaragode Dt., Kasaragode (12°30' N 74°59' E), 22.i.2002, coll. T.C. Narendran & Party. (ZSIK); Kannur Dt., Aralam (11°58' N 75°40' E), 1 Female, 12.v.1985, coll. T.C. Narendran; Kozhikode Dt., Nanminda (11°26' N 75°50' E), 1 Female, 7.xii.2003, coll. T.C. Narendran & Party; Palghat Dt., Agali (11°9' N 76°40' E), 1 Female, 12.xii.1987, coll. T C. Narendran & Party.

#### 4. *Neotrichoporoides curiosus* Narendran & Girish (Figs. 122)

2006. *Neotrichoporoides curiosus* Narendran & Girish, 40 : 12-13. Female, India (ZSIC).

*Redescription* : *Female* : Length 1.77mm. Dark metallic green with following parts as follows; antenna brown with pale scape; eye dull yellowish grey; ocelli pale reflecting yellow; mouth slightly pale; legs pale yellow with hindcoxa brown and reflecting metallic green; fourth tarsal segment and pretarsus brown; wings hyaline with veins pale brown; pubescence on body pale yellowish white.

*Head* (Fig. 122) : Wider than mesoscutum, 2.44x as broad as long in dorsal view; head width in anterior view a trifle more than or equal to its length; POL 2x OOL; OOL 1.33x OD; eye length 1.06x its width in profile; malar space 0.65x eye length in profile; MS with triangular fovea extending to half its length; mouth 1.4x malar space; most setae on head very short and pale. Antenna (Fig. 122) with scape 0.94x the length of eye, reaching front ocellus, but hardly reaching and never exceeding level of vertex; pedicellus plus flagellum about 1.8x width of mesoscutum, pedicellus 3x as long as wide, about 0.6x length of F1, funicle slender, equal to width of pedicellus. Relative length : width of antennal segments : scape = 29 : 7; pedicellus = 15 : 5; F1 = 17 : 5; F2 = 21 : 5; F3 = 21 : 5; CL<sub>1</sub> = 9 : 7; CL<sub>2</sub> = 8 : 8; CL<sub>3</sub> = 6 : 5; claval spine = 6 : 3.

*Mesosoma* : Rather weakly arched; propodeal slope about 45° Pronotum 0.75x as long as mesoscutum, hind margin slightly concave, mid lobe of mesoscutum 1.35x as long as broad, moderately shiny with distinct reticulations; 3 adnotaular setae on either side in a row; posterior most pair longer than other pairs. Scutellar length equal to mesoscutal length, a little longer than its own width, sculptured as mesoscutum; SMG nearer to SLG than to each other, slightly diverging posteriorly, enclosing maximum space 1.54x as long as its width; anterior setae placed a little before middle, nearer to SMG than to SLG; posterior setae slightly longer, nearer to SMG. Dorsellum a little more than 4x as broad as long; propodeum 2x as long as dorsellum, with dense raised reticulations; median carina distinctly raised; spiracle small, suboval; callus with 3 setae; legs of medium length; hindcoxa oblique, 2x as long as broad in profile; hind femur 4x as long as broad; spur of mid tibia 0.8x length of basitarsus; fourth tarsomere subequal in length to basitarsus of

midleg; forewing about 3.2x its maximum width; CC 0.74x as long as MV; SMV with 5 dorsal setae; MV 7.7x as long as STV, its front edge with 14-16 setae, PMV absent; speculum setose, closed behind; cubital line of setae not reaching base of wing. Hind wing narrowly obtuse at apex.

*Gaster* : Ovate, acuminate, distinctly longer than head plus mesosoma, 2.17x as long as broad in dorsal view, tip of hypopygium ending slightly before middle of gaster.

*Male* : Unknown.

*Hosts* : Unknown.

*Type locality* : India : Kerala, Waynad, Muthanga..

*Distribution* : India (Kerala).

*Material examined* : India, Kerala, Waynad Dt., Muthanga (11°44'N 76°29'E), 1 Female, 7.x.1995, coll. T. C. Narendran (ZSIK); Kannur Dt., Kavinissery (11°55' N 75°22' E), 1 Female, 16.ii.2003, coll. T.C. Narendran & Party; Malappuram Dt., Calicut University Campus (11°7' N 75°5' E), 2 Females, 10.x.1986, 5.ii.1989, coll. T.C. Narendran; Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 1 Female, 11.vii.2004, coll. T.C. Narendran and Party; Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 1 Female, 17.ii.2003, coll. T.C. Narendran & Party. Waynad Dt., Kalpetta, Puthurvayal (11°37' N 76°6' E), 1 Female, 6.ii.2003, coll. T.C. Narendran & Party; Palghat Dt., Siruvani forests (10°58' N 76°42' E), 1 Female, 26.ix.1987, coll. T.C. Narendran; Kannur Dt., Peravoor (11°53' N 75°44' E), 1 Female, 25.ii.1988, coll. T.C. Narendran.

### 5. *Neotrichoporoides delhiensis* (Shafee, Fatma & Kishore)

1984. *Tetrastichus delhiensis* Shafee, Fatma & Kishore, 394-395. Holotype : Female : India, Delhi (ZDAMU)

2004. *Neotrichoporoides delhiensis* (Shafee, Fatma & Kishore) : Hayat & Shahi, 38 : 308.

*Diagnosis* : *Female* : Length 2.27 mm; Head dark with ventral part yellow; Mesosoma dark with metallic blue reflections; legs yellow with hindcoxa dark brown. OOL 3x OD; malar space slightly shorter than eye; antenna with scape slightly more than 4x as long as wide; F1 as long as pedicellus; clava as long as F1; forewing 2.81x as long as broad; SMV with 7 and MV with 16 setae respectively on dorsum; mesoscutum with a row of 4 adnotaular setae on either side; gaster slightly longer than mesosoma.

*Male* : Unknown.

*Host* : ex. *Atherigona soccata* (Rondani) on *Sorghum bicolor* (Linn.)

*Distribution* : India (New Delhi).

*Material examined* : I have not come across this species so far. The above account is based on the original description of Shafee *et al.* (1984) and of Hayat & Shahi (2004).

*Remarks* : According to Hayat & Shahi (2004) both wings and one antenna of the holotype is on slide No. 671. The type specimen (designated by Hayat & Shahi) has a number 671 with no wings and with one antenna. According to these authors the color of the specimen has faded considerably.

6. *Neotrichoporoides doproides* Narendran sp. nov.

(Fig. 127)

*Holotype* : Female : Length 1.6 mm. Brown with following parts otherwise : head, lower frons, gena, posterior half of dorsum or pronotum, sides of pronotum, tegula, legs, base of gaster pale yellow; mesosomal dorsum with slight metallic green reflection on some parts in some angle; wings hyaline with veins pale brownish yellow, pilosity of forewing pale yellowish brown.

*Head* : (Fig. 127) 1.1x as wide as mesosoma; 2.54x as broad as its maximum length in dorsal view; head as broad as long in anterior view; POL 2x OOL, 3x OD; eye length 1.22x its width in side view, 2.15x as long as MS; MS with triangular fovea almost reaching half its length (6 : 13); mouth 1.33x MS; antennal formula 11433; toruli situated at level of lower margin of eye; scape 0.86x as long as eye, not exceeding level of vertex; pedicellus plus flagellum 1.81x as long as width of mesoscutum; pedicellus 2.4x as long as broad; 0.55x as long as F1; relative length : width of antennal segments : scape = 24 : 7; pedicellus = 12 : 5; F1 = 22 : 6; F2 = 18 : 6; F3 = 16 : 6; clava = 24 : 7. Antennal segments as in figure 127.

*Mesosoma* : Arched, propodeal slope gently declining (about 30°) posteriorly; pronotum 0.89x as long as mesoscutum, hind margin not distinctly arched; midlobe of mesoscutum 2.25x as long as its posterior margin, 0.6x as long as its anterior width; distinctly reticulate, without ML, with 3 adnotaular setae on either side, the middle seta being a little inside of other setae; posterior pair slightly longer than others; scutellum a little shorter than mesoscutum (8 : 9), 1.25x as broad as long, SMG not diverging posteriorly, enclosing a space 2.25x as long as broad; anterior scutellar setae placed well before middle, a little nearer to SLG, posterior pair of setae a little longer than anterior pair, dorsellum 5x as broad as long; propodeum 2.5x as long as dorsellum medially, strongly reticulate; propodeal spiracle rim fully exposed, separated from metanotum by its own diameter, callus with 4 setae on either side; hindcoxa 2x as long as wide; reticulate on dorsolateral side; hind femur 3.4x as long as wide; spur of mid tibia 0.44x as long as midmetatarsus; forewing excluding marginal fringe as long as broad; maximum length of marginal fringe equal to length of STV; CC 0.5x as long as MV; SMV with 5 dorsal setae; MV 8.6x as long as STV; front edge of MV with 12-13 dorsal setae; PMV absent; speculum closed behind by cubital line of setae.

*Gaster* : Acuminate, as long as combined length of head and mesosoma, 2.31x as long as broad in dorsal view; cercus with one seta longer than others; hypopygium reaching a little beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female India : Tamil Nadu, Siruvani Forests (Coimbatore), (11° 0' N 76° 58' E), 26.ix.1987, Coll. T. C. Narendran & Party (ZSIC).

*Paratype* : 1 Female India : Kerala, Malappuram dt., Edakkara, 24.iv.1989, Coll. T. C. Narendran & Party (ZSIC).

*Remarks* : This new species differs from all other Indian species by the characters given in the key in this work.

### 7. *Neotrichoporoides dunicus* Narendran sp. nov.

(Fig. 130)

*Holotype* : *Female* : Length 1.93 mm. Head and mesosoma liver brown with metallic green reflections; gaster brown with slight metallic green reflection; eye pale yellow with dark tinge; ocelli dark brown; flagellum dark brown; pedicellus and anelli brown; scape pale yellow with dark brown apical part dorsally; legs with all coxae concolorous with mesosoma; femora and tibiae yellow; first and second tarsal segments yellow; third slightly brown; fourth tarsal segment pale yellowish brown; pretarsi pale brown; wings hyaline, veins pale yellow; pilosity on wings pale brown.

*Head* : Width in anterior view subequal to its length, width in dorsal view 3.25x as broad as its median length; POL equal to OOL; OOL 2x OD; eye length 1.33x its width in side view, 2x as long as MS; MS with an inverted triangular fovea below eye, fovea reaching half length of MS; mouth 2.7x as long as MS; antennal formula 11433; toruli situated slightly above level of lower eye margin; scape shorter than eye (13 : 15), not reaching level of vertex; pedicellus plus flagellum 1.7x as long as width of mesoscutum; pedicellus 2x as long as broad, 0.60x as long as F1; relative length : width of antennal segments : scape = 23 : 10; pedicellus = 14 : 7; F1 = 23 : 7; F2 = 18 : 8; F3 = 16 : 8; clava = 27 : 8.

*Mesosoma* : Slightly convex, gently declining posteriorly, pronotum 0.33x as long as mesoscutum; hind margin arched; midlobe of mesoscutum 2.5x as long as its posterior width; as long as its anterior width; distinctly reticulate, without ML with one row of 3 adnotaular setae on either side; scutellum a little wider than long (14 : 8); SMG not diverging posteriorly, enclosed space between SMG 2.5x as long as broad; scutellum with 3 pairs of setae; scutellum a little wider than long or as long as wide; dorsellum 3.2x as broad as long, 0.83x as long as median length of propodeum; propodeum reticulate, propodeal spiracle rim slightly covered by callus, separated from metanotum by less than its diameter; callus with 5 setae on each side; hindcoxa 2.2x as long as broad; spur of midtibia 0.44x as long as midmetatarsus; forewing (excluding marginal fringe) 2.86x as long as wide; CC 0.6x as long as MV; SMV with 4 dorsal setae; MV 6.6x as long as STV; front edge of MV with 8-10 strong setae on dorsal edge; PMV 0.33x as long as STV; speculum setose.

**Gaster** : Longer than head plus mesosoma (29 : 24), 2.41x as long as broad in dorsal view; cercus without any distinct long seta; hypopygium reaching beyond middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female India : Uttaranchal, Dehradun (30° 18' N 78° 3' E), Forest Research Institute area, 8.iv.1978, coll. M. Verma (ZSIC).

**Paratype** : 1 Female, with the same data of holotype except for date of collection 19.v.1978 (ZSIC).

**Remarks** : This new species resembles *N. arunima* in having scutellum with 3 pairs of setae but can be distinguished from *arunima* by the characters given in the key in this work.

#### 8. *Neotrichoporoides galia* Narendran & Santhosh (Figs. 123)

2006. *Neotrichoporoides galia* Narendran & Santhosh, 40 : 13-15. Female India (ZSIC)

**Redescription** : **Female** : Length 2.62 mm, dark metallic green with following parts as follows : eye pale yellowish grey with black patch; ocelli brownish black; antenna blackish brown with scape and ventral side of pedicellus pale brownish yellow; foreleg pale brownish yellow with fourth tarsus and pretarsus blackish brown; midleg similar to foreleg but base of coxa slightly brown; hindleg similar to midleg but hindcoxa concolorous with mesosoma with pale apex; wings hyaline, veins pale yellow; pubescence on wing brown; pubescence on body pale white.

**Head** (Fig. 123) : Width subequal to width of mesoscutum (including tegulae); 2.33x as broad as long in dorsal view; head width in anterior view 1.18x its anterior length; POL 1.33x OOL; OOL 3x OD; eye length 1.21x its width in profile, malar space 0.52x eye length in profile, MS with triangular fovea extending half its length; mouth 1.7x malar space; antenna (Fig.123) with scape 0.95x to equal length of eye in profile, exceeding level of vertex; pedicellus plus flagellum 1.6x width of mesoscutum; pedicellus 2x as long as its width, 0.4x length of F1. Relative length : width of antennal segments : scape= 23 : 5; pedicellus = 8 : 4; F1 = 20 : 3; F2 = 20 : 3; F3 = 16 : 4; CL<sub>1</sub> = 6 : 4; CL<sub>2</sub> = 5 : 4; CL<sub>3</sub> = 5 : 4; CL<sub>4</sub> = 5 : 3.75 (clava total = 21).

**Mesosoma** : Hardly arched, propodeal slope 30° Pronotum median length 0.63x median length of mesoscutum; hind margin evenly curved; mid lobe of mesoscutum 1.13x as long as its maximum width, moderately shiny with distinct longitudinal reticulations; 7 adnotaular setae in irregular double rows, posterior pair longer than other pairs; mesoscutum with a median fovea on posterior half; scutellum subequal in length to mesoscutum; a little longer than wide, sculptured as mesoscutum; SMG nearer to SLG

than to each other, enclosing a space of 2.4x as long as its width; anterior setae placed well before middle, about equidistant from SLG and SMG; posterior setae slightly longer than anterior setae, nearer to SMG. Dorsellum 5x as long as broad. Propodeum 2.75x as long as dorsellum with dense raised reticulation; median carina raised; spiracles situated at a distance subequal to its diameter from metanotum, rim not fully exposed; callus with 4 setae. Hindcoxa 1.57x as long as its maximum width; hind femur 2.83x as long as wide; spur of mid tibia 0.4x length of basitarsus; fourth tarsomere distinctly shorter than basitarsus. Forewing 3.47x as long as its maximum width; CC 0.79x as long as MV; SMV with 5 dorsal setae; MV 8.4x as long as STV, with 19 setae on its anterior margin; PMV absent; speculum asetose and open below; cubital line of setae not reaching distal edge of speculum. Hind wing broadly obtuse at apex.

*Gaster* : Ovate, acuminate at apex, subequal to combined length of head plus mesosoma, 2.33x as long as broad, tip of hypopygium reaching middle of gaster.

*Male* : unknown.

*Hosts* : Unknown.

*Type locality* : India : Kerala, Kasaragode.

*Distribution* : India (Kerala, Tamil Nadu, West Bengal).

*Material examined* : India, Kerala, Kasaragode Dt., Karanthakad (12°31' N 74°58' E), 1 Female, 2.xi.2003, coll. T.C. Narendran & Party (ZSIK); Kasaragode Dt., Chowki (12°31' N 74°59' E), 2 Females, 23.i.2003, coll. T.C. Narendran & Party; Palghat Dt., Agali (11°9' N 76°40' E), 1 Female, 2.xii.1987, coll. T.C. Narendran; Malappuram Dt., Calicut (E), 7 Females, 10.v.1987, 5.ii.1989, 4.v.1989, University Campus (11°7' N 75°5' E), coll. T.C. Narendran; Malappuram Dt., Kalkandi (11°1' N 76°28' E), 1 Female, 13.xii.1987, coll. T.C. Narendran & Party; Idukki Dt., Vandiperiyar, Manjumala (9°35' N 77°5' E), 1 Female, 8.i.2004, coll. T.C. Narendran & Party; (E), 1 Female, 14.ii.2004, Kozhikode Dt., Nanminda (11°26' N 75°50'), coll. T. C. Narendran & Party; Idukki Dt., Adimali (10°2' N 76°59' E), 1 Female, 3.xii.1988, coll. T.C. Narendran & Party; Tamil Nadu, Coimbatore, Sugar Breeding Institute (11°1' N 76°58' E), 2 Females, 27.ix.1987, coll. T.C. Narendran; West Bengal, Kolkata, Salt lake (22°34' N 88°21' E), 2 Females, 4.v.1982, coll. S. K. Gupta (DZUC).

### 9. *Neotrichoporoides idukkiensis* (Narendran) comb.nov.

(Fig. 124)

2005. *Neogaleopsomyia idukkiensis* Narendran, 270-273. Holotype Female, India, (ZSIC).

*Redescription* : *Female* : Length 1.7 mm. Body metallic green; eye pale yellow with brownish red round patch in middle; ocelli reflecting yellow; antenna brown with basal part of scape slightly paler; fore and mid coxae brown; hindcoxa concolorous with mesosoma and other parts of legs yellowish white; tegula pale yellowish white; pubescence on body white. Wings hyaline with veins pale brown.

**Head** : Width in dorsal view 2.75x its maximum length; width in anterior view 1.1x its length, scrobal grooves separately (narrowly) join frontal fork in front of anterior ocellus; face with a raised ridge running from base of each torulus to dorsal clypeal margin on either side enclosing a small raised area in middle; mandibles tridentate, basal tooth somewhat blunt; ocelli surrounded by a groove with a connection to eye on either side; vertex reticulate; eye height in profile 2.2x length of MS. Antennal formula 11434; scape 3.82x as long as wider. Relative length : width of antennal segments : scape = 23 : 6; pedicellus = 9 : 5; F1 = 24 : 6; F2 = 25 : 6; F3 = 20 : 6; clava = 26 : 7, with a spicula at apex (CL<sub>1</sub> = 8 : 6; CL<sub>2</sub> = 6 : 7; CL<sub>3</sub> = 7 : 9; CL<sub>4</sub> = 5 : 5). Antennal segments as in figure 124.

**Mesosoma** : Pronotum subtriangular with a cross line near posterior margin (visible only under certain angles of illumination); pronotal spiracle very distinct and directed to laterally; mesoscutum with 2 pairs of adnotaular setae; surface distinctly reticulate, with ML; scutellum 1.2x as long as mesoscutum and 1.2x as long as distance between two SLG; dorsellum width 3x its median length; propodeum with a median raised flat and smooth carina which diverges posteriorly; surface distinctly reticulate; paraspicular carina and transverse carina on posterior margin absent. Prepectus reticulate; upper epimeron separated from lower epimeron by a transverse groove. Forewing length (excluding marginal fringe) 3.1x its maximum width; speculum setose; SMV with 4 dorsal setae; MV with 13-15 long setae. Relative lengths of forewing veins : SMV = 32; MV = 51; PMV = 1; STV = 9; CC = 34.

**Gaster** : 1.2x longer than mesosoma (112 : 93); all tergites reticulate dorsally; T1 with a triangular basal fovea, which runs to posteriorly as a ML.

**Male** : Unknown.

**Host** : Unknown.

**Distribution** : India, Southern Kerala; Idukki.

**Material examined** : Holotype and paratypes.

### 10. *Neotrichoporoides mediterraneus* Graham

(Figs. 132)

1986. *Neotrichoporoides mediterraneus* Graham, 6-8, Holotype : Female, Madeira (BMNH).

**Diagnosis** : Length 1.7-2.4mm. Indian specimens head and body dark metallic green; antenna brown with scape and under side of pedicellus pale yellow; legs pale yellow with the following exceptions : fore and mid coxae slightly brown on basal half; hindcoxa concolourous with mesosoma. Head slightly broader than mesoscutum; POL equal to or slightly greater than OOL; eye length about 1.3x as long as broad; pedicellus (Fig. 132) 2.2-2.6x as long as broad; pronotum about 0.5x length of mesoscutum; hind femur 3.3-3.5x as long as broad; MV 8-9.3x as long as STV; forewing 2.60-2.85x as long as broad, SMG of scutellum diverging slightly caudad; gaster slightly to distinctly longer than head plus mesosoma.

*Male* : Unknown.

*Hosts* : Probably some Diptera associated with coarse grasses (Graham, 1986).

*Distribution* : Europe, India (Graham, 1986).

*Material examined* : India, Kerala, Ernakulam Dt., Nedumbassery, harvested paddy field near Air port (10°1' N 76°18' E), 1 Female (on card, Reg. No. MoEF 2118), 12.i.2004, coll. T.C.Narendran & Party; Palghat Dt., Malampuzha (10°53' N 76°46' E), 1 Female (on card, Reg. No. MoEF 4710), 11.ii.1987, coll. T.C. Narendran & party; Kasaragode Dt., Karanthakad, harvested paddy field (12°31' N 74°58??' E), 1 Female (on card, Reg. No. MoEF 68), 21.i.2003, coll. T.C.Narendran & party; Malappuram Dt., Kalkandi (11°1' N 76°28' E), 1 Female (on card, Reg. No. MoEF 3611), 13.xii.1987, coll. T.C.Narendran & party; TamilNadu, Coimbatore (11°1??' N 76°58' E), 1 Female (on card, Reg. No. MoEF 2409), 1.ix.1987, coll. T.C.Narendran & party (ZSIK).

### 11. *Neotrichoporoides mohanae* Narendran sp. nov.

(Figs. 125-126)

*Holotype* : *Female* : Length 2.75 mm. Head yellow with upper half of frons, vertex and occiput dark brown and with slight metallic green tinge on vertex; eye black with margin brown; ocelli pale yellow; antenna dark brown with scape pale yellow; median parts of pronotum, mesoscutum, scutellum and propodeum dark metallic green; tegula pale yellow; lateral part of mesosoma pale yellow with dark shade on metapleuron; legs including coxae yellow with fore tarsal segments brown; pretarsi dark brown; wings hyaline with veins pale brownish yellow; pilosity of wings brown.

*Head* : As wide as mesosoma; head in anterior view as long as wide; POL 2x OOL; 2.7x OD; eye length 1.83x its width in side view; 1.7x as long as MS; MS with triangular fovea not extending half its length; mouth 1.6x malar space; antennal formula 11433, toruli situated at level of lower margin of eye; scape shorter than eye, not exceeding level of vertex; pedicellus plus flagellum 1.85x width of mesoscutum; pedicellus 2.6x as long as broad, 0.56x length of F1; relative length : width of antennal segments : scape = 35 : 8; pedicellus = 18 : 7; F1 = 32 : 8; F2 = 27 : 8; F3 = 22 : 9; clava = 33 : 10. Antennal segments as in figure 125.

*Mesosoma* : Weakly convex, propodeal slope gently declining (approximately 30°); pronotum 1.4x as long as mesoscutum, hind margin not distinctly arched; midlobe of mesoscutum 1.5x as long as its posterior width; a little shorter than its anterior maximum width; distinctly reticulate without distinct ML, with 3 adnotaular setae on either side, posterior pair longer than others; scutellum as long as mesoscutum, 1.2x as broad as long; SMG diverging posteriorly, enclosing a space 2.5x as long as its maximum width; anterior setae placed a little before middle and nearer to SLG than to SMG, posterior pair of setae as long as anterior pair; dorsellum 4x as broad as its median length; propodeum 2.6x as long as dorsellum, well reticulate, reticulations stronger than that of scutellum and

mesoscutum, propodeal spiracle slightly covered by callus, separated from metanotum by its own diameter, callus with 3 setae on posterior half; hindcoxa 2.2x as long as wide; hind femur 4.25x as long as wide; spur of midtibia 0.5x as long as metatarsus; forewing (Fig. 126) excluding marginal fringe 3.33x as long as wide; CC 0.61x as long as MV; SMV with 4 dorsal setae; MV 11x as long as STV; front edge of MV with 15-16 setae; PMV absent; speculum almost open behind.

*Gaster* : Acuminate, 1.73x as long as head plus mesosoma (including ovipositor sheath); gaster length 5x as long as its width in dorsal view; cercus with one seta longer than others on either side; sinuate; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female India : Kerala : Malappuram Dt., Thalappara, 11.iv.2001, Coll. Mrs. Rajmohana.

*Etymology* : The species *mohanae* is named after the collector Mrs. Rajmohana.

*Remarks* : This species can be separated from all other Indian species by the key given in this work.

## 12. *Neotrichoporoides nyemitawus* (Rohwer)

(Figs. 133)

1921. *Tetrastichus nyemitawus* Rohwer, 131-132. Holotype : Female, India, Coimbatore (USNM) [examined]

1984. *Tetrastichus agarwali* Shafee, Fatma & Kishore, 393. Holotype : Female, India, Delhi (ZDAMU).  
Synonymised by Hayat & Shahi (2004) 38 : 308.

1987. *Neotrichoporoides nyemitawus* (Rohwer) : Graham, 68. Redescription and key.

*Diagnosis* : Length 2.1-3.3 mm. Head and mesosoma dark metallic green or bright blue green; gaster green to bronze green with posterior margin of tergites more or less broadly lilac to purplish; legs yellow with mid coxae sometimes slightly darkened at base and about proximal half of hindcoxa dark. Antenna (Fig. 133) with pedicellus plus flagellum 1.70-1.75x width of mesoscutum; scape reaching well above vertex; F1 2.2-2.4x length of pedicellus, 5.2-5.5x as long as broad, as long as or a little longer than clava; F2 nearly 4x as long as broad; F3 about 3x as long as broad; clava 4-4.7x as long as broad; forewing almost 3x as long as broad; gaster 2.5-3x as long as broad; tip of hypopygium situated 0.35-0.4x length of gaster.

*Hosts* : *Atherigona conigera* Emden on *Melinis minutiflora* (Gramineae), *Atherigona soccata* Rondani on *Sorghum bicolor* (Graham 1987).

*Distribution* : Kenya, Thailand, India.

*Material examined* : India, Kerala, 1 Female, 17.viii.2003, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), coll. T. C. Narendran & ?Party; Kannur Dt., Kottiyoor (10°7' N 78°49') 19.ii.2003, coll. T.C.Narendran & Party; Malappuram Dt., Calicut University Campus (11°7' N 75°5' E), 15 Females, 3.i.1986, 1.ii.1989, 1.iv.1989, 21.iv.1989, 2.x.2000, 20.iv.2001, 18.ix.2002, coll. T.C. Narendran & Party; Kozhikode Dt., Nanminda (11°27' N 75°50' E), 3 Females, 14.ii.2004, 4.iv.2004, coll. T.C. Narendran & Party; Kozhikode Dt., Kodenchery (11°27' N 76°1' E), 1 Female, K 4.xii.1999, coll. T.C. Narendran & Party; Waynad Dt., Kalpetta, Thonikadavu (11°36' N 76°6' E), 1 Female, 7.ii.2003, coll. T.C. Narendran & Party; Waynad Dt., Sultan Batheri (11°40' N 76°17' E), 1 Female, 7.v.2000, coll. T.C. Narendran; Kannur Dt., Peravoor (11°53' N 75°44' E), 1 Female, 25.ii.1988, coll. T.C.Narendran; Palghat Dt., Malampuzha (10°53' N 76°46' E), 11 Females, 1.i.1986, 13-16.i.1986, 12.xii.1987, 19.i.1988 coll. T.C. Narendran; Palghat Dt., Siruvani forest (10°58' N 76°42' E), 3 Females, 26.ix.1987, coll. T.C. Narendran; Malappuram Dt., Nilambur forest (11°16' N 76°13' E), 3 Females, 1.i.1985, 30.i.2003, coll. T.C. Narendran & Party; Palghat Dt., Parambikulam, (10°24' N 76°49' E), 1 Female, 22.xii.1985, coll. T.C.Narendran; Kozhikode Dt., Calicut Regional Engineering College Campus (11°19' N 75°52' E), 1 Female, 8.xi.1985, coll. T.C. Narendran; Palghat Dt., Agali (11°9' N 76°40' E), 6 Females, 12.xii.1987, coll. T.C. Narendran & Party; Kozhikode Dt., Chaliyam (11°9' N 75°49' E), 1 Female, 14.iii.2003, coll. T.C.Narendran & Party; Thiruvananthapuram Dt., Attingal (8°41' N 76°50' E), 1 Female, 23.ii.1989, coll. T.C. Narendran & Party; Palghat Dt., Pattambi, (10°49' N 76°12' E), 1 Female, 13.viii.2003, coll. T.C. Narendran & Party; Thiruvananthapuram Dt., Vithura (8°40' N 77°7' E), 1 Female, 8.iii.2000, coll. T.C. Narendran & Party; Kozhikode Dt., Kakkayam (11°15' N 75°50' E), 1 Female, 9.ii.1996, coll. T.C. Narendran; Kasaragode Dt., Chowki (12°31' N 74°59' E), 1 Female, 23.i.2003, coll. T.C. Narendran & Party; Palghat Dt., Kootanad (10° 49' N 76° 11' E), 1 Female, 11.viii.2003, coll. T.C. Narendran & Party; TamilNadu, Annamalai University Campus (12°18' N 79°4' E), 1 Female, 10.x.2000, coll. R. Kanakaraj; Tamil Nadu, Coimbatore, UPASI (11°1'N 76°58' E), 3 Females, 1.ix.1987, 29.v.1991, coll. T.C. Narendran; West Bengal, Kolkatta, Salt lake (22°34' N 88°21' E), 1 Female, 14.v.1983, coll. S.K. Gupta; (DZUC).

13. *Neotrichoporoides stom* Narendran & Jilcy  
(Figs. 121)

2006. *Neotrichoporoides stom* Narendran & Jilcy, 40 : 11-12. Female, India (ZSIC).

*Redescription* : *Female* : Length 1.93 mm. Head pale brown with metallic green refringence. Eye pale brownish yellow with a central brown patch; ocelli dark brown; antenna pale brown with scape pale brownish yellow; dorsal notum of mesosoma metallic green; sides of mesosoma brown with slight metallic green tinge; legs pale yellow with basal three-fourths of hindcoxa brown with metallic green; fourth tarsal segment and pretarsi slightly darker; gaster brown with metallic green refringence; wings hyaline, veins pale brown; pubescence on wing brown; pubescence on body pale white.

*Head* (Fig.121) : Wider than mesoscutum (excluding tegula), 2.37x as broad as long in

dorsal view; head width in anterior view 1.1x its length; POL = OOL; OOL 1.2x OD; eye length 1.35x its width in profile; malar space 0.5x eye length; MS with triangular fovea reaching half its length; mouth 1.5x malar space. Antenna (Fig.121) with scape 0.86x length of eye, slightly exceeding level of vertex; pedicellus plus flagellum 1.47x width of mesoscutum; pedicellus about 1.9x as long as wide, as long as F1. Relative length : width of antennal segments : scape = 27 : 24; pedicellus = 13 : 7; F1 = 13 : 7; F2 = 13 : 7; F3 = 12 : 7; clava = 21 : 7.

**Mesosoma** : Moderately arched; propodeal slope 40° Pronotum 0.85x mesoscutum, hind margin slightly concave, mid lobe of mesoscutum 1.35x as broad as long, moderately shiny with distinct reticulations; three adnotaular setae on either side in a row; posterior most pair longer than others. Scutellum as long as mesoscutum, length subequal to its own width, sculptured as mesoscutum; SMG nearer to SLG than to each other, enclosing a space 2x as long as its width; anterior setae placed a little after middle, nearer to SMG than to each other; posterior setae slightly longer than anterior setae. Dorsellum 4.33x as broad as long; propodeum 2.67x as long as dorsellum, with dense raised reticulations and raised median carina; spiracle situated at a distance less than its diameter from metanotum; rim of callus partly over hanging spiracle; callus with 3 setae; hindcoxa distinctly reticulate on dorsally, 1.4x as long as broad; hind femur 3.67x as long as broad; spur of mid tibia about 0.67x length of basitarsus; fourth tarsomere shorter than basitarsus of midleg. Forewing about 3.3x as long as broad; CC a little longer than MV; SMV with 5 dorsal setae; MV 6.7x as long as STV; front edge of MV with 10 large setae, PMV absent; speculum partly setose, closed behind by cubital line of setae not reaching base of wing. Hind wing obtuse at apex.

**Gaster** : Ovate, acuminate at apex; a trifle longer than head plus mesosoma, 2.46x as long as broad in dorsal view, tip of hypopygium almost reaching middle of gaster.

**Male** : Unknown.

**Hosts** : Unknown.

**Type locality** : India : Kerala, Malappuram.

**Distribution** : India (Kerala).

**Material examined** : India : Kerala, Malappuram Dt., Thenjipalam (11°7' N 75°5' E) 1 Female, 7.ii.1989, coll. T.C.Narendran (ZSIC); Malappuram Dt., Thenjipalam (11°7' N 75°5' E) 2 Females, 7.ii.1989, coll. T.C. Narendran (DZUC).

#### 14. *Neotrichoporoides tonimus* Narendran

(Figs. 120)

2006. *Neotrichoporoides tonimus* Narendran, 40 : 9-10. Female. India (ZSIC).

**Redescription** : **Female** : Length 2.18 mm. Head yellow with upper part of frons, vertex and occiput slightly darker; eyes dark brown with posterior margin pale yellow; front

ocellus reflecting red; hind ocelli reflecting yellow; antenna dark brown with scape and ventral side of pedicellus pale brownish yellow; pronotum metallic green with lateral panels and ventral side yellow; mesoscutum, scutellum, dorsellum and propodeum metallic green with meso and metapleura and ventral sternites of mesonotum dark brown with area below forewing paler. Legs completely yellow with hindcoxa dark brown. Gaster brown with base of dorsum slightly paler. Wings hyaline; veins pale brownish yellow; pubescence pale brownish yellow.

*Head* : Distinctly wider than mesoscutum; 2.22x as wide as long in dorsal view (Fig. 120); head width in anterior view 1.1x its length; POL 1.5x OOL; OOL 3x OD. Eye length about 1.28x its width in side view; MS with triangular fovea not extending half of its length; mouth 2x malar space. Antenna (Fig. 120) with scape 0.86x length of eye, slightly exceeding the level of vertex; pedicellus plus flagellum 1.75x width of mesoscutum; pedicellus 2.5x as long as wide, about 0.67x length of F1. Relative length : width of antennal segments : scape = 21 : 4; pedicellus = 10 : 4; F1 = 15 : 5; F2 = 14 : 5; F3 = 13 : 5; clava = 20 : 6 (clava 3 segmented).

*Mesosoma* : Not distinctly arched; propodeal slope 30°; pronotum about 0.84x as long as mesoscutum, hind margin hardly arched; mid lobe of mesoscutum 1.3x its width, moderately shiny; 4 adnotaular setae on either side, posterior pair longer than other pairs; scutellum as long as mesoscutum, a little longer than the width between SLG, sculptured as mesoscutum; SMG nearer to SLG than to each other, enclosing a space above 2.4x as long as its width; anterior setae placed before middle, nearer to SMG than to SLG; posterior setae slightly longer than anterior setae, a small setal pit present just behind anterior pair; dorsellum 4x as broad as long; propodeum 2x as long as dorsellum, with dense raised reticulations, median carina distinctly raised, spiracle situated a distance less than its diameter from metanotum; callus with 3 setae. Hindcoxa weakly reticulate, 1.71x as long as wide; hind femur 3.75x as long as wide; spur of mid tibia about 0.5x length of basitarsus; fourth tarsomere a little shorter than half of basitarsus. Forewing 3.13x as long as wide; CC 0.72x length of MV; SMV with 4 dorsal setae; MV 7.71x as long as STV; front edge of MV with 18-20 setae; PMV absent; speculum setose and closed behind by cubital line of setae which reaches near base of wing. Hind wing bluntly acuminate.

*Gaster* : Ovate, acuminate at apex; 1.24x as long as combined length of head plus mesosoma; 3.1x as long as wide; tip of hypopygium ending a trifle beyond or at half length of gaster.

*Male* : Unknown.

*Hosts* : Unknown.

*Type locality* : India : Kerala, Kozhikode, Nanminda.

*Distribution* : India (Kerala).

*Material examined* : 1 Female, India, Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 8.iv.2001, coll. T.C. Narendran & Party; 1 Female, Pookad (11° 26' N 75° 50' E), 31.viii.2003, coll. T.C. Narendran & Party (ZSIC).

15. *Neotrichoporoides viridimaculatus* (Fullaway)  
(Figs. 131)

1955. *Burksia viridimaculata* Fullaway, 410. Holotype : Female, Hawaii : Honolulu (BPBM).  
 1975. *Tetrastichus bicolor* Saraswat, 2-5. Female, India, Nilgiri Hills (SEM). Synonymy with *viridimaculatus* by Hayat and Shahi (2004)  
 1986. *Tetrastichus saraswati* Husain & Khan, 242 [unnecessary replacement name for *T. bicolor* Saraswat] Hayat and Shahi (2004) synonymized.  
 1987. *Neotrichoporoides viridimaculatus* (Fullaway) : Graham, 67. Female, Male, redescription, key.

**Diagnosis : Female :** Yellow species with characteristic pattern of black or metallic green markings that form broken longitudinal stripes (in many specimens a dark 'T' shape mark behind ocelli); antenna with scape as long as or a little longer than eye; SMG of scutellum absent or faintly indicated in part; surface relatively smooth and shiny with fine engraved reticulations; gaster slightly longer than head plus mesosoma, 2.6-3x as long as broad.

**Remarks :** This species resembles the European species *N. dispersus* Graham in general colour pattern but *dispersus* differs in having : (1) Body with less extensive black markings, (2) SMG of scutellum traceable throughout its length or atleast a greater part of it, surface of scutellum less shiny with more raised reticulations.

**Hosts :** Unknown, but probably some species of Diptera collected in association with coarse grasses.

**Distribution :** Widely distributed in Old world and New world.

**Material examined :** India : Kerala : 3 Females, 11.xii.1987, Palghat Dt. : Malampuzha (10° 53' N 76° 46' E), coll. T.C.Narendran & Party; Malappuram Dt. : Calicut University Campus (11°7' N 75°5' E), 12 Females, 14.x.1988, 22.x.1988, 3.iv.1989, 10.iv.1989, 29.iv.1989, 2.ix.1989, 18.ix.2002, 19.ix.2002 and 8.x.2002, coll. T.C.Narendran & Party; 2 Females, 19.ii.2003, coll. T.C. Narendran & Party; Kannur Dt. : Kottiyoor (10°7' N 78°49') coll. T. C. Narendran & Party; Palghat Dt. : Kootanad (10° 49' N 76°11'E), 5 Females, 11.viii.2003, coll. T.C. Narendran & Party; Malappuram Dt. : Manjeri (11°7' N 76°7' E), 1 Female, 4.x.2003, coll. T.C.Narendran & Party; Thiruvananthapuram Dt. : Neyyar dam area (8° 37' N 77° 7' E), 1 Female, 24.iii.1989, coll. T.C. Narendran; Malappuram Dt. : Tanur (10°59' N 75°52' E), 1 Female, 8.xi.2002, coll. T.C. Narendran & Party; Kozhikode Dt. : Chaliyam (11°9' N 75°49' E), 5 Females, 14.iii.2003, coll. T. C. Narendran & Party; Kozhikode Dt. : Narmina (11°26' N 75°50' E), 2 Females and 2 Males 14.ii.2004, coll. T. C. Narendran & Party; Kottayam Dt. : Kumarakam (9°36' N 76°26' E), 1 Female, 17.iv.2004, coll. T.C. Narendran & Party; Palghat Dt. : Pattambi (10°49' N 76°12' E), 2 Females, 12.viii.2003. coll. T.C. Narendran & Party; Kasargode Dt. : Chowki (12°31' N 74°59' E), 1Female, 23.i.2003, coll. T.C. Narendran & Party; Kozhikode Dt. : Vellannur (11°19' N 75°53' E), 1 Female, 2.xii.1999, coll. Raj Mohana (DZUC).

16. *Neotrichoporoides yoopi* Narendran sp. nov.  
(Fig.128)

*Holotype : Female* : Length 1.6 mm. Dark metallic green with following parts as follows : eye grayish yellow; ocelli pale reflecting yellow; mandibles brownish yellow; antenna brown with hindcoxa concolorous with mesosoma; pretarsi dark brown; wings hyaline with veins and pilosity of wings yellowish brown.

*Head* : (Fig. 128) As long as mesosoma in dorsal view, head in anterior view 1.12x as broad as long; 4x as broad as long in dorsal view; POL 1.4x OOL; 3.5x as long as OD; eye length 1.33x its width in side view, 2.3x as long as malar space; MS with triangular fovea not quite reaching half its length; mouth 2.17x malar space; antennal formula 11433 (Fig. 128); toruli situated at level of lower margin of eye; scape distinctly shorter than eye (11 : 16) not at all reaching level of vertex; pedicellus plus flagellum 1.1x as long as maximum width of mesoscutum; pedicellus 1.83x as long as wide, as long as F1; relative length : width of antennal segments : scape = 22 : 7; pedicellus = 11 : 6; F1 = 11 : 7; F2 = 10 : 7.5; F3 = 9 : 9; clava = 21 : 10.

*Mesosoma* : Slightly convex; propodeal slope gently declining (20°); pronotum 0.55x as long as mesoscutum, hind margin slightly arched; midlobe of mesoscutum 1.25x as long as its posterior width, a little shorter than its anterior width (10 : 13), distinctly reticulate, without a ML, with 2 longitudinal rows of adnotaular setae, each row with 4 setae, posterior pair not distinctly longer than others; scutellum 1.22x as broad as long; SMG not diverging posteriorly, enclosing a space 1.6x as long as broad; anterior setae placed a little before middle and nearer to SLG; scutellum a little shorter than mesoscutum (9 : 11); dorsellum 4x as broad as long; propodeum 2.5x as long as dorsellum medially, strongly reticulate; propodeal spiracular rim almost exposed, separated from metanotum by its own diameter, callus with 4 setae on either side of propodeum; hindcoxa 2.25x as long as broad; reticulate; hind femur 3.5x as long as broad; spur of mid tibia 0.5x as long as midmetatarsus; forewing including marginal fringe 2.53x as long as broad, CC 0.67x as long as MV; SMV with 5 dorsal setae; MV 6.2x as long as STV; front edge of MV with 12-14 setae; PMV absent; speculum closed behind by a cubital line of setae.

*Gaster* : Ovate, as long as combined length of head plus mesosoma, 2.4x as long as broad in dorsal view; cercus with one seta longer than others; hypopygium exceeding a little beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 9.iv.1980, Coll. M. Hayat (ZSIC).

*Paratypes* : 4 Females. Collection data same as that of holotype (ZSIC).

*Remarks* : This species can be separated from all other Indian species by the characters given in the key in this work.

Genus *Nesolynx* Ashmead

- 1905. *Nesolynx* Ashmead, 966. Type species *Nesolynx flavipes* Ashmead by monotypy.
- 1913. *Omphalomomyia* Girault, (167) : 174. Type species *Omphalomomyia lividicaput* Girault by original designation (Bouček, 1988 Synonymized).
- 1913. *Ceratotrastichus* Girault & Dodd, in Girault, (167) 254. Type species *Ceratotrastichus bisulcatus* Girault & Dodd; by original designation (Bouček, 1988 Synonymized).
- 1917 *Aceratoneurella* Girault, (306) : 7. Type species : *Aceratoneurella cinctiventris* Girault, by original designation. [*Syntomosphyrum* of some authors, not Förster, 1878].

**Diagnosis :** Mid lobe of mesoscutum abundantly and regularly pilose, with each hair on a small papilla; vertex with abrupt edge right behind ocelli; anterior setae of scutellum near to front border; antenna short; scutellum without SMG; paraspiracular carina absent; mesoscutum without ML.

**Host :** Dipterous larvae; braconid cocoons. Develops as parasite on pupae of Lepidoptera and Diptera, the lepidopterous hosts probably as hyperparasites through Diptera mainly Tachnidae.

**Distribution :** Tropical and subtropical countries with warmer parts of temperate zones of Europe, Africa & Asia, New Guinea and Australia (Bouček, 1988).

Key to oriental species of *Nesolynx* Ashmead

- 1. Vertex with cross carina behind front ocellus and hind ocellus ( as in *Sigmophora*); T5 with dense micropits (Borneo) ..... *sigmophorae* Narendran
- Vertex without cross carina; T5 not as above ..... 2
- 2. Mesosoma yellow or orange; gaster yellow or orange, with black bands on dorsum or margin with black patches ..... 3
- Mesosoma black or dark brown with or without metallic refringence; gaster not as above, mostly black or brown with or without refringence ..... 4
- 3. Gaster yellow with sides black on dorsum; upper frons and vertex black or dark brown with metallic green or blue reflections; all legs including coxae immaculate white or yellow; flagellum brown or pale brownish yellow; pedicellus and scape immaculate white or yellow. (India, Oriental & Australian Regions)..... *thymus* Girault
- Gaster yellow with black cross bands (not conspicuous) on dorsum; head completely black with slight metallic green or blue refringence; all legs yellow; host : spider egg. (Indonesia) ..... *cinctiventris* (Girault)
- 4. All legs including all coxae yellow ..... 5
- Atleast forecoxa infuscated ..... 6

5. MV 3x as long as STV; body shining black green with often purple reflections on vertex, scutellum and on middle of gaster; abdominal petiole yellow; propodeum smooth without median carina. (Oriental Region, Solomon Islands) .....  
 ..... *zygaenarum* (Ferrière)
- MV 4-5x as long as STV; body shining black or brown with slight metallic refringence on mesoscutum and gaster in certain angles of illumination; propodeum with median carina. (India, Philippines) ..... *flavipes* Ashmead
6. Hindcoxa and fore coxa greenish black; (sometimes mid coxa also greenish black) hind femur brown above, other parts of legs yellow (Indonesia) .....  
 ..... *nigricoxis* (Ferrière)
- Hindcoxa yellow; other characters variable ..... 7
7. Mid lobe of mesoscutum with rather long semierect pilosity becoming larger posteriorly; wing pubescence not very dense; flagellum pale; sometimes darker apically, all metatarsi short. (India, Africa, Seychelles) .....  
 ..... *phaeosoma* (Waterston)
- Mid lobe of mesoscutum with pilosity not as above; wing pubescence dense; flagellum brown or dark brown with pedicellus and scape paler. (India, Indonesia) .....  
 ..... *javanica* (Ferrière)

### 1. *Nesolynx cinctiventris* (Girault)

1917. *Aceratoneurella cinctiventris* Girault, 7, Type Female, Java (USNM) (examined).

1977. *Nesolynx cinctiventris* (Girault) Bouček, 404.

*Diagnosis* : *Lectotype* : *Female* : Length 1.7mm (0.90 mm of Girault, 1917). Head black with slight metallic tinge; lower frons fulvous; general body orange, with black inconspicuous bands on gaster, apex of gaster black; antennal funicle somewhat wider than long, a little shorter than pedicellus; clava with a terminal spicule.

Through the kindness of Dr. Michael Gates, I could examine the types. The label shows 2 Female specimens. The rear one lacks a head and the proximal one is hereby designated the lectotype. This species resembles *N. thymus* very closely except that the gaster has complete cross bands and head almost completely black with slight metallic tinge. It is possible that this may be a variant form of *thymus*. More collections and more specimens are to be studied for finding out this synonymy.

*Host* : Spider eggs *Salatiga*, larvae of *Orcus fathimus* (Girault, 1917).

*Type locality* : Java.

*Distribution* : Java, Indonesia (Noyes, 2003).

*Material examined* : Holotype.

*Nesolynx flavipes* Ashmead

1905. *Nesolynx flavipes* Ashmead, 966. Holotype : Female Philippines (USNM) examined.

*Diagnosis : Female* : Length 0.8-0.92 mm. Black and shining with metallic aeneous tinge (in certain angles of illumination) on mesoscutum and gaster; flagellum brown or brownish black; pedicellus, scape and legs yellow; STV terminates in a rounded knob; PMV is long and slender; scape not reaching front ocellus; gaster ovate, as long as head plus mesosoma; petiole pale brownish yellow.

The specimens I have studied from India do not have long and slender PMV and flagellum is light brown.

*Host* : Hyperparasitic on *Helicoverpa armigera* (Hubner) (Noctuidae), *Metisa plana* Walker (Psychidae) through *Eucelatoria bryani* Sabrosky (Tachnidae), *Microplitis philippinensis* Ashmead (Hymenoptera : Braconidae).

*Type locality* : Philippines : Manila

*Distribution* : Philippines, India (Karnataka, Kerala).

*Material examined* : Besides holotype, 2 Females, India, Karnataka, Thalangattupura, ex pupa of *Trycholyga bombycis*, 1987 (coll. Unknown); 1 Female, India, Kerala, Calicut University Campus (11° 7' N 75° 5' E), Jan. 1986, coll. T. C. Narendran & Party.

3. *Nesolynx javanica* (Ferrière)

(Fig. 95)

1933. *Syntomosphyrum javanicum* Ferrière, 101, Holotype : Female, Java (BMNH).

1977. *Nesolynx javanica* (Ferrière) Bouèek, 404.

2005. *Nesolynx orientalis* Khan, Agnihotri & Sushil, 160-161. Holotype : Female India, Tamil Nadu (GBPU) syn. nov.

*Diagnosis : Female* : Length 1.2 - 1.8mm. Body aeneous black; antenna dark brown with scape and pedicellus paler; legs entirely yellow except for forecoxa black and fore femur mainly brown; gastral petiole yellow; scape not quite reaching front ocellus; pedicellus 0.5x length of scape, 2.5x as long as broad; antennal formula 11133; F1 distinctly shorter than pedicellus (7 : 11); subequal in length to F2; F3 shorter than F2; clava a little longer than F2 plus F3 (27 : 25) (In the original description Ferrière stated "clava not longer than the two preceding joints together, the last joint pointed") but in his figure clava is shown a little longer than F2 plus F3. In the specimens I studied from India clava is a little longer than F2 plus F3). From the figures and descriptions of *N. orientalis* it is clear that it is a junior synonym of *N. javanica*.

*Host* : Hyper parasitic on Lepidoptera (Through Tachinidae and Braconidae).

*Type locality* : Java.

*Material examined* : 11 Females, India, Karnataka, Thalangattupura, xi. 1995, coll. Narayanaswamy; 3 Females, India, Karnataka, University of Agricultural Science, (of *Bellaria melonella*) ex *Bracon* sp.; 5 Females, India, Karnataka, Bangalore (12° 58' N 77° 35' E), iii. 1995, coll. Veeranna ex. Uzifly *Exorista sorbilans* (Tachinidae); 1 Female, India, Kerala, Thiruvananthapuram, Palode (8° 42' N 77° 2' E), 1. vii. 2003, coll. T. C. Narendran & Party; 1 Female, India, Kerala, Thrissur, Vellanikkara (10° 31' N 76° 13' E), 1.vii.2003, coll. T. C. Narendran & party.

#### 4. *Nesolynx nigricoxis* (Ferrière)

1940. *Syntomosphyrum zygaenarum nigricoxis* Ferrière, (1939) : 139. Female & Male (BMNH).

1977. *Nesolynx nigricoxis* (Ferrière) Bouček, 404.

*Diagnosis* : According to Ferrière (1939), this species differs from *N. zygaenarum* in having hindcoxae (often mid coxae also) greenish black.

*Host* : *Apanteles artonae* Rohwer, *Goryphus* sp., ex. *Ptychomyia* and *Ferrisa virgata*. (Ferrière, 1939).

*Distribution* : Java, Indonesia.

#### 5. *Nesolynx phaeosoma* (Waterston)

(Fig. 93)

1915b. *Syntomosphyrum phaeosoma* Waterston, 343-372. Lectotype Female, Seychelles (BMNH) Africa.

1977. *Nesolynx phaeosoma* (Waterston); Bouček, 404, Female, Africa.

*Diagnosis* : *Female* : Length 1.3-1.5 mm. Black, interstices of mesoscutum shiny; wings hyaline; veins pale yellow or pale brownish yellow; scape distinctly longer than clava (33 : 32); pedicellus longer than F1 plus F2 (17 : 15); F3 wider than F2; clava about 1.6x as long as wide, longer than F2 plus F3; SMV with 3-4 dorsal setae; MV about 5x as long as STV; gaster longer than head plus mesosoma.

*Host* : Parasitic on pupae of *Goniozus nephantidis* (Hymenoptera : Bethyridae). Mainly hyperparasitic on Lepidoptera.

*Distribution* : India, Africa (Nigeria and Seychelles) (Noyes 2003).

*Material examined* : 8 Females, India, Karnataka, Bangalore (12° 58' N 77° 35' E), 2004, coll. Srikanth, P. N.; 10 Females, India, Kerala, Kasaragod (12°30' N 74°59' E), 24. vi. 2000, coll. Sujatha; 5 Females, India, Karnataka, Mysore, 21. i. 1996, coll. T. C. Narendran & Party; 1 Female, India, Kerala, Kannur Dt. Kudiyanmala, 24. xii. 1999.

#### 6. *Nesolynx thymus* Girault

(Fig. 94)

1916. *Omphalomomyia thymus* Girault, (295) : 485. Holotype : Female, Indonesia, Java (USNM) (examined)

1917. *Omphalomomyia thymus javae* Girault, (306) : 1-12. Holotype : Female, Java (QLD) (Bouček, 1977 synonymised).
1940. *Syntomosphyrum obscuriceps* Ferrière, 31(2) : 131-139. Holotype : Female (Bouček, 1977 synonymised).
1924. *Buonapartea aeniceps* Girault, (373) : 5. Holotype : Female, Australia (QLD) (Bouček, 1988 synonymised).

**Diagnosis** : This species can be easily identified by the distinct colour of body given in the key above. Additional features include : F1 shorter than pedicellus (15 :22), distinctly longer than F2 or F3; clava including apical spicule shorter than F2 plus F3; scape about 2x (1.8x) as long as clava; gaster as long as head plus mesosoma.

This species may be confused with *N. cinctiventris* Girault but can be separated from it using the key above. However, the species *N. cinctiventris* may be junior synonym of *N. thymus* Girault, but this can be confirmed only after studying more specimens.

**Variation** : In the type legs, pedicellus and scape are immaculate white, where as in the Indian specimens they are yellow or brownish yellow and funicle slightly darker. No dark setae are found in the mesosutum in the type (probably worn out).

**Type locality** : Java (Salatiga).

**Distribution** : India (Kerala, Karnataka, Uttaranchal (Dehradun), Maharashtra and Jharkhand), SriLanka and other areas of Oriental Region.

**Host** : Secondary parasite of *Zaratha* and Tachinidae; also parasitic on pupa of *Maruca testulalis* Geyer (Lepidoptera : Pyralidae).

**Material examined** : 8 Females, India, Karnataka, Thalangattupura, v.1995, coll. T. C. Narendran & Party; 2 Females, India, Karnataka, Mysore, 10.viii.1987, coll. T. C. Narendran & Party; 1 Female, India, Karnataka, Nagarhole (12° 1' N 76° 10' E), 17.viii.2001, coll. P. A. Sinu; 1 Female, India, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 17.ii.2003, coll. T. C. Narendran & Party; 1 Female, India, Uttaranchal, Dehra Dun (30° 18' N 78° 3' E), 22.x Hayat; 1 Female, India, Jharkhand, 27.xii.1994, coll. S. B. Zeya and S. I. Kazmi; 1 Female, India, Sri Lanka, Maha Illupattana (ex. Pupa of *Musca lestulalis*; 1976, coll. R. W. Fellowes (This specimen was determined as *N. thymus* by Bouček, 1978).

### 7. *Nesolynx zygaenarum* (Ferrière)

1933. *Syntomosphyrum zygaenarum* Ferrière, 102. Type Female, Java (BMNH).
1977. *Nesolynx zygaenarum* (Ferrière) Bouček, 404.

**Diagnosis** : **Female** : Length 0.9–1.2 mm. Antenna with pedicellus 1.7x as long as F1; F2 longer than F1; F3 shorter than F2; clava 2.6x as long as broad; distinctly longer than scape; combined length of F2 plus F3 shorter than clava; scape not reaching front ocellus; SMV with 3 dorsal setae; gaster longer than head plus mesosoma.

*Host* : Tachinidae on Zygaenids (Ferrière 1977).

*Type locality* : Java.

*Distribution* : Java, Indonesia, Malaysia & Solomon Islands (Noyes 2003).

*Remarks* : The above account is based on available published information.

### Genus *Oomyzus* Rondani

1870. *Oomyzus* Rondani, 141. Type species : *Pteromalus gallerucae* Fonscolombe, 1832, by monotypy.

*Diagnosis* : Body black or rarely brown with metallic tints varying from very weak to very strong or sometimes metallic colour totally absent. Female antenna usually with funicular segments not or slightly longer than wide (rarely funicular segments relatively longer); MS straight or nearly so; mesosoma tending to be relatively short; mesoscutum with a single row of 2-5 adnotaular setae on each side; SMG usually weak or absent, rarely strong; propodeum with or without paraspircular carinae (but not in the shape of inverted 'Y' as in *Tetrastichus*); first tarsal segment of mid and hindleg often shorter than second segment; forewing with 1 dorsal seta on SMV (rarely with 2 dorsal setae); gaster subcircular to ovate, from shorter than mesosoma to about as long as head plus mesosoma.

*Host* : Egg, larval or pupal parasitoids of mostly Coleoptera, but also Lepidoptera, Neuroptera and Diptera.

*Distribution* : All Continents except South America.

### Key to Indian species of *Oomyzus* Rondani

1. Forewing with speculum extending to STV below MV .....2
- Forewing with speculum if present not extending to STV below MV .....5
2. Scutellum with SMG absent or indistinct; antennal scape 4x as long as wide, longer than clava, pedicellus 1.5-1.7x as long as wide, longer than F1; F1 slightly longer than wide; F2 and F3 as long as wide, each shorter than F1; clava a little shorter than funicle, about 2x as long as wide; forewing with CC longer than MV; MV 2.2x as long as STV; gaster longer than mesosoma; head and mesosoma black with metallic reflection; gaster dark brown..... *cerococci* (Khan & Shaffee)
- Scutellum with SMG distinct; other characters not in above combination .....3
3. Gaster longer than mesosoma; antenna pale brown with scape dark brown; hind tibia dark brown with base and apex paler; scape reaching front ocellus; callus with 6 setae; forewing with CC equal to MV ..... *trounius* Narendran sp. nov.
- Gaster shorter than mesosoma; atleast antennal scape pale brown or yellow; all tibiae pale yellow or yellow; callus with fewer setae; forewing with CC as long as or longer than MV .....4

4. Antenna completely yellow, MS more than half length of eye in side view; pedicellus 1.3x as long as F1; clava a little shorter than funicle .....  
 ..... *wayalaricus* Narendran sp. nov.
- Antenna completely pale brown; MS shorter than half length of eye in side view; pedicellus 2x as long as F1; clava longer than funicle .....  
 ..... *viraktamathi* Narendran sp. nov.
5. First segment of mid and hind tarsi hardly shorter than second; body with moderately bright golden-green or green to blue metallic refringence ..... *sokolowskii* (Kurd.)
- First segment of mid and hind tarsi distinctly shorter than second; body with more obscure metallic tinge or without any metallic tinge; antenna black or brown .....  
 ..... 6
6. Midlobe of mesoscutum without ML, except in some cases it may be indicated by a shiny line (or change of surface) just near the scutellum ..... 7
- Midlobe of mesoscutum with ML which is distinct atleast over posterior half of mesoscutum ..... 9
7. Scape shorter than clava including apical spicule ..... 8
- Scape longer than clava (Fig.142); parasitic on Coleoptera .....  
 ..... *scaposus* (Thomson)
8. Forewing with CC shorter than MV; head black; parasitic on *Liriomyza* sp. (Diptera)  
 ..... *liriomyzae* Narendran
- Forewing with CC longer than MV; head yellowish brown; host : Coccinellids .....  
 ..... *mashoodi* Khan & Shafee
9. Body liver brown, without metallic refringence; forewing with longest cilia of apical margin 0.4x length of STV; funicular segments distinctly longer than broad (Fig.140); SMV with 2 dorsal setae ..... *neogallerucae* Narendran sp. nov.
- Body with blue to green metallic refringence; forewing with longest cilia of apical margin 0.5 to 1x length of STV, SMV with single dorsal seta .....  
 ..... *gallerucae* (Fonscolombe)

### 1. *Oomyzus cerococci* (Khan & Shafee)

1981. *Syntomosphyrum cerococci* Khan & Shafee, 344. Holotype : Female, India (ZDAMU).

1988. *Oomyzus cerococci* (Khan & Shafee) Bouček, 695.

1991. *Oomyzus cerococci* (Khan & Shafee) Graham, 200.

**Diagnosis : Female :** Length 1.38mm. Head and mesosoma dark metallic green; scutellum with SMG absent; forewing with speculum large extending below MV; first tarsal segment of mid and hind tarsi equal in length to second tarsal segment.

Bouček (1988) considers *cerococci* as a possible junior synonym of *O. scaposus* (Thompson). Graham however considers them as two distinct species since the first tarsal segment is distinctly shorter than second in mid and hindlegs in *O. scaposus* and differs in speculum and hosts of both species.

*Male* : Unknown.

*Host* : ex. *Cerococcus hibisci* Green. on *Hibiscus rosasinensis* Linn. (Khan & Shafee 1981).

*Remarks* : The above information is based on Khan & Shafee (1981), Bouček (1988) and Graham (1991).

## 2. *Oomyzus gallerucae* (Fonscolombe) (Fig. 144)

1832. *Pteromalus gallerucae* Fonscolombe, 302, Syntypes. France (destroyed). Neotype Female, France designated by Graham (1985) (BMNH).
1870. *Oomyzus gallerucae* (Fonscolombe) Rondani, 141.
1873. [*Oomyzus xanthomelaenae* Rondani, 148 nom. nud.] Graham 1991.
1905. *Tetrastichus xanthomelaenae* (Rondani) Marchal, 64-68.
1957. *Tetrastichus gallerucae* (Fonscolombe) Bouček, 180.
1991. *Oomyzus gallerucae* (Fonscolombe) Graham, 204.

*Diagnosis* : *Female* : Length 0.60-0.80mm. Body with relatively strong blue to green metallic refringence; SMV with 1 dorsal seta; midlobe of mesoscutum with an impressed ML; forewing with longest cilia of apical margin 0.5-1.0x length of STV; antenna with funicular segments quadrate or only very slightly longer than wide; scape not reaching front ocellus; clava as long as funicle; midlobe of mesoscutum with 2-4 adnotaular setae on each side; gaster as long as mesosoma.

*Male* : Differs from Female in antennal segments' measurements; scape with ventral plaque ; forewing with longest cilia of apical margin 0.75-1.0 length of STV.

*Host* : *Pyrrhalta luteola* (Muller) (Chrysomelidae) on *Ulmus* sp.

*Type locality* : France : Bouches du Rhone, Aix district.

*Remarks* : The above information is based on already published work of Graham (1991), Burks (1979), Domenichini (1964).

## 3. *Oomyzus liriomyzae* Narendran (Fig. 145)

2001. *Oomyzus liriomyzae* Narendran, 155. Holotype : Female, India (ZSIK).

*Diagnosis* : *Female* : Length 1.3mm. Black without metallic refringence; antenna blackish brown; mandible brown; ocelli white; eye blackish grey; foreleg : coxae, trochanter brownish

black; femur black with apex paler, tibia and tarsi pale brown; midleg : coxae black, trochanter blackish brown; femur black with apex paler, tibia black with apex slightly paler; tarsi pale brown; hindleg : coxa, trochanter and femur black with apex of femur paler, tibia brown with base and apex paler; tarsi brown with bases of segments slightly paler; wings hyaline, veins blackish brown; pilosity of wings brown.

*Head* : Width in anterior view 1.3x its length; POL clearly a little more than 2x OOL; MS straight, a little shorter than length of eye in profile; antenna (Fig. 145) with scape 0.83x length of eye in profile, not clearly reaching median ocellus.

*Mesosoma* : Midlobe of mesoscutum with 3 adnotaular setae on each side; enclosed space between SMG of scutellum 2x as long as broad; length of setae slightly shorter than distance between SMG of scutellum; propodeum longer than dorsellum; median carina distinct, paraspiracular carina indistinct, callus with 2-3 setae; metapleuron with moderately strong and slightly raised reticulations; hind femur 4x as long as broad; forewing length 2.23x its maximum width; CC distinctly shorter than MV; MV 3.8x as long as STV.

*Gaster* : 0.8x length of mesosoma in dorsal view, subequal to its maximum width, longest seta of each cercus nearly 2x length of next longest.

*Male* : Unknown.

*Host* : *Liriomyza* sp. (Diptera) on Cucumber and Tomato (Narendran *et al.*, 2001).

*Type locality* : India (Maharashtra).

*Material examined* : Holotype and paratypes.

*Remarks* : Characters mentioned in the key above are not included in the above diagnosis in order to avoid repetition.

#### 4. *Oomyzus mashoodi* (Khan & Shafee)

1981. *Syntomosphyrum mashoodi* Khan & Shafee, 346-347. Female, India (ZDAMU).

2004. *Oomyzus mashoodi* (Khan & Shafee) Hayat, 310.

*Remarks* : Hayat & Shahi (2004) states that this species may eventually prove to be a synonym of *O. scaposus* (Thomson). However, the figures of scape and clava of *mashoodi* is different from that of *scaposus* being not longer than clava. Colour of head and antenna also differs in both species.

#### 5. *Oomyzus neogallerucae* Narendran sp. nov. (Fig. 140-141)

*Holotype* : *Female* : Length 0.94mm. Liver brown; flagellum brown; pedicellus and scape pale yellow; coxae concolorous with mesosoma; femora pale brown with bases and apices paler; tibiae and tarsi yellow; pretarsi dark brown; tegula pale brownish yellow; wings hyaline with veins pale brown; pilosity of wing pale brown.

*Head* : Width in anterior view 1.1x its length; POL 1.3x as long as OOL; MS 0.55x length of eye in side view; antennal scape as long as eye in side view, not quite reaching front ocellus; pedicellus plus flagellum 1.1x width of mesosoma (Fig. 140), pedicellus 1.4x as long as F1, 2.8x as long as broad; F2 subequal to F1; F3 slightly longer than F2; clava slightly shorter than funicle (29 :30), slightly shorter than scape (29 :31); apical spine or spicula absent.

*Mesosoma* : Midlobe of mesoscutum with a weak ML, with 4 adnotaular setae on each side; scutellum convex, SMG slightly nearer to SLG than to each other, enclosed space between SMG 2x as long as wide, length of posterior seta of scutellum 0.75x width between the 2 SMG; mesoscutum and scutellum with fine engraved reticulations; dorsellum with a shallow ML, propodeum as long as dorsellum, 1.81x as broad as its median length, with a relatively broad, slightly raised median ridge (not forming a median carina); each callus with 3 setae; metanotum and hindcoxa smooth and shiny; hind femur 5.3x as long as broad; first tarsal segment of mid and hindleg shorter than second tarsal segment; forewing 1.9x as long as broad; CC as long as MV; MV 3.4x STV; SMV with 2 dorsal setae, speculum absent, fully setose.

*Gaster* : As long as mesosoma; shorter than head plus mesosoma (13 :17); cercus with no distinct long seta; hypopygium exceeding middle of gaster; ovipositor sheath not projecting posteriorly.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Uttar Pradesh, Mussooli, 11.iv.1978, coll. M. Verma (ZSIK).

*Paratypes* : 2 Females. Collection data same as that of holotype.

*Etymology* : Named after *N. gallerucae* (Fonscolombe)

*Remarks* : This new species differs from *N. gallerucae* by the characters mentioned in the key in this monograph.

## 6. *Oomyzus scaposus* (Thomson) (Fig. 142)

1878. *Tetrastichus scaposus* (Thomson), 284. Lectotype Female, Sweden (ZIL).
1912. *Tetrastichus coccinellae* Kurdjumov, 239. Lectotype Female, USSR (ZIL) designated by La Salle (1986) (Bouček, 1988 synonymised).
- 1915a. *Syntomosphyrum taprobanes* Waterston, 337-340. Holotype : Female Sri Lanka (BMNH) (Bouček, 1988 synonymised).
1943. *Tetrastichus melanis* Burks, 529-530. Holotype : Female USA (USNM) (Grahams, 1991 synonymised).
- 1953a. *Tetrastichus sexmaculatus* Kurian, 117-120, Female & Male, India : Bangalore (Type ?) (Hayat, 2004 synonymised).

**Diagnosis : Female :** Length 1.5-3.25 mm. Black, antenna completely black; metallic reflection bluish but often weak or absent; all coxae, trochanters and femora (except paler apices of femora) black or blackish brown; tibiae fuscous, almost black; tarsal segments concolorous with tibiae, those of midleg somewhat paler.

**Head :** Broader than long, antenna inserted a little above level of ventral margin of eye; malar space 0.75x length of eye; antenna as in figure 142.

**Mesosoma :** Mesoscutum with 3 adnotaular setae on each side; Forewing a little more than 2x as long as wide; SMV with 1 or 2 dorsal setae; MV a little shorter than 4x length of STV (15 : 4).

**Male :** Differs from Female mainly in the proportions of antennal segments (see Graham 1991 : 201); gaster about as long as mesosoma.

**Host :** *Coccinella quinquepunctata* Kirhy, *Coccinella septumpunctata* L., *Coccinella undecimpunctata* L., *Chilocorus bipustulatus* (L.), *Chilomenes sexmaculata* (F.), *Synharmonia conglobata* (L.) as a gregarious endoparasite of host prepupae and pupae (Graham, 1991).

**Remarks :** Graham (1991) synonymised *Tetrastichus melanis* Burks with *scaposus*. However, in the original figure of mesoscutum and scutellum of *melanis* by Burks (1943 : 522) the mesoscutum is shown with 6 adnotaular setae instead of 3-4 of typical *scaposus*.

**Material examined :** 11 Females, India, Orissa, Bhubaneswar, 17.01.2002, coll. S. M. A. Mandal, 7 Females, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 5.iii.2003, 9.iii.1986, 12.iii.2005, coll. M. Hayat; 1 Female, India : Kerala, Kasaragod (12°30' N 74°59' E), 21.i.2003, coll. T. C. Narendran & Party.

### 7. *Oomyzus sokolowskii* (Kurdjumov)

1912. *Tetrastichus sokolowskii* Kurdjumov, 238-239 Lectotype Female USSR (ZIL) designated by La Salle (1986 :601).

1961b. *Aprostocetus sokolowskii* (Kurdjumov) Graham, 39.

1991. *Oomyzus sokolowskii* (Kurdjumov), Graham 203.

**Diagnosis : Female :** Length 1.00-1.3 mm. Moderately bright golden-green or green to blue. Antenna (Fig. 143) with scape shorter than eye height, not reaching front ocellus; pedicellus plus flagellum about as long as width of mesoscutum, mesoscutum with ML weak, indistinct or absent anteriorly, 2-3 adnotaular setae on each side; SMG about equal distance from each other and from SLG; propodeum as long as or a little longer than dorsellum; callus with 2 setae; forewing with MV 2.1-2.4x as long as STV; speculum small, not extending below MV; gaster short, as long as or slightly longer than mesosoma.

**Male :** Differs from Female mainly in the proportions of size of antennal segments (see Graham 1991); gaster shorter than mesosoma.

**Host :** *Plutella xylostella* (L.), *Apanteles plutellae* Kurdjumov (Graham, 1991).

*Type locality* : USSR.

*Distribution* : Oriental Region, Palaearctic, Neotropical and Nearctic Regions.

*Material examined* : 3 Females, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 9.iv.1980, coll. M. Hayat.

8. *Oomyzus trounius* Narendran sp. nov.  
(Fig. 138-139)

*Holotype* : *Female* : Length 1.52 mm. Dark brown with reddish tinge; eye brown with marginal area yellowish brown; ocelli reddish brown; antenna pale brown with scape dark brown; tegula brown; legs with coxae concolorous with mesosoma; femora reddish brown with apices paler; front and mid tibiae pale brownish yellow; hind tibia dark brown with base and apex paler; all tarsi brown; wings hyaline, veins pale brownish yellow, pilosity of wings pale yellow.

*Head* : Width in anterior view 1.26x its length; POL 1.75x OOL; MS 0.56x length of eye in side view; antennal (Fig. 138) scape as long as eye length in side view, reaching front ocellus; pedicellus plus flagellum 0.88x width of mesosoma, pedicellus subequal in length to F1, 1.6x as long as wide; funicle broader than pedicellus; funicular segments equal or subequal in length and width; each funicular segment slightly longer than broad (11 :10); clava 2.55x as long as broad, distinctly shorter than funicular segments together (28 :33); clava shorter than scape; apical spine or spicula indistinct.

*Mesosoma* : Midlobe of mesoscutum without ML but with small median fovea near scuto-scutellargroove, with 3 adnotaular setae on each side; scutellum convex, 1.2x as wide as long; SMG nearer to SLG than to each other; enclosed space between SMG 2x as long as wide; length of posterior seta of scutellum shorter than width between SLG (3 :5); mesoscutum and scutellum with fine engraved reticulations, propodeum 1.5x as long as dorsellum, with weak reticulations, with well developed raised median carina; paraspiracular carina absent; propodeal spiracle fully exposed, separated from metanotum by half its diameter; each callus with 6 setae; metapleuron and hindcoxa weakly reticulate, not pitted; hind femur 4.2x as long as broad; first segment of mid and hind tarsi shorter than second tarsal segment; forewing 2x as long as broad, CC as long as MV; MV 3.4x as long as STV; speculum extending below MV to STV, closed behind by cubital line of setae; SMV with single dorsal seta.

*Gaster* : 1.17x as long as mesosoma; 0.82x as long as head plus mesosoma; ovipositor sheath hardly projecting posteriorly, cercus with 2 long setae of subequal length; hypopygium exceeding middle level of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : *Female*, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 9.xi.1979, coll. M. Hayat (ZSIC).

*Paratypes* : 1 Female of same data of holotype.

*Remarks* : This unique species can be separated from all other Indian species by the characters mentioned in the key to species given in this monograph.

9. *Oomyzus viraktamathi* Narendran sp. nov.  
(Fig. 136-137)

*Holotype* : *Female* : Length 1.3 mm. Black without metallic refringence; antenna pale brown with scape pale yellow; pedicellus with a black patch dorsally; eye black; ocelli pale black; coxae black; femora dark brown with apices pale yellow; tibiae and tarsi pale yellow; wings hyaline, veins pale brown; pilosity of wing pale yellowish brown; pubescence on body dirty white.

*Head* : Width in anterior view 1.1x its length; POL 3.5x OOL; MS straight, 0.36x length of eye (4 :11) in side view; antenna (Fig. 136) with scape 0.8x length of eye in side view, not clearly reaching median ocellus; pedicellus plus flagellum 0.72x width of mesoscutum; pedicellus 2x as long as F1, 1.87x as long as broad; F1 and F2 narrower than pedicellus; F2 a little wider than F1, subequal in length to F1; F3 shorter than F2, a little wider than F2; clava 2.88x as long as wide, a little longer than funicle (22 : 18), apical spicule or spine indistinct.

*Mesosoma* : Midlobe of mesoscutum without ML, with 2 setae on each side; scutellum as long as wide, moderately convex in profile; distance between SMG and SLG equal to that between each SMG; enclosed space between SMG 3x as long as wide; length of posterior scutellar seta shorter than width between SMG; mesoscutum and scutellum with weak engraved reticulations; propodeum a little less than 3x length of dorsellum, with strong reticulations, slightly raised, a little stronger than that of scutellum; well developed median carina present; paraspircular carina indistinct; each callus with 5 setae; metapleuron with strong, raised reticulations; hindcoxa well punctate with strong pits on dorsal side; hind femur 3.14x as long as broad, first segment of mid and hind tarsi shorter than second; forewing (excluding fringe) 2.2x as long as broad; CC distinctly longer than MV (17 :13), MV 2.6x as long as STV; speculum extends below MV to STV, closed behind by cubital line of setae; SMV with single dorsal seta.

*Gaster* : 0.93x as long as mesosoma; 1.21x as long as broad in dorsal view; ovipositor sheath very slightly projecting out, longest seta of cercus a little longer than others.

*Male* : Unknown.

*Host* : *Aleurodicus dispersus* on *Psidium* sp.

*Holotype* : Female, India : Karnataka, Bangalore (12° 58' N 77° 35' E), 15.v.1998, coll. M. V. Srinivas (ZSIC).

*Paratypes* : 8 Females. Collection data same as that of holotype.

*Etymology* : Named after Prof. C. A. Viraktamath who sent this species for my studies.

*Remarks* : This species resembles *O. wayalaricus* Narendran in having gaster shorter than mesosoma and CC as long as or longer than MV. However, both species can be separated by the characters mentioned in the key.

10. *Oomyzus wayalaricus* Narendran sp. nov.  
(Fig. 134-135)

*Holotype* : *Female* : Length 1.6mm. Black with following parts as follows : eye grayish yellow; ocelli pale reflecting yellow; antenna completely yellow; all coxae concolorous with mesosoma with apices paler; all femora brown with bases and apices paler; trochanter pale yellow; all tibiae and tarsi yellow; pretarsi brown, tegula brown; wings hyaline with veins pale brownish yellow, pilosity of wings pale yellow; pilosity of body white.

*Head* : Width in anterior view a little less than its length (19 : 20); POL 3x OOL; MS straight, 0.71x as long as eye in side view; antenna (Fig. 134) with scape 0.93x length of eye in side view, not reaching front ocellus, pedicellus plus flagellum 0.86x as long as width of mesosoma; pedicellus 1.3x as long as F1, 2x as long as broad; funicle broader than pedicellus, all funicular segments equal in length; F1 as wide as F2; F3 slightly wider than long; F2 and F3 as long as wide, clava 1.87x as long as wide, a little shorter than funicle (28 : 31), apical spicula or spine absent.

*Mesosoma* : Midlobe of mesoscutum without ML, with 3 adnotaular setae on each side; scutellum as long as wide; moderately convex in profile; distance between SMG and SLG equal to distance between each SMG, enclosed space of SMG 3x as long as broad; length of posterior seta of scutellum shorter than width between SLG (3 : 4); mesoscutum and scutellum with fine engraved reticulations; propodeum 2x as long as dorsellum, with strong reticulations, a little stronger than that of scutellum, well developed raised median carina present; paraspircular carina distinct (but not in the form of inverted 'Y'); each callus with 5 setae; metapleuron strongly reticulate; hindcoxa well punctate on dorsal side but reticulate on ventral part; hind femur 3.5x as long as broad; first segment of mid and hind tarsi subequal in length; forewing excluding fringe 2.31x as long as broad, CC as long as MV; MV 3x as long as STV; speculum large extending to STV below MV, closed behind by cubital line of setae; SMV with single dorsal seta.

*Gaster* : 0.87x as long as mesosoma, 1.33x as long as broad in dorsal view; ovipositor sheath hardly projecting posteriorly; longest seta of cercus slightly longer than others.

*Male* : Similar to Female, except antennal funicle 4 segmented and legs pale brown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Palghat Dt., Walayar Forests, 4.iii.1993, coll. S. B. Zeya (ZSIC).

*Paratypes* : 11 Females and 2 males of the same data of holotype.

Genus *Parachrysocharis* Girault

1913. *Parachrysocharis* Girault, [167] : 177. Type species *Parachrysocharis javensis* Girault, by original designation.

1915 *Parachrysocharis* Girault, [260] : 274-275 [Redescribed].

1917. *Parachrysocharis* Girault, [328] : 135-136 [Redescribed].

**Diagnosis** : Vertex without occipital carina; clava with a spicule at apex; midlobe of mesoscutum with conspicuous coarse longitudinal striae, scutellum without SMG; propodeum and paraspiracular carina enclosing spiracle on inner side.

**Remarks** : This genus resembles *Narendrania* Fousi (2004) in having longitudinal ridge on mesoscutum. However, *Narendrania* differs from *Parachrysocharis* in several features which are described under that genus in this work.

**Male** : Similar to Female; funicle 4 segmented and "clothed with long hairs"

**Host** : Eggs of Fulgoridae, which include *Pyrilla perpusilla* (Walker) and *Cenestera affinis* (Atkinson) (Flatidae) on Sugarcane.

**Distribution** : Oriental Region from India, SriLanka, to Philippines and Java (Bouček, 1988).

Key to Oriental species of *Parachrysocharis* Girault

1. Mesosoma with 16-18 longitudinal ridges; mesoscutum with 4-6 adnotaular setae on each side; scapula with single seta; forewing with SMV with 3 dorsal setae; mesosoma black on dorsal side ..... *javensis* Girault
- Mesosoma with 5 longitudinal ridges; other characters different from above ..... 2
2. Mesosoma with median longitudinal ridge reaching posterior margin of mesoscutum; propodeal spiracle not separated from metanotum; MV 2.8x as long as STV .....  
..... *malabarensis* Narendran sp. nov.
- Mesosoma without any longitudinal ridge reaching posterior margin of mesoscutum; propodeal spiracle not separated from metanotum; MV 3.25x as long as STV .....  
..... *anomalococci* (Khan & Shafee)

1. *Parachrysocharis anomalococci* (Khan & Shafee)

1980. *Syntomosphyrum anomalococci* Khan & Shafee, 332-334 Female India (ZDAMU)

2004. *Parachrysocharis anomalococci* (Khan & Shafee) Hayat, 311.

**Diagnosis** : This species resembles *Parachrysocharis malabarensis* Narendran sp. nov. in general colour but differs from it in having : 1) Different pattern of distribution of mesoscutal setae (see Figure 4C, Khan & Shafee 1980); 2) With very short fine longitudinal ridges which never reaches posterior margin of mesoscutum); 3) Each scapula with 7

setae and 4) propodeal spiracle separated from metanotum by 2x diameter of spiracle; 4) Scutellum with 2 pairs of setae and a pair of setal pits (Fig. 4C Khan & Shafee 1980).

*Host* : Fulgorid on *Ficus* sp. and eggs of *Pyrilla* sp. (Khan & Shafee 1980)

*Type locality* : India (Uttar Pradesh : Aligarh).

## 2. *Parachrysocharis javensis* Girault

1913. *Parachrysocharis javensis* Girault, [167] : 177. Type Female, Java (QM).

1915. *Parachrysocharis javensis* Girault, [260] : 274-275 [Redescribed].

1917. *Parachrysocharis javensis* Girault, [328] : 135-136 [Redescribed].

1916. *Tetrastichus pyrillae* Crawford, 101-102, Type Female, India, Pusa (QD?) (Bouček, 1988 Synonymised)

1980. *Syntomosphyrum udaipurensis* (!) Khan & Shafee, 329-332. Holotype : Female India, Orissa, Bhuvaneswar (ZDAMU) (Bouček, 1988 Synonymised).

*Diagnosis : Female* : Length 1.07-1.25 mm. Black with following parts as follows : frons and face mostly and legs golden yellow or yellow; ventral half of mesosoma and base of gaster broadly golden or pale brownish yellow; antennae dusky yellow with pedicellus and scape paler; POL 4x OOL; OOL a little shorter than OD (2 :3); mesoscutum 1.52x as broad as long; midlobe of mesoscutum as long as broad, with 16-18 longitudinal ridges on anterior half, with 4 adnotaular setae, the second one from anterior end slightly away from the longitudinal row (see Fig. 1209, Bouček 1988); scapula with one dorsal seta (Fig. 3E, Khan & Shafee 1980). Forewing with 3 dorsal setae on SMV.

*Host* : *Pyrilla perpusilla* (Walker), *P. aberrans*, *Cenestera affinis* (Atkinson).

*Distribution* : Java, India (Kerala, Uttar Pradesh, Aligarh, Delhi, Pusa), Sri Lanka, Australia.

*Remarks* : Bouček (1988) synonymised *Syntomosphyrum udaipurensis* Khan & Shafee (1980) with *P. javensis*. In *P. udaipurensis* the colour of body is brown and gaster dark brown with base yellow, mesoscutum 1.33x as broad as long; anterior pair of scutellar setae nearer to anterior margin. I do not know whether these are merely variations or characters of a distinct species. I could not examine the type of *P. udaipurensis*.

## 3. *Parachrysocharis malabarensis* Narendran sp. nov.

(Fig. 75-76)

*Holotype : Female* : Length 1.46mm. Head yellow with ocellar area slightly darker; eye grayish yellow; ocelli pale brownish red; antenna : flagellum black; pedicellus and scape yellow; mesosoma yellow with pale dark patch on anterior middle part of mesoscutum and on middle of pronotum; gaster black with a broad basal part yellow; legs yellow; wings hyaline with veins and pilosity brown.

**Head** : Partly collapsing; POL 6x OOL; OOL 0.5x OD; eye length 4.75x MS; MS straight, without a basal fovea; antennal formula 11233; scape not reaching front ocellus, 2.87x as long as broad, a little shorter than clava including apical spine (43 :45); pedicellus a little more than 2x as long as wide, subequal in length to F1; funicular segments subequal in length and width, clava subequal in length to combined length of F2 plus F3 (Fig. 76).

**Mesosoma** : (Fig. 75) With 5 longitudinal ridges, starting from anterior margin; with 7 or 8 adnotaular setae on either side; scutellum with SMG weakly indicated, with 2 pairs of setae, anterior pair near middle level of scutellum; propodeum with a median broad carina, propodeal spiracle not separated from posterior margin of metanotum; callus with 3 setae; prepectus 3x as long as its maximum width, reticulate; midtibial spur a little shorter than midmetatarsus (4 :5); second midtarsal segment distinctly longer than first; hind femur 4x as long as wide; forewing length about 2x its width, CC shorter than MV (13 :14); MV 2.8x STV; speculum not extending below MV, closed behind by cubital line of setae.

**Gaster** : Longer than head plus mesosoma; hypopygium not reaching middle; ovipositor sheath a little longer than preceding tergite in dorsal view (4 :3); ovipositor well exerted posteriorly.

**Holotype** : Female, India : Kerala, Calicut University Campus (11° 7' N 75° 5' E), 25.ix.1988, coll. T. C. Narendran & Party (ZSI).

**Paratypes** : 1 Female, SriLanka, 13.vii.1977 (ZSI) on eggs of *Pyrilla*.

**Remarks** : This new species can be separated from other Oriental species by the characters mentioned in the key.

### Genus *Quadrastichus* Girault

1913 *Quadrastichus* Girault, [167] : 232, 252. Type species : *Quadrastichus nigrinotatus* Girault, 1913a, by original designation.

1977. *Cecidotetrastichus* Kostjukov, 189 (as subgenus of *Tetrastichus*). Type species : *Cirrospilus vacuna* Walker, 1839a, by original designation. [Synonymised with *Quadrastichus* by Graham & La Salle, 1991 : 94].

1987. *Cecidotetrastichus* Kostjukov, (as genus); Graham, : 30, 36-37.

1991. *Quadrastichus* Girault; Graham & LaSalle, 94.

**Diagnosis** : SMV with 1 dorsal seta. Propodeum without posteriorly bifurcate paraspircular carina. Antenna with all funicular segments longer than wide; atleast F3 (and sometimes the others) with long curved setae which equals the length of the segment. Mesoscutum usually with only 1 adnotaular seta (rarely with 2 or 3). SMG of scutellum distinct. Gaster usually distinctly longer than head plus mesosoma and acute apically. Ovipositor sheaths not or only slightly projecting beyond last tergite of gaster.

### Key to Oriental species of *Quadrastichus* Girault

1. Mesosoma mostly yellow ..... 2
- Mesosoma black, dark brown or brown ..... 11
2. MS straight; antenna with 3 anelli; pedicellus shorter than F1; F2 slightly shorter than F1; mesoscutum with one adnotaular seta on either side; hind femur 3.7x as long as broad; forewing (including fringe) 2.43x as long as broad; MV 3.75x as long as STV; PMV 0.38x as long as STV, with a brown spot on either side corner of pronotum and on apex of axilla ..... *getiolus* Narendran sp. nov.
- MS curved; other characters partly or completely different ..... 3
3. Mesoscutum with two or three adnotaular setae on either side ..... 4
- Mesoscutum with one adnotaular seta ..... 6
4. Mesoscutum with two adnotaular setae on either side; pronotum yellow with a dark brown patch in middle, speculum extending below MV up to STV .....  
.....  
*lavania* Narendran sp. nov.
- Mesoscutum with more than two adnotaular setae on either side; other characters not as above ..... 5
5. Pronotum yellow with a characteristic black strip (Fig. 164) on either side; antennal toruli situated well above level of lower eye margin; propodeum with distinct median carina; hypopygium not reaching 0.5x length of gaster. ex. *Lantana* sp. ....  
..... *lantanae* Narendran sp. nov.
- Pronotum dark brown, without characteristic black stripes on sides; antennal toruli situated at level of lower margin of eye; propodeum without a median carina; hypopygium reaching 0.8-0.9x length of gaster; gall inducers of *Erythrina* .....  
..... *erythrinae* Kim
6. Propodeum without median carina; with distinct paraspiracular carina which encloses a concave area associated with spiracle; gaster shorter than head plus mesosoma; host : *Liriomyza trifolii*, India ..... *plaqueoi* Reina & LaSalle
- Propodeum with median carina, other characters partly or completely variable ... 7
7. Pedicellus distinctly longer than F1, 2x as long as broad; speculum absent; scape not exceeding vertex; eyes sparsely to moderately pubescent; lower margin of clypeus truncate, without distinct tooth or lobes; gaster about as long as or slightly shorter than head plus mesosoma; hypopygium extending slightly middle of gaster; body dark brown to black with extensive yellow markings. Host : *Liriomyza trifolii* Hansson & LaSalle (extralimital) Taiwan ..... *liriomyzae* Hansson
- Pedicellus as long as or shorter than F1; other characters partly or completely different ..... 8

8. Scape not exceeding level of vertex, slightly longer than eye height, 5 to 5.5x as long as wide; F1 slightly shorter than F2 or F3; clava 5 to 5.5x as long as broad; propodeum with paraspiracular carina enclosing spiracle; MV 6.2x longer than STV. Host : Parasitic on *Phyllocnistis citrella*; China, Japan, Taiwan & Thailand .... *citrella* Reina & LaSalle  
 — Scape exceeding level of vertex; other characters not as in above combination.... 9
9. Hypopygium not exceeding middle of gaster; clava with an apical spine, 0.52x as long as remaining length of clava; pedicellus shorter than (0.75x) F1; cubital line of setae of forewing starting from base of forewing ..... *longiclavatus* Narendran  
 — Hypopygium well exceeding middle of gaster; claval apical spine shorter than above; pedicellus as long as F1 (or subequal to F1), cubital line of setae starting a little away from base of forewing..... 10
10. Antenna with one anellus; scape shorter than clava; hind femur 3.75x as long as broad; mid lobe of mesoscutum 1.43x as long as scutellum .....  
 ..... *zenta* Narendran sp. nov.  
 — Antenna with two anelli; scape subequal in length to clava; hind femur 4.25x as long as broad; midlobe of mesoscutum 1.33x as long as scutellum .....  
 ..... *vinitia* Narendran sp. nov.
11. Forewing with speculum extending below MV towards STV ..... 12  
 — Forewing with speculum not extending below MV or speculum absent ..... 14
12. F1 0.54x length of F2; legs clear yellow except forecoxa partly brownish; antenna with 2 anelli; clava 1.19x as long as F2 plus F3; pedicellus 1.57x as long as F1 .....  
 ..... *ovulorum* (Ferrière)  
 — F1 longer than 0.54x length of F2, subequal or equal to F2; leg colour variable; antenna with one anellus; clava variable; pedicellus as long as or shorter than F1 ..... 13
13. Mesoscutum with 2 adnotaular setae on either side; hypopygium not reaching middle of gaster; femora with a brown band sub-apically; tibiae with a brown band sub-basally; phytophagous on tender shoots of Mango tree .....  
 ..... *suhdeeri* Narendran sp. nov.  
 — Mesoscutum with one adnotaular seta on either side; hypopygium exceeding slightly beyond middle of gaster; femora and tibia not with such bands subapically and sub-basally respectively as above; Entomophagous parasitic on Cecidomyidae (extralimital) (Europe) ..... *anysis* (Walker)
14. Mesoscutum with not more than 2 adnotaular setae on either side ..... 15  
 — Mesoscutum with 3 or 4 adnotaular setae on either side ..... 23
15. Antenna with 2 anelli ..... 16  
 — Antenna with 1 anellus ..... 20

16. Scape slightly exceeding level of vertex, longer than clava; body dark brown, with trochanters, apices of femora, all tibiae, and tarsi pale brownish yellow; pedicellus shorter than F1; funicular segments of equal length; hind femur 4.76x as long as wide; MV 2.57x as long as STV; gaster almost as long as head plus mesosoma; Burma (= Myanmar) ..... *saraicus* Narendran sp. nov.
- Scape not exceeding level of vertex, mostly not reaching level of vertex; other characters variable ..... 17
17. MS curved; propodeum without a median carina; gaster almost as long as head plus mesosoma combined; legs yellow with one-fifth base of fore and hindcoxae brown; gaster dark brown with base paler ..... *lurvi* Narendran sp. nov.
- MS straight; propodeum with a median carina or with a broad flat median raised area (not clearly forming a narrow carina); gaster distinctly longer than head plus mesosoma; colour of legs partly or completely different ..... 18
18. Speculum absent; eye 2.2x as long as malar space; fringe on MV 0.23x as long as width of wing disc of forewing; MV 3.6x as long as STV; hind femur 3.7x as long as broad; all legs including coxae yellow ..... *davius* Narendran sp. nov.
- Speculum present; other characters partly or completely different ..... 19
19. Eye height in profile 2.8x length of malar space; F1 subequal to F2; clava distinctly longer than F2 plus F3, hypopygium exceeding middle of gaster; femora brown with pale apices ..... *demiticus* Narendran sp. nov.
- Eye height in profile 1.6x as long as malar space; F1 shorter than F2; clava as long as ... F2 plus F3; hypopygium not reaching middle of gaster; mid and hind femora yellow with its basal one-third pale brown ..... *cerolus* Narendran sp. nov.
20. Mesoscutum with one adnotaular seta on either side at posterior part; eye height in profile 2.6x malar space; scape 4.6x as long as broad; pedicellus 3x as long as broad, slightly longer than F1; midlobe of mesoscutum 1.36x as long as scutellum; hind femur 5.33x as long as broad; MV 2.75x as long as STV; hypopygium not reaching middle of gaster; head, most of mesosoma and most of gaster black .....  
..... *fagri* Narendran sp. nov.
- Mesoscutum with 2 adnotaular setae on either side; other characters partly or completely different ..... 21
21. Funicle segments 1 to 3 subequal in length; scape slightly more than 3x as long as wide; pedicellus 1.5x as long as wide; legs dark brown except tibiae and two tarsal joints which are yellow ..... *longicarpus* (Khan & Shafee)
- Funicle segment not subequal in length, different in sizes; scape and pedicellus not as above; colour variable ..... 22
22. Antennal toruli situated a little above level of lower margin of eye; coxae and femora

- black (with apices of femora paler); MS slightly curved; F1 shorter than pedicellus; F3 longest funicular segment ..... *dicleus* Narendran sp. nov.
- Antennal toruli situated at level of lower eye margin; femora yellow; MS straight; F1 subequal in length to pedicellus; F3 not longest funicular segment .....  
..... *delusus* Narendran sp. nov.
23. Mesoscutum with 4 adnotaular setae; body without metallic reflection ..... 24
- Mesoscutum with 3 adnotaular setae; black with slight metallic refringence; other characters mostly different ..... 25
24. Eye pilose; MS with a basal inverted triangular shallow fovea below eye; scape exceeding level of vertex; mesoscutum brown, without ML .....  
..... *garuda* Narendran sp. nov.
- Eye bare, MS without a basal fovea; scape not exceeding level of vertex; mesoscutum black with a ML ..... *lekatus* Narendran sp. nov.
25. Pedicellus shorter than all funicular segments separately ..... 26
- Pedicellus longer than all funicular segments separately ..... 27
26. Scape shorter than eye height in profile; POL 1.75x OOL; antennal toruli placed slightly below level of lower eye margin; MV 2.7x as long as STV; midtibial spur as long as metatarsus ..... *mangalae* Narendran sp. nov.
- Scape a little longer than eye height in profile; POL 3.5x OOL; antennal toruli placed at level of lower margin of eye; MV 4.2x as long as STV; mid tibial spur 0.75x as long as metatarsus ..... *stomalis* Narendran sp. nov.
27. All funicular segments subequal in length; MV 3.83x as long as STV; PMV 0.25x as long as STV; hypopygium not reaching middle of gaster .....  
..... *narangae* Narendran sp. nov.
- Funicular segments unequal in length; MV 2.83x as long as STV; PMV absent; hypopygium exceeding a little beyond middle of gaster .....  
..... *bararius* Narendran sp. nov.

1. *Quadrastichus bararius* Narendran sp. nov.

(Fig. 167)

**Holotype : Female** : Length 1.1mm. Black with slight metallic green refringence; eye grayish yellow; ocelli pale reflecting yellow; antenna light brown with scape paler; tegula pale brown; legs : all coxae and femora dark brown with apices pale yellow; trochanters, tibiae and tarsi pale yellow; pretarsi dark brown; wings hyaline with veins pale brownish yellow; pilosity of wings pale brown.

**Head** : Partly collapsing; POL 3x OOL; OOL subequal to OD; lower margin of clypeus bidentate; mandibles bidentate; eye length in profile 2x as long as malar space; MS slightly

curved, without a basal fovea; antennal toruli placed at level of lower margin of eye; antennal formula 11233; scape not reaching level of vertex, shorter than eye height in profile, 4.3x as long as broad, a little shorter than clava (26 :27), pedicellus longer than any funicular segment ; F1 shorter than F2; F3 shorter than F1; clava longer than F2 plus F3 (27 :23), 3x as long as broad, with an apical spine (Fig. 167).

*Mesosoma* : 1.1x as long as broad; pronotum 0.36x as long as mesoscutum, mesoscutum with a ML; dorsum longitudinally and finely reticulate with 3 adnotaular setae, midlobe of mesoscutum 1.6x as long as scutellum; scutellum a little wider than long, enclosed space of SMG 1.4x as long as broad; dorsellum 0.2x as long as scutellum, 3x as broad as long, a little shorter than propodeum (2 :3), in dorsal view slightly extending over propodeum; propodeum reticulate with short and broad median carina; spiracle rim almost exposed, separated from metanotum by its own diameter; midtibial spur hardly as long as metatarsus; hind femur 5.5x as long as wide; Forewing (including marginal fringe) 1.9x as long as wide; SMV with single dorsal seta, MV 2.83x as long as STV; PMV absent; fringe on MV 0.15x as long as width of forewing disc; speculum small, closed behind by cubital line of setae, not extending below MV.

*Gaster* : Ovate, longer than head plus mesosoma (18 :15); cercus with one seta longer than others and sinuate, hypopygium exceeding a little beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Ernakulam Dt., Nedumbassery (Near Airport) (10°1' N 76° 18' E), 12.i.2004, coll. T. C. Narendran & Party.

*Paratype* : 1 Female, India : Kerala, Wayanad Dt., Muthanga (11° 44' N 76° 29' E), 7.v.2000, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Thonikadavu (11° 36' N 76° 6' E), 7.ii.2003, coll. T. C. Narendran & Party; 2 Females, India : Tamil Nadu, Mamallapuram, 16.ii.1993, coll. S. B. Zeya; 1 Female, India : Tamil Nadu, Kodaikanal, 21. ii. 1993, coll. S. B. Zeya & S. I. Kazmi; 2 Females, India : Kerala, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 28. xi. 1994, 7.v.2000, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Pedur, Thenjipalam, 28. xii. 2004, coll. T. C. Narendran & Party; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 5-6. x. 1994, coll. M. Hayat; 1 Female, India : Karnataka, Bangalore (12° 58' N 77° 35' E), 27. xii. 1988, coll. M. Hayat; 1 Female, India : Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9. xii. 2004, coll. T. C. Narendran & Party; 7 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 31. viii. 2002, 30. xi. 2001, 5. xii. 2002, 4. xii. 1997, 10. vi. 2003, 18. ix. 2002, coll. T. C. Narendran & Party; 2 Females, India : Karnataka, Sringeri (13°25' N 75°15' E), 22. v. 2003, 15. v. 2003, 23. v. 2003, coll. M. Hayat; 1 Female, India : Kerala, Palghat Dt., Chindaki (10° 39' N 76° 40' E), 13. xii. 1987, coll. T. C. Narendran & Party; 1 Female, India : Uttar Pradesh, Dehradun (30° 18' N 78° 3' E), 7. iv. 1978, coll. M. Verma; 1 Female, India : Kerala, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), 30. ix. 2002, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N

76° 58' E), 10. i. 2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Trivandrum Dt., Palode (8° 42' N 77° 2' E), 11. xii. 2004, coll. T. C. Narendran & Party; 1 Female, India : Tamil Nadu, Coimbatore (11° 0' N 76° 58' E), September 1987, coll. T. C. Narendran & Party; 1 Female, India : Karnataka, Nagarhole (12° 1' N 76° 10' E), 16. viii. 2002, coll. P. A. Sinu; 1 Female, India : Kerala, Wayanad Dt., Pookode lake (11° 36' N 76° 6' E), 8. ii. 2003, coll. T. C. Narendran & Party; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 11. vii. 1984, coll. M. Hayat & Islam; 1 Female, India : Kerala, Wayanad Dt., Muthanga (11° 44' N 76° 29' E), 7. x. 1995, coll. T. C. Narendran & Party.

**Remarks :** It resembles *O. narangae* Narendran in having pedicellus longer than any funicular segment but can be distinguished from *O. narangae* in having funicular segments unequal in length, PMV absent and in having hypopygium exceeding a little beyond middle of gaster.

## 2. *Quadrastichus cerolus* Narendran sp. nov.

(Fig. 168)

**Holotype : Female :** Length 1.85mm. Black with slight metallic green refringence; eye and ocelli reflecting pale yellow; fore and mid coxae brown, hindcoxae dark brown; mid and hind femora yellow with its basal one-third dark brown; fore femur and tibia pale yellow; fore tarsi pale brown; mid tibia and tarsi pale yellow; hind tibia and tarsi pale yellow; all pretarsi dark brown. Wings hyaline with veins pale brown, wing pilosity pale yellowish brown.

**Head :** Partly collapsing; POL 2x OOL; OOL 1.5x OD; clypeus not distinctly delimited, lower margin bilobed; mandibles bidentate; eye height in profile 1.6x malar space; MS straight, without a basal fovea; antennal toruli placed at level of lower margin of eye; antennal formula 11233; scape not reaching level of vertex, as long as eye height in side view; 4.33x as long as broad; pedicellus shorter than any other funicular segment (Fig. 168); F1 shorter than F2; F3 shorter than F2; clava as long as F2 plus F3, longer than scape (32 :26); clava without distinct seta or spine at apex.

**Mesosoma :** 1.2x as long as broad; pronotum 0.5x as long as mesoscutum; ML present; surface longitudinally reticulate, with 2 adnotaular setae on either side; anterior seta at mid level of mesoscutum; mid lobe of mesoscutum 1.23x as long as scutellum; scutellum 1.4x as broad as long; enclosed space of SMG 1.63x as long as broad; dorsellum 0.23x as long as scutellum, a little longer than median length of propodeum (1.5 :1); dorsellum and propodeum weakly reticulate; propodeum with a broad, flat, and short median carina; propodeal spiracular rim exposed, separated from metanotum by its own diameter; mid tibial spur 0.75x as long as metatarsus; hind femur 4x as long as broad; forewing (including fringe) 2.23x as long as broad; SMV with 1 dorsal seta; MV 2.85x as long as STV; PMV 0.43x as long as STV; fringe on MV 0.16x as long as width of forewing disc (excluding fringe); speculum closed behind by cubital line of setae.

**Gaster :** 2x as long as combined length of head plus mesosoma; cercus with one seta slightly longer than others; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Ernakulam Dt., Nedumbassery (Near Airport) (10°1' N 76° 18' E), 12.i.2004, coll. T. C. Narendran & Party (ZSIC).

*Paratype* : 2 Females, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10. i. 2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 14. xii. 2003, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9. xii. 2004, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Palghat Dt., Pattambi (10° 49' N 76° 12' E), 13. viii. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 17. ii. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Thonikadavu (11° 36' N 76° 6' E), 7. ii. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Pookode lake (11° 36' N 76° 6' E), 8. ii. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Silent valley (10°51' N 76° 37' E), 3. xii. 1988, coll. M. Hayat; 6 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 4.xii. 1993, 21. iii. 1989, 5. xii. 2002, 5. xii. 2003, 24. xii. 2001, coll. T. C. Narendran & Party; Female, India : Kerala, Idukki Dt., Vandiperiyar (11° 17' N 75° 51' E), 8. i. 2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Central Orchard, Pattambi (10° 49' N 76° 12' E), 12. viii. 2003, coll. T. C. Narendran & Party; Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 17. ix. 1991, coll. S. B. Zeya.

*Remarks* : This new species resembles *Q. demiticus* Narendran but can be separated from that species by the characters given in the key above.

### 3. *Quadrastichus davius* Narendran sp. nov. (Fig. 172)

*Holotype* : *Female* : Length 1.1mm. Black with following parts as follows : eye reflecting yellowish brown; ocelli reflecting pale yellow; antenna brown with scape and ventral part of pedicellus paler, all legs pale yellow with pretarsi darker; tegula pale yellowish brown. Wings hyaline with veins and pilosity brown.

*Head* : Width 1.12x its length in anterior view; width in dorsal view 4x its median length; POL 6x OOL; OOL 0.5x OD; clypeus not delimited, lower margin with 2 minute teeth; mandibles bidentate; eye length in profile 2.2x malar space; MS straight without a basal fovea. Antennal toruli placed slightly above lower eye margin; antennal formula 11233; scape not quite reaching level of vertex, shorter than eye height in profile, 3.4x as long as broad; F1 shorter than pedicellus, F2 longer than pedicellus; F3 shorter than pedicellus; clava a little longer than F2 plus F3 (32 : 29), longer than scape (32 : 25); clava 4.6x as long as wide with a terminal spine (Fig. 172).

*Mesosoma* : 1.41x as long as broad; pronotum 0.5x length of mesoscutum; mesoscutum without a ML; dorsum longitudinally reticulate with 2 adnotaular setae on either side;

anterior seta near middle level of mesoscutum; mid lobe of mesoscutum 1.14x as long as scutellum; scutellum a little broader than long (8 :7); SMG faintly represented, enclosed space 1.75x as long as broad; dorsellum 0.3x as long as scutellum, 3x as broad as long; subequal in length to propodeum; propodeum distinctly reticulate, with weak median carina; spiracle rim exposed, almost touching metanotum, mid tibial spur 0.8x as long as metatarsus; hind femur 3.7x as long as wide; forewing (including marginal fringe) 2.1x as long as wide; SMV with single dorsal seta, MV 3.6x as long as STV; PMV 0.2x as long as STV; fringe on MV 0.23x as long as width of forewing (excluding fringe); speculum absent, fully setose.

*Gaster* : Ovate, longer than head plus mesosoma (15 :12), cercus with one seta longer than remaining setae, sinuate; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 28.xi.1994, coll. T. C. Narendran & Party.

*Paratypes* : 2 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 11. ix. 2002, Jan 1986, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Kottiyoor (10° 7' N 78° 49' E), 18. ii. 2003, coll. T. C. Narendran & Party; Female, India : Kerala, Palghat Dt., Parambikulam (10° 26' N 76° 49' E), 22. xii. 1985, coll. T. C. Narendran & Party; Female, India : Kerala, Wayanad Dt., Muthanga (11° 44' N 76° 29' E), 10. x. 2000, coll. T. C. Narendran & Party; Female, India : Kerala, Kasaragod, Dt., CPCRI (12°30' N 74°59' E), 21. i. 2003, coll. T. C. Narendran & Party.

*Remarks* : This new species can be separated from all other Oriental species by the characters given in the key above.

#### 4. *Quadrastichus delusus* Narendran sp. nov.

(Fig. 162)

*Holotype* : *Female* : Length 1.25 mm. Black with slight metallic green refringence; eye reflecting pinkish brown; antenna pale brown with scape pale yellow and pedicellus yellow with brownish tinge; fore and mid coxae dark brown; hindcoxa concolorous with mesosoma; all femora, and tibiae yellow, fore tarsi yellow with slight brownish tinge; mid and hind tarsi yellow; pretarsi brown; wings hyaline with veins and pilosity pale yellowish brown.

*Head* : Partly collapsing; POL 2.33x OOL; OOL 1.5x OD; clypeus delimited on sides; lower margin bilobed; mandibles bidentate; eye height in profile 2x length of malar space; MS straight; antennal toruli situated at level of lower margin of eye, space between toruli a little more than space between toruli and eye margin, subequal to diameter of torulus; antennal formula 11133; scape not reaching level of vertex, as long as eye height in side

view; 4.43x as long as broad ; pedicellus 1.63x as long as wide, subequal in length to F1; F2 longer than F1 (15 : 11), F3 slightly shorter than F2 (15 : 16); clava 3.7x as long as broad, longer than F2 plus F3 (37 : 32), longer than scape (31 : 30), with a short spine at apex (Fig. 162).

*Mesosoma* : 1.33x as long as wide; pronotum 0.23x as long as mesoscutum; ML present, surface longitudinally reticulate, with 2 adnotaular setae on either side posteriorly, anterior setae about level of middle of mesoscutum; midlobe of mesoscutum 1.6x as long as scutellum; scutellum broader than long (10 : 7); enclosed space between SMG 1.75x as long as broad, scutellum with 2 setae on either side; dorsellum 0.29x length of scutellum, subequal in length to median length of propodeum; median carina very short, submedian area reticulate; propodeal spiracle rim exposed, separated from metanotum by less than its diameter; midtibial spur 0.75x as long as metatarsus; hind femur 4x as long as wide. Forewing (including fringe) 1.53x as long as broad; SMV with one dorsal seta; MV 3.6x as long as STV; PMV 0.6x as long as STV; fringe on MV 0.17x as long as width of forewing disc (without fringe); speculum closed behind by cubital line of setae.

*Gaster* : Ovate, longer than head plus mesosoma (22 : 18); cercus with one seta longer than others; hypopygium not quite reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Idukki Dt., Adimali (10° 2' N 76° 59' E), 3.xii.1988, coll. T.C.Narendran & Party.

*Paratypes* : 1 Female, India : Kerala, Idukki Dt., Adimali (10° 2' N 76° 59' E), 3. xii. 1988, coll. T. C. Narendran & Party; 3 Females, India : Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 22. viii. 2004, 18. vii. 2004, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 17. iv. 1989, 9. x. 2002, coll. T. C. Narendran & Party.

*Remarks* : This new species comes near *Q. dicleus* Narendran in having mesoscutum with 2 adnotaular setae on either side and funicular segments not subequal in length. It can be separated from *Q. dicleus* by the characters given in the key.

##### 5. *Quadrastichus demiticus* Narendran sp. nov.

(Fig. 104)

*Holotype* : Female : Length 0.94mm. Black; eye reflecting yellow with brick red spot at middle of ventral margin; ocelli pale reflecting yellow; antenna dark brown with scape pale yellow; tegula pale yellow; coxae dark brown, with apex of hindcoxa paler; femora brown with apices paler; tibiae and tarsi pale brownish yellow; pretarsi dark brown; wings hyaline with veins and pilosity brown.

**Head** : Slightly collapsing on occiput; width subequal to its length in anterior view; POL 2x OOL; OOL 1.5x OD; clypeus weakly bilobed, mandibles bidentate; eye height in profile 2.8x as long as malar space; MS straight; antennal toruli situated at level of lower margin of eye; antennal formula 11233; scape not reaching level of vertex; scape 5.75x as long as broad, shorter than eye height in profile, as long as clava; pedicellus 2x as long as broad, subequal in length to F1 or F2 or F3; clava distinctly longer than F2 plus F3 (23:17), apex with a short spine.

**Mesosoma** : As long as broad; pronotum 0.43x as long as mesoscutum; ML distinct; surface longitudinally reticulate, with 2 adnotaular setae on either side, anterior seta slightly anterior to middle, midlobe of mesoscutum 1.75x as long as scutellum; scutellum 2.25x as broad as long, with 2 pairs of setae on posterior half; enclosed space between SMG 1.33x as long as broad; dorsellum 0.25x as long as scutellum, as long as propodeum, median carina indistinct (a broad flat slightly raised area present); propodeal spiracle rim exposed, separated from metanotum by its own diameter; prepectus weakly reticulate; mid tibial spur 0.75x as long as metatarsus; hind femur 3.6x as long as wide; forewing (including fringe) 1.8x as long as wide; MV 2.71x as long as STV; PMV absent; fringe on MV 0.29x as long as width of wing disc (excluding fringe); SMV with one dorsal seta; speculum small, closed behind by cubital line of setae.

**Gaster** : Longer than head plus mesosoma; cercus with one seta longer than others, not quite sinuate; hypopygium exceeding middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, India : Kerala, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 28.xi.1994, coll. T. C. Narendran & Party.

**Paratypes** : 61 Females, India : Kerala, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 28. xi. 1994, 12. x. 1996, 26. x. 1995, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 17. x. 2002, 5. xii. 2002, coll. T. C. Narendran & Party; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), viii. 1999, coll. S. B. Zeya; 1 Female, India : Kerala, Malappuram Dt., Pedur, Thenjipalam, 28. xii. 2003, coll. T. C. Narendran & Party; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 12. iii. 1978, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Calicut Dt., Chaliyam (11° 9' N 75° 49' E), 14. iii. 2003, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), 4. x. 2003, 13. xi. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 2. xi. 2003, coll. T. C. Narendran & Party; 1 Female, India : Karnataka, Bangalore (12° 58' N 77° 35' E), 27. xii. 1988, coll. M. Hayat.

**Remarks** : This species differs from related species by the characters mentioned in the key above.

6. *Quadrastichus dicleus* Narendran sp. nov.

(Fig. 169)

*Holotype : Female* : Length 1.61mm. Black (without metallic refringence); eye brownish red; ocelli pale reflecting yellow; antenna pale brown with scape paler; coxae and femora (except paler apices of femora) concolorous with body; tibiae and tarsi pale yellow; pretarsi black; wings hyaline, with veins testaceous to brown.

*Head* : Not collapsing, width in anterior view 1.2x its length, width in dorsal view 3.83x its median length; POL 2x OOL; OOL 2.73x OD; clypeus not delimited, lower margin with 2 minute teeth; mandibles bidentate; eye length in profile 2.2x as long as malar space; MS slightly curved, without a basal fovea. Antennal toruli placed slightly above lower eye margin; scape not quite reaching level of vertex; antennal formula 11133; antennal toruli situated slightly above level of ventral margin of eye; scape not shorter than eye height in profile, 2.7x as long as wide; F1 a little shorter than pedicellus; F2 as long as F1; F3 longest funicular segment; clava as long as F2 plus F3, as long as scape; pointed at apex but without a spine or spicule.

*Mesosoma* : A little longer than wide (13 :7); pronotum 0.4x as long as mesoscutum; mesoscutum with ML, dorsum longitudinally reticulate with 2 adnotaular weak setae on either side, anterior seta near middle level of mesoscutum; midlobe of mesoscutum 1.44x as long as scutellum; scutellum 1.6x as broad as its length, enclosed space between SMG 1.8x as long as its width; dorsellum 3x as broad as long; a little shorter than propodeum (2 :3), extending a little over propodeum in dorsal view, 0.2x as long as scutellum; propodeum reticulate; without distinct median carina but with a broad and flat slightly raised area in middle; spiracle rim fully exposed, separated from metanotum by less than its diameter; callus with 2 setae; midtibial spur a little longer than metatarsus; hind femur 3.33x as long as its width; forewing (including marginal fringe) 1.94x as long as broad; SMV with single dorsal seta; MV 2.9x as long as STV; PMV absent; fringe on MV 0.16x as long as width of forewing (excluding lower marginal fringe); speculum closed behind by cubital line of setae, not extending below MV.

*Gaster* : Ovate, distinctly longer than head plus mesosoma (74 :52); cercus with one seta distinctly longer than remaining setae; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Kannur Dt., Aralam (11° 58' N 75° 40' E), 16.xii.1995, coll. T. C. Narendran & Party (ZSIK)

*Paratype* : 9 Females, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10. i. 2004, coll. T. C. Narendran & Party; 7 Females, India : Kerala, Malappuram Dt., Thalappara, 31. viii. 1987 coll. T. C. Narendran & Party; 30 Females, India : Kerala, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 12. x. 1996, 28. xi. 1994, coll. T. C. Narendran & Party; 30 Females, India : Kerala, Palghat Dt., Pattambi (10° 49' N 76° 12' E), 13. viii. 2003,

12. viii. 2003, coll. T. C. Narendran & Party; 5 Females, India : Kerala, Malappuram Dt., Pedur, Near Thenjipalam, 28. xii. 2003, coll. T. C. Narendran & Party; 4 Females, India : Kerala, Palghat Dt., Kalkandy, 13. xii. 1987, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Wayanad Dt., Mananthavady (11° 48' N 76° 1' E), 22. ii. 1988, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Wayanad Dt., Pookode, 8. ii. 2003, coll. T. C. Narendran & Party; 3 Females, India : Kerala, Wayanad Dt., Muthanga (11° 44' N 76° 29' E), 7. x. 1995, 7. v. 2000, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Calicut Dt., Pookad (11° 23' N 75° 44' E), 14. xi. 2001, 31. viii. 2001, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9. xii. 2004, coll. T. C. Narendran & Party; 6 Females, India : Kerala, Alappuzha Dt., Arattupuzha, 23. iv. 2000, coll. T. C. Narendran & Party; 1 Female, INDIA : Kerala, Palghat Dt., Muttikulangara, 11. xii. 1987, coll. T. C. Narendran & Party; 3 Females, India : Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 14. ii. 2004, 16. xi. 2003 coll. T. C. Narendran & Party; 3 Females, India : Karnataka, Nagarhole (12° 1' N 76° 10' E), 16. viii. 2001, 17. viii. 2001, coll. P. A. Sinu; 1 Female, India : Tamil Nadu, Coimbatore (11° 0' N 76° 58' E), Sept. 1987, coll. T. C. Narendran & Party; 24 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 4. v. 1989, 5. xii. 2002, 12. i. 2004, 8. xii. 2004, 5. vi. 1989, Jan. 1986, 31. xii. 1985, 16. iv. 1988, 12. i. 2004, 8. xii. 2004, 5. iv. 1987, 16. ix. 2002, 6. iii. 1987, Jan 1986, 16. iv. 1987, 7. iii. 2003, 22. ii. 2004, 17. xii. 1991, 29. xi. 2002, 15. xii. 2002, 8. xii. 2004, 7. ii. 2003, coll. T. C. Narendran & Party.

*Remarks* : This species can be distinguished from all other Oriental species by using the key given in this work.

### 7. *Quadrastichus erythrinae* Kim

(Fig. 180)

2004. *Quadrastichus erythrinae* Kim, (in Kim *et al.*), 244-249, Holotype : Female : Singapore (ANIC).

*Redescription* : *Female* : Length 1.45-1.6mm. Dark brown with yellow markings. Head yellow, except gena posteriorly brown. Antenna pale brown except scape posteriorly pale. Pronotum dark brown. The midlobe of mesoscutum with a "V" shaped or inverted triangular dark brown area from anterior margin, the remainder yellow. Scapula yellow. Scutellum, axilla and dorsellum brown to light brown. Propodeum dark brown. Gaster brown. Fore and hindcoxae brown. Mid coxa almost pale; femora mostly brown to light brown.

*Head* : POL 1.6-2x longer than OOL. Toruli situated at level of lower eye margin shallow groove present beneath torulus, extending slightly over half the distance from torulus to clypeal margin. MS only slightly curved, without triangular fovea below eyes. Clypeal margin bidentate. Antenna with one large anellus. All funicular segments approximately equal in length and width. Scape not extending above the vertex.

*Mesosoma* : ML on the midlobe of mesoscutum very weak to absent. Midlobe of mesoscutum with 3 to 5 short adnotaular setae. Scutellum with distinct SMG and SLG.

Propodeal spiracle relatively large, whole rim exposed. Propodeum without distinct median carina or paraspircular carina. Propodeal callus with 2 setae. SMV with 1 seta, situated slightly basal to the middle. PMV almost rudimentary. CC : MV : STV : PMV = 3.9-4.1 : 2.8-3.1 : 1.0 : 0.1-0.3. cubital line of setae not extending all the way to basal vein; leaving the speculum partially opened.

*Gaster* : (Fig. 180) Slightly longer than head plus mesosoma. Hypopygium extending 0.8-0.9x length of gaster and reaching posterior margin of T6. Cercus with 3 setae, the longest one slightly curved and about 1.3x as long as others.

*Male* : Length 1.0-1.15mm. Pale colouration white to pale yellow as opposed to yellow in Female. Pronotum dark brown. Scutellum and dorsellum pale brown; antenna with 4 funicular segments; gaster shorter than in Female.

*Host* : Gall inducers on *Erythrina variegata* L., *E. fusca* Lour., and *E. indica* L.

*Type locality* : Singapore.

*Distribution* : Mauritius, Re union, India and Singapore.

*Material examined* : 105 Females, India, Kerala, Manjeri (11° 7' N 76° 7' E), 12.iv.2005, coll. M. Sheeba; 12 Females, Kerala : Trivandrum Dt., reared from *Erythrina* sp. 24.iv.2005, coll. Prathapan; 51 Females Kerala : Malappuram Dt., Nilambur (11°16' N 76°13 ' E) 22.iv.2006, coll. M. Sheeba.

### 8. *Quadrastichus fagri* Narendran sp. nov.

(Fig. 100-101)

*Holotype* : *Female* : Length 1.35mm. Black, eye reddish brown; ocelli pale reflecting yellow; antenna black with pedicellus and scape pale yellow; tegula brown; fore coxa brownish black; mid coxa yellow; hindcoxa yellow with basal one-third black; gaster black with base and sternites pale yellow with a black spot on anterior part of hypopygium. Wings hyaline with veins and pilosity pale yellowish brown.

*Head* : partly collapsing; as long as wide in anterior view; POL 4.5x OOL; OOL equal to OD; clypeus weakly delimited, lower margin bilobed; mandibles tridentate; eye height in profile 2.6x malar space; MS straight; antennal toruli situated at level of lower eye margin; antennal formula 11133 (Fig. 100); scape not reaching level of vertex, 4.6x as long as broad, pedicellus 3x as long as broad, subequal to F2, slightly longer than F1; F3 shortest funicular segment; clava (including apical spine) 6.83x as long as broad, longer than F2 plus F3; longer than scape; clava with an apical spine.

*Mesosoma* : (Fig. 101) 1.45x as long as wide; pronotum 0.2x as long as mesoscutum; ML present; surface longitudinally reticulate, with one adnotaular seta on either side; mid lobe of mesoscutum 1.36x as long as scutellum; scutellum 1.8x as broad as long, with 2 setae on either side on posterior half, enclosed space between SMG 2x as long as broad; dorsellum as long as propodeum, 0.27x length of scutellum, with a weak median broad

carina; surface faintly reticulate; prepectus distinctly reticulate; propodeal spiracle partly covered by callus, separated by metanotum by less than diameter of spiracle; midtibial spur 0.7x as long as metatarsus; hind femur 5.33x as long as broad; forewing (including marginal fringe) 2.3x as long as broad; MV 2.7x as long as STV; PMV 0.25x as long as STV; fringe on MV 0.15x length of wing disc; SMV with 1 dorsal seta; speculum not extending below MV; closed behind by cubital line of setae.

*Gaster* : (Fig. 101) Ovate, tilted up posteriorly, 1.25x as long as head and mesosoma combined; cercus with one seta longer than others and sinuate; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown. Probably phytophagous.

*Holotype* : Female, India : Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9.xii.2004, coll. T. C. Narendran & Party (ZSIC).

*Remarks* : This species can be separated from all other Oriental species by a combination of characters viz. mesoscutum with one adnotaular seta on either side, eye height in profile 1.6x as long as malar space; F1 subequal to F2; clava distinctly longer than F2 plus F3, hypopygium exceeding middle of gaster, and femora brown with apices paler.

9. *Quadrastichus garuda* Narendran sp. nov.  
(Fig. 96-99)

*Holotype : Female* : Length 1.72 mm. Brown with following parts as follows : eye pale reflecting yellow; ocelli pale pinkish brown; antenna brown with ventral and proximal half of pedicellus and scape pale yellow; tegula pale brown; legs including coxae pale yellow; hypopygium pale brownish yellow; wings hyaline with veins and pilosity brown.

*Head* : Width 1.37x as wide as long in anterior view (Fig. 96), 2.79x as wide as long in dorsal view, POL 1.88x OOL; OOL subequal to OD; clypeus not delimited, lower clypeal margin distinctly bilobed; mandibles bidentate; eye pilose, height in profile 1.84x malar space; MS with a basal shallow triangular yellow fovea (Fig. 97); antennal toruli situated a little above level of lower eye margin; distance between toruli 3.6x distance between toruli and eye margin; antennal formula 11233; scape exceeding level of vertex, 3.63x as long as wide, a little longer than eye height, much shorter than clava; pedicellus 2.11x as long as broad, shorter than F1 (19 : 21), F2 longer than F1 (19 : 21); F3 subequal to F1; clava (including apical spine) a little longer than F2 plus F3 (43 : 40) (Fig. 98).

*Mesosoma* : 1.31x as long as wide; pronotum 0.23x as long as mesoscutum; ML absent, surface moderately reticulate, with 4 adnotaular setae on either side; mid lobe of mesoscutum 1.53x as long as scutellum; scutellum 1.41x as wide as long; enclosed space between SMG 1.55x as long as broad, with 2 pairs of setae, anterior pair near middle level of scutellum; dorsellum about 0.24x as long as scutellum, subequal to length of propodeum; propodeum with a median carina; propodeal spiracle rim exposed; spiracle almost touching

posterior margin of metanotum, with a spiracular groove extending posteriorly and obliquely, without paraspicular carina; hind femur 4.5x as long as broad; forewing including fringe 2.1x as long as wide; MV 3.5x as long as STV; PMV absent; STV with one dorsal seta; speculum very small, closed behind by cubital line of setae, fringe on MV 0.21x as long as forewing disc (excluding fringe) (Fig. 99).

*Gaster* : Ovate, distinctly longer than head plus mesosoma (105 : 76); cercus with one seta on either side longer than others; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Leaf gall of *Pouzolzia viminea* Wedd. (Urticaceae)

*Holotype* : Female, India : Manipur, Kaxm Kaullel Ukrrul District, Altitude 1350m. 23.xii.2001, Ranjit Singh (ZSIC).

*Remarks* : This species differs from all other Oriental species by having eye pilose; MS with a subocular fovea, scape exceeding level of vertex, mesoscutum with ML and other characters mentioned in the key above.

10. *Quadrastichus getiolus* Narendran sp. nov.  
(Fig. 173)

*Holotype* : *Female* : Length 0.81mm. Yellow; eye red and ocelli brick red, a brown spot on either side corner of pronotum and on apex of axilla, propodeum with slight brown tinge, median carina dark brown; setal pits of mesoscutum and scutellum dark brown; ovipositor sheath dark brown; gaster with a black spot at base ventrally; wings hyaline, veins and pilosity pale yellow.

*Head* : Collapsing; POL 2x OOL; OOL a little longer than OD; clypeus not delimited, lower margin slightly bilobed; mandibles bidentate, eye height in profile 1.2x as long as malar space; MS straight; antennal toruli situated slightly above level of lower margin of eye; antennal formula 11333; scape reaching level of vertex, as long as eye height in side view, 4.5x as long as broad; pedicellus 1.8x as long as broad; shorter than F1, equal in length to F3; F2 slightly shorter than F1; clava distinctly longer than F2 plus F3 (30 :20), longer than scape (30 : 18), with a spine at apex (Fig. 173).

*Mesosoma* : 1.73x as long as wide; pronotum 0.44x as long as mesoscutum; ML present but faint; surface faintly reticulate, with one adnotaular seta on either side posteriorly; midlobe of mesoscutum 1.5x as long as scutellum; scutellum a little wider than long (8 :7); enclosed space between SMG 3.5x as long as wide; scutellum with 2 pairs of setae situated behind middle level; dorsellum 0.3x as long as scutellum, subequal to median length of propodeum; propodeum with median carina; submedian areas weakly reticulate; propodeal spiracle with rim exposed, touching metanotum; mid tibial spur 0.75x as long as metatarsus; hind femur 3.7x as long as broad; forewing (including fringe) 2.43x as long as broad; MV 3.75x as long as STV; PMV 0.38x as long as STV; fringe on MV 0.22x width of forewing disc (excluding fringe); speculum small, closed behind by cubital line of setae.

*Gaster* : Ovate, longer than head plus mesosoma (15 : 13), cercus with one seta longer than others, sinuate; hypopygium hardly reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Tamil Nadu, Coimbatore (11° 0' N 76° 58' E), 3.iii.1993, coll. S. B. Zeya.

11. *Quadrastichus lantanae* Narendran sp. nov.

(Fig. 163-164)

*Holotype* : *Female* : Length 1.8mm. Body mainly yellow with the following parts as follows : eye slightly brownish yellow, ocelli brownish black, antenna dark brown with scape and distal half of pedicellus pale yellow; pronotum with characteristic black strip on either side (Fig.164); pretarsi dark brown; gaster with a black cross band on posterior half of dorsal side; ovipositor sheath black.

*Head* : Partly collapsing; POL 2x OOL; OOL 2x OD; eye height in profile 1.1x malar space; MS without fovea, a little curved beneath eye; anterior margin of clypeus slightly bilobed, without distinct teeth; mandibles bidentate; antennal torulus (Fig. 163) placed slightly above lower margin of eye; scape 3.6x as long as wide, slightly shorter than (or subequal to) eye height in profile, reaching level of vertex; antenna with two anelli; F1 a little shorter than F2 (15 : 16), a little longer than F3 (15 : 14); clava 3 segmented, 4.6x as long as wide, slightly longer than F2 and F3 combined, with a distinct terminal spine.

*Mesosoma* : (Fig. 164) Faintly sculptured; pronotum medially 0.57x as long as mesoscutum; mid lobe of mesoscutum about 1.2x longer than scutellum, with very weak indistinct ML and 3 weak adnotaular setae on either side; scutellum length subequal to shortest width in between SLG; enclosed space between SMG 2x as long as its width; dorsellum 3x as wide as its median length, a little longer than propodeum (8 : 6) extending posteriorly a little over propodeum, 0.33x as long as scutellum; propodeum not more strongly sculptured than pronotum, with distinct median carina and faint carina around spiracle. Forewing 1.88x as long as broad; SMV with single dorsal seta; MV 4.25x STV; PMV 0.21x STV (1.5 : 7); fringe on MV 0.19x width of wing; speculum not extending below MV, closed behind by cubital line of setae.

*Gaster* : Ovate, distinctly longer than head plus mesosoma (18 : 14); cercus with one seta distinctly longer than the remaining setae and sinuate. hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : ex. *Lantana* sp.

*Holotype* : Female, India : Karnataka, Billigiri Rangaswamy Temple Wild Life Sanctuary, Basavannakadu, 28.vi.2002, coll. P. A. Sinu (ZSIC).

*Remarks* : This new species differ from all other Oriental species in having mesosoma mostly yellow, MS curved, mesoscutum with 3 adnotaular setae on either side, pronotum dark brown, antennal toruli situated at level of lower margin of eye and hypopygium not reaching 0.5x length of gaster.

12. *Quadrastichus lavania* Narendran sp. nov.  
(Fig. 105-106)

*Holotype* : *Female* : Length 1.86mm. Yellow with brownish black on ocular area, on middle of pronotum, anterior half of mesoscutum on middle attached to anterior margin of pronotum, a small spot at anterior corner of mesoscutum, anterior corner of axillae, sides of metanotum, a band on T4 and ovipositor sheath completely (visible part); eye dull yellow with dark tinge; ocelli dark brown; antenna brownish yellow, with scape pale yellow; pedicellus pale brownish yellow; wings hyaline with veins and pilosity pale brownish yellow.

*Head* : As wide as long in anterior view; 4.2x as broad as long; POL 1.4x OOL; OOL 1.7x OD; clypeus weakly delimited, lower margin weakly bilobed; mandibles bidentate; eye height in profile 2.14x malar space; MS curved; antennal toruli situated well above level of lower margin of eye; antennal formula 11233 (Fig. 105); scape well exceeding vertex, 3.71x as long as its maximum width, shorter than eye height in profile, shorter than clava; pedicellus 2.2x as long as wide, shorter than F1; F2 longer than F1 but subequal to F3; clava 3.62x as long as broad, distinctly shorter than F2 plus F3 (29 :34), with a short spine at apex.

*Mesosoma* : 1.6x as long as broad; pronotum 0.5x as long as mesoscutum; ML indistinct; surface longitudinally reticulate, with 2 adnotaular setae near middle; midlobe of mesoscutum 1.55x as long as scutellum; scutellum 2.5x as broad as long, with 2 pairs of setae on posterior half; enclosed space between SMG 1.83x as long as wide; dorsellum 0.27x length of scutellum, subequal to length of propodeum; median carina of propodeum distinct, surface moderately reticulate; propodeal spiracle enclosed by semicircular paraspiracular carina; rim of spiracle exposed, separated from posterior margin of metanotum by 0.75x diameter of spiracle; midtibial spur as long as metatarsus; hind femur 4x as long as wide; forewing including fringe 1.9x as long as wide; MV 4.6x as long as STV; PMV 0.6x as long as STV; fringe on MV 0.16x width of forewing disc (excluding fringe); SMV with one dorsal seta; speculum closed behind by cubital line of setae, extending to STV below MV.

*Gaster* : (Fig. 106) Ovate, longer than head plus mesosoma (22.5 :16); cercus with one seta longer than others and slightly sinuate; hypopygium not quite reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 9.xi.1979, coll. M. Hayat & M. Verma.

*Remarks* : This species differs from all other known Oriental species in having : mesosoma mostly yellow, MS curved, mesoscutum with 2 adnotaular setae on either side, pronotum yellow with a dark brown patch in middle and speculum extending below MV up to STV.

13. *Quadrastichus lekatus* Narendran sp. nov.

(Fig. 170)

*Holotype* : Female : Length 1mm. Black with following parts as follows : eye brick red; ocelli pale yellow; antenna dark brown, with pedicellus pale brownish yellow and scape pale yellow; tegula brown; legs : coxae dark brown, femora dark brown, with apices paler; tibiae and tarsi pale yellow; pretarsi dark brown; wings hyaline with veins and pilosity brown.

*Head* : Collapsing; POL 3x OOL; OOL 1.33x OD; clypeus weakly delimited, lower margin entire; mandibles bidentate; eye height in profile 2x malar space; MS straight; antennal toruli situated at level of ventral margin of eye; antennal formula 11133 (Fig. 170); scape not reaching level of vertex; scape 3x as long as broad, shorter than eye length (9 :10); pedicellus a little longer than F1 (14 :13); F2 longer than F1 (15 :13); F3 a little shorter than F1 (12 :13); clava shorter than F2 plus F3 (30 :28), 1.76x as long as scape; with spine at apex.

*Mesosoma* : 1.44x as long as broad; pronotum 0.4x as long as mesoscutum; ML present; surface smooth and shiny, with 4 adnotaular setae in an irregular longitudinal row on either side; mid lobe of mesoscutum as long as scutellum; scutellum a little wider than long; enclosed space between SMG 2x as long as wide, with 2 pairs of setae; dorsellum slightly longer than median length of propodeum, 0.13x as long as scutellum; propodeum without median carina, surface smooth and shiny; propodeal spiracle rim exposed, separated from metanotum by less than its diameter; mid tibial spur 0.75x as long as midmetatarsus; hind femur 5x as long as wide; forewing including fringe 2.14x as long as broad; MV 3.4x as long as STV; PMV absent; fringe on MV 0.22x width of wing disc (excluding fringe); speculum absent, fully setose.

*Gaster* : Distinctly longer than head plus mesosoma (40 : 27); cercus with one seta a little longer than others, not sinuate; hypopygium reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Thiruvananthapuram Dt., Palode (8° 42' N 77° 2' E), Tropical Botanical Garden Research Institute Campus (TBGRI), 8.ii.2004, coll. T. C. Narendran & Party (ZSIC)

*Paratype* : 1 Female, India : Kerala, Trivandrum Dt., Palode (8° 42' N 77° 2' E), 8. ii. 2004, coll. T. C. Narendran & Party.

*Remarks* : This species differs from all other Oriental species in having the following combination of characters : eye bare; MS without a basal fovea; scape not exceeding level of vertex; mesoscutum black with ML; mesoscutum with 4 adnotaular setae on either side; body without metallic reflection; forewing with speculum absent, fully setose and mesosoma black.

14. *Quadrastichus longiclavatus* Narendran  
(Fig. 284)

2005. *Quadrastichus longiclavatus* Narendran, 8(1) : 113-120. Holotype : Female. (ZSIK).

*Redescription* : *Female* : Length 1.3mm. Pale brownish yellow; eye brick red; ocelli brownish black; antenna dark brown with bases of pedicellus and clava pale. Blackish brown spots on anterior corner of scapula, posterior to margin of scapula, on propodeum and on gaster; gaster with a large rounded yellow pit at base and black patches on sides of each tergite. Pubescence pale yellow except the darker long seta of cercus. Wings hyaline with veins and pilosity brown.

*Head* : (Collapsing slightly) Width in dorsal view 1.48x as broad as its maximum length; frons and vertex smooth, occiput weakly reticulate with ML; occipital margin carinate; clypeus not demarcated, lower margin entire; face below antennal toruli slightly convex in middle; eye length in profile 1.5x length of malar space; MS curved; POL 1.6x OOL. Antenna inserted at middle of frons, slightly above ventral ocular line. Antennal formula 11233; scape well above level of vertex; clava with an unusually long apical spine. Relative length and width of antennal segments : scape = 38 :8; pedicellus = 15 :8; F1 = 20 :7; F2 = 27 :8; F3 = 23 :8; clava = 38 :6 (excluding length of unusually long apical spine), length of apical spine = 21 (apical spine apparently two segmented).

*Mesosoma* : Pronotum weakly reticulate with an anterior median pit, posterior margin weakly concave, with a cross row of admarginal setae. Mesoscutum with a pair of very short setae on posterior half; faintly reticulate; mesoscutum with a pair of very short setae on posterior half; faintly reticulate; mesoscutum, a little broader than long; axilla well advanced anteriorly; dorsellum crescentic lying over metanotum and touching propodeum. Propodeum with an anterior ML which becomes carinate and forked posteriorly, submedian areas faintly reticulate; spiracle open, situated at a distance equal to its diameter from metanotum; propodeum with a hair on either margin near spiracle; nucha absent. Legs with single thin tibial spur subequal in length to that of hind metatarsus; hindcoxa smooth and shiny. Forewing length (excluding apical marginal fringe) 2.93x its maximum width (132 :45); SMV with 1 dorsal seta; cubital line of setae starting from base of wing; speculum closed below by cubital line of setae. Relative measurements : CC = 29; MV = 42; PMV = 2; STV = 11; MV with long setae, each seta subequal or a little longer than STV; maximum length of marginal fringe a little longer than STV. Hind wing spine like at apical half with long marginal fringe on posterior margin.

*Gaster* : Petiole transverse, inconspicuous; 1.27x longer than mesosoma, 2.8x its width;

T1 with a basal yellow pit; one seta of each circus distinctly longer than others and sinuate. Ovipositor sheath slightly exerted posteriorly; hypopygium reaching middle of gaster; gastral tergites slightly collapsing from dorsal side.

*Male* : Unknown.

*Host* : Unknown.

*Type locality* : India.

*Distribution* : India : Kerala

*Material examined* : 1 Female, India, Kerala, Kottayam Dt., Kumarakam (76° 22' -24' E 9°40'-42' N), 17.iv.2004, Coll. T. C. Narendran & Party; 1 Female, India, Kerala, Kozhikode Dt., Nanminda (11° 26' N 75° 50' E), 4.iv.2004, Coll. T. C. Narendran & Party.

### 15. *Quadrastichus longicarpus* (Khan & Shafee)

1988. *Tetrastichus longicarpus* (Khan & Shafee), 44, Female India (ZAMU)

2004. *Quadrastichus longicarpus* (Khan & Shafee), Hayat & Shahi, 311.

*Diagnosis : Female* : Length 1.49mm. Body dark with metallic reflections; antenna inserted just above lower level of eyes; scape a little more than 3x as long as wide; pedicellus as long as F1; funicular segments subequal in length. Mesoscutum with 2 adnotaular setae on either side; scutellum more than 1.5x length of mesoscutum; forewing a little less than 2.5x as long as wide; marginal fringe of forewing 0.8x length of STV; MV 3.4x as long as STV. Gaster longer than head plus mesosoma (After Khan & Shafee, 1988).

*Host* : ex. *Cerococcus hibisci* Green on *Hibiscus rosasinensis* L. (Khan & Shafee, 1988).

*Type locality* : India : Aligarh

*Distribution* : India (Aligarh)

### 16. *Quadrastichus lurvi* Narendran sp. nov.

(Fig. 102-103)

*Holotype : Female* : Length 1.35 mm. Black with following parts as follows : lower half of head pale brown; eye pale grayish yellow; ocelli pale reflecting yellow; antenna brown with pedicellus slightly paler, scape pale yellow; tegula pale yellowish brown; legs yellow with one fifth of fore and hindcoxa brown; gaster dark brown with pale base; wings hyaline with veins pale brownish yellow; pilosity of wings pale brown.

*Head* : Slightly collapsing on frons; width : length (anterior view) = 17 :16; width in dorsal view 4x its median length; POL 3x OOL; OOL equal to OD; clypeus weakly delimited; lower margin minutely bidentate; mandibles tridentate; eye height in profile 1.94x as long as malar space; MS curved; antennal toruli located at level of ventral margin of eyes, antennal formula 11233; scape not reaching level of vertex, scape 5.2x as long as broad, shorter than clava (26 : 31); pedicellus as long as F1; F2 as long as F1; F3 slightly

shorter than F2 (13 : 14); clava 4.3x as long as broad, longer than F2 plus F3 (26 : 31), with an apical spine (Fig. 102).

*Mesosoma* : 1.13x as long as wide, pronotum 0.29x as long as mesoscutum; ML very weakly represented; surface smooth and shiny without any trace of reticulation, with 2 adnotaular setae on either side (anterior seta on anterior half and posterior seta at middle of mesoscutum); midlobe of mesoscutum 1.17x as long as scutellum; scutellum 1.5x as broad as long; enclosed space between SMG 2x as long as broad, with 2 pairs of setae on posterior half of scutellum; prepectus smooth and shiny; dorsellum subequal to length of propodeum; 0.33x as long as scutellum propodeum without median carina, surface smooth and shiny; propodeal spiracle relatively small, rim exposed, separated from metanotum by a little more than diameter of spiracle; mid tibial spur as long as metatarsus; hind femur 4.5x as long as broad; forewing including fringe 2.1x as long as broad; MV 2.75x as long as STV; PMV absent; fringe on MV 0.22x as long as width of forewing disc(excluding fringe); SMV with one dorsal seta; speculum very small, closed behind.

*Gaster* : (Fig. 103) Almost as long as head and mesosoma combined; cercus with one seta longer than others and sinuate; hypopygium exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 30.viii.2002, coll. T. C. Narendran & Party (ZSIC).

*Paratypes* : 2 Females, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 10. vi. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Trivandrum Dt., Mannamkonam (8°25' N 77°1' E), 16. iv. 2003, coll. T. C. Narendran & Party.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : MS curved, propodeum without a median carina; gaster almost as long as head plus mesosoma; legs yellow with one-fifths of fore and hind coxae brown; gaster dark brown with base paler; scape not reaching level of vertex; antenna with 2 anelli; mesoscutum with 2 adnotaular setae on either side; speculum closed behind, and mesosoma mostly black.

17. *Quadrastichus mangalae* Narendran sp. nov.  
(Fig. 171)

*Holotype* : Female : Length 1.7mm. Black with slight metallic green reflection, eye yellowish pink; ocelli pale reflecting yellow; antenna pale brown with scape yellow and pedicellus brownish yellow; tegula pale yellow; coxae concolorous with mesosoma; all femora and tibiae immaculate yellow; fore tarsi yellow with slight brownish tinge; tarsi of mid and hindlegs immaculate yellow; pretarsi black; wings hyaline with veins and pilosity pale yellowish brown.

**Head** : Partly collapsing; POL 1.75x OOL; OOL 2x OD; clypeus not distinctly delimited, lower margin bilobed, mandibles bilobed; eye height in profile 1.86x malar space; MS straight; antennal toruli placed slightly below level of lower eye margin; space between toruli subequal to space between toruli and eye margin, 2x as wide as diameter of a torulus; antennal formula 11233 (Fig. 171); scape not reaching level of vertex, shorter than eye height in profile, 3.2x as long as broad; pedicellus shorter than any other funicular segment; F1 shorter than F2; F3 as long as F2; clava longer than F2 plus F3 (34 : 32), slightly longer than scape (34 :33), with a short spine at apex.

**Mesosoma** : A little longer than broad (35 : 30); pronotum 0.38x as long as mesoscutum, ML present, surface longitudinally reticulate, with 3 setae on either side (2 adnotaular setae one near anterior seta and one inner to it); mid lobe of mesoscutum 1.6x as long as scutellum; scutellum broader than long (15 :10), with 3 setae on either side (anterior setae middle between SMG & SLG, middle and posterior setae nearer to SMG); enclosed space between SMG 2x as long as broad; dorsellum 0.2x as long as scutellum, longer than propodeum; propodeum reticulate, with a broad, slightly raised median smooth area (not forming distinct carina); propodeal spiracle rim exposed, separated from metanotum by less than diameter of spiracle; mid tibial spur as long as metatarsus; hind femur 3.6x as long as broad. Forewing (including fringe) 2.41x as long as broad; SMV with one dorsal seta; MV 2.7x as long as STV; PMV 0.33x as long as STV; fringe on MV 0.24x as long as width of forewing disc (excluding marginal fringe); speculum closed behind by cubital line of setae.

**Gaster** : Ovate, longer than head plus mesosoma (23 :18); cercus with one seta longer than others; hypopygium almost reaching middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, India : Kerala, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), 17.viii.2003, coll. T. C. Narendran & Party.

**Etymology** : Named after my wife for her constant support and help in my work over many years.

**Remarks** : This species differs from all other Oriental species in having the following combination of characters : scape shorter than eye height in profile; POL 1.75x OOL; antennal toruli placed slightly below level of ventral ocular margin; MV 2.7x as long as STV; midtibial spur as long as metatarsus, pedicellus shorter than all funicular segments separately; mesoscutum with 3 adnotaular setae on either side, and body black with slight metallic reflection.

18. *Quadrastichus narangae* Narendran sp. nov.  
(Fig. 166)

**Holotype** : **Female** : Length 1.5 mm. Black with slight metallic green refringence; eye yellowish red; ocelli pale reflecting yellow; antenna dark brown with pedicellus pale

brown and scape pale yellow; coxae concolorous with mesosoma; femora concolorous with coxae except paler apices; tibiae pale yellow; fore tarsi pale brown; mid and hind tarsi pale yellow with slight brownish tinge on apices of fourth tarsi; pretarsi black. wings hyaline with veins and pilosity pale brown.

*Head* : Collapsing; POL1.5x OOL; OOL subequal to OD; clypeus delimited, lower margin bilobed; mandibles bidentate; maximum diameter of eye 1.83x length of malar space; MS straight without a basal fovea; antennal toruli placed at level of ventral margin of eye; antennal formula 11233 (Fig. 166); scape not reaching level of vertex, a little shorter than maximum diameter of eye height in profile, 3.82x as long as broad; pedicellus longer than any of the funicular segments; all funicular segments subequal in length, longer than wide; clava longer than F2 plus F3 (28 : 20), longer than scape (28 : 20); apex with a minute spine, shorter than a seta of clava.

*Mesosoma* : 1.2x as long as broad; pronotum 0.18x as long as mesoscutum, mesoscutum with ML present, longitudinally reticulate, with 3 adnotaular setae on either side; midlobe of mesoscutum 1.6x as long as scutellum; scutellum a little broader than long (10 : 7), enclosed space of SMG 1.75x as long as wide; dorsellum 0.3x length of scutellum, as long as propodeum; propodeum reticulate, with weak, short and broad median carina; propodeal spiracle rim exposed, separated from metanotum by its own diameter; midtibial spur 0.75x as long as metatarsus; hind femur 5x as long as broad; forewing including marginal fringe 2.13x as long as its maximum width; SMV with single dorsal seta; MV 3.83x STV; PMV 0.25x as long as STV; fringe on MV 0.15x as long as width of forewing disc (excluding fringe); speculum small, closed behind by cubital line of setae.

*Gaster* : Ovate, distinctly longer than head plus mesosoma (37 : 23); cercus with one seta longer than others on either side, slightly sinuate; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Holotype and some paratypes collected from lemon grass.

*Holotype* : Female, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, coll. T.C.Narendran & Party (ZSIC).

*Paratype* : 3 Females, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10. i. 2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Idukki, Manjumalai, Vandiperiyar (11° 17' N 75° 51' E), 8. i. 2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), Jan 1986, 5. x. 1988, 31. xii. 1985, 2. xii. 2003, coll. T. C. Narendran & Party; 5 Females, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 27. xii. 1994, Nov. 1980, x-xi. 1993, Oct. 1978, 30. xii. 1978, coll. M. Hayat; 1 Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 19.viii. 1979, coll. M. Verma; 3 Females, India : Kerala, Palghat Dt., Silent valley (10°51' N 76° 37' E), 30. xii. 1988, coll. M. Hayat; 1 Female, India : Kerala, Malappuram Dt., Nilambur

(11°16' N 76°13' E) 11. vii. 2004, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 12. x. 1996, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Palghat Dt., Pattambi (10° 49' N 76° 12' E), 13. viii. 2003, coll. T. C. Narendran & Party.

*Remarks* : This species can be separated easily by using the key given above.

### 19. *Quadrastichus ovulorum* Ferriere

1930. *Tetrastichus ovulorum* Ferriere, 36-37. Female & Male. Sierra Leone (BMNH)

1988. *Oomyzus ovulorum* (Ferriere), Boucek, 695.

2001. *Quadrastichus ovulorum* (Ferriere), Narendran *et al.*, 153.

*Diagnosis : Female* : Length : 1mm. Black without metallic refringence. Gaster with a large round yellow spot near the base; antenna brown; scape and pedicellus yellow; legs entirely clear yellow, except for the fore coxae which are partly brownish.

*Head* : POL equal to OOL; "cheeks" as long as diameter of eyes; mandibles bidentate; antennae inserted a little above lower eye margin; scape reaching front ocellus, longer than pedicellus and F1 together; pedicellus more than 2x as long as broad; antennal formula 11233.

*Mesosoma* : With notauli strong, ML weakly represented; scutellum with SMG weak; propodeum with large raised spiracles. Forewing with MV somewhat widened, 2x as long as SMV; STV about one-fourth as long as MV.

*Gaster* : Not longer than mesosoma; ovipositor slightly protruding.

*Host* : Eggs of *Epilachna* sp. (Coleoptera : Chrysomelidae)

*Type locality* : Sierra Leone.

*Distribution* : India : Karnataka, Andra Pradesh, Madyapradesh, Assam, Sri Lanka (Kelaniya) & Africa.

*Remarks* : The above account is based on available published information of various authors (Ferriere, 1930, Boucek, 1988 and Narendran, 2001).

### 20. *Quadrastichus plaquoi* Reina and La Salle (Fig. 285)

2004. *Quadrastichus plaquoi* Reina and La Salle, 13 (1) : 113 - 116. Holotype Female, India, Himachal Pradesh (BMNH).

*Diagnosis* : Body yellowish with dark spot in middle of pronotum and with transverse dark band on T4. Frons with broad median area rather than distinct ML. MS curved and without fovea beneath eye. Antennal scape reaching slightly higher than top of vertex. F1 and F2 equal in length. Midlobe of mesoscutum with single adnotaular seta placed in posterior half. Anterior seta on scutellum longer than posterior one. Propodeum quite

shiny, without a distinct median carina. Dorsellum rounded posteriorly, atleast 4x as long as broad. Forewing with speculum very small, area just distal to basal vein almost completely covered with setae, and area behind MV setose.

*Host* : *Liriomyza trifolli* (Burgess)

*Type locality* : India : Himachal Pradesh.

*Distribution* : India : Himachal Pradesh.

21. *Quadrastichus saraicus* Narendran sp. nov.  
(Fig. 178-179)

*Holotype* : *Female* : Length 1.04mm. Dark brown; eyes reflecting yellow; ocelli brown, antenna yellowish brown with scape pale yellow; legs brown except for pale brownish yellow trochanters, apices of femora, all tibiae and tarsi. Wings hyaline with slight brownish tinge; veins pale brownish yellow with dark margins; marginal fringe and pilosity of disc pale yellowish brown.

*Head* : Width 1.14x its length in anterior view; width in dorsal view 3.7x its median length; clypeus delimited, lower margin with 2 minute teeth medially; mandibles bidentate; POL 1.25x OOL; OOL 1.6x OD; vertex with minute sparse pubescence; eye 2.3x as long as MS; antenna inserted slightly above level of ventral margin of eye; scape slightly exceeding vertex; antennal formula 11233 (Fig. 179); scape almost as long as eye, longer than clava; clava longer than combined length of F2 and F3; pedicellus shorter than F1; funicular segments of equal length.

*Mesosoma* : A little wider than long (14 : 13); mesoscutum with ML, surface longitudinally reticulate, with 2 adnotaular setae on each side, anterior one being at the level of middle part of mesoscutum; scutellum 1.5x as broad as long; SMG nearer to SLG, enclosed space of SMG 1.8x as long as wide; dorsellum half length of propodeum; spiracle rim partly covered by callus, separated from metanotum by half its diameter; callus with 2 setae; midtibial spur as long as metatarsus; hind femur 4.76x as long as wide; forewing including marginal fringe 1.8x as long as wide; SMV shorter than CC; MV 2.57x as long as STV; PMV 0.45x as long as STV; marginal fringe 0.71x as long as STV; SMV with single dorsal seta; MV with 7 dorsal setae; speculum closed below by cubital line of setae.

*Gaster* : Subglobose, sessile, 1.37x as long as mesosoma, almost as long as combined length of head plus mesosoma; hypopygium exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : *Female*, Borneo: Sarawak, Buda Camp, SW Gunung Buda, 64 Km S. Limbang 4° 13' N 114° 56' E, 10. xi. 1996, coll. S. L. Heydon & S. Fung. (UCDC)

*Remarks* : This extralimital species is included here, since it may be easier to identify the species if it is encountered in the Indian Subcontinent in future.

22. *Quadrastichus stomalis* Narendran sp. nov.  
(Fig. 165)

*Holotype : Female* : Length 1.6 mm. Black with dull metallic green refringence; clypeus and nearby areas reddish brown; eye brownish red; ocelli dark brown; antenna dark brown with pedicellus and scape yellow; coxae concolorous with mesosoma; remaining segments yellow with pretarsi dark brown; wings hyaline with veins and pilosity pale brownish yellow.

*Head* : Collapsing; POL 3.5x OOL; OOL subequal to OD; clypeus delimited, lower margin bilobed; mandibles bidentate; eye height in profile 1.7x malar space; MS almost straight without a basal fovea; antennal toruli placed at level of ventral margin of eye; antennal formula 11233 (Fig. 165); scape not reaching level of vertex, a little longer than eye height in profile, 4.2x as long as broad; pedicellus shorter than F1, F2 longer than F1, F3 shorter than F2, clava 3.71x as long as broad, longer than F2 plus F3, longer than scape, without a minute spine.

*Mesosoma* : 1.6x as long as broad; pronotum 0.3x as long as mesoscutum, ML present, surface finely and longitudinally reticulate, with 3 adnotaular setae on either side; midlobe of mesoscutum 1.43x as long as scutellum; scutellum a little broader than long (14 :10), enclosed space of SMG 2x as long as wide; dorsellum 0.27x length of scutellum, a little longer than median length of propodeum (3 : 2); dorsellum and propodeum weakly reticulate; propodeum without a median carina; propodeal spiracle rim exposed; spiracle separated from metanotum by less than its own diameter; midtibial spur 0.75x as long as metatarsus; hind femur 3.5x as long as broad; forewing including marginal fringe 2.1x as long as broad; SMV with one dorsal seta; MV 4.2x STV; PMV 0.6x as long as STV; fringe on MV 0.16x as long as width of forewing disc (excluding marginal fringe); speculum small, closed behind by cubital line of setae.

*Gaster* : Ovate, distinctly longer than head plus mesosoma; cercus with one seta longer than others, hardly sinuate; hypopygium reaching middle of gaster.

*Male* : Unknown.

*Host* : Holotype and one paratype are collected from lemon grass.

*Holotype* : Female, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10.i.2004, coll. T.C.Narendran & Party.

*Paratype* : 1 Female, India : Kerala, Kannur Dt., Peravoor, 25. ii. 1988, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 16. xii. 1991, 24. xii. 2001, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Wayanad Dt., Pookode, 8. i. 2003, coll. T. C. Narendran & Party; 2 Females, India : Kerala, Idukki Dt., Cheruthoni (9° 51' N 76° 58' E), 10. i. 2004, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Calicut Dt., Kalipoyka (11°16' N 75° 48' E), 27. xi. 2003, coll. T. C. Narendran & Party; 1 Female, India : Kerala, Malappuram Dt., Parappanangady, July 1987, coll. T. C. Narendran & Party.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : scape a little longer than eye height in profile; POL 3.5x OOL; antennal toruli placed at level of lower eye margin; MV 4.2x as long as STV and midtibial spur 0.75x as long as metatarsus.

23. *Quadrastichus sudheeri* Narendran sp. nov.  
(Fig. 176-177)

*Holotype* : *Female* : Length 1.17 mm. Black; eye yellowish black; ocelli dark brown; antenna pale brownish yellow with scape pale yellow and clava slightly darker; fore and mid coxae brown; hindcoxa two-third from base dark brown, one-third at apex pale yellow; fore and mid femora yellow with a light brown band medially; hind femur yellow with a narrow brown band in apical half; tibiae yellow with a narrow brown band basally (bands on fore and midlegs weaker than on hindleg); all tarsi yellow; pretarsi dark brown. Wings hyaline, veins and pilosity pale brown. Gaster as in figure 176.

*Head* : Collapsing; POL 3x OOL; OOL a little wider than OD (2 : 1.5); clypeus weakly delimited, lower margin bilobed; mandibles tridentate, eye height in profile 1.33x malar space; MS straight; antennal toruli situated at level of lower margin of eye; antennal formula 11133; scape not reaching level of vertex, 4.7x as long as broad; pedicellus 1.86x as long as broad, shorter than F1, subequal to F2; F3 subequal to F1, clava longer than F2 plus F3 (30 : 27), longer than scape (30 : 28), 3.75x as long as broad, with a short spine at apex (Fig. 177).

*Mesosoma* : 1.45x as long as broad, pronotum 0.42x as long as mesoscutum; ML present, surface longitudinally reticulate, with 2 adnotaular setae on either side, both on posterior half of mesoscutum; midlobe of mesoscutum 1.4x as long as scutellum; scutellum 1.4x as wide as long, with 2 setae on either side, dorsellum 0.13x as long as scutellum, a trifle shorter than median length of propodeum; propodeum mostly smooth; median carina indistinct; propodeal spiracle rim partly covered by callus, separated from metanotum by less than its diameter; midtibial spur as long as gaster; hind femur 4.7x as long as broad; forewing (including fringe) 1.6x as long as broad; MV 3.6x as long as STV; PMV 0.2x as long as STV; fringe on MV 0.19x as long as width of forewing disc; SMV with one dorsal seta; speculum extend below MV up to STV; closed behind by cubital line of setae.

*Gaster* : Ovate, tilted upwards posteriorly, 1.5x as long as head and mesosoma combined; cercus with one seta longer than others and sinuate; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host & Biology* : Phytophagous. Oviposit on tender shoots of mango tree. Each act of oviposition takes about 40 seconds. Shortly after oviposition, the tender shoots dry up causing damage to the plant (Sudheer, per. Comm. 2004).

*Holotype* : *Female*, India : Kerala, Calicut Dt., Pookad (11° 23' N 75° 44' E), 19.ii.2004, coll. K. Sudheer (ZSIC).

*Paratypes* : 13 Females, of the same data of holotype.

*Etymology* : Named after Sudheer, who collected the species.

*Remarks* : This species differs from all other Oriental species in having the following combination of characters : mesoscutum with 2 adnotaular setae on either side; hypopygium not reaching middle of gaster, femora with a brown band subapically, tibia with a brown band subbasally, and general body colour black.

24. *Quadrastichus vinitia* Narendran sp. nov.  
(Fig. 107-108)

*Holotype* : *Female* : Length 1 mm. Yellow with following parts as follows : eye reflecting pale yellow; ocelli dull reflecting yellow; vertex, occiput, propodeum, pleura (mostly) and posterior half of gaster dark brown; anterior half of pronotum and a large patch adjoining anterior margin of mesoscutum and sides of scutellum partially dark brown; antenna dark brown with ventrolateral part of scape and apical and ventral parts of pedicellus pale yellow; tegula pale yellow; basal half of hindcoxa brown; wings hyaline with veins and pilosity pale brownish yellow.

*Head* : Slightly collapsing; 1.1x as wide as long in anterior view; 3.33x as broad as long in dorsal view; POL 2x OOL; OOL 2x OD; clypeus slightly delimited; lower margin with 2 minute teeth; mandibles bidentate; eye height in profile 2x malar space; MS curved; antennal toruli situated at level of ventral margin of eyes; distance between toruli 3x as wide as distance between toruli and eye margin; antennal formula 11233 (Fig. 107); scape exceeding a little over vertex, 4x as long as wide, as long as eye in profile, subequal to length of clava; pedicellus 2.7x as long as broad, subequal to F1; F2 slightly longer than F1 (16 : 15); F3 shorter than F1 (14 : 15); claval length subequal to F2 plus F3, 6x as long as its width, with a spine at apex.

*Mesosoma* : 1.35x as long as wide; pronotum 0.42x as long as mesoscutum; ML present; surface weakly reticulate, with one adnotaular seta on either side near posterior margin; mid lobe of mesoscutum 1.33x as long as scutellum; scutellum 1.3x as broad as long; enclosed space between SMG 1.5x as long as broad, scutellum with 2 pairs of setae, anterior pair near middle level; dorsellum 0.22x as long as scutellum, as long as median length of propodeum; propodeum with median carina present; propodeal spiracle rim exposed, separated from posterior margin of metanotum by less than diameter of spiracle; midtibial spur 0.5x length of metatarsus; hind femur 4.25x as long as broad; forewing including fringe 2.5x as long as broad; MV 5.25x as long as STV; PMV 0.25x as long as STV; SMV with one dorsal seta; fringe on MV 0.2x width of forewing disc (excluding fringe); speculum absent, setose.

*Gaster* (Fig. 108) : Ovate, shorter than head plus mesosoma (16 : 19); cercus with one seta longer than others and sinuate; hypopygium well exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Kottayam, Kumarakom (9°36' N 76°26' E), 25.ii.1993, coll. S. B. Zeya and S. I. Kazmi.

*Remarks* : This new species differs from all related species in the following combination of characters : antennae with 2 anelli; scape subequal in length to clava; hind femur 4.25x as long as broad and midlobe of mesoscutum 1.33x as long as scutellum.

25. *Quadrastichus zenta* Narendran sp. nov.  
(Fig. 174-175)

*Holotype* : Female : Length 0.88mm. Yellow; eye pale reflecting yellow with dark grey patch in middle; ocelli pale reflecting yellow with dark grey patch in middle of pronotum and apical corners of mesoscutum and apex of axilla; posterior tergites of gaster yellowish brown; wings hyaline with veins and pilosity pale brownish yellow.

*Head* : Slightly collapsing; 1.33x as wide as long in anterior view; POL 1.5x OOL; OOL 2x OD; clypeus not clearly delimited, lower margin slightly bilobed; mandibles bidentate; eye height in profile 2x malar space; MS curved; antennal toruli situated a little above level of lower eye margin; antennal formula 11133 (Fig. 174); scape slightly exceeding level of vertex, as long as eye height in profile, 5.6x as long as broad; pedicellus 3x as long as broad, as long as any funicular segment; clava 6x as long as broad; longer than F2 plus F3 (36 : 30), longer than scape (36 : 28), with a spine at apex.

*Mesosoma* : 1.47x as long as broad; pronotum 0.5x mesoscutum; ML faintly represented, surface mostly smooth, with one adnotaular seta on either side of posterior part; mid lobe of mesoscutum 1.43x as long as scutellum; scutellum a little wider than long (9 : 8), with 2 setae on either side on posterior half; dorsellum 0.25x as long as scutellum, subequal to median length of propodeum; median carina present; propodeal spiracle with rim slightly covered by callus on antero lateral part, separated from metanotum by less than its diameter; midtibial spur as long as half length of metatarsus; hind femur 3.75x as long as broad. Forewing (excluding marginal fringe) about 2x as long as wide; MV about 5x as long as STV; PMV 0.5x as long as STV; fringe on MV 0.38x as long as width of forewing disc, without fringe.

*Gaster* (Fig. 175) : Shorter than head plus mesosoma (13 : 15), longer than mesosoma (13 : 11); cercus with one seta longer than others, sinuate; hypopygium exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 13.xi.1979, coll. M. Hayat (ZSIK).

*Remarks* : This species differs from all other Oriental species in having the following

combination of characters : antenna with one anellus; scape shorter than clava; hind femur 3.75x as long as broad; midlobe of mesoscutum 1.43x as long as scutellum; hypopygium well exceeding middle of gaster and scape exceeding level of vertex.

### Genus *Sigmophora* Rondani

- 1867b. *Sigmophora* Rondani, 40. Type species : *Sigmophora scrophulariella* Rondani (monotypy).  
 1867a *Lopodytes* Rondani, 8. Type species : *Lopodytes prunicola* Rondani (monotypy).  
 1985. (Homonym of *Lopodytes* Stal, 1853) Synonymised by Graham, 160.  
 1913. *Eulophotetrastichus* Girault, [158] : 70. Type species : *Eulophotetrastichus io* Girault (original designation and monotypy). Synonymised by Graham, 1985 : 160.  
 1915. *Euplectrotetrastichus* Girault, [230] : 262. Type species : *Euplectrotetrastichus spenceri* Girault (original designation) Synonymised by Bouček 1988 : 687.  
 1946. *Lopodytiscus* Ghesquiere, 370 (Replacement name for *Lopodytes* Rondani) Synonymised by Graham, 1985 : 160.

**Diagnosis** : Body yellow to black, not metallic. Vertex with a cross carina between front ocellus and hind ocelli (ocellar carina); often with a second carina behind hind ocelli; frons with distinct scrobe, often upper margin carinate; MS with a triangular fovea below eye; lower margin of clypeus bilobed; Female antennal formula 11333; male antennal formula 11243; gaster sessile; outer rim of spiracle not fully exposed, partly covered by lobe of callus; hindcoxa mostly with a dorsal carina; one cercal seta longer than others on either side.

**Host** : Some species are known to be parasitic on gall forming Cecidomyiidae.

**Distribution** : Europe, India, Thailand, Vietnam, P. R. China, Korea, Japan, Papua New Guinea, Australia, Vanuatu, New Caledonia, Solomon Island, Madagascar, Cameroon, Congo, Ivory Coast, Nepal.

### Key to Oriental species of *Sigmophora* Rondani

(Based on Females)

1. Hindcoxa without dorsal carina; hind tibial spine slightly shorter than half length of hind metatarsus; triangular fovea of MS very small, 0.1x length of malar space; scape with moderately dense setae all over outer side ..... *polyseta* (Saraswat)
- Hindcoxa with distinct dorsal carina; hind tibial spine as long as or slightly longer than hind metatarsus; triangular fovea usually longer than above; scape with fewer setae than in above alternative ..... 2
2. Dorsellum with distinct median channel; scrobal carina very strong; head predominantly yellow; mesosoma and gaster mainly black; gena laterally expanded (Nepal, Taiwan, Japan, & China) ..... *aceris* Ikeda

- Dorsellum without median channel, but with weak ML or without ML; other characters partly or completely different ..... 3
- 3. Mesoscutum without ML; propodeum without paraspiracular carina; antero-median fovea of propodeum about 0.2x length of propodeum; triangular fovea of MS about 0.33x length of malar space; body yellow with occiput, vertex, frons, median part of pronotum antero-median part of mesoscutum and outer sides of SLG of scutellum dark brown to black (extralimital : P. R. China) ..... *diversa* Ikeda
- Mesoscutum with deeper groove or atleast a faint ML; other characters partly or completely different ..... 4
- 4. Mesoscutum with deep and complete sulcus; mesosoma 1.34x as long as broad; propodeum 2x as long as dorsellum; dorsellum without ML; forewing 2.54x as long as broad; SMG of scutellum strongly diverging posteriorly ..... *keralensis* Narendran sp. nov.
- Mesoscutum with ML weak or absent; mesosoma about 1.5x as long as broad; dorsellum with weak to strong ML; forewing 2.10-2.25x as long as broad; SMG of scutellum weakly diverging posteriorly ..... *brevicornis* (Panzer)

### 1. *Sigmophora aceris* Ikeda

1999. *Sigmophora aceris* Ikeda, 43-44. Female Japan<sup>†</sup> (EIHU)

*Diagnosis* : *Female* : Length 3.1-3.6mm. Head predominantly yellow; mesosoma and gaster predominantly black; occipital carina, ocellar carina and scrobal carina present; gena laterally expanded, triangular fovea of MS a little exceeding half length of MS; mesoscutum with two rows of adnotaular setae; antennal scape barely reaching vertex; mesosoma with petiole short and smooth; gaster 1.5x as long as mesosoma.

*Male* : Length 2.5-2.9mm. For other characters refer Ikeda (1999).

*Host* : *Asphondylia* sp. on *Acer mono*.

*Type locality* : Japan : Hokkaido : Sapporo, Spring.

*Distribution* : Japan, P. R. China, Nepal and Taiwan (Ikeda 1999).

*Remarks* : The above Diagnosis is based on the original description of Ikeda (1999) (Courtesy, Ikeda 1999).

### 2. *Sigmophora brevicornis* (Panzer)

*Cynips brevicornis* Panzer, (in Schaeffer, 1804) : 134.? Syntypes Female, ? Germany (not located).

1839. *Cirrospilus zeuxo* Walker, 194. Lectotype Female, France (BMNH), designated by Graham (1961a : 45) [examined]. [Synonymised by Domenichini, 1966a : 146].

1841. *Eulophus setiseries* Förster, 41. Lectotype Female, Germany (NM), designated by Domenichini, 1966a : 147 [not examined]. [Synonymised by Szelényi, 1941 : 403].

1846. *Eulophus verbasci* Dufour, 20. Syntypes, France (not located) [Synonymised with *Aprostocetus zeuxo* (Walker) by Graham, 1961a : 45].
- 1867a. *Lopodytes asphondyliae* Rondani, 9. Lectotype Male. Italy (Haliday, coll. NMI), designated by Graham (1985 : 160).
- 1867b. *Lopodytes prunicola* Rondani, 39-40 [unnecessary replacement name for *asphondyliae* Rondani][Synonymised with *Tetrastichus brevicornis* (Panzer) by Szelényi, 1941 : 403.
- 1867b. *Sigmophora scrophulariella* Rondani, 40. Lectotype Female, Italy (Haliday, coll. NMI) designated by Graham (1985 :160) [Synonymised by Bouček, 1974 : 265].
1904. *Tetrastichus tricolor* Ashmead, 162. Holotype : Female Japan (USNM) [Synonymised by Ikeda, 1999].
1921. *Tetrastichus isaaci* Rohwer, 130-131. Holotype : Female India (USNM) (Ikeda, 1999 synonymised).
1950. *Tetrastichus sayatamabae* Ishii, 142-143. Lectotype Female Japan (NIAES) (Ikeda, 1999 synonymised).

**Diagnosis** : Body yellow with black markings or predominantly black or rarely yellow; ocellar carina and occipital carina well represented; scrobal carina faint or absent; malar space a little longer than half length of eye; triangular fovea extending 0.3-0.6 length of malar space; mouth hardly greater than malar space; scape reaching or slightly exceeding level of vertex; pedicellus shorter than F1; mesoscutum with 1-3 rows of adnotaular setae; ML of mesoscutum absent, rarely faintly represented; median carina of propodeum raised and sharp with a triangular basal fovea which never reaches half length of carina; hind tibial spine slightly longer than hind basitarsus; forewing 2.10-2.25x as long as broad; CC shorter than MV; SMV with 4-6 dorsal setae; MV 6-7x as long as STV; speculum small, closed behind; gaster slightly longer than head plus mesosoma.

**Male** : Similar to Female except for differences described by Graham (1987).

**Host** : Gregarious ectoparasite of larvae and pupae of Cecidomyiidae (mainly *Asphondylia* sp.)

**Type locality** : Germany

**Distribution** : India, Thailand, Vietnam, P. R. China, Korea, Japan, & Europe (Ikeda 1999 & Graham 1987).

**Material examined** : 1 Female, India : Kerala, Thiruvananthapuram, Palode (8° 42' N 77° 2' E), 8.xii.2004, col. T. C. Narendran & Party (ZSIK).

### 3. *Sigmophora diversa* Ikeda

1999. *Sigmophora diversa* Ikeda. 48-49. Holotype : Female P. R. China (IZAS).

**Diagnosis** : **Female** : Length 2.0-2.2 mm. Mesosoma predominantly yellow, gaster dark brown dorsally with basal and apical areas yellow; ventral side yellow; ocellar and scrobal

carinae present; antennal scape reaching level of vertex; combined length of pedicellus plus flagellum about 1.3x as long as head width; SMG strongly diverging posteriorly; SLG without costula; dorsellum without ML; propodeum with median carina and small antero-median fovea; paraspircular carina absent; gaster with short petiole; gaster longer than mesosoma.

*Type locality* : P. R. China : Lichuanxingdoushan, Hubei Province.

*Distribution* : P. R. China.

*Remarks* : This species is not reported from Indian subcontinent but is included here for identification in case it is found later in this region. The above account is based on Ikeda (1999) (Courtesy Ikeda 1999).

#### 4. *Sigmophora keralensis* Narendran sp. nov.

(Fig. 90-92)

*Holotype : Female* : Length 2.2mm. Head yellow with adjacent area near occipital foramen dorsally dark brown; eye pink; ocelli pale reflecting yellow; margins of mandible dark brown; mesosoma yellow with brownish tinge, legs completely yellow with pretarsi brown; gaster black with sides partially dull yellow; wings hyaline with veins and pilosity pale brown; setae on mesoscutum and scutellum dark brown.

*Head* (Fig. 91) : Width in anterior view 1.1x as its length; width in dorsal view 3.5x its median length, as wide as mesosoma; ocellar carina and occipital carina strong; POL 1.86x OOL; 2.5x median ocellar diameter; vertex faintly rugose, with scattered pits; scrobe deep with very weak scrobal carina, face with a pair of weak carinae or ridge (facial carinae), area between carinae mostly smooth; eye length in side view 2.26x length of malar space length; triangular fovea of MS 0.43x length of malar space; mouth 1.44x as long as malar space; antennal formula 11333 (Fig. 90); scape 3.8x as long as wide, almost reaching level of vertex; combined length of pedicellus and flagellum 1.11x as long as head width; pedicellus 0.63x as long as scape, F1 2.16x as long as wide, 1.1x as long as pedicellus; F2 2.16x as long as wide, as long as F1; F3 1.7x as long as wide; 0.85x as long as F2; clava 3.7x as long as wide; 2.36x as long as F3.

*Mesosoma* : 1.34x as long as wide; pronotum medially engraved, reticulate and bare, laterally reticulate-punctate and setose. Midlobe of mesoscutum strongly engraved and reticulate with 2-3 irregular rows of 10-12 adnotaular setae in deep depressions or pits; ML deep; scapulae reticulate and setose; axilla rugose; scutellum as long as wide, well engraved reticulate with ML on anterior part basally; SMG widely separated, diverging distad, enclosed space 1.25x as long as distal width, 1.7x as long as proximal width, near to each other than to SLG; SLG laterally carinate, with costulae; anterior pair of scutellar setae situated before middle of scutellum; dorsellum with sparse pits; propodeum 2x as long as dorsellum, distinctly raised reticulate, with a median broad and short carina and an antero-median fovea about 0.4x length of propodeum, with inverted somewhat 'Y' shaped paraspircular carinae; callus with 2 setae; hindcoxa moderately raised reticulate,

with distinct dorsal carina; hind tibial spine as long as or slightly longer than hind metatarsus (Fig. 92). Forewing 2.54x as long as wide; SMV with 4 dorsal setae; CC : MV : STV= 16 : 21 : 3.

*Gaster* : Sessile, 2.3x as long as wide in dorsal view, 1.53x as long as mesosoma, 1.21x as long as combined length of head and mesosoma. Ovipositor sheath slightly produced; hypopygium not quite reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Malappuram, Calicut University Campus (11° 7' N 75° 5' E), 4.iv.1989, coll. T. C. Narendran & Party.

*Remarks* : This new species comes near *S. brevicornis* (Panzer) in having hind coxa with a distinct dorsal carina but can be separated from *brevicornis* by the characters mentioned in the key given above.

#### 5. *Sigmophora polyseta* (Saraswat)

1975. *Tetrastichus polyseta* (Saraswat), 17-19. India (USNM).

1999. *Sigmophora polyseta* (Saraswat) Ikeda, E. 49-50.

*Diagnosis* : *Female* : Length 2.34mm. Pale brown; frons dark brown; antenna pale brown; legs yellow; wings hyaline; scrobe absent; a cross carina present in front of front ocellus; mesoscutum with ML; and two rows of adnotaular setae; SLG without costula; SMV with 6-7 dorsal seta; petiole short and distinct; gaster longer than mesosoma.

*Male* : Unknown.

*Host* : Unknown.

*Type locality* : India : Tamil Nadu, "9-5, Kargudy - Ooty Road (Nilgiri Hills) coll. Mani & Party, 6-7.iv.1973.

*Remarks* : The above diagnosis is based on available published descriptions of Saraswat (1975) and Ikeda (1999).

#### Genus *Tachinobia* Bouček

1977. *Tachinobia* Bouček, 26-28. Type species : *Tachinobia repanda* Bouček.

*Diagnosis* : *Female* : MS absent; frontofacial sutures widely separated dorsally; clava with terminal spine; body usually somewhat flattened with elongate pronotum and propodeum; mesoscutum with notauli posteriorly shallow, midlobe without ML, with setae scattered over entire surface and not confined to a single row of adnotaular line of setae; scutellum without SMG, with 2 pairs of setae; hypopygium hardly reaching three-fourth of gaster from base.

**Male** : Apterous or brachypterous; ocelli absent, eyes somewhat reduced; antennal scape greatly swollen with large oval meso-ventral membranous area, clava without terminal spine.

**Discussion** : This genus resembles superficially the genus *Melittobia* but differs from it in having : 1) Scutellum without SMG (with SMG in *Melittobia*); 2) Frontofacial sutures widely separated from each other dorsally (frontofacial sutures narrowly separated in *Melittobia*); 3) Setae on head and mesosoma generally erect (in *Melittobia* setae on head and mesosoma generally decumbent).

**Hosts** : *Papilio lagaezei*, *Bessa remota*, *Sarcophaga banksi*. Gregarious parasitoids mostly in the puparia of Tachnidae parasitizing various Lepidoptera and also in various other Diptera attacking Lepidoptera and even eggs of spiders.

**Distribution** : America, Africa, India to South East Asia & Australia.

### 1. *Tachinobia repanda* Bouček (Fig. 157-159)

1977. *Tachinobia repanda* Bouček, 26. Female. Papua New Guinea (BMNH).

**Diagnosis** : **Female** : Length 0.7-1.4mm. Pitch black, with slight green to bronze reflection; antennal scape (Fig. 157), mouth parts, trochanters, tibiae and tarsi pale brown; rest of antennae darker; femora infuscate and sub metallic (in some cases, tibiae also infuscate sub basally). For other characters, see Bouček, 1977.

**Male** : Length 1.15-1.30mm. Blackish, head (Fig. 158) and mesosoma with faint metallic tinge as in Female; gaster more brownish and especially antennae (Fig. 159), tibiae and tarsi pale or brown (Bouček, 1977).

**Host** : Tachinidae attacking Lepidoptera. In India ex. *Bessa remota* & *Sarcophaga banksi*.

**Type locality** : Papua New Guinea : Central District, Konedobu.

**Distribution** : India (Tamil Nadu), South East Asia, Papua New Guinea, Solomon Islands, USA & Cuba.

**Remarks** : The above account of genus and species of *Tachinobia* is based on descriptions of Bouček (1977) & La Salle (1994). (Courtesy to Bouček, 1977 and La Salle 1994).

### Genus *Tamarixia* Mercet

1924. *Tamarixia* Mercet, 57-58. Type species : *Tamarixia bicolor* Mercet by monotypy and original designation.

1961. (*Aprostocetus* Westwood; Graham, 41-42, in part. Misidentification)

1966. (*Tetrastichus* Haliday; Domenichini, 1966 : 81-86, in part, 15-54, in part, 1967 : 76; Burks in Krombein *et al.*, 1979 : 900-1002, in part. Misidentification).

1987. *Tamarixia* Mercet; Graham, : 29, 36; Bouček, 1988 : 596-695.

**Diagnosis :** Midlobe of mesoscutum with 2 pairs of semierect, subequal setae, one pair in anterior half and other in posterior half; mesosoma squat or slightly convex; scutellum rather strongly transverse; lower margin of clypeus truncate, slightly convex, entire, slightly emarginate or with 2 minute lobes; Forewing with a single dorsal seta on SMV; forewing with CC from very slightly to much longer than MV; PMV absent or rudimentary; body without metallic colouration; mesosoma black; gaster black to yellow; gaster of Female subcircular to ovate.

**Biology :** Parasites of immature stages of Psylloidea (Hemiptera), especially Triozidae.

### Key to Oriental species of *Tamarixia* Mercet

1. Antenna with clava not distinctly segmented, 0.73x as long as scape; 1.22x as long as F2 and F3 combined; pedicellus 1.2x as long as F1; forewing about 2x as long as wide; head and mesosoma black; gaster pale yellow, sometimes slightly with brownish basal fovea; legs yellowish white, occasionally bases of coxae blackish ..... *bicolor* Mercet
- Antenna with clava distinctly 3 segmented; other characters partly or completely different from above ..... 2
2. Scape shorter than or at the most as long as clava; pedicellus shorter than F1 ..... 3
- Scape longer than clava; pedicellus as long as or longer than F1 ..... 4
3. Clava as long as F2 and F3 combined; antennal toruli situated a little more than one-third distance from anterior ocellus to mouth margin; body yellow with a brown patch on middle of pronotum, anterior median part of mesoscutum and middle of propodeum ..... *orientalis* Khan *et al.*,
- Clava 1.37x as long as F2 and F3 combined; antennal toruli situated at level of ventral margin of eye; body mostly black ..... *girishi* Narendran sp. nov.
4. Mesoscutum with ML ..... 5
- Mesoscutum without ML ..... 7
5. Clava 0.88x F2 and F3 combined; scape 1.5x as long as clava; pedicellus longer than F1; body black with antenna, legs, tegula, ventral and dorsal sides of gaster whitish yellow; a black oval patch on dorsolateral side of gaster (Fig.146) (Borneo) ..... *dwivarnus* Narendran sp. nov.
- Characters not as above ..... 6
6. Gaster black; pedicellus as long as F1; maximum width between SLG 1.3x its length; marginal fringe of forewing shorter than half of STV. Host : Psyllids ..... *leucaenae* Bouček
- Gaster yellow with dorsal sides and one-third posteriorly brownish black; pedicellus shorter than F1; maximum width between SLG 1.75x its length; marginal fringe of forewing almost as long as STV ..... *yoorica* Narendran sp. nov.

7. Pronotum, mesoscutum, scutellum and propodeum lying in one plane; scape 1.33x as long as clava; clava 1.1x as long as F2 and F3 combined; pedicellus as long as F1; black with yellow patch on dorsal tergites from base to T3; ex. leaf galls of *Terminalia arjuna*..... *sheebae* Narendran
- Pronotum, mesoscutum, scutellum and propodeum not lying in one plane; mesoscutum slightly convex on dorsally; other characters partly or completely different ..... 8
8. Pedicellus longer than F1 (13 :11); F3 1.4x as long as F1; scape 1.03x as long as clava; body black with following parts as follows : antenna pale yellow with clava brown; legs pale yellow with forecoxa, basal half of hindcoxa and middle part of hindfemur pale brown; gaster black with basodorsal half and a large median patch spreading from base to T3 brownish yellow ..... *pookodica* Narendran sp. nov.
- Pedicellus as long as F1; F3 0.8x as long as F1; scape 1.2x as long as clava; body black with a conspicuous pale basal spot on gaster; antenna uniformly and deeply infuscated except for a paler median strip of scape; legs almost entirely pale yellow, hind femur almost with trace of infuscation dorsally. Host : *Euphalerus citri* attacking lemon leaves ..... *radiata* (Waterston)

### 1. *Tamarixia bicolor* Mercet

1924. *Tamarixia bicolor* Mercet, 58-59. Holotype (?) Female, Spain : Madrip prov., Sesena (Mercet) lost (?).
1967. *Tetrastichus tamaricis* Domenichini, 76 (unnecessary replacement name for *bicolor* Mercet, a secondary homonym of *Tetrastichus bicolor* Girault, 1913).

*Diagnosis : Female* : Length 0.72-0.85 mm. Antenna with scape shorter than eye, not reaching median ocellus; pedicellus longer than F1; F1 longer than F2; F2 and F3 subequal in length; clava long; midlobe of mesoscutum about 1.7x as broad as long; enclosed space of SMG 1.85-1.9x as long as broad; forewing hardly more than 2x as long as broad; gaster nearly as long as head plus mesosoma.

*Type locality* : Spain (Madrid).

*Distribution* : Pakistan, Bulgaria, Spain.

*Host* : *Trioza chenopodii* Reuter (Hem., Triozidae) on *Chenopodium album* (Graham, 1991).

*Remarks* : This species is not yet reported from India but is likely to be encountered in North West India. The above account is based on Graham, 1991 (Courtesy : Graham, 1991).

### 2. *Tamarixia dwivarnus* Narendran sp. nov.

(Fig. 146-147)

*Holotype : Female* : Length 1.52mm. Black with following parts otherwise : eyes pink, ocelli pale reflecting yellow, antenna, legs, tegula, ventral side and dorsal side of gaster and ovipositor whitish yellow; wings hyaline with veins and pilosity whitish yellow.

**Head** : Width in anterior view 1.25x its length; width in dorsal view 2.4x its maximum length; clypeus not delimited, its lower margin slightly concave without any teeth or lobes; occiput with fine reticulations; mandibles bidentate; POL 2.8x OOL; OOL a little longer than OD; MS distinct; eye height in profile 2.9x length of MS; frons with 9-11 bristles along each orbit; toruli about one-third distance from anterior ocellus to mouth margin. Antenna inserted at level of lower ocular margin, antennal formula 11233 (Fig. 147). Ratio of length to width of antennal segments : scape = 34 : 8; pedicellus = 15 : 6; F1 = 13 : 7; F2 = 13 : 7; F3 = 13 : 7; clava = 23 : 10; scape about one-third longer than clava excluding spine at apex.

**Mesosoma** : Slightly convex dorsally; pronotum slightly narrower than mesoscutum (17 : 19) in dorsal view, 0.5x as long as mesoscutum, with an exposed spiracle directed posterolaterally; mesoscutum finely reticulate, with two pairs of adnotaular setae, one in anterior half and the other in posterior half; mesoscutum with ML indicated; scutellum about 0.64x as long as mesoscutum, maximum width between SLG 1.43x its length; enclosed space between SMG 1.75x as long as wide, with 2 pairs of setae; dorsellum smooth with transverse fovea on either side, half as long as propodeum; spiracle subcircular with almost exposed rim, separated from metanotum by less than its own diameter; callus with 3 setae; submedian areas of propodeum with weaker reticulations than on scutellum. Forewing (including marginal fringe) 2.3x its maximum width; SMV with one dorsal seta; SMV shorter than CC, as long as MV; MV with 10-11 dorsal setae, PMV absent; STV 2.1x as long as MV; CC slightly longer than MV; disc moderately pilose; marginal fringe short, about 0.25x as long as STV; speculum large and open behind; basal cell asetose.

**Gaster** : Sessile, subequal to mesosoma; hypopygium extending over half length of gaster; T1 larger than any of the remaining tergites; ovipositor exerted and directed posteriorly (Fig.146).

**Male** : Unknown.

**Host** : Unknown.

**Material examined** : *Holotype* : Female Srilanka : Central Province, Kandy Dt., Vict. Randenigala, Rantembe Sanct., 7° 13' N 80° 57' E, 23-30.viii.1999, MT, M & J. Wasbauer. (UCDC)

**Paratypes** : 1 Female, Srilanka : Central Province, Kandy Dt., Vict. Randenigala, Rantembe Sanct., Mahawe R. 7° 12' N 80° 57' E, 25-29.viii.1999, MT, M & J. Wasbauer. (UCDC)

**Remarks** : This new species differs from all other Oriental species in having the following combination of characters : clava 0.88x F2 and F3 combined; scape 1.5x as long as clava; pedicellus longer than F1; body black with antenna, legs, tegula, ventral and dorsal parts of gaster whitish yellow; a black oval patch on dorsolateral side of gaster; mesoscutum with ML; scape longer than clava.

3. *Tamarixia girishi* Narendran sp. nov.

(Fig.150)

*Holotype : Female* : Length 0.88mm. Black with following parts as follows : eye reddish brown; ocelli brown; antenna dark brown with scape and pedicellus pale yellow; tegula brown; legs yellow with basodorsal part of hindcoxa and forecoxa completely brown; pretarsi brown; gaster dark brown with base yellow; wings hyaline with veins pale brown.

*Head* : Width in anterior view 1.36x its length; width in dorsal view 4x its median length; clypeus delimited, its lower margin weakly emarginate; frontofacial sulcus not divergent dorsally; eye pilose; eye height in profile 3x malar space; MS straight with a shallow pit at base below eye; occiput not margined; POL 3x OOL; OOL subequal to OD; vertex with scattered short setae; antennal toruli situated at level of lower eye margin; antennal formula 11133 (Fig. 150). Ratio of length : width of antennal segments : scape = 31 : 8; pedicellus = 12 : 7; F1 = 11 : 8; F2 = 16 : 7; F3 = 15 : 7; clava including spine at apex 37 : 7 (Fig. 150).

*Mesosoma* : Moderately convex dorsally; pronotum, distinctly narrower than mesoscutum (15 : 21), 0.75x as long as mesoscutum; spiracle not fully exposed; mesoscutum finely reticulate, mostly smooth, with 3 adnotaular setae on either side, and with a faint ML; scutellum 0.88x as long as mesoscutum, maximum width between SLG 1.57x its length; enclosed space between SMG 1.75x as long as wide; dorsellum as long as median length of propodeum; propodeal spiracle rim exposed, separated from metanotum by its own diameter; submedian areas mostly smooth and shiny, short median carina present; callus with 2 setae on either side of propodeum. Forewing including marginal fringe 1.8x as long as wide; SMV with 1 dorsal seta; SMV shorter than CC, MV with 8 dorsal setae, as long as CC, 3x as long as STV; longest marginal fringe as long as STV; speculum completely setose (hence speculum absent).

*Gaster* : With a short transverse petiole, its surface smooth (yellow), gaster longer than mesosoma (25 : 23), distinctly shorter than head plus mesosoma; cercus with one seta longer than others; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Etymology* : Named after P. Girishkumar for his help in my research work.

*Holotype* : Female, Kerala, Kollam Dt., Kulathupuzha (8° 54' N 77° 4' E), 9.xii.2004, coll. T. C. Narendran & Party (ZSIC).

*Paratypes* : 1 Female Kerala, Trivandrum Dt., Mannamkonam (8°25' N 77°1' E), 16.iv.2003, coll. T. C. Narendran & Party; 2 Females Kerala, Wayanad Dt., Pookode Lake (11° 36' N 76° 6' E), 8.ii.2003, coll. T. C. Narendran & Party; 1 Female, Kerala, Kannur Dt., Aralam forest, 16.xii.1995, Coll. T. C. Narendran & Party.

**Remarks :** This species differ from all other Oriental species in having the following combination of characters : clava 1.37x as long as F2 and F3 combined; antennal toruli situated at level of ventral margin of eye; body mostly black and scape shorter than clava.

#### 4. *Tamarixia leucaenae* Bouček

1988b. *Tamarixia leucaenae* Bouček, 545-547. West Indies (BMNH)

**Diagnosis :** [Adapted from original description : Courtesy to Bouček, 1988]. **Female :** Length : 0.8-1.05mm. black or brownish black except for a small whitish spot below base of tegula; mesosoma with slight metallic tinge in strong light; antennae and legs whitish but pedicellus dorsally black from base; coxae dark in basal two-thirds or more and fore femur mostly dark in basal half; mid and hind femora and tibiae each broadly dark with white knee and white distal two-fifths of length; tarsi brownish at apex. Eye height 1.75x MS (10.5 : 6); POL 2x OOL; F1 longer than F2; propodeal spiracle separated from metanotum by its own diameter; forewing with MV about 3x as long as STV; gaster 1.07x length of mesosoma in dorsal view.

**Remarks :** This species comes near *T. yoorica* Narendran sp. nov. in general appearance but can be differentiated from *T. yoorica* by the key and by the diagnosis given above.

**Type locality :** West Indies (Trinidad) (Bouček, 1988); Mexico (McClay, 1990).

**Distribution :** West Indies, Sri Lanka (IIBC, 1992); Thailand (IIBC, 1992); New Caledonia (IIBC, 1992); Tanzania (IIBC, 1995).

#### 5. *Tamarixia orientalis* Khan, Agnihotri & Sushil

2005. *Tamarixia orientalis* Khan, Agnihotri & Sushil, 170-172 Female. India (IARI)

The species can be identified by the key given above and by the original description.

**Type locality :** India : Uttaranchal : Pantnagar (U. S. Nagar)

**Host :** Agromyzidae (Diptera) on sunflower (Khan *et al.*, 2005)

#### 6. *Tamarixia pookodica* Narendran sp. nov.

(Fig. 149)

**Holotype : Female :** Length 1.9mm. Black with following parts otherwise : eyes brick red; ocelli pale reflecting yellow; antenna pale yellow with clava brown; legs pale yellow with fore coxa, basal half of hindcoxa and middle part of hind femora pale brown; tegula pale brown; gaster black with basolateral half and a large median patch spreading from base to T3 brownish yellow.

**Head :** Not collapsing; width in anterior view 1.13x its length; width in dorsal view 2.43x its maximum length; clypeus not delimited, its lower margin slightly emarginate; occiput with fine reticulations; occipital foramen situated slightly below centre of head;

mandibles bidentate; inner tooth barely distinct; POL 2x OOL; OOL 2x OD; MS present; eye height in profile 2.17x MS; antennae (Fig. 149) inserted a little above lower ocular line, antennal formula 11233. Ratio of length : width of antennal segments : scape = 33 : 6; pedicellus = 13 : 5; F1 = 11 : 6; F2 = 12 : 6; F3 = 15 : 7; clava = 32 : 8.

*Mesosoma* : Slightly convex dorsally; pronotum slightly narrower than mesoscutum in dorsal view, 0.33x as long as mesoscutum, with an exposed spiracle directed upwards on posterolateral corner; mesoscutum finely reticulate, with two pairs of adnotaular setae, one in anterior half and one in posterior half; ML not indicated; scutellum almost as long as mesoscutum, maximum width between SLG 1.4x its length, with two pairs of setae, enclosed space between SMG 2.2x its width; scutellum transverse; width of area between SMG subequal to width of area between SLG and SMG; dorsellum 0.6x as long as propodeum; spiracle round and exposed, separated from metanotum by less than its own diameter; callus with 3 setae; submedian areas of propodeum with weaker reticulations than on scutellum. Forewing length 2.12x its maximum width; SMV with one dorsal seta; MV with 8 dorsal setae; PMV absent; STV 2.9x as long as MV; CC as long as MV; disc densely pilose; marginal fringe short, 0.5x as long as STV; speculum small, closed behind by cubital line of setae.

*Gaster* : Sessile, 1.19x as long as mesosoma; petiole not distinct; hypopygium extending over half length of gaster; T1 larger than any of the remaining tergites; ovipositor exerted, tilted upwards.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala : Wayanad Dt., Pookode Lake (11° 36' N 76° 6' E), 8.ii.2003, coll. T. C. Narendran & Party.

*Remarks* : This species differs from all the Oriental species in having the following combination of characters : pedicellus longer than F1; F3 1.4x longer than F1; scape 1.03x as long as clava; body mostly black and mesoscutum without ML.

### 7. *Tamarixia radiata* (Waterston)

1922. *Tetrastichus radiatus* Waterston, 13 : 55. (Bouček, 1988 transferred to *Tamarixia*) Male, Female, Pakistan (BMNH).

*Diagnosis* : *Female* : Length 1.3mm. Head broader than long; antennal toruli at one-third from lower margin of clypeus, to anterior ocellus; pedicellus longer than F1; propodeum smooth near median carina and with large slightly raised reticulations on outer half near spiracle; forewing 2.33x as long as wide.

*Type locality* : Pakistan.

*Distribution* : Pakistan, India : Uttaranchal, Aligarh (Bouček, 1988, Khan *et al.*, 2005).

*Host* : *Diaphorina citri* (= *Euphalerus citri*).

*Material examined* : 1 Female, India : Kerala, Alapetty Dt., Kayamkulam (9°10' N 76°30' E), 19.iv.2004, coll. T. C. Narendran & Party.

### 8. *Tamarixia sheebae* Narendran

2005. *Tamarixia sheebae* Narendran, 33(5) : 495-498. India : Kerala (ZSIC).

*Redescription* : *Female* : Length 1.1mm. Black; eye pale brownish red; ocelli pale brown; antennae pale brownish yellow, with scape pale yellow; pedicellus dorso-basally brown; mandibles dark brown; legs pale yellow with basal half of hindcoxa partly black; gaster black dorsally, latero-ventrally pale yellow, with a large median yellow patch spreading from base to T3. Wings hyaline with veins pale yellow, pubescence on body and wings pale brown.

*Head* : Width in dorsal view 1.7x its maximum length; clypeus not delimited, its lower margin entire; occiput with fine reticulations; occipital foramen situated slightly below centre of head; mandibles bidentate, inner tooth barely distinct. POL 2.18x OOL; MS distinct; eye height in profile 2.66x length of MS. Antennae inserted little above lower ocular line, antennal formula 11233. Ratio of length to width of antennal segments : scape = 32 : 8; pedicellus = 13 : 8; F1 = 13 : 9; F2 = 11 : 9; F3 = 11 : 13; clava = 24 : 12.

*Mesosoma* : Mesoscutum, scutellum, dorsellum and propodeum lying in the same plane. Pronotum slightly wider than mesoscutum in dorsal view, 0.7x as long as mesoscutum, with an exposed spiracle directed upwards on posteriolateral corner; mesoscutum finely reticulate with 2 pairs of adnotaular setae, one in anterior half and one in posterior half; scutellum almost as long as mesoscutum, maximum width between SLG a little more than 1.6x its length, with 2 pairs of setae; scutellum transverse, dorsellum smooth with transverse fovea on either side; spiracle circular and rim fully exposed; submedian areas of propodeum with weaker reticulations than on scutellum. Forewing length 2.36x its maximum width. SMV with one dorsal seta; MV with 8-9 dorsal setae; PMV absent; STV 2.92x as long as MV; CC slightly larger than MV; disc moderately pilose; marginal fringe short; speculum closed behind by cubital line of setae; basal line of setae weak; basal cell otherwise asetose.

*Gaster* : Subsessile; slightly longer than mesosoma, petiole slightly distinct in dorsal view, transverse; hypopygium extending over half length of gaster; T1 larger than any of the remaining tergites; ovipositor exerted, tilted upwards.

*Type locality* : India : Kerala (Narendran *et al.*, 2005)

*Distribution* : India : Kerala.

*Host* : Emerged from leaf galls of *Terminalia arjuna* (Roxb.) Wright & Arn. (Combretaceae). The subglobose galls were 20-25 mm long and 10-15 mm broad. *T. arjuna* found heavily infested with unknown galls, particularly in the rainy season.

*Material examined* : Holotype and paratypes.

9. *Tamarixia yoorica* Narendran sp. nov.

(Fig. 148)

*Holotype : Female* : Length 1mm. Black with following parts otherwise : eyes brown with pale reflecting yellow on margin around; ocelli pale reflecting yellow; antenna pale whitish yellow with basodorsal part of pedicellus and clava brown; legs pale yellow with following parts brown : forecoxa, basal half of mid and hindcoxae, middle of all femora and subbasal part of mid and hind tibiae and all pretarsi. Gaster yellow with dorsal side and one third of gaster posteriorly brownish black.

*Head* : Collapsed (hence difficult to measure width); clypeus not delimited, its lower margin with two median teeth; occiput finely reticulate; mandibles bidentate; POL about 3x OOL; OOL subequal to OD; MS distinct; eye height in profile 2.2x MS; frons with 9-11 bristles along each orbit. Antenna inserted at level of lower ocular margin, antennal formula 11233. Ratio of length : width of antennal segments : scape = 34 : 5; pedicellus = 11 : 6; F1 = 14 : 7; F2 = 14 : 7; F3 = 14 : 7; clava = 29 : 8; scape a little more than one fourth longer than clava.

*Mesosoma* : Slightly convex dorsally; pronotum a little narrower than mesoscutum (14:16) in dorsal view, 0.4x as long as mesoscutum, with an exposed spiracle directed posterolaterally; mesoscutum finely reticulate, with two pairs of adnotaular setae, one in anterior half and the other in posterior half; mesoscutum with ML indicated; scutellum 0.54x as long as mesoscutum, maximum width between SLG 1.75x its length; enclosed space between SMG 1.33x as long as wide, dorsellum about as long as propodeum; spiracle round and exposed, separated from metanotum by less than its own diameter; callus with 3 setae; submedian areas of propodeum smooth and shiny. Forewing including marginal fringe 2.4x as long as wide; SMV with one dorsal seta; SMV shorter than CC; MV with 10 dorsal setae, as long as CC, 3.75x as long as STV; marginal fringe almost as long as STV; speculum large extending up to posterior end of MV, closed behind by cubital line of setae.

*Gaster* : Sessile, 1.2x as long as mesosoma; hypopygium extending to about half length of gaster; ovipositor slightly exerted and directed posteriorly.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female India : Kerala : Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 9.ii.2003, coll. T C. Narendran & Party.

*Remarks* : This new species differs from all other species of Oriental Region in having : gaster yellow with dorsal side and one-third posteriorly brownish black; pedicellus shorter than F1; maximum width between SLG 1.75x its length; marginal fringe of forewing almost as long as STV; mesoscutum with ML and scape longer than clava.

Genus *Tetrastichus* Haliday

1844. *Tetrastichus* Haliday, 3 : 297. Type species : *Cirrospilus attalus* Walker, by original designation. Placed on the official list of generic names in Zoology by the ICZN, Opinion 720, 1965.
1857. *Ennetoma* Dahlbom : 292. Type species : *Eulophus hylotomarum* Bouche, by designation of Grahms 1990 synonymised by Grahms 1990.
1863. *Solenoderus* Motschulsky, 36 : 71. Type species : *Solenoderus cyaniventris* Motschulsky, by monotypy. (Synonymised by Bouček 1965)
1896. *Lygellus* Giard, 839. Type species : *Lygellus epilachnae* Giard, by monotypy. (Synonymised by Dominichni 1966).
1912. *Neotetrastichus* Perkins, 1(10) : 14. Type species : *Neotetrastichus minus* Perkins, by monotypy. (Burks 1943 synonymised).
1913. *Ceratoneuromyia* Girault 252. Type species : *Ceratoneuromyia arnoldi* Girault. Bouček 1988 synonymised.

[For other synonyms see Noyes 2003 website]

**Diagnosis** : SMV with 1 dorsal seta (rarely with 2 - 4 dorsal setae). Propodeum with a characteristic carina in the shape of an inverted Y (formed by paraspiracular carina and an additional carina running postero- medially from paraspiracular carina); median panels of the propodeum generally reticulate. Outer surface of hindcoxa usually with strong reticulation. Body usually black to dark or bright metallic; generally without light colouration.

**Discussion** : The generic limits of *Tetrastichus* are not well defined. The genus has the following two noteworthy characters : 1) single dorsal seta on SMV, and 2) an inverted Y shaped paraspiracular carina on the propodeum. However, some of the Indian species have 2-4 setae on SMV.

**Distribution** : All continents.

**Host** : Species of the genus attack a wide variety of hosts including Lepidoptera, Diptera, Coleoptera and Hymenoptera. The North American *T. polynemae* (Ashmead) has been recorded as a hyperparasitoid in the dragonfly eggs, and the Neotropical *T. periplanetae* attacks Cockroach oothecae.

Key to *Tetrastichus* species of Indian Subcontinent

[Mainly based on Females]

1. Pronotum with raised projecting spiracle on either side ..... 2
- Pronotum without such raised projecting spiracles ..... 3
2. Eye pilose with setae longer than diameter of an ocellus; forewing with CC distinctly longer than MV; anterior pair of scutellar setae situated beyond midlength and nearer to posterior pair of setae; head and mesosoma black; eye yellowish; legs yellow with

- coxae brown fading to yellow apically; gaster liver brownish black with apex darker (Sri Lanka) ..... *lankicus* Narendran
- Eye bare; vertex with shorter setae; forewing with CC distinctly shorter than MV; anterior pair of scutellar setae situated at midlength and not nearer to posterior pair (extralimital : Borneo) ..... *abatus* Narendran
3. Antenna with 4 anelli (careful observation and correct focussing are essential for detecting the number of anelli) ..... 4
- Antenna with fewer than 4 anelli ..... 8
4. Mesoscutum with an incomplete median longitudinal groove running from posterior margin to middle or slightly beyond; F1 distinctly longer than F2 (Fig. 181); gaster slightly shorter than mesosoma; body black with slight metallic green and blue reflections; legs with coxae and femora (except paler apex of femora) concolorous with body ..... *manjumalaicus* Narendran sp. nov.
- Mesoscutum with ML complete or almost complete; other characters partly or completely different ..... 5
5. Head, pronotum, mesoscutum, scutellum, a large part of T1 and a spot at base of T7 fuscotestaceous; mesosomal pleura, propodeum and gaster except as noted pitch black; F1 longer than pedicellus, as long as F2; length of clava equal to combined length of F2 and F3; SMV with 5 - 6 dorsal setae; gaster nearly 1.5x as long as head and mesosoma combined (extralimital : Philippines) ..... *clypeatus* Gahan
- Characters not as above; partly or completely different ..... 6
6. SMV with 5-6 dorsal setae; clava distinctly shorter than F2 plus F3 (Fig.183); mesoscutum with 12-14 pairs of adnotaular setae (anteriorly setae in two or three longitudinal rows); gastral tergites finely reticulate; gaster 2.5 to 3x as long as its dorsal width, distinctly longer than head plus mesosoma [body black with distinct metallic reflections; legs with coxae and femora dark with apices of femora paler] ..... *santhoshi* Narendran sp. nov.
- SMV with fewer than 3 dorsal setae; clava not shorter than F2 plus F3; mesoscutum with a single row of 3-4 adnotaular setae on each side; other characters variable .. ..... 7
7. SMV with 2 dorsal setae; F1 subequal to F2 (Fig.191 ); CC a little longer than MV (11 :10); mesoscutum with 3 pairs of uniform sized adnotaular setae; legs yellow with bases of coxae slightly dark; body black without distinct metallic reflections; gaster longer than mesosoma but shorter than head plus mesosoma ..... *bharathi* Narendran sp. nov.
- SMV with 1 dorsal seta; F1 equal in length to F2 (Fig.187); CC as long as MV; mesoscutum with 4 adnotaular setae on either side, posterior most pair longer than others; gaster as long as mesosoma; legs with fore and hindcoxae black with metallic

- green reflections; all femora brownishblack with apices paler; tibiae and tarsi pale brownish yellow; body black with metallic green or blue reflection; gaster as long as mesosoma ..... *iaricus* Narendran sp. nov.
- 8(3). Antenna with 3 anelli ..... 9
- Antenna with fewer than 3 anelli ..... 12
9. SMV with one dorsal seta ..... 10
- SMV with more than one dorsal setae ..... 11
10. Mesoscutum with ML obsolescent in anterior half, with 3 adnotaular setae on each side; enclosed space between SMG of scutellum about 1.63x as long as wide; mid tibial spur a little longer than midmetatarsus; hypopygium reaching a little beyond middle of gaster; head and mesosoma dark brown without metallic refringence; antenna and gaster completely yellow with a slight brownish tinge ..... *sringericus* Narendran sp. nov.
- Mesoscutum with ML complete, with 6 - 8 adnotaular setae on each side; enclosed space between SMG of scutellum 2.4x as long as broad; midtibial spur about 0.7x length of midmetatarsus; hypopygium not reaching middle of gaster; body with bright metallic reflections ..... *vayalicus* Narendran sp. nov.
11. SMV with 2 dorsal setae; mesoscutum without ML and with 3 adnotaular setae on each side; F1 subequal in length to scape and clava; forewing without speculum; femora yellow; gaster smooth, host : Lepidopteran leaf miner ..... *chakrataensis* Khan & Sushil
- SMV with 4 dorsal setae; mesoscutum with a complete ML and with 8 or 9 adnotaular setae on either side; forewing with speculum present and closed behind by cubital line of setae; F1 distinctly shorter than scape and shorter than clava; femora dark brown or black with apices paler; gaster weakly reticulate; host : gall midge ..... *dasi* Narendran sp. nov.
- 12(8). Antenna with one anellus ..... 13
- Antenna with two anelli ..... 47
13. Length of clava equal or subequal to combined length of F1, F2 and F3 ..... 14
- Length of clava much shorter than combined length of F1, F2 and F3 ..... 16
14. Mesopleura with a large testaceous spot beneath forewing; gaster as long as head plus mesosoma; general body colour metallic green ..... *colemani* Crawford
- Mesopleura without testaceous spot beneath forewing; other characters variable ... 15
15. SMV with 1 dorsal seta; F1 shorter than F3; F2 shortest funicular segment; F3 longer than wide; CC longer than MV; gaster shorter than mesosoma; head & body dark

- brown with varying degrees of metallic green reflections, host : Pupae of *Chilo partellus* (Swinhoe) ..... *partellus* Khan & Sushil
- SMV with 4 dorsal setae; F1 longer than F3; F3 shortest; F3 subequal in length to width; CC as long as MV; gaster as long as head plus mesosoma; body reddish brown with slight iridescent blue; host : Agromyzidae (Diptera) ..... *mohani* Khan & Sushil
- 16(13). Mesoscutum with 20 adnotaular setae arranged in 3 rows near each side; SMV with 5 dorsal setae; clava 3x as long as wide, shorter than F3 plus F2; pedicellus less than 2x as long as wide, 1.5x as long as F1; gaster longer than head plus mesosoma; body dark sclerotized with metallic reflections; legs dark brown except for yellow tibiae and basal 3 tarsal segments ..... *magnicorpus* Khan & Sushil
- Mesoscutum with fewer than 20 adnotaular setae on each side; other characters partly or completely different or variable ..... 17
17. Mesoscutum without ML ..... 18
- Mesoscutum with distinct ML ..... 24
18. Gaster shorter than mesosoma; clava a little longer or subequal to F2 plus F3; pedicellus longer than F1; F3 shorter than F1; scape not reaching front ocellus; black with greenish reflection on face, propodeum and base of gaster; host : Larvae of *Brontispa longissima* (Gestro), (extralimital : Java) ..... *brontispa* Ferrière
- Gaster distinctly longer than mesosoma ..... 19
19. PMV relatively long, slightly shorter than half length of STV; clava a little more than 1.39x length of scape; F1 a little longer than 2.5x pedicellus; mesoscutum with 3 pairs of adnotaular setae; body brownish black ..... *orientalis* Khan, Agnihotri & Sushil
- PMV absent or at the most slightly indicated; other characters variable ..... 20
20. F1 distinctly shorter than pedicellus ..... 21
- F1 distinctly longer than pedicellus ..... 22
21. SMV with 3 dorsal setae; clava 1.25x as long as scape; pedicellus shorter than F1; length of CC subequal to MV; inhabitants of galls on *Casuarina junghuhniana* Miq. in Java ..... *casuarinae* Ferrière
- SMV with 4 dorsal setae; clava about 0.9x length of scape; pedicellus longer than F1; CC distinctly shorter than MV; body black without metallic reflections; antenna dark with pedicellus and scape yellow; gaster dark with basal one-third yellow, lower half of frons, clypeus and malar space light yellow; parasitic on *Mangifera indica* in India ..... *mangifera* Khan & Sushil
22. Mesoscutum with one adnotaular seta on each side; head and body immaculate

- whitish yellow or just yellow (In Indian specimens gaster with a slight black mark or band on dorsal side posteriorly); lower clypeal margin entire; eyes pubescent, pale red or brick red. Borneo, India (Kerala, U.P)..... *bellus* Narendran
- Mesoscutum with 3-5 adnotaular setae on each side; head and mesosoma dark brown with metallic green reflections; other characters partly or completely different ..... 23
23. Mesoscutum with 3 adnotaular setae on either side; speculum of forewing relatively very large reaching middle of MV; propodeal spiracle situated a distance less than its diameter from metanotal margin; gaster brown with bright metallic green reflection ..... *sissoo* Khan, Agnihotri & Sushil
- Mesoscutum with 5 pairs of adnotaular setae; speculum smaller than in above alternate; propodeal spiracle situated almost at a distance from metanotal margin as its diameter; gaster black with light green reflections ..... *thoracicus* Khan, Agnihotri & Sushil
- 24(17).SMV with single dorsal seta ..... 25
- SMV with more than one dorsal seta ..... 78
25. CC as long as or shorter than MV ..... 26
- CC distinctly longer than MV ..... 44
26. Gaster shorter than, as long as or subequal to mesosoma ..... 27
- Gaster distinctly longer than mesosoma ..... 33
27. Clava distinctly longer than F2 plus F3, subequal or equal to length of scape; F1 equal to F2 ..... 28
- Clava shorter or as long as F2 plus F3; other characters may or may not agree .29
28. Head and body black with metallic green or bluish reflections; coxae and femora black or dark brown with apices of femora pale ..... *girishi* Narendran sp. nov.
- Head and body brownish black without metallic reflections; coxae and femora yellow, without any black markings ..... *dinoticus* Narendran sp. nov.
- 29(27).F1 distinctly longer than F2 ..... 30
- F1 shorter than or almost equal to F2 ..... 31
30. Mesoscutum with 5-9 adnotaular setae; CC as long as MV; clava distinctly shorter than scape; body black with metallic reflections ..... *miser* (Nees)
- Mesoscutum with 4 adnotaular setae; CC distinctly shorter than MV; clava distinctly longer than scape; body brownish black with faint bluish reflections on head, gaster brown on sides and green on dorsal side; host : *Apanteles* sp. .... *apanteles* Khan, Agnihotri & Sushil

31. CC of forewing relatively broad, usually less than 10x as long as broad; gaster semicircular; scape reaching vertex or slightly above; body fairly bright bluish green or green, sometimes with golden tinge (extralimital; China) ..... *coelarchus* Graham
- CC of forewing very narrow, more than 10x as long as broad; other characters may or may not agree ..... 32
32. Mesoscutum with 2-3 adnotaular setae on each side; clava about as long as F2 plus F3; F2 1.4-1.43x as long as broad; body black with weak bluish or greenish tinge; host : *Epilachna* sp. in part) ..... *epilachnae* (Giard)
- Mesoscutum with 4-6 adnotaular setae in a row on each side; clava distinctly shorter than F2 plus F3; F2 1.6x as long as broad; body dark brown with faint iridescent bluish green lustre ..... 35
- 33(26). F1 shorter than F2; mesoscutum with 4 adnotaular setae on each side; head, mesosoma and gaster black with metallic blue reflections; all coxa concolorous with body except for brown apices; all trochanters and femora brown; remaining parts yellowish brown, pretarsi brown, wings hyaline with veins pale yellow, pilosity brown; parasitic on egg case of cockroach (?) ..... *tunicus* Narendran sp. nov.
- F1 not shorter than F2; mesoscutum with more than 4 adnotaular setae; other characters variable ..... 34
34. SMV equal to MV; mesoscutum with 6 adnotaular setae on each side; body dark brown with faint iridescent bluish green lustre ..... *triozai* Khan, Agnihotri & Sushil
- SMV shorter than MV; mesoscutum with 7 adnotaular setae; body brown with yellow reflections; hyperparasitic on *Diacrisia obliqua* Walker through *Apanteles* sp ..... *pantnagarensis* Khan & Sushil
35. Scutellum with SMG and SLG a little broader than usual (Fig. 218); enclosed space between SMG 2x as long as broad; mesosomal dorsum with raised reticulations; clava as long as F2 plus F3, distinctly shorter than scape (31 :36); gaster a little more than 1.6x as long as broad in dorsal view; whole body black with metallic green reflection ..... *chinicus* Narendran sp. nov.
- Scutellum without SMG and SLG as above (if scutellum with broad SMG & SLG then antenna always with 2 anelli & the couplet leads to couplet No. 43); other characters partly or completely different or not in above combination ..... 36
36. Mesoscutal setae in 2 longitudinal rows (one row of adnotaular setae and a second inner row of setae) on each side (inner often with 2 setae only in some species) ... ..... 37
- Mesoscutal setae consist of single row of adnotaular setae on each side; inner row of setae absent ..... 39

37. Mesoscutum with 12-13 setae in 2 to 3 longitudinal rows on each side; eye height in profile 2.37x malar space; hypopygium reaching middle of gaster; general body colour dark bluish green ..... *ophiusae* Crawford  
 — Mesoscutum with 5-8 setae on each side; eye height less than 1.8x malar space 38
38. Mesoscutum with 5 setae (one adnotaular row of 3 setae, another inner row of 2 setae anteriorly) on each side; eye height in profile 1.5x as long as malar space; gaster reddish brown with slight metallic green reflection ..... *zeyae* Narendran sp. nov.  
 — Mesoscutum with 8 setae (one adnotaular row of 5-6 setae and another inner row of 2 setae) on each side; eye height in profile 1.66x as long as malar space; head and mesosoma black with metallic blue reflections; gaster brown with metallic blue reflections; all coxae concolorous with mesosoma ..... *dalotus* Narendran sp. nov.
- 39(36). All legs including coxae immaculate yellow; clava as long as scape, 1.35x (or a little over) as long as F2 and F3 combined; F1 shorter than F2; whole body bright metallic green; eye height in side view 3.14x length of malar space .....  
 ..... *albocoxalis* Narendran sp. nov.  
 — At least coxae dark coloured; other characters may or may not as above ..... 40
40. Femora unicoloured, completely yellow or pale brown without paler apices ..... 41  
 — Femora bicolored, (femora dark coloured with apices paler) ..... 42
41. Body bright metallic green; hypopygium not quite reaching middle of gaster; forewing 2.14x as long as broad; CC as long as or subequal to MV .....  
 ..... *hotspoticus* Narendran sp. nov.  
 — Body brown with head plus mesosoma slightly darker; hypopygium slightly exceeding middle of gaster; forewing 2.32x as long as broad; CC distinctly shorter than MV .....  
 ..... *badius* Narendran sp. nov.
42. Mandibles relatively very large (Fig. 213) with outer tooth somewhat falcate; clava longer than F2 plus F3, shorter than scape; eye pilose; F2 equal in length to F3; gaster a little more than 2.6x as long as broad ..... *mukatus* Narendran sp. nov.  
 — Mandibles normal, other characters variable ..... 43
43. Clava distinctly longer than F2 plus F3 (35.5 :30), a little more than 5x as long as wide, of same width of funicle; scape shorter than clava, POL 2.33x OOL; eye height in profile 2x length of malar space; F1 1.25x as long as pedicellus; black with metallic green reflections ..... *stom* Narendran sp. nov.  
 — Clava shorter than or as long as F2 plus F3; if a little longer, then other characters mostly different from above ..... 44
- 44(25). POL 2x OOL; clava 0.85x F2 plus F3; F1 distinctly shorter than F2; F1 1.75x as long as pedicellus; eye length about 1.5x as long as malar space; gaster 1.25x as long as

- mesosoma; body black with metallic green lustre, host : *Epilachna* beetles .....  
 .....*orissaensis* Husain & Khan
- POL 1.4x OOL; other characters not as above ..... 45
45. F1 distinctly longer than F2; clava about 2.6x as long as broad, broader than funicle, shorter than scape; F1 about 2.4x as long as malar space; enclosed space of SMG of scutellum 2x as long as broad; mesosoma a little shorter than 1.4x its width; black with slight metallic reflection ..... *kottiyooricus* Narendran sp. nov.
- F1 subequal to F2; clava more than 3x as long as broad, not broader than funicle, as long as scape; F1 less than 2x as long as broad; eye 1.33x as long as malar space; enclosed space of SMG atleast a little more than 2x as long as broad; mesosoma 1.5x as long as broad; black with weak bluish to greenish blue reflections; host : *Epilachna* beetles ..... (in part) *epilachnae* (Giard)
46. F1 as long as pedicellus; scape 1.35x as long as clava; antenna densely setose, (Plate XLXIII, (Fig.5) Khan *et al.*, 2005); CC 1.25x as long as MV; scutellum with 3 pairs of strong setae; body black, mostly iridescent ..... *orthagae* Khan, Agnihotri & Sushil
- F1 longer than pedicellus; scape as long as clava or a trifle longer; antenna not as above; CC 1.33x as long as MV; scutellum with 2 pairs of setae; head and mesosoma dark bluish green; gaster blackish brown with bluish tinge (extralimital : China) ..  
 ..... *shaxianensis* Liao
- 47(12).Dorsum of mesosoma (Fig. 267) unusually broad; submedian areas of propodeum coarsely reticulate and with irregular carinae; scape exceeding level of vertex, longer than eye in side view; body black with green reflections .....  
 ..... *mindicus* Narendran sp. nov.
- Dorsum of mesosoma not unusually broad; submedian areas of propodeum without irregular carinae; colour and other characters variable ..... 48
48. Mesoscutum without ML; clava as long as scape, 1.5x as long as F3, ending in a nipple like projection; mesoscutum and scutellum mostly smooth dorsally; body light brownish yellow ..... *momardicae* Domenichini
- Mesoscutum with ML; other characters variable ..... 49
49. Funicle segments equal or subequal in length ..... 50
- Funicle segments unequal in length (atleast one segment differ in length) ..... 61
50. Clava (including spicule) distinctly longer than scape ..... 51
- Clava subequal or shorter than scape ..... 56
51. Scutellum with 3 pairs of setae; ocelli surrounded by a groove; mesoscutum with 4 adnotaular setae; black with slight metallic green refringence on gaster .....  
 ..... *thonicus* Narendran sp. nov.

- Scutellum with 2 pairs of setae; other characters variable ..... 52
- 52. Clava including spicule distinctly longer than F2 plus F3 ..... 53
- Clava distinctly shorter than F2 plus F3 ..... 54
- 53. Whole body bright metallic green, with some bluish reflection; legs entirely yellow except for greenish base of fore coxa and greater part of hindcoxa; ocelli surrounded by a groove; F2 3x as long as broad ..... *hydrelliae* Sheng
- Whole body brown with metallic reflections; legs not as above : coxa and femora (except apices) concolorous with mesosoma; apices of coxae and femora and remaining segments pale yellow; ocelli not surrounded by groove; F2 about 2x as long as broad ..... *damitus* Narendran sp. nov.
- 54. Gaster about 2.6x as long as mesosoma; epipygium and ovipositor (Fig. 235) relatively long; head and body black with metallic blue reflections; legs dark brown with apices of femora, tibiae and tarsi pale yellow; ocelli not surrounded by a groove ..... *thalaparcus* Narendran sp. nov.
- Gaster not so long (Fig.233); epipygium and ovipositor sheath relatively shorter, other characters variable ..... 55
- 55. Body shiny green; legs yellow except for greenish base of forecoxa and dark green or dark brown greater part of hindcoxa; ocelli surrounded by a groove (often weak); parasitic on eggs of *Schoenobius* sp. and *Spodoptera mauritia* ..... *schoenobii* Ferrière
- Body black or brownish black with metallic green reflection, all coxae dark brown or black, ocelli not surrounded by a groove ..... *flavilatus* Narendran sp. nov.
- 56(50). Clava longer than F2 plus F3; ocelli not surrounded by a groove ..... 57
- Clava shorter than (or subequal) F2 plus F3; ocelli surrounded by a groove ..... 58
- 57. Gaster subcircular, as long as mesosoma; body shiny black ..... *niger* Ranaweera
- Gaster not subcircular, ovate, a little longer than mesosoma; body black with metallic green reflections, parasitic on *Cotesia* sp ..... *cotesiae* Narendran sp. nov.
- 58(56). SMV with 2 dorsal setae, trochanter, femora, tibiae and tarsus whitish yellow; forewing with slight yellowish tinge; body bright metallic green; gaster about 1.6x as long as mesosoma ..... *calicuticus* Narendran sp. nov.
- SMV with 1 dorsal seta; femora black (often with green reflection) or brown with apex paler; gaster length and colour of body variable ..... 59
- 59. Clava distinctly shorter than F2 plus F3; ocelli surrounded by a groove which extends laterally to eye margin; gaster mostly as long as mesosoma (body metallic blue with green reflections) ..... *taprobanensis* Ranaweera
- Clava equal, subequal or longer than F2 plus F3 ..... 60

60. Femora dark brown with apices paler; clava subequal to F2 plus F3; ocelli not surrounded by a groove; gaster distinctly longer than mesosoma; body black with slight metallic blue or green reflection on head and mesosoma; gaster mostly brown with dark median tergites ..... *arucicus* Narendran sp. nov.
- Femora yellow without dark colour, other characters variable ..... 64
- 61(49).Gaster with a distinct petiole ..... 62
- Gaster sessile without a distinct petiole ..... 64
62. Hindcoxa black; fore and mid coxa brown, femora brown with bases and apices paler, SMG and SLG of scutellum unusually very large (Fig. 239) with distinct cross ridges inside; enclosed area between SMG slightly concave; antenna including pedicellus brown with scape slightly paler, head and body without metallic reflections; (extralimital : Borneo)..... *heydoni* Narendran sp. nov.
- Legs completely yellow except sometimes forecoxa slightly brown at base SMG and SLG not as above; enclosed area of SMG with or without a fovea; flagellum pale yellow with a brown tinge; scape, pedicellus and legs (except slight brown fore coxal base in *umae* ) whitish yellow ..... 63
63. Scutellum with a median shallow fovea between SMG; mesoscutal and scutellar setae pale white; forewing pilosity pale white; marginal fringe 0.33x as long as STV; parasitic on Chrysopid on Coffee ..... *umae* Narendran sp. nov.
- Scutellum without a median fovea between SMG, mesoscutal & scutellar setae dark brown; forewing pilosity brown, marginal fringe 0.8x as long as STV .....  
.....  
*budaicus* Narendran sp. nov.
- 64(60, 61).Gaster shorter than mesosoma, dark green; legs yellow with coxae concolorous with darkgreen body, clava as long as F2 plus F3; parasitic on eggs of Pentatomidae .....  
.....  
*gardneri* Ferrière.
- Gaster longer than mesosoma, other characters variable ..... 65
65. SMV with 3 dorsal setae; MS slightly curved with a basal subocular pit; eye longer than scape, ocelli surrounded by a groove; mesoscutum with 7-8 adnotaular setae in a longitudinal row on either side; SMG of scutellum not diverging posteriorly; body black with metallic reflections ..... *neocupressi* Narendran sp. nov.
- SMV with 1 or 2 dorsal setae, other characters may or may not be different from above ..... 66
66. Spiracle of propodeum unusually enormous; clava a little longer than F2 plus F3 (14 : 13); scape 3x as long as pedicellus, propodeum without sculpture; host : *Hypsipyla robusta* Moore ..... *spirabilis* Waterston
- Spiracle of propodeum of normal size, other characters variable ..... 67

67. MS 0.75x as long eye, slightly curved; speculum extending as a narrow strip below MV; gaster longer than head plus mesosoma; body with dark bluish reflections; gaster more metallic sometimes with bronze or cupreous reflection.....  
..... *cupressi* Yang  
— MS not so long as above; if 0.75x as long as eye then atleast one other character differ from above..... 68
68. Eye with relatively long pilosity, clava 1.16-1.17x as long as F2 plus F3; gaster distinctly shorter than head plus mesosoma; head and mesosoma black with slight metallic reflection; gaster brown ..... *chindakicus* Narendran sp. nov.  
— Eye not so above (if eye with long pilosity then clava 2 segmented and SMV with 2 dorsal setae); other characters partly or completely different ..... 69
69. Mesoscutum with 1 adnotaular seta on either side in posterior part; SMV with 3 dorsal setae; scape 2.8x as long as wide; pedicellus equal to F1 in length; head completely yellowish brown; mesosoma brown with reddish yellow; gaster brown with yellowish tinge ..... *obliqua* Khan & Sushil.  
— Mesoscutum with more than 1 adnotaular seta on either side; other characters may or may not agree ..... 70
70. Mesoscutum with 7-8 setae in more or less 2 rows near each notauli; clava subequal in length to F2 plus F3; scape a little longer than clava; head plus body black with green reflections; gaster 1.23x as long as mesosoma .....  
..... *sumatus* Narendran sp. nov.  
— Mesoscutum with 3-5 adnotaular setae on each side in single row; other characters partly or completely different ..... 71
71. Mandibles unusually large, falcate with a tubercle like inner tooth; clypeus weakly bilobed; scape exceeding level of vertex; epipygium a little longer than 2x dorsal length of T6 (Borneo) ..... *vadanatus* Narendran  
— Mandibles not as above, other characters partly or completely different..... 72
72. Gaster elongate, pale brownish yellow with black markings on sides; legs including coxae yellow; gaster longer than head plus mesosoma; ocelli not surrounded by groove; mesoscutum with 4 adnotaular setae on either side .....  
..... *shonicus* Narendran sp. nov.  
— Gaster colour not as above; other characters variable ..... 73
73. Mesoscutum with a 'U' shaped depression or fovea; scape exceeding well above vertex; gaster 3.22x as long as broad, 1.82x as long as mesosoma; head and body dark brown with slight metallic green reflection ..... *garicus* Narendran sp. nov.  
— Mesoscutum without a 'U' shaped depression or fovea; other characters not as above; partly or completely different ..... 74

74. Gaster subglobose (Fig. 246), subequal or a little longer than mesosoma; antennal pedicellus subequal in length to F2 (Fig.245) or a little longer than F2; ML of mesoscutum incomplete anteriorly; head and body black or dark brown (with slight metallic refringence in some specimens); legs with coxae and femora dark brown with apices of femora paler ..... *ramamurthyi* Narendran sp. nov.
- Gaster not subglobose, ovate, distinctly 0.26-2.2x longer than mesosoma; other characters mostly different .....75
75. Hind femur completely yellow or pale brownish yellow; gaster 1.26x as long as mesosoma; eye height 2.14x MS; forewing about 2.87x its width; body with dark metallic green reflection ..... *dulciculus* Narendran sp. nov.
- Hind femur black with pale apex; gaster distinctly 1.26x longer than mesosoma; eye height and forewing length different from above; colour of body variable .....76
76. SMV with 2 dorsal setae; Female funicle 4 segmented, speculum open below; gaster brown; mesosoma and head black, without distinct metallic reflection .....  
..... *bispinus* Narendran sp. nov.
- SMV with 1 dorsal seta, other characters variable .....77
77. Gaster 1.54x as long as mesosoma; eye height in profile 1.6x as long as malar space; forewing length 2.48x as long as its maximum width [mesoscutum with 4-5 adnotaular setae on each side; head and body slightly dark metallic green] .....  
..... *laparus* Narendran sp. nov.
- Gaster 2.2x as long as mesosoma; eye height in profile 2.25x length of malar space [mesoscutum with 5 adnotaular setae; head and body darker than above with slight metallic green reflection] ..... *gadagkari* Narendran sp. nov.
- 78(24). SMV with 4 dorsal setae; antennal pedicellus shorter than F1; clava as long as or subequal to F2 plus F3; CC shorter than MV; gaster shorter than mesosoma; ML of mesosoma incomplete, being absent on anterior part; body black with metallic green reflection ..... *bilgircus* Narendran sp. nov.
- SMV with 2 dorsal setae; other characters variable .....79
79. Forewing with CC a little longer than or atleast as long as MV .....80
- Forewing with CC distinctly shorter than MV .....82
80. Head and mesosoma dark brown ,without metallic reflection; gaster yellowish brown; legs completely yellow; clava shorter than scape; POL 1.75x OOL .....  
..... *sinui* Narendran sp. nov.
- Body with metallic green or blue reflections; legs not completely yellow; coxa concolorous with mesosoma; femora brownish black except for paler apices; clava as long as or subequal to scape; POL not as above ..... 81

81. Pedicellus longer than F1; scape shorter than 2x length of pedicellus; STV 0.25x MV; gaster subsessile with a short wide petiole; body black with metallic reflections; host : *Sesamia inferens* Walker ..... *inferens* Yoshimoto
- Pedicellus shorter than F1; scape more than 2x (about 2.76x) length of pedicellus; STV 0.33x MV; gaster sessile; body metallic iridescent blue and green ..... *punjabensis* Kurian
82. POL 2.25x OOL; clava shorter than F2 plus F3, 2.5 to 3x as long as pedicellus; bright metallic blue or green reflection ..... *coorgensis* Kurian
- POL distinctly shorter than 2.25x OOL, usually 2x OOL; clava as long as F2 plus F3, shorter than 2.5x length of pedicellus; colour variable ..... 83
83. Body black or brownish black with hindcoxa yellow (with pale brownish tinge) non metallic, propodeum reticulately rugose, clava much wider than funicular segments ..... *howardi* (Olliff)
- Body metallic green or blue; hindcoxa concolorous with mesosoma; propodeum finely rugose; clava not much wider than funicular segments ..... *krishnieri* Mani

Species not placed in the key for want of details :

1. *T. clavatus* Khan, Agnihotri & Sushil
2. *T. kumaonensis* Saraswat
3. *T. tanjorensis* (Husain & Khan)
4. *T. cyaniventris* (Motschulsky)
5. *T. patannas* (Motschulsky)

1. *Tetrastichus albocoxalis* Narendran sp. nov.

(Figs. 222-223)

*Holotype* : *Female* : Length 1.67mm. Bright metallic green. Eye brown; ocelli reflecting yellow; antenna brown with scape and pedicellus yellow; legs including coxae completely yellow; tegula pale yellow. Wings hyaline, veins pale yellow with borders brown.

*Head* : A little wider than mesosoma, 1.29x as broad as its length in front view, a little more than 5x as broad as its median length in dorsal view; POL 1.75x OOL; OD a little shorter than OOL (3 :4); ocelli surrounded by a groove and connected laterally to outer sulcus by a short cross sulcus on either side. Eyes bare, 1.22x as long as wide in profile, 3.14x as long as malar space; MS straight; frons and vertex shiny with weak reticulations. Antennal formula 11133; scape as long as eye but distinctly exceeding level of vertex; antennal segments as in figure 222.

*Mesosoma* : 1.31x as long as broad; mid lobe of mesoscutum a little broader than long, reticulate; ML complete; each side with 3 adnotaular setae. Scutellum a little more than 1.6x as broad as long; SMG slightly near to SLG, enclosed space 1.5x as long as broad. Propodeum 2.5x as long as metanotum, spiracle separated from metanotum by half its diameter; callus with 3 setae on outer side of spiracle. Legs slender, mid tibial spur subequal to length of midmetatarsus. Forewing 2.29x as long as its maximum width; CC 5.67x as long as broad, subequal to MV; SMV with 1 dorsal seta; MV 3x as long as STV, with 13-15 strong setae on anterior margin; speculum closed, extending as a strip below MV; marginal fringe a little longer than 0.33x STV; area beyond speculum densely pilose.

*Gaster* : (Fig. 223) Sessile, ovate, distinctly longer than mesosoma, equal to combined length of head and mesosoma; hypopygium reaching a little beyond middle of gaster; tergites smooth and pilose.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Kochi, Nedumbassery (11° 1' N 76° 18' E), 12. i. 2004. T. C. Narendran & Party, (Reg. No. MoEF 2108).

*Paratype* : Female, India, Kerala, Kottiyoor (10° 7' N 78° 49' E), (Kannur Dt.) 19.ii. 2003. T. C. Narendran & Party (ZSIK).

*Remarks* : This new species differs from all other Oriental species in having only one anellus; all legs including coxae immaculate yellow; clava as long as scape, 1.35x (or a little over) as long as F2 and F3 combined; F1 shorter than F2, whole body bright metallic green and eye height in side view 3.14x length of malar space.

## 2. *Tetrastichus apanteles* Khan, Agnihotri & Sushil

2005. *Tetrastichus apanteles* Khan, Agnihotri & Sushil, 2 : 189-190. Holotype : Female (IARI?).

*Diagnosis* : In addition to the characters mentioned in the key the following additional characters may be of use in determining this species : Legs yellow with coxae, trochanters and femora (except paler apex of femora) infusate; POL less than 2x as long as OOL; malar space almost 2x longer than eye width; surface of propodeum smooth; speculum closed behind; gaster shorter than mesosoma.

*Male* : Unknown.

*Host* : *Apanteles* species on Pigeon pea twigs (Khan *et al.*, 2005).

*Type locality* : India, Uttaranchal : Pantnagar : Nainital

*Material examined* : 1 Female, India, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. ii. 2003, T. C. Narendran & Party (DZUC).

### 3. *Tetrastichus arucicus* Narendran sp. nov.

(Figs. 236-237)

*Holotype : Female* : Length 1.74mm. Dark brown with metallic green reflection; gaster more brownish; eye reddish brown; ocelli pale reflecting yellow; antenna brown with scape slightly paler; tegula, fore and mid coxae brown; hindcoxa dark brown; all femora dark brown with apices paler; tibiae and tarsi (except fourth one) pale yellow; fourth tarsi and pretarsi brown. Wings hyaline with veins pale brownish yellow; margins of veins darker.

*Head* : As wide as long in anterior view, as wide as mesosoma, 5.8x as broad as median length in dorsal view; POL 1.75x OOL; OD less than OOL (3 : 4); ocelli not surrounded by a groove; eye sparsely pubescent, a little over 1.2x as long as broad in side view, 2.2x as long as malar space; MS straight; head moderately reticulate. Antennal formula 11233; scape almost reaching front ocellus, a little shorter than eye in profile (10 : 11); antennal segments as in figure 236.

*Mesosoma* : As long as broad, moderately reticulate; mid lobe of mesoscutum length subequal to width, ML weakly indicated; adnotaular setae 3 on each side. Scutellum 1.4x as broad as long; SMG nearer to SLG than to each other, enclosed space 2x as long as broad. Propodeum 4.5x as long as dorsellum; submedian areas weakly reticulate; spiracle separated from metanotum by its own diameter. Callus with 3 setae (one anterior, one middle and one posterior). Mid tibial spur 0.75x as long as midmetatarsus. Forewing 2.2x as long as broad; CC a little shorter than MV (9 : 12), SMV with one dorsal seta; MV 2.4x as long as STV with about 10-12 setae on anterior margin; speculum closed behind but extends towards middle of MV as a narrow strip behind basal half of MV; marginal fringe 0.4x as long as STV.

*Gaster* (Fig. 237) : Sessile, ovate, distinctly longer than combined length of head plus mesosoma; hypopygium reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Calicut Dt. Chathamangalam, Regional Engineering College Campus (11° 19' N 75° 52' E), 28. xi. 1985 (ZSIK), T.C. Narendran.

*Paratypes* : 1 Female, India, Kerala, Palghat Dt., Siruvani forests (10° 58' N 76° 42' E), , 26. ix. 1987, T. C. Narendran.

*Remarks* : This species differs from all other Oriental species in having the following combination of characters : anelli 2; femora dark brown with apices paler; clava subequal to F2 plus F3; ocelli not surrounded by a groove; gaster distinctly longer than mesosoma; body black with slight metallic blue or green reflection on head; mesosoma and gaster mostly brown with dark median tergites.

4. *Tetrastichus badius* Narendran sp. nov.  
(Figs. 224-225)

*Holotype : Female* : Length 1.33 mm. Brown with head and mesosoma slightly darker. Eyes yellowish brown; ocelli pale reflecting yellowish brown; antenna dark brown with scape and pedicellus pale yellow; legs pale yellow with coxae pale brown; tegula pale brown; Wings hyaline with veins pale yellow with margins pale brown.

*Head* : Partly collapsing; POL 2.8x OOL; OD almost equal to OOL; ocelli not surrounded by a groove; eye bare; a little over 1.4x as long as broad in side view; 1.6-1.8x as long as malar space; MS straight; head moderately reticulate. Antennal formula 11133, scape as long as eye, reaching level of vertex; antennal segments as in figure 224.

*Mesosoma* : 1.1x as long as broad, reticulate, ML very faint (careful focusing is necessary to observe this) but complete, with 2-3 adnotaular setae on each side, mid lobe of mesoscutum as long as broad. Scutellum 1.5x as broad as long; SMG nearer to SLG than to each other, enclosed space 1.6x as long as broad. Propodeum 2x as long as dorsellum; spiracle separated from metanotum by a distance of its own diameter; callus with 3 setae. (1 anterior and 2 posterior). Midtibial spur 0.6x length of midmetatarsus. Forewing 2.32x as long as broad, CC 12x as long as broad, a little shorter than MV; SMV with 1 dorsal seta; MV 4x STV, marginal fringe 0.6x as long as STV (MV with 15 - 17 setae on anterior margin).

*Gaster* (Fig. 225) : Distinctly longer than mesosoma, subequal in length to head plus mesosoma, hypopygium slightly exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Alappetty Dt. Arattupuzha (9°14' N 76° 25' E), 23. iv. 2000, T. C. Narendran (ZSIK).

*Paratypes* : 3 Females, Kerala, Kannur Dt. Kottiyoor (10° 7' N 78° 49' E), 17 - 19. ii. 2003; 1 Female, Kerala, Calicut, Thiruvannur (11° 16' N 75° 47' E), 28. xi. 1994, T. C. Narendran, 1 Female, Kerala, Calicut, Anakampoyil (11°1 8' N 76° 3' E), 17. x. 1995, T. C. Narendran.

*Remarks* : This species differs from all other Oriental species in having the following combination of characters : only one anellus; body brown with head plus mesosoma slightly darker; hypopygium slightly exceeding middle of gaster; forewing 2.32x as long as broad and CC distinctly shorter than MV.

5. *Tetrastichus bellus* Narendran & Girish

2006. *Tetrastichus bellus* Narendran & Girish, 9(1) : 33 : 37. Holotype : Female, Borneo (UCDC)

*Redescription : Female* : Length 1.38 mm. Body immaculate whitish yellow, delicate; antenna with scape brownish yellow except for brown base, remaining parts brown; mandible brown; ovipositor brown; wings hyaline with veins pale yellowish brown.

**Head** : Width in anterior view 1.37x its length (excluding mandibles); width in dorsal view 2.21x its maximum length; temple broad; tentorial pits indistinct; clypeo-genal sulcus not complete, present near to lower clypeal margin; lower clypeal margin entire, not emarginated; mandible tridentate; scrobal depression deep forming a groove not reaching median ocellus; eyes with minute pubescence; eye height in profile 1.52x length of malar space; MS distinct with a relatively small subocular fovea; frontofacial sulcus absent; occiput not margined; OOL 1.6x POL. Antennal toruli situated just above level of lower margin of eye; antennal formula 11133, flagellum with long pubescence and sensillae, sensillae often exceeding each segment; scape 1.17x as long as eye height in profile, about 2.83x length of pedicellus; F1 1.33x length of pedicellus; F2 1.25x length of F1; F3 equal to F2; clava 1.8x as long as F3; apex of clava with a spicule.

**Mesosoma** : Not flattened, smooth; pronotum relatively large, 4.28x as wide as its maximum length, anterior margin almost straight medially; mesoscutum without ML, with a pair of setae on either side near axilla; axillae strongly and angulately advanced; scutellum with two strong SMG, anterior pair of setae erect and long, situated after middle, posterior pair small and situated near to posterior margin of scutellum; dorsellum without ML; propodeum with a median carina complete, submedian area smooth, rim of propodeal spiracle exposed, spiracle almost touching posterior margin of metanotum. Forewing 2.31x as long as wide; SMV with 1 dorsal seta (only 1 setal pit is present, seta lost); speculum closed behind by cubital line of setae; basal line of setae present; CC narrow; SMV 0.59x MV; PMV absent; STV about 0.22x length of MV. Hind wing 10.64x as long as its maximum width; hindcoxa smooth.

**Gaster** : Pointed apically; ovipositor distinctly visible from dorsal side; hypopygium extending beyond middle of gaster; one cercal seta longer than others on either side.

**Male** : Unknown.

**Host** : The Indian specimens were obtained from the leaf galls of *Ficus bengalensis* L. and *Terminalia paniculata* Roth.

**Type locality** : Borneo, Sarawak, S. Gunung Buda.

**Distribution** : India (Kerala); Borneo (Sarawak).

**Additional Material examined** : 5 Females, India : Kerala, Malappuram Dt., Manjeri (11° 7' N 76° 7' E), coll. M. Sheeba, 20.iii.2004; 3 Females, India, Kerala, Kalipoyka, near Calicut (11°16' N 75° 48' E), coll. M. Sheeba, 22.iv.2004; 1 Female, India, New Delhi, 23.ix.2005, coll. M. Sheeba, 22.iv.2004.

#### 6. *Tetrastichus bharathi* Narendran sp. nov.

(Figs. 191-192)

**Holotype** : **Female** : Length 2.29 mm. Black without metallic refringence; eye grayish yellow; ocelli reflecting yellow or brown; antenna dark brown with scape and pedicellus yellow; legs yellow with bases of coxae slightly dark; gaster black with brownish tinge on sides. Wings hyaline with veins pale brownish yellow.

*Head* : A little broader than mesosoma; 1.14x as broad as long in anterior view; 2.91x as broad as its median length dorsal aspect; POL 1.8x OOL; OOL a little more than OD; eye in profile a little longer than wide (19 : 17), 2.71x as long as malar space, almost bare with very sparse minute pubescence; MS straight, with a minute subocular pit at base; head weakly engraved with reticulations. Antennal formula 11433; scape not quite reaching front ocellus; subequal in length of eye in profile; antennal segments as in figure 191.

*Mesosoma* : 1.36x as long as wide; mid lobe of mesoscutum 1.33x as broad as long, with fine reticulations; ML deep and complete; mesoscutum with 3 strong erect adnotaular setae on each side. Scutellum about 1.2x as broad as long; SMG slightly nearer to SLG than to each other, enclosed space 2x as long as its width. Propodeum 1.5x as long as dorsellum; submedian area coarsely and irregularly corrugated; spiracle separated from metanotum by less than diameter of spiracle; callus with 6-8 setae outside spiracle. Forewing about 2.9x as long as broad; CC 12x as long as wide, slightly longer than MV (11 : 10); SMV with 2 dorsal setae; MV about 4.2x length of STV; its front edge with 12-13 setae; PMV absent; speculum small, closed below by cubital line of setae, not extending to MV; wing beyond speculum densely pilose, length of marginal fringes 0.5x that of STV.

*Gaster* (Fig. 192) : Longer than mesosoma (20 : 18), but shorter than head plus mesosoma (20 : 23); tergites smooth and shiny with faint reticulations on some parts; hypopygium reaching about middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Calicut University Campus (11° 7' N 75° 5' E), 02. iv. 1989. T. C. Narendran (ZSIK).

*Etymology* : Named after the wise king 'Bharath' of India.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 4; SMV with 2 dorsal setae; F1 subequal to F2; CC a little longer than MV; mesoscutum with 3 pairs of uniform sized adnotaular setae; legs yellow with base of coxae slightly dark; body black without metallic reflections; gaster longer than mesosoma, but shorter than head plus mesosoma; mesoscutum with ML deep and complete.

#### 7. *Tetrastichus bilgircus* Narendran sp. nov. (Figs. 258-259)

*Holotype* : *Female* : Length 2.6 mm. Black with slight metallic green reflection. Eye pale yellow with dark tinge and spots; ocelli reflecting yellow; antenna dark brown with scape and pedicellus paler. Coxae concolorous with mesosoma ; femora brownish black with apices pale yellow; tibiae and tarsi pale yellow; pretarsi brown; tegula dark brown; wings hyaline with veins brown.

**Head** : A little wider than long; a little over 1.3x as broad as long, about 7x as broad as median length in dorsal view; POL 1.71x OOL, OD : OOL = 4 : 7; eye bare, a little more than 1.3x as long as broad in side view, 2.4x as long as malar space; MS straight; head reticulate. Antennal formula 11142; scape reaching level of vertex, little shorter than eye length (11 : 12); antenna as in figure 258.

**Mesosoma** : 1.25x as long as broad; mid lobe of mesoscutum a little wider than long (13 : 11), with 5-7 adnotaular setae on each side; ML indistinct in anterior region near posterior margin of pronotum. Scutellum a little more than 1.3x as broad as long; SMG nearer to SLG than to each other; enclosed space 2.25x as long as broad. Propodeum 2x as long as dorsellum, spiracle separated from metanotum by a distance 2x as its diameter; callus with 2 posterior, 2 middle and 2 anterior setae. Mid tibial spur about 0.7x as long as midmetatarsus. Forewing 2.27x as long as broad; CC shorter than MV (16 : 18); MV 3.37x as long as STV, with numerous short setae on dorsal anterior margin; speculum closed behind, slightly extending as a strip below basal one-third of MV; marginal fringe 0.18x as long as STV.

**Gaster** (Fig. 259) : Sessile, shorter than mesosoma, hypopygium reaching middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, India, Karnataka, Bilgiri Ranga Sanctuary, 20. viii. 2001, P. A. Sinu (ZSIK).

**Paratypes** : 11 Females. Collection data same as that of holotype.

**Remarks** : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; SMV with 4 dorsal setae; antennal pedicellus shorter than F1; clva as long as or subequal to F2 plus F3; CC shorter than MV; gaster shorter than mesosoma; ML of mesosoma incomplete and body black with metallic green reflection.

#### 8. *Tetrastichus bispinus* Narendran sp. nov. (Figs. 256-257)

**Holotype** : Female : Length 2.66mm. Head and mesosoma black; gaster brown. Eye grey; antenna brown with scape paler. Front and mid coxae, front and mid femora except paler apices dark brown; hindcoxa and femora except paler apices black; all tibiae and tarsi pale yellow; pretarsi brown; tegula brown; wings hyaline with veins pale brownish yellow.

**Head** : Wider than mesosoma (47 : 44). A little wider than long in anterior view (24 : 21), 3.31x as broad as its median length in dorsal view. POL 2x OOL; OD : OOL = 4 : 5; ocelli surrounded by a groove in front. Eye with sparse pubescence, a little over 1.36x as

long as wide in side view, 3x as long as malar space; MS straight, with a small pit at base, head with distinct reticulations. Antennal formula 11242, scape exceeding level of vertex, shorter than eye height (13 : 15); antennal segments as in figure 256.

*Mesosoma* : 1.25x as long as broad; well reticulate, mid lobe of mesoscutum with 5 adnotaular setae on each side; wider than long (15 :13), ML complete. Scutellum as long as wide; SMG nearer to SLG than to each other, enclosed space a little over 2.6x as long as wide. Propodeum 3x as long as metanotum, distinctly reticulate, spiracle separated from metanotum by a distance less than half its diameter, callus with 3 setae posteriorly and 3 setae anteriorly near margin of spiracle on each side. Midtibial spur about 0.78x as long as midmetatarsus. Forewing 2.16x as long as broad; CC 6.5x as long as broad, shorter than MV (13 :16); SMV with 2 dorsal setae; MV a little over 3x STV; speculum open below, not extending as a strip below MV; marginal fringe 0.2x as long as STV.

*Gaster* (Fig. 257) : Sessile, equal or subequal to head plus mesosoma, hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, Borneo, Sarawak, SW Gunung Buda; 64 Kms S. Linbang, (4° 13' N 114° 56' E) 22-28. xi. 1996, S. L. Heydon & S. Fung (Bohart Museum, California). (UCDC)

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; SMV with 2 dorsal setae; Female funicle 4 segmented; speculum open below; gaster brown; mesosoma and head black without distinct metallic reflection.

### 9. *Tetrastichus budaicus* Narendran sp. nov. (Figs. 252-253)

*Holotype* : *Female* : Length 1.52mm. Head and mesosoma black; gaster brown; eye grayish yellow; ocelli reflecting yellow; antenna brown with scape whitish yellow; tegula brown; legs including coxae whitish yellow; mesoscutal and scutellar setae dark brown; wings hyaline with slight brownish tinge; veins pale brown, pilosity brown.

*Head* : A little wider than mesosoma (26 :24), 1.24x as broad as long in anterior view, 4x as broad as median length in dorsal view; POL 1.75x OOL; OD : OOL = 3 : 4. Eye bare, converging posteriorly in front view; length in side view 1.42x as long as wide, 3.4x as long as malar space, MS straight; head reticulate. Antennal formula 11233; scape not quite reaching level of vertex, a little shorter than eye length in side view (14 : 17), antennal segments as in figure 252.

*Mesosoma* : 1.4x as long as broad, mid lobe of mesoscutum 1.17x as long as broad, with 3 adnotaular setae on each side, ML indistinct near posterior margin of pronotum. Scutellum a little wider than long (15 : 12); SMG nearer to SLG than to each other, without a median

fovea; enclosed space 2x as long as its width. Propodeum 2x as long as dorsellum, submedian areas well reticulate, spiracle separated from metanotum by a distance 0.5x diameter of spiracle, callus with one posterior and 2 anterior setae. Midtibial spur as long as midmetatarsus. Forewing 2.23x as long as broad, CC shorter than MV (14.5 : 16); MV 3.2x as long as STV, with 12-13 setae on anterior margin on dorsal side; SMV with one dorsal seta; speculum closed behind, not running as a strip behind MV; marginal fringe 0.8x as long as STV.

*Gaster* : (Fig. 253) Petiolate; petiole broader than long, longer than mesosoma, shorter than head plus mesosoma; hypopygium reaching 0.68x length of gaster; ovipositor sheath lifted upwards.

*Male* : Unknown.

*Host* : Unknown.

*Etymology* : Named after the locality Buda, Borneo.

*Holotype* : Female, Borneo, SW Gunung Buda, 64 Kms S. Limbang (4° 13' N 114° 56' E), 8-15. xi. 1996. S. L. Heydon & S. Fung (Bohart Museum, California Davis). (UCDC)

*Remarks* : This species resembles *T. umae* in general appearance but differs in having : 1) Scutellum lacking median fovea, 2) SMG nearer to SLG than to each other, 3) setae on mesoscutum and scutellum dark brown, 4) pilosity of forewing brown, 5) speculum not extending as a strip below MV, 6) marginal fringe 0.8x as long as STV and in several other characters.

This new species differs from all other Oriental species in having the combination of characters : anelli 2; scutellum without a median fovea between SMG; mesoscutal and scutellar setae dark brown; forewing pilosity brown; marginal fringe 0.8x as long as STV; gaster with a distinct petiole and funicular segments unequal in length.

10. *Tetrastichus calicuticus* Narendran sp. nov.  
(Figs. 260-261)

*Holotype* : *Female* : Length 1.63 mm. Black with metallic green reflection. Eye dark brown, ocelli reflecting yellow; antenna black with scape yellow and pedicellus yellowish brown; tegula brown; legs pale yellow with all coxae concolorous with mesosoma; wings hyaline with slight yellowish tinge; veins pale brownish yellow.

*Head* : A little wider than mesosoma (27 :30), a little longer than wide (14 : 13). POL 2x OOL, OD : OOL = 3 : 4. Eye bare, about 1.9x as long as malar space; MS straight; head moderately reticulate. Antennal formula 11233; scape reaching level of vertex, as long as eye length in profile; antennal segments as in figure 260.

*Mesosoma* : 1.31x as long as wide; mid lobe of mesoscutum a little wider than long (13 :10), with 3 adnotaular setae on each side, ML slightly indistinct near posterior margin of pronotum. Scutellum width subequal to its length; SMG nearer to SLG than to each other,

enclosed space 2.2x as long as wide. Propodeum 2x as long as dorsellum, spiracle separated from metanotum by a distance less than its diameter; callus with 2 setae posteriorly and two on margin of spiracle. Mid tibial spur 0.9x as long as midmetatarsus. Forewing 2.25x as long as broad, CC 0.72x as long as MV; SMV with 2 dorsal setae; MV 4.1x as long as STV; speculum narrow, closed behind, not running as a narrow strip behind MV; marginal fringe 0.44x length of STV.

*Gaster* : (Fig. 261) Sessile, ovate, longer than head plus mesosoma; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Etymology* : Named after the district of the collection locality Calicut.

*Holotype* : Female, India, Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E) 14. ii. 2004, T. C. Narendran & Party (ZSIC).

*Paratypes* : 4 Females, Calicut Dt., Thiruvannur (11° 16' N 75° 47' E), 23. xi. 1996, R. Mohana.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; SMV with 2 dorsal setae; trochanter, femora, tibiae and tarsus whitish yellow; forewing with slight yellowish tinge; body bright metallic green; gaster about 1.6x as long as mesosoma; clava longer than F2 plus F3, longer than scape; funicular segments equal or subequal in length.

### 11. *Tetrastichus chakrataensis* Khan & Sushil

1993. *Tetrastichus chakrataensis* Khan & Sushil, (1992) : 42 : 8 Holotype : Female (ZSIC?)

*Diagnosis : Female* : Length 1.41mm. Dark brown with strong iridescent bluish reflection; legs uniformly yellow except coxae brown and tarsal segments 3-4 infuscated; antenna with F1 1.4x as long as F3; clava a little longer than scape; middle tibial spur shorter than respective metatarsus, distinctly shorter than F2 plus F3; gaster longer than mesosoma. (Khan & Sushil, 1993)

*Male* : Unknown.

*Host* : ex. Lepidopteran leaf mine (Khan & Sushil 1993) on wild plant.

*Remarks* : Request for type remained unanswered.

### 12. *Tetrastichus chindakicus* Narendran sp. nov. (Figs. 220-221)

*Holotype : Female* : Length 1.92 mm. Head and mesosoma black, with slight metallic green reflections; eyes pale yellow with dark tinge; ocelli pale reflecting yellow. Antenna

brown with scape and ventral half of pedicellus pale brownish yellow. Legs, forecoxa, femur (except paler apex), trochanter pale brown; mid and hindcoxae concolorous with mesosoma with apex paler; mid trochanter yellow, mid femur pale brown with apex yellow; hind trochanter and femur dark brown with apex of femur paler, all tibiae and tarsi yellow; tegula brown. Gaster brown with posterior half a little more dark. Wings hyaline with veins pale yellowish brown.

*Head* : As broad as mesosoma, 2x as broad as its length in anterior view, 4x as broad as median length in dorsal view. POL 1.8x OOL; OOL a little more than OD (4 :3). Eye with relatively long pilosity, 1.29x as long as its width in profile, 2.25x as long as malar space; MS straight. Antennal formula 11133; scape reaching front ocellus, hardly reaching level of vertex, as long as eye length, antennal segments as in figure 220.

*Mesosoma* : A little more than 1.3x as long as broad; mid lobe of mesoscutum 1.25x as broad as long, with fine longitudinal reticulations, ML distinct except one - third anteriorly; with 4 strong erect adnotaular setae on each side. Scutellum a little more than 1.27x as broad as long; SMG nearer to SLG than to each other, enclosed space a little more than 1.83x as long as broad. Propodeum 2.5x as long as metanotum, spiracle separated from metanotum by half its diameter, callus with 3 setae (outer to spiracle). Legs with midtibial spur subequal to half length of midmetatarsus. Forewing 2.41x as long as its maximum width; CC 5.25x as long as its maximum width, a little shorter than MV; PMV absent; MV a little longer than 2.6x STV; speculum closed behind by cubital line of setae, not extending to MV; region beyond speculum densely setose; marginal fringe a little more than 0.2x length of STV.

*Gaster* : (Fig. 221) A little longer than mesosoma but distinctly shorter than head plus mesosoma; hypopygium reaching beyond middle (0.71x of gaster) of gaster; tergites smooth.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala. Palghat Dt. Chindaki (10° 39' N 76° 40' E), 13. xii. 1988. T. C. Narendran (ZSIK).

*Paratypes* : 9 Females of same data of holotype; 1 Female of the same data of the holotype except date 13. xii. 1987; 1 Female, Kerala, Palghat Dt. Silent valley (10° 51' N 76° 37' E), 15. v. 1985. T. C. Narendran; 1 Female, Kerala, Idukki Dt. Vandiperiyar, Pasumala (9° 35' N 77° 5' E), 08. 01. 2004, T. C. Narendran & Party, 1 Female, Kerala, Pattambi (10° 49' N 76° 12' E), 13. viii. 2003, T. C. Narendran & Party (DZUC).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; eye with relatively long pilosity; clava 1.16 to 1.17x as long as F2 plus F3; gaster distinctly shorter than head plus mesosoma; head and mesosoma black with slight metallic reflection; gaster brown.

13. *Tetrastichus chinicus* Narendran sp. nov.  
(Figs. 217-219)

*Holotype : Female* : Length 2.11mm. Black with metallic green reflections; eyes grayish yellow, ocelli brown; antenna brown with scape slightly paler; tegula brown; Legs : coxae concolorous with mesosoma except paler apices; femora dark brown with apices paler; trochanters, tibiae and tarsi pale brownish yellow. Wings hyaline with veins pale brown.

*Head* : As wide as mesosoma, 1.67x as broad as long in front view, 4x as broad as its median length in dorsal view. POL 2.63x OOL; OD slightly less than OOL in diameter; ocelli surrounded by a groove with a cross groove connecting to ocular groove on either side. Eye bare, 1.38x as long as its width in profile, 1.5x as long as malar space; MS straight; head with distinct reticulations. Antennal formula 11133; scape reaching level of vertex, but not exceeding it, a little shorter than height of eye (12 :13); antennal segments as in figure 217.

*Mesosoma* : As long as broad, with distinct raised reticulations, ML deep, becoming shallow towards anterior end complete, with 5 short adnotaular setae on each side. Scutellum (Fig. 218) a little more than 1.3x as broad as long, SMG nearer to SLG, enclosed space 2x as long as broad, SMG deep and broad, SLG deeper and broader than SMG with strong costulae. Propodeum (Fig. 218) 3.5x as long as metanotum, submedian areas strongly reticulate, median and spiracular carinae well raised. Propodeal spiracle separated from metanotum by less than half diameter of spiracle; callus with 3 setae outside spiracle and 2 setae on inner side of spiracle anteriorly. Legs with midtibial spur 0.6x length of midmetatarsus. Forewing length 2.5x its maximum width; CC 13x as long as wide, equal in length to MV, with one dorsal seta; MV as long as STV, with 11 - 12 setae on its anterior margin, marginal fringe 0.25x length of STV. Speculum very large extending to area below MV, open behind; area beyond speculum sparsely pilose.

*Gaster* : (Fig. 219) A little longer than head plus mesosoma, smooth and shiny; hypopygium ending a little behind middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala. Palghat Dt. Chindaki (10° 39' N 76° 40' E), 13. xii. 1988. T. C. Narendran (ZSIK).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; scutellum with SMG and SLG a little broader than usual; enclosed space between SMG 2x as long as broad; mesosomal dorsum with raised reticulations; clava as long as F2 plus F3; gaster a little more than 1.6x broad as long in dorsal view; whole body black with metallic reflection.

**14. *Tetrastichus clavatus* Khan, Agnihotri & Sushil**

2005. *Tetrastichus clavatus* Khan, Agnihotri & Sushil, 2(1) : 182-183. Holotype : Female, India (IARI?)

*Diagnosis* : This species could not be included in the key given above since the description and figures provided by Khan *et al.*, (2005) do not agree. For instance in the description it is stated that antenna is with 3 anelli but in the figure 5 of Plate XLVII of Khan *et al.*, (2005) the antenna shows only one anellus. I could not examine the type nor could I get any clarification from the authors since my enquiries remained unanswered.

*Male* : Unknown.

*Host* : Unidentified leaf miner on *Dalbergia sissoo*.

*Type locality* : India, Uttaranchal, Nainital, Nagla.

**15. *Tetrastichus colemani* Crawford**

1912. *Tetrastichus colemani* Crawford, 42 :8 Holotype : Female India (USNM).

*Diagnosis* : *Female* : Length 1.8 mm. Metallic green; gaster brown at tip; scape and legs testaceous to light brown; mesoscutum with 4 adnotaular setae on left side and 5 on right side, ML incomplete anteriorly; mesopleura with a large testaceous spot beneath wing; F1 a little longer than pedicellus; F2 and F3 subequal to F1. Clava equal to F1, F2 and F3 combined; SMV with 1 dorsal seta; speculum present and closed behind; gaster equal to rest of body.

*Male* : 1.5 mm. F1 subequal to pedicellus; F2 a little longer than F1; clava a little longer than F3 plus F4.

*Type locality* : India, Karnataka, Bangalore.

*Host* : *Aspidomorpha miliaris* (Fabricius) (Coleoptera : Chrysomelidae)

*Remarks* : On my request Dr. Michael Gates of USNM examined the holotype and informed me the diagnostic features of the species. Dr. Gates informed that it does not seem that one (the fifth one) adnotaular seta is abraded off from left side of the mesoscutum.

**16. *Tetrastichus coorgensis* (Kurian)**

1952. *Aprostocetus coorgensis* Kurian, 1-59. Holotype, Female India (FRI)

1986. *Tetrastichus coorgensis* (Kurian); Husain & Khan, transferred.

*Diagnosis* : *Female* : Length 2-2.3 mm. Gena three-fifths length of eye; scape 3x as long as pedicellus; F1 three-fifth the scape; scape 2x as long as F3; clava with a nipple like process; hindcoxa concolorous with mesosoma; femur yellowish brown except for paler apex.

*Male* : Unknown.

*Type locality* : India : Karnataka, S. Coorg, Tithimatti.

*Host* : Pyralid larva parasitizing *Grewia latifolia* (Kurian, 1952), *Opisina arenosella* Walker (Lepidoptera : Oecophoridae).

*Remarks* : A request for loan of type did not succeed.

17. *Tetrastichus cotesiae* Narendran sp. nov.  
(Figs. 196-197)

*Holotype* : *Female* : Length 1.45 mm. Black with metallic green or blue reflections; eye brownish black; ocelli reflecting yellow with often reddish tinge; antenna dark brown with scape pale yellow; tegula dark brown; legs pale yellow with all coxae concolorous with mesosoma; pretarsi brown. Wings hyaline with veins pale yellow.

*Head* : A little wider than mesosoma (20 : 17), as broad as long in anterior view; 5x as broad as median length in dorsal view; POL a little over 2.3x OOL, equal to OD, ocelli not surrounded by a groove. Eye very sparsely pilose, 1.25x as long as wide in side view; a little more than 1.6x as long as malar space; MS straight; head distinctly reticulate. Antennal formula 11233; scape reaching front ocellus but not reaching level of vertex, a little shorter than eye (9 : 10). Antennal segments as in figure 196.

*Mesosoma* : 1.3x as long as broad, with distinct reticulations; ML complete, with 3 adnotaular setae on each side; mid lobe of mesoscutum a little broader than long (11 : 9). Scutellum a little broader than long (12 : 9); SMG nearer to SLG than to each other, enclosed space 1.8x as long as wide. Propodeum 4x as long as dorsellum, submedian areas distinctly reticulate; spiracle separated from metanotum by its own diameter; callus with 3 outer and 1 inner setae. Mid tibial spur about as long as midmetatarsus. Forewing 2x as long as wide; CC 11x as long broad, shorter than MV; SMV with 1 dorsal seta; MV a little less than 5x as long as STV, with 12 - 14 setae on anterior margin; marginal fringe 0.5x as long as STV.

*Gaster* : (Fig. 197) Sessile, ovate, distinctly longer than mesosoma but shorter than head plus mesosoma, hypopygium reaching middle of gaster, tergites shiny.

*Male* : Unknown.

*Host* : Hyperparasitic on *Cotesia* sp. (Braconidae).

*Holotype* : Female, India, Jammu, 10. x. 2002. R. K. Gupta (ZSIK).

*Paratype* : 4 Females of same data of holotype; 8 Females, India, Kerala, Dt. Thiruvananthapuram, Vellayani (8° 42' N 77° 9' E), 18. vi. 2005, J. S. Asha (DZUC).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; gaster ovate, a little longer than mesosoma; body black with metallic green reflection; clava longer than F2 plus F3; funicular segments equal or subequal in length and parasitic on *Cotesia* sp.

### 18. *Tetrastichus cupressi* Yang

1996. *Tetrastichus cupressi* Yang, 276 : 333-334. Holotype : Female China (NWCF).

**Diagnosis : Female :** Length 2.2-2.4mm. Dark bluish or sometimes partly to mainly bronze; gaster usually bright metallic. Besides characters mentioned in the key the following points may be useful for identification : The width of mouth margin 1.3x as long as MS; mesoscutum with 3-5 adnotaular setae on each side; SMG of scutellum slightly divergent posteriorly, thus the median area trapezoid.

**Male :** Unknown.

**Host :** *Phloeosinus aubei* (Coleoptera : Scolytidae) on *Cupressus* sp. and *Platycladus orientalis* (Cupressaceae).

**Type locality :** China : Yunnan.

**Material examined :** 1 Female, India, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. xi. 2003, T. C. Narendran & Party; 1 Female, Kerala, Kasargode, Kudlu, near Campus (12° 31' N 74° 60' E), 22. i. 2003, T. C. Narendran & Party; 1 Female, Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), April 1987, T. C. Narendran & Party; 1 Female, Kerala, Pattambi (10° 49' N 76° 12' E), 12. viii. 2003, T. C. Narendran & Party; 1 Female, Idukki Dt., Vandiperiyar (9° 35' N 77° 5' E), 8. i. 2004, T. C. Narendran & Party; 1 Female; India, Tamil Nadu, Coimbatore (11° 0' N 76° 58' E), ix. 1987.

**Remarks :** This is the first record of this species from India.

### 19. *Tetrastichus dalotus* Narendran sp. nov.

(Figs. 262-263)

**Holotype : Female :** Length 2.07mm. Head and Mesosoma black with metallic blue reflections; eye red; ocelli reflecting pale yellowish brown; antenna dark brown with scape and pedicellus pale brown; tegula brown; all coxae concolorous with mesosoma, all femora brown with apices yellow, remaining parts of legs yellow, pretarsi brown; wings hyaline with veins pale brown; pilosity brown; gaster brown with metallic blue reflections.

**Head :** Slightly wider than mesosoma (18 : 17), 1.17x as wide as long in anterior view; 5.14x as broad as median length in dorsal view; POL 2x OOL; OD equal to OOL. Eyes bare, 1.16x as long as wide in side view, 1.66x as long as malar space; MS almost straight in side view; head finely reticulate. Antennal formula 11133; scape not reaching level of vertex, 0.72x as long as eye in side view, antennal segments as in figure 262.

**Mesosoma :** 1.26x as long as broad, midlobe of mesoscutum 1.16x as broad as long, with 8 setae on each side (one adnotaular raw of 5-6setae and another inner raw of 2 setae) with distinct ML. Scutellum 1.21x as broad as long; SMG nearer to SLG than to each other, enclosed space 2.09x as long as broad. Propodeum 2.25x as long as dorsellum, submedian areas reticulate; spiracle separated from metanotum by a distance distinctly less than its diameter; callus with 3 posterior and 1 anterior setae; midtibial spur 0.8x as

long as midmetatarsus. Forewing 2.08x as long as broad, CC distinctly shorter than MV (13.5 : 18); MV 4.5x as long as STV, with 13 setae on anteriodorsal margin; speculum setose except for bare anterior regions, running below MV as a strip; marginal fringe 0.46x as long as STV.

*Gaster* : (Fig. 263) Sessile, equal to head plus mesosoma; hypopygium not reaching beyond middle of gaster.

*Male* : Unknown.

*Host* : *Spilosoma obliqua*.

*Holotype* : Female, India, Karnataka, Thalangattupara, 10. i. 1996, Narayanaswamy (ZSIK).

*Paratypes* : 2 Females of the same collection data of holotype.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; mesoscutum with 8 setae on either side; eye height in profile 1.66x as long as malar space; head and mesosoma black with metallic blue reflections; gaster brown with metallic blue reflections, and all coxae concolorous with mesosoma.

## 20. *Tetrastichus damitus* Narendran sp. nov.

(Figs. 228-229)

*Holotype : Female* : Length 1.38 mm. Honey brown; eyes reddish brown; ocelli reflecting yellow; antenna brown with scape and pedicellus pale brownish yellow; legs with coxae, femora (except apices) concolorous with body; trochanters, apices of femora, tibiae and tarsi pale yellow; pretarsus light brown; tegula pale brown. Wings hyaline; veins brown.

*Head* : Not collapsing, distinctly wider than mesosoma (13 : 11), as broad as long (including mandibles) in anterior view, 3.57x as broad as median length in dorsal view. POL 1.75x OOL; OD a little less than OOL (3 : 4). Eye sparsely pilose, 1.2x as long as broad in profile, 2.4x as long as malar space; MS straight, with a small subocular pit; head distinctly reticulate; mandibles somewhat resembling *T. mukatus* but relatively smaller than that of *mukatus*. Antennal formula 11133; scape a little shorter than eye height in profile (10 : 12), not reaching level of vertex; antennal segments as in figure 228.

*Mesosoma* : 1.43x as long as broad, reticulate, ML indistinct in anterior half with 2 adnotaular setae on each side, posterior pair longer; mid lobe of mesoscutum 1.44x as broad as long. Scutellum a little wider than long (12 : 11); SMG a little nearer to SLG than to each other, enclosed space 1.8x as long as broad. Propodeum 2x as long as dorsellum, spiracle separated from metanotum by a distance shorter than diameter of it, callus with 2 or 3 setae. Mid tibial spur a little exceeding half of midmetatarsus. Forewing 2.5x as long as broad, CC 16-17x as long as wide, shorter than MV; SMV with one dorsal seta; MV 3.25x as long as STV, speculum closed behind, extending as a streak below MV up to its middle.

**Gaster** : (Fig. 229) Sessile, ovate, distinctly longer than head plus mesosoma; hypopygium hardly exceeding middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female; India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. ii. 2003, T. C. Narendran & Party. (ZSIK).

**Paratypes** : 4 Females; India : Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. ii. 2003, T. C. Narendran & Party.

**Remarks** : This species somewhat resembles *T. mukatus* in mandible shape but in *T. mukatus* mandibles are relatively larger. Besides this species differs from *T. mukatus* in several other features : 1). Clava distinctly longer than scape; 2). Proportions of antennal segments differ; 3). POL 1.75x OOL; 4). Midlobe of mesoscutum with 2 adnotaular setae; 5). Midlobe of mesoscutum 1.44x as broad as long; 6). MV 3.25x as long as STV; 7). Speculum extending as a narrow stripe below MV; 8). Body colour honey brown.

This new species differs from all other Oriental species in having the following combination of characters : only one anellus; whole body brown with metallic reflections; legs not as above; coxa and femora (except apices) concolorous with mesosoma; apices of coxae, femora and remaining segments pale yellow; F2 about 2x as long as broad.

#### 21. *Tetrastichus dasi* Narendran sp. nov.

(Figs. 198-199)

**Holotype : Female** : Length 2.67 mm. Head and mesosoma black with metallic bluish or greenish reflections; gaster brown with metallic green reflections. Eye and ocelli reflecting yellow; antenna brown with scape yellow. Legs with fore and mid coxae, fore and mid femora (except paler apex) brown and hindcoxa and femur dark brown with paler apices. All tibiae and tarsi yellow; pretarsus dark brown; tegula pale brown; wings hyaline, margins of veins slightly darker.

**Head** : A little wider than mesosoma; about 1.14x as broad as long in front view; 4.2x as broad as its median length in dorsal view. POL 3.5x OOL; OOL a little shorter than OD (2 : 3). Eye bare, in profile 1.17x as long as wide, 3.5x as long as MS; MS straight; head distinctly reticulate. Antennal formula 11333; scape reaching front ocellus but not level of vertex, distinctly shorter than eye length in profile; antennal segments as in figure 198.

**Mesosoma** : 1.31x as long as its maximum width; mid lobe of mesoscutum a little longer than wide (12 : 11), with distinct longitudinally arranged reticulations, ML almost complete, with 6 adnotaular setae on each side; scutellum 1.2x as broad as long; SMG nearer to SLG than to each other, enclosed space 2x as long as wide; propodeum 3.5x as long as metanotum; callus with 6 setae outside spiracle; spiracle separated from metanotum by half its diameter. Legs moderately stout, midtibial spur almost as long as midmetatarsus.

Forewing 2.23x as long as its maximum width, CC 11.5x as long as its maximum width, a little shorter than MV (23 : 26); SMV with 4 dorsal setae; MV 3.25x as long as STV; speculum closed posteriorly by cubital line of setae, speculum extending a little posteriorly below MV; region beyond speculum moderately pilose; marginal fringe 0.25x as long as STV.

*Gaster* : (Fig. 199) A little more than 1.53x as long as mesosoma, longer than head plus mesosoma (23 : 17); tergites faintly reticulate and shiny; hypopygium reaching middle of gaster.

*Holotype* : Female, India, West Bengal, Balimghat (21° 42' N 88° 29' E), 05. iii. 2000, B. K. Das (ZSIK).

*Paratypes* : 8 Females. Collection data same as that of holotype (DZUC).

*Male* : Unknown.

*Host* : Gallmidge (Diptera : Cecidomyiidae) on *Syzygium cumini*.

*Etymology* : Named after Dr. B. K. Das who collected the specimen.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 3; SMV with 4 dorsal setae; mesoscutum with ML complete, with 8 or 9 adnotaular setae on each side of mesoscutum; forewing with speculum closed behind; femora dark brown or black with apices paler and gaster weakly reticulate.

## 22. *Tetrastichus dinoticus* Narendran sp. nov.

(Figs. 189-190)

*Holotype* : *Female* : Length 1.3mm. Brownish black, without metallic refringence. Eye pale yellowish gray, ocelli pale reflecting yellow; antenna brown with pedicellus and scape yellow; tegula and legs completely yellow with fore and hindcoxae slightly brown. Wings hyaline, veins pale yellow.

*Head* : A little wider than mesosoma, as long as its width anteriorly, 2.5x as broad as its median length in dorsal aspect. POL 2.33x OOL; OOL equal to OD. Eye bare, 1.21x as long as its width in profile, 2.83x as long as MS; head with faint reticulation. Antennal formula 11133; scape reaching level of vertex, not clearly exceeding it, shorter than length of eye in profile; antennal segments as in figure 189.

*Mesosoma* : About 1.29x as long as its maximum width; mid lobe of mesoscutum 1.33x as broad as long, with longitudinal reticulations, ML obsolescent anteriorly, with 3 adnotaular setae on each side; posterior pair a little longer than remaining ones. Scutellum as long as wide; SMG nearer to each other than to SLG, enclosed space 3.25x as long as wide. Propodeum about 2.67x as long as metanotum, submedian areas distinctly and uniformly reticulate, spiracle separated from metanotum by a distance 2x diameter of spiracle; callus with 5 setae on outer side of spiracle and one seta inner to spiracle. Legs with midtibial spur 0.75x as long as midmetatarsus. Forewing about 2.38x as long as

wide, CC 11x as long as wide, subequal to length of MV; SMV with 1 dorsal seta; MV 2.75x as long as STV, with 10 - 11 setae on outer margin, speculum closed posteriorly by cubital line of setae, slightly extending to posterior region below MV; region beyond speculum moderately pilose; marginal fringe 0.29x length of STV.

*Gaster* : (Fig. 190) As long as mesosoma, distinctly shorter than head plus mesosoma (16 : 22); shiny, hypopygium extending 0.82x length of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Karnataka, Bangalore (12° 58' N 77° 35' E), 21 - 30. iii. 1987, R. Ghorpade M. T. (UCDC).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; head and body brownish black without metallic reflections; coxae and femora yellow; clava distinctly longer than F2 plus F3; F1 equal to F2; CC subequal to length of MV; gaster as long as mesosoma; SMV with a single dorsal seta.

23. *Tetrastichus dulciculus* Narendran sp. nov.  
(Figs. 208-209)

*Holotype* : *Female* : Length 1.86mm. Black with metallic green reflection. Eye brown, ocelli pale reflecting yellow; antenna dark brown with pedicellus and scape pale brownish yellow; tegula brown; all coxae concolorous with mesosoma, remaining segments yellow with a slight reddish tint on 0.85 part of its length from base; apical 0.15 part yellow; pretarsi brown. Wings hyaline; veins pale brownish yellow.

*Head* : A little wider than mesosoma (19 : 18), as long as broad, 3.75x as broad as its median length in dorsal view. POL 2.33x OOL; OD a little less than OOL (2 : 3). Eye almost bare, 1.23x as long as its width in profile, about 1.8x as long as malar space; MS straight; head reticulate and shiny. Antennal formula 11233; scape almost reaching level of vertex, a little shorter than eye (14 : 16); antennal segments as in figure 208.

*Mesosoma* : 1.13x as long as broad, midlobe of mesoscutum a little wider than long (12 : 11), distinctly reticulate, ML complete, with 3 adnotaular setae on each side; posterior pair longer than others. Scutellum 1.33x as wide as long; SMG nearer to SLG than to each other; enclosed space 2x as long as broad. Propodeum 2x as long as dorsellum; submedian areas distinctly reticulate; spiracle separated from metanotum by its own diameter; callus with 2 setae on posterior side and 2 on anterior side. Midtibial spur 0.57x as long as midmetatarsus. Forewing 2.25x as long as broad; CC 19x as long as wide, distinctly shorter than MV (19 : 21); SMV with 1 dorsal seta; MV 3x as long as STV; marginal fringe 0.57x as long as SMV.

*Gaster* : (Fig. 209) Sessile, caudal region tilted up, a little longer than head plus mesosoma (19 : 18); hypopygium slightly exceeding middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Kozhikode, Nanminda (11° 26' N 75° 50' E) (near Calicut), 14. ii. 2004, T. C. Narendran & Party (ZSIK).

*Paratypes* : 1 Female, India, Kerala, Calicut, Tiruvannur (11° 16' N 75° 47' E), 12. x. 1996, T. C. Narendran & Party, 1 Female, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 31. viii. 2002, T. C. Narendran & Party, 3 Females, Kerala, Calicut, Tiruvannur (11° 16' N 75° 47' E), 28. xi. 1994, T. C. Narendran & Party.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; hind femur completely yellow or pale brownish yellow; gaster 1.26x as long as mesosoma; eye height 2.14x MS; forewing about 2.87x its width; body with dark metallic green reflection; hypopygium slightly exceeding middle of gaster.

#### 24. *Tetrastichus epilachnae* (Giard)

1896. *Lygellus epilachnae* Giard, 839. Syntypes, France : Saint-Roch, near Valenciennes (not located).

1940. *Tetrastichus jablonowskii* Szelényi, 85, 86-88, Figs. 1,2. Holotype : Female Hungary Budapest, Harmashatarhegy, 11. vi. 1934. (Synonymised with *epilachnae* by Domenichini, 1966a : 92).

*Redescription* : Female : Length 1.3-2 mm. Black usually with weak, bluish to greenish-blue tinge. Antennae black or brown, scape sometimes yellowish beneath, or wholly so. Coxae, trochanters and femora extensively or mainly black; tibiae yellow, sometimes black with only bases narrowly reddish; wings hyaline, venation yellow to fuscous.

*Head* : About 2.5x as broad as long; POL about 1.4x OOL; OOL 1.6-1.7x OD; eyes separated by 1.4x their length. Malar space 0.75x length of eye. Antenna with scape 0.9x length of eye or just reaching median ocellus; pedicellus plus flagellum 1.25-1.35x width of mesoscutum; pedicellus 1.9-2x as long as broad, from a little shorter than to very slightly longer than F1; funicle filiform, somewhat stouter than pedicellus, with segments subequal in length or F3 slightly shorter than the others. F1 1.5-1.8x, F2 1.5-1.7x, F3 1.5-1.6x as long as broad; clava not broader than funicle, about as long as F2 plus F3 in larger specimens, but somewhat longer in very small ones, 3.1-3.6x as long as broad, acutely pointed.

*Mesosoma* : 1.5x as long as broad, moderately arched dorsally. Midlobe of mesoscutum slightly broader than long, moderately convex; ML very fine, often obsolescent anteriorly; 2-3 fine reclinate setae on each side. Scutellum about 1.2x as broad as long, moderately convex in profile; SMG equidistant from each other and from SLG, or hardly nearer to the latter, enclosed space 2.4-2.8x as long as broad; length of setae nearly equal to distance between SMG. Propodeum 1.4-1.6x length of dorsellum, only slightly shiny, with slightly raised reticulation which is fine in larger specimens but often coarse in smaller ones, occasionally irregular; median carina thin; plicae weak, sometimes represented by a groove;

length of spiracles 0.3x length of propodeum at their level; callus with 1 seta outside spiracle and 1-3 farther black; spur of midtibia 0.65-0.72x length of basitarsus. Forewing with CC slightly shorter than or nearly as long as MV, 10-11.5x as long as broad; MV 2.5-3.4x length of STV, its front edge with 9-15 setae; speculum small, not extended below MV; wing beyond rather widely pilose, especially distad; STV rather thin proximally but expanded in distal 0.5; cilia 0.3-0.4x length of STV.

*Gaster* : Short, ovate, about as long as or slightly broader than mesosoma, 1.2-1.6x as long as broad; longer seta of each cercus nearly 2x length of last tergite; tip of hypopygium at 0.6x length of gaster.

*Male* : Differs from Females as follows : Antenna with scape about as long as eye, about 3x as long as broad, ventral plaque 0.65-0.75x length of scape; pedicellus plus flagellum 1.6-1.7x width of mesoscutum; pedicellus 1.6-1.7x as long as broad, as long as or slightly longer than F1; flagellum virtually filiform, somewhat stouter than pedicellus, F1 distinctly shorter than F2 and 1.27-1.53x as long as broad, F2 as long as or slightly shorter than F3 and 1.5-1.65x as long as broad, F3 and F4 subequal in length, each 1.55-1.9x as long as broad; clava not broader than F4, 3.8-4.6x as long as broad, as long as or somewhat longer than F3 plus F4; each funicular segment with a compact subbasal whorl of dark setae which reach somewhat beyond the tip of the segment.

*Host* : *Simmondsius pakistanensis*, *Epilachna* beetles (Coleoptera : Coccinellidae).

*Distribution* : Europe, China, India.

*Type locality* : France, Saint-Roch, near Valenciennes.

*Material examined* : 2 Females, India, Kerala, Kannur Dt., Kottiyoor forest (10° 7' N 78° 49' E), 17-19. xi. 2003, T. C. Narendran & Party; 1 Female, Kannur Dt., Kavinissery (11° 55' N 75° 22' E), 16. ii. 2003, T. C. Narendran & Party; 1 Female, Kasargode Dt., Central Plantation Crops Research Institute Campus (12° 31' N 74° 32' E), 21. i. 2003, T. C. Narendran & Party; 1 Female, Kasargode Dt., Karanthakad, near CPCRI (12° 31' N 74° 60' E), 21. i. 2003, T. C. Narendran & Party; 1 Female, Kasargode Dt., Kudly near CPCRI campus (12° 31' N 74° 60' E), 22. i. 2003, T. C. Narendran & Party; 2 Females, Kasargode Dt., Chowki, (12° 31' N 74° 60' E), 23. i. 2003, T. C. Narendran & Party; 2 Females, Waynad Dt., Muthanga (11° 44' N 76° 29' E), 7. v. 2000, T. C. Narendran & Party; 1 Female, Waynad Dt., Kalpetta, Puthurvayal (11° 37' N 76° 6' E), 6. ii. 2003, T. C. Narendran & Party; 2 Females, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 14. xii. 2004, T. C. Narendran & Party; 1 Female, Calicut Dt., Cheruvannur, 24. ii. 2002, Sudheer & Divakaran; 1 Female, Calicut Dt., Chaliyam (11° 9' N 75° 49' E), 23. iv. 1989, T. C. Narendran & Party; 1 Female, Malappuram Dt., Edakkara, 17. v. 1986, T. C. Narendran & Party; 1 Female, Calicut University Campus (11° 7' N 75° 5' E), 25. x. 2003, T. C. Narendran & Party; 1 Female, Trichur Dt., Vazhani, 3. vii. 2003, T. C. Narendran & Party; 1 Female, Trichur Dt., Kerala Agricultural University Campus, 30. x. 1985 T. C. Narendran & Party; 1 Female, Palghat Dt., Kalkandi (11° 1' N 76° 28' E), 13. xii. 2003, T. C. Narendran & Party; 1 Female, Palghat

Dt., Malampuzha (10° 53' N 76° 46' E), 15. i. 1986, T. C. Narendran & Party; 1 Female, Palghat Dt., Silent Valley (10° 51' N 76° 37' E), 15. v. 1985, T. C. Narendran & Party; 1 Female, Palghat Dt., Parambikulam (10° 26' N 76° 49' E), 22. xii. 1985, T. C. Narendran & Party; 2 Females, Kerala, Ernakulam Dt., Nedumbassery (10°1' N 76° 18' E), 12. i. 2004, T. C. Narendran & Party; 1 Female, Kerala, Idukki Dt., Thekkadi (9° 36' N 77° 12' E), 17. v. 1986, T. C. Narendran & Party; 1 Female, Trivandrum Dt., Vithura (8° 40' N 77° 7' E), 8. iii. 2000, T. C. Narendran & Party; 2 Females, Karnataka, Sringeri (13° 25' N 75° 15' E), 14. v. 2003, P. M. Sinu; 1 Female, Tamil Nadu, Chennai, 28. ix. 1999, A. Babu; 4 Females, India, West Bengal, Kalyani (21° 43' N 88° 30' E), 7. iii. 1998, B. K. Das; 1 Female, India, Assam, Johant, 25. xi. 1999, K. K. Shaw.

25. *Tetrastichus flavilatus* Narendran sp. nov.  
(Figs. 232-233)

*Holotype : Female* : Length 1.66mm. Black with metallic green reflection; eye dark brown with margins slightly paler, ocelli pale yellowish brown; antenna dark brown with pedicellus and scape pale brownish yellow; legs whitish yellow with fore and mid coxae brown, hindcoxa black; pretarsi dark brown; tegula brown; wings hyaline with veins pale brownish yellow; gaster dark brown on sides.

*Head* : Slightly wider than mesosoma (19 : 18), as long as wide in anterior view; 4.13x as broad as median length in dorsal view. POL 1.7x OOL; OD a little less than OOL (4 : 4.5); ocelli not surrounded by a groove. Eye bare, a little more than 1.36x as long as broad in side view, 2.4x as long as malar space, MS straight; head moderately reticulate. Antennal formula 11233; scape reaching level of vertex, a little shorter than eye in profile (13 : 15); antennal segments as in figure 232.

*Mesosoma* : A little longer than wide (24 : 22), reticulate, midlobe of mesoscutum broader than long (17 : 14), ML complete, with 3 pairs of adnotaular setae on each side. Scutellum a little broader than long (9 : 8); SMG nearer to SLG than to each other, enclosed space 2x as long as broad. Propodeum 2.5x as long as dorsellum; spiracle separated from metanotum by a distance equal to its diameter, callus with 3 setae. Mid tibial spur 0.75x as long as midmetatarsus. Forewing 2.63x as long as its maximum width; CC 16x as long as broad, shorter than MV (16 : 18); SMV with one dorsal seta; MV 4.5x as long as STV, marginal fringe 0.75x as long as STV; speculum closed behind, not extending to MV as a strip.

*Gaster* (Fig. 233) : Distinctly longer than head plus mesosoma (20 : 16); hypopygium hardly reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Calicut University Campus (11° 12' N 75° 5' E), 23. x. 2003, T. C. Narendran (ZSIK).

*Paratypes* : 6 Females of the same data of holotype, 1 Female, India, Kerala, Thonikadavu (11° 36' N 76° 6' E), 7.ii.2003, Coll. Narendran & Party.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; body black or brownish black with metallic green reflection; all coxae dark brown or black; ocelli not surrounded by a groove; gaster distinctly longer than head plus mesosoma; hypopygium hardly reaching middle of gaster and clava distinctly shorter than F2 plus F3.

26. *Tetrastichus gadagkari* Narendran sp. nov.  
(Figs. 247-248)

*Holotype* : *Female* : Length 1.73mm. Brownish black with metallic green and blue reflections; scutellum, T1 and T6 less brown with metallic green reflections. Eye dark yellow; ocelli reflecting pale yellow and brown; antenna brown with scape pale brownish yellow; tegula pale brown; all coxae, femora (except pale apices) concolorous with mesosoma; all tibiae and tarsi (except pale brown fourth tarsi) pale yellow. Wings hyaline with veins pale brown.

*Head* : A little wider than mesosoma (15 : 12); width subequal to its length in anterior view, 5x as broad as its middle length in dorsal view. POL 2.33x OOL; OD a little shorter than OOL (2.5 : 3); eye bare, a little over 1.4x as long as broad in side view, 2.5x as long as malar space, MS straight; head moderately reticulate. Antennal formula 11233; scape almost reaching front ocellus, a little shorter than eye length (8 : 10); antennal segments as in figure 247.

*Mesosoma* : Longer than wide (39 : 30), reticulation weak; mid lobe of mesoscutum wider than long (14 : 9), ML weak but complete, with 5 adnotaular setae on each side. Scutellum wider than long (15 : 12); SMG nearer to SLG than to each other, enclosed space a little over 2.1x as long as wide. Propodeum 2x as long as dorsellum; spiracle separated from metanotum by a distance less than its diameter, a deep fovea follows spiracle to posterior margin of propodeum; submedian areas of propodeum weakly and longitudinally reticulate; callus with 2 setae posteriorly and 2 at inner margin of spiracle. Mid tibial spur a little shorter than midmetatarsus (4.5 : 5.5). Forewing 2.37x as long as its maximum width; CC a little shorter than MV (22 : 24); SMV with one dorsal seta; MV a little over 3.4x as long as STV, with 10-12 setae on anterior margin; speculum closed behind, not quite running below MV; marginal fringe 0.57x as long as STV.

*Gaster* (Fig. 248) : A little longer than head plus mesosoma (28 : 24); hypopygium reaching a little beyond middle of gaster; ovipositor sheath tilted upwards.

*Male* : Unknown.

*Host* : *Spilosoma obliqua*.

*Etymology* : The species name is in honour of Prof. Raghavendra Gadagkar of Indian Institute of Sciences, Bangalore for his significant contributions to the study of Hymenoptera.

*Holotype* : 1 Female, Kerala, Palghat Dt., Malampuzha (10° 53' N 76° 46' E), 15. vi. 1986, T. C. Narendran (ZSIK).

*Paratypes* : 1 Female, Kerala, Palghat Dt., Agali (11° 9' N 76° 40' E), 12. xii. 1987, T. C. Narendran; 1 Female, Srilanka, Kandy Dt., Noruva Forest near Perademir (7° 17' N 80° 36' E), 13-14. viii. 1999, M & J. Wasbauer (Bohart Museum, California).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; gaster 2.2x as long as mesosoma; eye height in profile 2.25x length of malar space; mesoscutum with 5 adnotaular setae; body brownish black with metallic green and blue reflection.

### 27. *Tetrastichus gardneri* Ferrière

1931. *Tetrastichus gardneri* Ferrière, 291. Syntypes, India (BMNH)

*Diagnosis : Female* : Length 1.2-1.5mm. Dark green in some parts, more or less aeneus; antenna brown with scape yellow; legs yellow, but coxae concolorous with mesosoma; scape reaching front ocellus; vertex with a small furrow between lateral ocelli and eye.

*Male* : Similar to Female differing in antennae.

*Host* : Eggs of Pentatomidae (Mani, 1989)

*Type locality* : India, Dehra Dun.

*Remarks* : In the redescription given by (Mani 1989) the figure of the Female antenna and description do not agree. On my request, Dr. J. S. Noyes (per. comm.2005) informed that he checked a type specimen of *T. gardneri* Ferrière (Ferrière did not designate a holotype and it is necessary to designate a lectotype) - the specimen that "was labelled as type by Ferrière and thus presumably is the one that he thought best represents the species" According to Noyes this specimen shows the following features :

"The head has collapsed and frons is partially obscured by antennae, but I am pretty sure that there is a groove around the ocelli. The SMV has 4 setae dorsally on one side and 5 on the other. The ratio of the lengths of the flagellar segments is F120, F2 20, F3 16, clava 21 (although there seems to be a short spicule which would make the length 25). The dorsum of gaster has the basal tergite and apical tergite (T 7 plus T 8 atleast) metallic blue green, the remainder (middle portion) appears to be metallic coppery purple, although this might result from the median part of the gaster having collapsed" (J. S. Noyes, 2005, per.com.).

### 28. *Tetrastichus garicus* Narendran sp. nov. (Figs. 249-251)

*Holotype : Female* : Length 2.06mm. Liver brown slight metallic green reflection; pronotum and mesoscutum a little darker. Eye reddish brown; ocelli dark brown; antenna dark brown with scape paler; tegula dark brown; all coxae concolorous with body, femora

except bases and apices brown; trochanter, bases and apices of femora, tibiae and first 3 tarsi of each leg pale yellow; fourth tarsi with brownish tinge; pretarsi brown; wings hyaline with veins pale yellow.

*Head* : Wider than mesosoma (24 : 20); wider than long in anterior view (20 : 17); 4x as wide as median length in dorsal view. POL 1.5x OOL; OD 0.5x OOL; eye bare, a little larger than wide in side view (15 : 14), 2.5x as long as malar space; MS straight; head granulate reticulate. Antennal formula 11233; scape exceeding well above vertex, as long as width of eye in profile; antennal segments as in figure 249.

*Mesosoma* : (Fig. 250) A little over 1.29x as long as wide, midlobe of mesoscutum with U shaped depression, wider than long (12 : 9), ML complete, with 3 adnotaular setae on each side. Scutellum wider than long (13 : 10); SMG a little nearer to SLG than to each other; enclosed space 2x as long as broad. Propodeum 2x as long as dorsellum; spiracle separated from metanotum by less than diameter of spiracle; callus with 2 posterior setae and 2 setae on inner margin of spiracle. Mid tibial spur 0.75x as long as midmetatarsus. Forewing a little over 2.36x as long as broad; CC shorter than MV (16 : 21); MV 4.2x as long as STV, with 13-14 setae on anterior margin; speculum very narrow, closed behind, not extending as a strip below MV; marginal fringe 0.33x as long as STV.

*Gaster* (Fig. 251) : Sessile, pointed posteriorly, longer than head plus mesosoma; hypopygium almost reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, Kerala, Palghat Dt., Muttikulangara, (11° 7' N 75° 5' E) 11. xii. 1987, T. C. Narendran.

*Paratypes* : 1 Female, Siruvani forest (near Coimbatore) (10° 58' N 76° 42' E) 26. ix. 1987, T. C. Narendran.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; mesoscutum with a 'U' shaped depression or fovea; scape exceeding well above vertex; gaster 3.22x as long as broad, 1.82x as long as mesosoma; head and body dark brown with slight metallic green reflection; mesoscutum with 3 adnotaular setae on either side and CC shorter than MV.

29. *Tetrastichus girishi* Narendran sp. nov.  
(Figs. 230-231)

*Holotype* : Female : Length 1.53mm. Black with metallic green or blue reflections; eyes grayish yellow; ocelli pale reflecting yellow; antenna brown with scape pale brownish yellow; coxae and femora dark brown or black with apices of femora paler; tibiae and tarsi pale brownish yellow. Wings hyaline with veins pale brownish yellow with margins of veins darker.

*Head* : A little wider than mesosoma, as long as broad in front view, 3.5x as long as its maximum dorsal width; POL 1.8x OOL; OOL a little more than OD. Eye bare, length in profile 1.2x its width, 1.5x as long as malar space; MS straight; head with distinct reticulations. Antennal formula 11133; scape hardly reaching front ocellus, distinctly shorter than eye length in profile; antennal segments as in figure 230.

*Mesosoma* : 1.47x as long as its maximum width; width of mid lobe of mesoscutum subequal to its length, with longitudinal reticulations, ML complete, with 4 adnotaular setae on each side, posterior pair longer than remaining ones. Scutellum width equal to its length; SMG nearer to SLG than to each other, enclosed space 2.5x as long as broad. Propodeum 4x as long as metanotum, submedian areas well reticulate, spiracle situated a distance equal to its diameter from metanotum, callus with 3 setae outside spiracle. Legs with mid tibial spur a little shorter than metatarsus of midleg. Forewing 2.45x as long as its maximum width, CC 16x as long as wide, shorter than MV; SMV with 1 dorsal seta; MV 5x as long as STV, with 12 - 14 setae on its outer margin; speculum narrow, closed posteriorly, slightly extending to space below MV; region beyond speculum moderately pilose; marginal fringe 0.33x length of STV.

*Gaster* (Fig. 231) : A little shorter than mesosoma (18 : 19), shiny; hypopygium reaching a little beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Malappuram Dt., Thalappara (11° 7' N 75° 5' E), (near Calicut University Campus), 31. viii. 1987, coll. T. C. Narendran. (ZSIK).

*Paratypes* : 2 Females of same data of holotype; 1 Female, Calicut, Regional Engineering College (11° 19' N 75° 52' E), 18. xi. 1986, T. C. Narendran; 1 Female, Calicut University Campus (11° 7' N 75° 5' E), 17. x. 1988; 1 Female, Calicut University Campus (11° 7' N 75° 5' E), 15.ii. 1989; 1 Female, Kerala, Nilambur (11° 16' N 76° 13' E), 11. viii. 1987, T. C. Narendran & Party; 1 Female, Kerala, Kayamkulam, Central Plantation Crops Research Institute (9° 31' N 76° 32' E), 19. xi. 1989, T. C. Narendran & Party; 1 Female, Kerala, Trichur Dt. Peechi (10° 31' N 76° 13' E), 28. x. 1985, T. C. Narendran & Party; 1 Female, Kerala, Palghat Dt., Malampuzha (10° 53' N 76° 46' E), 5. i. 1986, T. C. Narendran.

*Etymology* : Named after P. Girishkumar for his assistance in my research.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; head and body black with metallic green or bluish reflections; coxae and femora black or dark brown with apices of femora paler; clava distinctly longer than F2 plus F3; F1 equal to F2; gaster little shorter than mesosoma; hypopygium reaching little beyond gaster and mesosoma 1.47x longer than its width.

30. *Tetrastichus heydoni* Narendran sp. nov.  
(Figs. 238-240)

*Holotype : Female* : Length 1.8mm. Head and mesosoma black; eye pale yellow; ocelli reflecting pale yellow; antenna brown with scape slightly paler; following parts of legs brown : fore and mid coxa, all trochanters, all femora except base and apices, all fourth tarsal segments and all pretarsi. Hindcoxa brownish black; hind tibia pale brownish yellow. Wings hyaline with slight brownish tinge; veins pale brown with margins darker; gaster brown with posterior part a little darkish brown.

*Head* : A little wider than mesosoma (19 : 18), 6.5x as broad long in dorsal view; a little wider than long in anterior view (24 : 21); POL 2.13x OOL; OD equal to OOL; eye bare, a little over 1.6x as long as wide in side view, 1.96x as long as malar space; MS straight; head distinctly reticulate. Antennal formula 11233; scape shorter than eye (8 : 10), reaching level of vertex but not exceeding it; antennal segments as in figure 238.

*Mesosoma* : 1.53x long as broad and mid lobe of mesoscutum a little wider than long (12 : 9), ML deeper towards posterior half, with 3 adnotaular setae on each side, mesoscutum with distinct raised reticulations. Scutellum a little wider than long (13 : 11), SMG and SLG very broad and deep (Fig. 239) with transverse ridges inside; enclosed space of scutellum about 4x as long as broad. Propodeum 4x as long as median length of metanotum; submedian region with raised reticulations; spiracle separated from metanotum by its own diameter; callus with 2 anterior setae and one posterior on each side. Mid-metatarsal spur as long as midmetatarsus. Forewing 2.21x as long as wide, CC shorter than MV (12 : 14.5); SMV with one dorsal seta; MV 3.63x as long as STV; MV with 13-14 setae on anterior margin; marginal fringe 0.5x as long as STV; speculum closed behind, not extending as a strip below MV.

*Gaster* : (Fig. 240) Petiolate, petiole broader than long, with longitudinal carinae; longer than mesosoma (12.5 : 11.5) but shorter than head plus mesosoma, hypopygium reaching well beyond middle of gaster; gaster subglobose in side view.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, Borneo : Sarawak; SW Gunung Buda, 64 Kms Lambang (4° 13' N 114° 56' E), 16-21. xi. 1996, SL Heydon & S. Fung (Bohart Museum, California). (UCDC)

*Paratypes* : 9 Females of the same data of holotype except date of collection 14-28. xi. 1996.

*Etymology* : Named after Dr. Steven L. Heydon (USA), who collected the species.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; hind coxa black; fore and mid coxa brown; femora brown with bases and apices paler; SMG and SLG of scutellum unusually very large with distinct cross ridges inside; enclosed area between SMG slightly concave; antenna including

pedicellus brown with scape slightly paler; head and body without metallic reflections. It does not fit to the key to species of *Titrastichus* by Narendran (2007).

31. *Tetrastichus hotspoticus* Narendran sp. nov.  
(Figs. 215-216)

*Holotype* : Female : Length 1.84 mm. Bright metallic green. Eye brownish red; ocelli reflecting yellow; antenna dark brown with scape pale yellow; legs pale yellow with coxae concolorous with mesosoma; legula brown; wings hyaline, veins pale yellow.

*Head* : A little wider mesosoma; a little wider than long in anterior view (20 : 19), 3x as broad as median length in dorsal view; POL 2.25x OOL; OD equal to OOL. Eye bare, 1.27x as long as wide in side view, 1.75x as long as malar space; MS straight; head distinctly reticulate with long sparse pilosity on lower frons. Antennal formula 11133; scape subequal to length of eye in profile, reaching level of vertex but not distinctly exceeding it; antennal segments as in figure 215.

*Mesosoma* : A little longer than wide (19 : 17); midlobe of mesoscutum a little broader than long (10 : 9); reticulations weak; mesoscutal sulcus not quite reaching posterior margin of pronotum, each side with 3 adnotaular setae. Scutellum a little broader than long (8 : 6), SMG a little nearer to SLG than to each other, enclosed space 1.5x as long as broad. Propodeum 2x as long as dorsellum, submedian areas well reticulate, spiracle separated from metanotum by about its diameter; callus with 3 setae outside spiracle. Forewing 2.14x as long as broad; CC 12x as long as broad, as long as MV; MV with 15-16 setae on anterior margin, 3.25x as long as STV; marginal fringe 0.57x as long as STV; speculum closed behind, slightly extending to MV.

*Gaster* : (Fig. 216) Sessile, smooth and shiny, oval, 1.46x as long as mesosoma, equal to combined length of head and mesosoma, hypopygium not quite reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 17. ii. 2003. T. C. Narendran & Party (ZSIK) Reg. No. MoEF 255.

*Paratypes* : 2 Females of the same data of holotype.

*Variation* : POL varies from 1.4-2.25x OOL; OOL 1.6x equal to OD; forewing length 2.14-2.54x its width; marginal fringe 0.25-0.57 as long as STV, MV 2.6x to 3.25x as long as STV.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : only one anellus; body metallic green; hypopygium not quite reaching middle of gaster; forewing 2.14x as long as broad; CC as long as or subequal to MV; mesoscutum with 3 adnotaular setae on either side; gaster as long as combined length of head and mesosoma.

32. *Tetrastichus howardi* (Olliff)  
(Fig. 276)

1893. *Euplectrus howardi* Olliff, 381-382. Holotype : Female, China (AMS).  
*Tetrastichus howardi* (Olliff), Bouček (1988) transformed to *Tetrastichus*.
1921. *Tetrastichus ayyari* Rohwer, 7 : 129. Holotype : Female, India (USNM) (Bouček (1988) synonymised).
1953. *Aprostocetus israeli* Mani & Kurian, 15 : 20. Holotype : Female, India (ZSIC) (Bouček (1988) synonymised).
1952. *Tetrastichus plecopterae* Kurian, 55. Holotype : Female India : Dehra Dun (FRI) (Hayat & Shahi, 2004 synonymised).
1986. *Tetrastichus davidi* Khan, Samraj & Khan, 409-411. Holotype : Female, India, Padappai (Hayat & Shahi, 2004 synonymised).
1988. *Tetrastichus nigricorpus* Khan & Shaffe, 42. Holotype : Female, India, Uttar Pradesh (Hayat & Shahi, 2004 synonymised).

*Redescription* : Female : Length 1.2-2 mm Body black; head black; scape yellowish-brown.

*Head* : Above strongly constricted in the middle, wider than mesosoma, width more than 4x median length; vertex narrow, emarginate; sparsely, shallowly and irregularly punctate; POL 2x OOL; OOL equal to front ocellar space; head from front nearly circular; antennae inserted below level of lower orbital borders; scape nearly reaching to front ocellus; face shallowly punctate, length of gena slightly more than 0.30 length of eye; eyes large, circular, pubescent; postorbital space extremely narrow above; antennal formula 11133; scape somewhat less than 2x pedicellus; F1 equal to pedicellus, remaining segments becoming gradually shorter; clava equal to last 2 funicular segments combined.

*Mesosoma* : Declivous in front; notauli distinct; median longitudinal furrow on mesonotum distinct; mesonotum smooth and shiny except for a few shallow and obscure punctae; scutellum convex, with 2 longitudinal grooves, shallowly punctate; propodeum reticulately rugose, with a median longitudinal carina; spiracles large, circular; hind tibial spur single, about 0.50 of metatarsus; forewing a little less than 2.50 of metatarsus; forewing a little less than 2.50x as long as wide; SMV : MV : STV : PMV = 100 : 75 : 37 : 0.

*Gaster* : Gaster sessile, slightly longer than mesosoma; T1 slightly longer than others and nearly equal to T2 and T3 combined; all tergites nearly smooth and shiny, except for slight scattered pubescence and faint transverse striations; ovipositor issuing from the T4, exerted.

*Male* : Similar to Female except antenna whitish yellow with clava black.

*Hosts* : *Anadevidia peponis* (Fabricius); *Argyria* sp.; *Attacus ricini* Boisduval; *Bethyplectes curculionis* (Thompson); *Chilo auricilia* Ddgn; *Chilo infuscatellus* (Snellen); *Chilo partellus* (Swinhoe); *Chilo sacchariphagus indicus* (Kapur); *Chilo sacchariphagus* (Walker); *Chilo simplex*

feeding on *Sorghum vulgare*; *Chilo suppressalis* (Walker); *Chilo venosatus*; *Chilo zonellus*; *Cnaphalocrosis medinalis* (Guenee); *Crocidolomia binotalis* Zeller; *Diatraea sticticraspis* Hampson; *Dysodia viridatrix* (Walker); *Galleria melonella* (Linnaeus); *Helicoverpa armigera* (Hubner); *Hyblaea puera* (Cramer); *Mythimna albistigma* Moore; *Opisina arenosella* (Walker); *Pectinophora gossypiella* (Saunders); *Plutella xylostella* (Linnaeus); *Polytela gloriosae* Fabricius; *Precis orithya* Linnaeus; *Scirpophaga incertulus* (Walker); *Sesamia inferens* (Walker); *Spodoptera litura* (Fabricius); *Spodoptera mauritia* Boisduval; *Sylepta derogata* (Fabricius) (Noyes, 2003), *Diaphania indica* (Saunders) (Nadarajan, L.; Jayaraj, S. 1977).

*Type locality* : Australia, New South Wales.

*Distribution* : Mauritius, Pakistan to Taiwan, Papua New Guinea and to Eastern Australia (Bouček, 1988).

*Remarks* : Bouček (1998) states that *Tetrastichus inferens* Yoshimoto is extremely close to *T. howardi* except for a slightly flattened dorsum of mesosoma in *T. inferens*. *T. howardi* is a very efficient biological control agent used against the notorious Black headed Caterpillar Pest of Coconut viz. *Opisina arenosella* in Kerala state (India).

*Material examined* : 21 Females, India, Kerala, Kasaragod, 15.xi.1998, coll. Sujatha.

### 33. *Tetrastichus hydrelliae* Sheng Jinkun

1995. *Tetrastichus hydrelliae* Sheng Jinkun, 17(1) : 23. Holotype, Female (Department of Plant Protection, JAU, Nauchang, China).

*Diagnosis* : *Female* : Additional characters : length 1.6-1.8 mm. This species resembles *T. schoenobii* Ferrière in general appearance but differs from it in having clava (including spicule) distinctly longer than F2 plus F3; body a little shorter and broader, slightly longer than combined length of head plus mesosoma; funicle segments a little large and narrower

*Male* : 1.14mm (Sheng, J. 1995).

*Type locality* : China : Jiangxi.

*Host* : *Hydrellia sasaki* Yusa et. Isitani (Ephydriidae) (Sheng, J. 1995).

*Material examined* : 6 Females, India, Kerala, Calicut Dt., Nanminda (Near Calicut) (11° 26' N 75° 50' E), 30. viii. 2002 and 4. iv. 2004 T. C. Narendran & Party; 1 Female, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. ii. 2003, T. C. Narendran & Party; 1 Female, Kerala, Alapetty Dt., Kayamkulam (9° 31' N 76° 32' E), 19. iv. 2004, T. C. Narendran & Party.

*Remarks* : This is the first record of this species from India.

### 34. *Tetrastichus iaricus* Narendran sp. nov.

(Figs. 187-188)

*Holotype* : *Female* : Length 2.1 mm. Black with metallic green or blue reflections; eye grayish yellow; ocelli reflecting yellow; antenna brown with pedicellus and scape yellowish

brown; tegula pale brown. Legs with coxae and femora concolorous with mesosoma except paler apices of femora; rest of segments yellow with apical tarsal segment and pretarsus pale brown; wings hyaline.

*Head* : A little wider than mesosoma; as wide as long in front view; about 5x as wide as maximum length in dorsal view. POL 2x OOL; OOL a little more than OD (5 : 4); eye bare in profile, 1.5x as long as wide, a little less than 2x as long as malar space (15 : 8); MS straight, head with weak reticulation. Antennal formula 11433; scape almost reaching front ocellus but not reaching level of vertex, subequal in length to eye in profile; antennal segments as in figure 187.

*Mesosoma* : 1.33x as long as its maximum width; mid lobe of mesoscutum as broad as long, with longitudinal reticulations, ML moderately deep and almost complete; with 4 adnotaular setae on each side, posterior pair longer than remaining setae. Scutellum width subequal to its length, SMG nearer to SLG than to each other; enclosed space 2x as long as broad. Propodeum 3x as long as metanotum; submedian area distinctly reticulate; spiracle almost touching metanotum, callus with 3 setae inside spiracle rim and two outside (one near spiracle and other posteriorly near coxa). Legs moderately stout, midtibial spur 0.71x length of metatarsus. Forewing 2x as long as broad; CC 10.5x as long as wide, subequal to MV; SMV with 1 dorsal seta; MV 5x STV with 10 - 12 setae on its outer margin; speculum closed posteriorly, not running below MV towards anterior end; region beyond speculum moderately pilose; marginal fringe 0.5x length of STV.

*Gaster* : (Fig. 188) As long as mesosoma, mostly shiny. Hypopygium exceeding a little beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : New Delhi, Indian Agricultural Research Institute (28° 40' N 77° 11' E), 06. viii. 1986, T. C. Narendran (ZSIK).

*Paratypes* : 1 Female, India, Kerala, Kozhikode, Vellannur (11° 17' N 75° 51' E), 24. xii. 2000 (DZUC); 1 Female, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 03. x. 1986, T. C. Narendran (DZUC).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 4; SMV with 1 dorsal seta; F1 equal in length to F2; CC as long as MV; mesoscutum with 4 adnotaular setae on either side; posterior most pair longer than others; gaster as long as mesosoma; legs with fore and hind coxae black with metallic green reflections; all femora brownish black with apices paler; tibiae and tarsi pale brownish yellow; body black with metallic green or blue reflection; ML moderately deep and almost complete.

### 35. *Tetrastichus inferens* Yoshimoto

1970. *Tetrastichus inferens* Yoshimoto. 1607-1609. Female, Taiwan (CNC)

*Diagnosis : Female* : Length 1.7-3.0 mm. Similar to *T. punjabensis* Kurian but differs in characters mentioned under key above: Body dark brown or black with slight blue green iridescence; scape, coxae, trochanters, tips of femora, entire tibiae and tarsi except apical tarsal segment pale or yellowish (Yoshimoto 1970).

*Male* : Length 1.4-1.7 mm. Similar to Female. Antennal scape with a lower plaque; funicle 4 segmented. For other characters see original paper of Yoshimoto (1970).

*Host* : *Sesamia inferens* (Walker) (Lepidoptera : Noctuidae)

*Distribution* : Taiwan, India (Introduced).

*Type locality* : Taiwan : Tainan.

36. *Tetrastichus kottiyooricus* Narendran sp. nov.  
(Figs. 204-205)

*Holotype : Female* : Black with slight metallic green refringence, eye reddish brown; ocelli pale reflecting yellow; antenna brown with pedicellus and scape pale brownish yellow; fore coxa brown; mid and hindcoxae concolorous with mesosoma with apices paler; all femora brown or dark brown with apices yellow; tibiae and tarsi yellow (except brownish yellow apical tarsus); pretarsus darker. Wings hyaline, veins pale brownish yellow.

*Head* : A little wider than mesosoma, as broad as long in anterior view, 6x as broad as its median length in dorsal view, about 2.2x as long as its maximum width in dorsal view. POL 1.4x OOL; 1.66x OD. Eye bare, a little more than 1.55x as long as its width in profile, 2x as long as MS, a little longer than 1.16x scape; head smooth with weak reticulations. Antennal formula 11133; scape reaching front ocellus but not reaching level of vertex; subequal to eye length in profile. Antennal segments as in figure 204.

*Mesosoma* : A little longer than 1.38x its width, middle lobe of mesoscutum a little wider than long (12 : 10), distinctly reticulate, with 3 adnotaular setae on each side; ML almost complete or hardly distinct near posterior margin of pronotum. Scutellum a little wider than long (11 : 10), SMG a little near to SLG than to each other, enclosed space 2x as long as its diameter. Propodeum 2.5x as long as metanotum, submedian areas distinctly reticulate; spiracle separated from metanotum by about 2x its diameter; callus with 2 or 3 outer setae and 1 seta inner to spiracle. Midleg with tibial spur 0.75x as long as midmetatarsus; forewing 2.54x as long as wide; CC 15-16x as long as wide, subequal to length of MV; SMV with single dorsal seta; MV a little longer than 2.6x STV; MV with 18 - 19 long setae on anterior margin; marginal fringe 0.25x as long as STV; speculum closed behind by cubital line of setae, not extending as a strip below MV; area beyond speculum densely setose.

*Gaster* : (Fig. 205) A little longer than head plus mesosoma, hypopygium reaching middle of gaster; tergites smooth and shiny with pubescence.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Kannur, Kottiyoor (10° 7' N 78° 49' E), 17. ii. 2003. T. C. Narendran & Party (ZSIK).

*Paratypes* : 5 Females of same data of holotype; 2 Females, Kerala, Nanminda (11° 26' N 75° 50' E) (near Calicut), 14. ii. 2004, T. C. Narendran & Party; 1 Female, West Bengal Kalyani (21° 47' N 88° 31' E), 07. iii. 1998, T. C. Narendran, 1 Female, Kerala, Idukki, Thekkadi (9° 36' N 77° 12' E), 15. v. 1986, T. C. Narendran; 1 Female, Kerala, Thiruvananthapuram Dt., Vithura (8° 40' N 77° 7' E), 8. iii. 2000. T. C. Narendran, 3 Females, Kochi, Nedumbasseri (10° 1' N 76° 18' E), 12. i. 2004, T. C. Narendran & Party, 1 Female, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 2. xii. 1987, T. C. Narendran; 4 Females, Kerala, Kasargode Dt., Central Plantation Crops Institute (CPCRI) (12° 31' N 74° 60' E), 21. i. 2003, T. C. Narendran & Party; 1 Female, Kerala, Idukki Dt., Vandiperiyar, Pasumalai, (9° 35' N 77° 5' E), 8. i. 2000. T. C. Narendran & Party; 2 Females, South Kerala, Vithura (8° 40' N 77° 7' E), 8. iii. 2000. T. C. Narendran & Party; 3 Females, Calicut, Chaliyam (11° 9' N 75° 49' E), 14. iii. 2003, T. C. Narendran & Party; 3 Females, Kerala, Kasargode, Chowki (12° 31' N 74° 59' E), 23. i. 2003, T. C. Narendran & Party; 1 Female, Kasargode (12° 30' N 74° 59' E), 21. i. 2003 T. C. Narendran & Party; 1 Female, Kerala, Calicut, Thiruvannur (75° 47' E 11° 16' N), 26. x. 1995. T. C. Narendran & Party. All types are in DZUC.

*Etymology* : Named after the locality from where the holotype was collected.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anellus 1 only; F1 distinctly longer than F2; clava about 2.6x as long as broad, broader than funicle, shorter than scape; F1 about 2.4x as long as malar space; enclosed space of SMG 2x as long as broad; mesosoma a little shorter than 1.4x its width; POL 1.4x OOL; body black with slight metallic reflections.

### 37. *Tetrastichus krishnieri* (Mani)

1941. *Aprostocetus krishnieri* Mani 3 : 36. Holotype : Female, India (ZSIK) [Hussain & Khan, 1986 transferred to *Tetrastichus*].

*Diagnosis : Female* : Length 2.5 mm. This is extremely close to *Tetrastichus howardi* but can be separated by using the key given above. This species is not represented in my collection and the type could not be examined as repeated requests did not materialise.

*Male* : Unknown.

*Host* : *Hypolixus truncatulus* (Fabricius) (Coleoptera : Curculionidae) on *Amaranthus* sp.

*Type locality* : India, Tamil Nadu, Coimbatore.

### 38. *Tetrastichus kumaonensis* Saraswat

1975. *Tetrastichus kumaonensis* Saraswat : 7-10. Holotype Male. India, (SEA).

This species is based on male and hence it is difficult to ascertain its correct identity from the descriptions and figures. It is doubtful that it belongs to the genus *Tetrastichus* Haliday. It may be a species of *Aprostocetus* Westwood.

*Type locality* : India : Chaubattia : Kumaon Hills.

### 39. *Tetrastichus lankicus* Narendran

2005. *Tetrastichus lankicus* Narendran (A) 24 (1) : 41-42. Holotype : Female, Sri Lanka (UCDC).

*Redescription : Female* : length 1.3-1.5 mm. head and mesosoma black; eye yellowish; ocelli pale reflecting yellow; antenna brown with scape yellow; legs yellow with coxae brown fading to yellow apically; gaster liver brownish black with apical tergites darker. Wings hyaline, veins pale yellow.

*Head* : Tilted ventrally so that mouth directed posteriorwards; width in anterior view 1.16x as wide as its length; width in dorsal view 2.26x as wide as its maximum length; temples moderately narrow; tentorial pits moderately large and distinct ; lower clypeal margin bilobed; mandibles with an outer falcate tooth; scrobe shallow, margins indistinct; eye pilose; eye height in profile 1.3x length of malar space; MS distinct and straight without a basal fovea; frontofacial sulcus indistinct or absent; occiput not margined. POL 1.71x OOL; setae of vertex relatively very long, their length nearly diameter of an ocellus. Antennal toruli situated at level of lower margin of eye; antennal formula 11233; flagellum with one row of long sensillae on each segment, densely pubescent with long semierect setae; apex of clava with a spicula and seta; length of seta 2x length of spicula; scape 0.77x as long as height of eye in profile, 2.5x as long as pedicellus; F1 subequal to length of pedicellus; F2 shorter than F1; F3 transverse and distinctly wider and shorter than F2; clava 2.6x as long as F3.

*Mesosoma* : Not flattened; pronotum relatively large, 2.6x as wide as its maximum length; anterior margin concave medially, surface finely reticulate, with a large projecting unusually raised spiracle on either side; mesoscutum with a median deep groove with 3 setae in a row on either side; axillae strongly and angulately advanced; dorsellum with a median carina; propodeum with an inverted "Y" shaped paraspiracular carina on either side; median carina present; submedian areas strongly rugose-reticulate; rim of propodeal spiracle fully exposed, spiracle situated at a distance half its diameter from metanotal margin. Forewing 2.76x as long as wide; SMV with one dorsal seta; speculum closed behind by a cubital line of setae; basal line of setae present; CC distinctly longer than MV; PMV absent; STV 0.33x as long as MV. Hind wing 4.18x as long as wide; hindcoxa rather strongly reticulate on dorsal side.

*Gaster* : Somewhat ovate apically; ovipositor sheath hardly visible from dorsum; hypopygium extending beyond middle of gaster, one cercal seta on each side longer than others and sinuate.

*Male* : Unknown.

*Host* : Unknown.

*Type locality* : Sri Lanka, Peradeniya.

*Material examined* : Type only.

40. *Tetrastichus laparus* Narendran sp. nov.  
(Figs. 254-255)

*Holotype : Female* : Length 1.94 mm. Slightly dark with metallic green reflection; eye brown; ocelli reflecting pale brown; antenna brown with scape and pedicellus pale; tegula brown with slight metallic green reflection; coxae concolorous with body; femora brown or dark brown with apices pale yellow; tibiae and tarsi pale yellow; trochanters pale brownish yellow; wings hyaline with veins pale brownish yellow.

*Head* : A little wider than mesosoma (30 : 28); 1.11x as broad as long in anterior view, 3.33x as broad as median length in dorsal view, POL 2.5x OOL; OD : OOL=3.5 : 4. Eye bare, a little longer than wide in side view (16 : 14), 1.6x as long as malar space, MS straight; head reticulate, a depression running from base of eye margin to toruli. Antennal formula 11233; scape not quite reaching front ocellus, distinctly shorter than eye height in profile (12 : 16); antenna as in figure 254.

*Mesosoma* : A little longer than wide (19 : 17), midlobe of mesoscutum a little over 1.28x as long as broad; ML complete; mesoscutum weakly reticulate, with 4-5 adnotaular setae on each side. Scutellum a little broader than long; SMG a little nearer to SLG than to each other, enclosed space 3x as long as its width. Propodeum 2.5x as long as dorsellum, well reticulate, spiracle separated from metanotum by a distance subequal to diameter of spiracle; callus with 4 posterior and 3 anterior setae on each side. Mid tibial spur 0.71x as long as midmetatarsus. Forewing 2.48x as long as broad, CC shorter than MV; SMV with one dorsal seta; MV 3x as long as STV; speculum closed behind, not extending as a strip behind MV; marginal fringe 0.2x as long as STV.

*Gaster* : (Fig. 255) Sessile, longer than head plus mesosoma; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Malappuram (11° 7' N 75° 5' E), 26. i. 1986, T. C. Narendran (ZSIK).

*Paratypes* : 2 Females, Kerala, Waynad Dt., Muthanga (11° 44' N 76° 29' E), 7. x. 1989, T. C. Narendran; 1 Female of the same data of the holotype except date 10. x. 2000; 1 Females, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 1990, T. C. Narendran; 1 Female, Kerala, Palghat Dt., Chindakki (10° 39' N 76° 40' E) 13. xii. 1987, T. C. Narendran.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; gaster 1.54x as long as mesosoma; eye height in profile 1.6x as long as malar space; forewing length 2.48x as long as its maximum width; mesoscutum with 4 or 5 adnotaular setae on either side; head and body slightly dark metallic green and SMV with one dorsal seta.

#### 41. *Tetrastichus magnicarpus* Khan & Shafee

1988. *Tetrastichus magnicarpus* Khan & Shafee, 45-46. Holotype : Female, India, (ZDAMU).

*Diagnosis* : *Female* : Length 2.59 mm. Black with metallic reflections; OD equal to OOL; other characters as in key. Additional characters : F1 3x as long as wide, distinctly longer than F2 and F3 separately; F3 3x as long as wide; forewings 2x as long as wide; CC with 16 setae.

*Male* : Unknown.

*Host* : ex *Ferrisia virgata* (Cockerell) (Homoptera : Pseudococcidae) on *Ficus glomerata*

*Type locality* : India, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), Sasmi.

*Remarks* : The above account is based on the original description of Khan & Shafee.

#### 42. *Tetrastichus mangifera* Khan & Sushil

1993. *Tetrastichus mangifera* Khan & Sushil, 89 : 333-335. Holotype Female, India (ZDAMU).

*Diagnosis* : *Female* : Length 1.12mm. Additional characters other than those mentioned in the key : Body without metallic reflections; antenna dark with pedicellus and scape yellow; gaster dark with basal one third yellow.; lower half of frons, clypeus and malar space light yellow; malar space distinctly longer than eye width (14 : 9); scape almost as long as F1 plus F2 plus F3; pedicellus distinctly longer than F1; midtibial spur longer than midmetatarsus. Gaster longer than mesosoma.

*Male* : Unknown.

*Host* : Coccids on *Mangifera indica* (Khan & Sushil, 1993).

*Type locality* : India, Uttaranchal, Nainital.

*Remarks* : Judging from the nature of paraspiracular carina of propodeum (Fig. 14 Khan & Sushil, 2005) it is doubtful whether this species belongs to *Tetrastichus*. The above diagnosis is based on the original paper of Khan & Sushil (1993).

#### 43. *Tetrastichus manjumalaicus* Narendran sp. nov. (Figs. 181-182)

*Holotype* : *Female* : Length 1.7 mm. Black with slight metallic green reflections; eye darkened; ocelli pale reflecting yellow; antenna dark brown with scape and pedicellus

paler; all coxae and femora concolorous with body except paler apices of femora; trochanter, tibiae, and tarsi pale brownish yellow; pretarsi dark brown.

*Head* : Slightly broader than mesosoma; 1.12x as broad as long in front view; 2.6x as broad as long in dorsal view; POL 1.75x OOL; OOL a little more than 1.3x OD; eye in profile 1.13x as long as broad, 2.25x as long as malar space, moderately pilose; MS straight; head slightly shiny with weak engraved reticulation. Antennal formula 11433; scape reaching level of vertex but not clearly exceeding it, equal in length to eye length in profile; antennal segments as in figure 181.

*Mesosoma* : 1.25x as long as broad; mid lobe of mesoscutum a little broader than long (11 : 10) with fine longitudinal reticulation, ML distinct except on one third anteriorly; 5 erect strong adnotaular setae on each side. Scutellum a little wider than long; SMG slightly nearer to SLG than to each other, enclosed space 1.86x as long as broad. Propodeum about 2.7x as long as dorsellum; spiracle separated from metanotum by its diameter; callus with 2 setae outside spiracle and one inside. Legs stout, length of midtibial spur 0.75x length of metatarsus; forewing 2.06x as long as its maximum width; CC 12.5x as long as broad; SMV with one dorsal seta; MV 2.73x as long as STV; its front edge with about 16-18 setae; PMV absent; speculum closed behind by cubital line of setae, speculum small, not extending below MV, wing beyond speculum widely pilose; length of marginal fringe 0.57 x length of STV.

*Gaster* (Fig. 182) : A little shorter (or Subequal) (24 : 25) than mesosoma; ovipositor sheath densely setose; tergites smooth and shiny; hypopygium just exceeding middle of gaster (not at all exceeding apex).

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : *Female* : India : Kerala, Idukki District, Vandiperiyar, Manjumalai (9°35' N 77° 5' E), Cardamom Plantations, 08. i. 2004, coll. T. C. Narendran & Party (ZSIK).

*Paratypes* : 2 Females with same collection data as of holotype.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 4; mesoscutum with an incomplete median longitudinal groove running from posterior margin to middle or slightly beyond; F1 distinctly longer than F2; gaster slightly shorter than mesosoma; body black with metallic green and blue reflection.

#### 44. *Tetrastichus mindicus* Narendran sp. nov.

(Figs. 266-268)

*Holotype* : *Female* : Length 2.18 mm. Black with metallic green reflection; eye brown; ocelli reflecting yellow; antenna blackish brown with scape and ventral side of pedicellus pale brownish yellow, tegula brown; all coxae concolorous with mesosoma; femora

brownish black with apices pale brownish yellow ; tibiae pale yellowish brown; first 3 tarsi pale yellow; fourth tarsi brownish yellow; pretarsi brown; wings hyaline with veins pale brown.

*Head* : As wide as mesosoma, a little wider than long in anterior view (23 : 22), about 5x as wide as long in dorsal view. POL 1.75x OOL; OD : OOL = 3 : 4; eye bare, 1.3x as long as broad in side view, 1.86x as long as malar space; MS straight; head with large pits on parascrobal space, gena and lower frons well reticulate. Antennal formula 11233; scape exceeding level of vertex, longer than eye in side view; antennal segments as in figure 266.

*Mesosoma* : (Fig. 267) 1.26x as long as broad; midlobe of mesoscutum 1.88x as broad as long, with 3 adnotaular setae, ML deep and complete; scutellum 2.06x as wide as long, SMG nearer to SLG than to each other; enclosed space as long as broad; only one pair of setae could be seen. Propodeum 2x as long as dorsellum; submedian areas distinctly and coarsely reticulate; spiracle slightly raised at sides, separated from metanotum by a little distance more than its diameter; callus with 2 posterior and 2 anterior setae. Mid tibial spur 0.43x as long as midmetatarsus. Forewing 2.03x as long as broad, CC subequal to MV, SMV with one dorsal seta; MV 3.1x STV; MV with 15-17 setae on anterior margin; speculum closed behind, not extending as a strip below MV, marginal fringe 0.3x as long as STV.

*Gaster* : (Fig. 268) Sessile, a little longer than mesosoma (30 : 28), shorter than head + mesosoma (30 : 37); hypopygium reaching a little beyond middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 4. vii. 2004, T. C. Narendran & Party (DSIK).

*Remarks* : This is an extraordinary species with unusually wide mesosoma and SMG, raised propodeal spiracle and carinae and broad dorsellum. Only one pair of scutellar setae could be detected (no other pair or setal pits could be detected). It is likely that this species belongs to an undescribed genus. Study of more specimens is needed to ascertain its true generic status.

#### 45. *Tetrastichus miser* (Nees)

1834. *Eulophus miser* Nees, 173. Syntypes Female. Germany, Sickershausen, August (Nees) (destroyed) Graham (1991) designated Neotype Female, Great Britain ? near London (Walker) (the lectotype of *Cirrospilus attalus* Walker, 1839 : 353).

The species *Cirrospilus attalus* Walker (1839), *Entedon medianus* Ratzeburg (1848) are reported (see Graham, 1991 for details) junior synonyms of *Tetrastichus miser*.

*Diagnosis* : Besides key additional characters : Eye with extremely short pubescence;

malar space 0.66x length of eye; SMG of scutellum equidistant from each other and from SLG, or hardly nearer to the latter, enclosed space 2.2–2.8x as long as broad; callus with 4-7 setae arranged in two groups, one near the spiracle and the other near hind corner of propodeum; SMV with 1 dorsal seta; gaster slightly shorter or as long as mesosoma; hypopygium reaching 0.5x length of gaster.

The redescription provided by Graham (1991) is good enough for identification of this species.

*Male* : See Graham (1991).

*Host* : *Rhynchaenus alni* (L.), *R. fagi* (L.), *R. pilosus* (L.), *R. quercus* (L.), *R. salicis* (L.), *R. oxyacanthae* (Marsham) (Coleoptera : Curculionidae) (Graham 1991).

*Remarks* : The above account is based on Graham (1991). The above European species was reported from India by Narasimham (1984) and Noyes (2003).

#### 46. *Tetrastichus mohani* Khan & Sushil

1993. *Tetrastichus mohani* Khan & Sushil, 331-332. Holotype, Female, India (ZSIC).

*Diagnosis* : POL less than 2x OOL; scape a little over 3.2x as long as wide; F2 shorter than F1, quadrate; clava almost as long as F2 plus F3; mesoscutum with 4 adnotaular setae on each side; enclosed space between SMG of scutellum 2.57x as long as wide; figure 3 of Khan & Sushil (1992) shows propodeum with several finger like carinae on posterior margin.

*Male* : Unknown.

*Host* : Agromyzid leaf mine.

*Type locality* : India : Uttaranchal : Nainital.

#### 47. *Tetrastichus momardicae* Domenichini

1964. *Tetrastichus momardicae* Domenichini, 101 : Holotype Female (SEA) (new name for *Tetrastichus lasiopterae* Bhatnagar 1952).

*Diagnosis* : *Female* : Additional characters besides those mentioned in the key above are : clava 1.5x as long as F3, distinctly longer than F2 plus F3 (27 : 17) mesosoma light reddish brown; OOL subequal to POL; mesoscutum, scutellum and propodeum smooth; face impunctate; SMV subequal in length to MV, gaster longer than mesosoma, acuminate towards apex.

*Male* : Unknown.

*Host* : *Lasioptera falcata* Felt (Diptera : Cecidomyiidae).

*Type locality* : India, Kerala, Trivandrum.

48. *Tetrastichus mukatus* Narendran sp. nov.  
(Figs. 212-214)

*Holotype : Female* : Length 1.96 mm. Black with slight metallic blue reflection; eye pale brown, ocelli reflecting yellow; antenna brown with scape pale yellow; fore and mid coxae pale yellowish brown; all femora pale brown with apices pale yellow; hindcoxa dark brown with apex paler; all tibiae pale yellow; all tarsi except light brown fourth tarsus pale yellow; pretarsi brown. Wings hyaline with veins pale yellow.

*Head* : Slightly wider than mesosoma (16 : 15), 1.13x as broad as long in anterior view, 5.33x as broad as its median length in dorsal view. POL a little over 2.14x OOL; OD a little shorter than OOL (3 : 3.5); ocelli not surrounded by a groove; eye with short sparse pilosity, about 1.29x as long as broad in side view, 2.25x as long as malar space; MS straight with a small subocular pit at base; head distinctly reticulate; mandibles relatively very large with outer tooth somewhat falcate (Fig. 213). Antennal formula 11133, scape a little shorter than eye in profile (7 : 8), not reaching level of vertex; antennal segments as in figure 212.

*Mesosoma* : 1.4x as long as broad, reticulate, ML indistinct on anterior one - third, with 3 adnotaular setae on each side, posterior pair longer than others; mid lobe of mesoscutum 1.125x as broad as long. Scutellum 1.143x as broad as long; SMG a little nearer to SLG than to each other, enclosed space 1.75x as long as broad. Propodeum 2x as long as dorsellum; spiracle separated from metanotum by a distance shorter than its diameter; callus with 3 short setae. Midtibial spur a little exceeding basal half of hind metatarsus (4 : 7). Forewing 2.25x as long as broad, CC 16x as long as broad, shorter than MV; SMV with 1 dorsal seta; MV 2.57x as long as STV, marginal fringe 0.285x as long as STV, MV with 10 setae on front margin. Speculum closed behind by cubital line of setae, not extending to MV.

*Gaster* : (Fig. 214) Sessile, ovate, distinctly longer than head plus mesosoma (28 : 23); hypopygium reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : 1 Female, India, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. ii. 2003, T. C. Narendran & Party. (ZSIK)

*Paratypes* : 1 Female with same data as for holotype, 1 Female, SriLanka, Central Kandy Dt., University of Peradeniya, Hantana 10-14. viii. 1999 M. & J. Wasbaeur (Bohart Museum, California)

*Variation* : In SriLankan specimen gaster more brownish.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anellus 1; mandibles relatively very large with outer tooth somewhat falcate; clava longer than F2 plus F3, shorter than scape; eye pilose; F2 equal

in length to F3; gaster little more than 2.6x as long as broad, distinctly longer than head plus mesosoma; body black with slight metallic blue reflection.

49. *Tetrastichus neocupressi* Narendran sp. nov.  
(Figs. 241-242)

*Holotype : Female* : Length 2.1 mm. Black with metallic bluish green reflections. Eye brick red; ocelli reflecting reddish brown; antenna brown with scape pale brownish yellow; tegula pale brown; coxae and femora (except paler apices of femora) concolorous with mesosoma, tibiae and tarsi yellow with brownish tinge on fourth tarsi; pretarsi brown. Forewing hyaline with veins pale yellow.

*Head* : Width subequal to width of mesosoma, a little wider than long in anterior view (25 : 22), 6.5x as wide as median length in dorsal view. POL 2x OOL; OD a little shorter than OOL (2 : 3); eye with extremely short (careful observation under proper magnification is necessary for detecting this) pubescence, a little over 1.2x as long as wide in side view, 1.7x as long as malar space; MS straight; head distinctly reticulate. Antennal formula 11233; scape almost reaching front ocellus, a little shorter than height of eye in profile (14 : 17), antennal segments as in figure 241.

*Mesosoma* : A little longer than 1.2x its maximum width, with raised reticulation; mid lobe of mesoscutum a little broader than long (17 : 16), ML complete, with 8 adnotaular setae on each side. Scutellum distinctly wider than long (13 : 9), SMG slightly nearer to SLG, enclosed area 1.8x as long as broad. Propodeum 3x as long as dorsellum; spiracle separated from metanotum by a distance almost equal to its diameter; callus with 3 setae posteriorly and 3 setae anteriorly. Mid-metatarsal spur a little shorter than metatarsus (4.5 : 5). Forewing 2.16x as long as broad; CC 7x as long as broad, shorter than MV (14 : 15); SMV with 3 dorsal setae; MV 3.75x as long as STV; speculum closed behind not running as a strip behind MV; anterior margin of MV with 14 setae; marginal fringe 0.25x length of STV.

*Gaster* : Longer than mesosoma (26 : 20) as long as head plus mesosoma; hypopygium almost reaching middle of gaster (12 : 13) (Fig. 242).

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Malappuram Dt., Kohinoor, (near Calicut University Campus) (11° 7' N 75° 6' E), 10. x. 2003, T. C. Narendran. (ZSIK).

*Paratypes* : 1 Female of the same data of holotype. 1 Female, Calicut University Campus (11° 7' N 75° 5' E), 18. v. 1989, T. C. Narendran; 1 Female, Kerala, Palghat Dt., Agali (11° 7' N 76° 40' E), 12.xii.1987, coll. T. C. Narendran & Party; 1 Female, Kerala, Palghat Dt., Chindaki (10° 39' N 76° 40' E), 18. xii. 1987, T. C. Narendran; 1 Female, Kerala, Kottiyoor (10° 7' N 78° 49' E) (Kannur Dt.), 19. ii. 2003 T. C. Narendran & Party.

*Remarks* : This species comes near *T. cupressi* Yang in general colour but differs from *cupressi* in having SMV with 3 dorsal setae; MS straight and speculum of forewing not running as a strip behind MV.

#### 50. *Tetrastichus niger* Ranaweera

1950. *Tetrastichus niger* Ranaweera, (1947), 9 : 12-14. Holotype, Female, India (IARI).

*Diagnosis : Female* : Length 1.4-1.7 mm. Black without metallic refringence, legs testaceous except coxa and femora which are dark brown; ocelli not surrounded by a groove; eye bare; scape not reaching front ocellus; clava broader than funicle and longer than F2 plus F3; ML incomplete anteriorly with 3-5 adnotaular setae on each side; forewing reaching beyond tip of gaster; SMV with 1 dorsal seta; gaster as long as mesosoma.

*Male* : similar to Female but slightly smaller.

*Host* : *Simplicia robustalis* Guen. (Lepidoptera : Noctuidae) on tea (Ranaweera, 1947)

*Type locality* : Sri Lanka, Passara.

*Distribution* : Sri Lanka and India.

*Material examined* : 1 Female, India, Uttar Pradesh, Aligarh (27° 54' N 78° 4' E), 17. xii. 1984, M. Hayat; 1 Female, Aligarh (27° 54' N 78° 4' E), xi. 1980, M. Hayat; 1 Female, 13. iv. 1979, M. Hayat; 1 Female, India, Kerala, Palghat Dt., Pattambi, Valloor (10° 49' N 76° 12' E), 13. viii. 2003, T. C. Narendran & Party.

*Remarks* : Khan & Sushil (1992) included this species in their key to Indian species without mentioning the collection data. Ranaweera (1947) states that there are 3 or 5 cilia on SMV. This may be ventral setae.

#### 51. *Tetrastichus obliqua* Khan & Sushil

1992. *Tetrastichus obliqua* Khan & Sushil, (1993), 89 : 335-336. Holotype Female, India (ZSI?).

*Diagnosis : Female* : Length 1.24 mm. Antenna uniformly yellow; the figure No. 25 of propodeum (Khan & Sushil, 1992) shows peculiar representation of structure; the scape a little less than 3x as long as broad; ML complete (Khan & Sushil, 1992).

*Male* : Unknown.

*Host* : *Spilosoma obliqua* Walker (Lepidoptera : Arctiidae).

*Type locality* : India : Nainital : Pantnagar.

#### 52. *Tetrastichus ophiusae* Crawford (Fig. 272-275)

1912. *Tetrastichus ophiusae* Crawford, 42 : 8 Holotype : Female, India (USNM) examined.

*Diagnosis : Female* Length 2.5 mm. Dark bluish green; antenna brown with scape and

lower half of pedicellus paler; eye dark gray; ocelli brown, coxae dark brown with metallic green reflections; femora brown with apical part pale yellow; tibia and tarsi pale yellow; pretarsus brown; wings hyaline, veins pale brown; pubescence on body white. Head 1.25x as wide as its length in anterior view (Fig. 274), 3.6x as wide as its median length in dorsal view (Fig. 273); ocelli enclosed in a semicircular groove on anterior part with a groove connecting toruli and ventral side of eye on either side; POL 2.1x OOL; eye height in profile 2.37x length of malar space; frons lanceolate with some large scattered punctae; antennal formula 11133; scape reaching front ocellus; antennal segments as in figure 272. Mesosoma with 2-3 rows of 13 setae on each side; enclosed space between SMG of scutellum about 1.9x as long as wide. Propodeum and gaster as in figure 275. Gaster longer than head plus mesosoma.

*Male* : Unknown.

*Host* : *Ophiusa melicerta* (Dru.) (Lepidoptera : Pyralidae).

*Type locality* : India : Karnataka : Mysore.

*Material examined* : Holotype only (USNM No. 14380).

### 53. *Tetrastichus orientalis* Khan, Agnihotri & Sushil

2005. *Tetrastichus orientalis* Khan, Agnihotri & Sushil, 185-187. Holotype Female, India (IARI)

*Diagnosis : Female* : Length 1.83 mm. Besides the characters mentioned in the key the following additional characters may be of use : Ocelli surrounded by a groove; F1 to F3 gradually increasing in length; enclosed space between SMG of scutellum a little over 2.6x as long as wide; propodeal spiracle separated from metanotum by a distance equal to its diameter; SMV subequal to MV; middle tibial spur longer than midmetatarsus. For other characters the original paper of Khan *et al.*, (2005) may be referred.

*Male* : Unknown.

*Host* : ex. eggs of yellow stem borer *Tryporyza incertulus* Walker (Lepidoptera : Pyraustidae) (Khan *et al.*, 2005).

*Type locality* : India : Uttaranchal, Nainital, Pantnagar.

*Remarks* : The above account is based on Khan *et al.*, 2005.

### 54. *Tetrastichus orissaensis* Husain & Khan

1986. *Tetrastichus orissaensis* Husain & Khan, 20 : 240. Holotype, Female, India (ZSIC) as new name for *Aprostocetus epilachnae* by Kurian, 1954, preoccupied by Giard, 1896.

*Diagnosis : Female* : Similar to *T. epilachnae* (Giard), but differs from it in the characters mentioned in the key above.

*Male* : Unknown.

*Host* : *Epilachna* beetles (Coleoptera : Chrysomelidae) on Brinjal, larval parasite of *Epiphyrops* moth.

*Type locality* : India, Orissa, Cuttack

*Remarks* : It is quite likely that *T. orissaensis* is an aberrant form of *T. epilachnae* (Giard) but to be sure a comparison of the relevant types are necessary. A request for loan of types of *orissaensis* remained unanswered.

#### 55. *Tetrastichus orthagae* Khan, Agnihotri & Sushil

2005. *Tetrastichus orthagae* Khan, Agnihotri & Sushil, 195. Holotype Female, India (IARI?).

*Diagnosis : Female* : In addition to the characters mentioned in the key, the following additional characters may be of use for the identification. Eye pubescent; middle leg uniformly yellow; hindleg yellow with coxa darker; funicular segments decreasing in length; mesoscutum with 4 adnotaular setae on each side; ML of mesoscutum incomplete; fore-metatarsus with a row of 7 setae arranged in a straight line; apical rim of fore, middle and hind tibiae with 2, 2, 8 & 5 pegs respectively (Khan *et al.*, 2005).

*Male* : Unknown.

*Host* : Mango leaf webber *Orthaga exvinacea* Hmps. (Lepidoptera : Pyralidae).

*Type locality* : India : Uttaranchal, Pantnagar.

*Remarks* : The above Diagnosis is based on the original paper by Khan *et al.*, (2005).

#### 56. *Tetrastichus pantnagarensis* Khan

1983. *Tetrastichus pantnagarensis* Khan, 185. Female, India (ZSI lost?).

*Diagnosis : Female* : Length 1.51 mm; eyes setose; clava shorter than F2 plus F3; F1 longest; scape shorter than clava; enclosed space between submedian lines of scutellum a little over 1.7x as long as its width.

*Host* : *Apanteles taragamae* through *Diaphania indica* and *Diacrisia obliqua* (Walker) (Khan, 1982).

*Type locality* : India : Nainital, Pantnagar.

#### 57. *Tetrastichus partellus* Khan & Sushil

1992. *Tetrastichus partellus* Khan & Sushil, (1993) : 3 : 339-340. Holotype : Female, India (ZSIC).

*Diagnosis : Female* : Apart from characters mentioned in the key above, the propodeum of figure 42 of Khan & Sushil (1992) shows unusual paraspircular and irregular marginal median carinae. The SMV (Fig. 43 of Khan & Sushil) shows single dorsal seta longer than STV. The pedicellus (Fig. 41 of Khan & Sushil) shows 3 long dorsal setae and 3 shorter setae on ventral margin at distal end. Mid tibial spur is as long as midmetatarsus.

*Male* : Unknown.

*Host* : Pupae of *Chilo partellus* (Swinhoe) (Lepidoptera : Pyralidae) on *Zea mays*. (Khan & Sushil, 1992).

*Material examined* : 1 Female India, Kerala, Kannur Dt., Kottiyoor (10° 7' N 78° 49' E), 19. ii. 2003 agrees with the description of Khan very closely but differs in the median carina of propodeum not wavy or irregular and carinae not unusual as in the figure 42 of Khan & Sushil (1992).

#### 58. *Tetrastichus punjabensis* (Kurian)

1952. *Aprostocetus punjabensis* Kurian, 57. Female, India (SEA?)

1986. *Tetrastichus punjabensis* (Kurian); Husain & Khan, 241.

*Aprostocetus nowsherensis* (Kurian, 1952) ; Hayat & Shahi 2004 : 313 Synonymised with *T. punjabensis*.

*Diagnosis : Female* : Length 1.75-2 mm. Metallic iridescent blue and green; scape yellowish brown, rest of antenna brown. Legs : coxae concolorous with body; trochanters and femora brownish black, remaining parts yellowish brown.

*Head* : POL 3.5x OOL; malar space slightly less than two-thirds length of eye; antennal formula 11133; scape slightly shorter than 3x length of pedicellus; F1 longest funicular segment; clava slightly longer than combined length of F3 and F2, as long as scape, apex of clava with a nipple like process at tip.

*Mesosoma* : With ML present; hind femur slightly over 2x as long as hindcoxa; hind metatarsus slightly more than half the combined length of rest of tarsi. Forewing two and one-third as long as its width; SMV very slightly longer than MV; STV one-third MV; PMV absent.

*Gaster* : Slightly more than 1.5x length of mesosoma; ovipositor very slightly exerted.

*Male* : Unknown.

*Host* : Unidentified insect defoliating *Dalbergia sissoo* (Sisam) (Mani, 1989)

*Type locality* : Punjab.

(Courtesy to Kurian, 1952 and Mani, 1989).

#### 59. *Tetrastichus ramamurthyi* Narendran sp. nov.

(Figs. 245-246)

*Holotype : Female* : Length 2 mm. Black with very slight metallic greenish blue reflection; eye pale yellow; ocelli brown; antenna brown with scape three fourth from base slightly paler; tegula brown; all coxae concolorous with mesosoma; trochanter and femora brown (hind femur dark brown) with apices paler; tibiae and tarsi (except pale brownish yellow fourth tarsi) pale yellow; pretarsi pale brown. Wings hyaline with veins pale yellow.

*Head* : A little wider than mesosoma (27 : 24), a little wider than long in anterior view (20 : 17), 4.5x as broad as dorsal median length. POL 2.25x OOL; OD equal to OOL. Eye bare, a little over 1.2x as long as wide in side view, a little over 2.28x as long as malar space; MS straight; head well reticulate. Antennal formula 11233; scape reaching level of vertex, a little shorter than eye length (15 : 16); antennal segments as in figure 245.

*Mesosoma* : A little over 1.3x as long as wide, reticulate; mid lobe of mesoscutum a little wider than long (14 : 12), with 4 adnotaular setae on each side; ML complete. Scutellum as wide as long; SMG nearer to SLG than to each other, enclosed space 2x as long as wide; propodeum 5x as long as dorsellum; spiracle separated from metanotum by about half length of its diameter; callus with 2 or 3 setae. Mid tibial spur almost as long as midmetatarsus. Forewing 2.13x as long as broad; CC shorter than MV; SMV with one dorsal seta; MV 2.833x as long as STV; PMV absent; speculum closed behind, without a strip below MV; marginal fringe 0.6x as long as STV; MV with 12-14 setae on anterior margin.

*Gaster* : (Fig. 246) Sessile, subglobose, subequal to mesosoma, hypopygium reaching beyond middle of gaster; ovipositor sheath slightly lifted upwards.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Calicut University Campus (11° 7' N 75° 5' E), 5. ii. 1989, T. C. Narendran (ZSIK).

*Paratypes* : Same locality of holotype, date 6. viii. 1986, T. C. Narendran; 1 Female, Kerala, Thalappara, (near Calicut University) (11° 7' N 75° 5' E) 31. viii. 1987, T. C. Narendran; 2 Females, Kerala, Kayamkulam, CPCRI Campus (9° 10' N 76° 30' E), 19. xi. 1989, T. C. Narendran & Party.

*Etymology* : Named after Prof. V. V. Ramamurthy, Division of Entomology, Indian Agricultural Research Institute, New Delhi for his significant contributions to taxonomy.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; gaster subglobose, subequal or a little longer than mesosoma; antennal pedicellus subequal in length to F2 or a little longer than F2; ML of mesoscutum incomplete anteriorly; head and body black or dark brown; legs with coxae and femora dark brown with apices of femora paler and mesoscutum with 4 adnotaular setae on either side.

60. *Tetrastichus santhoshi* Narendran sp. nov.  
(Figs. 183-184)

*Holotype* : Female : Length 3.5 mm. Black with slight metallic green and blue reflections; eye grayish yellow; ocelli reflecting yellow; antenna dark brown with scape and pedicellus pale brownish yellow; all coxae and femora concolorous with mesosoma except for pale apices of femora. Trochanter, apex of femur, tibia and tarsi pale brownish yellow; pretarsi black or dark brown. Wings hyaline, veins with pale brown border.

**Head** : A little narrower than mesosoma; 1.18x as broad as long in anterior view; 3.83x as broad as long in dorsal view; POL 3x OOL; OOL equal to OD; eye in profile 1.29x as long as its width, 1.8x as long as malar space, bare; MS slightly curved, head distinctly engraved with reticulation. Antennal formula 11433; scape reaching front ocellus but not level of vertex, distinctly shorter than eye in profile; antennal segments as in figure 183.

**Mesosoma** : 1.18x as long as broad; mid lobe of mesoscutum as long as wide, with distinct raised reticulations, ML deep and complete, with 2–3 longitudinal row of 12–14 adnotaular setae on each side. Scutellum length subequal to its width; SMG distinctly nearer to SLG than to each other, enclosed space 2x as long as broad. Propodeum 2.5x as long as dorsellum; submedian area slightly reticulate; spiracle separated from metanotum by a distance less than diameter of spiracle; callus with 3–5 setae outside spiracle. Legs stout, midtibial spur 0.9x as long as metatarsus. Forewing 2x as long as its maximum width; CC 13x as long as wide; SMV with 5 dorsal setae; MV 3x as long as STV, its front edge with 20 - 22 setae; PMV rudimentary; speculum large, closed below by cubital line of setae, anteriorly extending below MV up to its middle; wing beyond speculum moderately pilose, length of marginal fringes 0.66x as long as STV.

**Gaster** : (Fig. 184) 1.45x as long as mesosoma, distinctly longer than combined length of head and mesosoma (45 : 31); tergites weakly reticulate. Hypopygium exceeding almost middle of gaster but not beyond middle.

**Male** : Unknown.

**Host** : *Spilosoma obliqua*.

**Holotype** : Female, India : Kerala, Calicut University (11° 7' N 75° 5' E), 05. xi. 1989. T. C. Narendran (ZSIK)

**Paratypes** : 1 Female; Kohinoor; near Calicut University Campus (11° 7' N 75° 5' E), 10. x. 2003 T. C. Narendran; 1 Female Calicut University Campus (11° 7' N 75° 5' E), November 1985 T. C. Narendran Party; 1 Female; Calicut University Campus (11° 7' N 75° 5' E), 02. ii. 2003, K. Surekha; 1 Female; Calicut University Campus (11° 7' N 75° 5' E), Aug. 1986, T. C. Narendran & Party; 1 Female; Idukki Dt., Vandiperiyar (9° 35' N 77° 5' E) 08. i. 2004, T. C. Narendran & Party; 1 Female; Waynad Dt. Kalpetta, Thonikadavu (11° 34' N 76° 8' E), 07. ii. 2003, T. C. Narendran & Party; 1 Female; Karnataka, Thalangattupara, 01.i.1995, Narayanaswamy.

**Etymology** : Named after S. Santhosh, Department of Zoology, University of Calicut for his assistance in the collection work.

**Remarks** : This new species differs from all other Oriental species in having the following combination of characters : anelli 4; SMV with 5 or 6 dorsal setae; clava distinctly shorter than F2 plus F3; mesoscutum with 12-14 pairs of adnotaular setae in two or three longitudinal rows on either side; gastral tergites finely reticulate, gaster 2.5- 3x as long as its dorsal width, distinctly longer than head plus mesosoma; body black with distinct metallic reflections; legs with coxae and femora dark with apices of femora paler.

61. *Tetrastichus schoenobii* Ferrière

1931. *Tetrastichus schoenobii* Ferrière, 22 : 290. Holotype Female, Magaya (BMNH).

*Redescription* : *Female* : Length 1.10-1.60 mm. Body shining green with some bluish reflections; antennae brown, scape yellow; legs entirely yellow, except greenish base of forecoxae and greater part of hindcoxae.

*Head* : Transverse, very short behind eyes; ocelli in grooves; OOL less than POL; scrobe broad, not deep; eyes almost rounded; length of gena equal to length of eye, genal furrow complete; antennae inserted in the middle of face; scape short, scarcely reaching front ocellus; pedicellus elongate, a little shorter than 0.50 of scape; anelli 2, first very small; funicular segments 3, elongate, 3x as long as wide and about 2x as long as pedicellus, subequal in length; clava with 3 segments, narrow and elongate, almost as long as preceding 2 segments combined; all the segments covered with short pubescence.

*Mesosoma* : Smooth and shining, very finely shagreened; mesonotum with deep notauli, median furrow very weak, nearly obliterated anteriorly; scutellum as long as mesonotum, with 2 thin, but well marked, longitudinal furrows; propodeum finely rugulose, dull with median and lateral carinae just before spiracles, small and rounded; wings large, reaching beyond the tip of gaster; SMV with a single hair; MV longer than SMV; STV very thin at base, slightly broadening apically, broader than MV, its length about 0.33x MV; marginal ciliae short.

*Gaster* : Elongate, oval, pointed behind, not broader than mesosoma and a little longer than head and mesosoma combined; ovipositor slightly exerted.

*Male* : Length 0.80-1.20mm. Similar but smaller; antennae narrower, F1 smaller than others, about as long as pedicellus; funicle and clava with short hairs; sensorial organ on the scape narrow, elongate, almost as long as scape itself; gaster oval, a little longer than mesosoma.

*Host* : Eggs of *Scirpophaga incertulus* (Walker) (Lepidoptera : Pyralidae), *Spodoptera mauritia*, *Tryporyza insertulus*.

*Distribution* : India, Sri Lanka, Bangladesh, Malaysia, Thailand and China.

*Type locality* : Malaya : Setapak.

*Material examined* : 15 Females, India, Kerala, Kannur, 23. ii. 1999, Rajmohana, K; 11 Females, Kerala, Calicut Dt., Nanminda (11° 26' N 75° 50' E), 30. viii. 2002, 7. xii. 2003, 2. ii. 2004, 14. ii. 2004, T. C. Narendran & Party; 1 Female, Kerala, Kannur Dt., Cherukunnu, 16. ii. 2003, T. C. Narendran & Party; 1 Female, Kerala, Ernakulam Dt., Nedumbassery (10° 1' N 76° 18' E), 12. i. 2004, T. C. Narendran & Party.

*Remarks* : The above diagnosis is based on the available published descriptions (Courtesy : Ferrière, 1931 and Mani, 1989).

62. *Tetrastichus shonicus* Narendran sp. nov.  
(Figs. 243-244)

*Holotype : Female* : Length 1.9 mm. Head and mesosoma black with very slight metallic green reflection. Eye yellowish grey; ocelli reflecting yellow, antenna brown with scape and pedicellus pale yellow; tegula pale brownish yellow, all legs (including coxae) yellow; Wings hyaline with slight yellowish tinge, veins pale yellow; gaster yellowish brown with sides, dorsolateral corners and posterior end dark.

*Head* : Wider than long (13 : 12) in anterior view; wider than mesosoma (13 : 1), 3.25x as broad as median length in dorsal view. POL 1.75x OOL; OD half of OOL. Eye with sparse short pubescence, 1.3x as long as wide, 1.86x as long as malar space; MS straight; head reticulate. Antennal formula 11233; scape reaching front ocellus but not exceeding it, a little shorter than eye length in side view (11 : 13); antennal formula as in figure 243.

*Mesosoma* : As wide as long, reticulate, mid lobe of mesoscutum a little wider than long (11 : 9); ML distinct except near posterior margin of pronotum, with 4 adnotaular setae on each side. Scutellum a little wider than long (10 : 8), SMG slightly diverging posteriorly, width between them anteriorly and posteriorly in ratio 3 : 4. Propodeum 2.25x as long as dorsellum, spiracle separated from metanotum by its own diameter, callus with one anterior and 2 posterior setae. Mid tibial spur 0.8x length of midmetatarsus. Forewing 2.76x as long as broad, CC shorter than MV (11 : 14); MV 3.5x as long as STV, with 11-12 setae on anterior margin; speculum narrow, closed behind, not running as a narrow strip behind MV; marginal fringe 0.37x length of STV.

*Gaster* : (Fig. 244) Sessile, ovate, longer than head plus mesosoma; pubescent; hypopygium not quite reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype : Female*, India : Kerala, Kottiyoor (10° 7' N 78° 49' E) (Kannur Dt.), 17-19. ii. 2003, T. C. Narendran & Party (ZSIK).

*Paratypes* : 3 Females, of the same data of holotype, except date of collection 19. ii. 2003; 13 Females, Kerala, Nanminda (11° 26' N 75° 50' E) (near Calicut) 4-16. xi. 2003, T. C. Narendran & Party; 11 Females, Kerala, Pattambi (10° 49' N 76° 12' E), 12-13. viii. 2003, T. C. Narendran & Party; 3 Females, Kerala, Manjeri (11° 7' N 76° 7' E), 17. viii. 2003, T. C. Narendran & Party; 4 Females, Kerala, Tiruvannur (11° 16' N 75° 47' E) (near Calicut), 28. x. 1994, T. C. Narendran & Party; 2 Females, Kerala, Thenjipalam (11° 7' N 75° 5' E), 17. vii. 2003, 3. x. 2003, T. C. Narendran & Party; 3 Females, Kerala, Nilambur (11° 16' N 76° 13' E), 30. i. 2003, T. C. Narendran & Party; 4 Females, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 16. vii. 2001, 9. viii. 2001, 17-23. x. 2003, T. C. Narendran & Party; 1 Female 1 Female, Kerala, Calicut, Pookad, 14.xi.2001, coll. T. C. Narendran & Party; Kerala, Calicut, Kalipoyka (11° 16' N 75° 48' E), 27. xi. 2003, T. C. Narendran & Party; 1 Female, Karnataka, Sringeri (13° 25' N 75° 15' E), 22. v. 2003, P. A. Sinu.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; gaster elongate, longer than head plus mesosoma, pale brownish yellow with black markings on sides; legs including coxae yellow; mesoscutum with 4 adnotaular setae on either side.

63. *Tetrastichus sringericus* Narendran sp. nov.  
(Figs. 185-186)

*Holotype* : *Female* : Length 1.61 mm. Head and mesosoma dark brown without metallic refringence; eye pale yellowish brown; ocelli reflecting yellow; antenna and gaster completely yellow with pale brownish tinge; coxae and femora yellowish brown with apex of femur paler; trochanter, tibiae and tarsi yellow. Wings hyaline with veins pale.

*Head* : A little wider than mesosoma, a little wider than its length in anterior view, 2.92x as wide as its median length in dorsal view. POL 1.82x OOL; OOL a little more than OD (4 : 3); eye sparsely pilose in profile a little more than 1.3x as long as wide, 2.29x as long as malar space; MS straight; head mostly smooth with weak reticulations. Antennal formula 11333; scape not quite reaching front ocellus, distinctly shorter than eye in profile; antennal segments as in figure 185.

*Mesosoma* : A little more than 1.6x as long as its maximum width; mid lobe of mesoscutum 1.5x as broad as long, with longitudinally arranged reticulations, ML obsolescent anteriorly with 3 adnotaular setae on each side, posterior pair longer than other setae. Scutellum 1.23x as broad as long, SMG nearer to SLG than to each other; enclosed space about 1.63x as long as its width. Propodeum 2x as long as metanotum; submedian area well reticulate; spiracle separated from metanotum by about half its diameter; callus with 2 or 3 setae near spiracle. Legs slender, mid tibial spur a little longer than midmetatarsus. Forewing 2.26x as long as broad, CC 14x as long as wide, a little shorter than MV; SMV with 1 dorsal seta; MV 3.75x as long as STV, with 16 - 18 setae on its outer margin; speculum closed behind by cubital line of setae, speculum extended below MV up to its middle, marginal fringe sparse, 0.4x as long as STV.

*Gaster* : (Fig. 186) Longer than mesosoma, a little longer than head plus mesosoma; tergites smooth; hypopygium reaching a little beyond middle.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : *Female*, India : Karnataka, Sringeri (13° 25' N 75° 15' E), 07. iv. 2001, Coll. Sinu, P. A. (ZSIK).

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 3; mesoscutum with ML obsolescent in anterior half, with 3 adnotaular setae on each side; enclosed space between SMG about 1.63x as long as wide; midtibial spur a little longer than midmetatarsus; hypopygium reaching a little beyond middle of gaster; head and mesosoma dark brown without metallic refringence; antenna and gaster completely yellow with a slight brownish tinge.

64. *Tetrastichus sinui* Narendran sp. nov.  
(Figs. 206-207)

*Holotype : Female* : Length 1.76 mm. Head and mesosoma brownish black; eye brown with margin paler; ocelli reflecting brown; antenna pale brownish yellow with pedicellus and scape paler; all legs including coxae pale yellow; tegula pale brownish yellow. Wings hyaline with veins pale yellow; gaster brown.

*Head* : 1.18x as broad as mesosoma; 1.31x as long as broad in anterior view, 5.4x as broad as its middle length in dorsal view; POL 3.25x OOL; OD a little shorter than OOL (3 : 4). Eye bare, 1.25x as long as broad in profile, 2.5x as long as malar space; MS straight; head mostly smooth, with weak reticulations. Antennal formula 11233; scape reaching front ocellus, not quite reaching level of vertex, 0.85x length of eye in profile, antennal segments as in figure 206.

*Mesosoma* : 1.27x as long as broad, midlobe of mesoscutum 1.25x as broad as long, distinctly reticulate; ML deeper in posterior half, weak or faint in anterior half of mesoscutum, with 3 adnotaular setae on each side, posterior pair longer than other setae. Scutellum 1.2x as broad as long; SMG a little nearer to SLG than to each other, enclosed space 1.5x as long as broad. Propodeum 4x as long as dorsellum; spiracle separated from metanotum by a little more than 2x diameter of spiracle; callus with 7 long setae and one seta on outer margin of spiracle. Midtibial spur 0.5x as long as mid-metatarsus. Forewing 2.55x as long as its maximum width; CC 12x as long as wide, equal to MV; SMV with 2 dorsal setae; MV 4.6x as long as STV; marginal fringe 0.4x as long as STV.

*Gaster* : (Fig. 207) Sessile, ovate, longer than mesosoma (20 : 15); tergites smooth, hypopygium hardly reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype : Female*, India : Karnataka, Muravikomavu, Sringeri (13° 25' N 75° 15' E), 7. iv. 2001, P. A. Sinu (ZSIK).

*Etymology* : Named after P. A. Sinu, who collected the species.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anellus 1; head and mesosoma dark brown without metallic reflection; gaster yellowish brown; legs completely yellow; clava shorter than scape; POL 1.75x OOL; CC equal to MV and SMV with 2 dorsal setae.

65. *Tetrastichus sissoo* Khan, Agnihotri & Sushil

2005. *Tetrastichus sissoo* Khan, Agnihotri & Sushil, 89 : 183-185.

*Holotype : Female* : India (IARI).

*Diagnosis* : Besides the characters mentioned in the key the original description is good enough to identify this species. General body colour is dark brown with metallic refringence. Enclosed space between SMG and scutellum a little over 2.4x as long as wide; speculum of forewing large running as a strip below MV.

*Male* : Unknown.

*Host* : ex leaf miner on *Dalbergia sissoo* (Sisam) (Khan *et al.*, 2005)

*Type locality* : India : Uttaranchal, Nainital, Nagla.

*Remarks* : The above account is based on the original description of Khan *et al.*, (2005).

#### 66. *Tetrastichus spirabilis* Waterston

1922. *Tetrastichus spirabilis* Waterston, 9 : 89.

*Holotype* : Female, India (BMNH).

*Diagnosis* : *Female* : Length 2 mm. Besides key characters given above the following points may be useful for identification : antenna inserted on lower orbital border; pedicellus about 1.5x as long as wide; ratio of funicular segment length = F1- 7, F2 - 7, F3 - 6, clava - 14; mesoscutum with ML distinct; propodeum without sculpture; forewing 2.5x as long as wide; MV about 4x as long as STV; hind metatarsus as long as preceding segment; third hind tarsal segment shorter than second; fourth longest.

*Male* : Length 1.5 mm. For further details original paper by Waterston (1922) may be consulted.

*Host* : *Hypsipyla robusta* (Moore) (Lepidoptera : Pyralidae).

*Type locality* : India : Dehra Dun.

*Remarks* : The enormous spiracle of propodeum seems to make this an isolated species (Graham, 1991).

#### 67. *Tetrastichus stom* Narendran sp. nov.

(Figs. 226-227)

*Holotype* : *Female* : Length 1.75 mm. Black with metallic green reflection. Eyes dark brown; hind ocelli reflecting brown, front ocellus reflecting yellow; antenna dark brown with scape and pedicellus pale yellow; all coxae concolorous with mesosoma; all femora dark brown with apices pale yellow; tibiae and tarsi pale yellow; tegula pale brown; wings hyaline; veins pale yellow with margins brown.

*Head* : Wider than mesosoma (25 : 21), as wide as long in anterior view; a little more than 6x as wide as long in dorsal view. POL 2.33x OOL; OD a little shorter than OOL (3 : 4); ocelli not surrounded by a groove; eye with very short sparse pilosity, 1.27x as long as wide in side view, 2x as long as malar space; MS straight, head moderately reticulate. Antennal formula 11133; scape a little shorter than eye height in profile (12.5 : 14); not exceeding vertex; antennal segments as in figure 226.

**Mesosoma** : As broad as long, weakly reticulate, ML indistinct on anterior one - third; mid lobe of mesoscutum a little broader than long (10 : 9), with 3 adnotaular setae on each side. Scutellum a little over 1.6x as broad as long; SMG a little nearer to SLG than to each other. Propodeum 3x as long as dorsellum, spiracle separated from metanotum by 2x its diameter; callus with 3 setae, anterior seta on the inner margin of spiracle. Mid tibial spur 0.6x as long as midmetatarsus. Forewing 2.15x as long as broad, with a short PMV (0.33x as long as STV), CC 15x as long as broad, distinctly shorter than MV; SMV with one dorsal seta; MV 4.7x as long as STV, with 12 - 14 setae on its distal margin; marginal fringe 0.66x as long as STV.

**Gaster** : (Fig. 227) Sessile, ovate, distinctly longer than head plus mesosoma (21 : 19); hypopygium reaching or slightly exceeding middle of gaster.

**Male** : Unknown.

**Host** : Unknown.

**Holotype** : Female, India : Kerala, Calicut Dt. Nanminda (11° 26' N 75° 50' E), 14. ii. 2004, T. C. Narendran & Party (ZSIK).

**Paratypes** : 2 Females, collection data same as that of holotype; 1 Female, Kerala, Calicut, Anakampoyil (11° 18' N 76° 3' E), 17. x. 1995, T. C. Narendran.

**Remarks** : This new species differs from all other Oriental species in having the following combination of characters : anellus 1; clava distinctly longer than F2 plus F3; scape shorter than clava; POL 2.33x OOL; eye height in profile 2x length of malar space; F1 1.25x as long as pedicellus; general body colour black with metallic green reflections.

68. *Tetrastichus sumatus* Narendran sp. nov.

(Figs. 264-265)

**Holotype** : Female : Length 2.5 mm. Black with metallic green reflection. Eye brownish black; ocelli dark brown; antenna brown with scape pale yellowish brown; tegula brown; fore and mid coxae dark brown with metallic refringence; hindcoxa concolorous with mesosoma; all femora dark brown with paler apices; tibiae and tarsi yellow, pretarsi brown; wings hyaline with veins pale brown.

**Head** : A little wider than mesosoma, a little wider than long in anterior view (26 : 27), 4.75x as broad as median length in dorsal view; POL 1.5x OOL; OD : OOL = 3 : 4. Eye sparsely pilose, 1.4x as long as broad in side view, 2x as long as malar space; MS straight; head well reticulate; ocelli not enclosed by a groove. Antennal formula 11233; scape reaching front ocellus, not reaching level of vertex, distinctly shorter than eye length in profile (11 : 14); antennal segments as in figure 264.

**Mesosoma** : A little longer than wide (13 : 12); mid lobe of mesoscutum a little wider than long (16 : 14), 7-8 adnotaular setae on each side, ML almost complete. Scutellum a little more than 1.3x as wide as long, SMG nearer to SLG than to each other; enclosed space 1.8x as long as broad. Propodeum 5x as long as dorsellum, spiracle separated from metanotum by 0.6x diameter of spiracle, callus with 3 posterior setae and 3 anterior setae

on margin of spiracle. Mid tibial spur 0.83x as long as midmetatarsus. Forewing 2.32x as long as broad, CC 0.7x as long as MV; SMV with 2 dorsal setae, MV a little more than 4x as long as STV; MV with 22-23 anterior marginal setae; speculum closed behind, not running as a strip behind MV; marginal fringe 0.25x as long as STV.

*Gaster* : (Fig. 265) Sessile, combined length of epipygium and ovipositor sheath in side view about 0.5x remaining length of gaster; gaster distinctly longer than head plus mesosoma; hypopygium reaching about middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Calicut University Campus (11° 7' N 75° 5' E), 12. iv. 1989, T. C. Narendran (ZSIK).

*Paratype* : 1 Female, collection data same as that of holotype except date 18. iii. 1989; 1 Female, Kerala, Kottiyoor (10° 7' N 78° 49' E), 17. ii. 2005, T. C. Narendran & Party.

*Variation* : In one paratype from Kottiyoor the hypopygium reaching middle of gaster.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; mesoscutum with 7 to 8 setae in more or less 2 rows near each notauli; clava subequal in length to F2 plus F3; scape a little longer than clava; gaster 1.23x as long as head plus mesosoma; body black with metallic green reflections.

#### 69. *Tetrastichus taprobanensis* Ranaweera

1950. *Tetrastichus taprobanensis* Ranaweera, (1947), 9 : 10-12.

*Holotype* : Female, Sri Lanka (TRI).

*Diagnosis* : Female : Length 1.92-2.65 mm. metallic blue with greenish reflections; legs pale cream coloured with coxae and major part of femora concolorous with mesosoma; head as broad as mesosoma; ocelli surrounded by a groove which extends on sides to the eye; antennal scape reaching front ocellus, more than 2x as long as broad; funicle segments subequal in length. Mesoscutum with complete ML.

*Male* : Similar to Female but smaller. For other differences see original description by Ranaweera (1947).

*Host* : *Darna nararia* Moore (Lepidoptera : Limacodidae) on tea.

*Type locality* : Sri Lanka, Passara.

*Material examined* : 1 Female, India, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 27. iv. 1989, Surekha; 1 Female, Calicut University Campus (11° 7' N 75° 5' E), 25. x. 2003, T. C. Narendran & Party; 2 Females, Kerala, Palghat Dt., Kalkandi (11° 1' N 76° 28' E), & Agali (11° 7' N 76° 40' E), 12-13. xii. 1987, T. C. Narendran & Party; 1 Female, Kasargode, Kudlu, near CPCRI (12° 31' N 74° 60' E), 22. i. 2003, T. C. Narendran & Party; 1 Female; Calicut Dt., Nanminda (11° 26' N 75° 50' E), 2. ii. 2004 T.C. Narendran & Party.

**Remarks :** In the original description Ranaweera has stated that SMV is with 7-9 short bristles on upper side and single bristle on lower side. Probably what he meant is single dorsal bristle and 7-9 ventral bristles located posteriorly and anteriorly.

70. *Tetrastichus thalaparicus* Narendran sp. nov.  
(Figs. 234-235)

**Holotype : Female :** Length 3.06 mm. Black with very slight metallic bluish green reflection. Eye yellowish grey, ocelli reflecting yellow; antenna dark brown with scape and pedicellus paler. All coxae concolorous with body, femora dark brown with apex paler; tibiae and first 3 tarsi of each leg pale brownish yellow; fourth tarsus of each leg dark brown; tegula brown; wings hyaline with veins pale yellow and margins of veins darker.

**Head :** A little wider than mesosoma (23 : 22), 1.10x as broad as its length in anterior view; 4.6x as broad as long in dorsal view. POL 1.57x OOL; OD 0.57x OOL; ocelli not surrounded by a groove. Eye bare, 1.11x as long as broad in profile, 1.66x as long as malar space, MS straight; head distinctly reticulate. Antennal formula 11233; scape reaching level of vertex, as long as height of eye in profile; antennal segments as in figure 234.

**Mesosoma :** A little longer than wide (24 : 22), reticulate, midlobe of mesoscutum a little wider than long (12 : 10.5), ML complete, with 3 or 4 adnotaular setae on each side. Scutellum a little longer than wide (11 : 10); SMG slightly nearer to SLG than to each other, enclosed space 2.75x as long as wide. Propodeum 4x as long as dorsellum; spiracle separated from metanotum by a distance half its diameter, callus with 2 setae posteriorly. Mid tibial spur 0.7x length of midmetatarsus. Forewing 2.35x as long as broad; CC 0.73x as long as MV, SMV with one dorsal seta; MV 5x as long as STV, marginal fringe 0.33x length of STV; speculum open posteriorly, extending as a strip below MV up to its middle.

**Gaster :** (Fig. 235) A little longer than 1.72x combined length of head plus mesosoma; epipygium and ovipositor sheath relatively long; hypopygium ending far ahead of middle of gaster.

**Male :** Unknown.

**Host :** Unknown.

**Holotype : Female,** India : Kerala, Malappuram Dt., Thalappara (near Calicut University) (11° 8' N 75° 7' E), 31. VIII. 1987, Coll. T. C. Narendran & party (ZSIK).

**Remarks :** This new species differs from all other Oriental species in having the following combination of characters : anelli 2; gaster about 2.6x as long as mesosoma; epipygium and ovipositor sheath relatively long; head and body black with very slight metallic bluish green reflection; ML complete and CC shorter than MV.

71. *Tetrastichus thonicus* Narendran sp. nov.  
(Figs. 193-195)

**Holotype : Female :** 2.25 mm. Black; eye brown; ocelli reflecting yellow; antenna brown with scape pale yellow; mandibles brown; coxae dark brown; fore and mid femora brown

on outer basal half, part and following segments pale yellow; hind femora slightly darker than fore and hind femora with apex pale yellow, following segments of hindleg pale yellow, except brown fourth tarsal segment and pretarsus; first, second and third tarsal segments of hindleg more yellow; tegula brown; forewing hyaline; veins pale brownish yellow.

*Head* : A little more than 1.15x width of mesosoma; 1.1x as broad as long in anterior view, 5x as broad as its median length in dorsal view; POL 2.75x OOL; OD equal to OOL; ocelli surrounded by a groove with a cross groove connecting ocular groove on either side. Eye sparsely pilose with very minute pilosity, a little longer than 1.2x its width in profile, 2.2x as long as malar space; MS straight; head with weak reticulation. Antennal formula 11242; scape hardly reaching level of vertex, about as long as eye. Antennal segments as in figure 193.

*Mesosoma* : A little wider than 1.28x its length, with raised reticulations, ML deep and complete, with 4 adnotaular setae on each side; mid lobe of mesoscutum 1.18x as broad as long. Scutellum (Fig. 195) as broad as long; SMG nearer to SLG than to each other, enclosed space 2x as long as broad. Scutellum with 2 pairs of setae, middle pair nearer to anterior pair than to posterior pair; posterior setae 1.5x as long as middle seta. Propodeum 4x as long as dorsellum, submedian areas with raised reticulations; spiracle separated from metanotum by 2x its diameter; callus with 2 setae on outer side and one on outer margin of spiracle. Legs with middle tibial spur about 0.8x length of midmetatarsus. Forewing 2.1x as long as broad; CC 11.5x as long as wide, 0.59x length of MV; SMV with 1 dorsal seta; MV about 4.9x length of STV, PMV rudimentary; marginal fringe 0.5x length of STV; MV with 20 - 24 setae on anterior margin; speculum narrow, closed, not extending to MV; area beyond speculum densely pilose.

*Gaster* : (Fig. 194) Distinctly longer than mesosoma, but a little shorter than head plus mesosoma; hypopygium reaching middle of gaster; tergites smooth and shiny, pilose on sides (Fig. 194).

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Idukki, Cheruthoni (9° 51' N 76° 58' E), 10. i. 2004, T. C. Narendran & Party (ZSIK).

*Paratype* : 1 Female, collection data same as that of holotype.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; scutellum with 3 pairs of setae; ocelli surrounded by a groove; mesoscutum with 4 adnotaular setae; general body colour black with slight metallic green reflections and antenna with 2 anelli.

## 72. *Tetrastichus thoracicus* Khan, Agnihotri & Sushil

2005. *Tetrastichus thoracicus* Khan, Agnihotri & Sushil, 89 : 191. Holotype : Female, India (IARI?)

**Diagnosis** : Characters mentioned in the key is sufficient for identification of the species. However the following may be of use : enclosed space between the SMG of scutellum (see Fig. 6. page 194 of Khan *et al.*,2005) 3.5x as long as wide; ocelli not surrounded by a groove (Fig. 1 page 194 of Khan *et al.*,2005).

**Male** : Unknown.

**Host** : ex leaf miner on *Dalbergia sissoo* (Sisam) (Khan *et al.*, 2005)

**Type locality** : India : Uttaranchal, Nainital, Nagla.

**Remarks** : The above account is based on the original description of Khan *et al.*, (2005).

### 73. *Tetrastichus triozei* Khan, Agnihotri & Sushil

2005. *Tetrastichus triozei* Khan, Agnihotri & Sushil, 191-192.

**Holotype** : Female, India (IARI?).

**Diagnosis** : Female : Besides the characters mentioned in the key the following points may be of use : legs yellow with fore and hindcoxae dark brown; femora of fore and hindlegs infuscated with apices pale. POL more than 2x OOL; SMV with 1 dorsal seta. Gaster shorter than mesosoma. For other characters the original description of Khan *et al.*, (2005) may be referred.

**Male** : Unknown.

**Host** : Leaf galls of *Trioza fletcheri* on *Treuzia nudiflora* Linn. (Khan *et al.*,2005).

**Type locality** : India : Uttaranchal, Matkota (Pantnagar).

**Remarks** : The name *triozei* should be *triozae* if the authors have named it after the host. However, the author did not specify that the name is after its host or not (Though it seems likely that the authors indicated to name it after its host). If the name is *T. triozae*, then it is preoccupied by *T. triozae* Burks (1943).

### 74. *Tetrastichus tunicus* Narendran sp. nov. (Figs. 202-203)

**Holotype** : Female : 1.22 mm. Head, mesosoma and gaster black with metallic blue reflections; eye brownish red, ocelli reflecting yellowish brown; antenna pale brownish yellow with scape and pedicellus yellowish brown; tegula brown; all coxae concolorous with body except apices brown; all trochanter and femur brown, remaining parts yellowish brown; pretarsi brown; wings hyaline with veins pale yellow; pilosity brown.

**Head** : Wider than mesosoma (23 : 20), 1.35x as wide as long in anterior view, 2.87x as broad as median length in dorsal view; POL 1.66x OOL, OD equal to OOL. Eye bare, 1.26x as long as wide in side view; 1.5x as long as malar space; MS almost straight in side view; head moderately reticulate. Antennal formula 11133; scape not reaching level of vertex, 0.66x as long as eye in side view; antennal segments as in figure 202.

*Mesosoma* : 1.23x as long as broad, mid lobe of mesoscutum 1.09x as broad as long, with single row of 4 adnotaular setae on each side, ML indistinct near posterior margin of pronotum; scutellum 1.21x as broad as long, SMG a little nearer to SLG than to each other, enclosed space 2.09x as long as broad. Propodeum 2.66x as long as dorsellum, submedian areas reticulate; spiracle separated from metanotum by a distance distinctly less than diameter of it; callus with 1 posterior and 2 anterior setae; midtibial spur 0.85x as long as midmetatarsus. Forewing 1.95x as long as broad, CC a little shorter than MV (11 : 13), MV 3.25x as long as STV, with 14 setae on antero-dorsal margin; speculum closed behind, running below MV as a strip; marginal fringe 0.71x as long as STV.

*Gaster* : (Fig. 203) Sessile, distinctly shorter than head plus mesosoma (0.75x); hypopygium not reaching beyond middle of gaster.

*Male* : Unknown.

*Host* : Eggs of Cockroaches?

*Holotype* : Female, India : Malappuram Dt., Calicut University Campus (11° 7' N 75° 5' E), 18.xi.2004, T.C.Narendran & Party, (ZSIK).

*Paratypes* : 3 Female of the same collection data as of holotype.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anellus 1; F1 shorter than F2; mesoscutum with 4 adnotaular setae on each side; head, mesosoma and gaster black with metallic blue reflections; and parasitic on eggs of cockroaches.

#### 75. *Tetrastichus umae* Narendran sp. nov. (Figs. 269-271)

*Holotype* : Female : Length 1.86 mm. Head and mesosoma black; gaster brown; eye grey; ocelli pale reflecting yellow, flagellar segments pale brownish yellow; pedicellus and scape whitish yellow; tegula pale brown; legs whitish yellow with brown tinge on basal half of forecoxa. Wings hyaline, veins and pilosity pale yellow.

*Head* : A little wider than mesosoma (16 : 14), 1.2x as wide as long in anterior view, 6x as broad as median length in dorsal view; POL 2x OOL; OD : OOL = 3 : 4. Eye bare, converging posteriorly in front view, 1.4x as long as broad in side view, 2x as long as malar space; MS straight; head moderately reticulate. Antennal formula 11233; scape not reaching level of vertex, a little shorter than eye (16 : 17.5); antennal segments as in figure 269.

*Mesosoma* : 1.27x as long as broad; midlobe of mesoscutum 1.25x as broad as long, with 3 adnotaular setae, ML deep and complete; scutellum (Fig. 270) a little wider than long (15 : 12); with a median fovea 0.5x as long as width between SMG, SMG not nearer to SLG but a little nearer to each other. Propodeum 2x as long as dorsellum; submedian areas coarsely reticulate, spiracle separated from metanotum by a distance shorter than half its diameter, callus with 4 posterior and one anterior setae. Midtibial spur 0.8x as long as

midmetatarsus. Forewing 2.2x as long as broad; CC a little shorter than MV (17 : 19); SMV with one dorsal seta; MV 3.2x as long as STV, with 9-10 setae on anterior margin; speculum closed behind, extends as a strip below MV up to its middle; marginal fringe 0.33x as long as STV.

*Gaster* : (Fig. 271) Petiolate; petiole short, wider than long; gaster longer than mesosoma but shorter than head plus mesosoma; hypopygium reaching 0.6x length of gaster.

*Male* : Unknown.

*Host* : Chrysopid (Chrysopidae) on Coffee plant.

*Holotype* : *Female* : India, Bangalore (12° 58' N 77° 35' E), Common wealth Institute of Biocontrol (Hebbal) (12° 59' N 77° 52' E), 28. xi. 1992. Reared by Uma, N. (ZSIK).

*Paratypes* : 5 Females, collection data same as that of holotype.

*Remarks* : This new species differs from all other Oriental species in having the following combination of characters : anelli 2; scutellum with a median shallow fovea between SMG; mesoscutal and scutellar setae pale white; forewing pilosity pale white; marginal fringe 0.33x as long as STV and gaster with a short petiole.

#### 76. *Tetrastichus vyalicus* Narendran sp. nov.

(Figs. 210-211)

*Holotype* : *Female* : Length 2.82 mm. Dark or bright metallic green or with bluish reflections. Eye brown, ocelli pale reflecting yellow; antenna black with scape pale brownish yellow; tegula black and femora concolorous with mesosoma except for pale apices; tibiae pale bluish yellow; tarsi yellow. Wings hyaline; veins pale brownish yellow.

*Head* : A little wider than mesosoma, 1.37x as broad as long in front view, 4x as broad as long in dorsal view. POL 1.75x OOL; OD equal to OOL ; ocelli not surrounded by a groove; eye with very sparse short pilosity, mostly bare; eye 1.31x as long as broad in side view, 1.7x as long as malar space; MS straight; head distinctly reticulate. Antennal formula 11333 (careful observation is necessary to see the 3 anelli); scape reaching front ocellus, not reaching level of vertex, 0.71x length of eye; antennal segments as in figure 210.

*Mesosoma* : About 1.2x as long as broad, distinctly reticulate, ML complete, 6-8 adnotaular setae on each side; mid lobe of mesoscutum 1.22x as broad as long; scutellum 1.22x as broad as long; SMG slightly nearer to SLG; enclosed space 2.38x as long as broad. Propodeum 2x as long as dorsellum; spiracle separated from metanotum by less than half its diameter; callus with 2-3 short setae posteriorly and 2 anteriorly. Midtibial spur about 0.7x length of metatarsus. Forewing a little more than 2.24x as long as broad, CC 6x as long as broad, a little shorter than MV; SMV with 1 dorsal seta; MV 3.33x as long as STV, anterior margin of MV with 16-18 setae; marginal fringes 0.4x as long as STV.

*Gaster* : (Fig. 211) Sessile, ovate, distinctly longer than head plus mesosoma (21 : 16); tergites mostly shiny; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India : Kerala, Western Ghat, Waynad, Kalpetta, Puthurvayal (11° 37' N 76° 6' E), 06. ii. 2003, T. C. Narendran & Party (ZSIK), MoEF No. 206.

*Paratypes* : 1 Female, collection data same as that of holotype.

*Remarks* : This new species comes near *T. sringericus* Narendran in having antenna with 3 anelli and SMV with one dorsal seta. However, it differs from *sringericus* in having : mesoscutum with ML complete, with 6-8 adnotaular setae on each side; enclosed space between SMG 2.4x as long as broad and in other characters mentioned in the key above.

### 77. *Tetrastichus zeyae* Narendran sp. nov.

(Figs. 200-201)

*Holotype* : Female : Length 1.81 mm. Head dark brown with metallic blue tinge; mesosoma black with metallic blue reflection, gaster reddish brown with slight metallic blue reflection; eye pale yellow; ocelli reflecting yellow; antenna pale brown with scape and pedicellus yellow; tegula brown, fore and mid coxae dark brown, hindcoxa concolorous with mesosoma, femora brown with apex yellow; all tibiae yellow, all tarsi whitish yellow, pretarsi brown. Wings hyaline with veins pale yellow, pilosity yellowish brown.

*Head* : Wider than mesosoma (29 : 26), a little over 1.1x as wide as long in anterior view, 4x as broad as median length in dorsal view; POL a little over 1.8x OOL; OD a little shorter than OOL. Eye bare, a little longer than wide (12 : 11) in side view, 1.5x as long as malar space; MS straight; head moderately reticulate. Antennal formula 11233. Scape a little exceeding level of vertex, 0.92x as long as eye in side view; antennal segments as in figure 200.

*Mesosoma* : A little over 1.3x as long as broad, midlobe of mesoscutum 1.25x as broad as long, with 5 adnotaular setae in two rows on each side, (outer row with 3 and inner row with 2 setae on anteriorly); ML indistinct near posterior margin of pronotum. Scutellum 1.29x as broad as long, SMG a little nearer to SLG than to each other, enclosed space 2.2x as long as broad. Propodeum 4x as long as dorsellum, submedian areas reticulate, spiracle separated from metanotum by a distance little less than its diameter; callus with 2 posterior and 2 anterior setae. Midtibial spur a little over 0.8x as long as midmetatarsus. Forewing 2.1x as long as broad, CC a little shorter than MV (21 : 24), MV 3x as long as STV, with 14-15 setae on antero-dorsal margin; speculum closed behind, running below MV as a strip; marginal fringe 0.25x as long as STV.

*Gaster* : (Fig. 201) Sessile, distinctly longer than head plus mesosoma; hypopygium not reaching middle of gaster.

*Male* : Unknown.

*Host* : Unknown.

*Holotype* : Female, India, Kerala, Calicut University Campus (11° 7' N 75° 5' E), 2. iii. 1993, S. B. Zeya (ZSIK).

*Paratype* : 1 Female of the same collection data of holotype.

*Remarks* : This new species comes near *T. dalotus* Narendran in having mesoscutum with 2 rows of setae on either side, but differs from *dalotus* by the characters mentioned in the key in this work.

### Species Incertae Sedis

#### 78. *Tetrastichus cyaniventris* (Motschulsky)

1863. *Solenoderus cyaniventris* Motschulsky, 36 : 71. Type Female Sri Lanka (ZMMS).

1965. *Tetrastichus cyaniventris* Motschulsky, Bouček, 543-564.

*Diagnosis* : Subelongate, convex, humped, anteriorly scarcely shiny, black, antennal scape and pedicellus rufo-testaceous, middle of femur infuscate; head depressed, posteriorly arcuate, margined, ocelli black; eye ordinarily round, convex, rufo-ferruginous; antennal length almost equal to length of Mesosoma, sub-linear, depressed, apex acuminate; mesosoma with ML, mesoscutum wide, convex, subquadrate, median lobe triangular, notauli pitted; metanotum trapezoid, rugose. Gaster straight, apex acuminate, medially concave, depressed, sessile, shiny, metallic green.

*Type locality* : Sri Lanka (= Ceylon) : Mt. Patannas.

#### 79. *Tetrastichus patannas* Motschulsky

1863. *Tetrastichus patannas* Motschulsky, 36(3) : 39. (ZMMS).

The type could not be examined since the request for the type remained unanswered. The poor description does not give any clue as to the identity of this taxon.

*Type locality* : Sri Lanka (Mt. Patannas).

#### 80. *Tetrastichus tanjorensis* (Husain & Khan)

1986. *Tetrastichus tanjorensis* (Husain & Khan), 243. Holotype : Female ZSIK (lost?) (as a new name for *Neparaprostocetus asphondyliae* Mani 1939 which is preoccupied by Rondani, 1867) (ZMMS).

I could not examine the type of this species in spite my efforts to procure it through loan. Judging from the original description it is likely that this belongs to *Aprostocetus* and not to *Tetrastichus*.

### Genus *Thripastichus* Graham

1987. *Thripastichus* Graham, 26, 30, 39. Type species *Tetrastichus gentilei* Del Guercio by original designation.

*Diagnosis* : Lower margin of clypeus bidentate; frons with median longitudinal ridge or line; mandible with a strong acute outer tooth, followed by an obliquely truncate, serrulate lobe; antennal toruli situated hardly above ventral edge of eye; SMV with 2 dorsal setae which are fairly close to each other, near middle of the vein; propodeum large, smooth without median carina and with entire spiracle exposed; gaster distinctly narrowed at base; petiole small, but visible; ovipositor concealed; body black with metallic tint; gaster of Female and male with pale subbasal spot.

*Host* : Thrips of family Phlaeotripidae.

*Distribution* : Holarctic, Indomalaya and Neotropical.

1. *Thripastichus gentilei* (Del Guercio)  
(Fig. 109)

1911. *Tetrastichus gentilei* Del Guercio, 222-227. Syntypes, Italy (Del Guercio) (not located).
1923. *Tetrastichus thripophonus* Waterston, 453-455. Holotype : Female, West India : Trinidad, summer 1922 (F.W. Urich) (BMNH) [examined]. [Synonymised with *gentilei* by Domenichini, 1966a : 179.]
1937. *Tetrastichus tatei* Dozier, 129-130. Holotype : Female, Puerto Rico : Mayaguez (USNM) [not examined]. [Synonymised by Burks, 1943 : 526].
1943. *Tetrastichus thripophonus* Waterston; Burks, 525-526.
1960. *Tetrastichus thripophorothripiscidis* Narayanan, Subba Rao & Ramachandra Rao, 171. Holotype : Female, India [not examined]. [Synonymised by Bouček, 1988 : 597]
- 1966a. *Tetrastichus gentilei* Del Guercio; Domenichini, 178-179, 1966b : 33.
1987. *Tetrastichus gentilei* (Del Guercio) Graham, 26, fig. 36.

*Diagnosis* : *Female* : Length 1.17-1.19 mm. Head, mesosoma and distal 0.67 of gaster dark brown; rest of body light brown or light yellow; antenna dark yellow except for paler scape; legs light yellow; wings hyaline. Head with POL 1.33x OOL; scape a little longer than 2x pedicellus; funicular segments subequal except F1 slightly longer than others; clava wider than funicular segments, a little shorter than scape; mesoscutum length subequal to its maximum width, with 3 adnotaular setae, without ML; scutellum a little wider than long; dorsellum 0.63x as long as median length of propodeum, 3x as broad as long; spiracle separated from metanotum by less than half diameter of spiracle; paraspicular carina and median carina absent; forewing with MV longer than SMV, with 9 dorsal setae on MV. Gaster petiolate; petiole relatively small, transverse, gaster slightly longer than mesosoma.

*Type locality* : India (Delhi).

*Distribution* : Widely distributed. See distribution of genus above.

*Host* : *Gynaikothrips ficorum* (Marchal); *G. uzeli* (Zimmerman), *Liothrips laureli* (Mason), *L. oleae* (Costa), *L. urichi* Karny, *Phlaeothrips pedicularius* Haliday (Graham, 1991).

**Remarks :** The above account is based on already published information by various authors since I have not examined any material of this species. Courtesy La Salle 1994 for permitting to draw from the electroscan photographs of this species.

### Genus Incertae Sedis

### **Farooqiella Ahmad**

2005. *Farooqiella* Ahmad, 71-72. Type species *Farooqiella kashmiriensis* Ahmad..... Female, India (J & K).

The original description of this genus is extremely poor and speaks of the need for stronger editorial peer review by research journals for acceptable minimal standards of valid publication. The poor description and crude figures do not give any information on the real identity of this taxon. It may be *Aprostocetus* or *Neotrichoporoides*. In the original paper, the author states "Holotype deposited in National Pusa Collection, Indian Agricultural Research Institute, New delhi-110 012" However, Professor V.V. Ramamurthy, Division of Entomology, IARI, New Delhi in one of his personal communication (per.com.Jan. 2006) informed me that the type is not so far deposited in IARI. Hence according to the recent code of nomenclature I doubt whether the name of this taxon is available or not, since the type depository remains unknown. Repeated requests to the author of the species and Institution for a loan of the type remained unanswered.

### SUMMARY

The genera and species of the subfamily Tetrastichinae of the family Eulophidae of Indian subcontinent are reviewed in the light of discovery of several new taxa from the region and recent changes and advances in the taxonomy of this subfamily in other geographic regions. The Indian subcontinent includes India, Sri Lanka, Nepal, Myanmar, Bhutan, Bangladesh and Pakistan. 33 genera (out of 34 treated here) are recognized valid with the largest of these *Aprostocetus* having 76 species. Two new genera are described viz. *Idukkiella* and *Kostjurixia*. The genus *Minotetrastichus* Graham is recorded for the first time from India. A total of 124 new species are described and 148 known species are commented upon or redescribed, with host and distributional data. Keys to genera of Indian subcontinent and key to species of most genera are provided. Besides, a few synonyms and new combinations are also given in this work. A host-parasitic index is provided at the end. An index to species is also given. In the beginning of the monograph a historical resumé and a brief account on the biology are provided.

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*Aprostocetus gala*
- Ferrisia Virgata* (Cockerell) (Homoptera : Pseudococcidae)  
*Aprostocetus maculates*  
*Tetrastichus magnicorpus*  
*Nesolynx nigricoxis*
- Formica Fusca* L. (Hymenoptera : Formicidae)  
*Melittobia acasta*
- Formica Pratensis* Rezius (Hymenoptera : Formicidae)  
*Melittobia acasta*
- Formica Sanguinea* Latreille (Hymenoptera : Formicidae)  
*Melittobia acasta*
- Fulgorids on *Ficus* sp. (Homoptera)  
*Parachrysocharis anomalococci*.
- Gall fly (Diptera : tephritidae)  
*Aprostocetus coimbatoensis*
- Galleria Melonella* (Linnaeus) (Lepidoptera : Pyralidae)  
*Tetrastichus howardi*
- Goniozus Montanus* Kieffer (Hymenoptera : Bethylidae)  
*Aprostocetus versicolor*
- Goniozus Nephantidis* (Musebeck) (Hymenoptera : Bethylidae)  
*Nesolynx phaeosoma*
- Goryphus* sp. (Hymenoptera : Ichneumonidae)  
*Nesolynx nigricoxis*

*Gymnomerus Laevipes* Shuckard (Hymenoptera : Eumenidae)

*Melittobia acasta*

*Gynaikothrips Ficorum* (Marchal) (Thysanoptera : Phlaeothripidae)

*Thripastichus gentilei*

*Gynaikothrips Uzeli* (Zimmerman) (Thysanoptera : Phlaeothripidae)

*Thripastichus gentilei*

*Helicoverpa Armigera* (Hubner) (Lepidoptera : Noctuidae)

*Nesolynx flavipes*

*Heliothis Armigera* (Hubner) (Lepidoptera : Noctuidae)

*Tetrastichus howardi*

*Homona Coffearia* (Nietner) (Lepidoptera : Tortricidae)

*Aprostocetus versicolor*

*Hyblaea Puera* (Cramer) (Lepidoptera : Hyblaeidae)

*Tetrastichus howardi*

*Hydrellia Sasakii* Yusa et. Isitani (Diptera : Ephydriidae)

*Tetrastichus hydrelliae*

*Hypolixus Truncatulus* (Fabricius) (Coleoptera : Curculionidae)

*Tetrastichus krishneri*

*Hypsipyla Robusta* (Moore) (Lepidoptera : Limacodidae)

*Tetrastichus spirabilis*

*Icerya Zimmeramanni* (Hemiptera : Margarodidae)

*Aprostocetus purpureus*

*Kerria Lacca* (Kerr.) (Homoptera : Coccoidea : Kerridae)

*Aprostocetus purpureus*

*Kerria Lacca* (Kerr.) (Homoptera : Kerridae) on *Mangifera indica*

*Aprostocetus nainitalensis*

Lac insect on Sandal wood

*Aprostocetus bangaloricus* Narendran

*Laccifer Chinensis* Mahdihassan (Hemiptera : Dactylopiidae)

*Laccifer Javanus* Chamberlin (Hemiptera : Dactylopiidae)

*Aprostocetus purpureus*

*Laccifer Lacca* Kerr. (Hemiptera : Dactylopiidae)

*Aprostocetus purpureus*

*Laccifer Sindica* Chamberlin (Hemiptera : Dactylopiidae)

*Aprostocetus purpureus*

*Lasioptera Falcata* Felt. (Diptera : Cecidomyiidae)

*Tetrastichus momardicae*

Lasiocampid : larva (Lepidoptera : Lesiocampidae)

*Aprostocetus versicolor*

*Laspeyresia Pomonella* L. (Lepidoptera : Tortricidae)

*Melittobia acaosta*

Lepidopteran leaf miner wild plant

*Tetrastichus chakrataensis*

Lepidopteran parasite

*Nesolynx phaeosoma*

Lepidopteran hyperparasite through Tachnidae & Braconidae

*Nesolynx javanica*

Leaf webber larvae on Vanilla

*Aprostocetus vanillae*

*Leptomastix Dactylopii* Howard (Hymenoptera : Encyrtidae)

*Aprostocetus purpureus*

*Leucospis Intermedia* Illegger (Hymenoptera : Leucospidae)

*Melittobia acaosta*

*Liothrips Laurelli* (Mason) (Thysanoptera : Phlaeothripidae)

*Thripastichus gentilei*

*Liothrips Oleae* (Costa) (Thysanoptera : Phlaeothripidae)

*Thripastichus gentilei*

*Liothrips Urichi* Karny (Thysanoptera : Phlaeothripidae)

*Thripastichus gentilei*

*Liriomyza* sp. (Diptera : Agromyzidae)

*Oomyzus liriomyzae*

*Liriomyza Trifolii* Hanson & La Salle (Diptera : Agromyzidae)

*Quadrastichus liriomyzae*

*Quadrastichus plaquoi*

*Lydella Grisescens* Robineau-Desvoidy (Diptera : Larvaevoridae)

*Melittobia acaosta*

*Macrocentrus Homonae* Nixon (Hymenoptera : Braconidae)

*Aprostocetus versicolor*

*Maruca Testulalis* Geyer (Lepidoptera : Pyralidae)

*Nesolynx thymus*

*Megachile Muraria* Latreille (Hymenoptera : Megachilidae)

*Melittobia acasta*

*Melanagromyza Obtusa* (Malloch) (Diptera : Agromyzidae)

*Aprostocetus obtusae*

*Metisa Plana* Walker (Psychidae)

*Nesolynx flavipes* Ashmead

*Microplitis Philippinensis* Ashmead (Hymenoptera : Braconidae)

*Nesolynx flavipes* Ashmead

*Monodotomerus Obsoletus* Fab. (Hymenoptera : Torymidae)

*Melittobia acasta*

*Musca Domestica* L. (Diptera : Muscidae)

*Melittobia acasta*

*Mythimna Albistigma* Moore (Lepidoptera : Noctuidae)

*Tetrastichus howardi*

*Natada Nararia* Moore (Lepidoptera : Limacodidae)

*Tetrastichus taprobanensis*

*Nebrarctia Obliqua* Walker (Lepidoptera : Arctiidae)

*Tetrastichus obliqua*

*Nipaeococcus* sp. on Citrus (Homoptera : Pseudococcidae)

*Aprostocetus vigricornis*

*Nipaeococcus Viridis* (Homoptera : Pseudococcidae)

*Aprostocetus rajai*

*Notodacus Xanthodes* (Broun) (Diptera : Tephritidae)

*Aceratoneuromyia indica* (Silvestri)

*Oecanthus Pellucens* (Scopoli) (Orthoptera : Gryllidae)

*Aprostocetus percaudatus*

*Ophiusa Melicerta* (Drury)(= *Achaea janata*) (Lepidoptera : Noctuidae)

*Tetrastichus ophiusae*

*Opisina Arenosella* Walker (Lepidoptera : Xyloryctidae)

*Tetrastichus coorgensis*

*Tetrastichus howardi*

*Orcus Fathimus* : larvae

*Nesolynx cinctiventris*

*Orthaga Exvinacea* Hmps. (Lepidoptera : Pyralidae)

*Tetrastichus orthagae*

*Osmia Leucomelaena* Kaltebach (Hymenoptera : Megachilidae)

*Melittobia acasta*

*Osmia Adunca* Latreille (Hymenoptera : Megachilidae)

*Melittobia acasta*

*Papilio Lagaezei*

*Tachinobia* sp.

*Paratachardia Lobata* Green (Hemiptera : Kerridae)

*Aprostocetus uthonia*

*Pectinophora Gossypiella* (Saunders) (Lepidoptera : Gelechiidae)

*Tetrastichus howardi*

Pentatomid : eggs (Pentatomidae)

*Tetrastichus gardneri*

*Periplaneta Americana* (L.) (Blattodea : Blattidae)

*Aprostocetus hagenowi*

*Periplaneta Australasiae* (F.) (Blattodea : Blattidae)

*Aprostocetus hagenowi*

*Periplaneta Fuliginosa* (Serville) (Blattodea : Blattidae)

*Aprostocetus hagenowi*

*Phlaeothrips Pedicularis* Haliday (Thysanoptera : Phlaeothripidae)

*Thripastichus gentilei*

*Phloeosinus Aubri* (Coleoptera : Scolytidae)

*Tetrastichus cupressi*

*Phyllocnistis Citrella* Stinton (Lepidoptera : Gracillariidae)

*Citrostichus phyllocnistoides*

*Phyllocnistis* sp. (Lepidoptera : Gracillariidae)

*Iniostichus* sp.

*Phylloplecta Hirsuta* (Hemiptera : Triozidae) on Arjun leaves

*Aprostocetus bouceki*

*Phytodietus Capuae* (Hymenoptera : Ichneumonidae)

*Aprostocetus versicolor*

*Pieris Braccicae* (Lepidoptera : Pieridae)

*Oomyzus sokolowski*

*Platycephala Umbreclata* F. (Chloropidae)

*Kostjukovius platycephalae*

*Planococcus Citri* (Homoptera : Coccoidea)

*Aprostocetus purpureus*

- Platycephala Umbreclata* F. (Chloropidae)  
*Kostjukovius platycephalae*
- Plutella Xylostella* (L.) (Lepidoptera : Plutellidae)  
*Oomyzus sokolowskii*  
*Tetrastichus howardi*
- Polytela Gloriosae* Fabricius (Lepidoptera : Noctuidae)  
*Tetrastichus howardi*
- Precis Orithya* Linnaeus (Lepidoptera : Nymphalidae)  
*Tetrastichus howardi*
- Prosopis* sp. (Hymenoptera : Colletidae)  
*Melittobia acasta*
- Pseudococcus Vastator* (Maskell) (Homoptera : Pseudococcidae)  
*Aprostocetus nigricornis*
- Pseudococcus Lilacinus* Cockrell (Homoptera : Coccoidea)  
*Aprostocetus purpureus*
- Psyllids (Hemiptera : Psyllidae) in *Grewia asiatica* L. : leaf gall  
*Aprostocetus psyllidis*
- Ptychomyia* (Diptera : Tachinidae)  
*Nesolynx nigricoxis*
- Pulvinaria* sp. (Homoptera : Coccidae)  
*Baryscapus impeditus*
- Pyralid larva parasitizing *Grewia latifolia*  
*Tetrastichus coorgensis*
- Pyrilla Aberrans* (Kirby)(Homoptera : Lophopidae)  
*Parachrysocharis javensis*
- Pyrilla Perpusilla* (W.) (Homoptera : Lophopidae)  
*Parachrysocharis javensis*
- Pyrilla Perpusilla* (Walker) (Homoptera : Lophopidae) : eggs  
*Parachrysocharis* sp.
- Pyrilla* sp. (Homoptera : Lophopidae) : eggs  
*Parachrysocharis anomalococci*
- Pyrrhalta Luteola* (Muller) (Coleoptera : Chrysomelidae)  
*Oomyzus gallerucae*
- Rhynchaenus Alni* (L.) (Coleoptera : Curculionidae)  
*Tetrastichus miser*

*Rhynchaenus Fagi* (L.) (Coleoptera : Curculionidae)

*Tetrastichus miser*

*Rhynchaenus Pilosus* (L.) (Coleoptera : Curculionidae)

*Tetrastichus miser*

*Rhynchaenus Quercus* (L.) (Coleoptera : Curculionidae)

*Tetrastichus miser*

*Rhynchaenus Salicis* (L.) (Coleoptera : Curculionidae)

*Tetrastichus miser*

*Rhynchaenus Oxyacanthae* (Marsham) (Coleoptera : Curculionidae)

*Tetrastichus miser*

*Salatiga* sp.

*Nesolynx cinctiventris*

*Sarcophaga Banksi* (Diptera : Sarcophagidae)

*Tachinobia repanda*

*Schoenobius Bipunctifer* (Walker) (Lepidoptera : Pyralidae) : eggs

*Tetrastichus schoenobii*

*Schoenobius* (Lepidoptera : Pyralidae) : eggs

*Aprostocetus kuriani*

*Scirpophaga Incertulas* (Walker) (Lepidoptera : Pyralidae)

*Tetrastichus schoenobii*

*Tetrastichus howardi*

*Scirpophaga Excerptalis* Walker (Lepidoptera : Pyralidae)

*Tetrastichus schoenobii*

*Scymmus Subviliosus* Gueze (Coleoptera : Coccinellidae)

*Aprostocetus neglectus*

*Sesamia Inferens* Walker (Lepidoptera : Noctuidae)

*Tetrastichus schoenobii*

*Tetrastichus howardi*

*Tetrastichus inferens*

*Sinophorus Alcae* (Ellinger & Sachleben) (Hymenoptera : Ichneumonidae)

*Melittobia acasta*

*Simplica Robustalis* Guen. (Lepidoptera : Noctuidae)

*Tetrastichus niger*

*Simmondsius Pakistanensis* Ahmad & Ghani ( Coleoptera : Coccinellidae)

*Tetrastichus epilachnae*

*Spilosoma Obliqua* Walker (Lepidoptera : Arctiidae)

*Tetrastichus dalotes*

*Tetrastichus santhoshi*

*Tetrastichus gadagkari*

*Spodoptera Litura* (Fabricius) (Lepidoptera : Noctuidae)

*Tetrastichus howardi*

*Spodoptera Mauritia* (Boisduval) (Lepidoptera : Noctuidae)

*Tetrastichus schoenobii*

*Tetrastichus howardi*

*Stelis Nasuta* Latreille (Hymenoptera : Megachilidae)

*Melittobia acasta*

*Sycanus Collaris* Fabr. (Hemiptera : Reduviidae)

*Mestocharella indica*

*Sylepta Derogata* (Fabricius) (Lepidoptera : Pyralidae)

*Tetrastichus howardi*

*Synharmania Conglobata* (L.) (Coleoptera : Coccinellidae)

*Oomyzus scaposus*

*Tachardia Lacca* (Homoptera : Coccidae)

*Aprostocetus purpureus*

*Tachardia Albizziae* Green (Homoptera : Coccidae)

*Aprostocetus purpureus*

*Tachardiaephagus Tachardiae* Howard (Hymenoptera : Encyrtidae)

*Aprostocetus purpureus*

Tachinidae (Diptera)

*Nesolynx thymus*

Tachinidae (Diptera) on Zygaenids

*Nesolynx zygaenarum*

Thrips (Thysanoptera : Phlaeothripidae)

*Thripastichus* sp.

*Trioza Chenopodii* Reuter (Hemiptera : Triozidae)

*Tamarixia bicolor*

*Trioza Fletcheri* (Crawford) (Hemiptera : Triozidae)

*Tetrastichus triozae*

*Trioza Obsoleta* Bickton (Hemiptera : Triozidae)

*Citrostichus phyllocnistoides*

***Tropicomyia Atomella* (Malloch) (Diptera : Agromyzidae)**

***Aprostocetus atomelli* (Khan)**

***Trypoxylon Figulus* L. (Hymenoptera : Sphecidae)**

***Melittobia acasta***

***Tryporyza incertulus* Walker (Lepidoptera : Pyraustidae) : eggs**

***Tetrastichus orientalis***

***Tetrastichus schoenobii***

**Undetermined leaf miner on *Eugenia cumini* (Myrtaceae)**

***Mestocharella javensis***

**Unidentified leaf miner on *Dalbergia sissoo***

***Tetrastichus clavatus***

**Unidentified egg mass of bug on *Populus deltoids***

***Mestocharella deltoids***

***Zaratha* (Lepidoptera : Agonoxenidae)**

***Nesolynx thymus***

## ASSOCIATED PLANTS

*Acacia* (Fabaceae)

*Parachrysocharis anomalococci*

*Acermono* Maxim. (Sapindaceae)

*Sigmophora aceris*

*Amaranthus* (Amaranthaceae)

*Tetrastichus krishnieri*

*Artemesia* : galls (Compositae)

*Aprostocetus artemesiae*

*Atriplex* (Chenopodiaceae)

*Goethella asulcata*

*Brassicarapa* (Brassicaceae)

*Oomyzus sokolowski*

Brinjal

*Tetrastichus orissaensis*

Brinjal : flower galls

*Goethella asulcata*

*Calycopteris Floribunda* Lam. (Combretaceae) : Leaf gall

*Aprostocetus calius*

*Aprostocetus calycopteridis*

*Capsicum Annum* L. (Solanaceae) : flower galls

*Goethella asulcata*

*Capsicum* sp. : flower galls

*Ceratoneura indi*

*Castanopsis Indica* (Roxb. ex Lindl.) (Fagaceae) : Plant galls

*Aprostocetus akhrulensis*

*Casuarina Junghuhiniana* Miq. (Casuarinaceae)

*Tetrastichus casuarinae* Ferriere

Citrus Plants (Rutaceae)

*Aprostocetus nigricornis*

*Aprostocetus purpureus*

Coffee Plants (Rubiaceae)

*Tetrastichus umae*

*Aprostocetus purpureus*

*Cupressus* sp. (Cupressaceae)

*Tetrastichus cupressi*

*Chenopodium Album* L.(Chenopodiaceae)

*Tamarixia bicolor*

*Dalbergia Sissoo* (Sisam) (Fabaceae) : Leaf mine

*Tetrastichus sissou*

*Tetrastichus thoracicus*

*Tetrastichus punjabensis*

*Erythrina Variegata* L. (Fabaceae)

*Quadrastichus erythrinae*

*Erythrina Fusca* Lour. (Fabaceae)

*Quadrastichus erythrinae*

*Erythrina Indica* L. (Fabaceae)

*Quadrastichus erythrinae*

*Eucalyptus* : leaf galls

*Leptocybe invasa*

*Eugenia Cumini* (L.) (Myrtaceae)

*Mestocharella javensis*

*Euphorbia* sp. (Euphorbiaceae)

*Aprostocetus vatiata*

*Ficus Bengalensis* L. (Moraceae) : leaf galls

*Tetrastichus bellus*

*Aprostocetus uthonia*

*Ficus Racemosa* L. (Moraceae)

*Tetrastichus magnicarpus*

*Ficus Glomerata* Roxb. (Moraceae)

*Tetrastichus magnicarpus*

*Glycine Max* (L.) Merr. (Fabaceae)

*Tetrastichus obliqua*

*Grewia Asiatica* L. (Tiliaceae) : Leaf galls

*Aprostocetus psyllidis*

*Helianthus Annuus* L. (Asteraceae)

*Tamarixia orientalis*

*Hibiscus Rosasinensis* L. (Malvaceae)

*Oomyzus cerococci*

*Quadrastichus longicarpus* (Khan & Shafee)

*Hyparrhenia Hirta* (L.) (Liliopsida : Poaceae)

*Aprostocetus granulatus*

*Jasminum Multiflorum* (Oleaceae)

*Aprostocetus manja*

*Kochia* sp. (Chenopodiaceae)

*Kolopterna kohatensis*

*Lantana* sp. (Verbenaceae)

*Quadrastichus lantanae*

Lemon grass (Gramineae)

*Aprostocetus cauperdatus*

*Mangifera Indica* L. (Anacardiaceae) : Leaf galls

*Aprostocetus sankarani*

*Aprostocetus nainitalensis*

*Aprostocetus purpureus*

*Quadrastichus sudheeri*

*Tetrastichus mangifera*

*Melinis Minutiflora* (Gramineae)

*Neotrichoporoides nyemitawus*

Pigeon pea : twigs (Fabaceae)

*Tatrastichus apanteles*

*Pouzolzia Viminea* (Wedd.) (Urticaceae) : leaf gall

*Quadrastichus garuda*

*Populus Deltoids* Bartr. ex Marsh (Salicaceae)

*Mestocharella deltoids*

*Platyclus Orientalis* (L.) (Cupressaceae)

*Tetrastichus cupressi*

*Psidium Guajava* L. (Myrtaceae)

*Aprostocetus lasallei*

*Oomyzus viraktamathi*

*Quercus Leucotrichophora* Camus(Oak) : Leaf Galls

*Aprostocetus shimlicus*

*Quercus Leucotrichophora* (Oak) : Button galls

*Aprostocetus taruna*

*Rubus Calycinus* (Rosaceae) : Twig gall

*Aprostocetus denticularis*

*Saccharum Officinarum* (Poaceae)

*Baryscapus chrysopae*

*Santalum Album* L. (Santalaceae)

*Aprostocetus bangaloricus* Narendran

*Aprostocetus bangaloricus* Narendran

*Sesbania Aegyptica* Poir. (Leguminosae) : galls in flower buds

*Ceratoneura indi*

*Solanum Indicum* L. (Solanaceae)

*Goethella asulcata*

*Solanum Melongena* L. (Solanaceae)

*Aprostocetus ajmeerensis*

*Sorghum* sp. (Poaceae)

*Aprostocetus diplosidis*

*Sorghum Vulgare* (Poaceae)

*Aprostocetus coimbatorensis*

*Tetrastichus howardi*

*Sorghum Bicolor* (L.)(Poaceae)

*Aprostocetus gala*

*Neotrichoporoides delhiensis*

*Neotrichoporoides nyemitawus*

Sun Flower

*Tamarixia orientalis*

*Syzygium Cumini* L. (Myrtaceae)

*Tetrastichus dasi*

*Thea Sinensis* L. (Theaceae)

*Tetrastichus taprobanensis*

*Tetrastichus niger*

*Terminalia Arjuna* (Roxb.) : Leaf galls

*Tamarixia sheebae*

*Terminalia Chebula* (Combretaceae)

*Mestocharella indica*

*Aprostocetus bouceki*

*Terminalia Paniculata* (Roxb.) (Combretaceae)

*Tetrastichus bellus*

*Treuzia Nudiflora* L.

*Tetrastichus triozei*

*Ulmus* sp. (Ulmaceae)

*Oomyzus gallerucae*

*Vanilla* (Orchidaceae)

*Aprostocetus vanillae*

*Zea Mays* L. (Poaceae)

*Tetrastichus partellus*

*Ziziphus Mauritiana* Lam. (Rhamnaceae)

*Aprostocetus purpureus*

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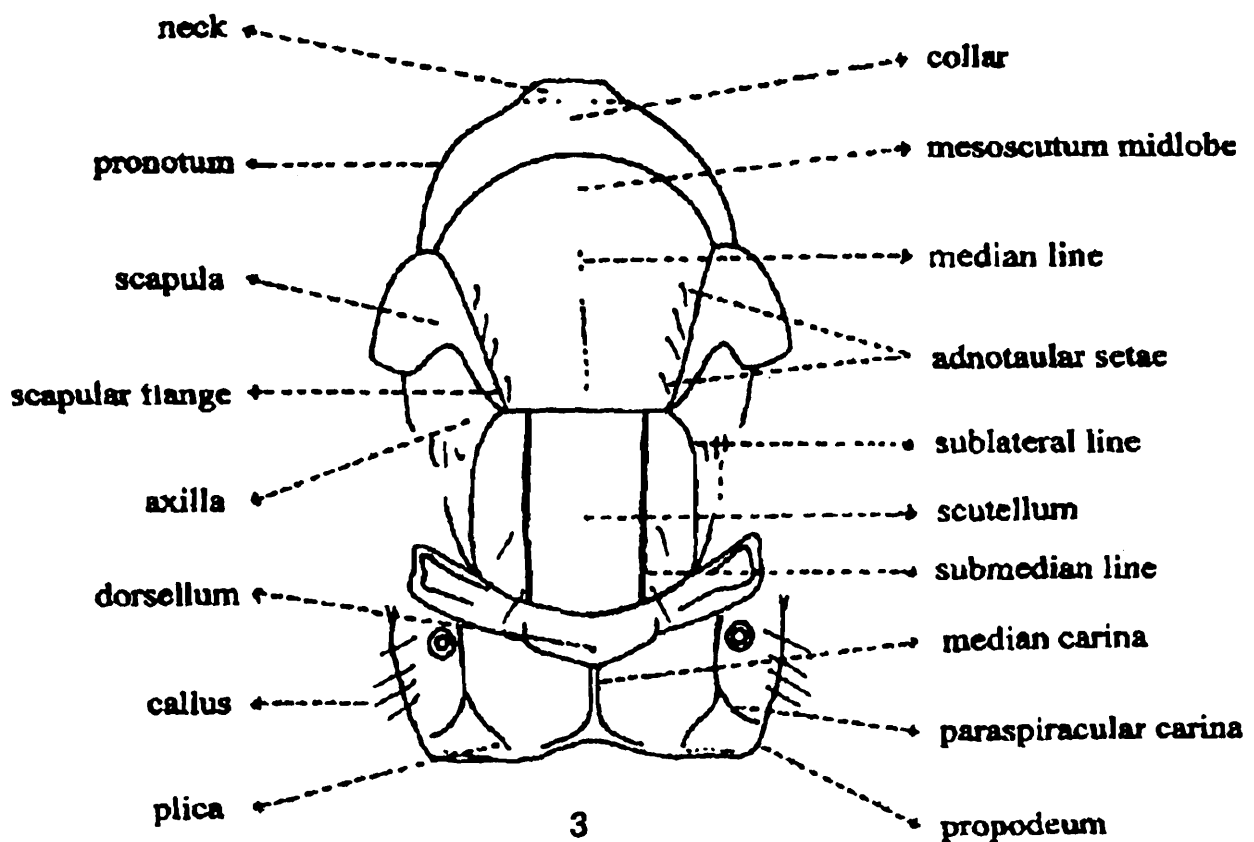
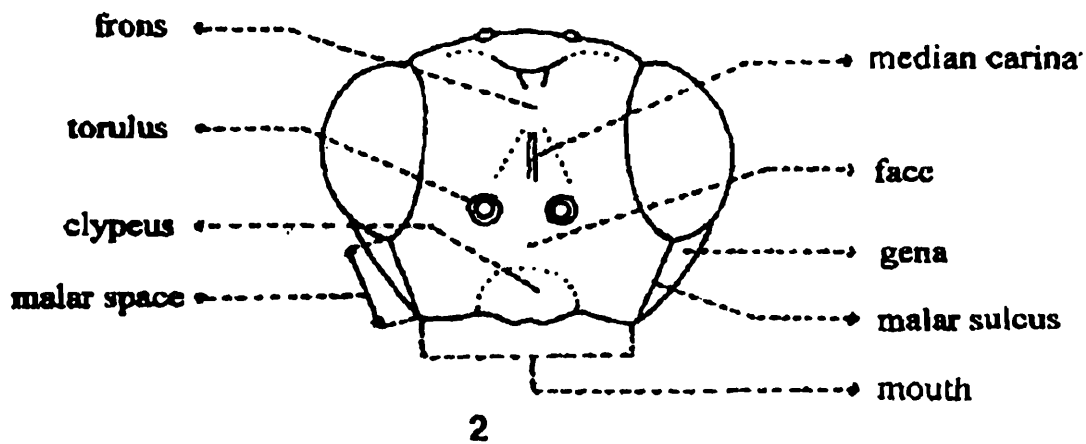
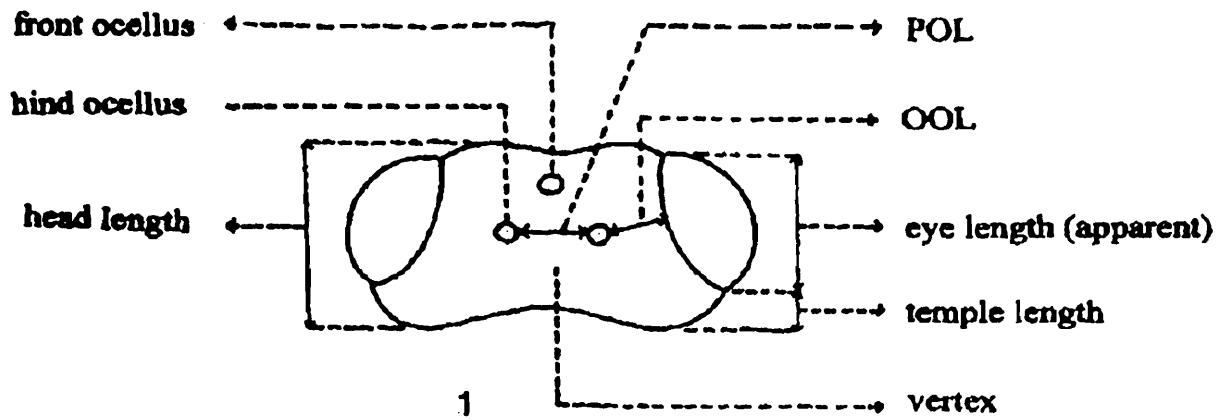


Fig. 1-3. Terminology of Tetrastichinae : 1. Head dorsal view; 2. Head front view; 3. Mesosoma.

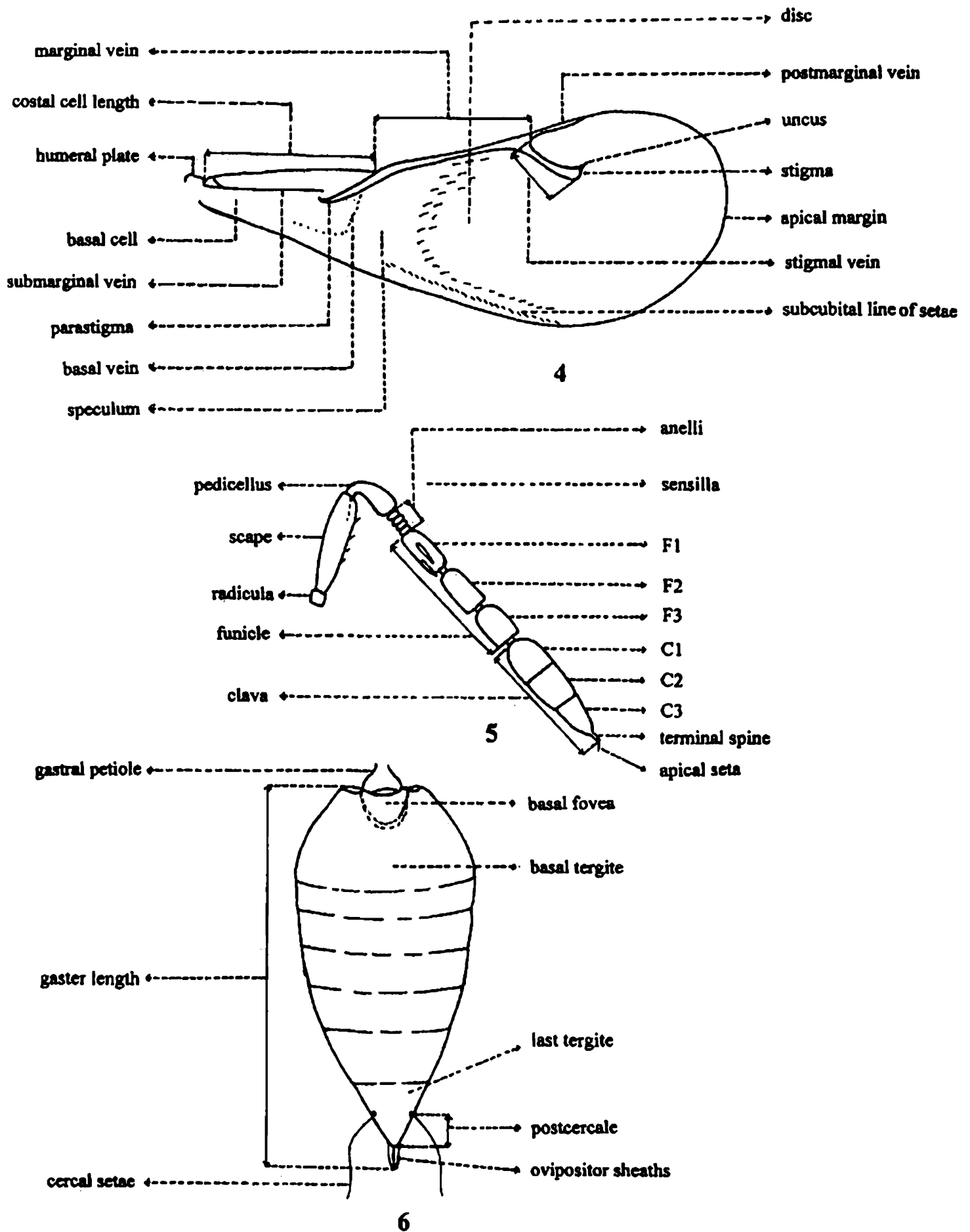


Fig. 4-6. Terminology of Tetrastichinae : 4. Forewing; 5. Antenna; 6. Gaster

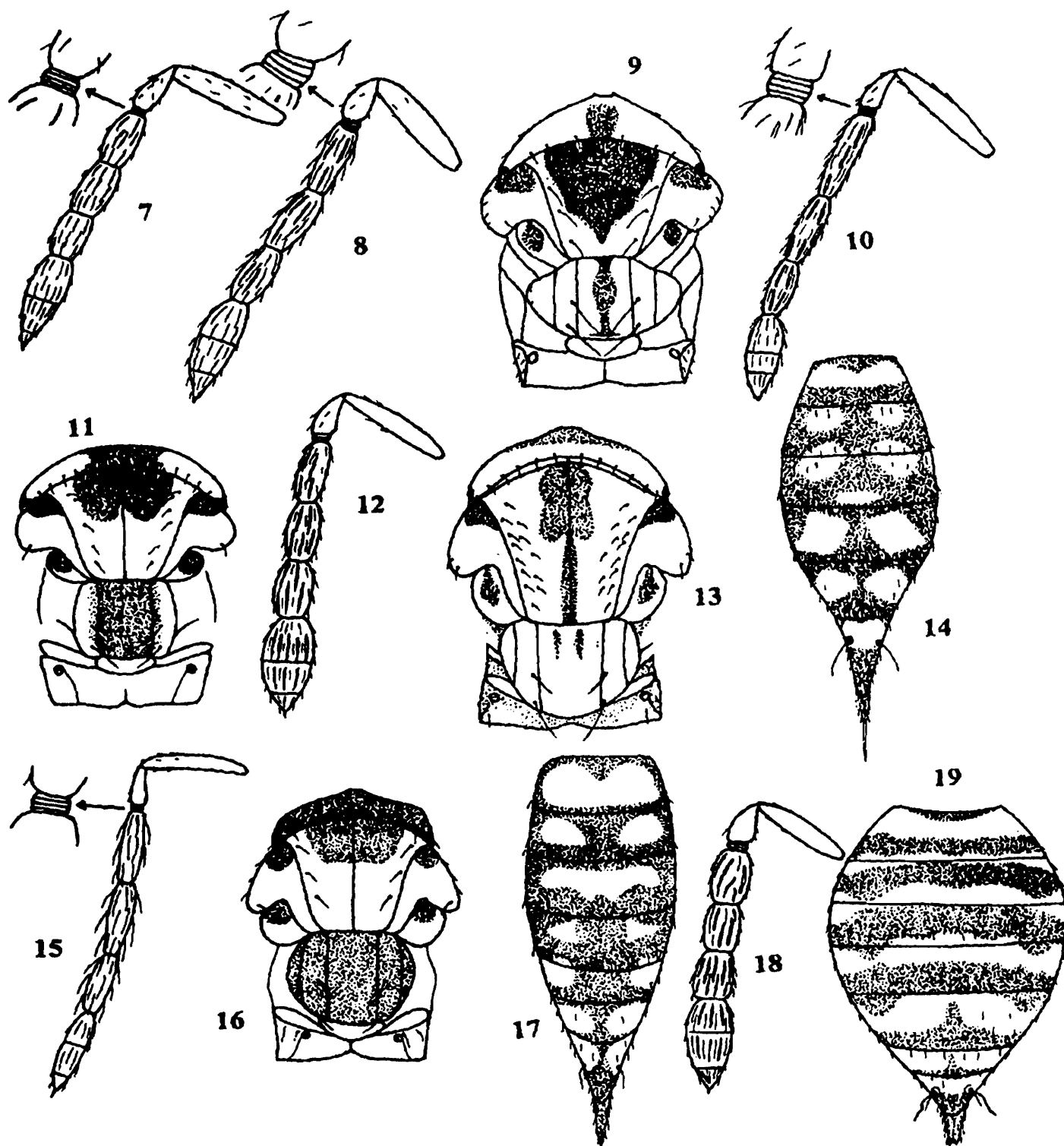
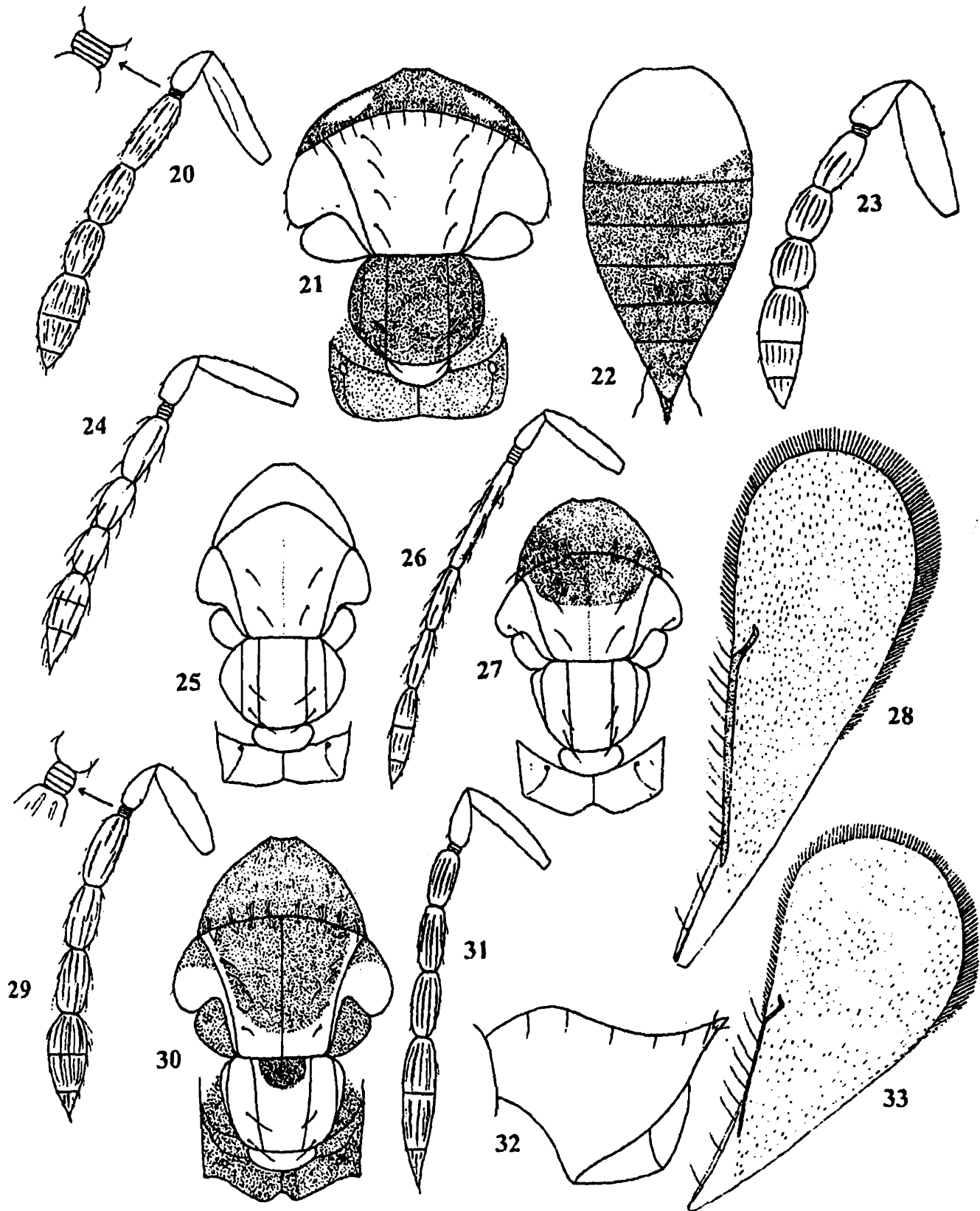


Fig. 7. *Aprostocetus manja* sp. nov. Female : Antenna; Figs. 8-9. *Aprostocetus ricosus* sp. nov. Female : 8. Antenna; 9. Mesosoma. Figs. 10-11. *Aprostocetus malcis* sp. Female : 10. Antenna; 11. Mesosoma; Figs. 12-14. *Aprostocetus narius* sp. nov. Female : 12. Antenna; 13. Mesosoma; 14. Gaster. Figs. 15-17. *Aprostocetus dala* sp. nov. Female : 15. Antenna; 16. Mesosoma; 17. Gaster; Figs. 18-19. *Aprostocetus neogala* sp. nov. Female : 18. Antenna; 19. Gaster.



Figs. 20-22. *Aprostocetus benazeer* sp. nov. Female : 20. Antenna; 21. Mesosoma; 22. Gaster; Fig. 23. *Aprostocetus retura* sp. nov. Female : Antenna; Figs. 24-25. *Aprostocetus silenti* sp. nov. Female : 24. Antenna; 25. Mesosoma; Figs. 26-28. *Aprostocetus vimania* sp. nov. Female : 26. Antenna; 27. Mesosoma; 28. Gaster; Figs. 29-30. *Aprostocetus hayati* sp. nov. Female : 29. Antenna; 30. Mesosoma; Figs. 31-33. *Aprostocetus decatus* sp. nov. Female : 31. Antenna; 32. Gaster; 33. Forewing.

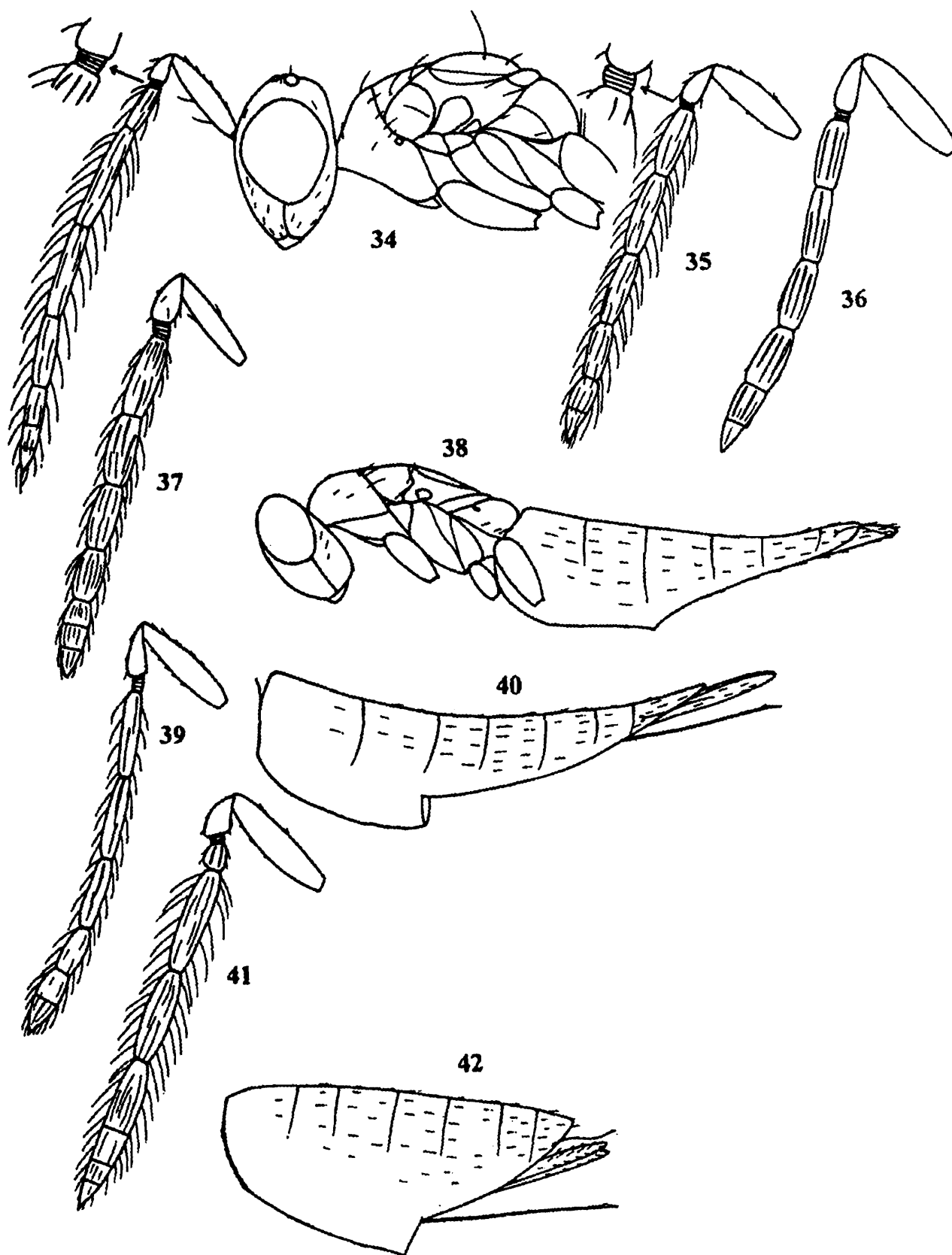
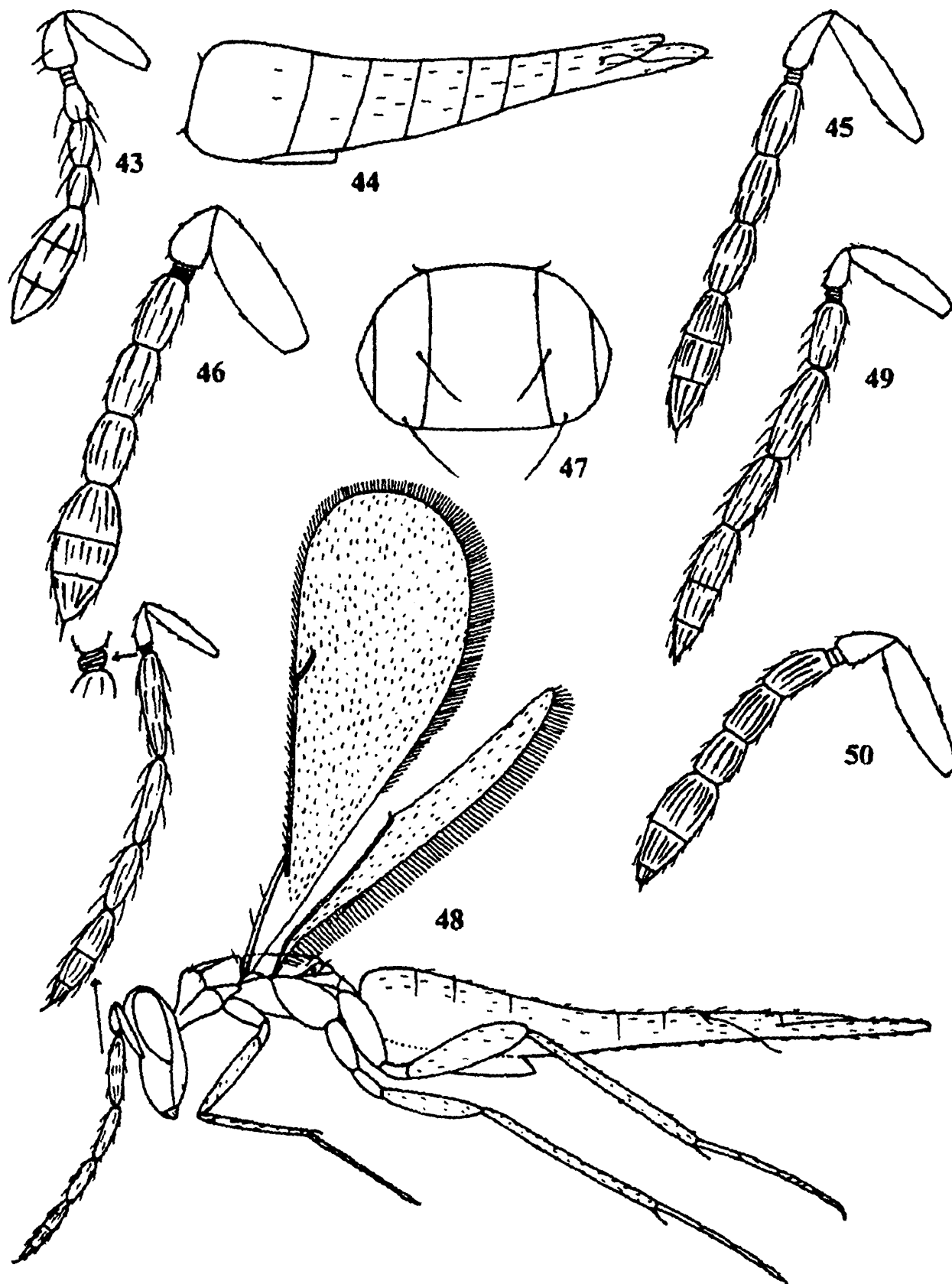
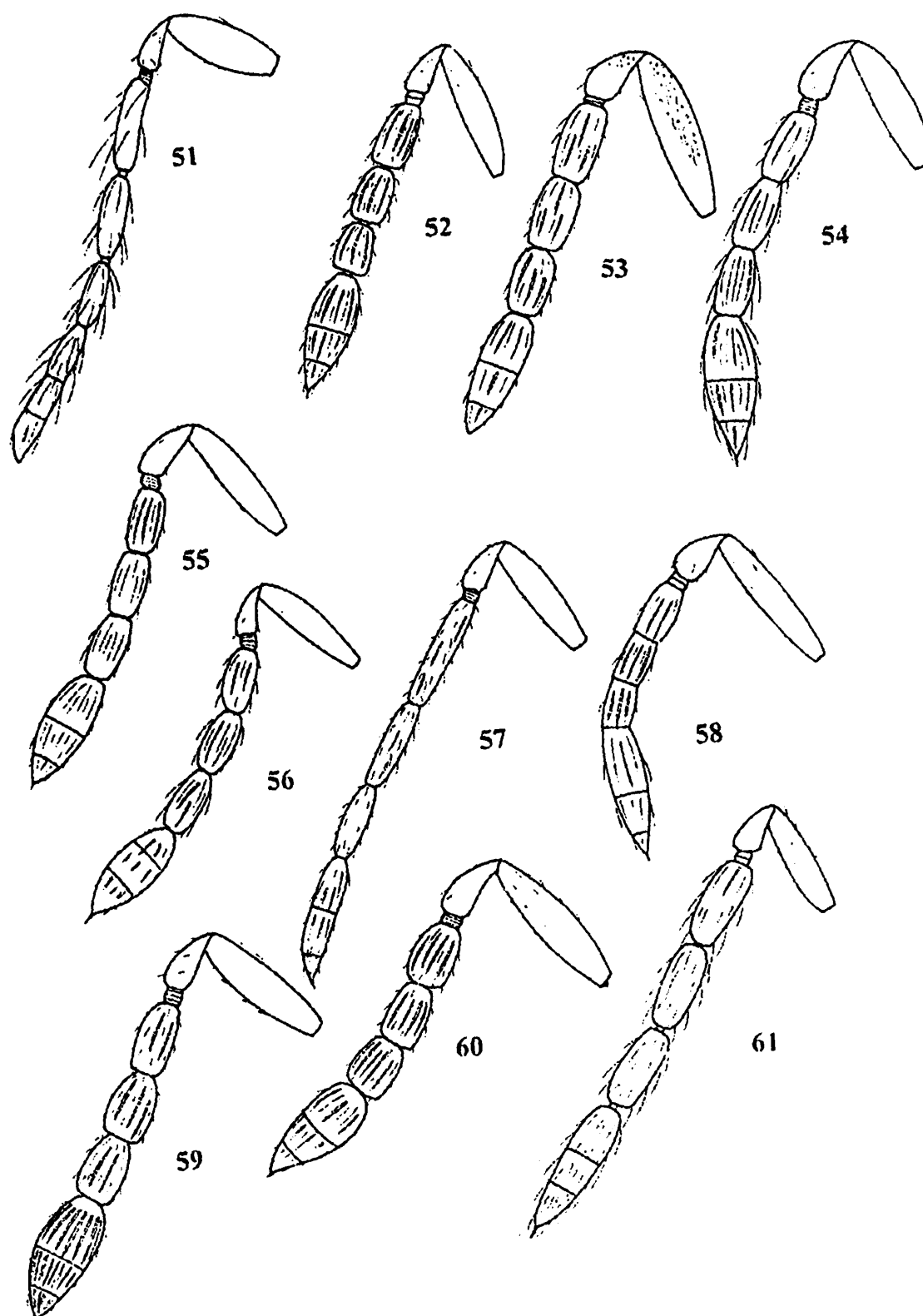


Fig. 34. *Aprostocetus selonus* sp. nov. Female : Head and mesosoma; Fig. 35. *Aprostocetus aruna* sp. nov. Female : Antenna; Figs. 36. *Aprostocetus hanti* sp. nov. Female : Antenna; Figs. 37-38. *Aprostocetus kodei* sp. nov. Female : 37. Antenna; 38. Body profile; Figs. 39-40. *Aprostocetus harithus* sp. nov. Female : 39. Antenna; 40. Gaster; Figs. 41-42. *Aprostocetus ashotus* sp. nov. Female : 41. Antenna; 42. Gaster.



Figs. 43-44. *Aprostocetus karicus* sp. nov. Female : 43. Antenna; 44. Gaster; Fig. 45. *Aprostocetus uthonia* sp. nov. Female : Antenna; Figs. 46-47. *Aprostocetus amalius* sp. nov. Female : 46. Antenna; 47. Mesoscutum Fig. 48. *Aprostocetus vanillae* sp. nov. Female : Body profile; Fig. 49. *Aprostocetus kaya* sp. nov. Female : Antenna; Fig. 50. *Aprostocetus rajai* sp. nov. Female : Antenna.



**Fig. 51.** *Aprostocetus calasmus* sp. nov. Female : Antenna; **Fig. 52.** *Aprostocetus declus* sp. nov. Female : Antenna; **Fig. 53.** *Aprostocetus ille* sp. nov. Female : Antenna; **Fig. 54.** *Aprostocetus angus* sp. nov. Female : Antenna; **Fig. 55.** *Aprostocetus calius* sp. nov. Female : Antenna; **Fig. 56.** *Aprostocetus shimlicus* sp. nov. Female : Antenna; **Fig. 57.** *Aprostocetus nadicus* sp. nov. Female : Antenna; **Fig. 58.** *Aprostocetus vatjata* sp. nov. Female : Antenna; **Fig. 59.** *Aprostocetus taruna* sp. nov. Female : Antenna; **Fig. 60.** *Aprostocetus dellus* sp. nov. Female : Antenna; **Fig. 61.** *Aprostocetus nagri* sp. nov. Female : Antenna.

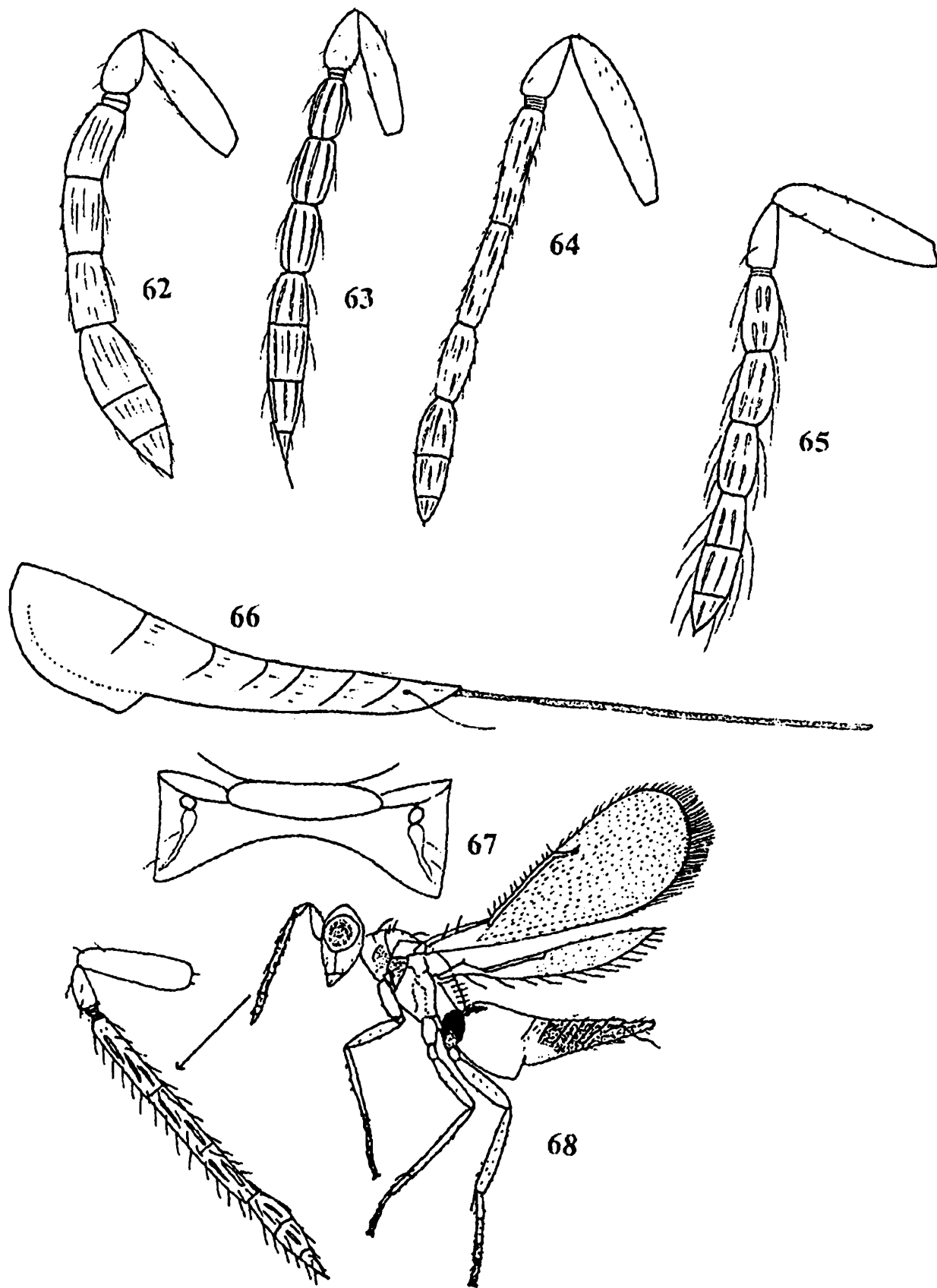
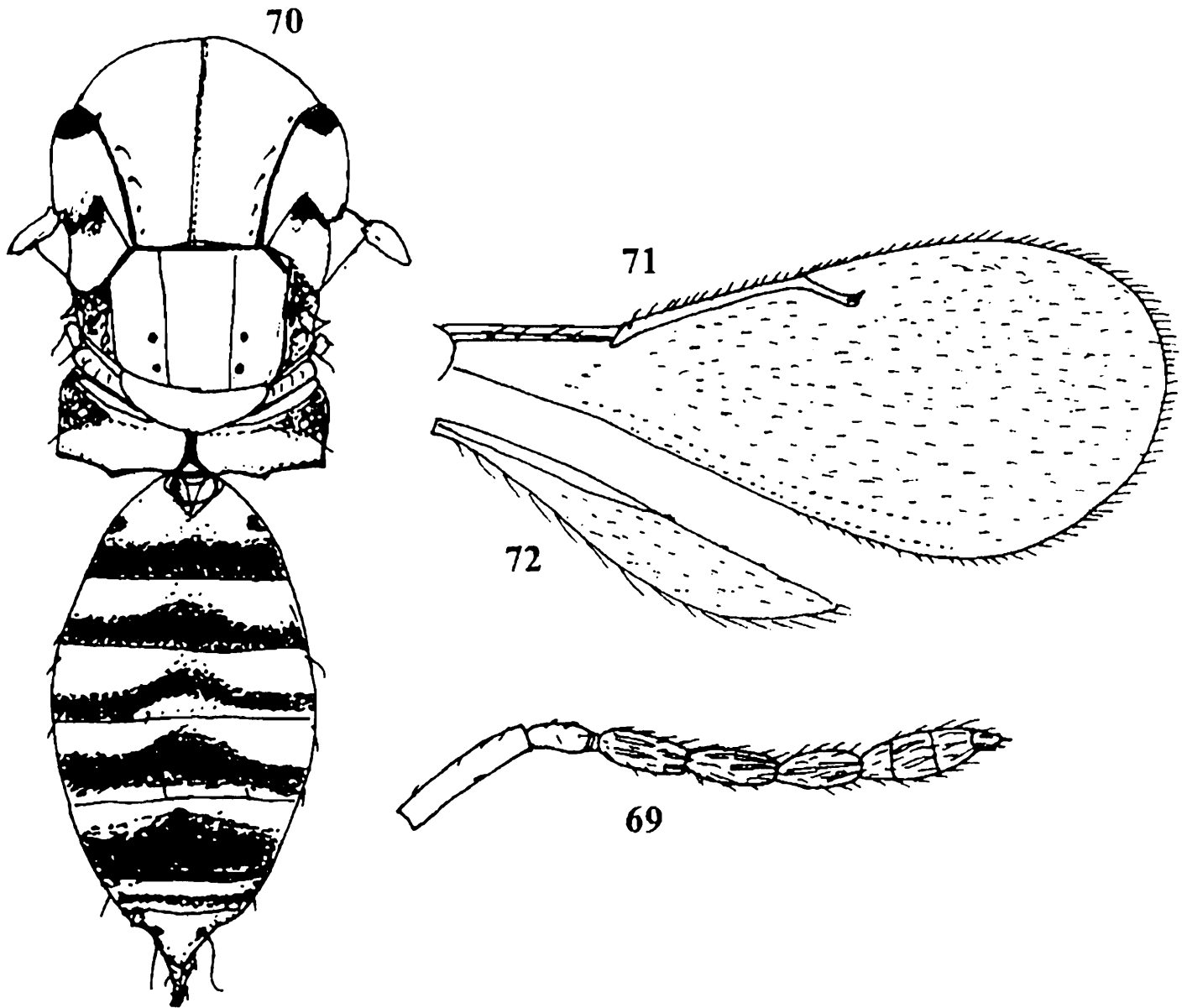


Fig. 62. *Aprostocetus licalis* sp. nov. Female : Antenna; Fig. 63. *Aprostocetus serycus* sp. nov. Female : Antenna; Fig. 64. *Aprostocetus yesica* sp. nov. Female : Antenna; Figs. 65-67. *Aprostocetus cauperdatus* sp. nov. Female : 65. Antenna; 66. Gaster; 67. Propodeum Fig. 68. *Aprostocetus sringeriensis* sp. nov. Female : Body profile.



**Figs. 69-72.** *Aprostocetus gala* sp. nov Female : 69. Antenna; 70. Mososoma and gaster; 71. Forewing; 72. Hind wing.

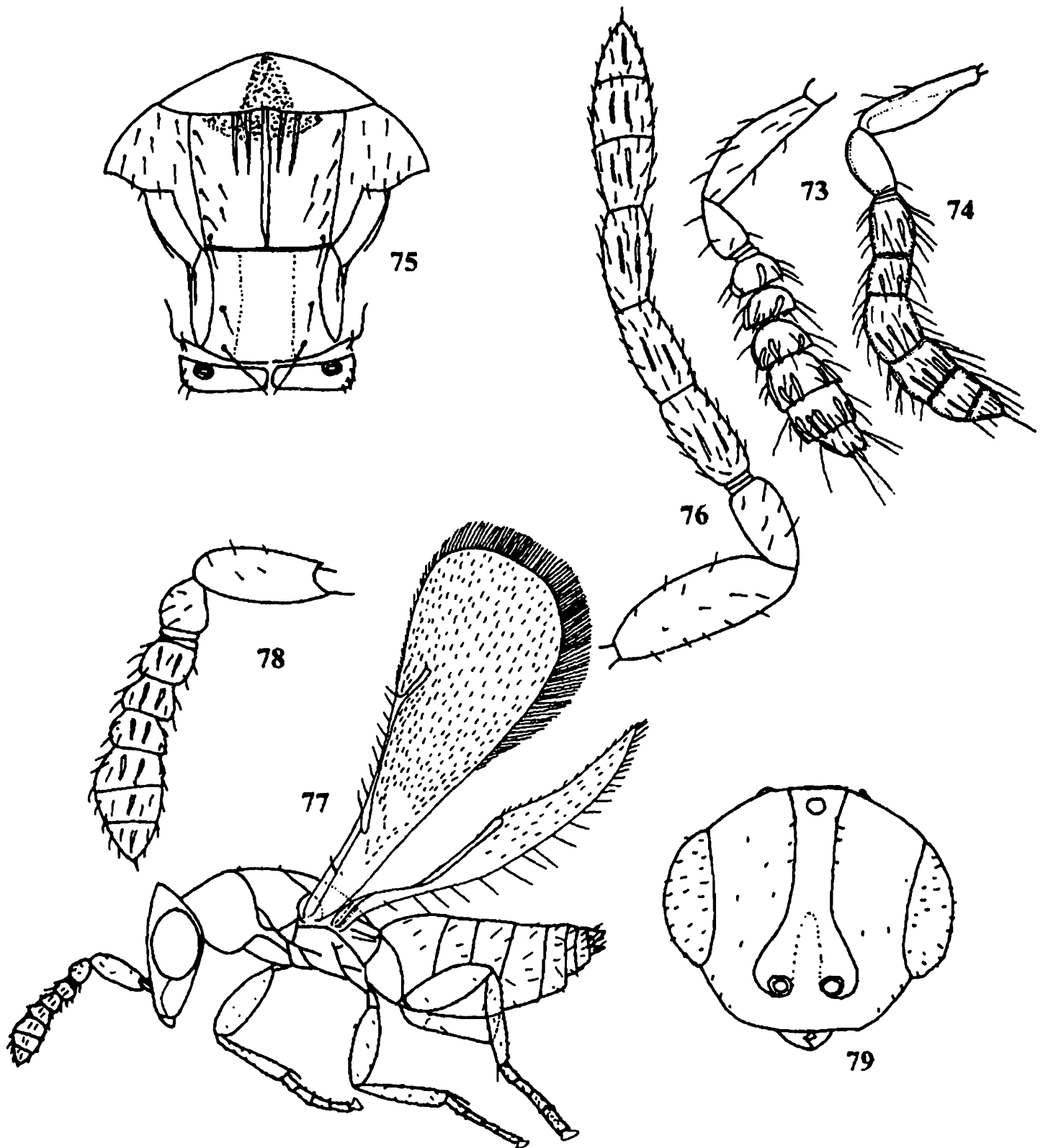


Fig. 73. *Aceratoneuromyia indica* (Silvestri) Female : Antenna; Fig. 74. *Aceratoneuromyia wayanadensis* Narendran & Santhosh Female : Antenna; Figs. 75-76. *Parachyrsocharis malabarensis* sp. nov. Female : 75. Mesosoma; 76. Antenna. Figs. 77-79. *Kostjurixia ootiyensis* sp. nov. Female : 77. Body profile; 78. Antenna; 79. Head front view.

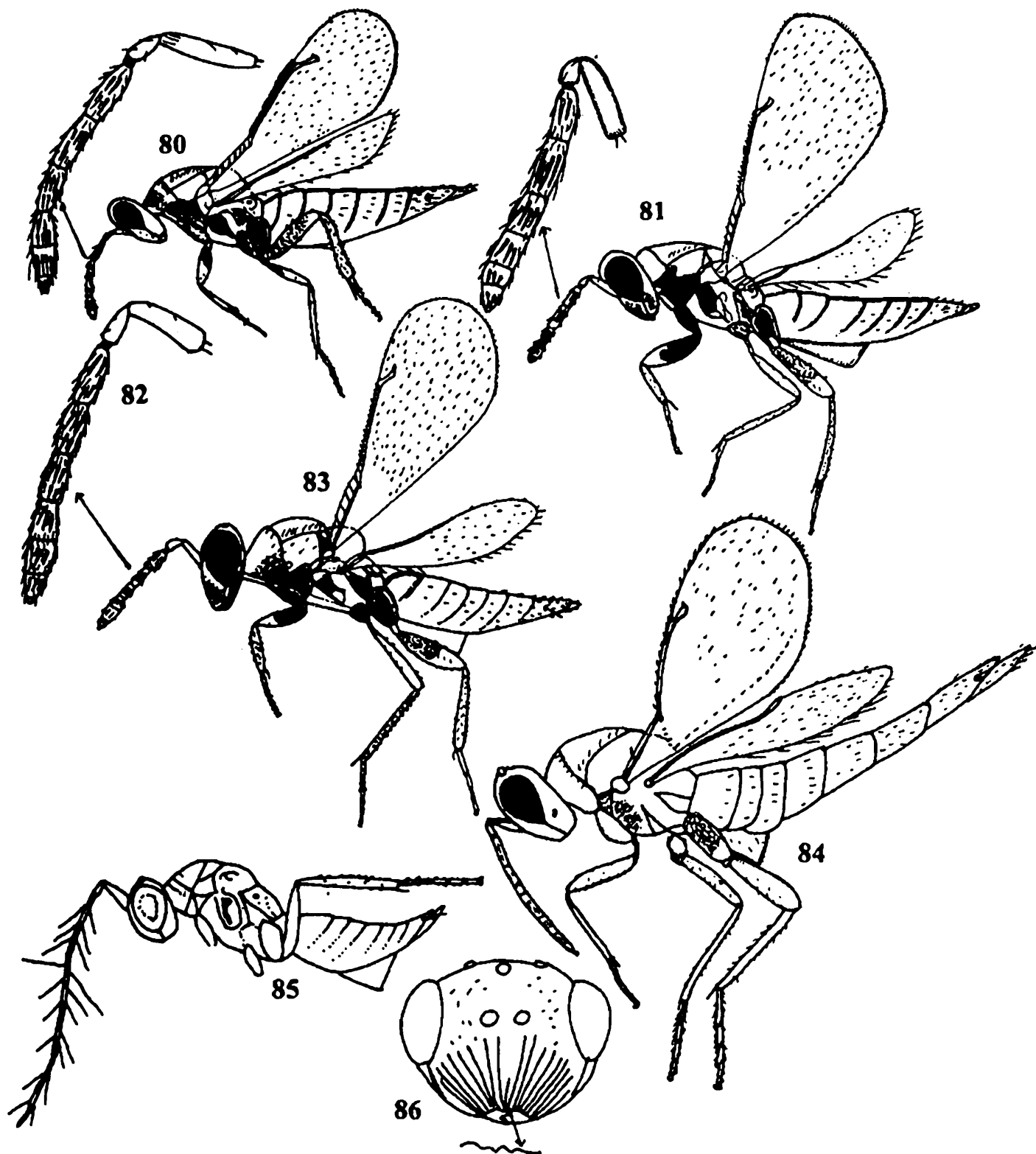


Fig. 80. *Anaprostocetus keralicus* Narendran & Girish Kumar, Female : Body profile; Fig. 81. *Anaprostocetus areos* Narendran & Fousi, Female : Body profile; Figs. 82-83. *Anaprostocetus sringeriensis* Narendran & Santhosh, Female : 82. Antenna; 83. Body profile. Fig. 84. *Neogasterichus longigastris* Narendran, Female : Body profile. Fig. 85. *Lasalleola obsona* Narendran, Female : Body profile. Fig. 86. *Ceratoneura indi* Girault, Female : Head front view.

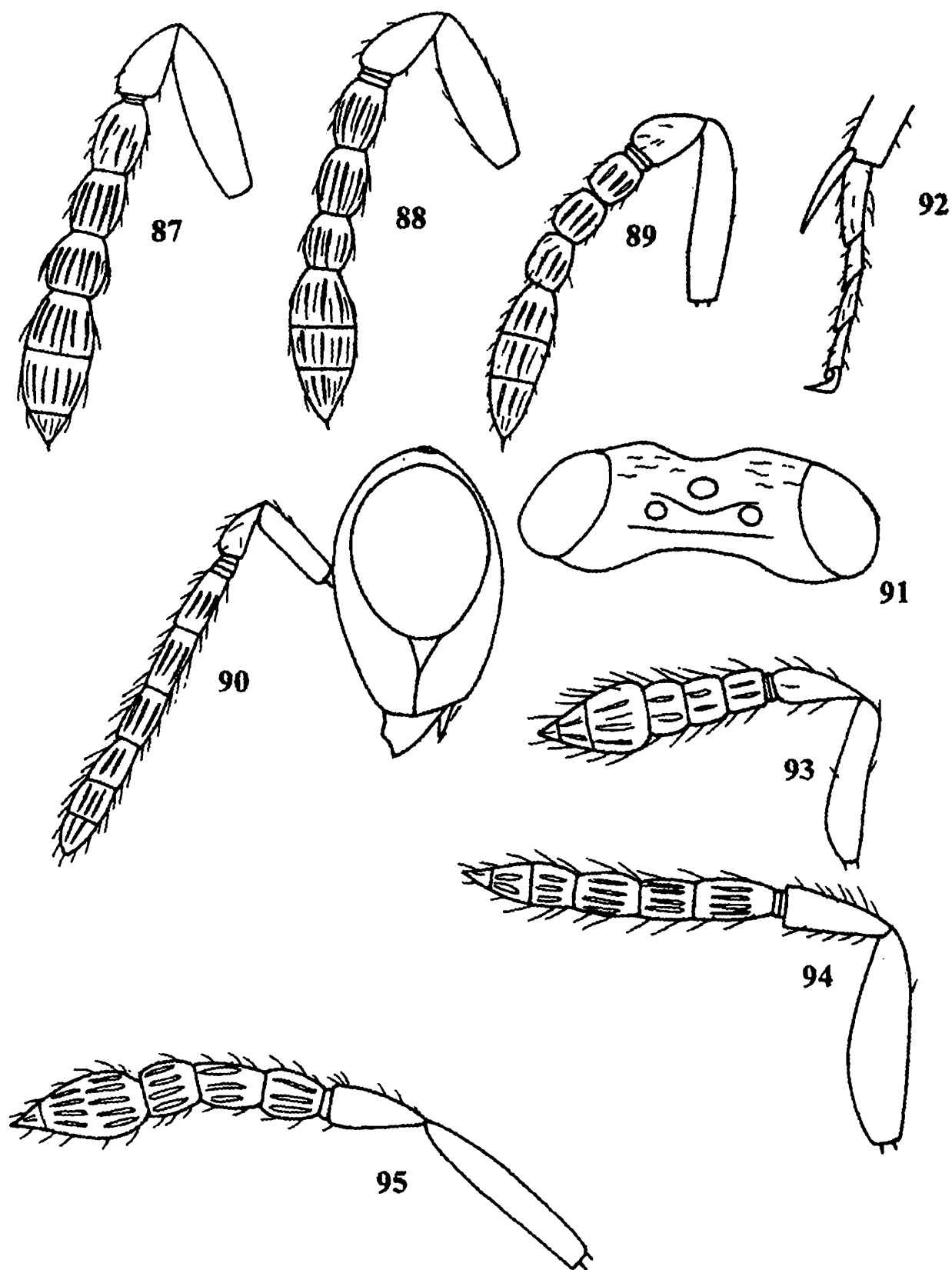
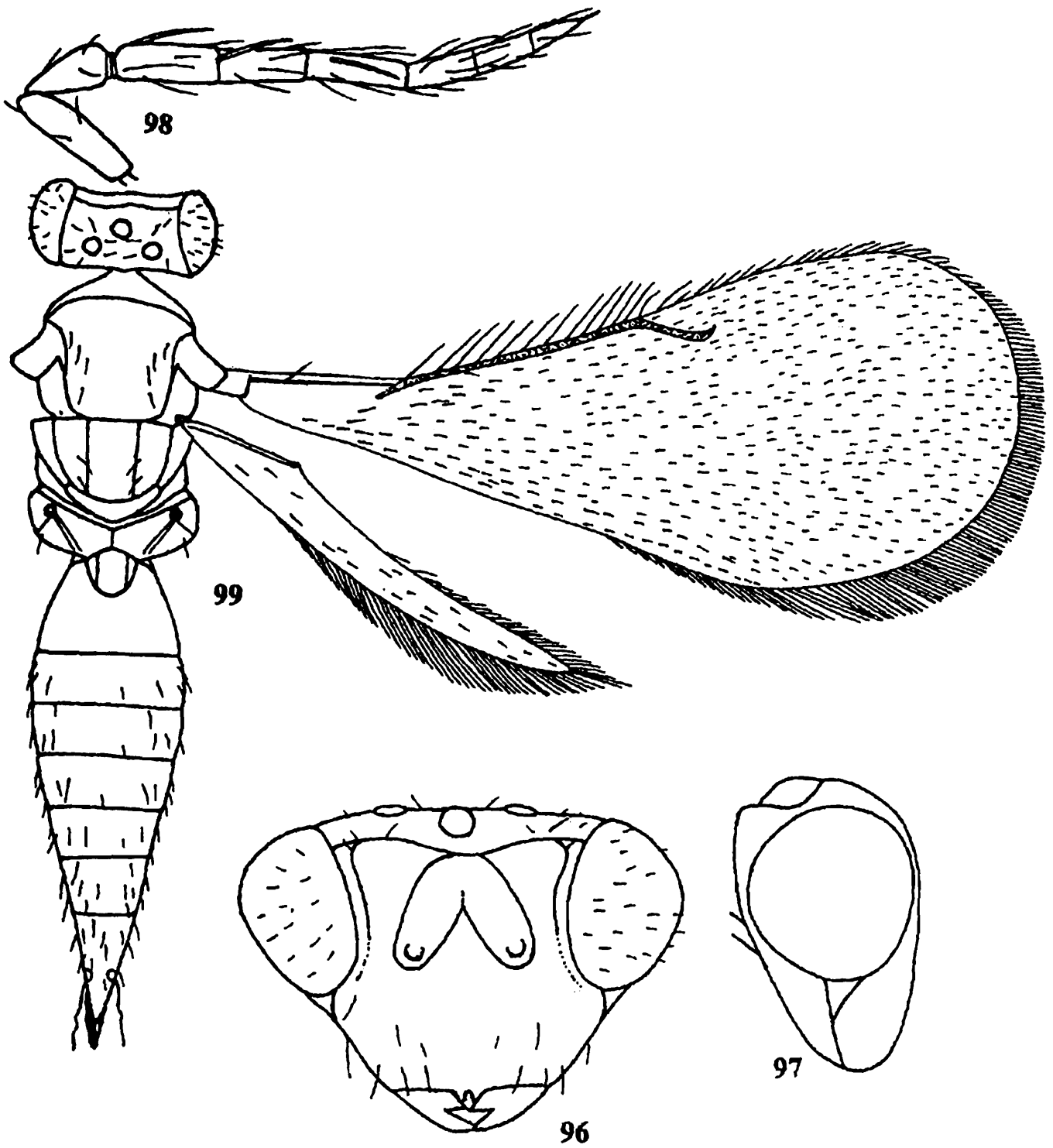
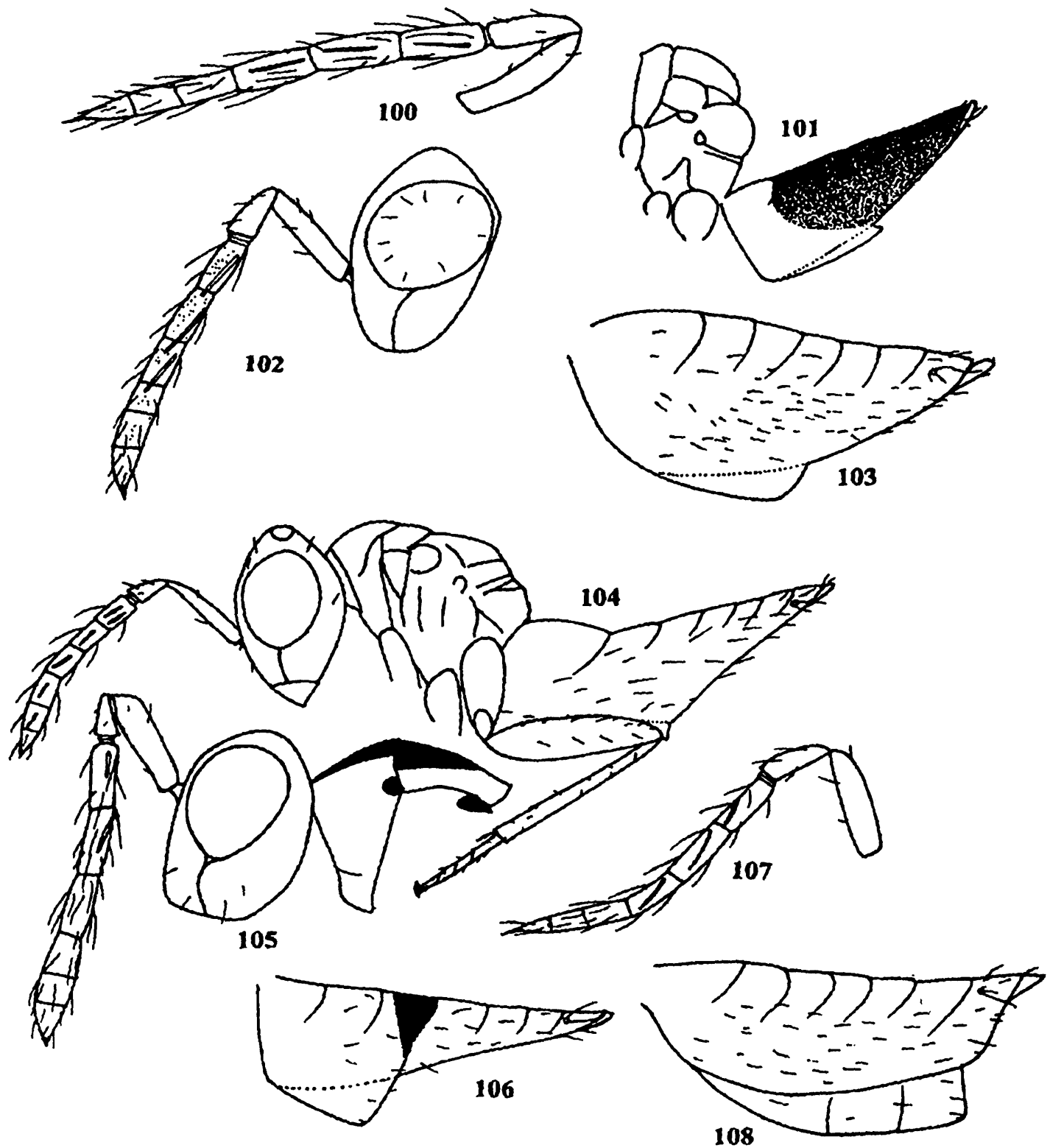


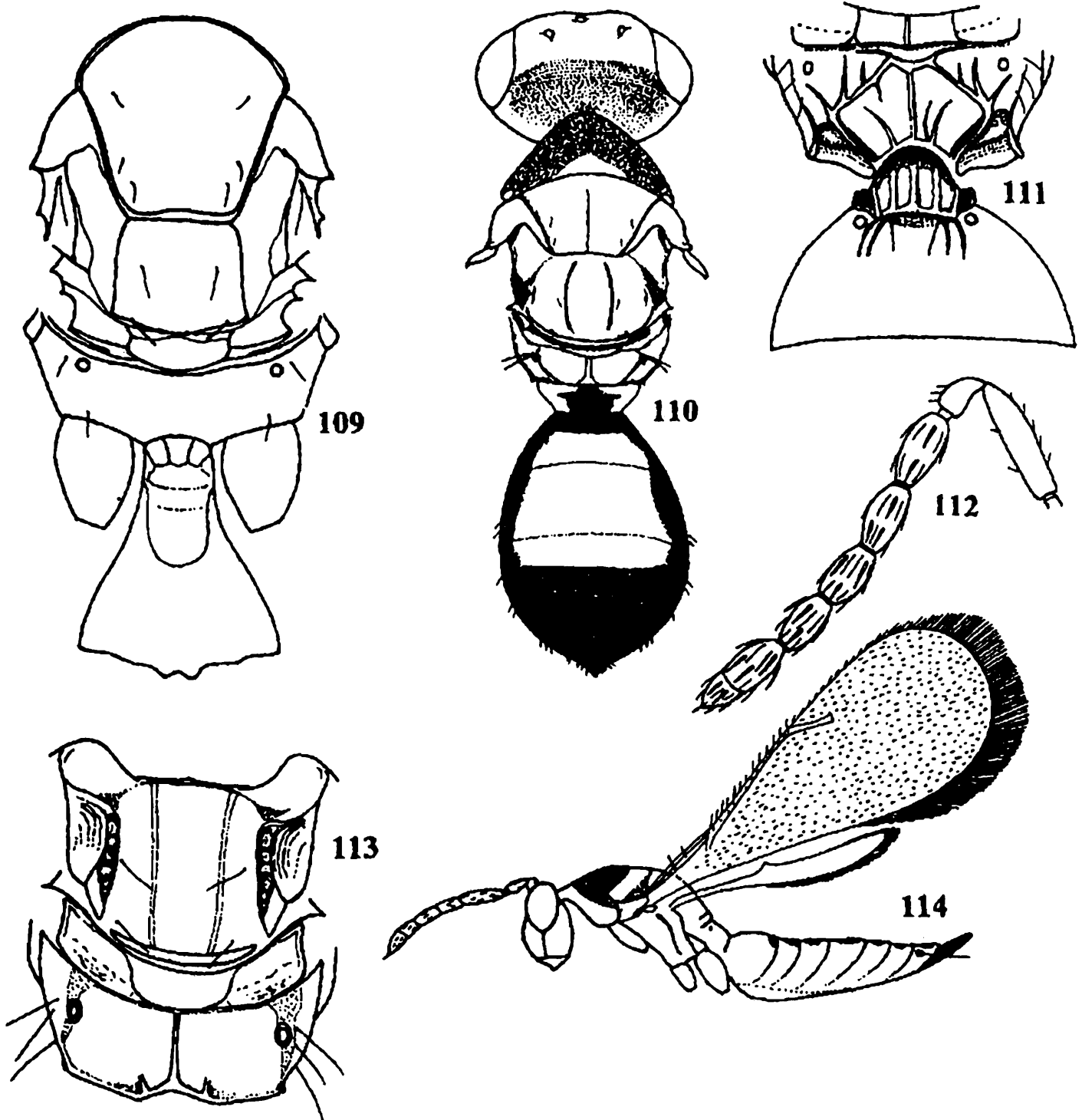
Fig. 87. *Baryscapus jicus* sp. nov. Female : Antenna; Fig. 88. *Baryscapus barica* sp. nov. Female : Antenna; Fig. 89. *Baryscapus impeditus* (Nees) Female : Antenna; Figs. 90-92. *Sigmophora keralensis* sp. nov. Female : 90. Head with antenna; 91. Head dorsal view; 92. Hind tibia with spine; Fig. 93. *Nesolynx phaeosoma* (Waterston) Female : Antenna. Fig. 94. *Nesolynx thymus* Girault Female : Antenna; Fig. 95. *Nesolynx javanica* (Ferière) Female : Antenna.



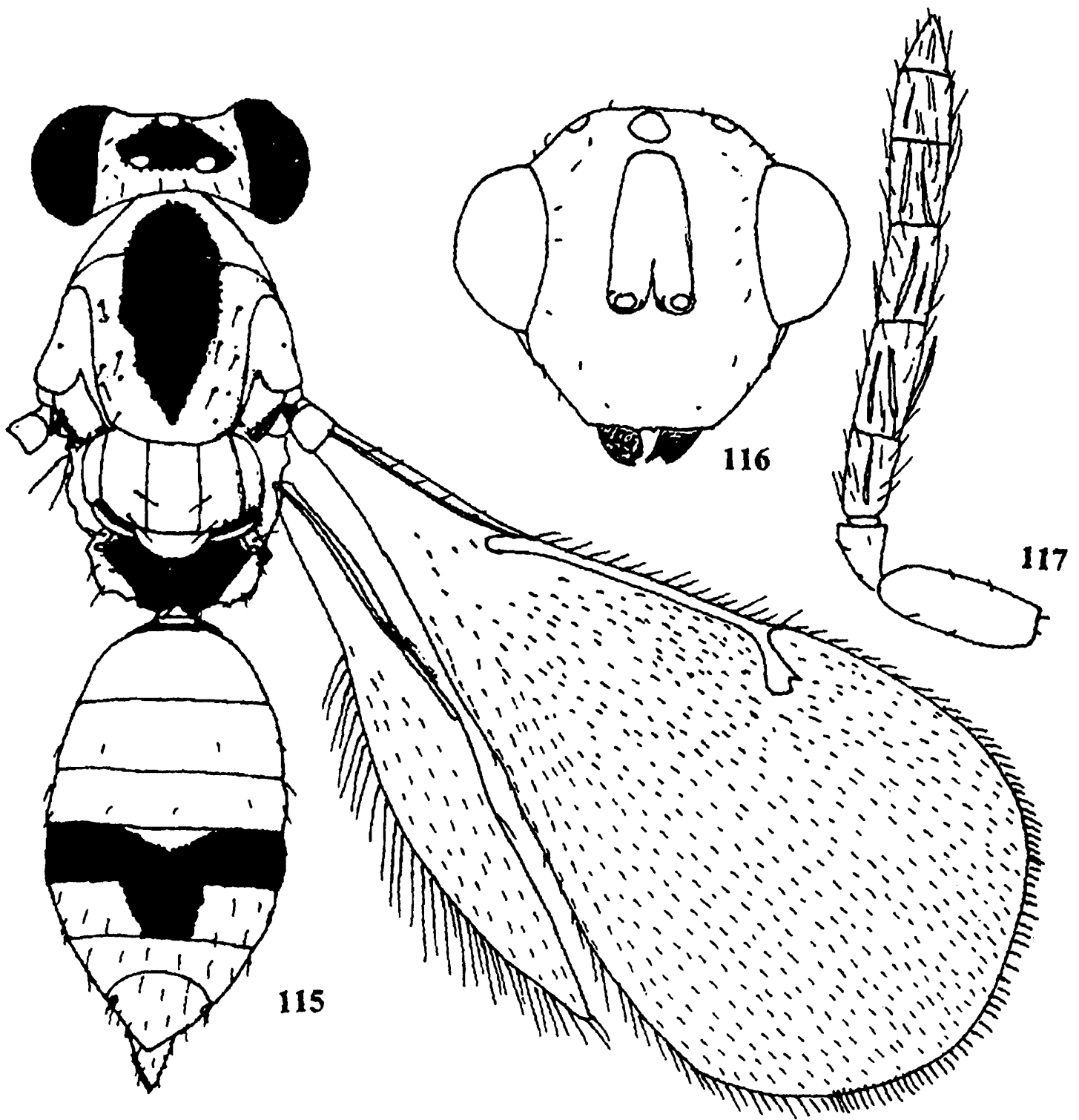
Figs. 96-99. *Quadrastichs garuda* sp. nov. Female : 96. Head front view; 97. Head side view; 98. Antenna; 99. Body profile.



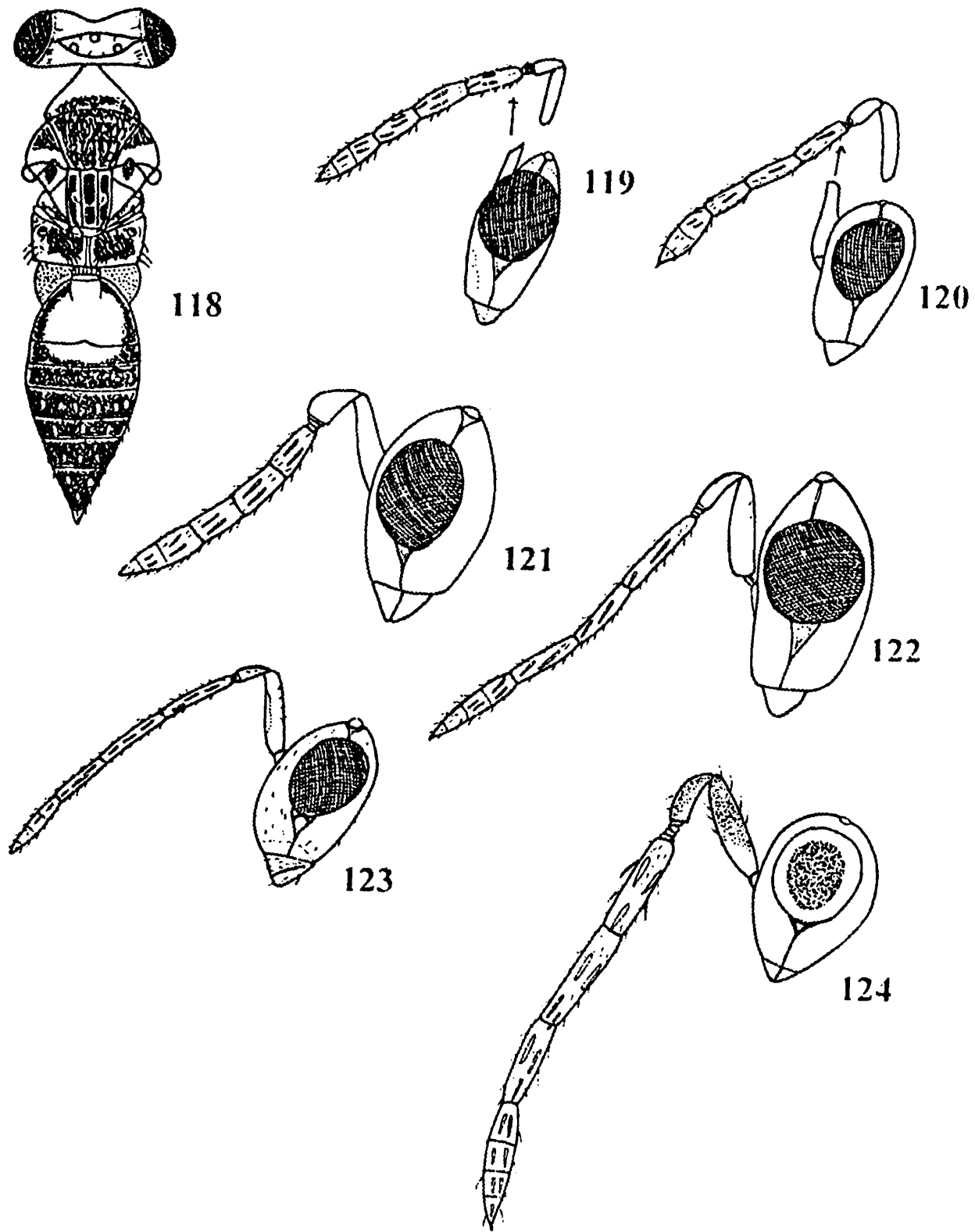
Figs. 100-101. *Quadrastichs fagri* sp. nov. Female : 100. Antenna; 101. Mesosoma and Gaster; Figs. 102-103. *Quadrastichs lurvi* sp. nov. Female : 102. Head with antenna; 103. Gaster; Fig. 104. *Quadrastichs demiticus* sp. nov. Female : Body profile. Figs. 105-106. *Quadrastichs lavania* sp. nov. Female : 105. Head with antenna and pronotum; 106. Gaster; Figs. 107-108. *Quadrastichs vinitia* sp. nov. Female : 107. Antenna; 108. Gaster.



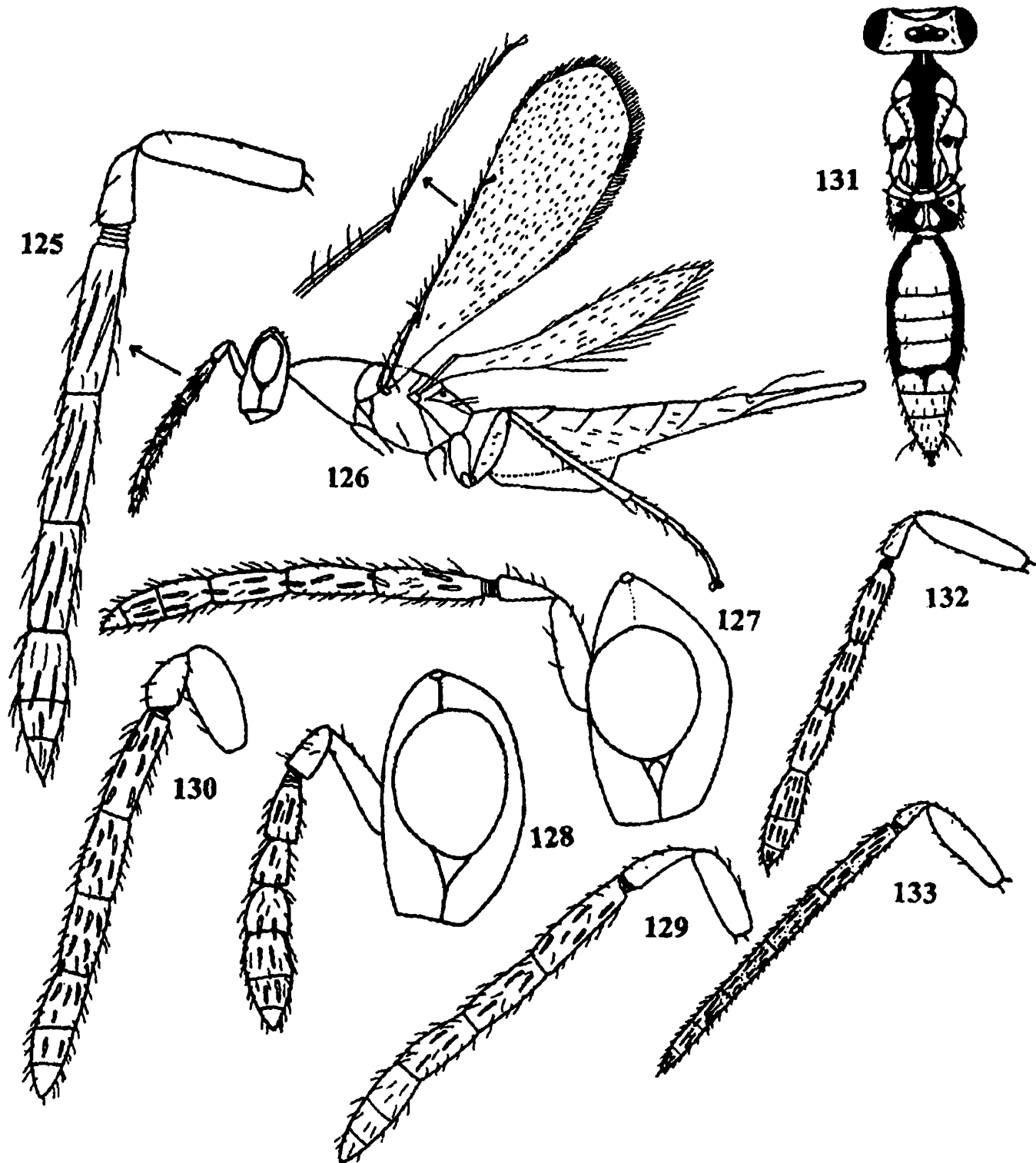
**Fig. 109.** *Thripastichus gentilei* Del Guercio Female : Mesosoma, Petiole and base of gaster (Modified from La Salle, 1994. Courtesy : La Salle). **Fig. 110.** *Citrostichus phyllocnistoides* Narayanan, Female : Body dorsal view (Modified from Boucek, 1988. Courtesy : Boucek); **Fig. 111-112.** *Mestocharella javensis* Gahan, Female : 111. Propodeum and base of gaster; 112. Antenna (Modified from Kamijo, 1994, Courtesy : Kamijo). **Fig. 113.** *Holcotetrastichus* sp. Female : Scutellum, Metanotum and Propodeum (Mofidied from Graham, 1991. Courtesy : Graham). **Fig. 114.** *Neomestocharella keralensis* Narendran & Fousi, Female : Body profile.



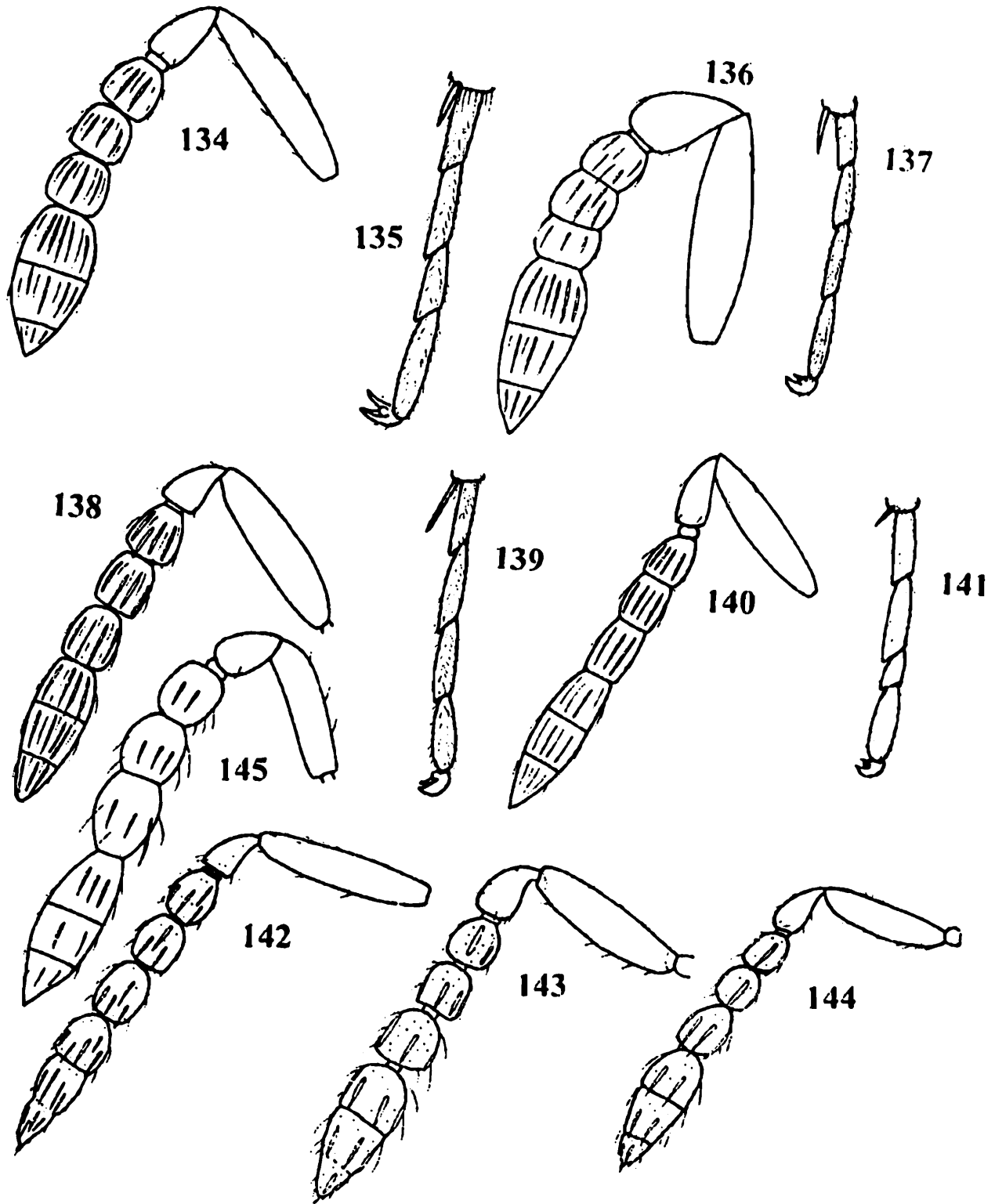
Figs. 115-117. *Minotetrastichus ziasmi* sp. nov. Female : 115. Body profile; 116. Head front view; 117. Antenna.



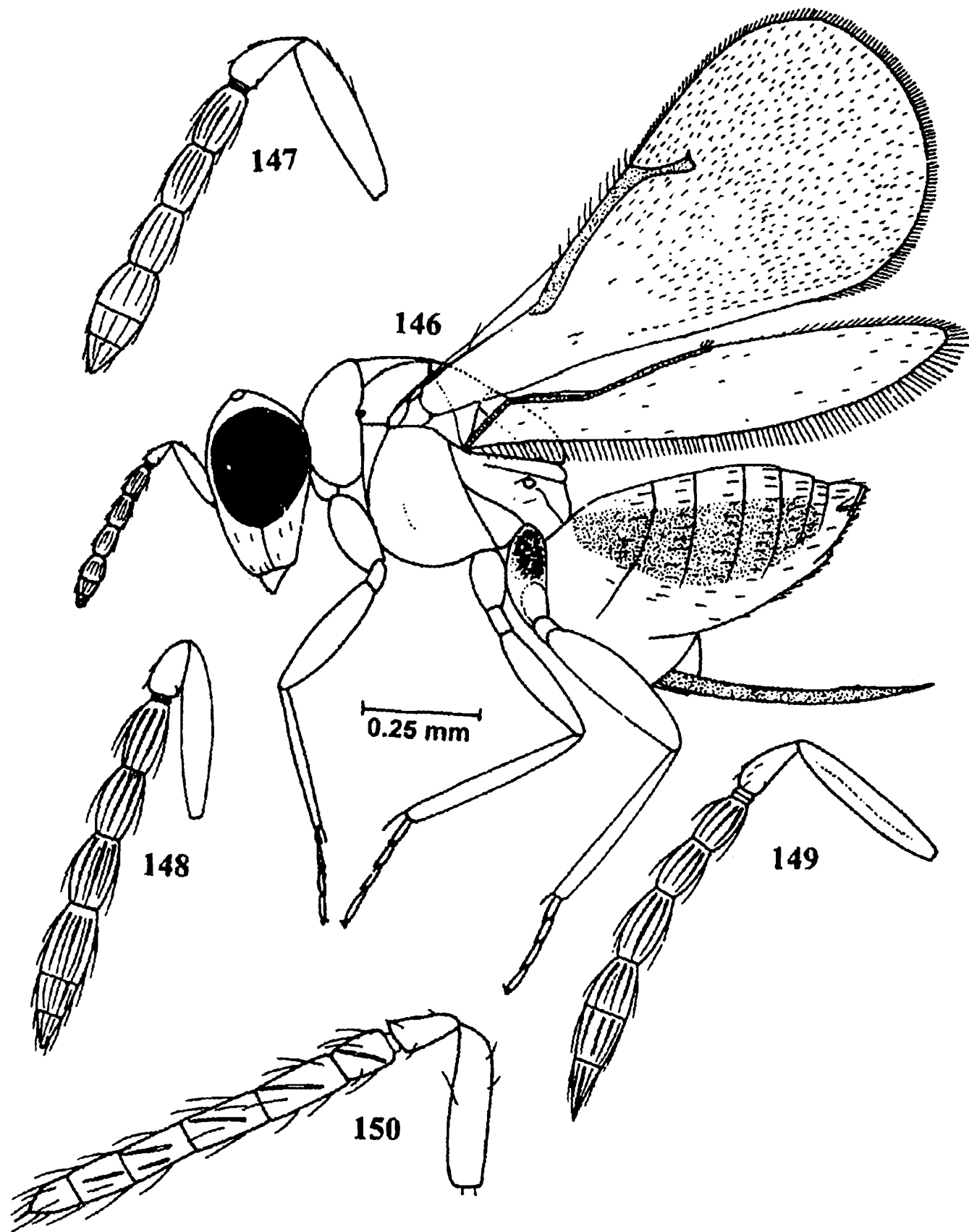
**Fig. 118.** *Neotrichoporoides beonus* Narendran, Female : Body dorsal view; **Fig. 119.** *Neotrichoporoides crinius* Narendran, Female : Head and antenna; **Fig. 120.** *Neotrichoporoides tonimus* Narendran, Female : Head and antenna. **Fig. 121.** *Neotrichoporoides stom* Narendran & Jilcy, Female : Head and antenna. **Fig. 122.** *Neotrichoporoides curiosus* Narendran & Girish, Female : Head and antenna; **Fig. 123.** *Neotrichoporoides galia* Narendran & Santhosh, Female : Head and antenna. **Fig. 124.** *Neotrichoporoides idukkiensis* (Narendran) Female : Head and antenna.



Figs. 125-126. *Neotrichoporoides mohanae* sp. nov. Female : 125. Antenna; 126. Body profile. Fig. 127. *Neotrichoporoides doproides* sp. nov. Female : Head and antenna; Fig. 128. *Neotrichoporoides yoopi* sp. nov. Female : Head and antenna; Fig. 129. *Neotrichoporoides arunima* sp. nov. Female : Antenna; Fig. 130. *Neotrichoporoides dunicus* sp. nov. Female : Antenna; Fig. 131. *Neotrichoporoides viridimaculatus* Fullway, Female : Body dorsal view. Fig. 132. *Neotrichoporoides mediterraneus* Graham, Female : Antenna; Fig. 133. *Neotrichoporoides nyemitawus* (Rohwer), Female : Antenna.



**Figs. 134-135.** *Oomyzus wayalaricus* sp. nov. Female : 134. Antenna; 135. Hind tarsus with tibial spine; **Figs. 136-137.** *Oomyzus viraktamathi* sp. nov. Female : 136. Antenna; 137. Hind tarsus with tibial spine; **Figs. 138-139.** *Oomyzus trounius* sp. nov. Female : 138. Antenna; 139. Hind tarsus with tibial spine; **Figs. 140-141.** *Oomyzus neogallerucae* sp. nov. Female : 140. Antenna; 141. Hind tarsus with tibial spine; **Figs. 142.** *Oomyzus scaposus* (Thomson), Female : Antenna; **Fig. 143.** *Oomyzus sokolowaskii* (Kurdjumov), Female : Antenna; **Fig. 144.** *Oomyzus gallerucae* (Fonscolombe), Female : Antenna; **Fig. 145.** *Oomyzus liriomyzae* Narendran, Female : Antenna.



Figs. 146-147. *Tamarixia dwivarnus* sp. nov. Female : 146. Body profile : 147. Antenna; Fig. 148. *Tamarixia yoorica* sp. nov. Female : Antenna; Fig. 149. *Tamarixia pookodica* sp. nov. Female : Antenna; Fig. 150. *Tamarixia girishi* sp. nov. Female : Antenna.

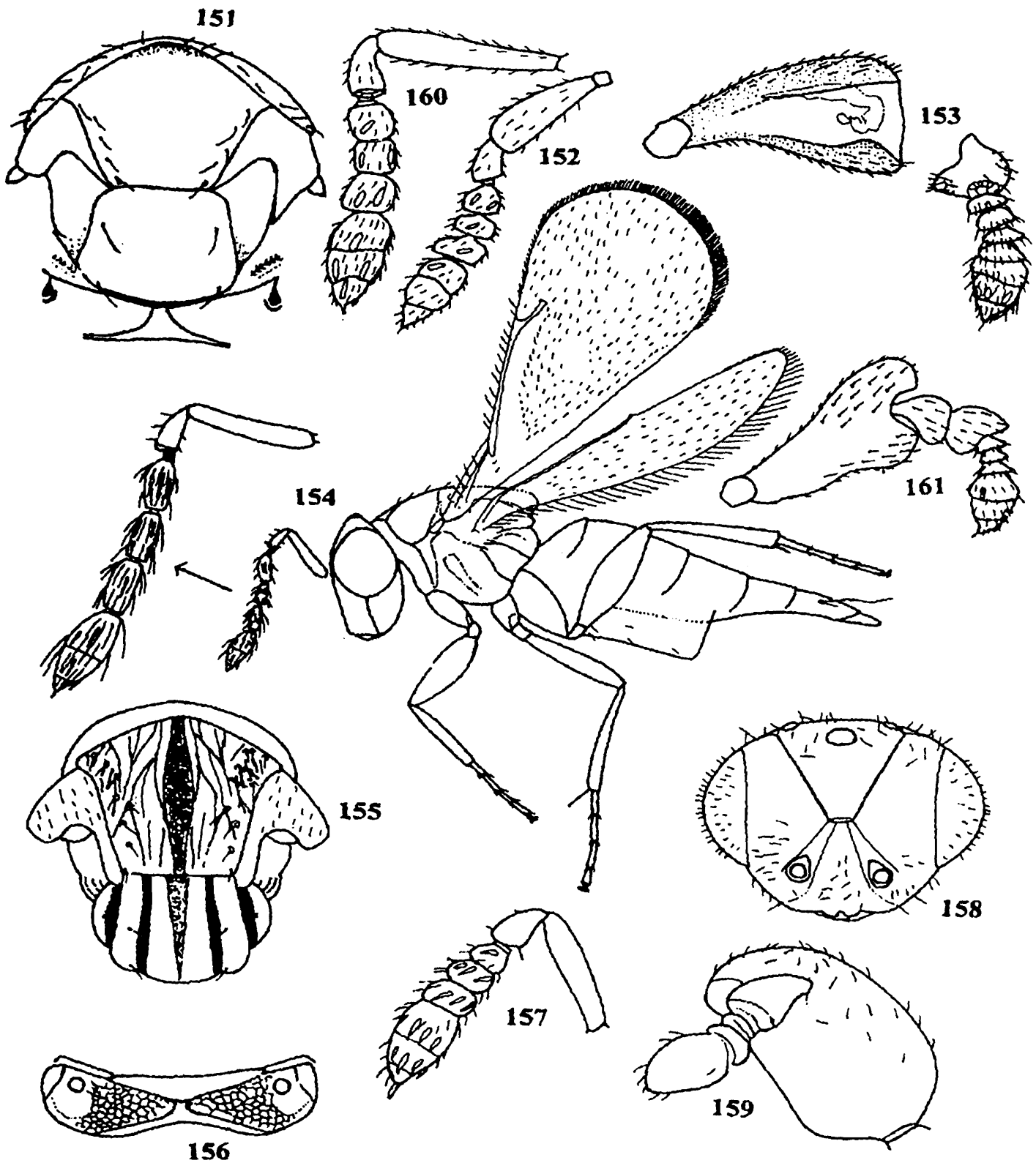


Fig. 151. *Goethella asulcata* Girault, Female : Mesosoma; Figs. 152-153. *Melittobia assemi* Dahms, 152. Female : Antenna; 153. Male : Antenna; Fig. 154. *Aprostocetus calycopteridis* sp. nov. Female : Body profile and antenna; Figs. 155-156. *Narendrania keralensis* Fousi, Female : 155. Mesonotum; 156. Propodeum; Figs. 157-159. *Tachinobia repanda* Boucek. 157. Female : Antenna; 158. Head front view; 159. Male : Antenna; Figs. 160-161. *Melittobia acasta* (Walker), 160. Female : Antenna; 161. Male : Antenna.

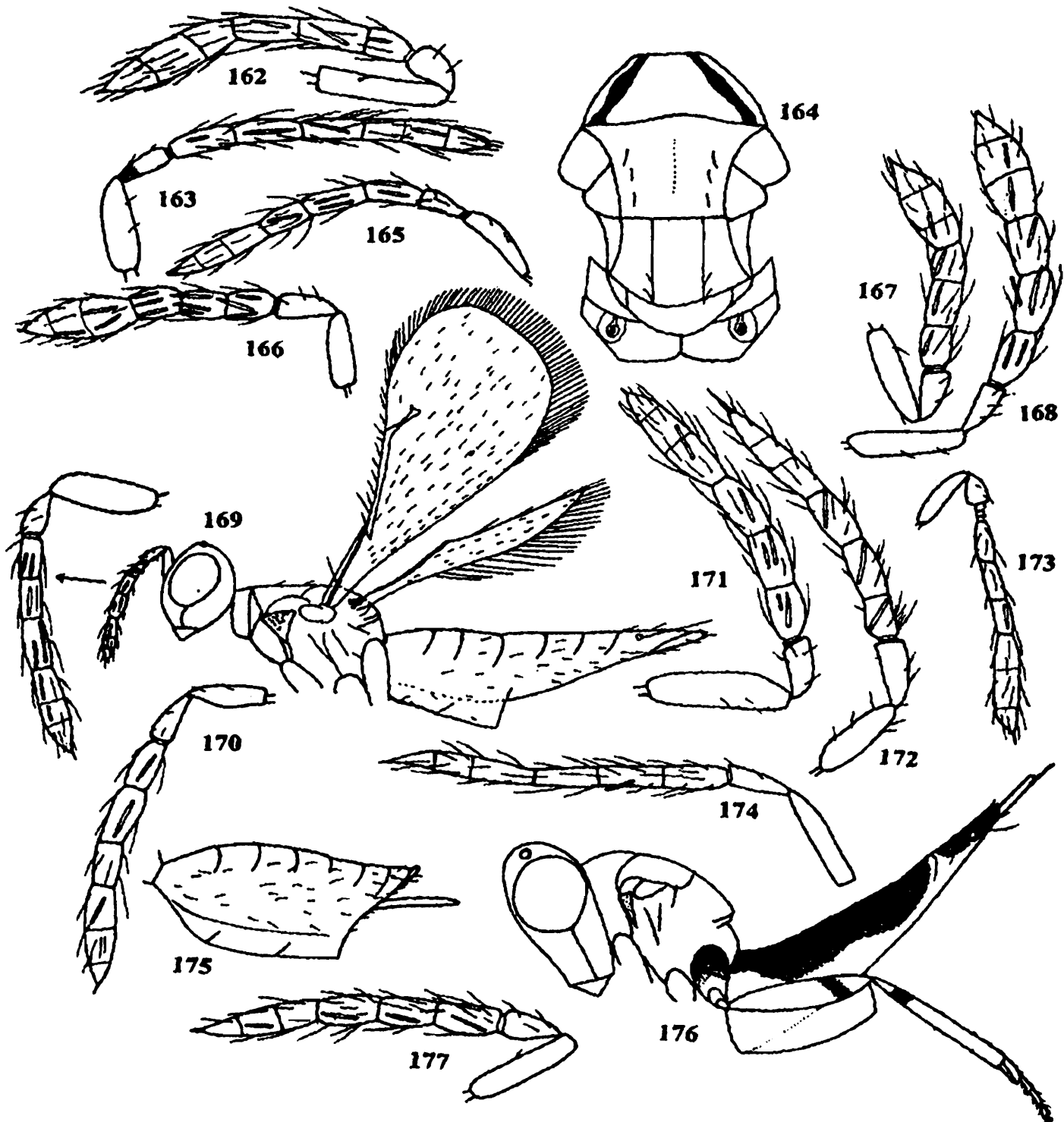
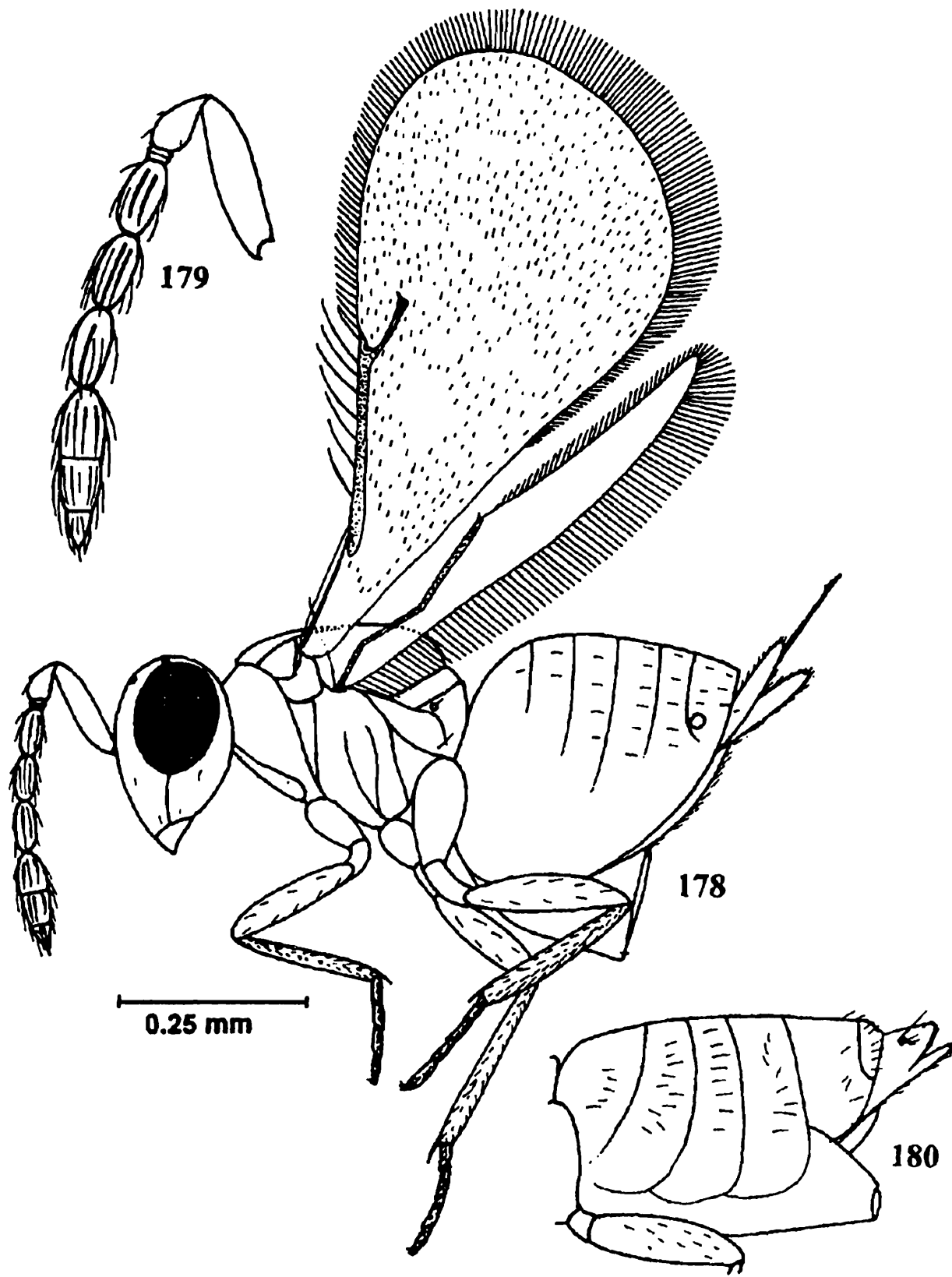
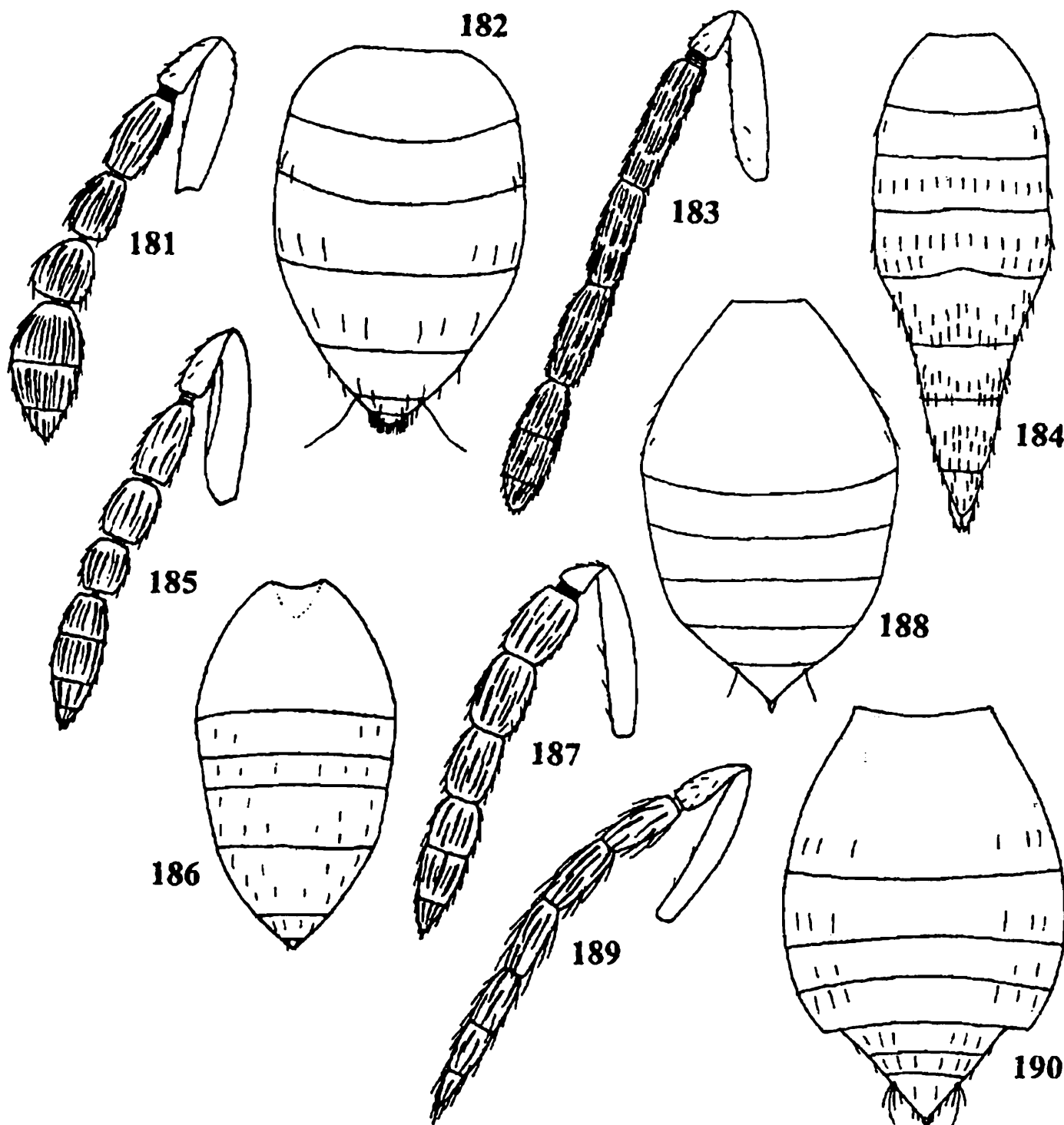


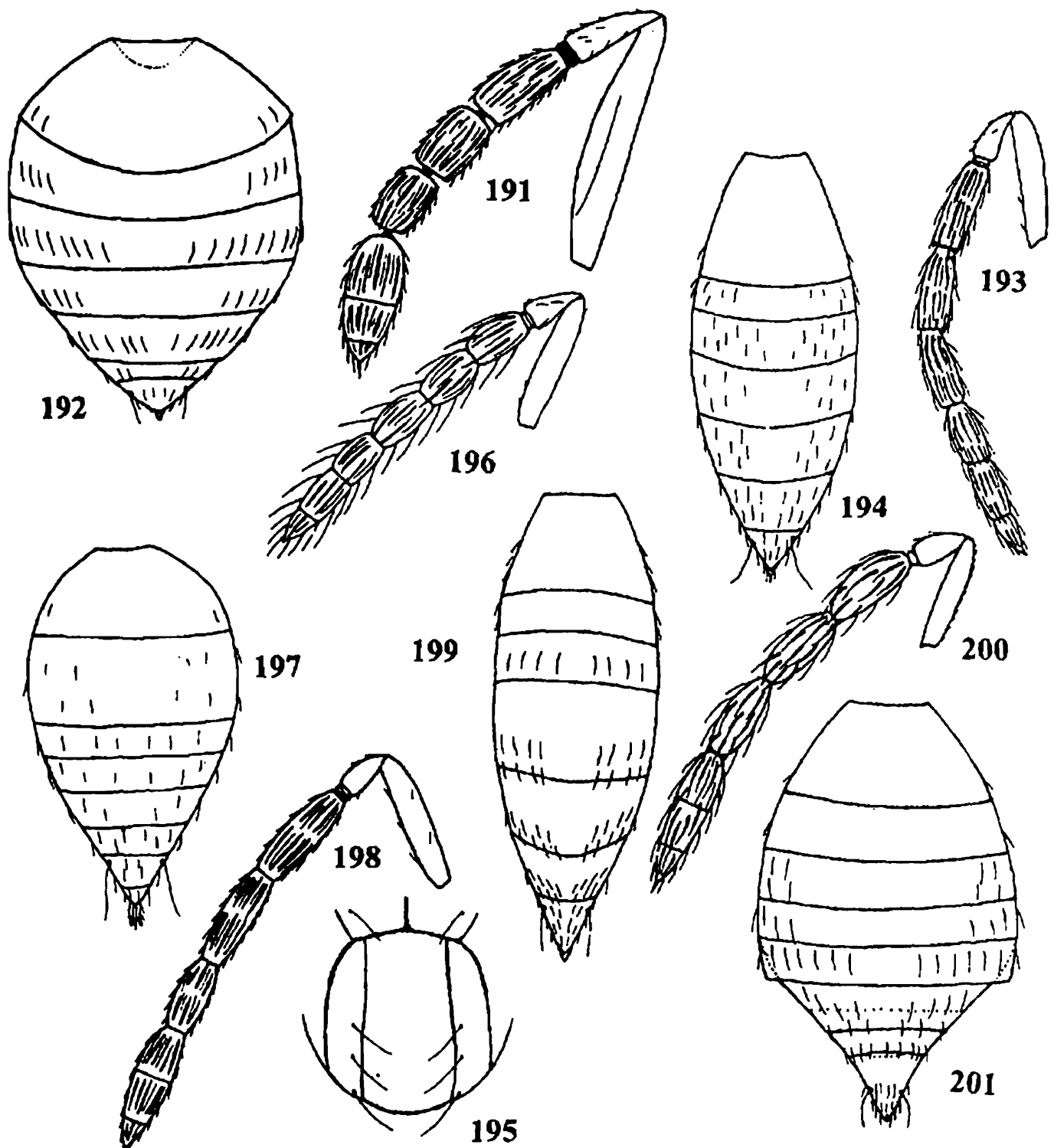
Fig. 162. *Quadrastichus delusus* sp. nov. Female : Antenna; Figs. 163-164. *Quadrastichus lantanae* sp. nov. Female : 163. Antenna; 164. Mesosoma; Fig. 165. *Quadrastichus stomalis* sp. nov. Female; Antenna; Fig. 166. *Quadrastichus narangae* sp. nov. Female : Antenna; Fig. 167. *Quadrastichus bararius* sp. nov. Female : Antenna; Fig. 168. *Quadrastichus cerolus* sp. nov. Female : Antenna; Fig. 169. *Quadrastichus diceus* sp. nov. Female : Body profile and antenna; Fig. 170. *Quadrastichus lekatus* sp. nov. Female : Antenna; Fig. 171. *Quadrastichus mangalae* sp. nov. Female : Antenna; Fig. 172. *Quadrastichus davius* sp. Female : Antenna. Fig. 173. *Quadrastichus getiolus* sp. nov. Female : Antenna; Fig. 174-175. *Quadrastichus zenta* sp. nov. Female : 174. Antenna; 175. Gaster; BFig. 176-177 *Quadrastichus sudheeri* sp. nov. Female : 176. Body profile; 177. Antenna.



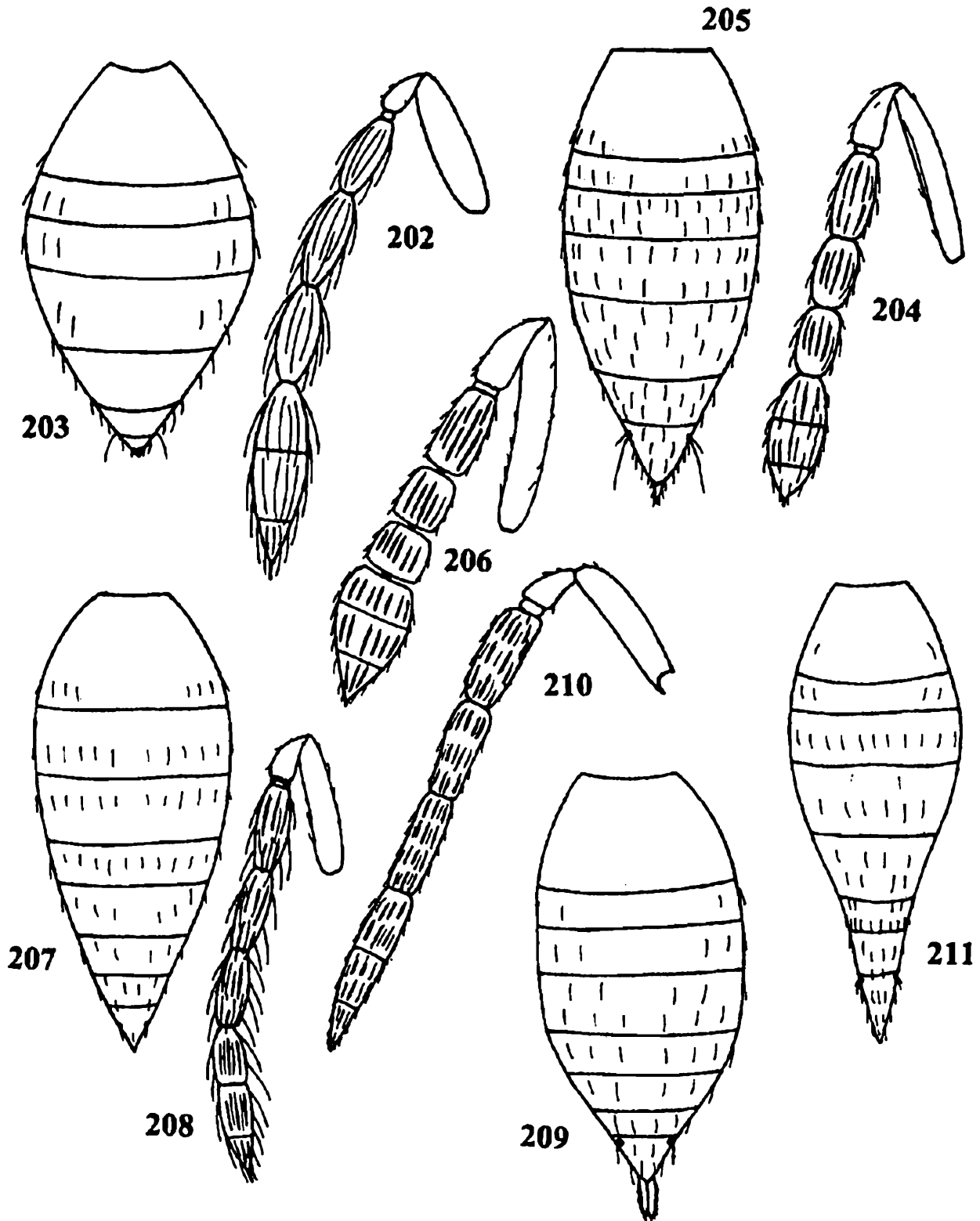
Figs. 178-179. *Quadrastichus saraicus* sp. nov. Female : 178. Body profile : 179. Antenna; Fig. 180. *Quadrastichus erythrinae* Kim; Gaster.



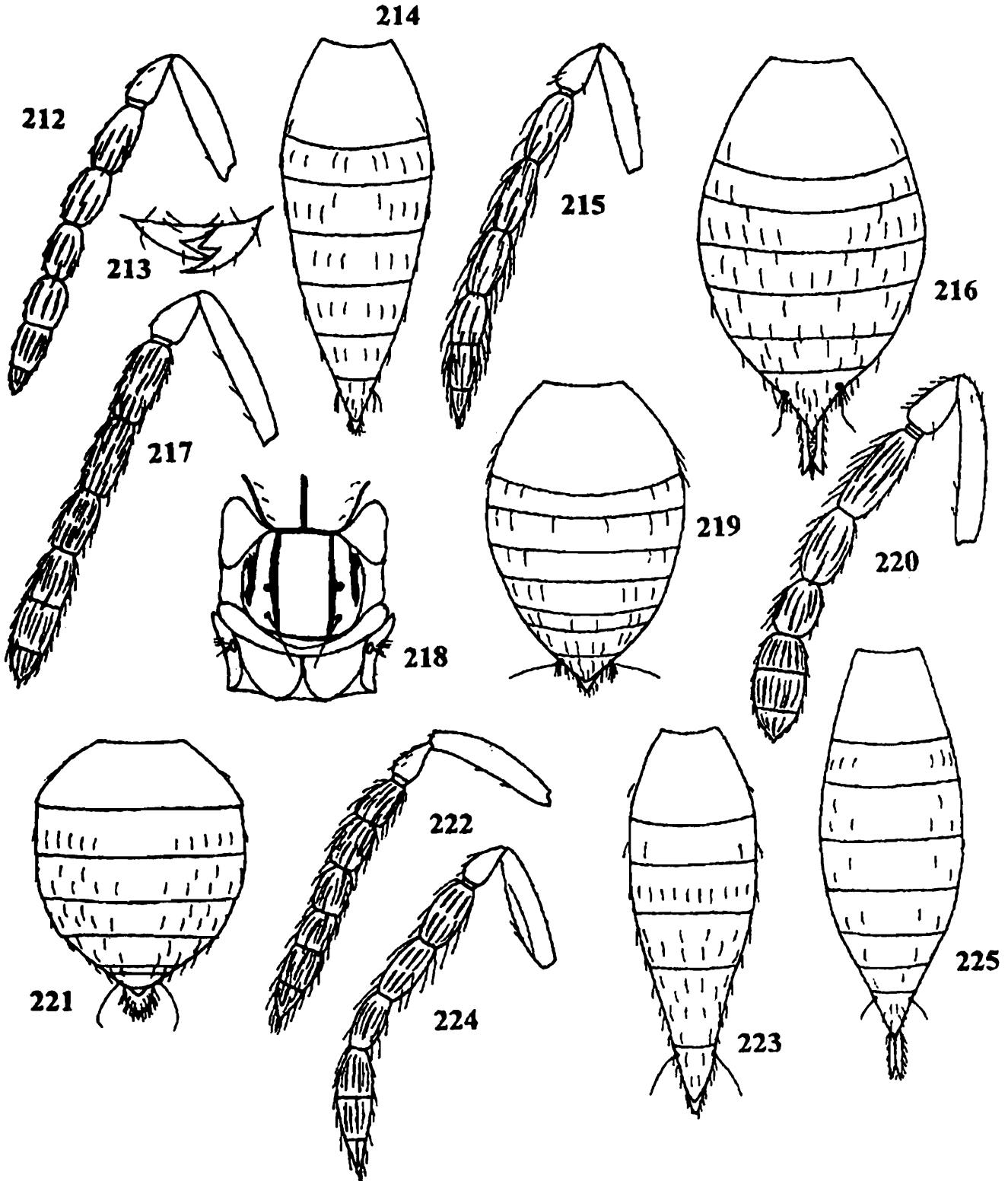
Figs. 181-182. *Tetrastichus manjumalaicus* sp. nov. 181. Antenna; 182. Gaster; Figs. 183-184. *Tetrastichus santhoshi* sp. nov. Female : 183. Antenna; 184. Gaster; Figs. 185-186. *Tetrastichus sringericus* sp. nov. Female : 185. Antenna; 186. Gaster; Figs. 187-188. *Tetrastichus iaricus* sp. nov. Female : 187. Antenna; 188. Gaster; Figs. 189-190. *Tetrastichus dinoticus* sp. nov. Female : 189. Antenna; 190. Gaster.



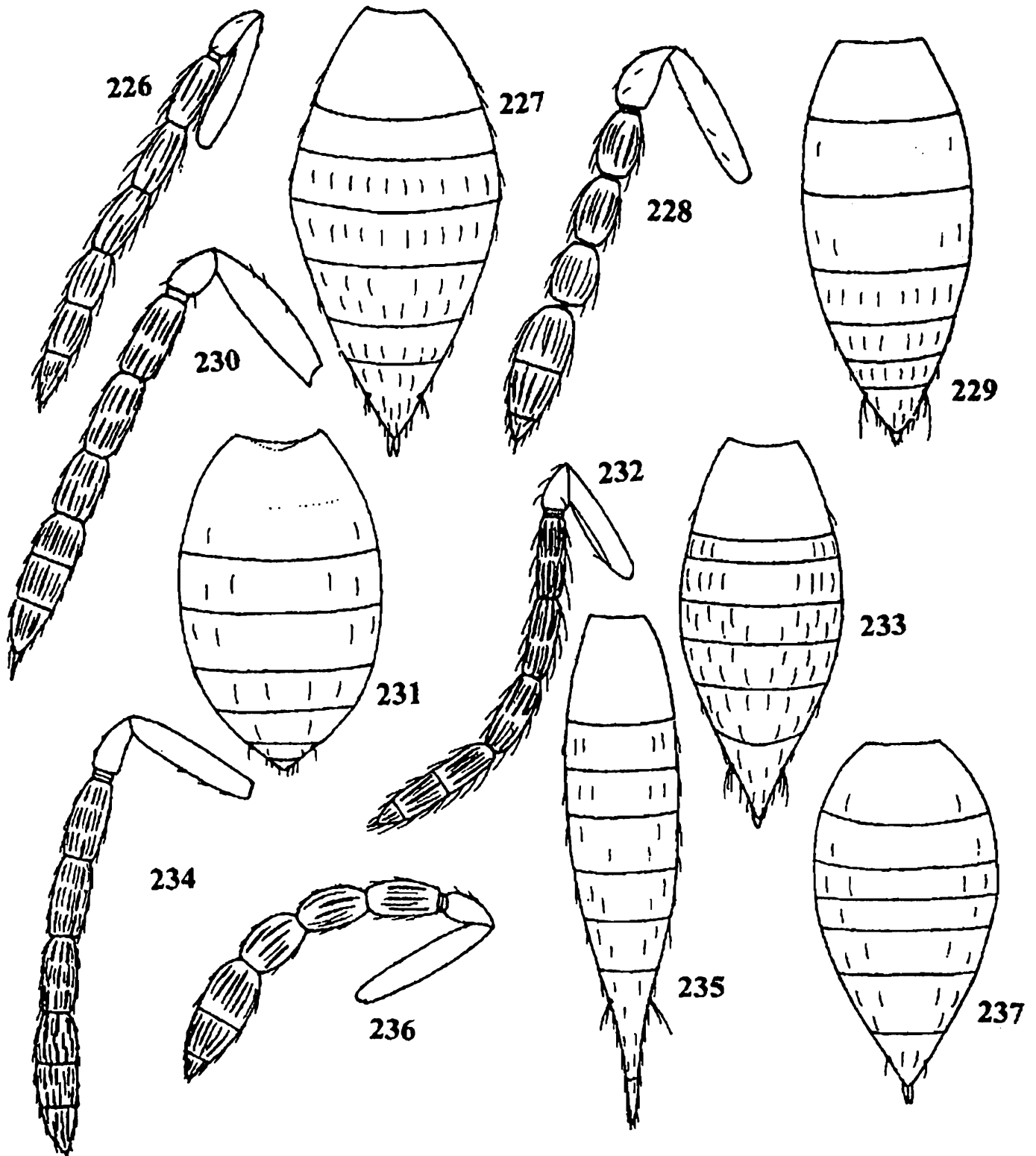
**Figs. 191-192.** *Tetrastichus bharathi* sp. nov. Female : 191. Antenna; 192. Gaster; **Figs. 193-195.** *Tetrastichus thonicus* sp. nov. Female : 193. Antenna; 194. Gaster; 195. Scutellum; **Figs. 196-197.** *Tetrastichus cotesiae* sp. nov. Female : 196. Antenna; 197. Gaster; **Figs. 198-199.** *Tetrastichus dasi* sp. nov. Female : 198. Antenna; 199. Gaster; **Figs. 200-201.** *Tetrastichus zeyae* sp. nov. Female : 200. Antenna; 201. Gaster.



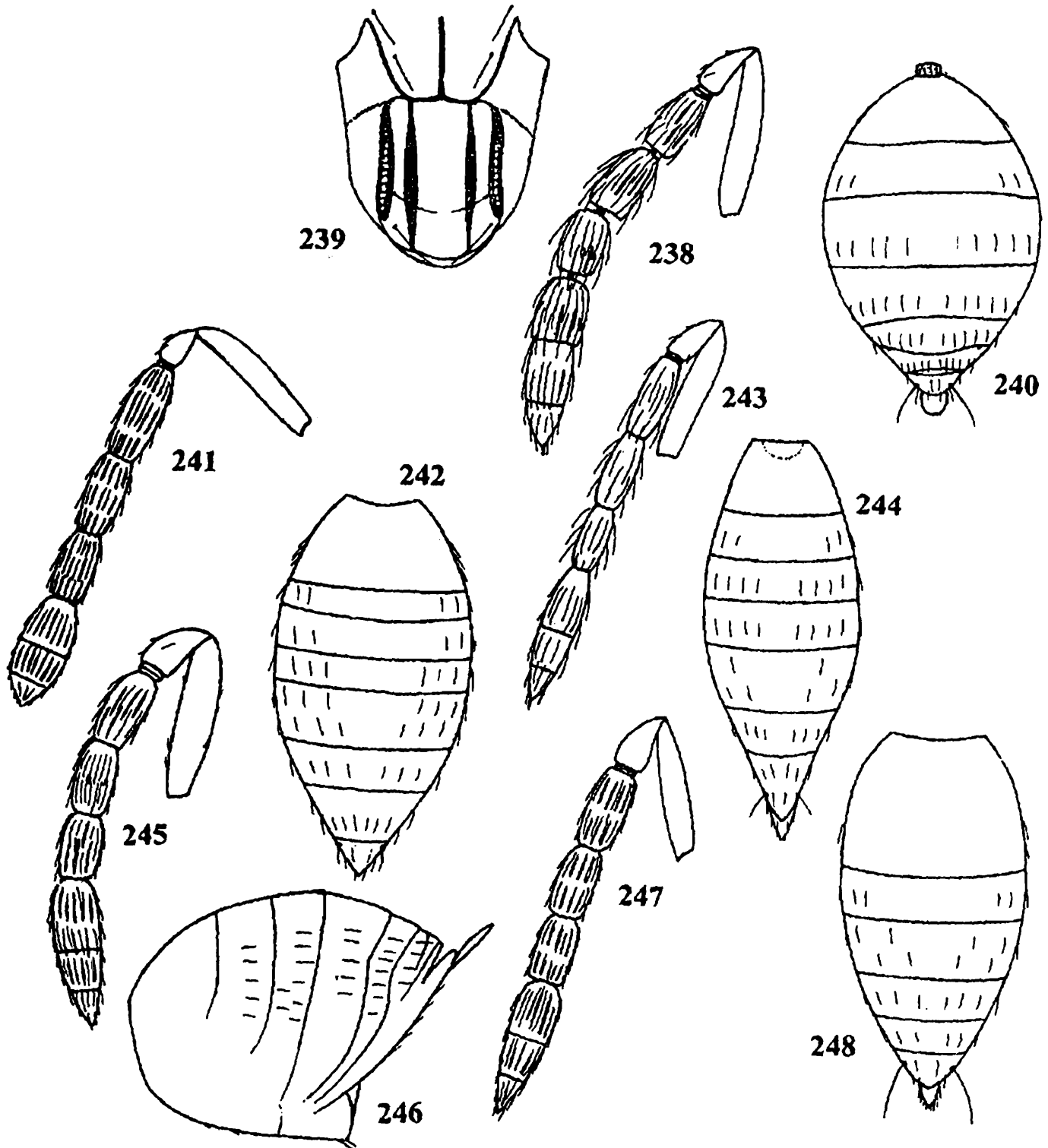
Figs. 202-203. *Tetrastichus tunicus* sp. nov. Female : 202 Antenna; 203. Gaster; Figs. 204-205. *Tetrastichus kottiyooricus* sp. nov. Female : 204. Antenna; 205. Gaster; Figs. 206-207. *Tetrastichus sinui* sp. nov. Female : 206. Antenna; 207. Gaster; Figs. 208-209. *Tetrastichus dulciculus* sp. nov. Female : 208. Antenna; 209. Gaster; Figs. 210-211. *Tetrastichus vayalicus* sp. nov. Female : 210. Antenna; 211. Gaster.



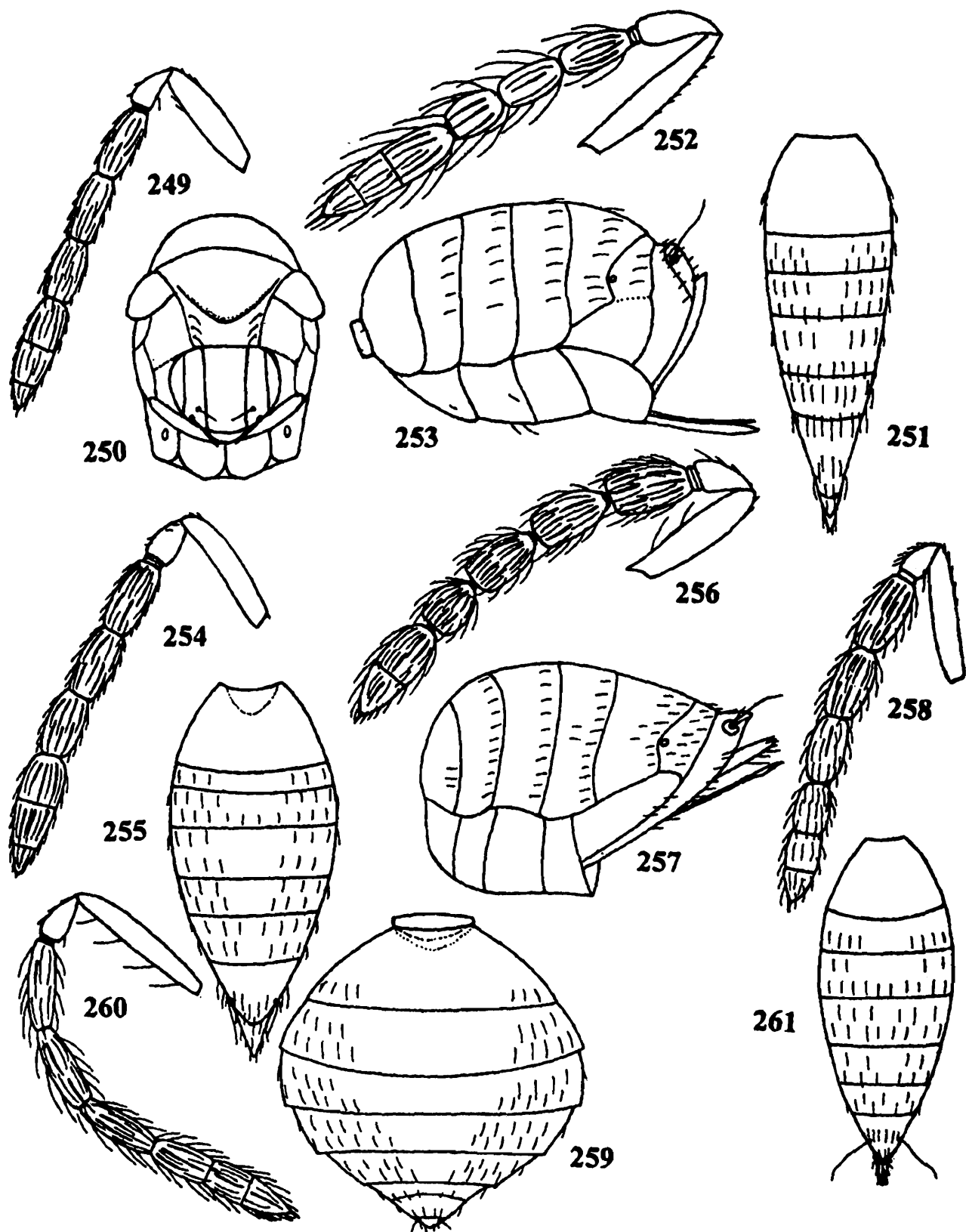
**Figs. 212-214.** *Tetrastichus mukatus* sp. nov. Female : 212. Antenna; 213. Mandible; 214. Gaster; **Figs. 215-216.** *Tetrastichus hostspoticus* sp. nov. Female : 215. Antenna; 216. Gaster; **Figs. 217-219.** *Tetrastichus chinicus* sp. nov. Female : 217. Antenna; 218. Scutellum with Propodeum; 219. Gaster; **Figs. 220-221.** *Tetrastichus chindakicus* sp. nov. Female : 220. Antenna; 221. Gaster; **Figs. 222-223.** *Tetrastichus albocoxalis* sp. nov. Female : 222. Antenna; 223. Gaster; **Figs. 224-225.** *Tetrastichus badius* sp. nov. Female : 224. Antenna; 225. Gaster.



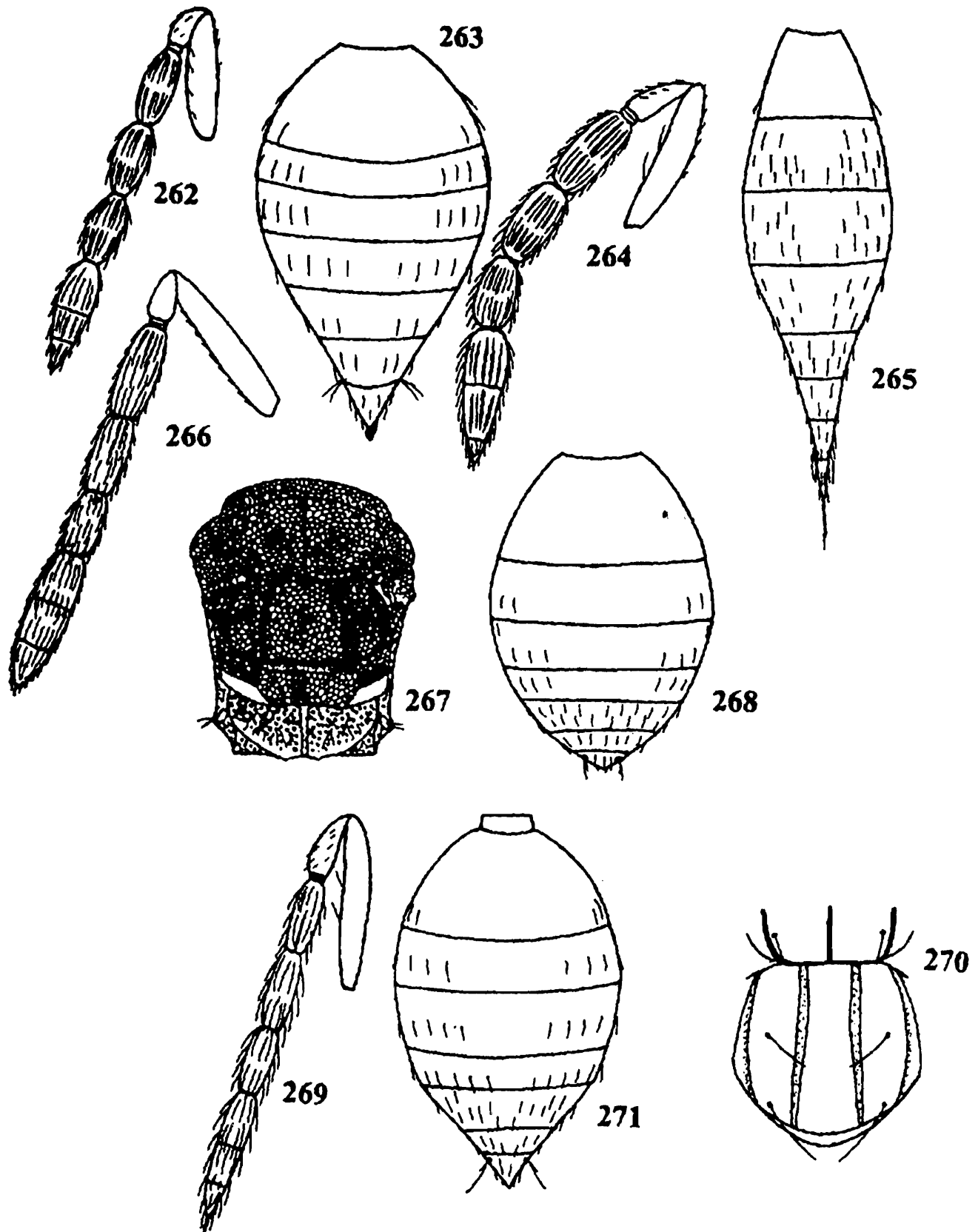
Figs. 226-227. *Tetrastichus stom* sp. nov. Female : 226. Antenna; 227. Gaster; Figs. 228-229. *Tetrastichus damitus* sp. nov. Female : 228. Antenna; 229. Gaster; Figs. 230-231. *Tetrastichus girishi* sp. nov. Female : 230. Antenna; 231. Gaster; Figs. 232-233. *Tetrastichus flavilatus* sp. nov. Female : 232. Antenna; 233. Gaster; Figs. 234-235. *Tetrastichus thalaparicus* sp. nov. Female : 234. Antenna; 235. Gaster; Figs. 236-237. *Tetrastichus arucicus* sp. nov. Female : 236. Antenna; 237. Gaster.



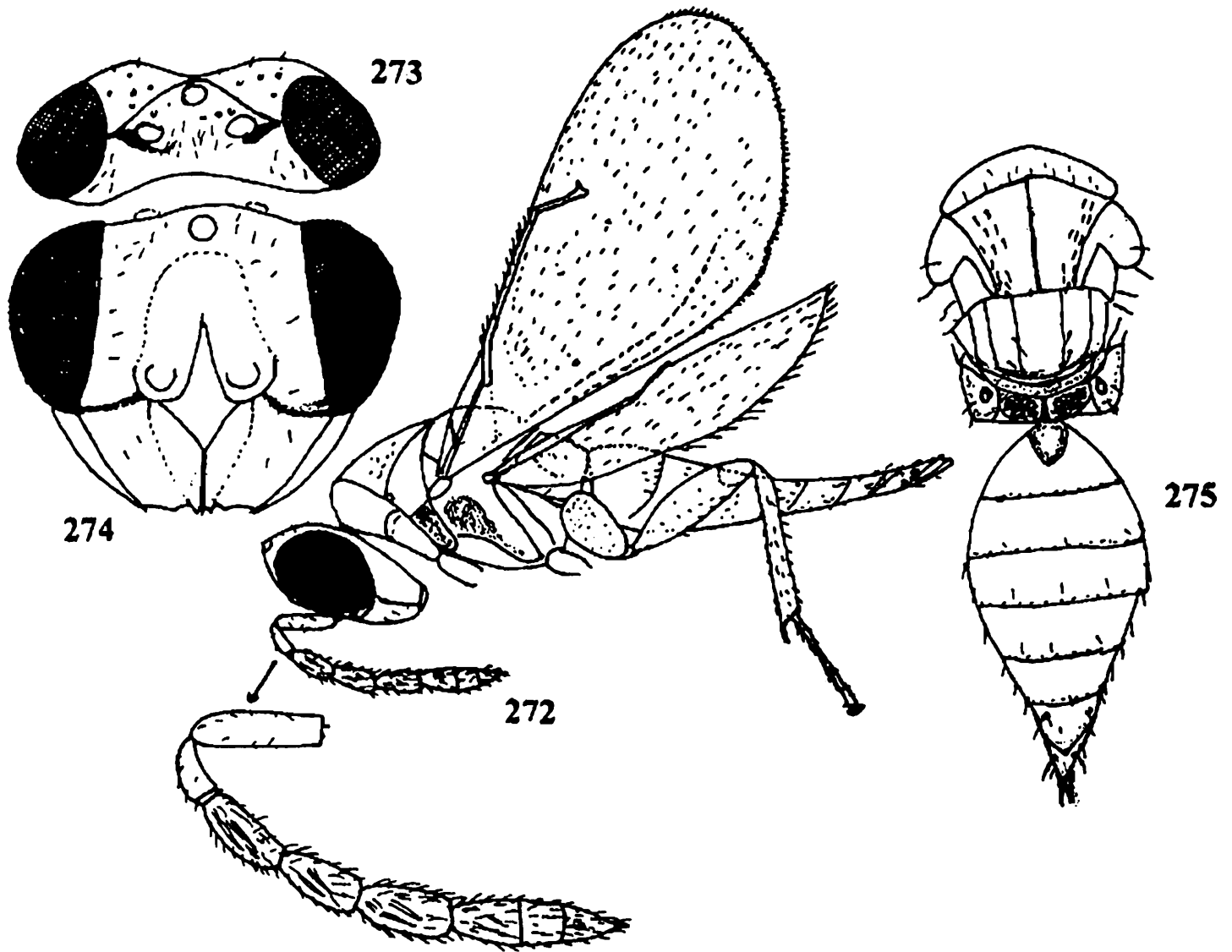
**Figs. 238-240.** *Tetrastichus heydoni* sp. nov. Female : 238. Antenna; 239. Part of Mesoscutum and Scutellum; 240. Gaster; **Figs. 241-242.** *Tetrastichus neocupressi* sp. Female : 241. Antenna; 242. Gaster; **Figs. 243-244.** *Tetrastichus shonicus* sp. nov. Female : 243. Antenna; 244. Gaster; **Figs. 245-246.** *Tetrastichus ramamurthyi* sp. nov. Female : 245. Antenna; 246. Gaster; **Figs. 247-248.** *Tetrastichus gadagkari* sp. nov. Female : 247. Antenna; 248. Gaster.



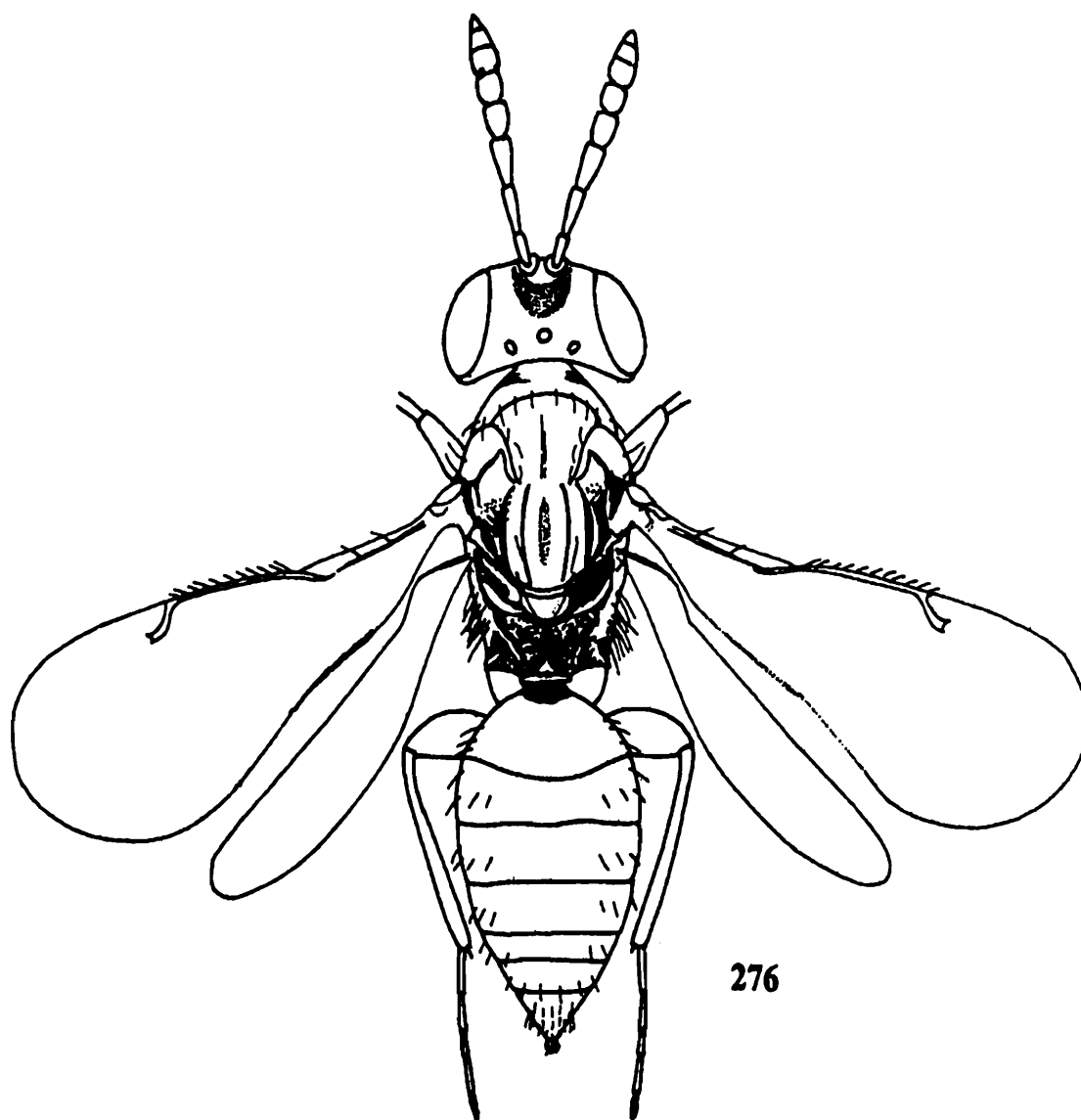
**Figs. 249-251.** *Tetrastichus garicus* sp. nov. Female : 249. Antenna; 250. Mesosoma; 251. Gaster; **Figs. 252-253.** *Tetrastichus budaicus* sp. nov. Female : 252. Antenna; 253. Gaster; **Figs. 254-255.** *Tetrastichus laparus* sp. nov. Female : 254. Antenna; 255. Gaster; **Figs. 256-257.** *Tetrastichus bispinus* sp. nov. Female : 256. Antenna; 257. Gaster; **Figs. 258-259.** *Tetrastichus bilgircicus* sp. nov. Female : 258. Antenna; 259. Gaster; **Figs. 260-261.** *Tetrastichus calicuticus* sp. nov. Female : 260. Antenna; 261. Gaster.



Figs. 262-263. *Tetrastichus dalotus* sp. nov. Female : 262. Antenna; 263. Gaster; Figs. 264-265. *Tetrastichus sumatus* sp. nov. Female : 264. Antenna; 265. Gaster; Figs. 266-268. *Tetrastichus mindicus* sp. nov. Female : 266. Antenna; 267. Mesosoma 268. Gaster; Figs. 269-271. *Tetrastichus umae* sp. nov. Female : 269. Antenna; 270. Part of mesoscutum and scutellum; 271. Gaster.

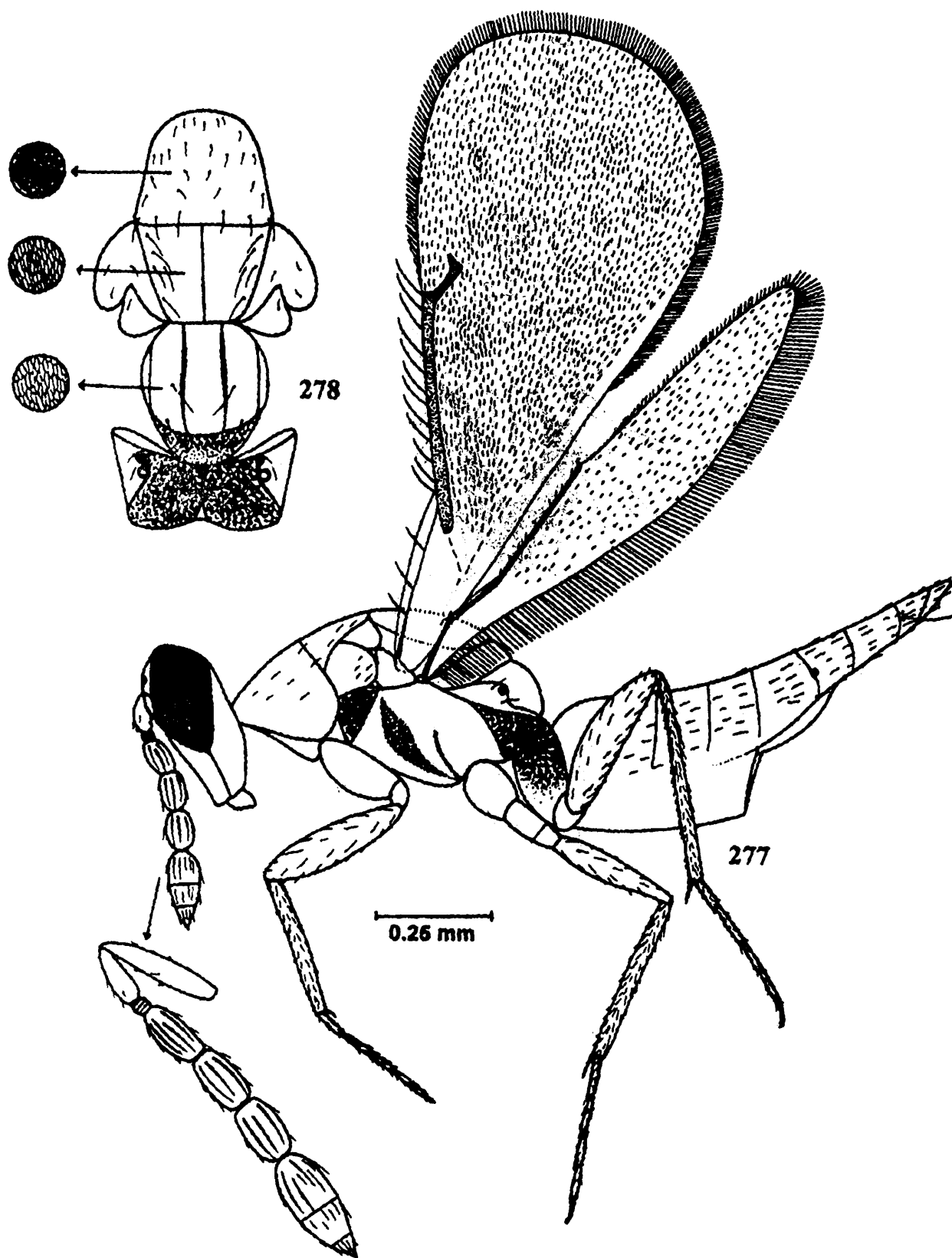


Figs. 272-275. *Tetrastichus ophiusae* Crawford, Female : 272. Body profile and antenna; 273. Head dorsal view; 274. Head front view; 275. Body dorsal view.



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**Fig. 276.** *Tetrastichus howardii* (Olliff) : Body profile



Figs. 277-278. *Idukkiella elattariae* sp. nov. Female : 277. Body profile and antenna; 278. Mesosoma

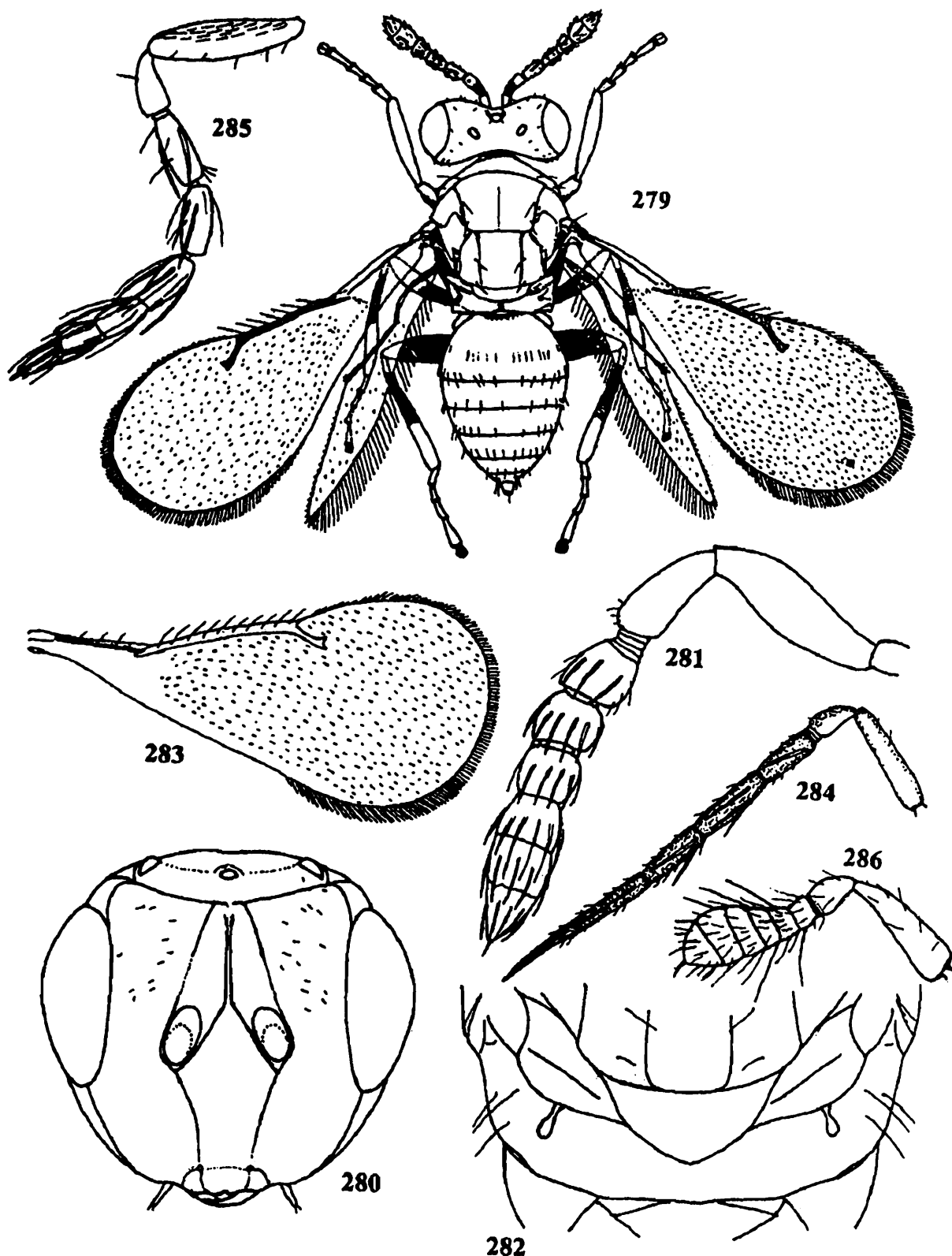


Fig. 279. *Tamarixia leucaenae* Boucek; Body dorsal view (Modified from Boucek, 1988. Courtesy : Boucek). Figs. 280-283. *Leptocybe invasa* Fisher & LaSalle, Female : 280. Head front view; 281. Antenna; 282. Scutellum and propodeum; 283. Forewing; Fig. 284. *Quadrastichus longiclavatus* Narendran, Female : Antenna; Fig. 285. *Quadrastichus plaquoui* Reina & La Salle : Female : Antenna. Fig. 286. *Kostjukovius keralensis* Narendran sp. nov. Antenna.

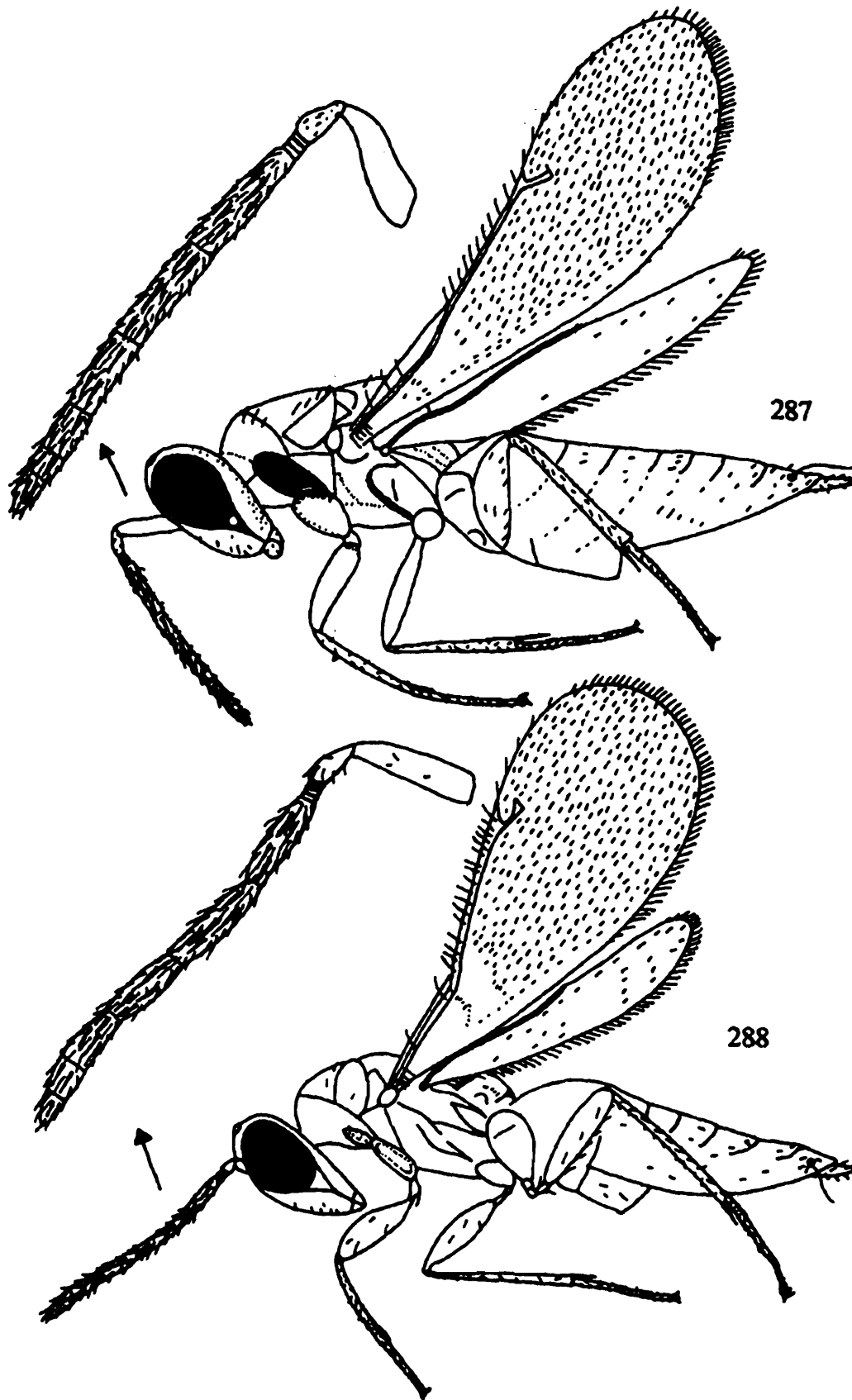
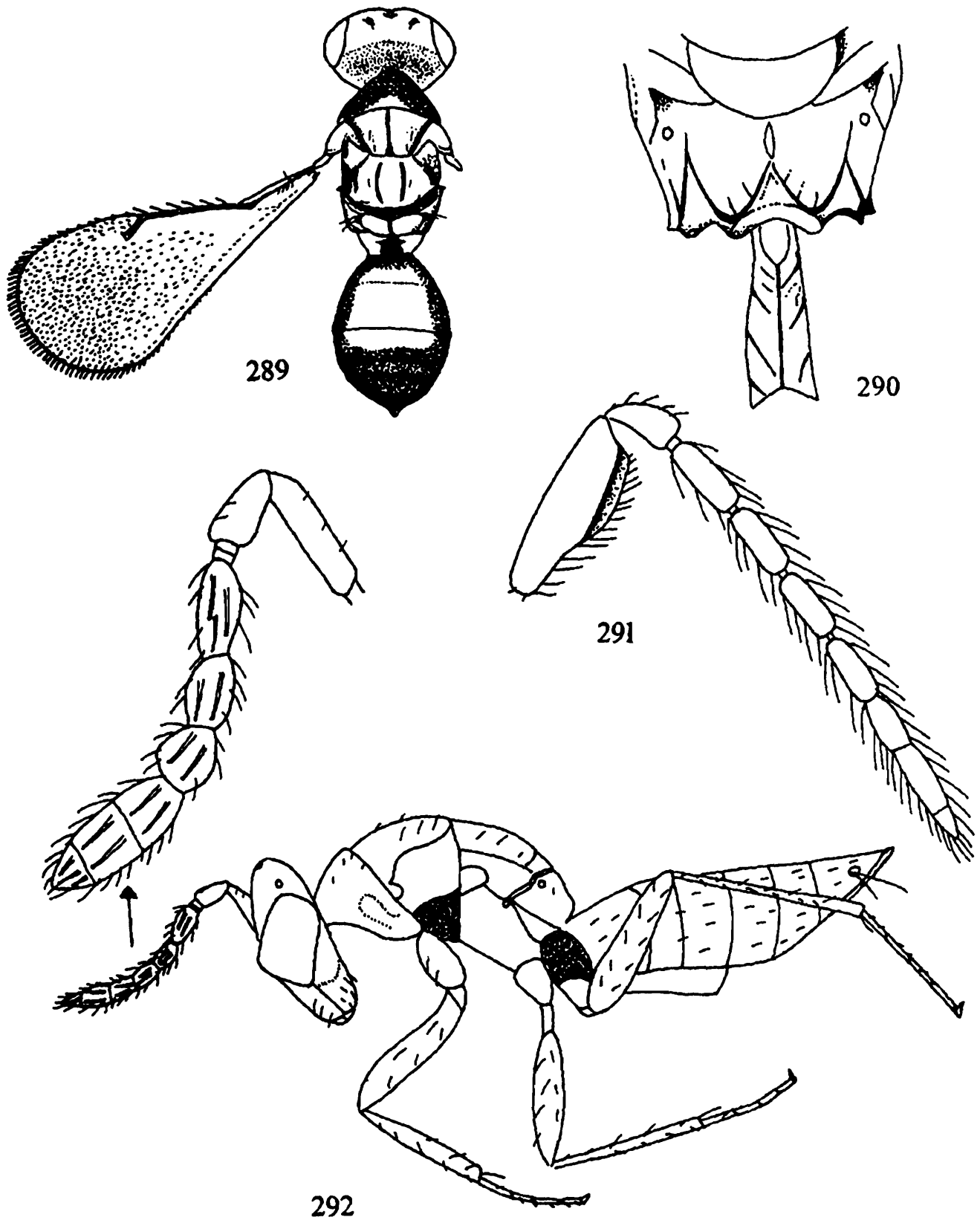


Fig. 287. *Aprostoporoides curiosus* Narendran Female : Body profile; Fig. 288. *Aprostoporoides manjericus* Narendran Female : Body profile.



**Fig. 289.** *Chitrostichus phyllocnistoides* (Narayanan) Female : Body dorsal view; **Figs. 290-291.** *Iniostichus longipetiolatus* Kamijo & Ikeda Female : 290. Propodeum and Petiole : 291. Antenna; **Fig. 292.** *Kiggrella oryzae* Narendran Female : Body profile.

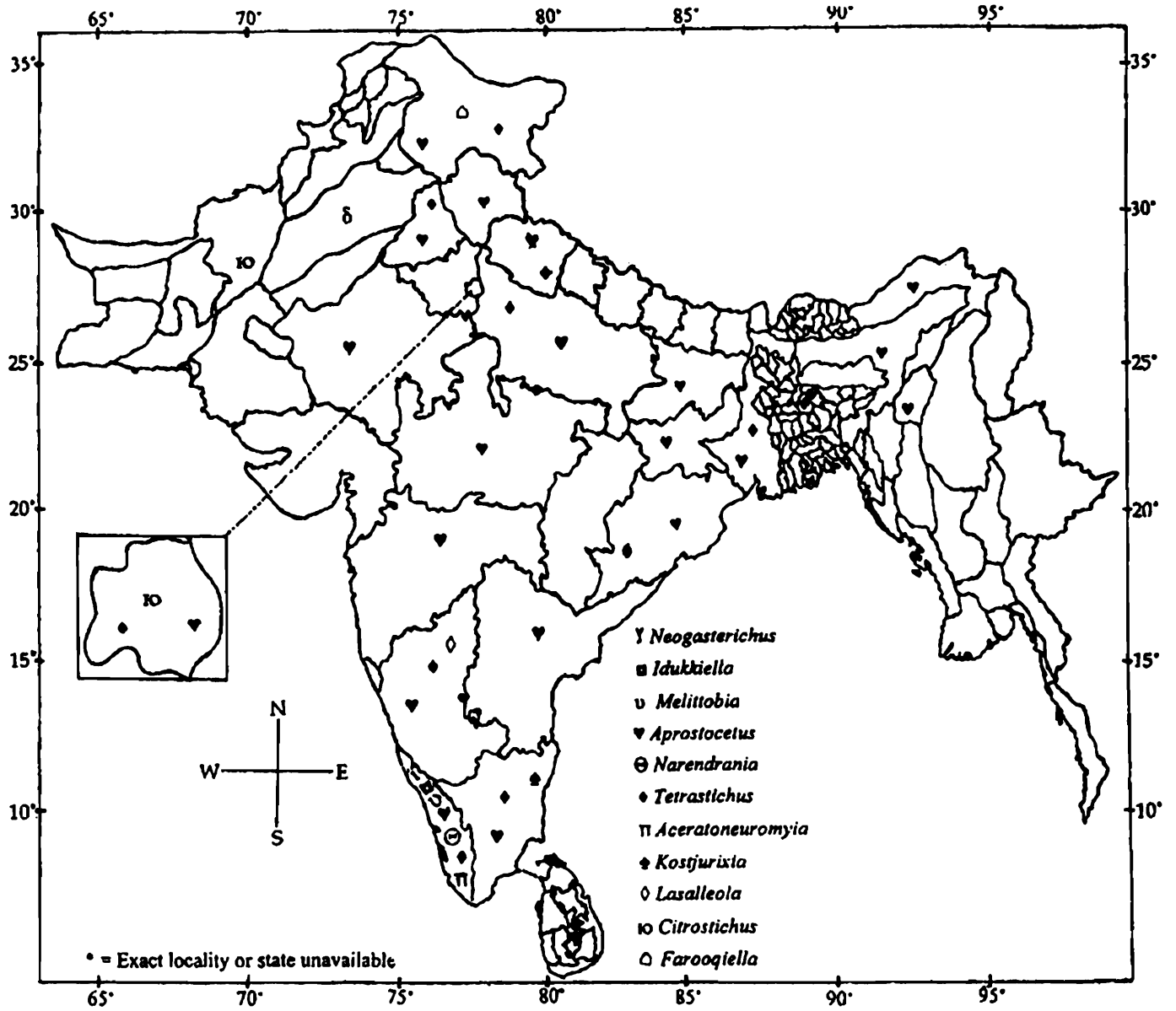


Fig. 293. Distribution of 11 genera of *Tetrastichinae* : *Neogasterichus*, *Idukkiella*, *Melittobia*, *Aprostocetus*, *Narendrania*, *Tetrastichus*, *Aceratoneuromyia*, *Kstjurixia*, *Lasalleola*, *Citrostichus*, *Farooquiella*

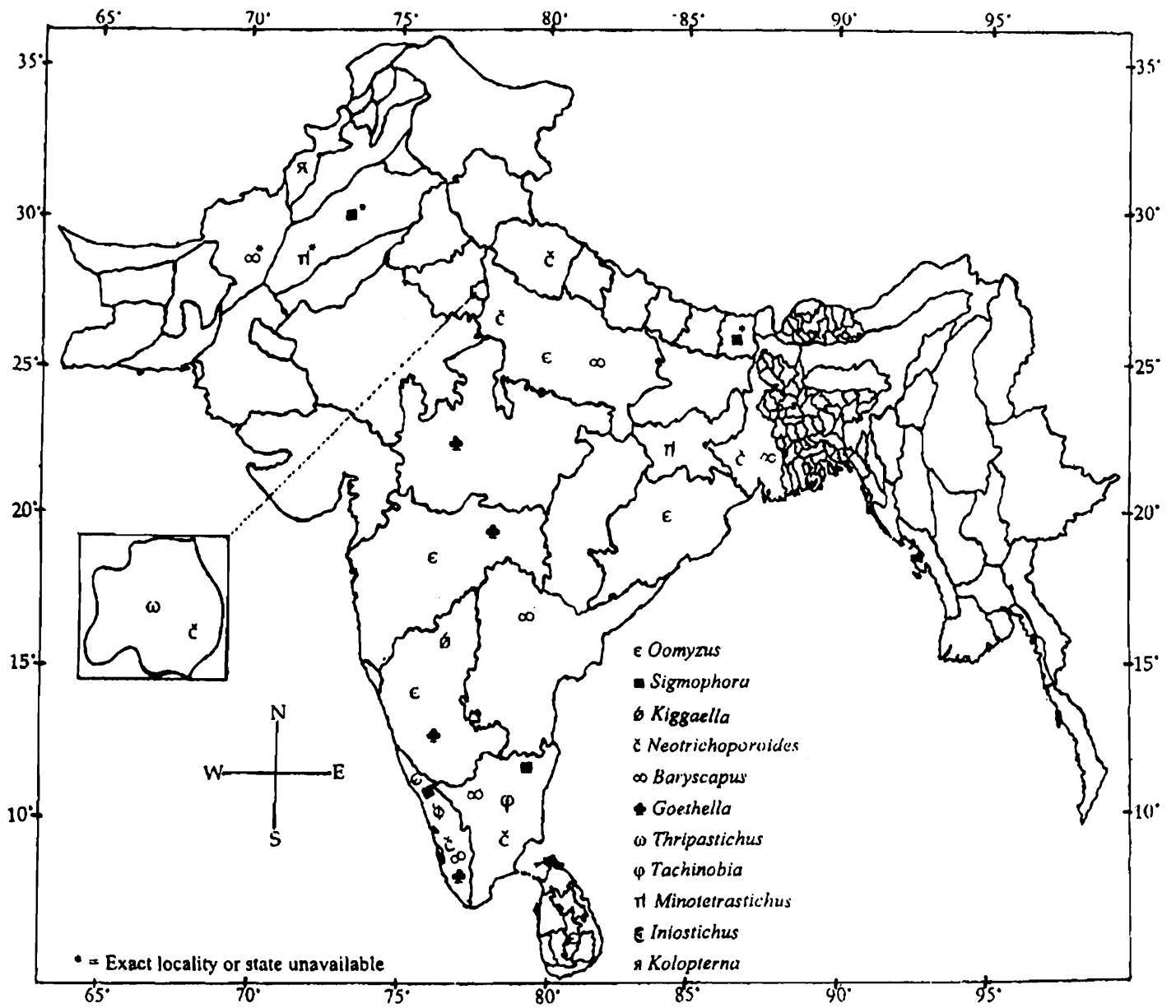


Fig. 294. Distribution of 11 genera of Tetrastichinae : *Oomyzus*, *Sigmophora*, *Kiggaella*, *Neotrichoporoides*, *Baryscapus*, *Goethella*, *Thripastichus*, *Tachinobia*, *Minotetrastichus*, *Iniostichus*, *Kolopterna*.

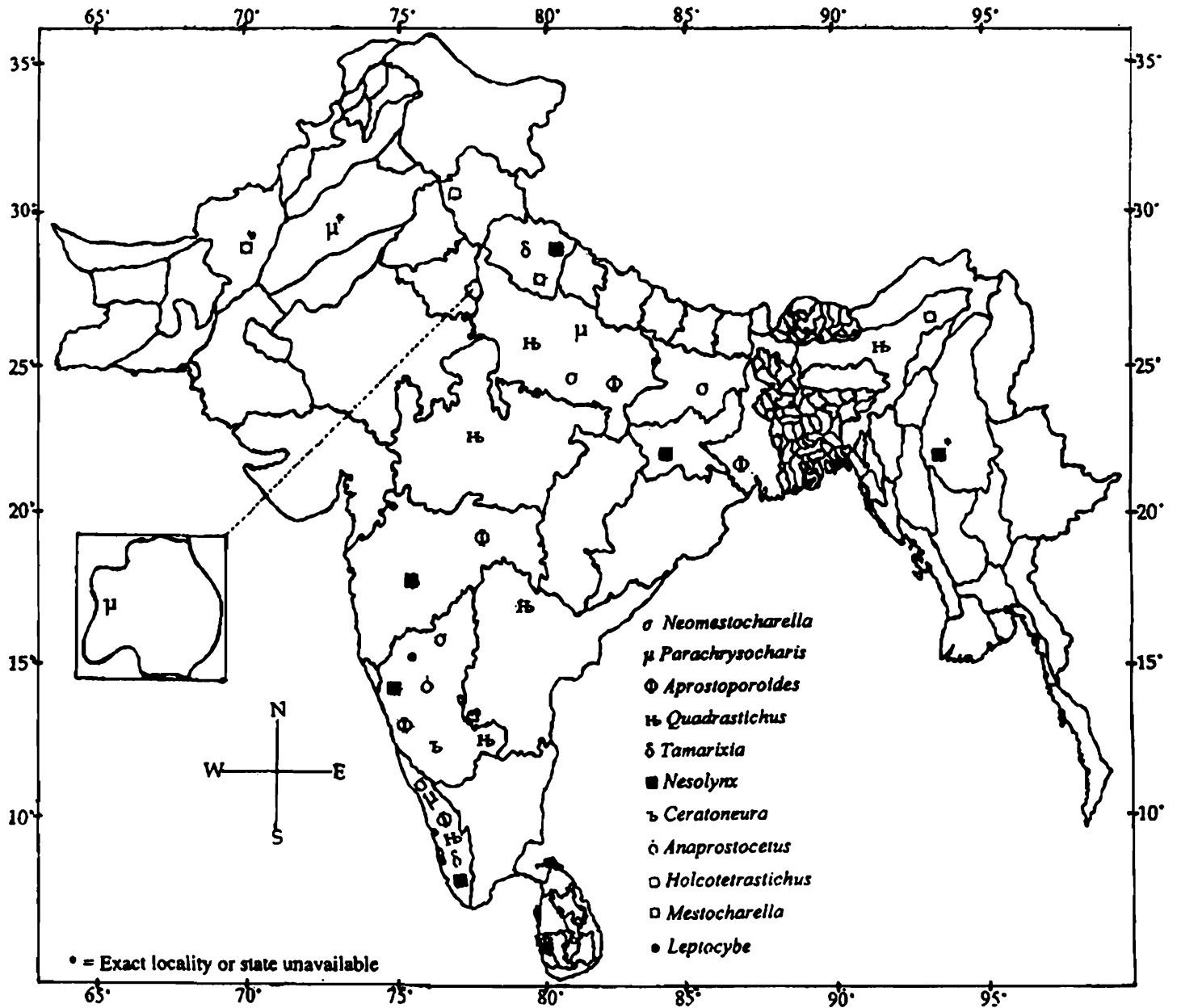
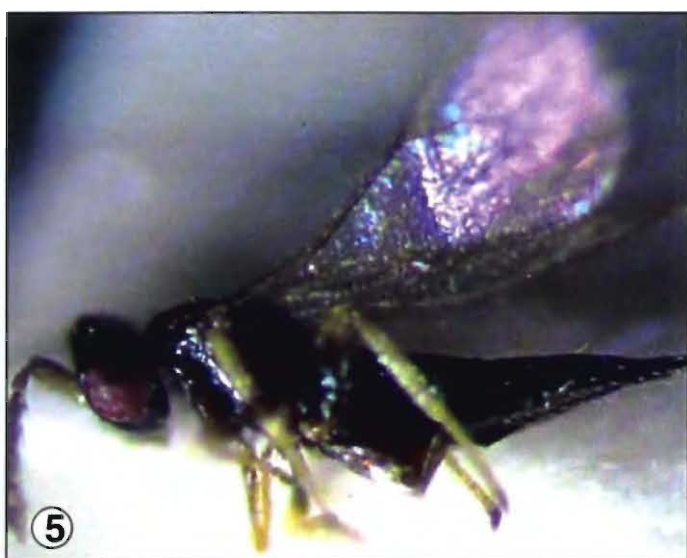


Fig. 295. Distribution of 11 genera of Tetrastichinae : *Neomestocharella*, *Parachrysocharis*, *Aprostoporoides*, *Quadrastichus*, *Tamarixia*, *Nesolynx*, *Ceratoneura*, *Anaprostocetus*, *Holcotetrastichus*, *Mestocharella*

PLATE-I



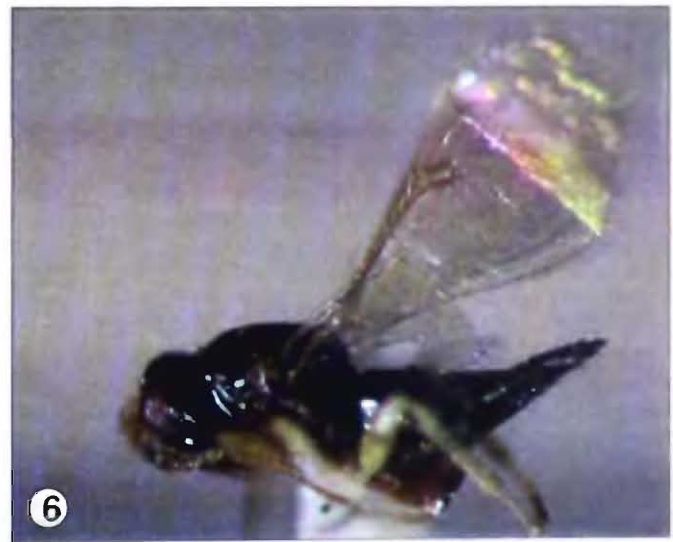
1. *Anaprostocetus sringeriensis*; 2. *Anaprostocetus aereus*; 3. *Anaprostocetus keralicus*; 4. *Aprostoporoides curiosus*; 5. *Aprostocetus dichus*; 6. *Aprostocetus manja*

PLATE-II



1. *Aprostocetus yesica*; 2. *Aprostocetus taruna*; 3. *Aprostocetus calycopteridis*; 4. *Quadrastichus longiclavatus*;  
5. *Quadrastichus demiticus*; 6. *Quadrastichus mangalae*

PLATE-III



1. *Neutrichoporoides crinius*; 2. *Neutrichoporoides galia*; 3. *Neutrichoporoides beonus*; 4. *Baryscapus barica*; 5. *Quadrastichus fagri*; 6. *Quadrastichus delusus*

PLATE-IV



1. *Tamarixia sheebae*; 2. *Aceratoneuromyia wayanadensis*; 3. *Baryscapus jicus*; 4. *Kiggaella oryzae*; 5. *Lasalleola obsona*; 6. *Neogasterichus longigastris*