

Fauna of India



DIPTERA

VOLUME - IX

CHLOROPIDAE

(SIPHONELLOPSINAE and RHODESIELLINAE)

(PART - 1)

P.T. CHERIAN

Chloropidae ("green eyed flies") is one of the medium-sized families of Acalypterate Diptera. Though many of them are harmless, some like the eye flies of the Orient and eye-gnats of the New World are vectors of certain eye diseases. The fritflies and wheat stem-maggots destroy agricultural crops. More than 2100 species under 155 genera are so far known from the world of which 150 species and 55 genera are known from India. In this part, out of the four subfamilies of Chloropidae, two, Siphonellopsinae and Rhodesiellinae have been dealt with. Half of the species described in this volume represent new taxa.

**THE FAUNA OF INDIA
AND
THE ADJACENT COUNTRIES**

DIPTERA

Volume IX

CHLOROPIDAE

(PART 1)

SIPHONELLOPSINAE

and

RHODESIELLINAE

P. T. CHERIAN

Southern Regional Station, Zoological Survey of India, Chennai

Edited by the Director, Zoological Survey of India



**Zoological Survey of India
Kolkata**

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FOREWORD

In all cultures taxonomic classification means survival. The beginning of wisdom, as the Chinese say, is calling things by their right names. Yet it is generally accepted that more than 88 per cent of the insect species of the world still remain uncensused. Study of immature stages of insects is another area with a busy future. The biology of more than 99 percent of our insects remain unknown.

Shortage of experts, complexity of many families and abundance of species, hampers the progress of work on many insect groups. It is all the more true in the case of Diptera, an order having tremendous value in medical, veterinary and agricultural sciences. Of the 98 Dipteran families reported from India we have detailed information on hardly eight families. For every species higher form of life disappearing there are thousands of insects that travel the road to extinction. Extinction of species before their existence is known, which Wilson calls centinelan extinction, is happening all around us. The need to explore and reveal our least known faunal resources is really great.

Dr. P. T. Cherian is a leading Dipteran biosystematist of India today. In the present work the author demonstrates extensive knowledge of a group which was little known from the Orient before he commenced his work more than three decades ago. This part dealing with many new taxa with the one to follow it will enrich our knowledge of a speciose group of insects of great economic value.

I am confident that you will enjoy this book as much as the author enjoyed preparing it and I, reading it.

Kolkata
January, 2002

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

PREFACE

The audit of biodiversity today is far short of reality. It is all the more so of a species rich group like the Diptera represented in India which in all probability is home for 8-10% of the total number of species on the earth. The alpha taxonomy of hardly 10 of the 98 Dipteran families reported from India and the adjacent countries, is today somewhat adequate. This includes detailed information on hardly one or two of the acalypterate families, in many of which a shift from predatory behaviour or scavenging to plant feeding has increased the rate of species formation and evolution.

Vol. IX on the Diptera was originally intended to include the whole of Chloropidae. But as the work progressed more materials became available and it proved much too large for one volume. Hence an additional half volume is planned. In this part I, an attempt has been made to recognise, describe and classify the flies of two subfamilies, Siphonellopsinae and Rhodesiellinae of the family Chloropidae of India and the adjacent countries. Hitherto it has not been possible to name even some of the commonest of these small flies represented in the area because of the lack of a well illustrated reference work on them.

In the present work, apart from the descriptions of general morphological characters of the adults and immature stages and observations on geographical distribution and phylogeny, a partly revised classification of the family is presented. Nartshuk's family Siphonellopsidae has been relegated to the rank of a subfamily, Siphonellopsinae, as traditionally done. Thus the four subfamilies are followed: 1. Siphonellopsinae 2. Rhodesiellinae 3. Oscinellinae and 4. Chloropinae. Four valid genera are recognised in the subfamily Siphonellopsinae and three tribes, Rhodesiellini, Scoliophthalmini and Stenoscini under the subfamily Rhodesiellinae. 11 genera are recognised under Rhodesiellini, 1 under Scoliophthalmini and 4 under Stenoscini. Limits of some genera have been redefined and 2 genera and 44 species new to science are described. 3 specific synonyms, 11 new combinations and some changes of specific determinations are included, many species are recorded for the first time after they were originally described and the range of distribution of many have been extended.

Work on the fully illustrated Part II of the volume dealing with the remaining two species rich subfamilies, Oscinellinae and Chloropinae is in progress. It is hoped that the two parts when published will prove to be of use to entomologists and will form the basis for further research on a world-wide basis on this large group.

Chennai
April, 1995

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This volume has had a long gestation period. So many people have graciously given advice, help and assistance during its preparation. Through the last nearly three decades, commencing with my student days, Dr. M.S. Mani, formerly Professor Emeritus, School of Entomology, St. John's College, Agra, has always been a source of advice, inspiration and encouragement. To him I owe much, especially for reading through the manuscript critically and offering valuable advice as well as specific suggestions.

I am greatly indebted to the successive former Directors of the Zoological Survey of India, for encouraging this work in every regard and especially to Dr. T. N. Ananthakrishnan, for entrusting the study of the family to me during his tenure. I express my sincere gratitude to the present Director, Dr. J.R.B Alfred, for steady encouragement.

Dr. C.W. Sabrosky, formerly of the Systematic Entomology Laboratory, U.S. Department of Agriculture, Washington D.C., has always been a source of help and inspiration. I am grateful to him for many of the identified specimens of the Zoological Survey of India, for kindly sending specimens from his collections and various courtesies received through the years. I am thankful to Dr. E.P. Nartshuk, Zoological Institute, Leningrad, Dr. H. Andersson, Zoological Institute of Lund University and Dr. K. Kanmiya, School of Medicine, Kurume University, Japan, for various help and for a few figures adapted from their books. My thanks are due to the successive Curators of the British Museum, Natural History, London, for the loan of types and unidentified specimens and to Dr. I. Papp, Hungarian Natural History Museum, for kindly examining some types and informing the characters and measurements in a personal communication.

I am grateful to Prof. Santokh Singh of the School of Entomology, St. John's College, Agra, for initially suggesting this family for study and for the training in field collections and to Dr. Ipe M. Ipe of the same institution and Dr. K.A. Spencer Callington, England, for the times together in the field collections.

My grateful thanks are due to my former colleagues in the Zoological Survey of India, Dr. A.G.K. Menon, Dr. S. Khera, Dr. Asket Singh, Dr. R.S. Pillai, Dr. A.N.T.

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***Dedicated to
My Teacher
Dr. M. S. Mani
in love and gratitude***

INTRODUCTION

A review of the progress in the taxonomy and zoogeography of Diptera of India and the adjacent countries reveals that out of about 98% families so far reported from India, substantive information is available only on a dozen families. Because of their small size and delicate nature many families, especially those belonging to the Acalypterate Diptera, are often not even represented in most collections. Among the least understood, though fairly large and economically important families is Chloropidae (Acalyptratae : Diptera).

The Chloropids, commonly called “green-eyed flies”, are small to medium-sized flies (0.5–7mm), rather smooth, predominantly black, but sometimes yellow with black to brown stripes and maculae. They occur almost anywhere—in grasslands, moors, marshes, low vegetation in forests and on graminous plants. Some frequent flowers and a few such as the eyefly of the Orient (**Siphunculina**) and eye-gnats (**Hippelates**) of the New World are attracted to body and eye secretions of man and animals and are important as vectors of certain eye diseases. Their food habits are varied.

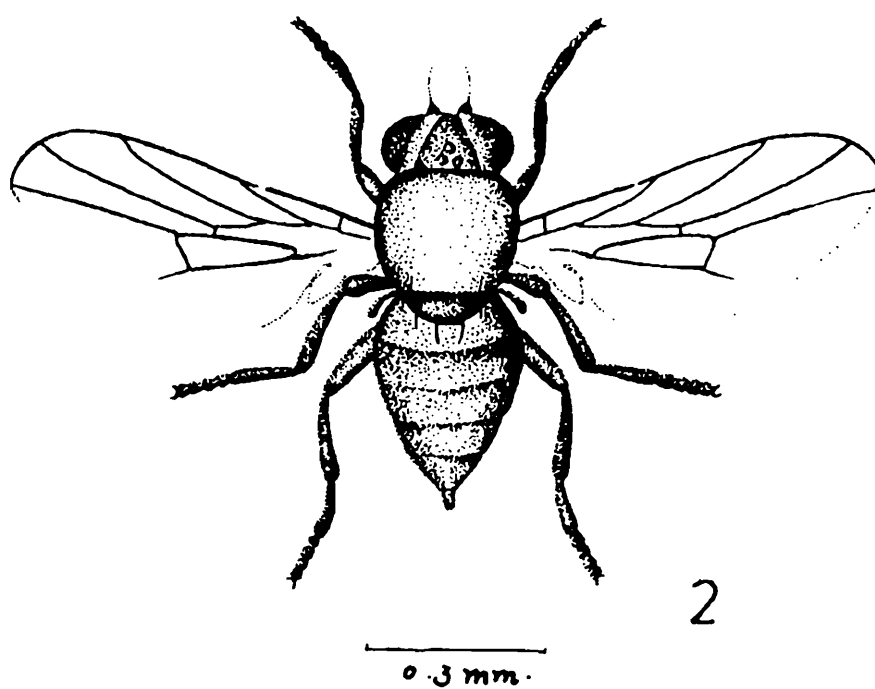
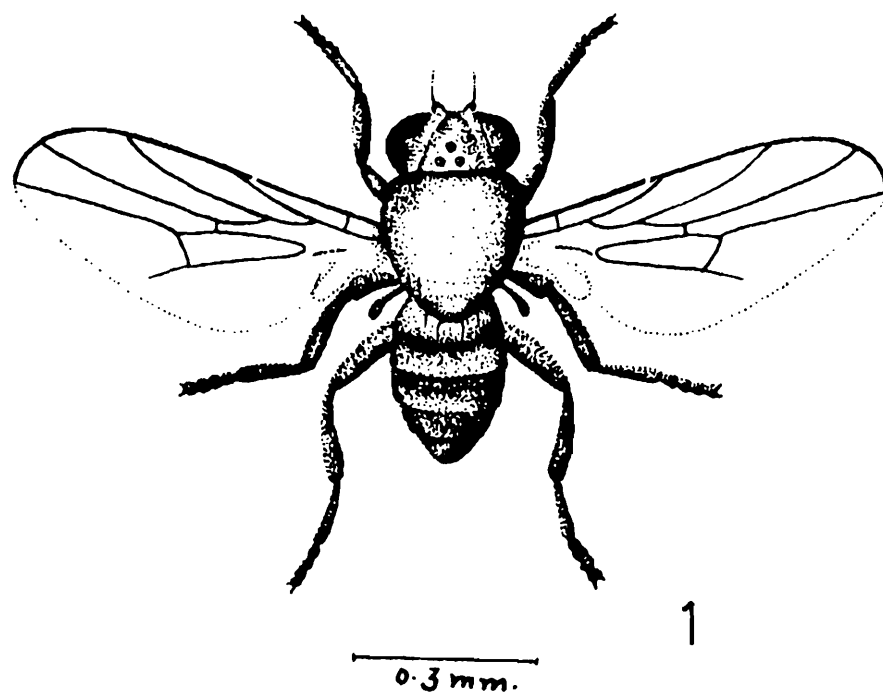
Many larvae are saprophagous and feed especially on the frass from damage by other insects. Others like the destructive fritflies (**Oscinella**) and wheat stem-maggots (**Meromyza**) are phytophagous. A few are gall formers, some devour the egg masses of spiders and mantids and some others are predacious on root aphids.

Of about 2100 species described under 155 genera from the world, only about 450 species, belonging to 74 genera, are so far known from the Oriental Region. Of these 150 species and 55 genera have been reported from India and adjacent countries. About 60% of these species, including 40% comprising new taxa, were recorded by the author.

It was originally intended to include all the Chloropidae, known from India and adjacent countries, in one volume, since the number of genera and species was rather small when the work was initiated. Extensive surveys carried out in all the Indian States, Union Territories and some Indian Ocean Island groups, through two and a half decades have yielded approximately more than 250 additional species, many of which are new. As this seems to be rather too large for a single volume, in Part I, two subfamilies, Siphonellopsinae and Rhodesiellinae, are alone included. The remaining two subfamilies Oscinelliane and Chloropinae will be covered in the second part.

MORPHOLOGY OF THE ADULTS AND IMMATURE STAGES

Head (Figs. 3-6) : It is remarkable on account of its great mobility and large size. The contour of the head differs in different genera and is of taxonomic value at generic level. In lateral view, it is usually rounded, square or even triangular. An extensive portion of the head is occupied by the *compound eyes* (ce). The holoptic eyes are often so large that they meet or almost meet on the median line but dichoptic when they are widely separate, as is in chloropids. Externally each eye consists of many *facets*, which are the corneas of individual *ommatidia*. In Chloropidae very rarely the anterior and anterodorsal ommatidia are larger than the posterior ones, as in some species of *Tachinoceros* de Meijere. The eye may be circular, oval or squarish with vertical, horizontal or diagonal long axis. The eye colour varies among species, but a pattern of green is often evident in life in many genera. The spaces between the facets are often clothed with fine pubescence, which may be dense, sparse or totally absent. There are three *ocelli* (o) situated on the anterior and lateral declivities of the more or less prominent *ocellar triangle* (oct) or *ocellar tubercle*. A pair of proclinate, reclinate or erect and convergent, cruciate or divergent *ocellar bristles* (oc) are almost always present behind the anterior ocellus on the triangle. In some species the ocellar tubercle is with a tuft of short hairs. The median portion of the upper extremity of the head, bounded by the eyes laterally, the occiput posteriorly and the frons anteriorly is called the *vertex*. It is a relatively indefinite area, containing the ocellar triangle medially and the paired *orbital plates* (vertical plates) laterally. On the vertex there are the *outer vertical bristles* (out) which are directed outward, the *inner vertical bristles* (inv) which almost always are directed inward and in the middle, behind the ocelli, the convergent, cruciate or parallel *postvertical bristles* (pvt). In a generalized insect (Figs. 1&2) the frons extends from the vertex to the frontoclypeal (epistomal) suture, between the two anterior tentorial pits. These landmarks are not always clear, and some dipterists (de Meijere 1916, Hendel 1928, Crampton 1942, Henning 1973) have adapted convenient topographical definitions of the frontal areas. The area dorsal to the insertions of the antennae (morphologically the postfrons) is usually called the *frons* and the frontal area (morphologically the prefrons) above the clypeus and below the antennae is referred to as the *face*. In Chloropidae and other Schizophora this is of particular phylogenetic and systematic importance. It is uniformly sclerotized and has undergone characteristic modifications associated with the formation of a ptilinum. The *ptilinum* is a peculiar, invaginated sac-like organ, armed with small scales (Strickland 1953) and it lies immediately above the bases of the antennae. It is everted with pulsating motions during emergence of the adult and assists the adult to escape from its puparium and the surrounding substrate. The arcuate slit through which the ptilinum is everted is the *ptilinal fissure* or *suture*, its lateral extremities nearly coincide with the upper limits of the

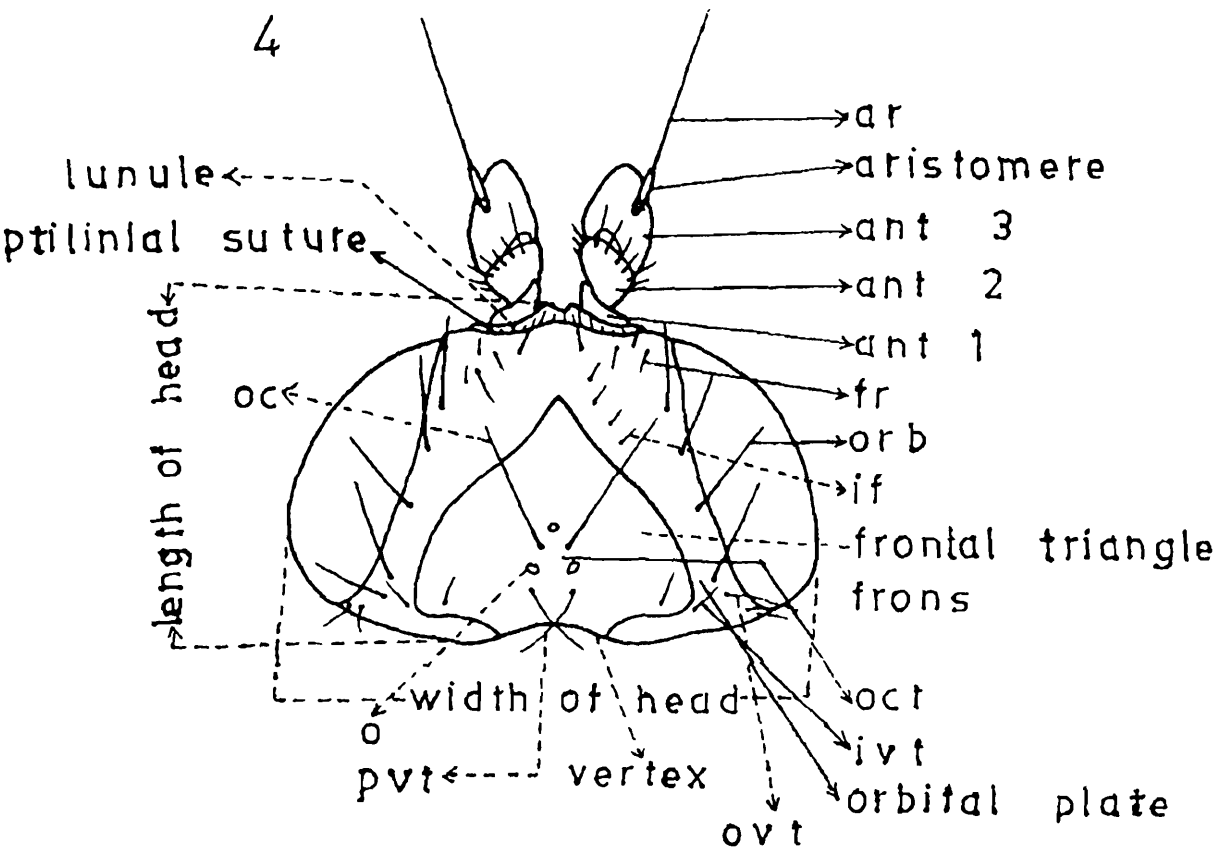
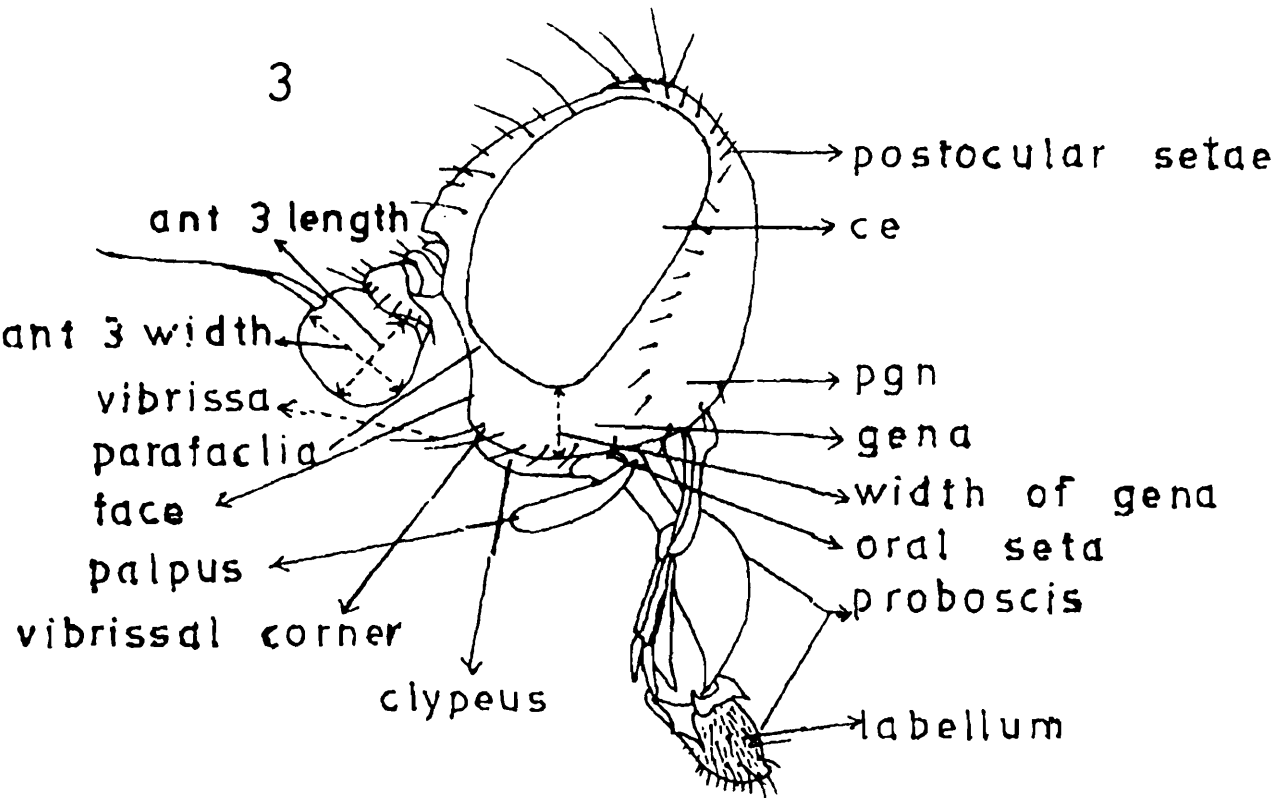


Figs. 1-2 : *Oscinella fusidentata* Cherian. 1, Male. 2. Female.

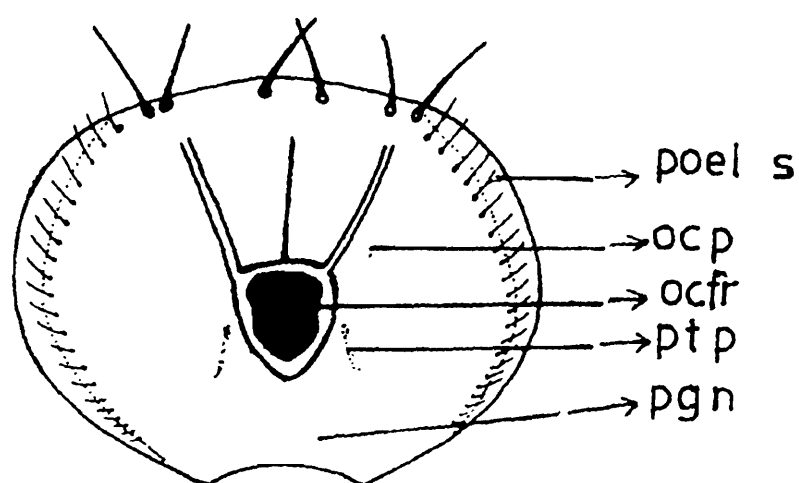
frontogenal sutures. After emergence, the ptilinum is retracted within the head capsule and is hidden from view but its position is marked by the *ptilinal suture*. A crescentic median plate lying between the ptilinal suture and the bases of the antennae is called the *lunule*. The frons (exclusive of the ocellar triangle) is differentiated into a relatively large median frontal vitta (interfrons) on which is the *frontal triangle* which is usually strongly sclerotized and distinct but very rarely not clearly demarcated. Sometimes it is so large that it covers much of frons. The shape, colour, sculpture and tomentosity of the frontal triangle have considerable taxonomic value. Lateral to the frontal vitta are the paired fronto-orbital plates. The frontal vitta usually bears *interfrontal bristles* (*if*) or hairs or both. They may be reclinate, proclinate or laterocline. The *if* are usually arranged in a row along each lateral margin of frontal triangle but rarely they may be in more than one row on the triangle. Bristles on the fronto-orbital plates are called *fronto-orbital bristles* or orbital bristles (*orb*). Their arrangement in some Siphonellopsinae indicates that they, at least the more distinct ones, represent the *upper* and the rest *lower orbital bristles*. The anteromedial portion of the head, bounded dorsally by the insertions of the antennae, ventrally by the frontoclypeal suture and laterally by the eyes is the *face*. Each side of the face is marked by a suture that extends dorsally from the anterior tentorial pit toward the base of the antenna. These grooves are the frontogenal sutures (Matsuda 1965) and the median facial plate lies between them. The two arms of the ptilinal suture lie ventrally outside the frontogenal sutures and form the inner margins of the parafacials. Each *parafacial* abuts the fronto-orbital plate dorsally and the gena ventrally. Lying between the inner margin of each parafacial and the corresponding frontogenal suture is a strip, often convex and usually narrow, called the *facial ridge* (vibrissal ridge). Each facial ridge fades out dorsally but ventrally it terminates in a more or less angular prominence, the *vibrissal* corner which frequently bears one or rarely more bristles, the *vibrissae*. In Chloropidae the facial plate has a pair of longitudinal *antennal grooves* (foveae), separated by a median ridge, the *facial carina*.

The facial carina may be reduced, linear or greatly developed. The *lower facial margin* is sometimes called the epistoma but this term should be avoided because it is ambiguous (Crampton 1942, Mc Alpine 1981). *Clypeus* lies between the face and the labrum and supports the cibarial dilator muscles. It is limited dorsally by the frontoclypeal suture and anteriorly by the clypeolabral articulation. In Chloropidae, as in most higher Diptera, the clypeus is reduced to a narrow, at times U-shaped, sclerite that is separated from the lower margin of the face by a frontoclypeal membrane.

The region between the lower margin of eye and the subcranial cavity consists of the gena above and a narrow subgena below. The subgenal suture, which begins at the anterior tentorial pit and runs posteroventrally, separates these two sclerites.



Figs. 3-4 : Explanation of terms, abbreviations and measurements in the text. *Apotropina japonica* Kanmiya. 3, Head, lateral view. 4, Head, dorsal view. (Partly from Kanmiya, 1983).



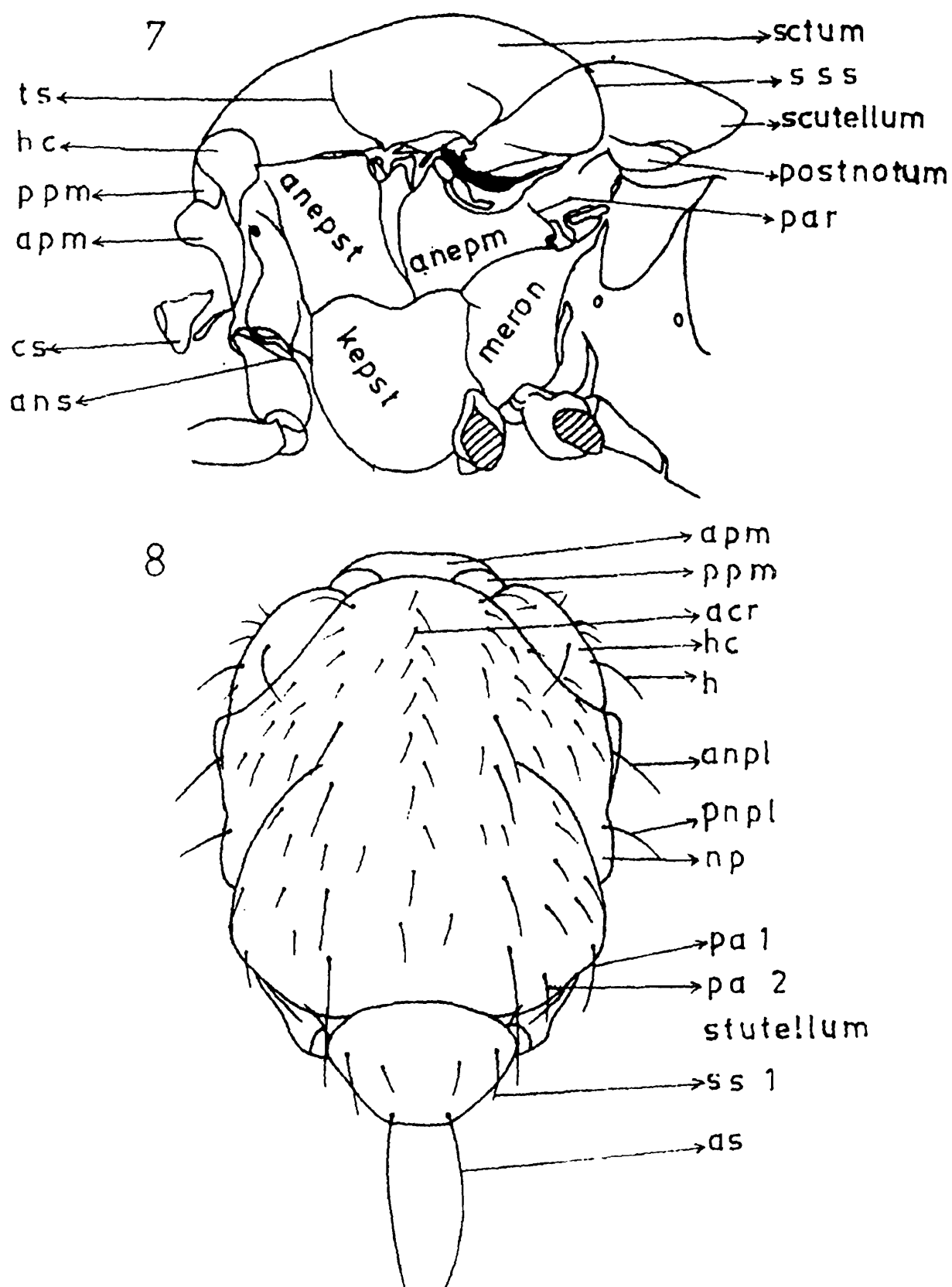
Figs. 5-6 : Explanation of terms and abbreviations in the text. 5, *Lipara lucens* Meigen (bristles and hairs omitted) Head, anterior view (Partly from Andersson, 1977).6, *Rhodesiella* sp., Head, posterior view.

Often in Chloropidae, the two sclerites are fused and are collectively called *gena* (cheek, jowl) and join the *postgena* (pgn) posteriorly. The relative width and hairiness of gena are of taxonomic value ; the setulae along the anteroventral margin of the gena are referred to as the *oral setae* or *peristominal bristles*. The posterior surface of postgena is sometimes flat and slides against a corresponding surface of the propleuron.

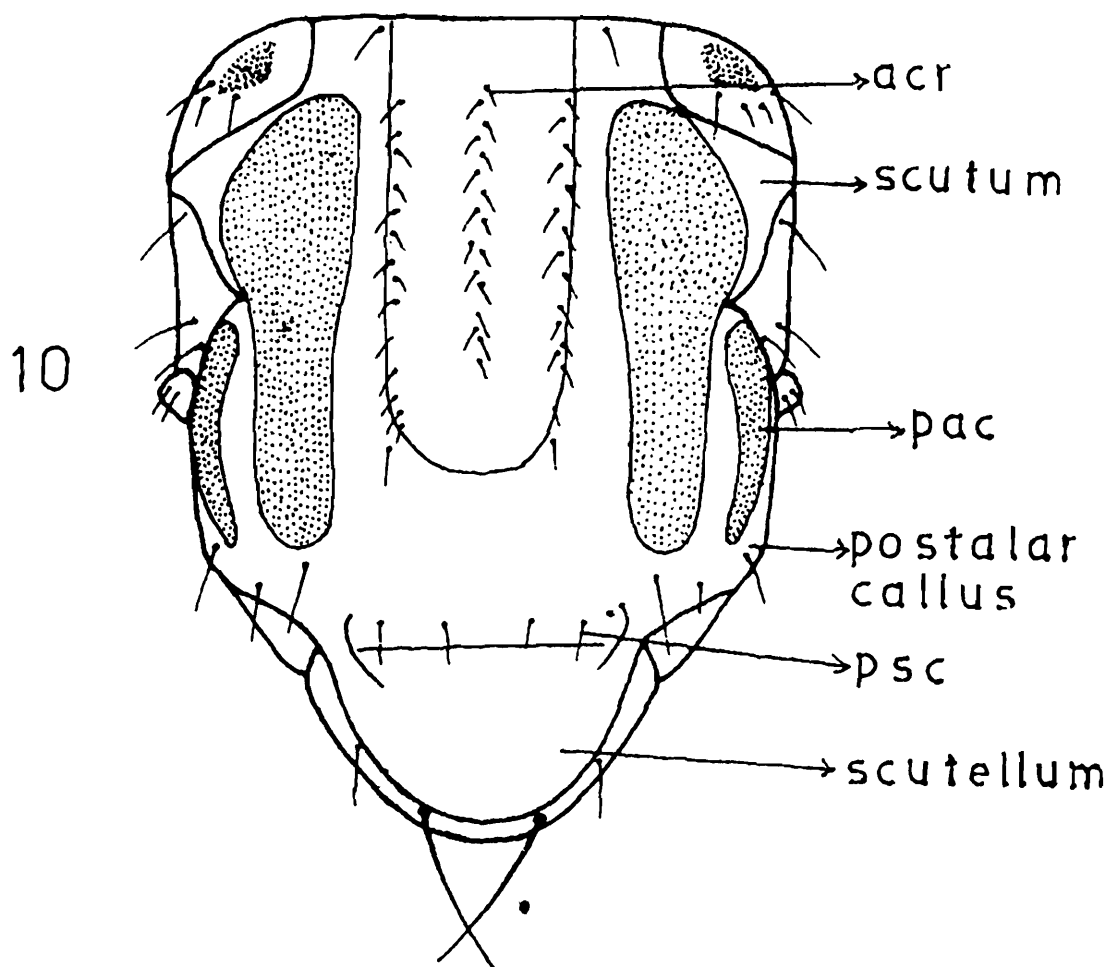
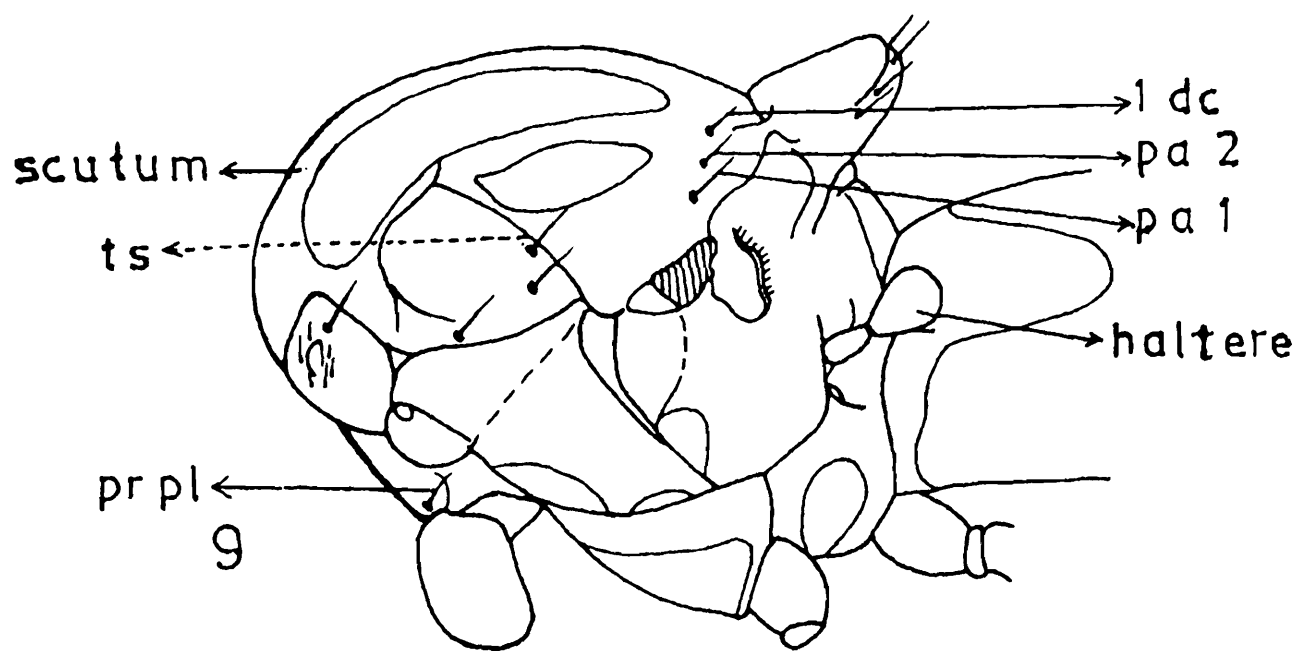
The posterior surface of the head capsule forms the *postcranium* (Fig. 6) which is almost flattened in Chloropidae. The principal landmarks are the *occipital foramen* (ocfr) and the *posterior tentorial pits* (ptp). According to Snodgrass (1935) the narrow rim of the occipital foramen is the postocciput, which is separated from the rest of the postcranium by the postoccipital suture. The upper half of the postcranium, the *occiput* (*ocp*) merges ventrally with the postgena. The occiput contains median occipital sclerite, the upper margin of which passes over the vertex into the ocellar triangle. The principal setae on the occiput are the *postocular setae* (*poel s*).

Antennae arise from membranous antennal sockets between the frons and the face. The antenna has three segments. The *first antennal segment* (ant 1) is in most species small and is partly hidden by the *second antennal segment* (ant 2) which is usually short but sometimes rather long. The third antennal segment (ant 3) shows great diversity ; it may be rounded, elongated, reniform or even trapezoid. It bears the *arista* (*ar*). Arista is often slender and bristle-like but thickened and flattened in some genera. It is often located dorsally but sometimes subapically or even apically. It may be bare, pubescent or densely pubescent and rarely pectinate. It consists of three *aristomeres* but only two are usually distinct. The mouthparts form a tubular sucking organ, the *proboscis*. The proboscis is of the haplostomate type (Frey, 1921), soft and short but not uncommonly it is more sclerotized and lengthened with long *labellum*. In the latter case the vibrissal angle is produced. The *palpi* are of medium size, slightly curved and often circular in cross-section. They bear fine hairs and short bristles. At the base of the proboscis is seen the *clypeus* which is often black. The labella are intersected by three pairs of pseudotracheae. The food is imbibed by applying the soft labella to liquid substances such as nectar or to dry food sources such as pollen grains and dried honeydew that have first been suitably moistured with saliva.

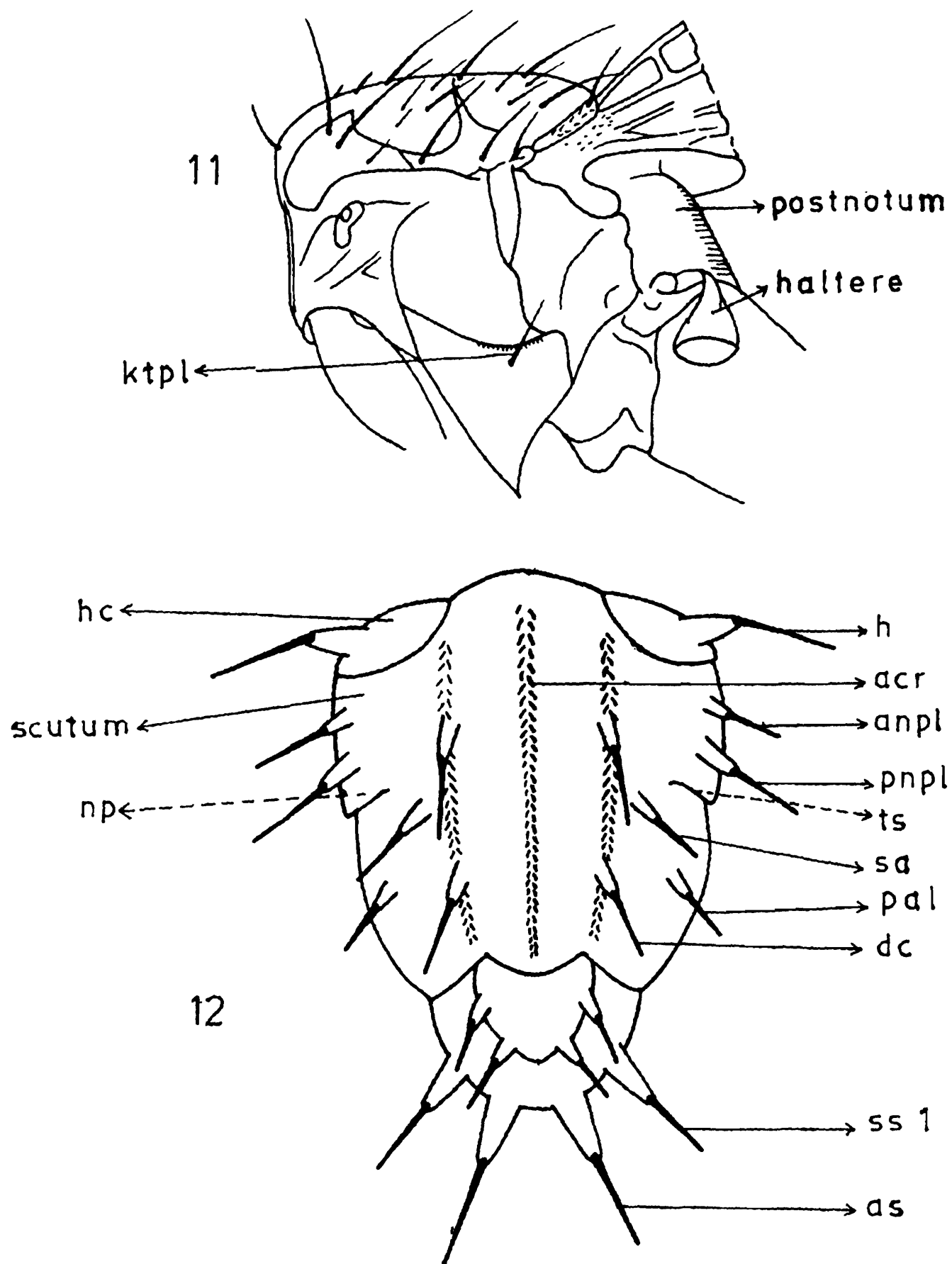
Thorax (Figs. 7-12) : The three segments of the thorax are the *prothorax*, *mesothorax* and *metathorax*. As in other Diptera the mesothorax is greatly enlarged to accommodate the muscles for the single pair of wings but the prothorax and metathorax are greatly reduced. basically each segment has a dorsal tergal plate, the *notum*, a lateral plate, the *pleuron* and a ventral plate, the *sternum*. Generally the notum can be more or less divided into the *prescutum*, *scutum* and *scutellum* (Mc Alpine 1981). In Diptera



Figs. 7-8 : Explanation of terms and abbreviations in the text. 7, *Lipara japonica* Kanmiya. Thorax, lateral view. 8, *Apotropina japonica* Kanmiya. Thorax, dorsal view (Partly from Kanmiya, 1983).



Figs. 9-10 : Explanation of terms and abbreviations in the text. 9, *Chlorops* sp., Thorax, lateral view. 10, *Laiosina* sp., Thorax, dorsal view.



Figs. 11-12 : Explanation of terms and abbreviations in the text. 11, *Apotropina* sp., Thorax, lateral view. 12, *Tricimbomyia muzhiyarenses* Cherian. Thorax, dorsal view.

this division, however, is applicable only to the mesonotum. The lateral pleural sclerites are considered to be derived from subcoxal elements of ancestral legs, which came to be incorporated into the thoracic wall. They consist of an anterior *episternum* and a posterior *epimeron* separated by a *pleural suture* which runs between the leg base and the wing base and serves to strengthen the pleuron. The episternum may be divided into an upper *anepisternum* (*anepst*) and a lower *katepisternum* (*kepst*); the epimeron may similarly be separated into the *anepimeron* (*anepm*) and *katepimeron*. However, as indicated earlier, when referring to the sclerites of the mesothorax all these terms are usually used unmodified except for the term mesonotum. The head is joined to the thorax by a membranous area of the prothorax called the cervix (neck) which bears the *cervical sclerites* (*cs*). The *pronotum* is divided into the anterior *anteppronotum* (*apm*) (anterior pronotum) and *postpronotum* (posterior pronotum). The *postpronotum* (*ppm*) is better developed in Chloropidae and is intimately associated with the mesonotum and its posterolateral margins form the *postpronotal lobes* (*humeri* or *humeral calli*, (*hc*)). The number, size and position of the *humeral bristles* (*h*) provide useful taxonomic characters. Laterally the *propleuron* may be indistinctly divided into an anterior *proepisternum* and a small *proepimeron*. Together the two parts form an arch over the base of the anterior coxa. The propleuron blends into the fused junction of the mesopleural katepisternum and anepisternum. The presence or absence of *proepisternal* (propleural) hairs is important in separating some genera. The prosternum may be divided externally into an anterior *presternum* and a posterior *basisternum* but this is almost always indistinct in Chloropidae.

The *mesonotum* includes the entire dorsum of the mesothorax (Mc Alpine 1981). Its three basic components are the *prescutum*, the *scutum* (mesoscutum, mesonotum of authors) and the *scutellum*; it also includes the fourth part posteriorly, the *postnotum* (metanotum, postscutellum) which is probably derived from an intersegmental acrotergite. Unfortunately, many dipterists have misapplied the term mesonotum to the scutum only (Mc Alpine, 1981).

The true prescutum is greatly reduced in Diptera and is not distinct in Chloropidae. The true scutum occupies most of the thoracic dorsum and its gross development is an outstanding apomorphic character. Because of its expanded condition and concomitant distortion the homologies of its features are not easily recognised. A predominant feature of the scutum is the *transverse suture* (*ts*). It is derived from a pair of lateral sutures that divide the scutum into an anterior *presutural area* and a posterior *postsutural area*. Each half of the suture arises laterally in front of the anterior notal wing process and continues towards the midline of scutum. The *scutoscutellar suture* (*sss*) separating the scutum and the scutellum is the hindmost *transscutal* suture. The following designations are applied to the other features of the scutum. The anterolateral region of the scutum between the postpronotal lobe and

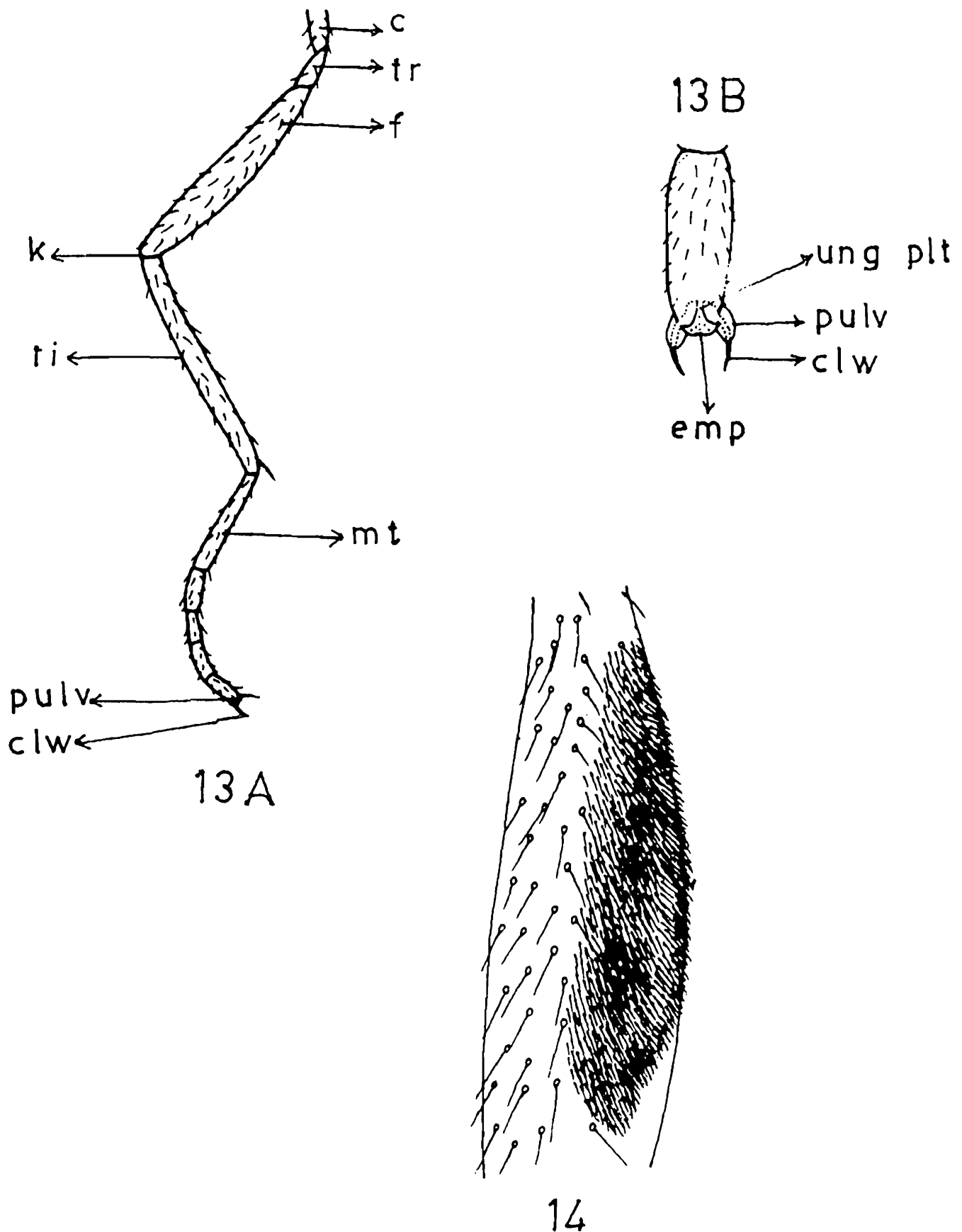
the wing base is a clearly delimited, sunken area called the *notopleuron* (*np*). The swollen area lying just behind the lateral extremities of the transverse suture and anteromedial to the anterior notal wing process is called the *prealar callus* (*pac*). The swollen area between the scutellum and the posterior base of the wing is called the *postalar callus*. A ridge stretching from the anterolateral angle of the scutellum to the wing base is the *postalar ridge* (*par*). The lateral margin of the scutum immediately above the attachment of the wing is the supra-alar area.

The shape of scutellum varies in different genera and species and may be short, semi-circular, triangular or even greatly prolonged and cylindrical with convex or flattened disk. The postnotum includes all the parts behind and below the scutellum.

The mesopleuron includes the entire pleuron of the mesothorax and is divided by the pleural suture into an anterior episternum and a posterior epimeron. The pleural suture often takes a zigzag course. The episternum is divided transversely by the *anapleural suture* (*ans*) into an upper part, the *anepisternum* (*anepst*) (mesopleuron of many dipterists) and a lower part, the *katepisternum* (*kepst*) (sternopleuron of authors). Similarly the epimeron is transversely divided into *anepimeron* (pteropleuron) and the *katepimeron* (barrettee). Katepimeron when distinct lies along the dorsal rim of *meron* (hypopleuron, meropleuron). In Chloropidae katepimeron is not well developed whereas the meron is greatly developed.

The metathorax is reduced and its dorsum, the *metanotum* is usually scarcely visible externally. The metanotum connects the mesothoracic postnotum to the first abdominal tergite. In Chloropidae it is concealed beneath the base of the first abdominal tergite. The mesosternum and metasternum are almost entirely invaginated in the family.

The scutum in chloropidae provides many distinguishing characters. The surface may be smooth, glabrous or sculptured in different ways. It can be bare or hairy with the hairs evenly distributed or arranged in rows. Of the latter the most conspicuous are the *dorsocentrals* and the *acrosticals* (*acr*). The major bristles on the scutum are the *notopleurals* (*npl*) the *anterior* and *posterior* (*pa 1* and *pa 2*) *postalar bristles*, 1-4 *dorsocentrals* (*dc*) and the *prescutellar bristles* (*psc*). Species of the subfamily Siphonellopsinae (family Siphonellopsidae of Nartshuk) also have *supraalar* (*sa*), prescutural and small prealar bristles. Supraalar bristles are found rarely in Oscinellinae (Eg. *Tricimbomyia* Cherian) also. The scutum is usually unicoloured black or striped with light yellow green or brown longitudinal stripes or vittae. The median stripe usually ends before scutellum and is often parted by a light streak along the *acr* lines. Each submedian stripe commences from or posterior to humeral callus and extends to the *dc*. It is normally broader anteriorly. Each lateral stripe continues from behind the notopleural incision and is abbreviated posteriorly. In



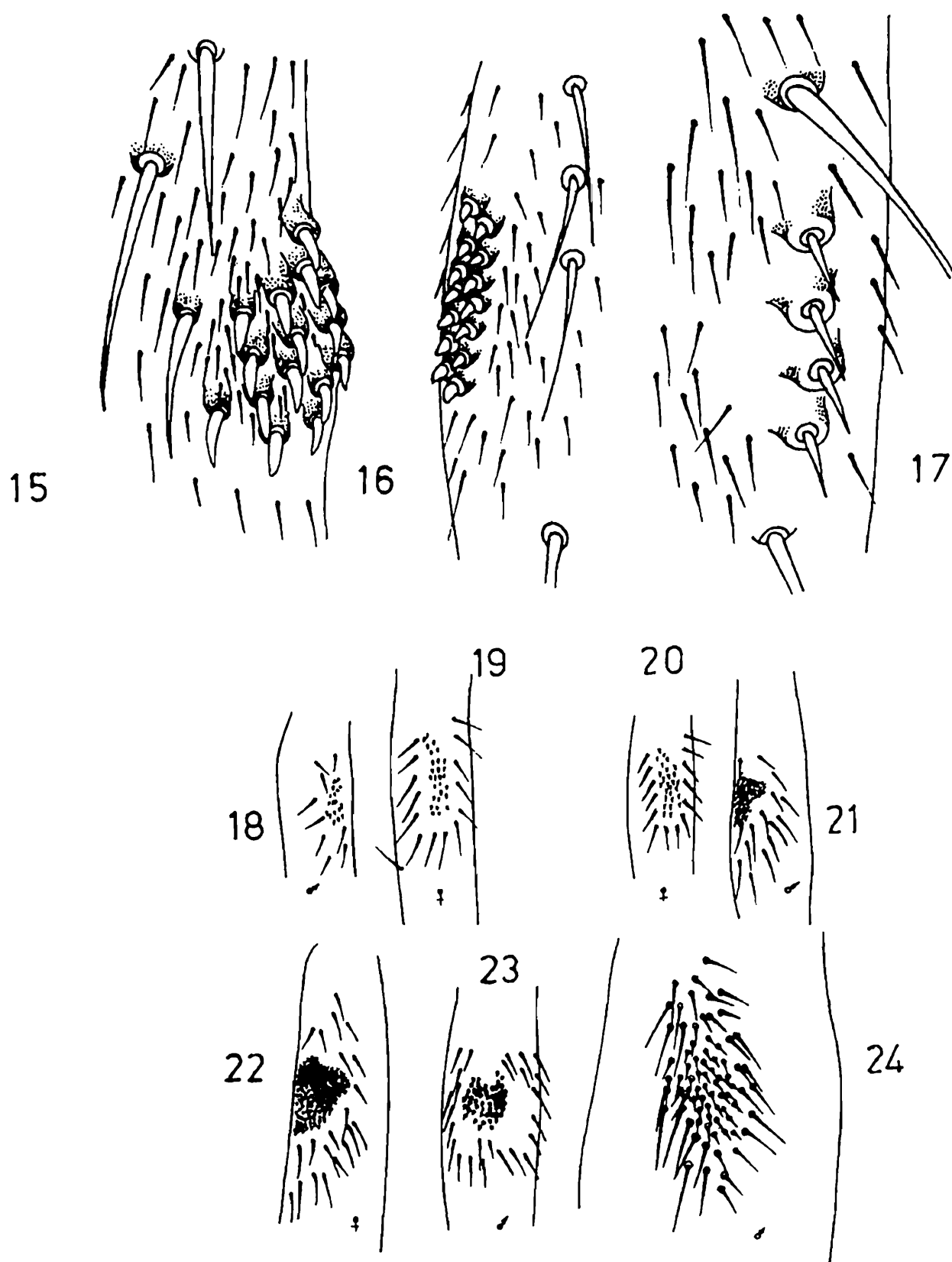
Figs. 13-14 : Explanation of terms and abbreviations in the text. 13, *Oscinella fusidentata* Cherian. A, Middle leg. B, Last tarsomere of middle leg. 14, *Thaumatomyia* sp., Tibial organ.

darker specimens of distinctly striped species an indistinct dark infuscation continues from behind the posterior ending of the median vitta to the scutellum or the darker stripes are more or less fused. On the scutellum the *apical scutellar bristles* (*as*) are usually well developed and may at times be borne on finger-like projections, tubercles or warts. The *lateral scutellar bristles* (*ss*) are normally smaller and their number varies from one to numerous. The propleuron may possess one or a few propleural bristles (*prpl*). The anepisternum in some genera may have a few to numerous hairs the presence or absence of which is of great generic significance. Siphonellopsinae and some Stenoscinini possess a katepisternal bristle (*ktpl*).

Legs (Fig. 13A): The legs are usually simple and relatively short. Each leg is attached to the thorax by a ball joint, which enables the basal segment, the *coxa* (*c*) to rotate in a restricted measure, its direction being in the main downwards, i.e. away from the body. At its apex the short *trochanter* (*tr*) articulates in a dicondylous or hinge joint, turning the rest of the leg essentially outward and moving it up and down. Little movement is possible between the trochanter and the long *femur* (*f*), which has the function of removing the articulation of the more distal parts of the leg further outward. In the dicondylous *knee* (*k*) joint the leg is bent downward, and the long and thin tibia (*t*) reaches the ground with its apical spurs, the five segmented tarsus (*ta*) being inserted at its tip and providing a broader contact with the ground. The *first tarsal segment* or *tarsomere* is always more or less long in Chloropidae and the apical ones short. On the distal end of the fifth tarsomere (Fig. 13B) is the acropod which is believed to be homologous with the dactylopodite of a crustacean limb (de Meijere, 1901). The principal sclerite of the acropod is the ventrally located *unguitractor plate* (*ung plt*); distally it bears a pair of *claws* (*clw*) and proximally it is attached to the distal margin of the fifth tarsomere. The distal end of the acropod bears an unpaired median process, the *empodium* (*emp*). On each side of the acropod near the lateral margins of the unguitractor plate is a pair of flap-like processes, the *pulvilli* (*pulv*). Both the pulvilli and the *empodium* act as adhesive organs and sometimes possess hollow hairs through which a viscous substance is secreted.

The different leg surfaces are ascertained by imagining that all the legs are fully extended laterally, parallel to each other and at right angles to the main axis of the body. Thus each segment of each leg has an anterior, posterior, dorsal and ventral surface. Other surfaces are named on the same basis, eg. anterodorsal, posterodorsal, anteroventral and posteroventral.

The hind femur is sometimes thickened and the hind tibia correspondingly curved (Fig. 202). In some species the anterior femur may be thickened and spines can be seen on the anteroventral and posteroventral surfaces of *f* 1 and *f* 3. The legs are covered with short hairs but distinct bristles are not present except one ventral apical



Figs. 15-24 : Femoral organ. 15, *Dicraeus styriacus* Strobe. 16, *Incertella albipalpis* (Meigen). 17, *Oscinella maura* (Fallen). 18, *Rhodesiella plumiger* Meigen, female. 19, *R. pallipes* Duda, male. 20, *R. pallipes*, female. 21, *Scoliophthalmus ussuricus* Nartshuk, male. 22, *S. ussuricus*, female. 23, *Elachiptera cornuta* Fallen, male. 24, *Lipara similis* Schiner, male. (From Andersson, 1977 & Nartshuk, 1987).

spur on t 2 and sometimes on t 3. In many genera, most commonly in the subfamily Oscinellinae, there is an elongate oval area, covered with dense, short fine hairs on the posterodorsal aspect of t 3. It is called *tibial organ* (Fig. 14).

A similar organ is found in some species of Sepsidae where it was found to have secretory function (Sulc, 1928-1929). Usually the males and rarely the females of many species possess a femoral organ (figs. 15-24) consisting of a group of warts with short spine-like hairs on the middle femur. The organ is very small and before 1977 has been mentioned in the literature on only a few occasions (Balachowsky and Mesnil, 1935). Hind femur, especially in some species of Rhodesiellinae, may bear one or more short black spurs basoventrally and a group of warts on the anterodorsal surface a little beyond base.

Wing (Fig. 25): For convenience the wing is treated under three headings: the *axillary area* containing the *axillary plates* between the lateral margins of the notum and the bases of the wing veins, the basal *stalk* containing the bases of the wing veins and associated plates and membranes and the *blade* or main area of the wing. The anterior margin of the wing is called the *costal margin*. The most proximal plate at the extreme base of the costal margin is the *tegula* (*tg*); the adjacent, more distal plate, articulating with the base of the *costa* (*c*) is called the *basicosta* (*ba*). The axillary plates are reduced in the family. The wing stalk contains the bases of all main wing veins. The posterior margin of the wing stalk has a broad lobe called the *alula* (*al*). Proximally this lobe is continuous with the *alar squama* (*asq*) and distally it is separated from the rest of the wing by an indentation called the *alular incision* (*ali*).

Only very rarely the wing blade is absent in adult Chloropids. The *costa* (*c*) becomes absent beyond the insertion of *radius* (or may extend a little beyond) in the subfamily Chloropinae and may extend to the insertion of the *m* in other subfamilies. Just proximal to the insertion of the first branch of *radius* (*r* 1) there is a *costa break* (*cb*) which is believed to be the special point for flexing the wing during flight (Henning, 1973). The *subcostal vein* is retained only for a short distance near the *humeral cross-vein* (*hcv*) or as an indistinct weak fold along *r* 1. The first three longitudinal veins represent the *radius* (*r* 1, *r* 2+3, *r* 4+5). The next two are the branches of the *media* (*m* 1+2, *m* 3+4). The *cubitus* and *anal veins* are absent in Chloropidae except, in some cases, for an inconspicuous fold referred to as the *anal vein*. The costal segments 1-4 are denoted by *mg* 1, *mg* 2, *mg* 3, and *mg* 4. Apart from the humeral cross-vein, the other cross-veins are the *radio-medial* (*r-m*) (anterior cross-vein) and the *medial* (*m-m*) (posterior cross-vein). The closed cells are the *basal costal* (*bc*), *costal* (*c*), *subcostal* (*sc*) or marginal cell and *basal radial* (*br*) (first basal). The *basal medial* (second basal) and *discal* (*d*) are united to form a single cell, usually referred to as

the *disca* (*d*) cell. The other cells are submarginal cells (*sum*), first posterior cell (1 *pc*) and the second posterior cell (2 *pc*). Sometimes characters of the anal lobe are

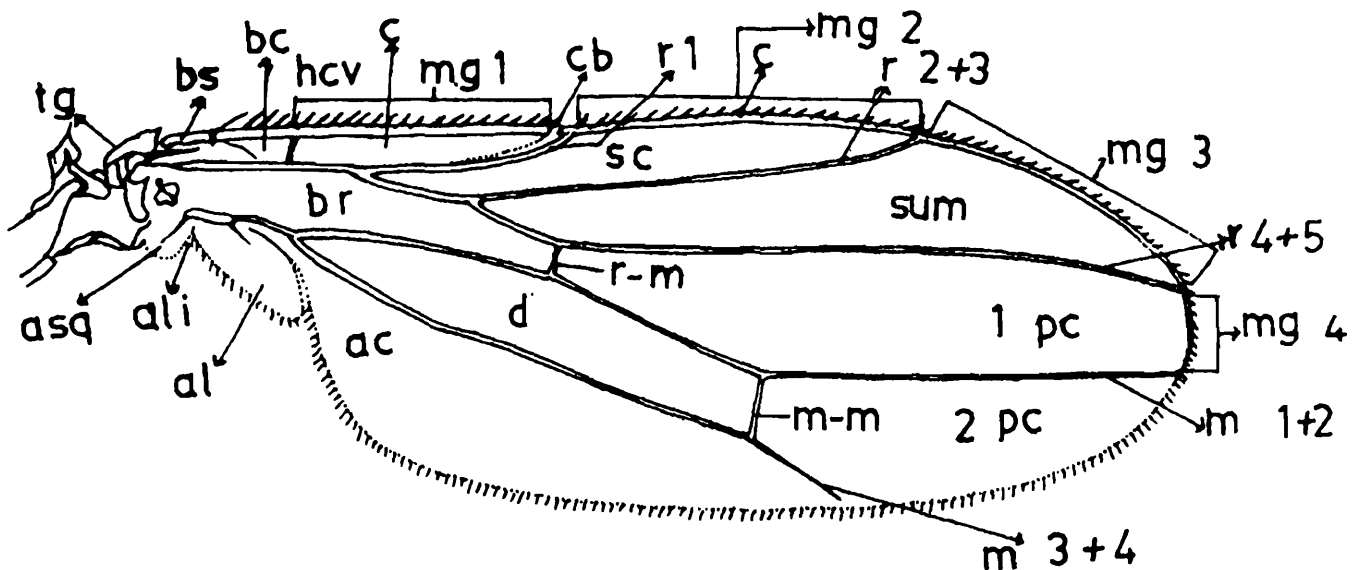


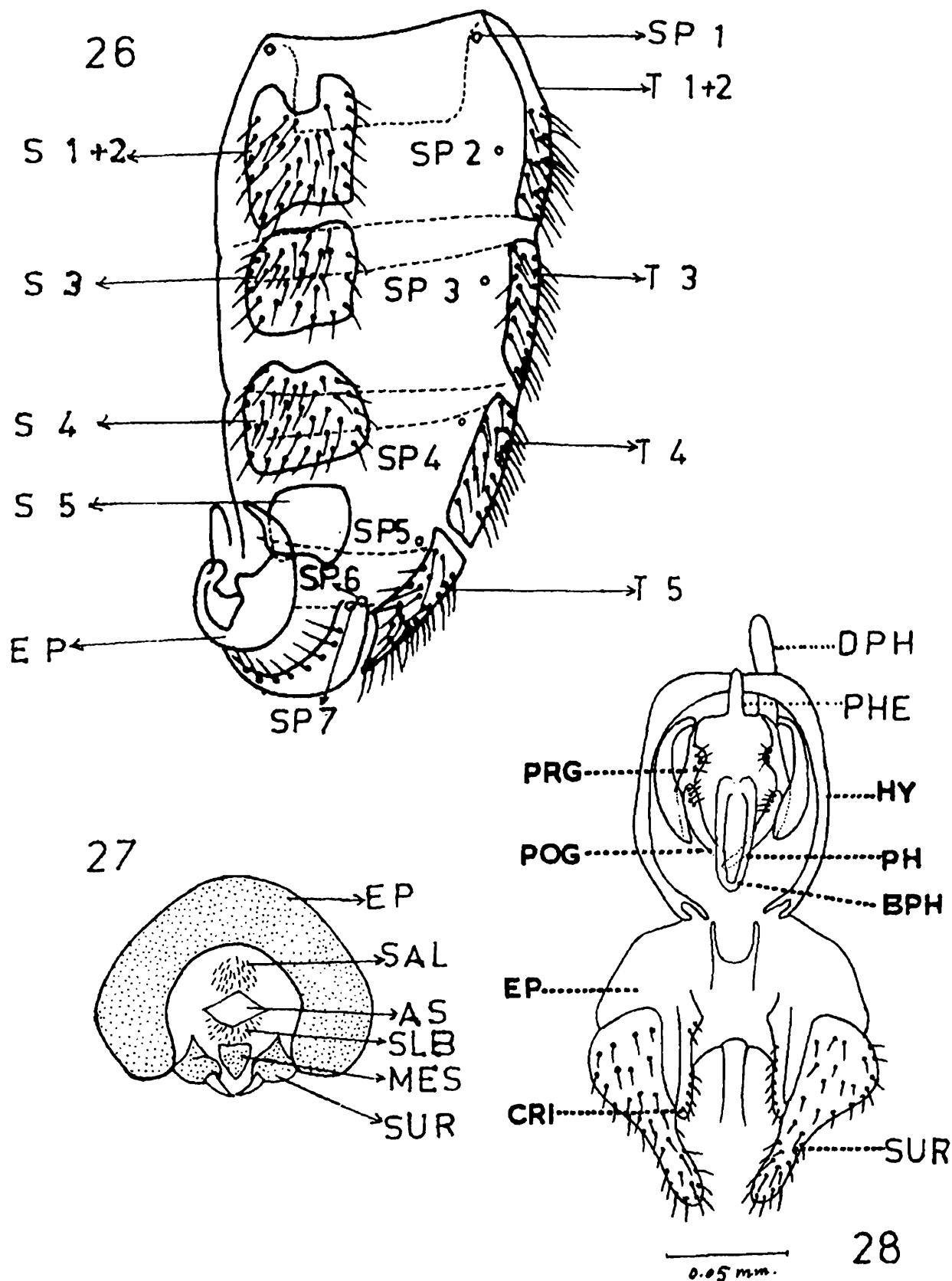
Fig. 25 : Abbreviations in the text. *Apotropina* sp., wing.

expressed in terms of the anal cell (*ac*) (axillary cell) which usually includes all of the wing surface bounded by *m* 3+4 and wing margin, exclusive of the alular lobe. A slight flexure of *m* 3+4 at about the middle of its basal segment is typical for Chloropid flies.

Abdomen (Figs. 26, 29) : It is ovoid, oval or almost cylindrical. The pre-abdomen, which can be seen from above, is composed of segments 1-5. The tergites (*T*) are well developed and their lateral parts partly cover the ventral surface of abdomen.

The tergites 1 and 2 are confluent, forming syntergite 1+2 which is usually longer than each remaining tergite. In male, tergites 1-5 are usually symmetrical. Sternite (*S*) 1 is sometimes vestigial, in narrow band-form, sometimes parted or even completely absent. Sternites 2-5 are usually symmetrical, the 5th rarely reduced. The spiracles (*SP*) 1-5 are placed in the membrane near the tergite. In some genera like *Anatrichus* and *Myrmecosepsis* the first two tergites are fused and cover the rest of abdomen.

In the male *terminalia* (post abdomen) there is only one dorsal sclerite between tergite 5 and the epandrium. This sternite is thought to represent the fused sternites 7-8. It bears 2 spiracles on either side.

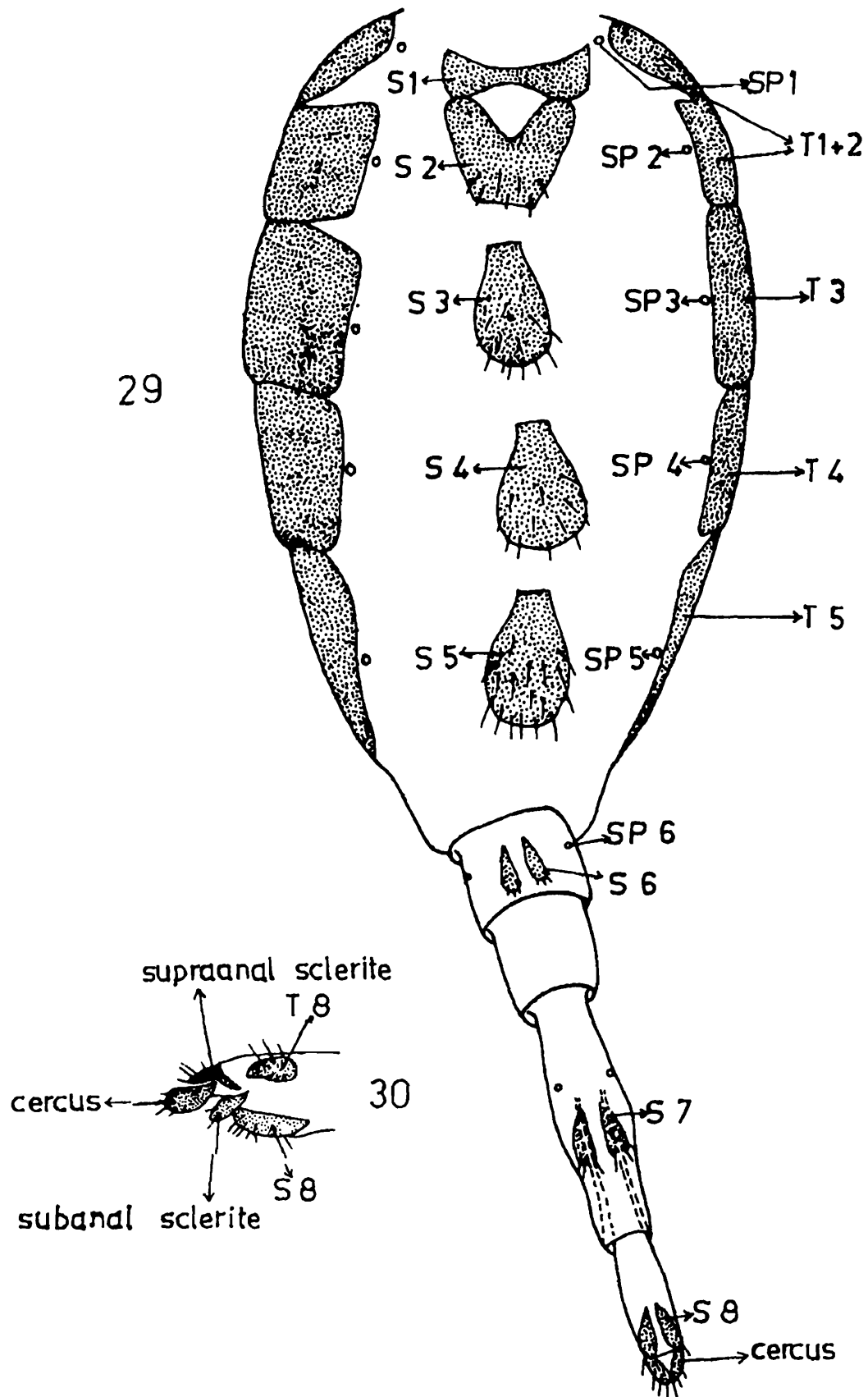


Figs. 26-28 : *Elachiptera cornuta* Fallen. male. 26, Abdomen, latero-ventral view (From Nartshuk, 1987).

27, *Chlorops* sp., Epandrium, posterior view (From Andersson, 1977). 28, *Rhodesiella* sp., Male genitalia, ventral view.

Male terminalia (Figs. 27-28) : The epandrium (EP) is believed to represent tergite 9. It is hemispherical or roof like with a ring like opening or narrow or wide dorsodistal notch. The opening is closed by the movable forceps, the *surstyli* (SUR), which according to Mc Alpine (1981), represents the reduced 10th tergite. In some groups the surstyli seem to represent a complex of sclerites, named the posterior, median and anterior lobes of the surstylus (Andersson, 1977). Encircled by the epandrium is the *supraanal lobe* (SAL), the *subanal lobe* (SLB), the *anus* (AS) and the *cerci* (CRI). Of these the first two are usually indistinct but their presence is indicated by groups of small chaetae. The *cerci* may be free or may be fused to form a mesolobus (MES). One paired sclerite is sometimes found at the sides of the subanal lobe. This may represent the posterior lobe of the surstylus. The epandrium and its associated appendages form the caudal wall of the genital pouch. When the insect is at rest the epandrium and its appendages move downward and forward to cover the pouch. The genital pouch is also limited by the usually somewhat U-shaped *hypandrium* (HY) which represents sternite 9 (Andersson, 1977). Caudally this articulates with the epandrium. Anterior to this articulation there are the two arms of the U, the hypandrial corni, which articulate with the anterior lobes of the surstyli or to a separate ventral epandrial sclerite, which may at times be divided. These sclerites are the same as the connecting rods of calypteratae and represent sternite 10 (Mc Alpine, 1981). The *inner copulatory organ* is the *phallus* (PH) and the *gonites*. The phallus or aedeagus develops from tissues behind sternite 9 and most authors regard it as a derivative of segment 10 (Mc Alpine, 1981). Its primary function is to transfer sperm to the female reproductive system. The external wall of the phallus is usually at least partially sclerotized and frequently consists of some plates, processes, spines and lobes. It is not possible to homologize all the parts that have been distinguished and named by different authors but a number of basic elements can usually be distinguished. These include a proximal *basiphallus* (BPH), a distal *distiphallus* (DPH) and a distal opening, the gonopore.

The basiphallus is the sclerotized basal sector of the aedeagus. Internally it is subtended by an *aedeagal apodeme* or *phallapodeme* (PHE). It is separated from basiphallus by a membranous articulation and joins the basiphallus at a distinct angle (Henning, 1976). Above the articulation the aedeagal apodeme forms a flat or more or less cup-shaped phallapodemic sclerite. Contraction of the muscles attached to the aedeagal apodeme results in the exertion of the aedeagus (Henning, 1976). The distiphallus forms the relatively discrete apical section of the aedeagus. A pair of gonopods or pregonites (PRG) arising posterolaterally on sternite 9 and a pair of *parameres* or *postgonites* (POG) located between the pregonites and articulating with the base of the aedeagus are present. These assume different shapes and are also arranged in different ways in different genera.



Figs. 29-30 : 29, *Oscinella* sp., Female abdomen, ventral view.
30, *Oscinella* sp., Ovipositor, lateral view.

Female terminalia (Fig. 30) : In diptera all the elements of the terminalia, including the cerci, are called the *ovipositor* (Mc Alpine, 1981). The genital opening between segments 8 and 9 leads to the pouch-like or tubiform genital chamber. The paired oviducts unite to form a common oviduct that opens by means of the primary gonopore in the dorsal wall of the genital chamber. The paired cerci are the most prominent elements of the proctiger. The ovipositor is terminated by the *cerci* and the *supraanal* and *subanal* plates. A pair of rudimentary spermathecae and long spermathecal ducts have been observed in chloropidae.

EARLY STAGES

(A) The Egg

The eggs (Fig. 31) are normally about 2.5–5.x as long as wide, cylindrical fusiform, ovate or crescent shaped, one surface often being slightly flattened or concave. The egg is often striated and sculptured, with the terminal micropylar area on the asymmetrically tapered apex. In genera like *Oscinella* the chorion is usually raised in longitudinal ridges most of which extend the whole length but some end abruptly while in *Incertella*, *Meromyza* and *Thaumatomyia* transverse ridges divide the chorion into rectangular areas. The micropyle is often a cup-shaped structure traversed by small micropylar canals converging to a point internally. The eggs of only a few species of each group are known. Some of the eggs known are unexpectedly different from closely related ones. The eggs of many genera are yet to be studied. Therefore much confirmation of the egg types will be required before a truly reliable key can be produced.

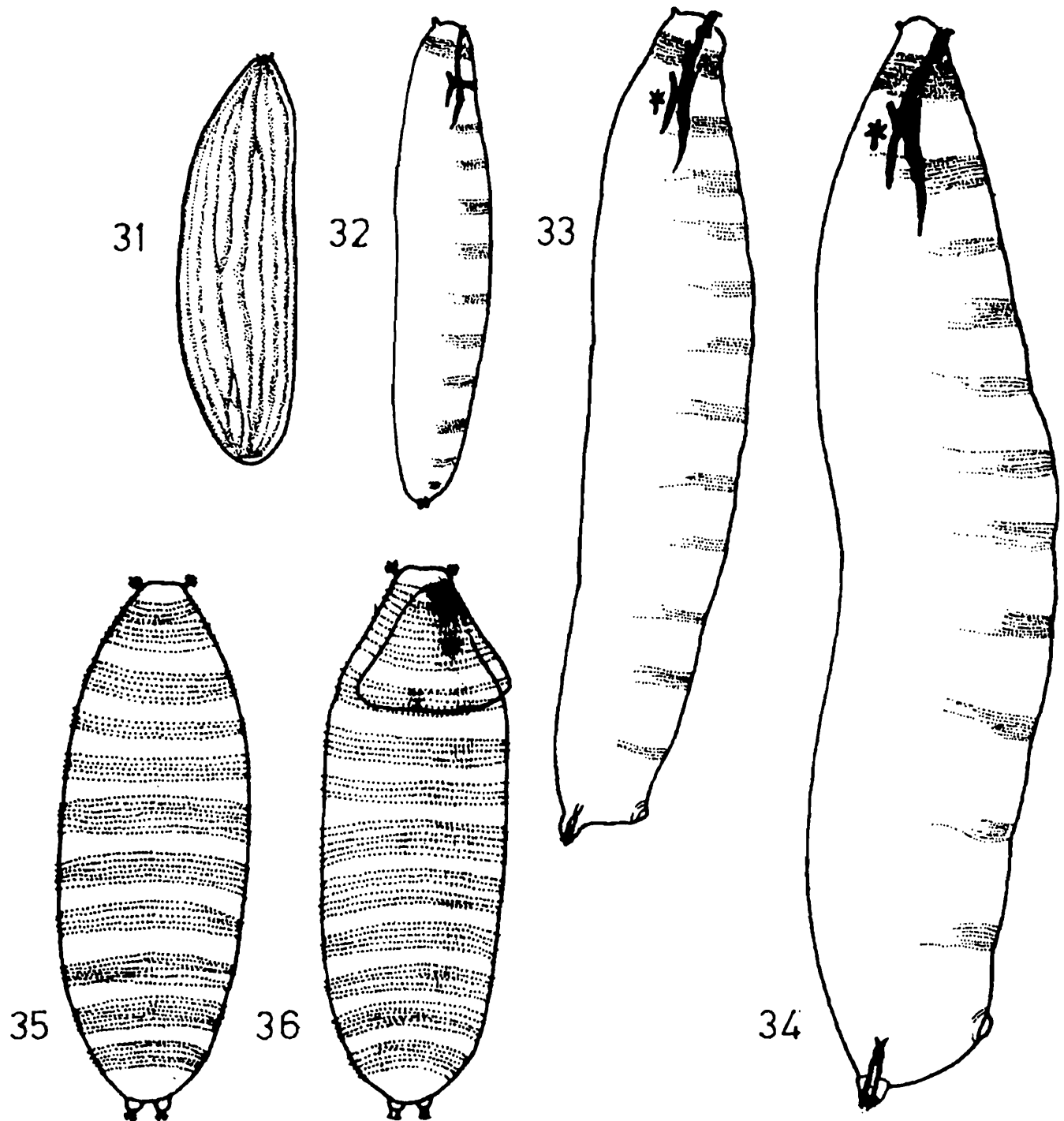
(B) The Larva

There are normally three free larval stages and a hidden fourth inside the hardened skin of the third instar, which skin is known as the puparium. Of all the immature stages it is in the third instar larvae that the characteristic morphological differences between species are most fully developed and for this reason this stage is being described in detail.

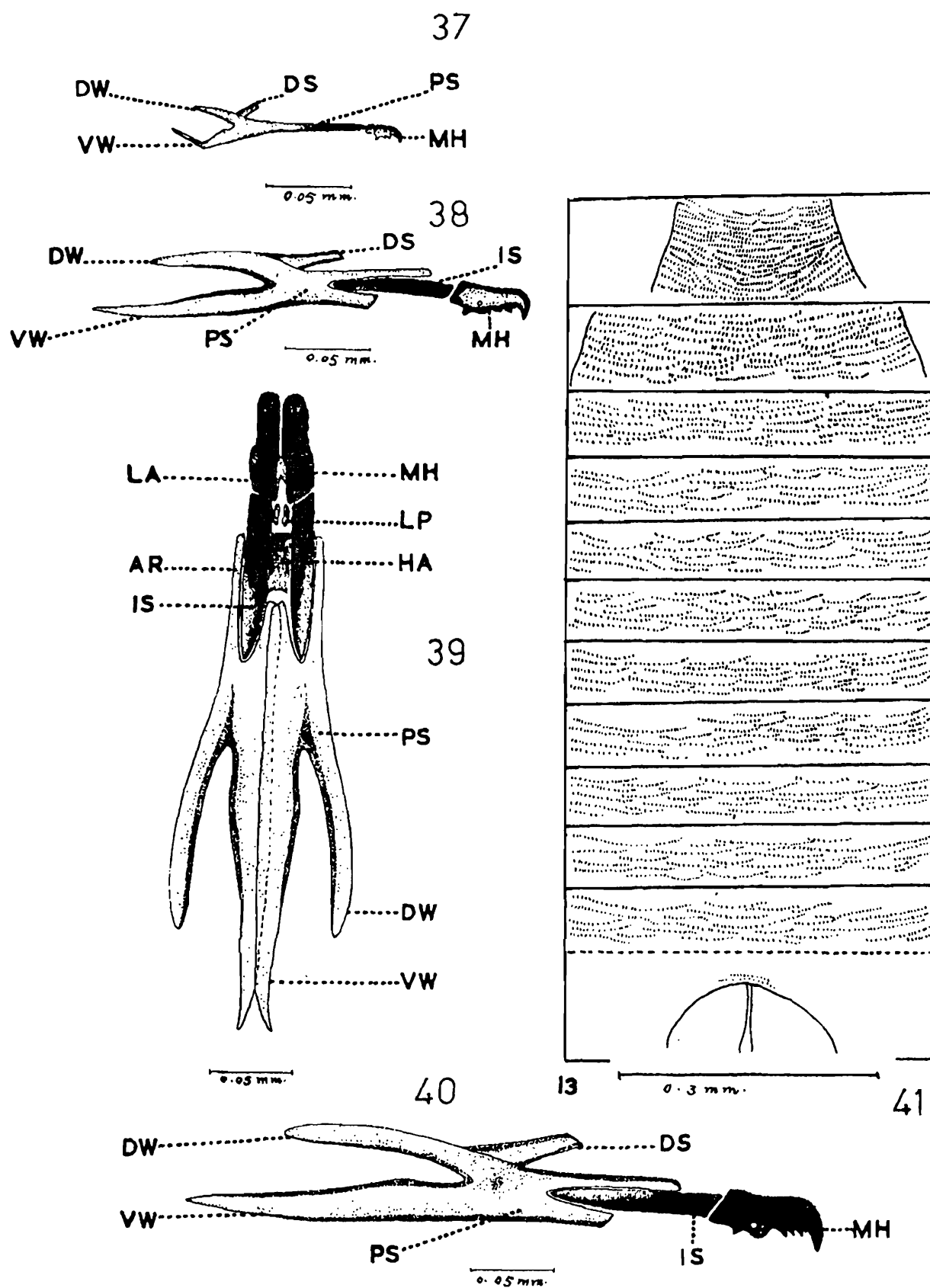
a. THIRD INSTAR LARVA (Fig. 34)

1. General Description

Typical third instar larvae vary according to species, in length from 3 to 7 or 8 mm and in colour from white, through creamy white to pale yellow (except for *Meromyza* spp. which are pale green) and are more or less translucent, depending on the amount of fat body reserves present. The malpighian tubules are often visible in part as deep yellow intertwining threads. The larvae are apodous, free of cuticular outgrowths and



Figs. 31-36 : *Oscinella fusidentata* Cherian. 31, Egg. 32, 1st instar larva. 33, 2nd instar larva. 34, 3rd instar larva. 35, Pupa. 36, Empty puparium.



Figs. 37-41 : *Oscinella fusidentata* Cheria. 37, Cephalo-pharyngeal skeleton, 1st instar larva. 38, Cephalo-pharyngeal skeleton, 2nd instar larva. 39-40, Cephalo-pharyngeal skeleton, 3rd instar larva. 39, Ventral view. 40, Lateral view. 41, Arrangement of spicules, 3rd instar larva, ventral view.

approximate in shape to a cylinder, slightly flattened dorso-ventrally, tapering anteriorly and more broadly rounded posteriorly.

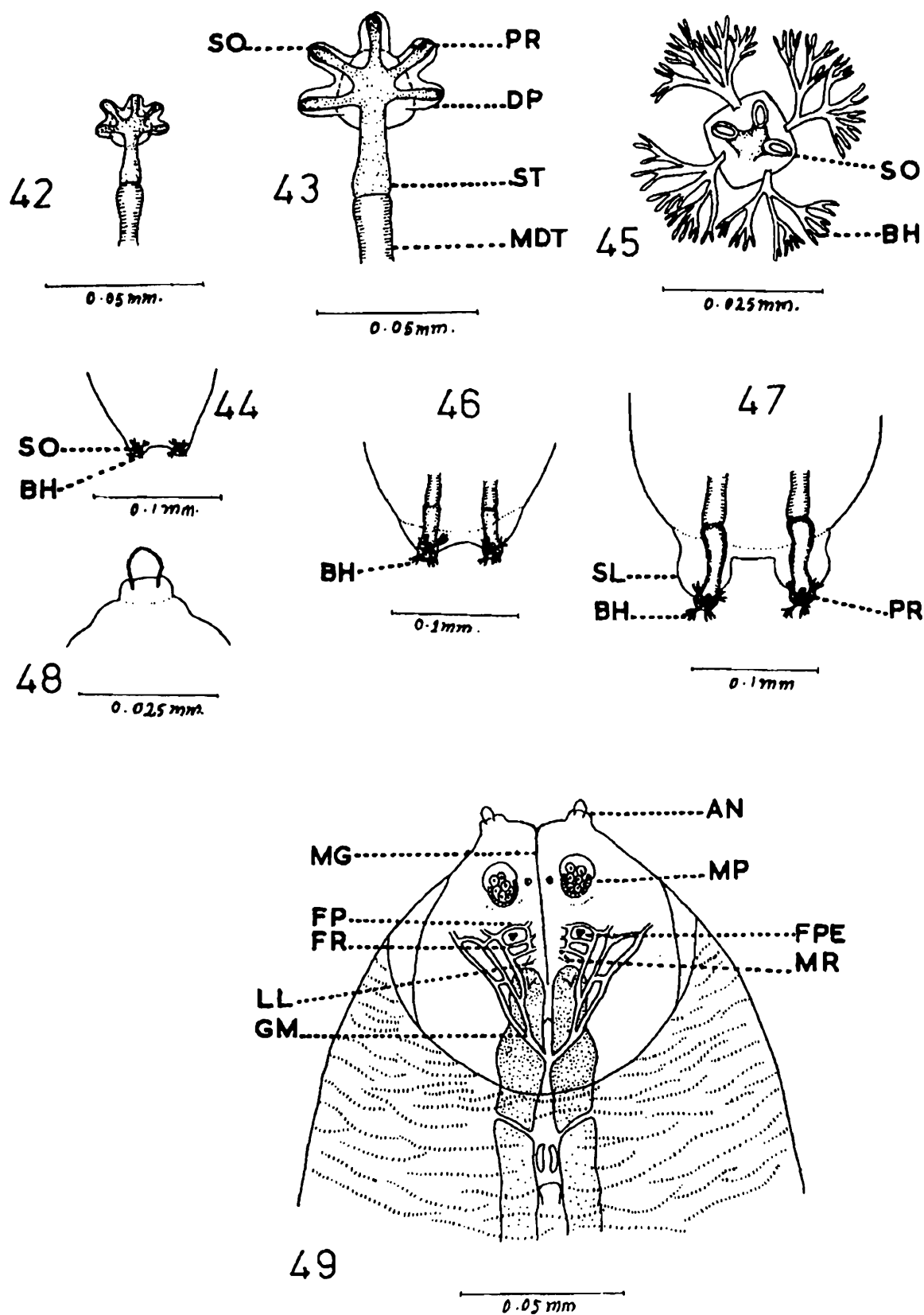
The antennae (Fig. 48) are at the extreme anterior of the head (except for *Chlorops* spp. and some of its relatives in which they are lateral). In general at low magnification except for heavily sclerotized mouth-hooks other cephalic characters are not discernable. The head and the following 11 segments are demarcated only by slight constrictions round the body. Each segment usually has a zone of transverse cuticular ridges in the form either of striae or rows of spicules which encircle the body to a greater or lesser extent, depending on the species and the relative position of the segment.

Third instar larvae are amphipneustic and have paired digitate anterior spiracles (Fig. 43) opening just in front of the posterior margin of the first thoracic segment. A main dorsal tracheal trunk runs the length of the body and joins the anterior to the posterior spiracle which opens to the exterior, on a spiracular lobe (SL), at the end of the abdomen.

2. The Cephalo-pharyngeal skeleton (Figs. 39-40)

In Chloropidae, as in other cyclorrhaphous larvae, the highly modified ectodermal cephalo-pharyngeal skeleton consists mainly of paired sclerites. Anteriorly there is a pair of *mouth-hooks* (MH), both working together in a vertical plane and each with an apical tooth followed by a variable number of smaller teeth. Posteriorly each *mouth-hook* articulates with an *intermediate sclerite* (IS) and these two are joined ventrally by a *hypostomal arch* (HA). The intermediate sclerites are more or less fused with a large paired *pharyngeal sclerite* (PS), each side of which may be divided into a *dorsal wing* (DW) and a *ventral wing* (VW) joining anteriorly, and giving rise to an anterior prolongation of the ventral wing, the *atrial rod* (AR), over part of the intermediate sclerite. More or less fused anterodorsally to each of the pharyngeal sclerites is a median *dorsal sclerite* (DS). In some genera, on the top of the ventral wing, there is a wing process. Besides the main sclerites, there are a few other smaller pieces which enter into the structure of the skeleton. The most important of these taxonomically are the dentate sclerites which are usually situated ventrally to each mouth-hook but in some genera the pair are fused to form a single median dentate sclerite. Dorsal to these sclerites and between the mouth-hooks, a narrow strap-like *liguloid arch* (LA) can sometimes be seen and lying between this arch and the hypostomal arch are a pair of small *liguloid plates* (LP).

The phylogeny of these sclerotized structures has been a controversial topic since they were first described by Leuckart (1863). Henning (1948-52) assessed and reviewed the interpretations of various authors and linked them with his own findings. Later Snodgrass (1953) discussed the metamorphosis of the head of a fly and Nartshuk (1987) gave a comprehensive account of the larval structures of many genera of Chloropidae.



Figs. 42-49 : *Oscinella fusidentata* Cherian. 42, Anterior spiracle, 2nd instar larva. 43, Anterior spiracle, 3rd instar larva. 44, Posterior spiracle, 1st instar larva. 45, Posterior spiracle, 1st instar larva (enlarged). 46, Posterior spiracle, 2nd instar larva. 47, Posterior spiracle, 3rd instar larva. 48, Antenna, 3rd instar larva. 49, Facial mask, 3rd instar larva, ventral view.

3. *The Head and Facial Mask* (Fig. 49)

All the morphological characters associated with the head are concentrated on the ventral, and to a lesser extent, the lateral aspect and collectively form the facial mask. Anteriorly there is a pair of two segmented, usually unsclerotized *antennae* (AN), consisting of a basal and an apical, generally ovoidal, segment. Just posterior to the antennae, or level with them in *Chlorops*, is a pair of *maxillary palps* (MP), each usually formed of a somewhat sclerotized ring. The ring may be complete or incomplete anteriorly, in the latter instance it is termed an open type. The ring usually contains four to six papillae with a further pair lying anterolaterally. There is a further small palp, lying between the maxillary palp and the mouth-hooks called the *frontal palp* (FP) (Nye, 1958) and the three or four cells of which it is comprised, the *frontal papillae* (FPE). The reduced labium can usually be seen as a small sclerite lying posterior to the oral opening and is termed the labial plate and on it there are two pairs of labial pores which might more reasonably be regarded as the true remnants of the labial palp. The *median groove* (MG) divides the facial mask incompletely.

On the facial mask there are four pairs of cephalic papillae named anterior, pre-frontal, labial and genal papillae. The function of these structures is unknown although they are assumed to be sensory.

Immediately anterior to the mouth-hooks and partially surrounding them are the *labral lobes* (LL), which appear to assist in the channelling of food particles, rasped off by the mouth-hooks into the mouth opening, situated between them. Cephalic rami, which appear to be colourless cuticular thickenings, assist in the channelling of food particles. These commence in the mouth opening between the mouth-hooks and run anteriorly, bifurcating and anastomosing to form the main features of the facial mask, mainly within the area bounded by the cephalic papillae. The rami in part or whole may be plain, crenulate, serrate or toothed and are in numbers and arrangement extremely variable from genus to genus. The small areas bounded by the rami are termed cephalic cells and their arrangement and size are entirely determined by the rami. These rami are divided into three broadly defined areas : the *mid-frontal rami* (MR) lying between the frontal palps, the *frontal rami* (FR) on the three outer sides of the frontal palps and the *genal rami* (GM) lying in the area between the genal papillae and the mouth-hooks.

Occasionally in thoroughly relaxed or dead specimen a long "tongue" can be seen everted, in side view, between the base of the head and first thoracic segment. This is normally invaginated and is a pouch of spare cuticle used, when the head is withdrawn into the thorax either as a distate reaction or in the formation of the puparium.

4. *The Thorax and Abdomen* (Fig. 41)

The three thoracic segments are each characterised by a mid-ventral pair of small vestigial legs consisting of a group of three closely apposed papillae, each bearing a

minute seta. Keilin (1915) has found it to be in direct relation with the imaginal discs of the legs. In some species a line of six to eight thoracic papillae, similar to the cephalic papillae, can be seen in the throacic segments, and likewise abdominal papillae in some abdominal segments.

Encircling the anterior of the first thoracic segment is a *spicular zone*, consisting either of a series of irregular rows of spicules, arranged in loose groups or of a series of overlapping striae which are usually finely serrated. the type and number of rows depend on the species. These bands are in general repeated in each segment of the body, though the nature of the spicules and their arrangements often vary down the length of the larvae in different genera and species. Nye (1958) and later Nartshuk (1987) classified the spicules roughly into a series of intergrading types. Very frequently the abdominal spicular zones consists not only of the spicules at the anterior of each segment but also of a number at the posterior of the preceding segment with which they form a functional group. It must be stressed that in the illustrations of the spicular zones, the thick horizontal lines separate the spicules into these functional groups which often consist of the posterior of one segment and the anterior of the next. The only feature these spicular zones have in common is a tendency to be more numerous on the venral aspect of the body, and to tail off rapidly towards the flanks. This is, in part, due to the functions of these zones which, together with a slight protrusion in some species of the intersegmental area to form a pseudopod, aid in locomotion.

Following the thorax are eight abdominal segments, the terminal or anal segments being subdivided by the anus, which is frequently bounded fore and aft by a number of spicules often giving the appearance of a ninth segment. The tracheation and innervation indicate, however, that there are only eight true segments.

The most prominent morphological features of the larva, apart from the cephalo-pharyngeal skeleton, are the *anterior spiracles* (Fig. 43). They usually project laterally from the posterior margin of the first thoracic segment. They consist of a *spiracular trunk* (ST), being the continuation of the *main dorsal tracheal trunk* (MDT), which at this point tends to be bulbous and sometimes bears a small *scar* left by the spiracle of the second instar larva. The trunk then narrows before again enlarging to form a chamber from which the *digitate processes* (DP) arise. The arrangement of these processes varies between the genera and Nye (1958) broadly classified these into four intergrading types :

Fan	:	3-7	digitations
Rosette	:	7-12	digitations
Transverse rosette	:	10-15	digitations
Branched	:	9-15	digitations

Though the species of a genus have spiracles of the same type, the average number of digitations may differ from species to species. The number of digitations varies to

a small extent, within the species, both between individuals and even between the left and right spiracles. From the point where they project from the thorax, the spiracles are loosely covered by a sheathing membrane, reaching to the end of the digitate process where the chitin is thickened to form a *peritreme* (PR) surrounding the *spiracular opening* (SO).

The *posterior spiracles* (Fig. 47) often borne on spiracular lobes (SL) commence at the end of the main dorsal tracheal trunk and as in the anterior spiracles, a thickened annular ridge is formed at the junction of the tracheal and spiracular trunk. The latter distally trifurcates and each branch opens to the exterior by a *peritreme*. From the cuticle between these peritremes there usually arises four groups of branched hairs (BH).

b. THE SECOND INSTAR LARVA (Fig. 33)

The second instar larvae are a reduced version of the third. They may be recognised by their respiratory system for, although again amphipneustic the anterior spiracles (Fig. 42) are relatively smaller and knob-like, with very short digitate processes and cannot be characterised into types. The cephalopharyngeal skeleton (Fig. 38) though smaller, is similar in form but the sclerites are less tanned than in the corresponding third instar larva. The anterior and posterior spiracles (Fig. 46) have the same pattern as in the third instar and differ in the details.

c. THE FIRST INSTAR LARVA (Fig. 32)

These are almost transparent and have their characters further diminished. They are metapneustic and the main dorsal tracheal trunk merely terminates anteriorly in the prothorax as a number of branching tracheoles. The cephalo-pharyngeal skeleton (Fig. 37) usually differs from that of the second and third instars in having no separate intermediate sclerite but merely a long anterior process to the pharyngeal sclerite which articulates with the mouth-hooks. The posterior spiracles (Figs. 44-45) are smaller in relation to those of later instars.

(C) The Pupa (Fig. 35)

The third instar larva becomes sluggish and its body shortens before it turns into the pupa. The puparium (Fig. 36) is formed partly out of the larval skin which hardens. The skin turns yellow and through different shades to deep brown. The body surface is grooved by wavy transverse lines, representing the spiracular zones of the last instar larva. In this and some other details it retains some of the morphological characters of the larva. The anterior and posterior spiracles are practically in the same form as in the third instar. The anterior end usually becomes flattened dorso-ventrally. The head is withdrawn into the prothoracic segment from which projects the anterior spiracles. Each posterior spiracle is seen at the tip of a tubercle. The nature of stigmatic opening and the branched hairs are almost the same as in those

of the third instar. The pupal period may last from about a week as in *Oscinella fusidentata* Cherian (1980) to as many as 291 days as reported by Parker (1918) in *Thaumatomyia glabra* (Meigen).

BIOLOGY

The majority of chloropids, the biology of which is known, are closely associated with plants, both cultivated and wild varieties, while a few are associated with animals.

Among the better known ones are the rice stem maggot (*Chlorops oryzae*), the barley stem maggot (*Meromyza nigriventris*) and the wheat stem maggot (*Chlorops mugivorous*). Through the years much information has accumulated on the life history, bionomics, behaviour, distribution, seasonal frequency, geographical races, occurrence of mixed generations, voltinism of the maggots, insect resistance, efficiency of strain selection and inheritance of resistance of these economically important species, especially the rice stem maggot. But in respect of many genera and species practically nothing is so far known of the biology nor of the immature stages. This is particularly true of most of the genera and species described in recent years.

Many chloropids are associated with animal and plant hosts. Though information on hosts of species occurring in India and adjacent countries is scanty, yet from the world the hosts of about 10% of the species is known.

PHYLOGENY

The holometabolous insect order Diptera is generally divided into the two suborders, Nematocera and Brachycera, the latter comprising the subgroups Orthorrhapha and Cyclorrhapha or into three suborders, Nematocera, Brachycera and Cyclorrhapha. In 1974 Steyskal divided Diptera into two suborders, Tipulata and Psychodata, with the latter comprising five infraorders: Psychodomorpha, Blepharicerimorpha, Culiomorpha, Bibiomorpha and Muscomorpha. He included all the brachycerous families under Muscomorpha and further divided it into three subgroups, Homodactyla, heterodactyla and cyclorrhapha, with the last one comprising all the higher Dipteran families. Both Steyskal and Griffiths (1972) retained the two well known subgroups Acroptera and Atriata under Cyclorrhapha based on the presence or absence of atrium in the larval head. Griffiths further divided Atriata into Hypocera, Platypezidea, Syrphidea and Schizophora of which to the last one Chloropidae undoubtedly belongs.

Griffiths divided Schizophora into five superfamilies : Lonchaeoidea, Lauxanoidea, Drosophiloidea, Nothyboidea and Muscoidea, thereby abandoning the usage of two well known and traditionally accepted family groups Acalyptratae and Calyptratae of

Henning (1952) and other Dipterists. He included most of the Acalyptrate and all Calyptrate families under the superfamily Muscoidea which in turn was further divided into nine prefamilies (termed superfamilies by Steyskal) including Tephritoninea under which he dealt with Chloropidae. According to Griffiths, Tephritoninea (= Superfamily Tephritoidea) has the following four apomorphous character states :

1. Aedeagus elongate, flexible, coiled when at rest, extended by pressure of body fluid and bears fine cuticular processes ('pubescence').
2. Musculus hypandriotergalis lost.
3. In female 7th and 8th abdominal segments elongate forming retractile ovipositor. 8th sternum divided into paired longitudinal sclerites.
4. Costa broken at the end of subcosta (or at the end of r 1 if subcosta is reduced).

Griffiths recognized fourteen families within Tephritoinea of which four namely, Chloropidae, Acartophthalmidae, Carniedae and Milichiidae were put together under the family group Chloropidae as the members of the group, according to him, have the following characters :

1. Presence of two rudimentary spermathecae with long and fine spermathecal ducts.
2. Phallapodeme free anteriorly but fused with body wall posteriorly.
3. 6th tergum in male reduced.
4. Vestige of 8th tergum in male absent.
5. Anal vein, when present, shortened and not reaching wing margin.

Griffiths summed up the apomorphous characters of the family Chloropidae as follows :

1. Maxillary lacinia rudimentary
2. Postverticals convergent
3. Frontal triangle large
4. Propleuron margined at anterior edge of its lateral exposure
5. Subcosta developed as distinct vein only at its base whence to costal break at most as a fold
6. Anal cell not evident, with veins forming its posterior boundaries absent or largely reduced to folds

7. Base of m 4 lost
8. 6th tergum in male lost completely
9. Aedeagus much reduced
10. Vestige of 7th tergum in male lost
11. 7th tergum in female divided along centre-line of dorsum
12. 7th sternum reduced.

Andersson (1977), while discussing the conclusions drawn by Griffiths on the phylogenetic affinities of Chloropidae to other families of Schizophora, focussed attention on the inherent discrepancies in the characters used for considering the family group Chloropidae as a monophyletic one. Besides, according to Andersson, recognizing the various families including Chloropidae under Tephritoidea, as Griffiths defined it, and considering it a distinct group, has demerits, since two of the four characters used for drawing the conclusions are shared by other families of Schizophora, the existence of one of the characters in Chloropidae has not been definitely proved while the fourth is not applicable to the family. Andersson did not however suggest any revised groupings of the Schizophoran families.

Mc Alpine *et al.* (1981) justifiably incorporated some of the modifications suggested by Griffiths and Steyskal in the system of Henning (1973). In addition they also incorporated in their new system of classification of Diptera, some advances in the evolutionary relationships of various groups. They also retained the usage of the well known and familiar group names Acalyptratae and Calyptratae. Thus they divided Diptera into two suborders Nematocera and Brachycera as traditionally done. Under Brachycera they recognized three infraorders Tabanomorpha, Asilomorpha and Muscomorpha. Muscomorpha was further divided into Aschiza and Schizophora and the latter into Acalyptratae and Calyptratae. Acalyptratae was further divided into nine superfamilies : Conopoidea, Nerioidae, Diopsoidea, Tephritoidea, Opomyzoidea, Sciomyzoidea, Lauxanioidea, Sphaeroceridae and Ephydroidea. They included the family Chloropidae under Ephydroidea along with eight other families namely, Curtonotidae, Drosophilidae, Diastatidae, Camillidae, Ephydriidae, Cryptochetidae, Tethinidae and Canacidae. Because of its inherent merits this system is followed here and Chloropidae is placed in the superfamily Ephydroidea. As various aspects of evolution and phylogeny of the family have been dealt along with that of other Dipteran families by Mc Alpine *et al* (1981), little need be added here.

ZOOGEOGRAPHICAL DISTRIBUTION

Zoogeography deals with the geographical distribution of animals, the factors governing this distribution, the zoogeographical affinities of continents, countries and ecosystems in landscapes and the evolution of present-day patterns of distribution from those of the past. It is common knowledge that different lands and ecosystems have different animals, which are often quite distinctive and characteristic of the region. Except perhaps man and the plants and animals passively and actively introduced by human agency, no species of animal is found all over the world. Each species is generally characteristic of some region, which is the centre of its origin and differentiation and which is its area of distribution. It is here that the species finds its optimal environment. There is generally a marked concentration of genera and species in the area of differentiation of a group. The genera and species that differentiated in a region are autochthonous to it. The present-day pattern of distribution cannot be explained wholly on the basis of the conditions now prevailing. The present-day distributional patterns actually represent modifications of the distributional patterns of the past.

A meaningful interpretation of the biogeography of India is possible only on the basis of its geomorphological evolution. The conditions, operating at present, have not given rise to the present-day patterns. It is important to stress that the present-day climate of India, especially the monsoon rainfall type, does not underlie the origins of the biogeographical characters, but like other characters themselves, is a product of the geomorphological evolution. The present-day distribution represents, therefore, merely a dynamic phase in the uninterrupted course of the biogeographical evolution of India that has by no means either stopped or even substantially slowed down now. The outstanding characters of the biogeography of India today consists in the 1. the source, nature and complexity of the component elements of its flora and fauna and 2. the peculiarities of the distributional patterns.

The origins of the flora and fauna of India and some adjacent countries

India is generally placed in the Oriental Realm of Wallace (1876) but according to Mani (1974) parts of the Punjab and the higher Himalaya should be included within the Palaearctic rather than the Oriental area. The western parts of the Indo-Gangetic plains of northern India are related more to the Ethiopian—Mediterranean than to the Malayan area. The eastern parts of India, together with parts of Myanmar (Burma), eastern Tibet, south China and Vietnam (Indo-China) and Thailand constitute a natural biogeographical area that is entirely distinct in its faunal composition and history from both India (Peninsula) and the Malayan area. While the forest covered

lower ranges of the Himalaya, south of the crestline of the Main Range, and eastern Tibet represent a narrow westward extension of the Indo-Chinese subregion of the Oriental, the higher elevations of the Himalaya, belong to the Turkmenian subregion of the Palaearctic Realm. Though faunistically an extension of the Peninsula, the Indo-Gangetic plains are biogeographically neutral transition between the Peninsular and Extra-Peninsular areas. The Peninsula of India is quite distinct geomorphologically and biogeographically from the rest of India and its primary faunistic affinities are to be tracked back more to the Madagascar Region than to the Oriental area.

India should, strictly speaking, be described as comprising the distinctive Peninsula as the primary and principal biogeographical region, with the Himalaya and other extra-peninsular parts merely as biogeographical appendages of secondary importance (Mani, 1974). The Peninsula and the Eastern Borderlands of India may, despite their fundamental differences in history, flora and fauna, be described as parts of the Oriental Realm of Wallace. Considered from this point of view, three principal amphitheatres of origins of floras and faunas, differentiations and radiations have contributed largely to the composition and evolution of the biogeography of India, 1. the Peninsula, 2. the Higher Himalaya and 3. the eastern amphitheatre of the Indo-Chinese and Malayan Subregions of the Oriental realm. Of these three, only the first lies wholly within the limits of India while the other two are largely outside our boundaries and touch India only by their margins. The flora and fauna differentiated in these amphitheatres fall under two major groups, viz., 1. the Gondwana derivatives and 2. the Asiatic derivatives.

The Peninsula *per se* is biogeographically *India vera* (true India), the largest and the oldest region of differentiation of the original floras and faunas of India. This complex arose from the ancient stock of Lemuria and the still older Gondwana floras and faunas (Mani, 1974). These evolved in the Peninsula throughout the Palaeozoic, Mesozoic and Tertiary, right nearly upto the Pleistocene times, and spread into the extra-peninsular areas during the late Tertiary. This was a tropical humid forest fauna and was widely and continuously distributed even upto the foot of the newly rising Himalaya, until perhaps relatively recent times. The affinities of this fauna were mainly with Madagascar and South Africa, but to some extent also with Australia and south America, especially in the more ancient groups. The physiognomy of this fauna, before it was modified by the influx of the Oriental elements from the Assam gateway, and before it was impoverished by elimination of habitats under the influence of man, can only be partially reconstructed from the present-day relict character of the Peninsular fauna. The evolutionary stagnation of the original fauna of the Peninsula gave place to rapid and complex changes with the influx of exotic elements, when the Assam contact with Asia was established, as an early phase of the Himalayan

uplift. The faunal contributions from the Oriental Region were also followed later by contribution from the Afrotropical (Ethiopian) and still later during Pleistocene times to some extent even from the Palaearctic areas. Although in certain groups, the Indo-Chinese amphitheatre has contributed largely or even exclusively to the present-day Peninsular fauna, the contributions from the different exotic sources were equally strong (Mahendra, 1939). The Peninsula is at present characterised by its remarkable wealth of Phylogenetic (Gondwana) and geographical (Asiatic) relicts, Pleistocene relicts of the Himalaya, endemics, ancient and phylogenetically older groups and by the presence of ecologically anomalous (Habitat-fremde forms) groups (Khajuria, 1924). The peninsular fauna is on the whole at present remarkable for its greatly impoverished remnants that are also rapidly vanishing. The Peninsula is thus remarkable at present for the extensive faunal regression, degradation and impoverishment.

The fauna that differentiated in the Eastern Amphitheatre is likewise a humid-tropical forest one, but unlike the Peninsular faunas is largely composed of phylogenetically much younger and taxonomically higher groups, derived almost exclusively from Asia. These faunas are characterized by a high degree of phylogenetic plasticity, evolutionary intensity and ecological and geographical instability. In marked contrast to the Peninsular faunas, eastern faunas, are not older than perhaps the Pliocene, Pleistocene and even post-Pleistocene times. The faunas spread westwards along the forest covered ranges of the Himalaya to the Peninsula and may be spoken of as the replacing faunas in the Peninsula, the original fauna of which is of much greater age. The Eastern faunal Amphitheatre was also extensively penetrated by the Peninsular, Palaearctic and Afrotropical elements. The fauna of this amphitheatre is still in course of pronounced enrichment and intense speciation. The Indo-Chinese and Malayan areas of faunal differentiation and radiation overlap in Assam—North Burma (Mani, 1974).

The Himalayan Amphitheatre is a part of the Palaearctic Realm and represents the southern-most limits of the Turkmenian Subregion in the west and to some extent the Manchurian Subregion in the extreme east. This area has the youngest, highly plastic and ecologically highly specialised faunas. There is relative poverty of relicts. The fauna was differentiated mostly during Pliocene—Pleistocene and partly also recent times. The higher Himalaya differs from other faunal amphitheatres in the high intensity of isolation and speciation in nearly all groups, especially insects. Three secondary centres of independent faunal differentiation, two of which are wholly within the Palaearctic and the third considerably influenced by the Indo-Chinese fauna are recognized here. We have in the extreme west the Northwest Himalayan centre. The higher Himalaya in the east is a secondary centre corresponding to a part

of the Tibeto-Eremian Centre of De Lattin (1966). The forest zone of the Himalaya together with the north Burmese mountains, forms the third subcentre.

The principal biogeographical components of the flora and fauna of India include therefore 1. the true Indian or the Peninsular autochthonous elements; and 2. the Indo-Chinese and the Malayan complex, 3. the Turkmenian, 4. the Mediterranean and 5. the Afrotropical intrusives.

India thus comprises mainly an ancient area of endemics and relicts fauna in the Peninsula; recent areas of young and highly differentiated humid tropical forest fauna encroaching in the east and a youthful, ecologically highly specialised endemic mountain-autochthonous fauna of the Palaearctic in the higher Himalaya. The formation of the route of interchanges of the flora and fauna through the Assam gateway marks an early phase of the uplift movements of the Himalayan system. The major events of the complex geomorphological evolution, commencing from the northeastward movement of Madagascar—Peninsular landmass, are well known (Krishnan, 1974). According to Mani (1974) the movement of this mass obliterated the Tethys Sea progressively westwards from the east (Fig. 50) where the sediments were squeezed and folded to give rise to the Tertiary mountain areas we know as the eastern Tibet, Nepal, Bhutan, Assam, Myanmar, South China and Vietnam and also established the physical contact of the ancient mass of the Peninsula with the newly formed areas of Asia. The northern edge of the advancing Peninsula down-warped and thrust under the rising Himalaya and Tibet and in the foredeep thus formed arose series of receding lagoons and marshes as vanishing relicts of the Tethys and it was filled up with the detritus from the Himalaya and from the Peninsular plateau in the south. In this process of buckling and down-warping, the Peninsular rim was fissured east-west and through these areas of weakness spewed forth the extensive Deccan Lava flows. The same movements brought about block-fracturing of the western parts of the Peninsula and marine subsidence of the fragments in the Arabian Sea, giving rise to the scraps of the Western Ghats. The obliteration of the residual Tethys Sea perhaps within subrecent times, completed the physical contact of the Peninsula with Asia in the west also and with the Afrotropical Region (Mani, 1974).

The formation of the Assam-gateway represents the most important phase in the biogeographical evolution of India. This gateway opened up extensive interchanges between the Peninsular autochthonous and Asiatic Tertiary mountain faunas. The Peninsular elements spilled over into the extra-peninsular areas and the faunas differentiated in the Tertiary mountains of south China, Indo-China, Thailand and Malaya intruded westwards along the Himalaya as far west as the great defile of the R. Sutlej and southwards into the Peninsula and Sri Lanka, which still formed part

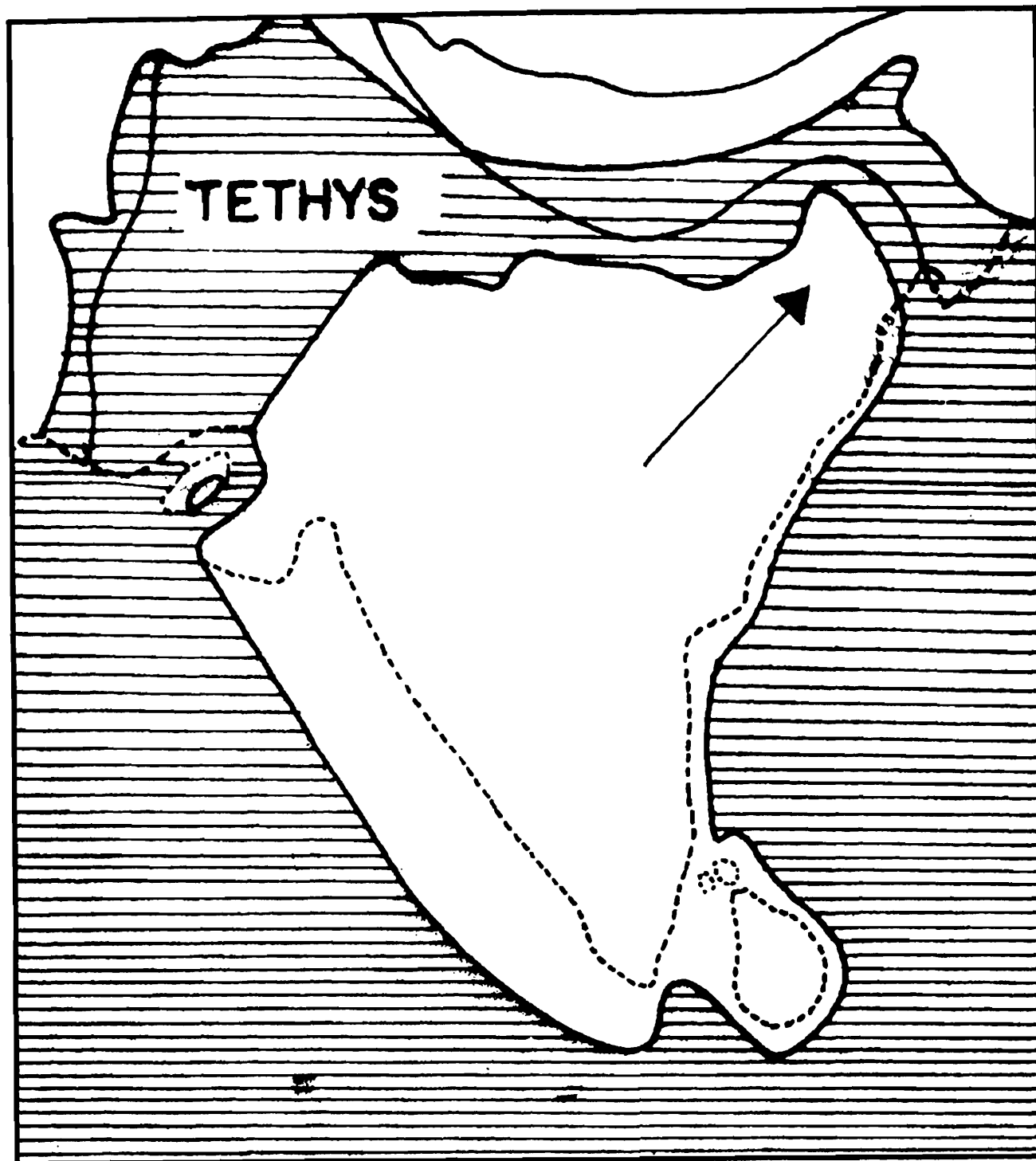


Fig. 50 : Hypothetical position of the Indian Peninsular mass, antecedent to the Assam-contact with Asia (From Mani, 1974).

of the Peninsular mainland of India (Jacob, 1949). The presence and intermingling of the Indo-Chinese-Malayan complex in the flora and fauna of the Peninsula perhaps is the most important result of these interchanges. The uplift of the Himalaya led also to the evolution *pari passu* of the lowland steppes elements of the fauna of Asia into the temperate and high altitude elements of the Turkmenian subregion of the Palaearctic by the Pliocene times. During the Pleistocene glaciations the temperate Turkmenian elements of the Himalaya spread southwards to the Peninsular south and during interglacial times the Peninsular elements advanced northwards to the Himalaya. The history of this alternating advance of the Palaearctic and the Peninsular types today is recapitulated in the seasonal oscillations of temperate forms of plants and animals with the warmer Peninsular types in the transitional Peninsular margin that we know as the Indo-Gangetic plains of northern India. The late phase in the evolutionary changes saw the intrusion of the Mediterranean and Afrotropical elements, eastwards on the Himalaya and southwards in the Peninsula and across the Peninsula as far east as the Eastern Border lands of Assam (Mani, 1974).

The foregoing discussions, based partly on the contributions of earlier workers, provides clues to the general trend in the pattern of distribution and zoogeographical evolution of the fauna of India and adjacent countries.

Zoogeographic distribution of *Chloropidae* of India and adjacent countries

The revisionary works of Sabrosky (1965, 1977b, 1980b), Nartshuk (1970, 1983, 1987), Andersson (1977), Spencer (1977, 1978), Kanmiya (1983) and others provide data on the distributional pattern of Chloropids. A comprehensive analysis of the distribution of the family, represented in India and adjacent countries, however must await the completion of studies on all the subfamilies. However, on the basis of studies so far completed, the faunistic composition and pattern of present-day distribution of the faunas, belonging to the subfamilies Siphonellopsinae and Rhodesiellinae represented in the area may be discussed.

The six faunal realms, Oriental, Palaearctic, Afrotropical (Ethiopian), Australian, Neotropical and Nearctic, as recognized by zoogeographers, are used here for faunal limits and distribution.

Subfamily SIPHONELLOPSINAE

Of the four genera recognized under this subfamily, *Apotropina* enjoys world wide distribution, while *Siphonellopsina* is endemic to the Oriental, *Protohippelates* to the Australian and *Siphonellopsis* to the Palaearctic Regions. Two genera from the Oriental Region are represented here.

Apotropina : This genus is represented in the Oriental Region by eight species (including a new one described here), of which three occur in our area. Of these the new species is endemic to India and is confined to the eastern elevated region of the Himalaya, while *obscuripes* (Brunetti), known so far only from India and Sri Lanka, occurs mostly above 1000m in the eastern Himalaya and rarely at lower elevations in Central India and Sri Lanka. The third species *fulvitaris* (Walker) occurs in the Neotropical, Australian and, Sri Lanka of the, Oriental Regions.

Siphonellopsina : The small genus known by two species, endemic to the Oriental Region is represented in the area by *kokagalensis* Andersson, endemic to Sri Lanka.

Subfamily RHODESIELLINAЕ

All the three tribes under this subfamily are represented in the area.

Tribe RHODESIELLINI

This tribe attains its maximum development in the Oriental Region. All the eleven genera namely, *Merobates*, *Tachinoceros*, *Indophthalmus*, gen. nov. *Pseudonomba*, *Bharathella*, *Amnonella*, *Euthyridium*, *Dactylothyrea*, *Neorhodesiella*, gen. nov., *Nomba* and *Rhodesiella* recognized under this tribe, are distributed in the Oriental Region. Of these the first six are confined to this Region, while *Nomba* and *Euthyridium* are found in addition in the Australian, *Dactylothyrea* in the Afrotropical and *Neorhodesiella* in the Afrotropical and Palaearctic Regions also. Only *Rhodesiella* enjoys world wide distribution ; but for *Merobates* and *Nomba* all the other nine genera are distributed within our area.

Genera endemic to India : Out of 9 genera occurring in India and adjacent countries, *Pseudonomba* Cherian, *Bharathella* Cherian, a new genus *Indophthalmus* and *Amnonella* Cherian are Indian endemics. Of these the first three are known only from Aizawl district of Mizoram and the last one from Meghalaya, all in the foot-hills of the Himalaya in northeastern India. Three of these are monotypic genera, while there are two species coming under *Indophthalmus*. All the species belonging to these genera were collected during premonsoon months and have their range of distribution restricted to altitudes between 900 and 1300 m.

Tachinoceros : Two of the three species of this small Oriental genus are restricted to northeastern India, within a range of 800 and 1400 m in the foot-hills of eastern Himalaya, while the third is found only in Indonesia. One of the species from India is found in the pre- and the other during the post-monsoon periods.

Euthyridium : This small and rare genus, found in the Australian and Oriental Regions, is represented by two species in the latter, which includes an Indian endemic found in the lower ranges of the Eastern ghats while the other is confined to the Philippines.

Dactylothyrea : In the number of species this is the second largest genus of Rhodesiellini and is distributed both in the Oriental and Afrotropical regions. The Oriental taxa comprising 7 species, represent mostly tropical and temperate elements. 5 species have been reported from the area, of which two are Indian endemics. In India altitudinally their range of distribution extends from 400 to 2100 m and they are abundant in the eastern ranges of the Himalaya while two species are available in the Western Ghats. In the other subregions of the Oriental some species are found in lower reaches also.

Rhodesiella : This species-rich genus is widely distributed in all the faunal regions. It is the largest known genus of the subfamily and attains its maximum development and diversity in the Oriental Region, followed by the Afrotropical. Out of 77 species, including 32 new species described in this volume, found in the Oriental Region 53 are distributed in the area. Of these 39 are endemic to India, 3 to Sri Lanka, and one each to Bhutan and Nepal. Only 9 species found here are known to have their range of distribution in the Oriental Region beyond the limits of India and adjacent countries. Of these 5 are represented in the Palearctic Region, including 2 found also in the Australian Region. The relatively high degree of endemism noticeable in India can partly be attributed to the richness and diversity of the Indian fauna and partly to the fact that not much is known of this group from other areas of the Oriental Region. At least some of the species now believed to be endemic to India may eventually be found in nearby countries in future.

In India the great majority of the species of *Rhodesiella* are concentrated in the eastern ranges of the Himalaya, followed by areas of Western Ghats, Eastern Ghats and the Plains in that order. Thus out of a total of 47 species found in India and one each in Nepal and Bhutan, 31 are distributed in the eastern ranges of the Himalaya. Of these 22 representing 73% of the species recorded from this area and 29% of the species known from the Oriental Region, are confined to this region. Similarly 20 species are represented in the Western Ghats of which 9 are confined to the area. Eastern Ghats has a component of 9 species including 2 endemics. Only 5 species are so far known from other areas of India, mostly the plains, of which only one is confined to the plains.

Neorhodesiella : The range of distribution of this genus is not clearly known since all its species were earlier included under *Rhodesiella*. However it is fairly abundant in the Oriental Region and atleast one species each occur in the Afrotropical and

Palearctic Regions also. In the Oriental Region it is represented by 15 species, all endemic to the Region. Of these 11 are distributed in India and adjacent countries, including 5 new species described in this volume. They comprise 10 species endemic to India and one to Sri Lanka. Of the Indian representatives 4 are confined to the Western Ghats, 3 to the Plains and the rest are more widely distributed. In comparison to *Rhodesiella*, most of the species of which are found in the hilly areas at high altitudes, 40% of the species of *Neorhodesiella* distributed in India are found in the lower altitudes in the Plains. Besides, while there is a high degree of endemism and concentration of species of *Rhodesiella* in the North-eastern Himalaya, only 2 species of *Neorhodesiella* are represented here neither of which is endemic to the area.

As the majority of species studied are new taxa their affinities on a global basis cannot at present be settled. The fact that most of the species are distributed in the eastern ranges of the Himalaya speaks however for their Indo-Chinese affinities.

Tribe SCOLIOPHTHALMINI

The only genus *Scoliophthalmus* Becker is represented in the Oriental, Australian and Afrotropical Regions. In the Oriental Region it has 8 representatives, including the three new species described in this volume. Of these one is found also in the Australian Region. Out of the four species found in the area three are Indian endemics. Two of these were collected from the plains and one each from the eastern Himalaya and Western Ghats. The fourth species is distributed in other areas of the Oriental Region also. They are found mostly in the pre- and post-monsoon months.

Tribe STENOSCINI

This tribe is represented by the small typically Oriental genus *Javanoscinis* Andersson and the larger *Psilacrum* Becker of the Oriental, Afrotropical, Australian and Nearctic Regions. Out of 2 species of *Javanoscinis*, one, an Indian endemic, is found in the northeastern Himalaya at an altitude of 1250m. The other species and some from the Oriental Region dealt with so far under *Stenoscinis*, but may possibly be belonging here, are found in the tropical and temperate climes. *Psilacrum* has two representatives in the area under study and both are endemic to India. Of these one is found in northeastern India and the other in the southern range of the Western Ghats and the coastal area of Kerala in Peninsular India.

From an analysis of the pattern of distribution of the fauna belonging to the two subfamilies in India and adjacent countries the following can be surmised.

1. There is a great concentration of genera and species in the Indian part of eastern Himalaya, followed by the Western Ghats, Eastern Ghats, hilly terrains of Sri Lanka and the plains of India in that order.

2. Of the 19 genera belonging to the two subfamilies known from the world, 16 are represented in the Oriental Region of which 7 genera are confined to this Region. In the area under study 14 genera are found including 4 which are endemic to India.

3. The two subfamilies are represented by 126 species in the Oriental Region, of which 88 are found in the study area. Of these 66 are endemic to India, 5 to Sri Lanka, 1 to Bhutan, 1 to Nepal and 1 is found only in India and Sri Lanka. Thus 54.1% of the species found are endemic to the area which represents 58.7% of the species found in the Oriental Region.

4. 14 species found here are distributed in other areas of the Oriental Region. Of these 5 are represented in the Palaearctic, 3 in the Australian and 1 in the Neotropical Regions.

CLASSIFICATION

Family CHLOROPIDAE RONDANI

1856. Chloropidae Rondani, (as Chloropina). *Dipt. Ital. Prodromus*, 1 : 125. Type genus : *Chlorops* Meigen, 1803.
1820. Oscinidae Fallen, (as Oscinides). *Oscinides sveciae* Lund. Type genus : *Oscinis* Latreille 1804; isogenotypic synonym of *Chlorops* Meigen (Sabrosky, 1941).
1957. Mindidae Paramonov, *Ann. Mag. nat. Hist.*, (12) 9 : 779. Type genus : *Minda* Paramonov; synonym of *Pemphigonotus* Lamb, 1917 (Mc Alpine, 1958).
1961. Echiniidae Paramonov, *Ann. Mag. nat. Hist.*, (13) 4 : 97. Type genus : *Echinia* Paramonov (= *Anatrichus* Loew) (Sabrosky, 1962).
1987. Siphonellopsidae Nartshuk, *Trud. Zool. Inst. Acad. Nauk USSR*, 136 : 6. Type genus : *Siphonellopsis* Strobl, 1905. New synonym.

The first chloropid fly designated under the binomial system of nomenclature was *Musca frit* Linnaeus, 1758, although Linnaeus had earlier described this species in 1750. The second species named under the system was *Musca saltatrix* Linnaeus, 1761, first mentioned in *Fauna Sveciae*, 1746. Initially several chloropid species were assigned to the genus *Musca* L. The first chloropid genus *Chlorops* was erected by Meigen in 1803. In 1810 Fallen included *Oscinis* Latreille, an objective junior synonym of *Chlorops* in the family Micromyzides. Though Fallen (1820) proposed the family name Oscinidae, in which was included species of chloropid, milichiid, agromyzid and ephydrid flies, yet the grouping was not generally accepted. While Meigen (1830) included the chloropids in the comprehensive family Muscides, Macquart (1835)

distributed the Chloropid genera among the Psilomydes, Ulidiens, Piophilides and Heteromyzidae, chiefly in the last one where we find genera like *Chlorops*, *Siphonella* and *Oscinis*.

Meigen (1830, 1838) divided the genus *Chlorops* Meigen into two sections on the basis of costa reaching $r\ 4 + 5$ or $m\ 1 + 2$. Macquart (1835) used the generic name *Chlorops* Meigen for the first section and *Oscinis* Latreille for the second. Rondani (1856) erected the subfamilies (Strips) Chloropina and Oscinina for the two sections and placed them in the family Agromyzidae.

The family name Oscinidae was extensively used during the 19th century but was later replaced by Chloropidae, after *Oscinis* was synonymised with *Chlorops* and the subfamily Oscininae was replaced by Oscinellinae (Becker, 1910). Duda (1930) divided Chloropidae into three subfamilies, Chloropinae, Oscinellinae and Palaeoscinellinae, of which the last one is invalid (Sabrosky, 1941). In 1932 he recognised the subfamilies Siphonellopsinae and Chloropinae, including under the latter three tribes Chloropini, Oscinellini and Hippeladini (together with a fourth subfamily Heringiinae although this was founded on the agromyzid genus *Heringia* Enderlein, 1934). Sabrosky (1941) and others recognised only two subfamilies Chloropinae and Oscinellinae, with the latter comprising all the genera included under Siphonellopsinae, Hippelatinae and Oscinellinae. Even tribes and generic groups were not recognised till Andersson (1977), on the basis of phylogenetic studies on 98 genera and subgenera, divided Chloropidae into three subfamilies, Siphonellopsinae, Oscinellinae and Chloropinae. Besides, he divided Oscinellinae into two tribes, Rhodesiellini and Oscinellini and under the latter tribe suggested nine genus groups. In addition under Chloropinae he recognised twelve generic groups.

Nartshuk (1983, 1987) gave the family Chloropidae the status of a superfamily Chloropoidea and divided it into the families Siphonellopsidae and Chloropidae, the former comprising genera dealt with earlier under the subfamily Siphonellopsinae of the undivided family Chloropidae and the latter the rest of the Chloropid genera. In addition she divided the family Chloropidae, of her concept, into four subfamilies Rhodesiellinae, Oscinellinae, Hippelatinae and Chloropinae, by retaining the old subfamily names and raising the tribe Rhodesiellini of Andersson (1977) to the status of a subfamily. Besides, she gave Andersson's generic groups the status of tribes and erected many more tribes. Thus under Rhodesiellinae she recognised three tribes, Rhodesiellini, Scoliopteralmini and Stenoscinini ; under Oscinellinae ten tribes, Botanobini, Elachipterini, Oscinisomatini, Fiebrigellini, Siphonellini, Liparini, Tricimbini, Incertellini, Oscinellini and Dicareini and under Chloropinae eight tribes,

Mephachymerini, Meromyzini, Cetemini, Mindini, Chloropini, Diplotoxini, Pseudothaumatomyiini and Lasiosinini.

In raising subfamily Siphonellopsinae to the family rank, Nartshuk (1987) relied on the number and nature of *orb* and *if*, the relative sizes of *out* and *ivt*, number of *dc* bristles, presence or absence of *sa*, *prs* and bristle on *kepst*, number of *h*, arrangement of bristly hairs on scutum and such other characters. Thus members of Siphonellopsidae almost always have 3 *orb* (rarely, 4) atleast some of which are proclinate, about 3 usually proclinate *if*, well developed *ivt* which often is subequal to or more developed than *out*, 1-4 *dc* bristles, 2 *h* of which one is generally turned mesad and often additional bristles like *sa*, *prs* and a bristle on *kepst* while Chloropidae, of her concept, has usually numerous reclinate or erect *orb* and *if*, well developed *out* which is longer than *ivt*, usually 1 *dc* and 1 *h*. Besides, in the latter group additional bristles like *sa*, *prs* and bristle on *kepst* are generally absent. However, irrespective of the character taken, there are species, in the Chloropidae of her concept, which possess most of these characters. Thus *Tricimbomyia* Cherian, a typical genus of Oscinellinae, has only 3 *orb* and 3 *if*, *out* and *ivt* which are subequal, 2 *dc* of which one is presutural and well developed *sa*. Besides, in this genus basal scutellars are closer to anterior margin of scutellum and dorsal in position as found in some species of *Apotropina* and its relatives. At least in one new species of *Rhodesiella* before me *ivt* is much longer than *out* and *Semaranga* has 3-4 *dc*. In two new species of *Rhodesiella* belonging to Rhodesiellinae, included in this volume, there are two distinct *h*, the inner of which though not turned mesad recalls the condition in *Apotropina shewelli* Sabrosky. Furthermore some of the species of *Psilacrum* and related genera belonging to the tribe stenoscini of subfamily Rhodesiellinae have 3 *if* which are proclinate and also a distinct bristle on *kepst* and many species of *Dasyopa* and a few others have well developed *prs*. As for hairs on the scutum the condition occurring in *Apotropina shewelli* Sabrosky and *A. ornatipennis* Malloch is not much different from what is found in *Oscinella*, *Incertella* and a few others.

As suggested by Sabrosky (1960), splitting of families, as often happens especially in Acalyptrates, merely upgrades our difficulties and it has the unfortunate concomitant effect of promoting lack of understanding. By increasing the number of family names the usefulness of well known family names as giant nuclei of organized knowledge amid the complexity of living things is diluted. As the genera and species included under Siphonellopsidae show distinct affinities to and possess many characters in common with the rest of the group as discussed above, it is felt that Siphonellopsidae, as the group is understood now, does not merit the status of a separate family. Hence the genera and species of this group are dealt with under the subfamily Siphonellopsinae of the undivided family Chloropidae as traditionally done.

There is enough justification in retaining Siphonellopsinae as a separate subfamily and the distinctive identity of subfamily Chloropinae has long been accepted by various authors. The rest of the members of Chloropidae are dealt with under the undivided subfamily Oscinellinae by Sabrosky (1941, 1951, 1977, 1980), Kanmiya (1983) and others while as mentioned earlier, Nartshuk (1983, 1987) had different views. Out of the two tribes Rhodesiellini and Oscinellini into which Andersson (1977) divided the subfamily Oscinellinae the first, she raised to the status of a subfamily Rhodesiellinae and the second she further divided into two subfamilies by retaining the subfamily name Oscinellinae and restricting it to the majority of genera dealt with under it earlier and raising the tribe Hippeladini of Duda (1932) to the rank of a subfamily Hippelatinae for the remaining genera. Studies of some of the taxa known so far and a few genera and many new species not known earlier but described here suggest however that there is enough justification in according a separate subfamily status to Rhodesiellinae by Nartshuk (1987). As for Hippelatinae, characters like the presence of hind tibial spur and a few others are not of much significance, since some of these are found in some measure in the other genera of Oscinellinae also. Hence it is felt that the group does not merit a separate subfamily status and the members are retained in the Oscinellinae. Thus four subfamilies are followed :

1. Siphonellopsinae as understood by Duda (1932), Andersson (1977), Kanmiya (1983) and others ;
2. Rhodesiellinae as defined by Nartshuk (1987) and including the genera of tribe Rhodesiellini of Andersson (1977) and a few more like *Javanoscini* dealt with under Oscinellini by him ;
3. Oscinellinae comprising the genera dealt with under the tribe Oscinellini by Andersson but excluding the genera coming under the tribe Stenoscini, which were separated and placed under Rhodesiellinae by Nartshuk and
4. Chloropinae as defined and understood by various authors through the years.

This volume was originally intended to include all the Chloropidae known from India and adjacent countries, since the number of genera and species to be dealt with appeared rather limited when the work was planned. But as large collections comprising many new taxa became available, it has proved to be too large for one volume. Hence in this Part I only two subfamilies Siphonellopsinae and Rhodesiellinae are dealt with.

Key to the subfamilies of CHLOROPIDAE

1. Orbital bristles 3-4, proclinate or laterocline ; *ovt* subequal to or shorter and slender than *ivt* ; *h* 2, well developed ; 1 *kepst* bristle often present ; some distal abdominal sternites of male asymmetrical.....Siphonellopsinae

- Orbital bristles usually numerous, rarely a few, erect or reclinate; *out* longer and stouter than *ivt* (if very rarely *ivt* more developed than *out* as in a species of *Rhodesiella*, *anepst* with hairs). *h* almost always 1; abdominal sternites of male symmetrical 2
2. Costa reaching m 1 + 2 3
- Costa reaching only r 4 + 5 or slightly beyond Chloropinae
3. Ocellar bristles proclinate and divergent Rhodesiellinae
- Ocellar bristles erect, reclinate, convergent or parallel-sided Oscinellinae

Subfamily 1. SIPHONELLOPSINAE DUDA

1932. *Siphonellopsinae* Duda, In : Lindner Die Fliegen der palaearktischen Region, 6 (1) : 14.
1930. *Palaeoscinellinae* Duda, *Folia Zool. Hydrobiol.*, 2 : 46 (in part). Synonym (Sabrosky, 1941).

Head wider and higher than long ; frons broad, wider than eye and more than half as wide as head ; frontal triangle large, usually extending beyond middle of face, polished or tomentose; face narrow ; facial carina not developed ; antenna short, arista slender with fine pubescence ; gena at times wider than ant 3; eye with sparse minute pubescence or appearing bare, often with diagonal long axis ; head bristles vary in degree of development ; *out* shorter and slender than *ivt*, rarely absent ; *ivt* curved inwards or outwards ; *oc* proclinate, widely divergent ; *pvt* cruciate ; *orb* 3-4, anteriormost two laterocline, posteriormost one or two usually more or less proclinate ; *if* 3-4, long, confined to anterior half of frons ; oral vibrissae 1-2, well developed.

Scutum longer than wide, with well developed notopleural incision extending to dorsocentral line ; *anepst* bare ; scutellum wider than long, suborbicular or suboval with slightly convex or flattened disc ; *h* 2, well developed, dorsal one inclinate, ventral one laterocline or reclinate ; *npl* 1 + 1 ; one presutural bristle inner to *npl* at times present ; *dc* 2-4, well developed ; a few *acr* setae in two irregular or somewhat regular rows present in some species ; *as* longer than or shorter than scutellum; *ss* as long as or shorter than *as*, often located in basal half of scutellum ; *kepst* usually with one bristle.

Wing with costal break at distal end of r 1 ; basicosta with two distinct bristles of which dorsal one very long; costa reaching m 1 + 2.

Legs with long or short tibial organ ; hind tibial spur present or absent ; femoral organ absent.

Sternites 6-8 in males asymmetrical ; epandrium often with posteroventral corni; cerci fused, often with a pair of long bristles.

Distribution : This subfamily is widely distributed and is reported from the Nearctic, Palaearctic, Ethiopian, Australian and Oriental Regions. Two genera, *Apotropina* Lamb and *Siphonellopsis* Strobl are known from the Palaearctic Region and *Apotropina* and *Siphonellopsina* Andersson from the Oriental Region.

Andersson (1977) included the genera *Protohippelates* Andersson *Parahippelates* Becker, *Lasiopleura* Becker, *Siphonellopsina* Andersson and *Siphonellopsis* Strobl in this subfamily and Nartshuk (1987) three more namely, *Apotropina*, *Limochaeta* Duda and *Omochaeta* Duda. Out of these 8 genera *Lasiopleura*, *Limochaeta*, *Omochaeta* and *Parahippelates* are considered synonyms of *Apotropina* by Sabrosky (1941, 1977, 1980), Kanmiya (1983) and others. Hence only four valid genera namely *Apotropina*, *Siphonellopsina*, *Protohippelates* and *Siphonellopsis* belonging to this subfamily are so far known of which the last three are known by very limited number of species and the first also is a relatively small genus.

Key to the genera of SIPHONELLOPSINAE

1. Epandrium large, conical ; ventral epandrial sclerites rod-shaped ; S 7 + 8 relatively long *Protohippelates* Andersson.

Epandrium semispherical ; ventral epandrial sclerite broad ; S 7 + 8 very short 2

2. Thoracic bristles well developed with 1-3 *dc*, *prs*, *pra* and *sa* ; pregonites short *Apotropina* Hendel

Thoracic bristles partly reduced with 0 + 1 or 1 + 1 *dc* and no distinct *prs*, *pra* and *sa* ; pregonites long 3

3. Thoracic bristles long ; scutellum normal, rounded with convex disc ; scutellar bristles long; epandrium without corni ; phallus very small *Siphonellopsina* Andersson

Thoracic bristles short ; scutellum very short with flat disc ; scutellar bristles short ; epandrium with projecting corni ; phallus large with large basiphallus and membraneous distiphallus *Siphonellopsis* Strobl

Two genera *Apotropina* and *Siphonellopsina* are known from within the zoogeographical limits of India and adjacent countries of which the latter is known by a single species endemic to Sri Lanka.

Genus 1. *Apotropina* Hendel

1868. *Ectropa* Schiner, Diptera (Art. I). In *Wullerstorf-urbair, Reise der Osterreichischen Fregatte Novara, Zool.*, **2** (1 B) : 242. Type species : *Ectropa viduata* Schiner. Original designation. Preoccupied by *Ectropa* Wallengren, 1863.
1907. *Apotropina* Hendel. *Wien ent. Ztg.* **26** : 98. (New name for *Ectropa* Schiner, preoccupied).
1910. *Lasiopleura* Becker. *Archivum Zoologicum*, **1** : 130. Type species : *Lasiopleura longepilosa* Strobl. (= *Oscinis longepilosa* Strobl). Monotypy. (Synonym by Sabrosky, 1980 a).
1911. *Parahippelates* Becker. *Ann.Hist. nat. Mus. nat. hung.*, **9** : 109. Type species : *Parahippelates pulchrifrons* (de Meijere) (= *Osinis pulchrifrons* de Meijere). By original designation. (Synonym by Sabrosky, 1941 and 1980 a).
1913. *Pseudohippelates* Malloch. *Proc. U.S. Nat. Mus.*, **46** : 261. Type species : *Pseudohippelates capax* (Coquillett) (= *Hippelatas capax* Coquillett). By original designatin. (Synonym by Sabrosky, 1941).
1930. *Omochaeta* Duda. *Folia Zool. Hydrobiol.*, **2** : 59. Type species : *Omochaeta specularifrons* (Enderlein) (= *Oscinosoma specularifrons* Enderlein). By designation of Sabrosky, 1940. (Synonym by Sabrosky, 1941).
1934. *Liomochaeta* Duda. *Arb. morph, taxon. Ent. Berl.*, **1** : 42. Type species : *Liomochaeta dimorpha* (Osten Sacken) (= *Oscinis dimorpha* Osten Sacken). By original designation. (Synonym by Sabrosky, 1977).
1940. *Oscinelloides* Malloch. *Proc. Linn. Soc. N.S. Wales*, **65** : 262, 267. Type species : *Oscinelloides bispinosa* (Becker) (= *Oscinella bispinosa* Becker). By original designation and monotypy. (Synonym by Sabrosky, 1964).

Medium sized flies with polished or sparsely to densely tomentose frontal triangle, one to several *dc*, well developed *prs*, *pra* and *sa*, short pregonites and knob-like epandrium.

Head wider and higher than long and slightly wider than thorax, roughly squarish or trapezoidal with straight anterior and convex posterior margins. Frons broad, wider than eye and more than half as wide as head, narrowing towards anterior margin, sometimes decidedly so, anterior margin even with eyes, not projecting ; frontal triangle conspicuous, broad at base, of characteristically different length in different species. Face narrow, corresponding in width to anteriorly narrowed frons; facial carina not developed. Antenna short ; ant 3 rounded ; arista slender or with weakly thickened basal segments and with short pubescence. Gena nearly as wide as

or wider than ant 3 with a shining ridge below ; parafacialia usually linear and not visible in profile ; vibrissal angle rounded, not angulate, postgena usually black ; occiput black, not concave. Eye minutely sparsely haired or appearing bare, large and bulging, longer than broad, in extreme cases parallel to frons with ommatidia enlarged towards face and with more or less diagonal long axis. Head bristles vary in degree of development (length and strength) ; *ovt* often present but absent in some species; *ivt* long, curved inwards ; *oc* long, proclinate and divergent ; *orb* 3, anteriormost 2 laterocline, directed over eye, posteriormost and often weaker one usually more or less proclinate. *pst* 1, long and straight ; *pvt* cruciate shorter than *oc* ; *if* a few, in one row outside margin of frontal triangle, anterior most one flanking or anterior to apex of triangle, often more developed than *fr* and other *if*, and cruciate at tips ; a row of postocular setae present ; oral vibrissae 1-2, stout and black.

Thorax : Scutum slightly longer than broad, convex, tomentose, hairs in regular rows in acrostical, dorsocentral and intra-alar positions, but few other hairs ; humeral calli large and well marked ; scutellum short, wider than long, broadly rounded apically, entirely tomentose and with smooth and convex disc; pleura largely tomentose except for part of *kepst* ; *anepst* bare or rarely with fine, short hairs ; *kepst* with 1 or a few upcurved setae. Thoracic bristles long and distinct ; *h* 2, 1 mesocline, the other reclinate; *npl* 1 + 1, posterior varying in position ; *pa* 1 well developed ; *pa* 2 smaller than *pa* 1; *pra*, 1 *prs* and 1 *sa* present ; *dc* 1-4, when 3 or 4 present one presutural ; *as* longer than scutellum ; *ss* 1, often short and weak.

Legs normally developed slender ; hind femur longer than fore femur but seldom very elongate ; hind tibia with a small or long apical spur which may be absent in some species ; femora and tibiae sometimes with a row of prominent hairs ventrally; fore tarsus sometimes broadened ; femoral organ absent ; tibial organ narrow but distinct.

Wing hyaline or narrowly or entirely fuscous brown to pale brown ; proportions of veins and cells different and useful in descriptions of species ; all veins strong, costa especially so, ending at m 1 + 2, just beyond apex of wing ; m 3 + 4 with distinct flexure along back of discal cell, sometimes strong with a stub vein projecting into discal cell ; basicosta with one long, black seta ; anal angle nearly a right angle or obtusely rounded. Haltere yellow.

Abdomen narrow, cylindrical, shorter than scutum, tergal surface weakly sclerotized, largely wrinkled in dried condition ; sternites 6-7 in male distinct but asymmetrical, linked with each other on left side ; spiracles 6-7 asymmetrical in male.

Male genitalia : Epandrium large, spherical, sometimes with narrowly prolonged ventrodistal corner and small dorsodistal opening ; cercus short, narrowly separated; surstylus conical, narrowly prolonged inwards ; hypandrium closed or narrowly separated ; pregonite and postgonite distinct, completely separated ; basiphallus expanding distally; distiphallus distinct ; phallapodeme with broadened dorsal plate and narrowly elongate basal stalk.

Andersson (1977) considered *Parahippelates* Becker (resurrected from the synonymy under *Lasiopleura*) to be distinct from *Lasiopleura* Sens. lat., (now *Apotropina*) on the basis of possession of strong hind tibial spur and the ventrodistal narrow projection on epandrium. The grounds for separating the two genera however appear to be weak, because of the alternate absence or presence of hind tibial spur and epandrial corni as indicated by Spencer (1977). I don't have in my collections specimens representing *Parahippelates* as understood by Andersson but on the basis of available information I follow Sabrosky (1980), Spencer (1977) and Kanmiya (1983) in considering the two as cogenetic.

The genus *Apotropina* retains several plesiomorphic features in the nature and development of cephalic and thoracic bristles, male-sternites and terminalia as described above and as reviewed by Griffiths (1972), Andersson (1977), Nartshuk (1977) and Spencer (1977). Besides, Kanmiya (1983) noticed a definite division of pentagonal-shaped sclerites between the basisternum and medial sternal groove, a condition supposedly prevalent in the members of the genus. According to Sabrosky (1980 a) difference in degrees of development of various characters have made it difficult to group species satisfactorily. He could identify two groups of obviously closely related species with a few others that are intermediate between the two. The first group has 1 *dc*, dull, densely tomentose frontal triangle, strong flexure in m 3 + 4 along back of discal cell, broadened anal area of wing, gently sigmoid r 2 + 3 and long second sector of costa in relation to third sector. The second group has 3-4 *dc*, highly shining frontal triangle which may be polished or sparsely tomentose, weak flexure of m 3 + 4, not broadened anal area of wing, anteriorly concave r 2 + 3 and shorter or only slightly longer second sector of costa in relation to third sector.

Six species belonging to *Apotropina* have been reported so far from the Oriental region of which *fulvitaris* (Walker), *obscuripes* (Brunetti) and *zeylanica* Lamb are represented in India and adjacent countries. Of these, the first two are described here, besides a new species from India and *zeylanica* is synonymised with *obscuripes*.

Distribution : The exact zoogeographical distribution of this genus is not very clear because of the lumping of several taxa. According to Sabrosky (1980) this appears to be an old, primitive and widely distributed group of characteristic habitus.

Key to the species of *Apotropina* of the Oriental Region

1. Scutellum with 4 pairs of scutellar bristles ; arista bare ; antenna blackish brown *coenosoides* (Frey)
 Scutellum with 2 pairs of scutellar bristles ; arista pubescent (if rarely bare metatarsi dilated); antennae predominately yellow or brownish yellow 2
2. Wing with black or deeply brownish spot near tip *dimorpha* (Osten Sacken)
 Wing not spotted, often brownish along anterior margin 3
3. Arista long and bare ; metatarsi slightly dilated *fulvitaris* (Walker)
 Arista of normal size, distinctly pubescent ; metatarsi normally developed 4
4. Frontal triangle black with its extreme yellow tip extending somewhat indistinctly almost to anterior margin of frons *obscuripes* (Brunetti)
 Frontal triangle uniformly black, usually reaching a little beyond middle of frons but not its anterior margin 5
5. Frontal triangle densely and almost wholly grey tomentose ; width of gena more than half that of ant 3 ; ss much less than half the *as* *tomentosa*, sp. nov.
 Frontal triangle shining, at most posterior and posterolateral corners tomentose; gena almost linear ; ss half the *as* *meijerei* (Sabrosky).

1. *Apotropina obscuripes* (Brunetti) (Figs. 51-54)

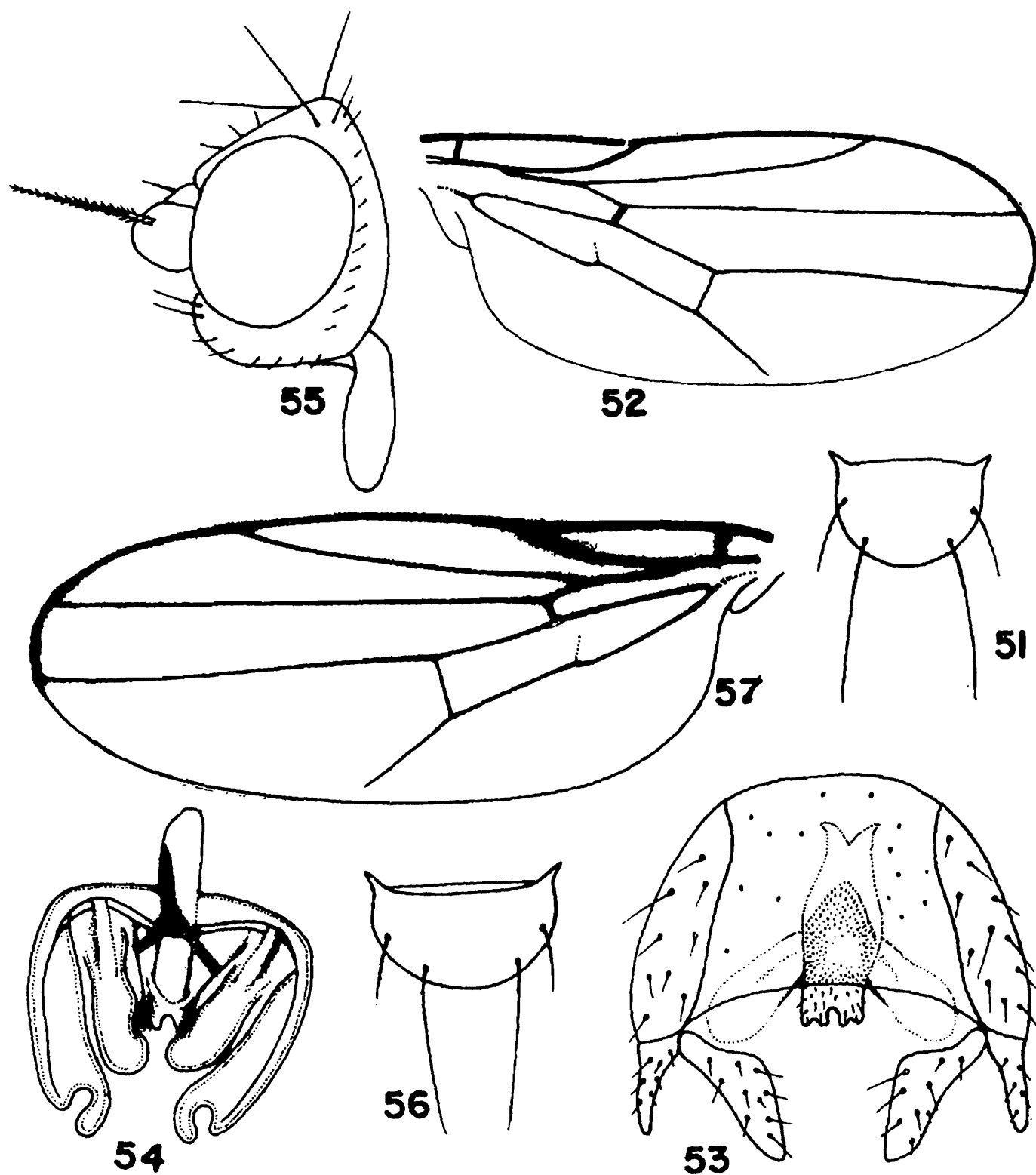
1913. *Oscinis obscuripes* Brunetti, *Rec. Indian Mus.*, 8 : 190. Type locality : Assam : Dibrugarh.
1918. *Lasiopleura zeylanica* Lamb, *Ann. Mag. nat. Hist.* (9) 1 : 388. Type local. : Sri Lanka : Peradeniya. N. Syn.

Male, female : Head : Higher than long, length, height and width ratio 13 : 15 : 19. Frons wider at vertex than in front, maximum width almost equal to its own length and $0.52 \times$ the width of head, brownish-black behind and brownish-yellow in front, with a few dark *fr* ; frontal triangle, shining black except for grey tomentose posterolateral and posterior margins including ocellar triangle, reaching clearly a little more than two-thirds length of frons whence continuing somewhat indistinctly almost to its anterior margin, with an yellowish tinge (in the type specimens of *obscuripes* and *zeylanica* and also in some of the other examples yellowish anterior

part is more clear than in a few of the other specimens). Face slightly concave, yellowish-white and greyish-white tomentose ; facial carina not developed ; lower facial margin short and greatly widened. Antenna erect, yellow but for dark brown upper half of ant 3 ; ant 2 with distinct dorsal bristle ; ant 3 a trifle wider than long ; arista becoming very slender terminally, dark brown with conspicuous concolorous fine pubescence. Gena half as wide as ant 3, silvery grey and grey tomentose with lower margin having the form of a thin, low, linear brown to dark brown ridge and with a row of slender dark hairs a little above the margin ; vibrissal angle rather blunt, not projecting beyond anterior eye margin ; parafacialia linear ; postgena darkish, especially along posterior margin. Eye large, bare, with slightly oblique long axis. Palpi nearly spindle-shaped, yellow ; proboscis fairly long, shiny brownish-black with distal end thickened ; area around inner border of lower facial margin shiny brownish-black. Head bristles dark brown, some very long ; *ovt* much shorter than *ivt* ; *orb* 3, hair-like, anteriormost proclinate, posterior two partly laterocline ; *oc* proclinate, widely divergent, stout, almost as long as *ivt* ; *pvt* less than half the *oc*, convergent to cruciate ; *if* about 3 on each side outside the triangle, anterior most more developed and proclinate.

Thorax : Black, densely grey tomentose, except for certain shining areas of scutum and pleura. Scutum longer than wide, width and length ratio 11 : 8, with bristly hairs (size of which vary according to the size of the fly) confined to one median and two *acr* rows ; tomentose nature of scutum also varies in different specimens with more shiny and less tomentose areas in some. Scutellum (Fig. 51) nearly suborbicular, of *Oscinella*-type, about 1.4 x as wide as long with nearly flattened disc which is tomentose and in certain areas shiny like scutum and with a few short hairs. Pleura tomentose but for more shiny and less tomentose areas mostly of *kepst* and partly of propleuron and other areas. Thoracic bristles and hairs black, well developed ; *h* 2 of which one mesocline and the other reclinate, outer one 0.6 x the inner ; *npl* 1 + 1, shorter than inner *h* ; *prs* 1, almost equal to outer *h* ; *sa* 1, shorter than and *pa* 1 equal to *npl* ; *pa* 2 short, hair-like ; *dc* 4, 1 presutural and 3 postsutural in position, 1 *dc* longer and stouter than other thoracic bristles but for *as*, of the others sequentially anterior ones becoming shorter, anteriormost one-third 1 *dc* ; *as* widely separated at base, 2.4 x as long as scutellum and equal to 1 *dc* ; *ss* 1, 0.35 x the *as* but very slender.

Wing (Fig. 52) : 2.6 as long as wide, entirely deeply infuscated with infuscation more conspicuous in some specimens along upper half ; veins dark brown ; proportions of costal sectors 2 to 4 in the ratio 10 : 6 : 3 ; r-m cross-vein distad of middle of discal cell, opposite 0.55 - 0.57 of its length ; terminal sectors of veins r 4 + 5 and m 1 + 2 slightly diverging but in some specimens less conspicuously so ; flexure in basal half



Figs. 51-54 : *Apotropina obscuripes* (Brunetti). 51, Scutellum. 52, Wing. 53, Epandrium, ventral view. 54, Phallic complex, ventral view.

Figs. 55-57 : *Apotropina tomentosa*, sp.n. 55, Head, lateral view. 56, Scutellum. 57, Wing.

along back of discal cell prominent with somewhat of a stub vein projecting into discal cell. Stalk of haltere brown, knob yellow to whitish-yellow.

Legs : Long and slender ; coxa mostly yellow with slender hairs especially on fore coxa ; fore femur with short and a row of long hairs ; all femora brownish-yellow basally and brownish-black distally with the intensity of the colouration varying in some specimens ; fore and hind tibiae mostly blackish-brown but for yellow bases ; mid tibia predominantly brown ; almost all fore tarsal and last two or three segments each of mid and hind legs dark brown, rest of tarsi yellowish-brown ; mid tibia with one or two terminal black spines ; basal tarsal segment of hind leg with 2-3 erect stout hairs in a row ventrally near base ; tibial organ narrow.

Abdomen : Rather long, much narrower than thorax, in some specimens entirely brownish-black (but for basal segment) while in others first three basal segments yellowish brown and the rest dark brown. Female cerci short.

Male genitalia (Figs. 53-54) : Epandrium narrowly produced on ventrodistal corner ; cercus incised on ventral margin, the depth of median incision about one-third its length ; pregonite large and flattened ; distiphallus at rest extending beyond hypandrium ; phallapodeme well developed.

Length : Male 2.4 mm ; wing 2.6 mm. Female 2.5-2.6 mm ; wing 2.6-2.7 mm.

Specimens studied : *Holotype*, Female, Assam : Dibrugarh, Abor Expedition, 17-18.xi.1911, Coll. Kemp ; 1 female, Madhya Pradesh : Jabalpur : Ram Durgavel, from grass, 16.viii.1969, Coll. V.S. Durve ; 1 female, West Bengal : Darjeeling Dist., Takdah, 1500 m, 26.iii.1973, Coll. H.S. Sharma ; 4 males, Mizoram : Lunglei Dist., Zobawk, 22.iii.1979, Coll. P.T. Cherian ; 1 female, Assam : Garampani, 19.ix.1979, Coll. P.T. Cherian.

Because of similarities in the nature of frontal triangle and almost all other characters, all the more so of the type of *obscuripes* and the information available on that of *zeylanica* and the fact that range of colouration of legs, nature and development of wing, body bristles and such other characters show minor differences in different specimens of *obscuripes* I consider that only one species is involved and *zeylanica* is a synonym of *obscuripes*.

Remarks : Nothing is known about the biology of the species. The specimens from Mizoram and Garampani in Assam were collected, along with those of some species of *Conioscinella* Duda and *Rhodesiella* Adams, from the leaves of unknown shrubs.

2. *Apotropina fulvitaris* (Walker)

1860. *Dacus fulvitaris* Walker, *J. Proc. Linn. Soc. London Zool.*, 4 : 153. Type locality : Celebes : Macassar
1912. *Oscinella luteipes* Becker (Neotropical nec Oriental), *Ann. hist. nat. Mus. nat. Hung.*, 10 : 210. Type locality : Peru : Pachitea-Mundung
1977. *Lasiopleura fulvitaris* (Walker) Sabrosky, *Cat. Dipt. Orient. Region.*, 3 : 290.

Female : Head white about eyes. Frons slightly broader than eye, yellow ; frontal triangle shiny black, reaching a little beyond middle of frons. Face yellow, white tomentose. Antenna rusty yellow ; ant 3 nearly rounded, a little longer than broad ; arista long, bare ; occiput white tomentose. Gena yellow, white tomentose, half as wide as ant 3. Palpi yellow ; inner lower facial margin black. Thorax elongate ; scutum and sutellum densely brownish grey tomentose, partly shining with two grooves along dorsocentral lines ; pleura grey tomentose ; *anepst* and *anepm* shining peach brown. Legs except anterior coxa reddish ; distal half of hind femur slightly thickened ; middle legs have basal two tarsal segments and bases of femora yellow ; base of fore femur faintly yellowish ; legs are otherwise black or brownish-black (in the type hind legs are missing) ; posterior tarsi tawny, with black tips (according to Walker). Wings infuscated, with dark brown veins ; m-m cross-vein straight, upright, parted by about twice its length from the wing margin and about thrice its length from r-m cross-vein. Haltere testaceous. Abdomen lanceolate.

Length : Female, 2.5 mm.

I have not examined the type or other named specimens of this species. Sabrosky (1977), in his catalog of Oriental Chloropidae, transferred *fulvitaris* from *Dacus* genus in Tephritidae to Chloropidae and indicated that *luteipes* (Becker) of Neotropical, not Oriental is a synonym of *fulvitaris* and extended its zoogeographical range to Sri Lanka also. Hardy (1959) in his paper on the Walker types of fruit flies in the British Museum states as follows "No specimens can be found in collection labelled *fulvitaris* and it is not in the card file. A specimen is in collection, however labelled '*D. pallitaris* Walker' Celebes, Macassar, W.W. Saunders, B.M. 1868-4', which fits Walker's description of *fulvitaris*. It is in rather poor condition, the antennae, hind legs and apical half of the abdomen are gone and the body is covered with considerable debris. This is a chloropid genus ? I cannot find it represented in the B.M. Collection." In the diagram of the wing of the above specimen given by Hardy last sector of m 1+2 is convex above basally and it is sinuate along its entire length, m-m cross-vein is parted only by about its length from the wing margin (and not twice its length as

indicated by Walker in his original description) and there is a well defined anal vein, not found in other species of the genus, atleast known from the Oriental Region.

If Hardy's diagram is a true representation of the wing of the species and Walker's observation that arista is bare is equally true, the species is very different from all other Oriental species. If not (the pubescence of arista cannot be verified as antennae of the type are lost) there is a possibility that *obscuripes* (Brunetti) and *fulvitaris* may be the same species, with the former only a synonym of the latter, provided there are 4 *dc* in *fulvitaris*. The description given above is based on Walker, supplemented partly by the description of *luteipes* from Peru and Hardy's observations on the type.

3. *Apotropina tomentosa*, sp. nov. (Figs. 55-57)

Female : Head (Fig. 55) : Slightly higher than long, length, height and width ratio 14 : 15 : 19. Frons narrowing anteriorly, maximum width equal to its own length and 0.55 x the width of head, blackish brown and densely grey tomentose along posterior margin and area around posterior half of frontal triangle and yellowish-brown in front ; frontal triangle distinctly demarcated, dull black, densely grey tomentose except for small area in front of ocellar triangle, reaching two-thirds length of frons and ending with narrowly obtuse apex. Face much narrower than anterior part of frons, slightly concave in the middle except for its central part, yellowish brown and finely grey tomentose ; facial carina reaching almost middle of face as a brown low, linear demarcation ; lower facial margin much narrower than in *obscuripes* (Brunetti). Antenna tomentose, ferruginous-yellow except for dark brown upper margin ; ant 2 broader than long with slender dark spine ; ant 3, 0.8 x as long as wide ; arista shorter than in *obscuripes*, thickened basally, gradually becoming very slender terminally, brownish-black with fairly dense, slender hairs. Gena half as wide as ant 3, whitish-yellow, silvery-grey tomentose with a row of slender pale hairs above the oral margin ; oral margin linearly thickened, with the demarcation extending to lower part of parafacialia above oral vibrissae ; vibrissal angle rounded, not projecting beyond eye margin ; oral vibrissa fairly long and slender ; postgena dark brown behind and concolorous with gena in front ; parafacialia almost inconspicuous. Eye fairly large, appearing bare with more or less vertical long axis. Palpi curved, slender brownish-yellow ; proboscis well developed, a little swollen behind terminal end, subshining brownish black, recalling the condition in *obscuripes* (Brunetti) ; area around inner border of lower facial margin shiny brownish black. Head bristles dark brown, some very long ; *out* short and slender, less than half the *ivt*, the latter curved inwards and proclinate ; *pvt* cruciate, shorter than *ivt* ; *oc* proclinate, divergent equal to *ivt* ; *orb* 3, short, slender, almost hair-like, anteriormost proclinate, posterior 2

laterocline and directed over eye ; *if* 3, anteriormost anterior to apex of triangle, procline, middle one flanking the triangle outside its apex, slightly procline, posteriormost turned inwards ; *pst* 1, slender.

Thorax : Black, densely grey tomentose except for part of pleura. Scutum 1.2 x as long as wide with one median and 2 *acr* rows of parted bristly black hairs as in *obscuripes*. Scutellum (Fig. 56) suborbicular, 1.25 x as wide as long, tomentose like scutum, with flat disc bearing two to four short, black hairs ; pleura tomentose like rest of thorax except for anteromedian part of *kepst* ; *kepst* with a few yellow hairs. Thoracic bristles well developed ; *h* 2, one mesocline and the other reclinate, the latter 0.6 x the former ; *npl* 1+1, anterior one a little longer than the posterior ; *prs* 1, equal to posterior *npl* ; *sa* 1 distinctly and *pa* 1 slightly shorter than posterior *npl* ; *pa* 2 short, slender, hair-like ; *dc* 4, 1 prescutellar and 3 postscutellar in position, sequentially anterior ones becoming shorter, posteriormost much longer and stronger than other thoracic bristles except for *as* ; *as* widely separated at base, 2 x as long as scutellum ; *ss* 1, 0.35 x the *as*.

Wing (Fig. 57) : 2.5 x as long as wide, dark brown with the infuscation more prominent along upper half ; veins dark brown ; proportions of costal sectors 2 to 4 in the ratio 27 : 16 : 8 ; r-m cross-vein a trifle distad of middle of discal cell, opposite 0.54 of its length ; terminal sectors of veins r 4+5 and m 1+2 slightly diverging towards their apices ; flexure in basal half along back of discal cell prominent with traces of a stub vein projecting partly into discal cell ; stalk of haltere brown, knob yellow to brownish yellow.

Legs : Long and slender ; coxae with slender white hairs ; fore coxa yellow ; mid and hind coxae dark brown ; fore femur slightly thickened with erect black hairs of which some are almost in a row ; all femora more or less dark brown but for yellowish basal part ; fore and hind tibiae almost wholly and mid tibia narrowly in the middle dark brown, rest of the areas yellowish ; all fore tarsi, last three tarsal segments of mid and last three or four tarsi of hind legs dark brown, rest of tarsi yellow ; basal tarsal segments of fore and hind legs slightly thickened, both with almost a row each of more or less erect hairs ventrally of which two or three near base of the latter are black ; mid tibia with short, slender, black terminal spur ; tibial organ long and slender.

Abdomen : Narrower than thorax, subshiny brownish black, partly grey tomentose. Female cerci short, of medium thickness.

Length : Female 2.4 mm; wing 2.8 mm

Holotype : Female, India : West Bengal : Darjeeling Dist., Lepchajagat, 2190 m, 11.vi. 1975, Coll. J.K. Jonathan.

Paratype : 1 female, collection data same as of holotype.

A. tomentosa is closely related to *obscuripes* (Brunetti) but unlike in the latter, in *tomentosa* frontal triangle is almost wholly densely grey tomentose and does not reach anterior margin of frons and scutum is wholly dull and grey tomentose and not partly shining.

Genus 2. *Siphonellopsina* Andersson

1977. *Siphonellopsina* Andersson, *Ent. Scand. Suppl.*, 8 : 50-51. Type species : *Siphonellopsina kokagalensis* Andersson. By original designation and monotypy.

Medium sized black flies with brownish wing, 1 *dc* and minute phallus.

Head higher than long. Frons deeply depressed, narrowing anteriorly, with a few *fr*; frontal triangle finely tomentose, not clearly demarcated, subshiny and reaching three-fourths length of frons. Face straight, narrow, white tomentose; facial carina not developed. Antenna erect; ant 2 short, apically with a row of black bristles and dorsally with a stronger bristle; ant 3 as long as wide, suborbicular and white pilose; arista bare, slender but for thickened base. Gena narrower than palpi, width about half that of ant 3, with a row of oral vibrissae; vibrissal angle receding; postgena developed, silvery white tomentose, with a row of long postocular setae reaching through it to posterior peristomial bristle. Eye large, naked with nearly vertical long axis. Palpi flat, curved with black hairs; proboscis short; clypeus narrow, black, shining. Head bristles developed; *out* outcurved, longer than *ivt*; *pvt* cruciate; *oc* proclinate, divergent rather well developed; *orb* 3, anterior two proclinate, posterior most curved outwards; one *fr* well developed and equal to anterior *orb*, proclinate and convergent; *if* 1, proclinate and turned inwards; posterior peristomial bristles very long.

Thorax longer than wide. Scutum grey or brownish tomentose; humeral callus well developed; scutellum suborbicular, tomentose; propleuron and *anepst* partly shining, rest of pleural region white tomentose. Thoracic bristles well developed; *h* 2, one turned inwards; *npl* 1+1, anterior one more developed; *pa* 1 longer than and *pa* 2 much shorter than anterior *npl*; 1 *dc* well developed; dorsocentral line with hair-like bristles; *acr* short, in two indistinct rows; *as* and *ss* 1 well developed; *kepst* with a short bristle.

Wing deeply brownish; flexure of m 3+4 very distinct. Haltere whitish.

Legs rather long. Fore legs with stout, laterally compressed tibiae and tarsi; foretibia with black stout hairs; tibial organ developed.

Abdomen long and narrow, finely grey tomentose; sternites densely tomentose; abdominal hairs short.

Male genitalia : epandrium without corni; mesolobus large with a pair of very long and many smaller bristles and hairs; middle lobe of sursylus simple or bifid; hypandrium ring-shaped; pregonites long; postgonites very small; phallus minute.

Siphonellopsina is closely related to *Siphonellopsis* Strobl in possessing long pregonites and only 1 *dc* and in the absence of distinct prealar, presutural and supraalar bristles, but unlike the latter the former has long thoracic bristles, normally developed, convex scutellum and well developed *as*. Besides, in *Siphonellopsina* phallus is minute and epandrium is without corni. According to Andersson (1977) the gonites, phallopodeme and phallopodemic sclerite in *Siphonellopsina* may possibly be acting as a pseudophallus as is the case in *Diplotoxa* Loew.

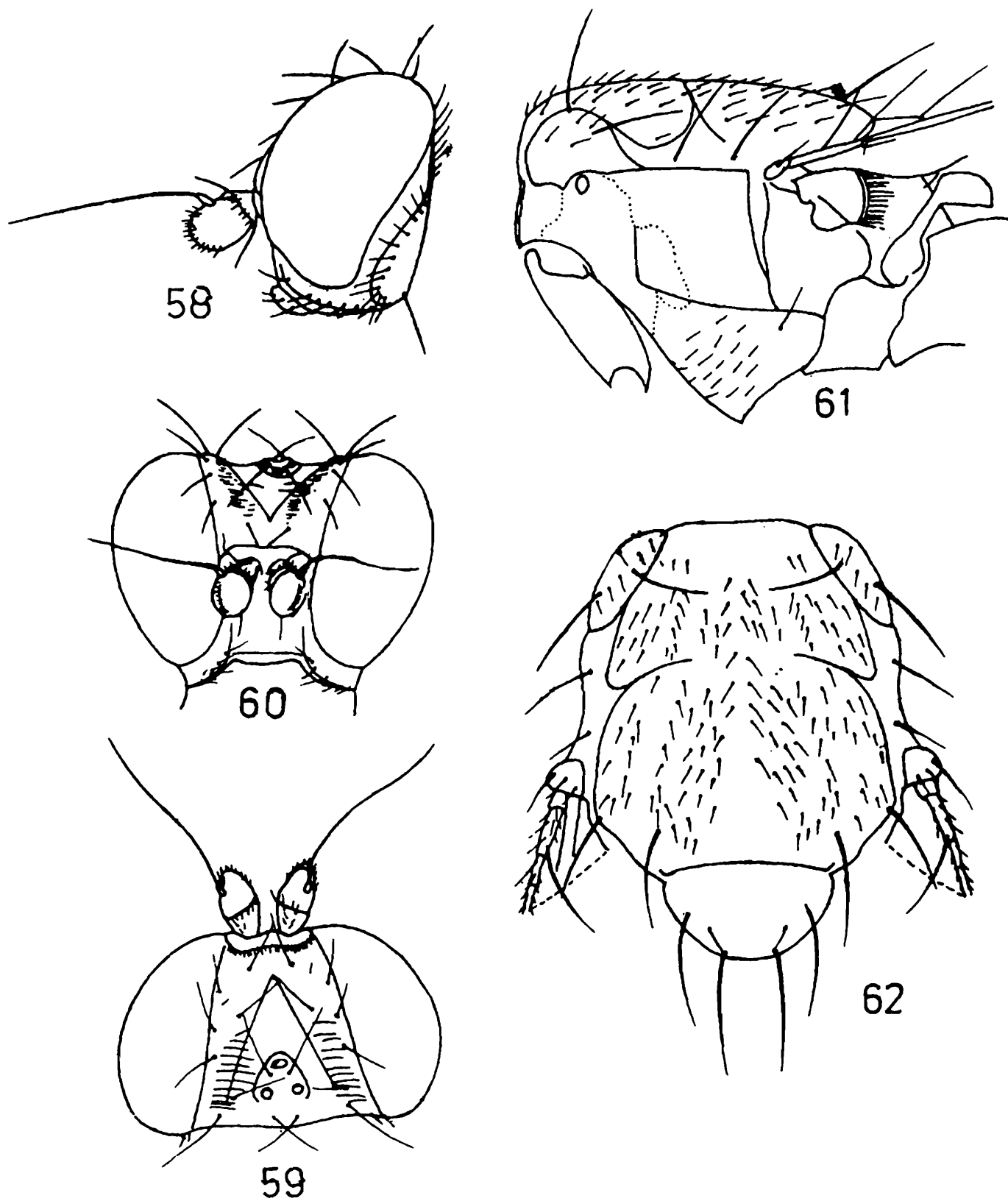
Distribution : Oriental Region. This genus is so far known by only two species, the type species *kokagalensis* Andersson from Sri Lanka and *obscuripennis* (de Meijere) from Sumatra. *S. kokagalensis* Andersson, the only species under the genus so far known from India and adjacent countries is described here.

Biology : There is no information so far on the biology or ecology of this genus.

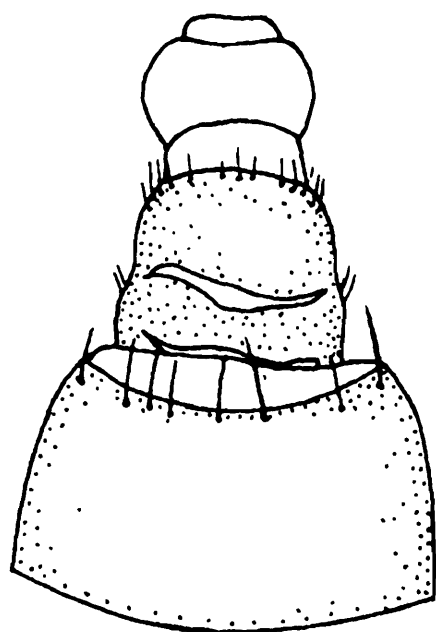
4 *Siphonellopsina kokagalensis* Andersson (Figs. 58-66)

1977. *Siphonellopsina kokagalensis* Andersson, *Ent. Scand. Suppl.* 8 : 51-54. Type locality : Sri Lanka : E. Province. Kokagala Mountains : 20 miles north of Bibile.

Male : *Head* (Figs. 58-60) : Higher than long, length, height and width ratio 23 : 32 : 45. Frons narrow in front, width in front 14, behind 24, length 25, deeply depressed, area in front of frontal triangle brownish and shining, area behind black and finely tomentose; frontal triangle indistinct, reaching three fourths length of frons, black, subshining and finely tomentose. Face straight, narrow, pale and white tomentose; facial carina not developed. antenna erect; and 2 short, yellowish brown, apically with a row of black bristles, dorsally with a stouter bristle and below with one or a few long, erect bristles; ant 3 flat, as long as wide, rounded apically, white tomentose, yellowish brown with dark tinge, especially on outer side; arista bare, thickened and brownish-yellow basally and slender and black apically. Gena narrow, somewhat narrower than palpi, yellow, white tomentose with a row of oral vibrissae; postgena densely silvery-white tomentose; vibrissal angle receding; parafacialia indistinct. Eye large naked with nearly vertical long axis. Palpi flat, curved, yellow brown with black hairs; proboscis short, black, shining; clypeus narrow, black, shining. Head bristles developed; *out* curved outwards, longer than *ivt*; *pvt* cruciate, shorter



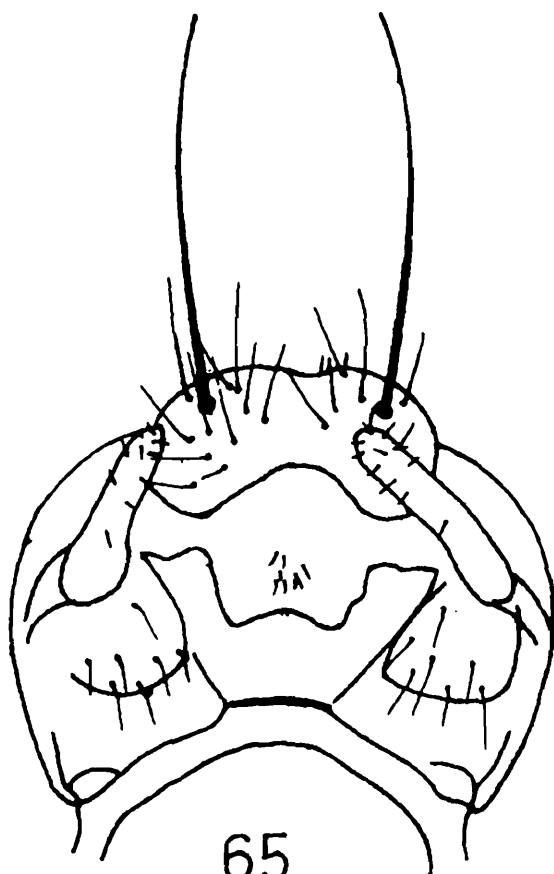
Figs. 58-62 : *Siphonellopsina kokagalensis* Andersson (Adapted, Andersson, 1977). 58, Head, lateral view. 59, Head dorsal view. 60, Head, anterior view. 61, Thorax, lateral view. 62, Thorax, dorsal view.



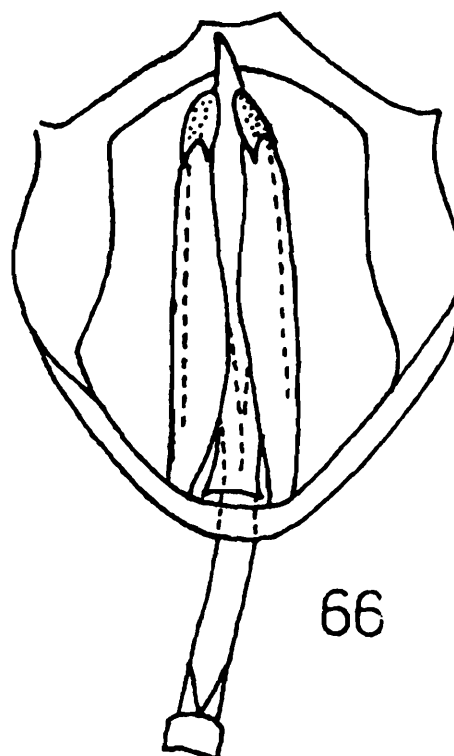
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65



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Figs. 63-66 : *Siphonellopsina kokagalensis* Andersson (Adapted, Andersson, 1977). 63, Apical part of male abdomen, dorsal view. 64, Ditto, ventral view. 65-66, Male genitalia, ventral view.

than *out*; *oc* proclinate, divergent, trifle longer than *out*; *orb* 3, anterior two proclinate, posterior one turned outward; one *fr* proclinate, slightly convergent, projects a little beyond anterior margin of frons, equal to anterior *orb*; *if* 1, proclinate and turned inward; one row of well developed postocular setae reaching posterior peristomial bristle present, the latter long and well developed.

Thorax : (Figs. 61-62) : Black, longer than wide and silvery white, grey or brown tomentose. Scutum with one row of hair-like bristles on *dc* line and one indistinct row of such *acr* bristles on each side and many shorter hairs. Scutellum (Fig. 62) suborbicular with convex disc. Posterior part of propleuron and anterior part of *anepst* shining, rest of the areas of pleura densely white tomentose; *kepst* with numerous white hairs. Thoracic bristles a little reduced than in species of related genera except for *Siphonellopsis* Strobl; *h* 2, subequal, inner one turned inward; *npl* 1+1, anterior one more long and stout; *pa* 1 slightly longer than *npl*; *pa* 2 very small, hair-like; *as* longer than and *ss* 1 slightly shorter than scutellum.

Wing : Deeply brownish, especially along dark veins; proportions of costal sectors 1 to 4 in the ratio of 38 : 40 : 29 : 10; *m* 3+4 with distinct flexure, its apical setor half that of the preceding sector. Knob of haltere whitish with darkened tip, stalk blackish at base.

Legs : Rather long, fore coxa yellowish brown and densely white tomentose; fore femur brownish and darkening towards apex; fore tibia black with numerous stout black hairs; fore tarsi black to brownish black; middle coxa yellow; middle femora yellowish basally and brownish distally; hind tarsi yellow but for darkened three last segments; tibial organ well developed.

Abdomen (Figs. 63-64) : Long and narrow, grey tomentose, brownish black, subshining medially and shining at sides; sternites densely tomentose; abdominal hairs short and black.

Male genitalia (Figs. 65-66) : Epandrium without ventral corni; male cerci fused, large with two long and many shorter bristles; middle lobe of surstylus simple; hypandrial corni fused, articulating with ventral epandrial sclerite; pregonites long; postgonites very short; phallus extremely small, rather indistinct; synsternum S 7+8 long, in the middle divided by a transverse, desclerotized area and with two pairs of sensilla trichodea. S 5 in male well developed; S 6 indistinct.

Length : Male 4 mm; wing 3 mm.

This species is so far known by only the holotype, a male, deposited in the Entomological Museum, Zoological Institute, Lund University, Sweden and collected

on 13.iii. 1962 through sweeping above surface of small stream in Kokagala Mountains, Eastern Province of Sri Lanka, by Brinck Andersson Cederholm of the Lund University Ceylon expedition of 1962. I have not examined the specimen and the description and the diagrams are as given by Andersson (1977).

Subfamily 2. RHODESIELLINEAE NARTSHUK

1977. Rhodesiellini Andersson, *Ent. Scand Suppl.*, 8 : 55 (in part).

1987. Rhodesiellinae Nartshuk, *Trud. Zool. Inst. Acad. Nauk USSR*, 136 : 225.

Head higher than long and much wider than high; frons usually narrowing anteriorly; frontal triangle glabrous and clearly demarcated or rarely even short, indistinct and finely tomentose; gena linear to nearly as wide as or wider than ant 3, with or without hairs; eye orbicular, suborbicular, oval or rarely subtriangular with or without hairs and with vertical, oblique or horizontal long axis; antenna black or wholly or partly yellow; ant 3 rarely produced dorsodistally; arista naked or with distinct hairs; facial carina poorly developed; proboscis of medium-size; palpi short. Head bristles with proclinate and divergent *oc*, well developed *ovt* and *ivt*, cruciate *pvt*, 3-15 *orb*, 3-14 *if* outside frontal triangle and one oral vibrissa.

Thorax shiny black or yellow, without or rarely with longitudinal vittae; scutellum rounded, triangular, trapezium-shaped or greatly elongated with flattened or convex disc bearing scutellar bristles often on finger-shaped projections, large tubercles or warts; *anepst* with distinct hairs (except in Stenoscinini); thoracic bristles with 1 *h*, 0+1, 1+1 or 1+2 *npl*, *pa* 1, 1 *dc*, *as* and 1-3 *ss*; rarely a bristle on *kepst* present.

Wing hyaline or faintly brownish with well developed or rarely greatly reduced anal area; m-m cross-vein greatly to slightly oblique; m 1+2 straight or strongly curved; r 2+3 usually curved towards costa.

Abdomen broadly oval or long and slender; male genitalia with large epandrium, variously modified gonites and phallus or rarely of Oscinella-type.

The subfamily is treated here as defined by Nartshuk (1987) and comprises all the genera placed under Rhodesiellini by Andersson (1977) and a few more which were included by him in Oscinellini but separated under the tribe Stenoscinini by Nartshuk. In the costa reaching m 1+2 this subfamily shows affinity to Siphonellopsinae and Oscinellinae but differs from Chloropinae. Out of the three tribes Rhodesiellini, Scoliophthalmini and Stenoscinini, into which the subfamily is divided by Nartshuk, while the first two appear to be natural groups, the third shows some transitional

tendencies towards Siphonellopsinae on the one hand and Oscinellinae on the other. All the members of Rhodesiellinae have the Plesiomorphous feature of proclinate and divergent *oc* and share this character with Siphonellopsinae and Chloropinae whereas in Oscinellinae *oc* are upright or reclinate and cruciate, convergent or parallel-sided. While in Rhodesiellinae the *orb* are generally numerous and are reclinate or upright, in Siphonellopsinae there are only 3-4 *orb*, some if not all of which are proclinate or laterocline. Besides, in Siphonellopsinae there are 2 *h* but in Rhodesiellinae almost always only 1 *h* is present. In addition, members of tribes Rhodesiellini and Scoliopteralmini of Rhodesiellinae have hairy *anepst* whereas in Siphonellopsinae such hairs are absent. In the absence of hairs on *anepst*, presence of reduced number of *if* of which some often are proclinate, occasional presence of a bristle on *kepst*, nature of scutellum and similarities in male genitalia tribe Stenoscinini shows affinities to Siphonellopsinae. In the general habitus of body, nature of scutellum and male genitalia Stenoscinini also resembles Oscinellinae. Because of these transitional characters various authors included genera belonging to Stenoscinini under Oscinellinae but Nartshuk separated it from the rest and included it as a distinct tribe under Rhodesiellinae.

Because of the transitional tendencies tribe Stenoscinini may be said to interlink the three subfamilies Siphonellopsinae, Rhodesiellinae and Oscinellinae.

Distribution : World-wide, but species most numerous in the Oriental and Afrotropical Regions.

Remarks : Adults are found on foliage, grass and flowers and some species even enter houses. Some species are lethargic and shade-loving and are found mostly on the under surface of leaves during day. At times two to four species can be collected from the leaves of shrubs by a single sweep of a net. Not much is known about the eggs and larvae of most of the species belonging to the various genera.

Key to the tribes of RHODESIELLINAE

1. Predominantly black species, with numerous inclinate *if* and without longitudinal vittae on scutum; transverse suture normal, not cutting deeply into disk of scutum; *anepst* with distinct hairs; *kepst* without bristles; scutellum mostly triangularly elongate; scutellar bristles borne on tubercles or prominent warts 2
- Black or yellow species, with 3 often proclinate *if*; transverse suture often cutting deeply into scutum; *anepst* without hairs; *kepst* at times with a bristle; scutellum mostly suborbicular with convex disc; scutellar bristles not borne on tubercles or prominent warts Stenoscinini

2. Gena linear to narrow, width not more than half that of ant 3, with or without hairs; eye large, rounded or oval with vertical or oblique long axis; arista pubescent
Rhodesiellini

Gena broad, polished, bare, width equal to or more than that of ant 3; eye oval with almost horizontal long axis; arista completely bare.....Scoliophthalmini

Tribe 1. RHODESIELLINI ANDERSSON

1977. Rhodesiellini Andersson, *Ent. Scand. Suppl.*, 8 : 55. Type genus : *Rhodesiella* Adams, 1905.

Head usually higher than long but rarely long and wider than high; frons shiny or subshiny, with a few *fr*; frontal triangle often large with slightly convex, straight or concave side margins, pointed, obtuse or almost truncate anterior margin, smooth, shiny black blue or green metallic lusture and very rarely a few fine hairs. Eye large, bare but very rarely with minute, scattered pubescence and vertical or slightly oblique long axis. Gena linear to about half as wide as ant 3, rarely with a few hairs. Face usually narrow, flat or concave; facial carina usually not developed. Antenna black to yellow; ant 2 very rarely longer than ant 3, the latter usually wider than long; arista slender with long or short hairs. Proboscis short or of medium size; palpi often cylindrical. Head bristles well developed with long proclinate and divergent *oc*, well developed *out* and *ivt*, cruciate *pvt*, numerous reclinate *orb* and *if* in a row outside triangle along each lateral margin or rarely arranged in two to three distinct or indistinct rows on the triangle.

Thorax with dense punctate hairs; scutellum more or less prolonged, subtriangular or trapezoid, rarely extraordinarily long, with flattened or convex disc and coarsely punctate than scutum; *anepst* with distinct hairs; thoracic bristles with 1 *h*, 0+1 or 1+1 *npl*, *pa* 1, *pa* 2 (rarely absent), 1 *dc*, *as* and 1-3 *ss*; scutellar bristles often borne on large tubercles or warts but enen rarely on finger-shaped projections.

Wing broad, of *Rhodesiella* type, usually with well developeed anal area, oblique m-m cross-vein and often curved m 1+2 and short, procurved radial veins.

Legs usually of medium size, often with femoral organ and no tibial organ; hind femur at times thickened and with spinous bristles along anteroventral and posteroventral surfaces; some species with tuberculate spinous structures near base of hind femur which may probably be sensory in function.

Abdomen short and broad to narrow and elongate; female cerci usually slender. Male genitalia sometimes very large but mostly of medium size; epandrium often

with deep and wide dorsodistal incision; cerci often absent; gonites often three-lobed with the postgonites apically curved inwards.

Distribution : Some of the genera enjoy world-wide distribution though the species are more numerous in the Oriental and Afrotropical Regions. A Few of the genera are hitherto known only from the Oriental Region.

Remarks : Andersson (1977) included six genera namely *Rhodesiella* Adams *Dactylothyrea* de Meijere, *Nomba* Walker, *Euthyridium* Frey, *Tachinoceros* de Meijere and *Scoliophthalmus* Becker under this tribe of which the last genus was transferred to the tribe Scoliophthalmini by Nartshuk (1983). Besides, she included *Merobates* Duda also in this tribe. Since then three more genera *Amnonella* Cherian, *Pseudonomba* Cherian and *Bharathella* Cherian, were described of which the last two are here transferred from Scoliophthalmini to this tribe. In addition, two new genera are also described here under this tribe. Thus eleven genera belonging to the tribe Rhodesiellini are now known all of which are represented in the Oriental Region. Except *Nomba* Walker and *Merobates* Duda other genera are distributed in India and adjacent countries, of which *Amnonella*, *Bharathella*, *Pseudonomba* and one new genus are endemic to India.

Key to the world genera of RHODESIELLINI Andersson

- 1. Scutellum with 6 or more pairs of ss of nearly equal length borne on small or prominent warts inserted at regular intervals imparting serrate appearance to lateral scutellar margins 2

Scutellum with 1-2 pairs of ss borne on warts or tubercles and lateral scutellar margins without serrate appearance 3
- 2. Scutellum large, oval, broader across the middle than base, longer than and often as wide as scutum; *as* not longer than *ss* ; scutellar bristles borne on prominent warts; gena though narrow, yet distinct..*Nomba* Walker

Scutellum conical or subconical, narrowing more or less regularly from base to apex, broadest across base and shorter and narrower than scutum; *as* much longer than *ss*; scutellar bristles borne on small warts; gena almost indistinct*Pseudonomba* Cherian

ant 2, 1.5-2.5 x as long as wide and often longer than ant 3; prosternum with numerous hairs*Tachinoceros* de Meijere

ant 2 wider than long and shorter than ant 3; prosternum without hairs 4.

4. Head extraordinarily long; frons projecting far in front of eyes; occiput in the region of *out* with numerous fine bristles. *Merobates* Duda
 Head not extraordinarily long, almost always much shorter than wide; frons very rarely projecting slightly beyond eyes, usually ends at level of anterior margin of eyes; occiput in the region of *out* without bristles, rarely with a few hairs 5
5. Scutellum with 2-3 pairs of elongate finger-like marginal projections bearing scutellar bristles *Dactylothyrea* de Meijere
 Scutellum without finger-like marginal projections; scutellar bristles borne on tubercles or warts 6
6. Scutellum large and rectangular; frontal triangle grooved, sculptured or with round pits..... *Euthyridium* Frey
 Scutellum not rectangular, often conical, subconical, rounded or even elongated; frontal triangle neither grooved, sculptured nor with pits though rarely with punctate *if* 7
7. Frontal triangle with evenly distributed, finely punctate hairs; scutellum extraordinarily long with narrow and cylindrical distal half; distiphallus not clearly demarcated from phallapodeme and short and stumpy
 *Amnonella* Cherian
 Frontal triangle without fine hairs (though in one species *if* are arranged in 2-3 longitudinal rows on the triangle on each side); scutellum conical, subconical or even rounded in outline and not narrow and cylindrical distally; distiphallus demarcated from phallapodeme, usually long, broad or narrow, if rarely short and stumpy *if* in 2-3 rows on frontal triangle 8
8. Gena well developed, half as wide as ant 3; arista very slender, almost of *Scoliophthalmus*-type but for a few minute pubescence; wing small in comparison to size of the body *Bharathella* Cherian
 Gena not well developed, often linear, width not more than one-fourth to very rarely one-third that of ant 3; arista with dense, prominent hairs; wing of normal size 9
9. Frontal triangle partly tomentose, which have the form of fine microchaetae; ant 3 subtriangular with upper anterior angle slightly produced, almost of *Scoliophthalmus*-type; *if* in one row on frontal triangle along each lateral margin or in 2-3 rows on triangle on each side; distiphallus short and stumpy.....
 *Indophthalmus*, gen. nov.

Frontal triangle smooth and shiny and not tomentose; ant 3 orbicular or suborbicular, not of *Scoliophthalmus*-type; *if* in one row outside frontal triangle along each lateral margin; distiphallus not short and stumpy, often greatly elongated and variously modified 10

10. Scutellum longer than wide, triangular or subtriangular in outline; at least *as* borne on elevated base or well developed tubercle; 1 *dc* shorter and slender than *pa* 1; terminal sector of *r* 4+5 usually very slightly bent forward apically, that of *m* 1+2 often slightly or greatly convex above a little beyond base and at times weakly sinuate along its entire length; distiphallus stumpy or only slightly elongated, often not uniformly thickened; postgonites without sclerotized processes *Rhodesiella* Adams

Scutellum wider than long, rounded in outline with convex disc (only very rarely as long as wide and with nearly flattened disc); *as* borne on very fine tubercle or wart; 1 *dc* longer and stouter than other thoracic bristles except for *as* (if very rarely 1 *dc* a trifle shorter than *pa* 1, scutellum much wider than long); terminal sector of *r* 4+5 usually distinctly bent forward apically, that of *m* 1+2 straight or nearly straight; distiphallus greatly elongated, slender, arched and almost uniformly cylindrical; postgonites usually with sclerotized processes *Neorhodesiella*, gen. nov.

Genus 3. *Dactylothyrea* de Meijere

1910. *Dactylothyrea* de Meijere, *Tijdschr. Ent.*, 53 : 154. Type species : *Dactylothyrea infumata* de Meijere. By designation of Sabrosky, 1941.
1912. *Elaphaspis* Bezzi, *Rev. Zool. Afro.*, 2 : 82-84. Type species : *Elaphaspis leucopsis* (Bigot) (= *Rhinotora leucopsis* Bigot). By original designation and monotypy.

Head normally somewhat higher than long, with long bristles and hairs. Frons not projecting, longer than wide, with a few *fr*; frontal triangle glabrous, large, reaching anterior margin of frons; *if* in a row on the edge of the lateral margin. Face short, wide, shiny with indistinct carina. ant 2 short; ant 3 rounded or a trifle wider than long, pubescent; arista long and slender, basal segment short and without hairs, the rest with distinct pubescence. Eye large, bare, in some species the anterior ommatidia larger, with oblique to vertical long axis. Gena mostly linear; parafacialia not developed. Proboscis and palpi short. *out* and *pvt* subequal; *ivt* equal to the proclinate and divergent *oc*; *orb* 6-10, reclinate.

Thorax shiny black; humeral callus hairy, with long *h*; scutum convex with dense punctate hairs; scutellum thick, convex, sides and disc with dense hairs; *anepst* and *kepst* with hairs; *npl* 1+1, subequal; *pa* 1 equal to *npl*; 1 *dc* much longer than *npl*;

scutellum with 2-3 pairs of large finger-shaped projections ; *as* and *ss* 1 borne on finger-shaped projections and *ss* 2 when present borne on a wart or tuberculate projection.

Legs long ; femora sometimes thickened ; tibial and femoral organs absent ; hind femur often with stout spines along anteroventral and posteroventral margins.

Wing much shorter than body with large alula and rarely with brown tinge.

Abdomen narrower than thorax, usually partly black and partly yellow. Female cerci slender. Male genitalia large, without distinct cerci ; distiphallus long, with flat apex ; postgonite with long, curved posterior cornus.

Distribution : Afrotropical and Oriental Regions.

Remarks : Members of the genus can easily be differentiated by their finger-shaped scutellar projections and highly convex scutellum. Of the seven species of *Dactylothyrea* de Meijere reported from the Oriental Region, *distincta* Cherian, *indica* Cherian and *spinipes* Becker are known from India. *D. spinipes* Becker is also represented in Sri Lanka, besides *hyalipennis* de Meijere. *D. hyalipennis* de Meijere and *spinulosa* de Meijere are being reported here for the first time from India. A key to all the seven species from the Oriental Region is given and all the five species so far known from India and adjacent countries are redescribed. This includes *spinipes* de Meijere, the description of which is based on available information, as the species is not available for study.

Key to the species of *Dactylothyrea* de Meijere from the Oriental Region

1. Wing in the apical half and along anterior margin distinctly brownish *infumata* de Meijere

Wing hyaline, without brownish tinge ; if very rarely slight brownish tinge present it is not confined to distal half and anterior margin 2

2. Hind femur with stout spines along anteroventral and posteroventral margins 3

Hind femur without unusual spines 5

3. Scutellum with only four large finger-shaped projections ; third sector of costa almost equal to the second *spinipes* Becker

Scutellum with four large and two small finger-shaped projections ; third sector of costa shorter than the second 4

4. Fore and hind coxae yellow ; terminal sectors of veins r 4+5 and m 1+2 very distinctly convergent.....*spinulosa* de Meijere

Fore coxa black, only hind coxa yellow ; terminal sectors of veins r 4+5 and m 1+2 only slightly convergent, almost parallel.....*distincta* Cherian

5. Legs predominantly yellow, only last two tarsal segments of hind leg black ; r-m cross-vein proximad of middle of discal cell*indica* Cherian

Legs predominantly black ; femora wholly or partly black as also some tarsal segments of all the legs ; r-m cross-vein distad of middle of discal cell 6

6. Apical scutellar process shorter than scutellum ; lateral scutellar process less than one-third the terminal pair ; wing colourless ; abdomen on the basal third only yellow*hyalipennis* de Meijere

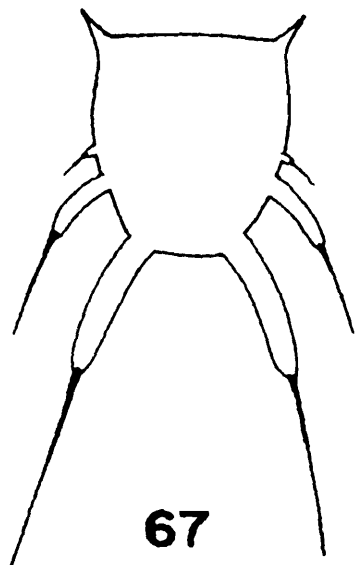
Apical scutellar process longer than scutellum ; lateral scutellar process more than half as long as the terminal pair ; wing with slight brownish tinge ; basal half of abdomen yellow*armata* de Meijere

5. *Dactylothyrea hyalipennis* de Meijere (Figs. 67-70)

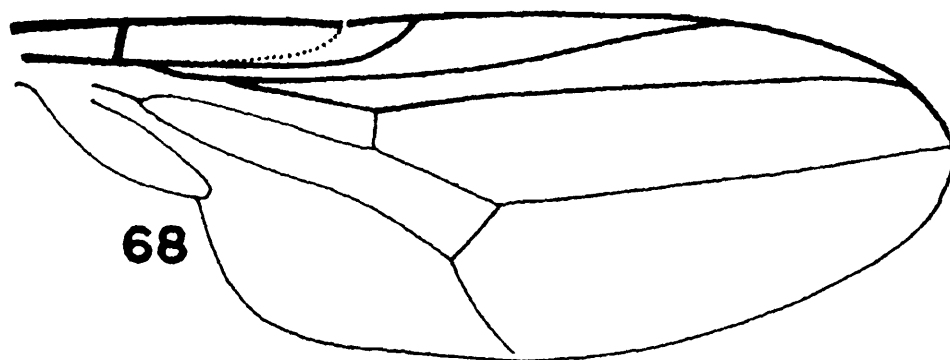
1910. *Dactylothyrea hyalipennis* de Meijere, *Tijdschr. Ent.*, 53 : 155. Type localities : Batavia (Djakarta), Gunung Ungaran, Salatiga, Semarang and Wonosobo, Java.

Male, Female : Head : Length, height and width in the ratio 15 : 17 : 26. Frons slightly narrowing anteriorly, subshiny, black, width 0.42x that of head and 0.8x its own length, with a few prominent white *fr* ; frontal triangle shiny black, ending with obtuse apex ; *if* about 5, slightly proclinate but turned inwards. Face concave, brownish black ; carina very low, somewhat distinct unlike in most other species ; lower facial margin dark brown. Antenna dull black, in some species with partly rusty yellow tinge ; ant 3 with fine dark pubescence, width and length in the ratio 5 : 4 ; arista very slender, black with short, sparse pubescence. Eye with oblique long axis. Gena partly tomentose, dull black, well developed, width in the middle almost half that of ant 3 ; postgena shiny black ; vibrissal angle receding. Proboscis and palpi black, the former with slender brown hairs ; occiput at each side with a prominent depression. Head bristles well developed, black but for yellowish white *orb* and *if* ; *out* and the cruciate *pvt* equal ; *ivt* very short and slender, two-fifths the length of *out* ; *orb* 5-6, slender, longest one a little shorter than *ivt* ; *oc* slender, almost as long as *ivt*.

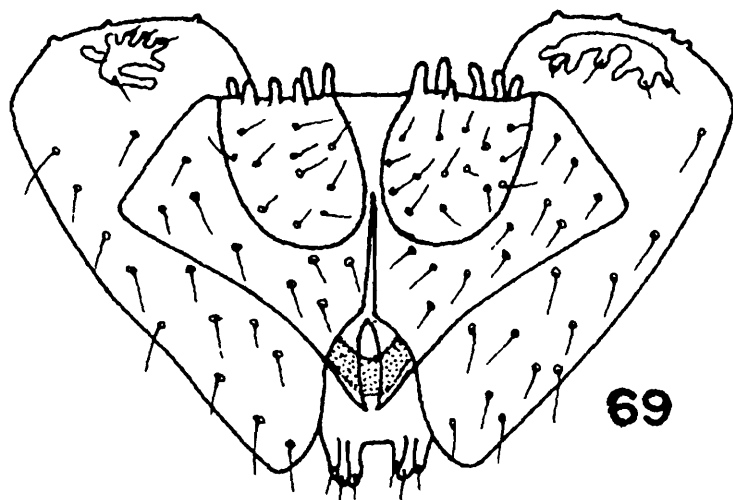
Thorax : Scutum longer than wide, width and length in the ratio 23 : 26, with prominently convex disc bearing punctate yellowish white hairs. Pleural region shiny ;



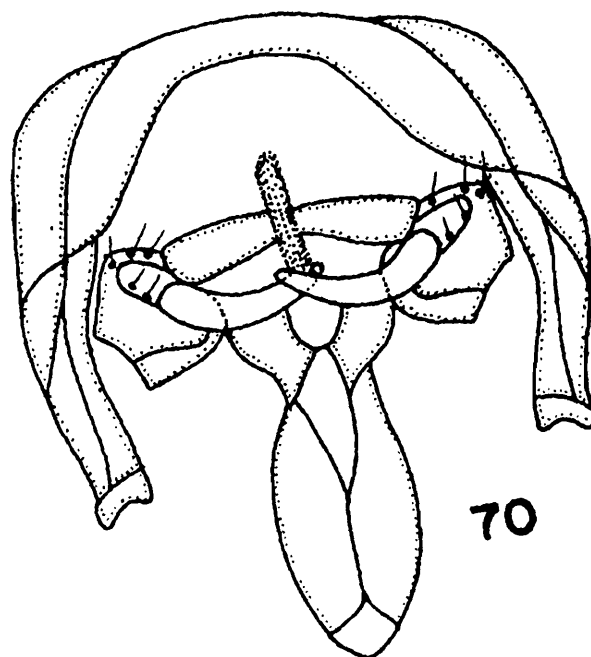
67



68



69



70

Figs. 67-70 : *Dactylothyrea hyalipennis* de Meijere. 67, Scutellum. 68, Wing. 69, Epandrium. 70, Phallic complex, ventral view.

anepst and *kepst* with yellowish white hairs. Scutellum (Fig 67) highly convex, longer than wide, width and length in the ratio 5 : 6 pubescent like but the punctae more coarse than on scutum. Thoracic bristles black ; *h* 1, only a trifle shorter than *out* ; *npl* 1 + 1, anterior one distinctly and posterior one slightly larger than *h* 1 ; *pa* 1 equal to and 1 *dc* longer than *npl* ; the finger-shaped projection at the base of *as* a little shorter than scutellum and that at the base of *ss* 1 about one-fourth the length of scutellum ; *as* and *ss* 1, 1.4x the length of the projections at their bases ; *ss* 2 mostly absent, in some specimens represented by a hair-like bristle borne on a wart ; all the thoracic bristles except *as* and *ss* 1 borne on distinct warts.

Legs : Fore coxa black ; fore femur black but for the pale distal end ; fore trochanter yellow ; fore tibia, except for the pale base, and all fore tarsal segments brownish black ; mid trochanter, the two ends of mid femur and the first three mid tarsal segments yellow, rest of the areas black or brownish black ; hind coxa, basal third of hind femur and first tarsal segment yellow, the rest of the areas of hind leg black.

Wing (Fig. 68) : Hyaline with dark brown veins ; length and width in the ratio 69 : 22 ; proportions of costal sectors 2 to 4 as 7 : 4 : 2 ; r-m cross-vein beyond the middle of discal cell, opposite 0.61 of its length ; terminal sectors of veins r 4 + 5 and m 1 + 2 distinctly converging distally, the former convex above althrough its length, the latter straight. Haltere whitish yellow.

Abdomen : Narrow, two basal segments and the basal half of third segment yellow, rest of the area of third segment and all the following segments brownish black. Female cerci slender, black. Male genitalia (Figs. 69-70) : Distiphallus shorter than phallapodeme, ending with broadly obtuse apex ; pregonites distally very broad and flattened ; epandrium broader than in most other species ; unlike in other Oriental species, the genitalia of which are known, short but distinct cerci are present ; surstylus short and blunt.

<i>Length :</i>	Male	3.9 mm	Wing	3.3 mm
	Female	4.0 mm	Wing	3.4 mm.

Specimens examined : 1 female, Batavia, xi. 1908, Coll. E. Jacobson ; 1 female, Mizoram : Aizawl Dist. Melthum, 13.iii.1979, Coll. P.T. Cherian ; 7 males, 1 female, Meghalaya : Nangpo, 25.iv.1980, Coll. Amnon Friedberg.

One of the specimens studied is a topotype from Batavia in Jakarta.

D. hyalipennis de Meijere is related to *infumata* de Meijere from Java but differs in having hyaline wing, distinctly convergent terminal sectors of veins r 4 + 5 and m 1 + 2, shorter scutellar projections and mostly black fore femur.

Distribution : Indonesia : Jakarta, Batavia, Bali ; Sumatra, Java ; Wonosobo ; Philippines : Luzon ; Malaysia : Malaya, Borneo (Sarawak) ; Sri Lanka ; Gunang Ungaran, Salatiga, Semarang ; India : Meghalaya, Mizoram.

6. *Dactylothyrea indica* Cherian (Figs. 71-74)

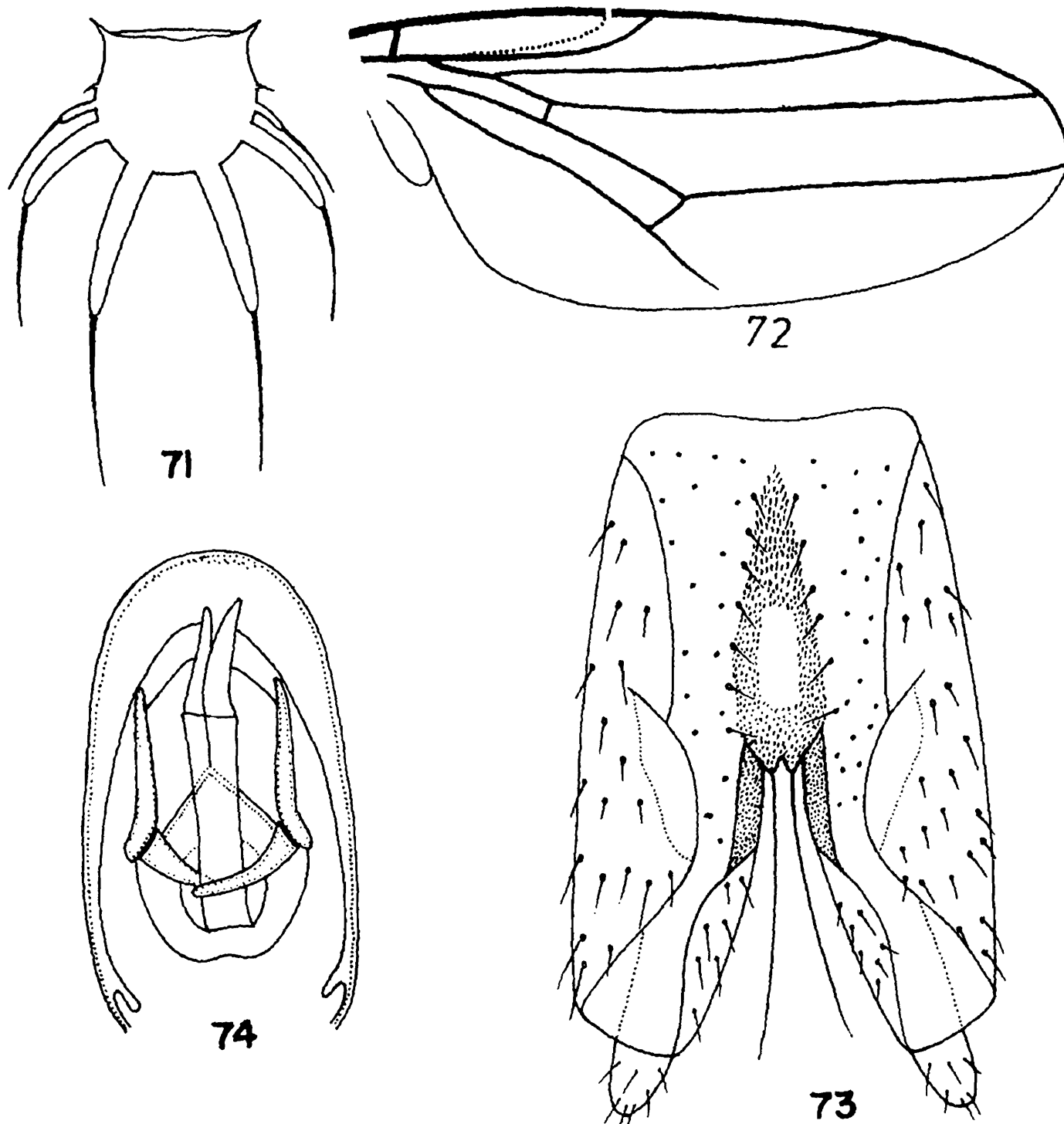
1976. *Dactylothyrea indica* Cherian, *Oriental Insects*, 10 (2) : 153-154. Type locality : West Bengal : Darjeeling, Goke F.R.H.

Male, Female : *Head* : Length, height and width ratio 2 : 2 : 3. Frons brownish black, slightly narrowing anteriorly, width at vertex 0.41x that of head and 0.85x its own length ; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with broadly obtuse apex. Eye large, bare, in profile occupying almost the entire head, long axis vertical. Gena black, almost linear ; vibrissal angle nearly rounded ; postgena with yellow hairs. Face shiny black. Antennae yellowish brown to brown with darkish tinge at the apex above ; ant 3 wider than long (14 : 11) ; arista slender, dark brown, with conspicuous, concolorous pubescence. Palpi and proboscis blackish brown ; *out* long, stout, equal to width of eye ; *ivt* slightly shorter than *out* ; *pvt* cruciate, equal to *out* ; *oc* a little shorter than *pvt* ; *orb* 7-8, very slender, recumbent, longest lesser than half the *out* ; *if* in a row of 7-8 ; *orb* and *if* white or yellowish white, rest of the head bristles normally black but in some specimens all the bristles yellow.

Thorax : Shiny black. Scutum convex, width nearly equal to its own length and to the width of head, with moderately dense piliferous punctae bearing long, white hairs. Scutellum (Fig. 71) greatly convex, length and width in the ratio 15 : 14, the former half that of scutum, broadly rounded at apex ; except for a dorsal polished, hairless area near base, punctate and pubescent like scutum ; *anepst* and *kepst* with white hairs, the latter highly polished ; *h* 1, slender, two-thirds the width of eye ; *npl* 1+1, equal to *h* but stouter ; *pa* 1 equal to *npl* ; 1 *dc* stout, elongated, equal to *pvt* ; scutellum with six finger-like projections bearing scutellar bristles, of these the one at the base of *as* slightly longer than scutellum (17 : 14) and 0.77 x the *as*, that at the base of *ss* 1 two-thirds the *ss* 1 and slightly shorter than scutellum (6 : 7) and that at the base of *ss* 2 two-fifths the *ss* 2 and 0.27 x the scutellum ; *as* 1.5 x the *out* and the scutellum ; *ss* 1 a little longer than *out* and *ss* 2 nearly 0.6 x the *ss* 1.

Wing (Fig. 72) : Hyaline, veins brown ; costal sectors 2 to 4 as 22 : 16 : 9 ; r-m cross-vein proximad of the middle of discal cell, opposite 0.43 of its length ; terminal sectors of veins r 4+5 and m 1+2 slightly converging distally. Haltere yellow.

Legs : Wholly yellow but for the black last two segments of hind tarsi.



Figs. 71-74 : *Dactylothyrea indica* Cherian. 71, Scutellum, 72, Wing. 73, Epandrium, ventral view. 74, Phallic complex, ventral view.

Abdomen : Small in comparison to the body ; two basal segments brownish yellow, the rest brownish black ; in some specimens the entire dorsum brownish yellow with dark tinge on one or two segments. Male genitalia (Figs. 73-74) : Distiphallus cylindrical nearly along its entire length, ending with uneven broad opening ; phallapodeme reaching distal arm of hypandrium ; terminal half of pregonite and whole of epandrium much narrower than in *hyalipennis* ; cerci very short and slender, each with a very long terminal bristly hair.

<i>Length</i> :	Male	2.4 – 2.6 mm	Wing	2.3 – 2.5 mm
	Female	2.5 – 2.7 mm	Wing	2.5 – 2.6 mm

Material studied : *Holotype*, Male, India : West bengal ; Darjeeling, Goke F.R.H., 11.iv. 1973, Coll. H.S. Sharma. *Paratypes*, 4 males, 4 females, data same as of holotype and 1 male, Darjeeling : Rangiram, 2000m, 25.v.1974, Coll. J.K. Jonathan.

Other specimens studied : 4 males, 2 females, Mizoram : Champhai, 1750 m., 18.iii.1979, Coll. P.T. Cherian ; 1 male, U.P. : Mussoorie, 1800 m., vii.1933, Coll. H.S. Pruthi ; 1 male, Meghalaya : Nangpo, 18.iii.1980, Coll. P.T. Cherian ; 1 male, Meghalaya : Mawphlong, 21.iv.1980, Coll. P.T. Cherian.

This species resembles *hyalipennis* de Meijere, from which it differs in the predominantly yellow colour of legs and the presence of three pairs of finger-shaped projections on scutellum bearing scutellar bristles. Besides, unlike in *hyalipennis* r-m cross-vein in *indica* is proximad of the middle of the discal cell and male genitalia show many differences.

Distribution : India : West Bengal, U.P., Mizoram and Meghalaya.

7. *Dactylothyrea spinipes* Becker

1916. *Dactylothyrea spinipes* Becker, *Ann hist. nat. Mus. natn. Hung.* 14 : 443. Type localities : Formosa : Taihoku and Sokotsu.

1931. *Dactylothyrea bakeri* Malloch, *Ann. Mag. nat. Hist.* (10), 7 : 491. Type locality : Philippines : Luzon, Mount Makiling.

Thorax and scutellum black, with large punctae and whitish hairs. Scutellum convex, distal margin semicircular, somewhat longer than broad, with four somewhat bent finger-like projections of which the two apical ones almost twice as long as the laterals. The bristles more or less longer than the projections on which they are borne. Pleura shiny black. *anepst* somewhat punctate and pubescent. Haltere white. Head black, frons dull with white hairs and shining black frontal triangle, the basal

margin of which is not touching the eye margin and its apex reaches the anterior margin of frons. Antennae light rusty yellow, with pubescent arista. Palpi reddish yellow. Abdomen yellow in the basal half and blackish brown in the distal half. Legs black, coxal segment including the distal part of one coxa and the basal part of one femur as also two or three last segments of all tarsi pale yellow. Hind femur somewhat thickened with 4-5 stout spines below. Wing colourless, third and fourth longitudinal veins parallel, the first three costal sectors approximately equally long.

Length : 2-3 mm. 3 examples from Formosa : Taihoku and Sokotsu, April, 1912 (Sauter).

Distribution : Formosa ; India : Goa ; Philippines : Luzon, Negros ; Sri Lanka.

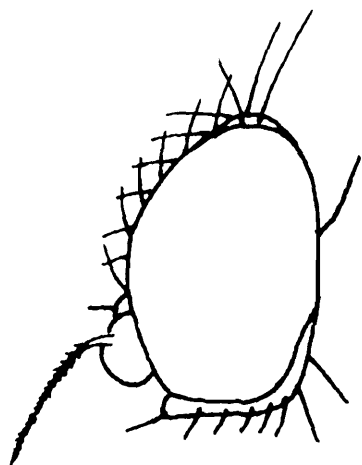
This species is closely related to *spinulosa* de Meijere, but in the latter fore coxae are yellow, veins r 4+5 and m 1+2 are convergent, third sector of costa is much shorter than the second sector and scutellum is with six finger-like projections. *D. spinipes* also shows affinity to *distincta* Cherian from India, but in the latter there are six finger-shaped projections on scutellum bearing the scutellar bristles (two of which are much smaller) and third sector of costa is distinctly shorter than the second where as in *spinipes* there are only four finger-shaped projections on scutellum and third sector of costa is approximately equal to the second.

I have not examined specimens of *spinipes* and the above description is based on Becker and Malloch.

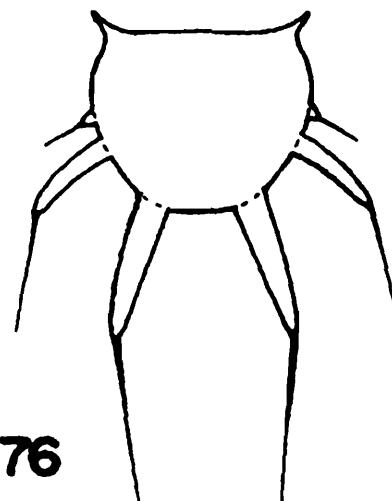
8. *Dactylothyrea distincta* Cherian (Figs. 75-79)

1976. *Dactylothyrea distincta* Cherian, *Oriental Insects*, 10(2) : 152-153. Type locality : West bengal : Darjeeling, near Hima Falls.

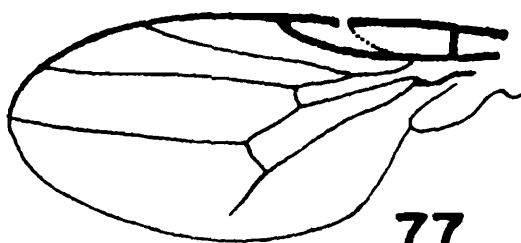
Male, Female : *Head* (Fig. 75) : Length, height and width ratio 10 : 10 : 17. Frons brownish black, slightly narrowing anteriorly, width 0.41 x that of head and almost equal to its own length ; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with almost pointed apex. Eye large, bare, in profile occupying almost the entire head, long axis almost vertical. Gena nearly linear but in side view lower facial margin slightly projecting ; vibrissal angle almost rounded. Antennae pale brown with yellowish white pubescence ; ant 3 slightly wider than long (6 : 5) ; arista long, slender, pale at the basal two-thirds, otherwise brown with short, concolorous hairs. Face brownish black. Palpi and proboscis black to brownish black ; *out* stout, two-thirds the width of eye ; *ivt* a little shorter than *out* ; *pvt* cruciate ; *orb* 6, slender, distinctly recumbent, longest two-thirds the *out* ; *if* about 5, equal to *orb* ; *oc* slender, proclinate, widely divergent, two-thirds the *out* ; *fr* a few, white,



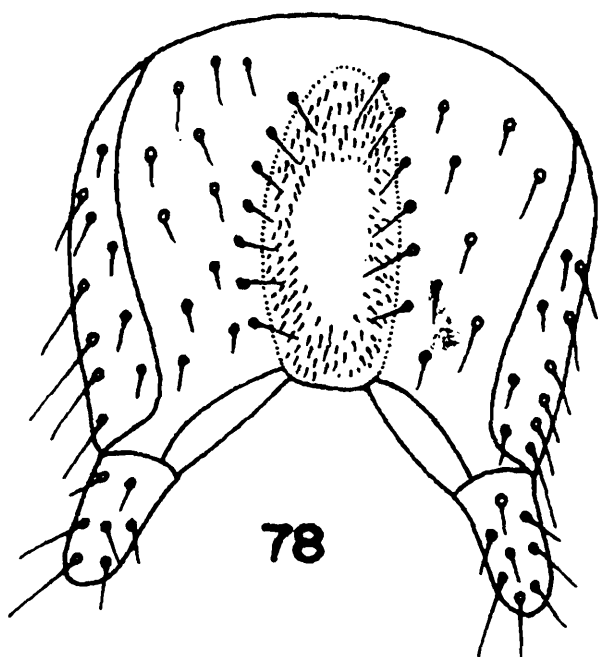
75



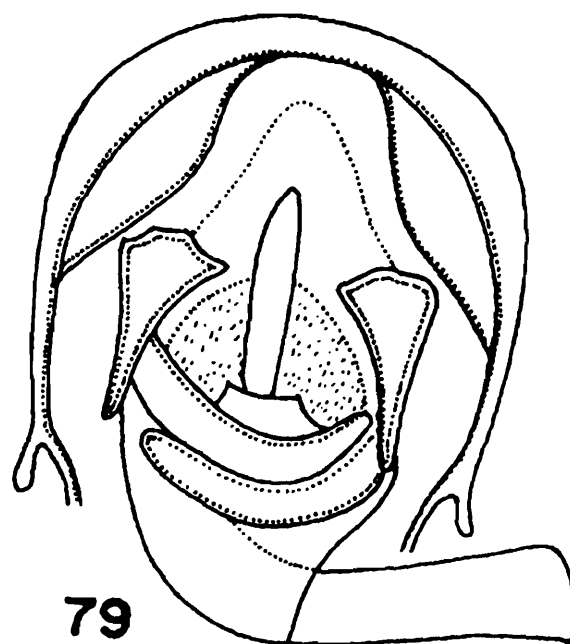
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78



79

Figs. 75-79 : *Dactylothyrea distincta* Cherian. 75, Head, lateral view. 76, Scutellum, 77, Wing. 78, Epandrium, ventral view. 79, Phallic complex, ventral view.

scattered, arranged mostly in the anterior part of frons ; a row of about 7 setae present on the lower margin of gena ; *orb*, *fr*, *oc* and *if* white, the rest of the bristles of head black.

Thorax : Wholly black ; scutum distinctly convex, width and length equal, the former almost equal to width of head, with dense coarse piliferous punctae bearing white hairs ; scutellum (Fig. 76) greatly convex, well developed, length and width in the ratio 8 : 7, the former almost half the length of scutum, punctae much coarser and the white hairs longer than on scutum ; *anepst* and *kepst* with numerous white hairs ; *h* 1, almost equal to *out* ; *npl* 1 + 1, equal to *h* but slightly stouter ; *pa* 1 equal to *npl* ; 1 *dc* stout, elongated, 1.55 x the *npl* ; thoracic bristles borne on prominent warts of which the one at the base of 1 *dc* more conspicuous. Scutellum with two small and four large finger-like projections bearing the scutellar bristles, of these the one at the base of *as* two-thirds the *as*, that at the base of *ss* 1 half the *ss* 1 and almost half as long as scutellum and the one at the base of *ss* 2 one-fourth the *ss* 2 and one-eighth the scutellum ; *as* a little longer than scutellum and twice the *out* ; *ss* 1, 0.8 x the *as* and equal to scutellum and *ss* 2 almost half the *as*.

Wing (Fig. 77) : Hyaline, small in comparison to the body ; length 2.6 x the width ; costal sectors 2 to 4 as 16 : 13 : 7 ; r-m cross-vein distad of the middle of discal cell, opposite 0.67 x of its length ; terminal sector of vein m 1 + 2 slightly curved, especially before its ending. Haltere brownish yellow ; of the 20 specimens before me, in four including 3 types haltere with distinct dark brown tinge. This darkening was not discernable at the time of original description and may be the result of preservation and hence is not considered a character of the species, though at least in one specimen it was distinctly infuscated even on the day of collection.

Legs : Fore coxa black ; mid and hind coxae and all trochanters yellow to brownish yellow ; all femora (except at the yellow bases especially of hind femur) and tibiae wholly black ; hind femur with stout black spines arranged in two rows of 8-9 each at the distal two-thirds ventrally and these form a crib into which fits in the slightly curved hind tibia ; tarsi yellow except the last three dark brown segments of fore and hind tarsi and the last two brown segments of middle tarsi ; in three specimens even hind femur wholly black and hind coxae also are entirely blackish brown.

Abdomen : Narrower than body ; three basal segments yellowish brown, the rest black to brownish black, with a few pale and numerous dark hairs ; in a few specimens even the basal segments with distinctly dark tinge.

Genitalia (Figs. 78-79) : Epandrium fairly broad, with distinct hairs ; distiphallus elongate, cylindrical along its entire length, ending with nearly circular, uneven apex ; pregonite medially with long hairs and posteriorly with curved cornus ; surstylus

short and slender ; cerci not developed. Female cerci short and very slender, with yellowish brown tinge.

Length :	Male	2.8 mm	Wing	2.46 mm
	Female	4.0 mm	Wing	2.70 mm

Material studied : Holotype, male, India : W. Bengal : Darjeeling, near Hima Falls, 2.iii.1973, Coll. H.S. Sharma. Paratypes, 3 males, 2 females, collection data same as of holotype.

Other specimens studied : 1 male, 1 female. Meghalaya : Kyrdumkhulai, 29.iii.1973, Coll. P.T. Cherian ; 1 male, Mizoram : Kolasib, alt. 1250 m., 8.iii.1979, Coll. P.T. Cherian ; 3 males, 7 females, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian ; 1 female, Tamil Nadu : Periyar Dist., Gathesal, 5.i.1990, Coll. P.T. Cherian.

This species is closely related to *spinipes* Becker but can be differentiated in having third pair of scutellar bristles on rather tuberculate projections and in the second costal sector being longer than the third.

Remarks : Though typically haltere, hind coxa and basal part of hind femur are yellow, in some specimens even hind coxa and whole of hind femur are black to brownish black and in those specimens even haltere shows signs of infuscation.

The darkening of haltere normally is an important character in separating species but in those of the types in which it is evident now, it was not discernable even two to three years after collection but seems to have developed through long preservation. At least in one specimen from Nangpo, collected in 1980, infuscation was however evident two days after collection. Maturity of the specimens might have contributed to the degree of darkening of hind coxae and whole of hind femora as also the haltere in some specimens as they are all identical in other characters. Hence I consider that all of them belong to the same species.

9. *Dactylothyrea spinulosa* de Meijere, (Figs. 80-83)

1916. *Dactylothyrea spinulosa* de Meijere, *Tijdschr Ent.*, 58 : 95. Type locality : Fort (1915) de Kock, Sumatra.

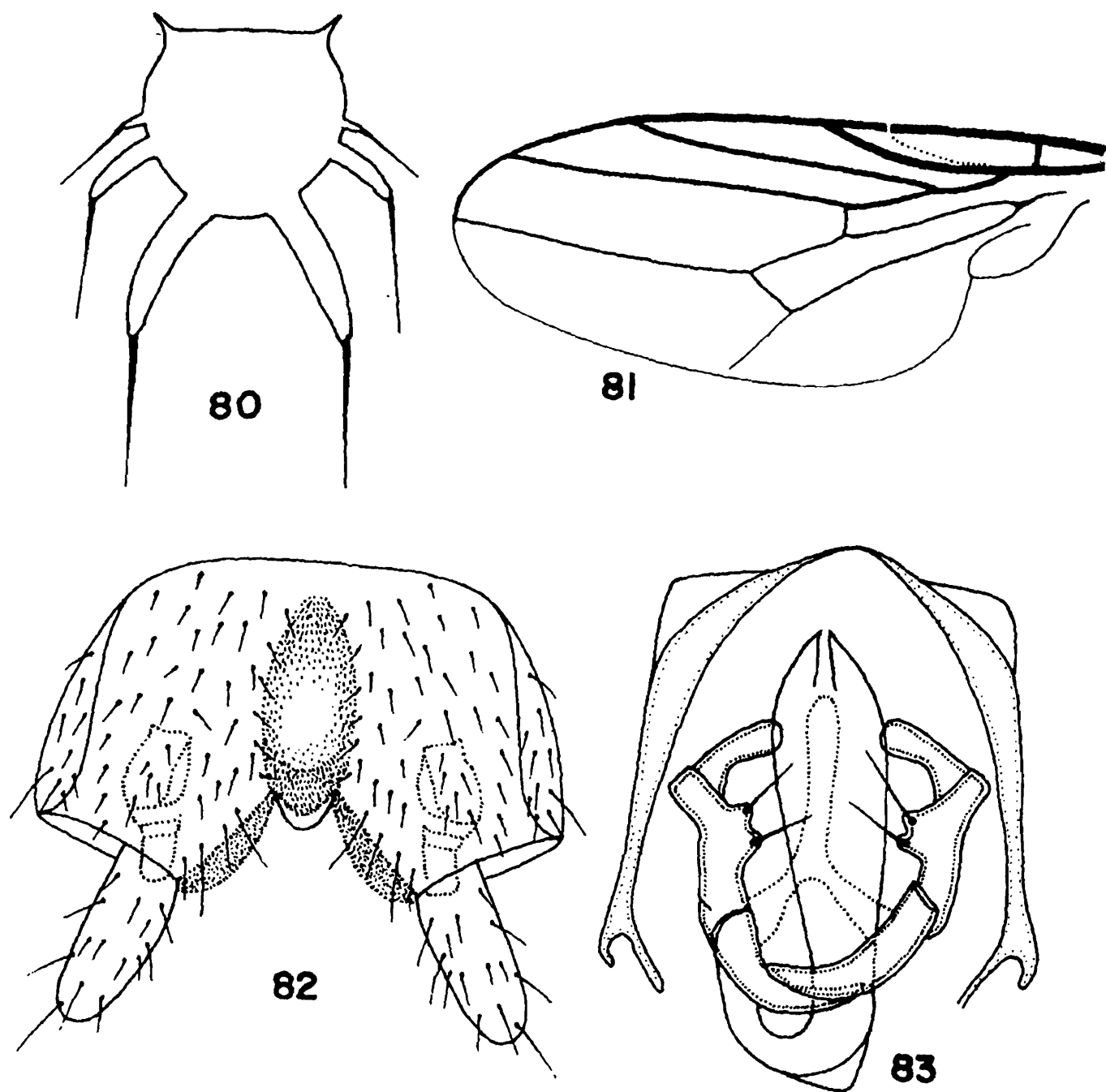
Male, Female : *Head* : Higher than long, length, height and width ratio 17 : 20 : 35. Frons subshiny black, width and length subequal, the former 0.43 x that of head, with a few, almost erect slender *fr* that are only slightly shorter than *if* ; frontal triangle large, smooth, shining black, reaching anterior margin of frons and ending

with nearly pointed apex. Face deeply concave, dull shiny black ; facial carina raised and triangular between antennae and reaching middle of face whence low and tapers off and do not reach lower facial margin which is thin and distinctly raised up and minutely grey tomentose. Antennae not erect ; ant 2 short, brown with yellowish tinge in some specimens ; ant 3 a trifle wider than long, yellowish brown in the lower half and with darkish tinge in upper half ; arista dark brown with very fine concolorous, dense pubescence. Gena one-fourth as wide as ant 3, grey tomentose in upper half ; vibrissal angle rather blunt, stopping much behind anterior margin of eye, with well developed oral vibrissae ; parafacialia not developed. Eye large, bare with vertical long axis. Proboscis and palpi short, the former distally and the latter almost wholly deeply brownish with dark tinge. Head bristles well developed, yellowish white except for the vertical bristles ; *out* and the cruciate *pvt* subequal ; *ivt* two-thirds as long as *pvt* ; *oc* proclinate, widely divergent, as long as but more slender than *ivt* ; *orb* about 8, recumbent, longest one two-thirds the *ivt* ; *if* in a row of about 7-8, slightly proclinate and turned inwards, almost as long as *orb*.

Thorax : Wholly black ; scutum a trifle narrower than head and almost as long as wide, with prominently convex disc bearing very dense, deeply punctate yellowish white hairs ; scutellum (Fig. 80) 1.2 x as long as wide, sharply demarcated from scutum, with greatly convex disc bearing hairs and punctae as on scutum ; *anepst* and *kepst* fairly densely white pubescent. Thoracic bristles well developed, black ; *h* 1, only a little shorter but much slender than *npl* ; *npl* 1+2, subequal and equal to *pa* 1 ; 1 *dc* 1.5 x as long as *npl*. Scutellar bristles borne on finger-like projections ; those at the base of *as* as long as the bristles and 0.8 x as long as scutellum ; *ss* 1 1.5 x as long as its basal projection, the latter half as long as the distal projection ; *ss* 2 three-fourths as long as *ss* 1, its basal projection rather tuberculate and one-third as long as *ss* 2.

Legs : Fore and hind coxae and all trochanters yellow ; midcoxa black ; tibiae almost wholly and femora, but for the yellow area basally, black ; tarsi yellow except for the dark brown three distal segments of each leg, of these the distal hind tarsal segments nearly black ; hind femur distinctly thickened, length 4 x its own greatest breadth and with well developed 8-9 black spines arranged in the distal half on the anteroventral and posteroventral surfaces, forming a crib into which fits in the bowed tibia ; hind tibia with a short, terminal, black, slightly curved spine.

Wing : (Fig. 81) : Much shorter than body, hyaline with brown veins ; costal sectors 2 to 4 in the ratio 10 : 6 : 3 ; r-m cross-vein greatly distad of the middle of discal cell, opposite 0.62 of its length ; terminal sectors of veins r 4+5 and m 1+2 prominently converging distally than in *spinipes* Becker ; anal area of wing moderately developed. Haltere yellow, in some specimens stalk with brown tinge.



Figs. 80-83 : *Dactylothyrea spinulosa* de Meijere. 80, Scutellum. 81, Wing. 82, Epandrium, ventral view. 83, Phallic complex, ventral view.

Abdomen : Short, suboval, brownish black but for the brownish yellow three basal segments. Female cerci short and slender. Male genitalia (Figs. 82-83) much similar to that of *infumata* but distiphallus very long, slender basally and gradually broadening before tapering off and ending with bifid, pointed apex ; surstylus broader than in *infumata* ; pregonites club-shaped posteriorly, distally broad and that of two sides overlapping ; short but distinct mesolobus present.

Length :	Male	2.6 mm.	Wing	2.2 mm.
	Female	3.0 mm.	Wing	2.5 mm

Specimens examined : 1 female, Mizoram : Kolasib, 8.iii.1979, Coll. P.T. Cherian ; 5 males, 4 females, Meghalaya : Nangpo, 18.iv.1980, Coll P.T. Cherian.

D. spinulosa keys near *spinipes* Becker, but unlike in the latter species, it has yellow fore coxae and three pairs of finger-shaped projections on scutellum. Besides, in *spinulosa* second sector of costa is much longer than the third sector and terminal sectors of veins r 4+5 and m 1+2 are distinctly convergent distally.

Distribution : Sumatra : Fort de Kock ; India : Mizoram, Meghalaya.

Genus 4 *Rhodesiella* Adams

1864. *Macrostyla* Lioy, *Atti. 1st. Veneto Sci.*, (3) 9 : 1126. Type species : *Macrostyla plumiger* (Meigen) (= *Chlorops plumiger* Meigen). By monotypy. Preoccupied by *Macrostyla* Winnertz, 1846.
1905. *Rhodesiella* Adams, *Kansas Univ. Sci. Bull.*, 3 : 197. Type species : *Rhodesiella tarsalis* Adams. By original designation and monotypy.
1908. *Meroscinis* de Meijere, *Tijdschr. Ent.*, 51 : 172. Type species : *Meroscinis scutellata* de Meijere. By monotypy.
1911. *Prionoscelus* Becker, *Ann. hist. nat. Mus. natn. Hung.*, 9 : 99. Type species : *Prionoscelus magnus* Becker. By designation of Sabrosky, 1941.
1918. *Lonchonotus* Lamb, *Ann. Mag. nat. Hist.*, (9) 1 : 337. Type species : *Lonchonotus formosus* Lamb. By original designation and monotypy. Subgenus on authority of Sabrosky, 1951.
1933. *Aspistyla* Duda, In *Lindner Fliegen palaerkt. Reg.*, Fam. 61, Lfg. 72 : 224. (new name for *Macrostyla* Lioy, 1864). Type species *Chlorops plumiger* Meigen. Automatic.

Medium to large, 1.5 – 5 mm, black species with large rounded, naked eyes, hairy arista and prolonged scutellum.

Head usually higher than long with long yellow or black hairs and bristles. Frons slightly projecting, shiny or subshiny with a few *fr* ; frontal triangle large, usually almost as wide as frons at vertex with slightly convex, straight or concave side margins, pointed, obtuse or almost truncate anterior margin and smooth shiny black, blue or green metallic lusture. Eye large, bare, very rarely with minute, scattered pubescence, rounded oval with vertical to slightly oblique long axis. Gena narrow to linear, with one row of hairs ; parafacialia not developed. Face usually narrow, flat or concave, shiny black to brownish black ; facial carina usually not developed ; lower facial margin slightly to distinctly raised. Antenna yellow, black or dark brown ; ant 2 shorter than ant 3, the latter usually wider than long, sometimes rounded, with fine pubescence ; arista long, slender, dark, rarely yellow with long rather dense hairs. Proboscis short or of medium size ; palpi short, cylindrical. Head bristles well developed ; *out* long to very long ; *ivt* shorter than *out* ; *orb* 6-15, reclinate, sequentially anterior ones becoming shorter and weaker, longest usually about two-thirds the *out* ; *oc* long, proclinate, widely divergent ; *pvt* cruciate, equal to *out* or a little shorter ; *if* in a row outside frontal triangle, along each lateral margin ; a few species with a tuft of black, white or yellow hairs on the ocellar triangle ; oral vibrissae moderately developed.

Thorax shiny black but rarely dark brown with dark or yellow hairs and bristles. Scutum generally convex, very rarely slightly flattened, relatively wide, with dense, usually long, evenly distributed hairs arising from coarse to very coarse granulae or stellate punctae. Pleural region glabrous with distinct hairs on *anepst* and *kepst*. Scutellum triangular or subtriangular, flat or greatly or slightly convex, pubescent like but usually more coarsely punctate than scutum. Thoracic bristles fairly long ; *h* 1, very rarely 2, slender, shorter than *out* ; *npl* 0+1 or 1+1, subequal ; *pa* 1 usually longer than and *pa* 2, when distinct, shorter than *npl* ; 1 *dc* shorter than *npl* ; scutellar bristles borne on large or small tubercles or prominent warts ; *as* shorter than, equal to or longer than scutellum ; *ss* 1-3, exhibiting various ranges of development.

Wing rather short and broad with well developed and rarely slightly reduced anal angle ; some of the veins exhibit modifications especially among some not well defined groups of species within the genus, thus terminal sector of *m* 1+2 may be slightly or strongly concave basally or even straight along its entire length, posterior marginal cell may or may not be uncommonly expanded and vein *r* 4+5 be straight or concave above apically ; *m-m* cross-vein more or less oblique ; discal cell fairly narrow. Haltere yellow, dark brown or black.

Legs short, wholly or partly yellow or mostly black or dark brown ; hind femur sometimes slightly or greatly thickened and in some species with thick black hairs or spines along its anteroventral and posteroventral surfaces forming a crib into which

fits in the bowed tibia ; tibial organ not developed. Some species with 2-5 very conspicuous tuberculate spinous structures near base of hind femur which may probably be sensory in function and some species with a group of warts in an oval area a little beyond base.

Abdomen short and broad to narrow and elongated, black or partly yellow, sparsely tomentose and with pale or black hairs. Female cerci usually slender. Male genitalia sometimes very large but mostly of medium size ; epandrium oval with terminal surstyli ; pregonites usually with stout bristles ; postgonites generally apically incurved and hook-like ; distiphallus long and often swollen in the middle ; phallapodeme with broadened dorsal plate.

Distribution : This genus is widely distributed in all the faunal regions though it is more abundant in the Oriental and Afrotropical Regions.

Remarks : The nature of frontal triangle, number of *orb*, nature of eye and antennal segments, wing venation, relative thickness of hind femur, curvature of hind tibia, length, shape of convexity of scutellum, size and arrangement of scutellar bristles and tubercles, relative size and length of abdomen and size and development of male genitalia exhibit a wide range in development in different species.

Becker (1911) in his paper on Indo-Australian Chloropidae recognized three groups in this genus and later Malloch (1931) also almost accepted Becker's definitions. Thus there are species with elongate subtriangular scutellum, fairly large scutellar tubercles, short 1 *dc* and partly or wholly black femora and tibiae representing the *scutellata* group, those possessing elongate triangular scutellum, prominent scutellar tubercles, frontal triangle often with pimple-like projections, wholly yellow femora and tibiae and short 1 *dc* forming the *elegantula* group and others having short convex scutellum that is often rounded in outline, small scutellar tubercles or warts, large 1 *dc*, partly or wholly yellow legs and terminally greatly curved last sector of vein *r* 4+5 comprising the *tibiella* group. To this group was added another by Cherian (1977) comprising members of *Lonchonotus* Lamb, which Sabrosky (1951) relegated to the status of a subgenus of *Rhodesiella*, with very large scutellar tubercles, long and narrow abdomen and large male genitalia. The male genitalia of many of the species of *Rhodesiella* were not described earlier. Those known included that of only three of the species of the *tibiella* group. On the basis of the study of the male genitalia of many known and new species it is felt that *tibiella* group is a distinctive one because apart from other characters enumerated above, in the case of all the species of this group, the male genitalia of which are so far known, the distiphallus is greatly elongated, arched or bent, relatively slender and almost uniformly thickened, postgonites are usually with sclerotized processes and the build of the hypandrium is also very different from that of the rest of the species of *Rhodesiella*. Therefore the species of the *tibiella* group are

separated here and along with some new species described in this volume are included in a new genus *Neorhodesiella*.

As for the remaining three groups, whatever be the character or combination of characters taken there are intermediate forms which render drawing of definite limits practically impossible. Members of all the three groups are represented in the collections and are dealt with here. The general characters of *Rhodesiella* described above pertain to the species retained in the genus after those of *Neorhodesiella* have been separated.

Sabrosky (1977) considered *Euthyridium* Frey and *Tachinoceros* de Meijere congeneric with *Rhodesiella*. All the three have many similarities but because of the distinctive nature of some of their characters enumerated under these genera, they are considered different from *Rhodesiella*.

Habits and habitats : Species of *Rhodesiella* are very common in any general collecting. They usually rest or move about in a characteristic manner on the lower surfaces (rarely on the upper surfaces also) of leaves of shrubs and are generally shade loving. Some species occupy leaves upto 4-5m above the ground and a few occur on the inflorescence of banana plants. A few species can be collected by sweeping grass and other annuals. Generally most of the species are rather lethargic in their movements.

Distribution : Though world wide in distribution, the genus attains its greatest development and species diversity in the Oriental Region, followed by the Afrotropical. 55 species are so far known from the Oriental Region of which 19 have been reported from India and another 5 from adjacent countries. Of these 10 known from the Oriental Region, including 5 from India and one from Sri Lanka, belong to the new genus *Neorhodesiella*. 53 species are described here of which 32 are new and 12 hitherto known only by the types are recorded for the first time since they were originally described.

Three species namely, *quadriseta* (de Meijere), *indica* Cherian and *yamagishii* Kanmiya are considered here synonyms of *elegantula* (Becker), *nitidifrons* (Becker) and *hirtimana* (Malloch) respectively. Specimens of *ceylonica* (Frey), *nana* (Duda) and *planiscutellata* (Lamb) were not available for study and hence a free translation of the original descriptions of the first two and the original description of the last one are reproduced here, to make available under one cover all the information on the species so far known from the area under study.

In the following key 52 species are dealt with. Of these 50 are based on the study of identified specimens, including mostly types, while *nana* (Duda) and *planiscutellata*

(Lamb) have been placed on the basis of information available, including the original description. *R. ceylonica* (Frey) has been excluded due to paucity of information on some important characters.

Key to the species of *Rhodesiella* from India and adjacent countries

1. Frontal triangle without pimple-like elevation or sulcus ; knob of haltere black, brownish black or yellow ; legs predominantly black or brownish black but at times mostly yellow 2
 Frontal triangle with pimple-like elevation at center or two-thirds its length from vertex margin and often with one or more sulci and rarely with impressed lines ; knob of haltere usually yellow, if rarely blackish brown frontal triangle without sulcus and surstylus not developed ; femora and tibiae yellow, only the tarsi sometimes in part infuscated (if very rarely mid and hind femora partly brownish black, frontal triangle with six small and one large depression) ...48
2. Antenna wholly black.....3
 Ant 3 yellow or brownish yellow 4
3. Frontal triangle greenish blue ; thorax and abdomen with white hairs ; only 1 ss present ; r-m cross-vein proximad of the middle of discal cell, opposite 0.43 of its length ; proportions of costal sectors 2-4 in the ratio 10 : 14 : 9*trispinosa*, sp.n.
 Frontal triangle bluish black ; thorax and abdomen with black hairs ; 2 ss present ; r-m cross-vein in the middle of discal cell ; proportions of costal sectors 2-4 in the ratio 12 : 17 : 7*nepalensis*, sp.n.
4. Frontal triangle partly very finely pubescent ; *orb* 15 ; scutellum 2 x as long as wide at base and cylindrical distally*numeralis*, sp.n.
 Frontal triangle not pubescent ; *orb* not more than 13, scutellum atmost 1.6 x as long as wide at base and not cylindrical distally 5
5. *ant* 3 greatly flattened, large 1.75 x as wide as long ; arista almost terminal, originating from anterodorsal angle of ant 3 ; coxae, trochanters, hind femur, mid tibia and all tarsi entirely and fore and mid femora, except for part of their distal halves, yellow ; fore and hind tibiae predominantly black
*terminalis*, sp.n.
ant 3 normally developed, atmost 1.4 x as wide as long ; arista dorsal ; legs without the above combination of colouration 6
6. Knob of haltere black or brownish black.....7
 Knob of haltere yellowish white, yellow or brownish yellow.....28

7. Basal antennal segments black or brownish black.....8
 Antenna wholly yellow, atmost dark brown along dorsodistal margin.....21
8. Last three or four fore tarsal segments fuscous, one or two basal segments yellow or brownish yellow.....9
 Last two fore tarsal segments fuscous, three basal segments yellow or brownish yellow.....14
9. Last four fore tarsi and last two of mid and hind legs dark brown, rest of the tarsal segments yellow or brownish yellow.....10
 Last three fore tarsi and last one of mid and hind legs dark brown, rest of the tarsal segments yellow or brownish yellow.....11
10. Frontal triangle of medium size, shiny black with violet blue tinge and ending with nearly pointed to obtuse apex; eye with vertical long axis; *orb* 6; second sector of costa shorter than the third sector; r-m cross-vein in the middle or slightly distad of the middle of discal cell; terminal sector of m 1+2 greatly convex above a little beyond base*manipurensis* Cherian
 Frontal triangle large, occupying much of the area of frons, shiny bluish green, broadly truncate at apex and subtrapezoidal in outline; eye with oblique long axis; *orb* 9; second sector of costa equal to the third sector; r-m cross-vein proximad of the middle of discal cell, opposite 0.42 of its length; terminal sector of m 1+2 only very slightly convex above a little beyond base.....*proxima*, sp.n.
11. Frontal triangle shiny black with purple blue tinge and ending with broadly obtuse apex; *orb* 6; r-m cross-vein almost in the middle of the discal cell; fore tibia yellow and only brownish in the middle.....*sabroskyi* Cherian
 Frontal triangle violet, violet blue or dark blue and ending with truncate to widely truncate apex; *orb* 8; r-m cross-vein proximad of middle of discal cell, opposite 0.37-0.45 of its length; fore tibia black or brownish black, atmost yellow at distal end.....12
12. Fore tibia becoming thickened distally and with long black hairs; mid tibial spine in male as long as first tarsus of mid leg and becoming hair-like apically; all fore tarsi with prominent and last two tarsi each of mid and hind legs with a few erect black hairs; 2 ss present.....*hirtimana* (Malloch)
 Fore tibia normal, not thickened distally and without long black hairs as above; mid tibial spine in both sexes half or less than half as long as first tarsus of mid leg; tarsi with normal hairs; only 1 ss present.....13

13. Hind femur not thickened in both the sexes and without denticles on the ventral aspect ; terminal sector of m 1+2 only slightly convex above a little beyond base, is 2.7 x as long as the penultimate sector and straight along its length beyond the flexure.....*triinfuscata*, sp.n.

Hind femur in male thickened, with dense denticles ventrally in the distal half in both the sexes ; terminal sector of m 1+2 greatly convex above a little beyond base, is only 2.2 x as long as the penultimate sector and slightly sinuate along its entire length.....*normalis* (Malloch)

14. 2-3 pairs of ss present 15

Only 1 pair of ss present..... 16

15. Scutellum greatly convex with sloping sides ; hind femur greatly thickened in female, one-third as wide as long with dense, well developed denticles on ventral aspect ; a weak ss 3 at times present.....*janabilensis*, sp. n.

Scutellum less convex and with nearly sharp lateral margins ; hind femur in both sexes very slightly thickened, about one-fourth as wide as long, with very fine denticles on ventral aspect ; ss 3 not present.....*quinguaginoso*, sp. n.

16. Frontal triangle narrowly obtuse at apex ; terminal sector of m 1+2 only slightly convex above a little beyond base ; third sector of costa 1.2-1.37 x as long as the second ; ss 1, 0.35-0.4 x as long as *as*.....*achala*, sp.n.

Frontal triangle broadly obtuse to truncate at apex ; terminal sector of m 1+2 greatly convex above a little beyond base ; third sector of costa 1.6-2.5 x as long as *as* or shorter..... 17

17. Frontal triangle bluish green ; *orb* 11-12 ; hind femur 4 x as long as wide in male ; male genitalia with hypandrium abruptly narrowing towards base where it is subtriangular.....*luteoterminalis*, sp.n.

Frontal triangle black, steel blue, purple or dark blue ; *orb* 8-9 ; hind femur about 3 x as long as wide in male (if less thickened, surstylus long and slender) ; male genitalia not as above..... 18

18. Hind femur in male 3.8-4.0 x as long as wide ; knob of haltere partly yellowish brown ; surstylus narrow, elongated, pointed at apex and that of two sides overlapping each other apically ; epandrium as in fig 142.....*longistyli*, sp. n.

Hind femur in male about 3 x as long as wide ; knob of haltere wholly dark brown to brownish black ; surstyli and epandrium not as above..... 19

19. Frontal triangle very large and very broadly truncate at apex ; hind femur in female less thickened than in male ; male genitalia as in figs. 127-128.....*scutellata* (de Meijere)
- Frontal triangle less large, broadly obtuse to subtruncate at apex ; hind femur in both sexes greatly thickened ; male genitalia not as above 20
20. Frontal triangle predominantly dark blue and broadly obtuse at apex ; male genitalia as in figs. 132-133.....*lobulata* Cherian
- Frontal triangle predominantly black, subtruncate at apex ; male genitalia as in figs. 137-138*narendrani* Cherian
21. Second sector of costa equal to or longer than the third sector ; 2 ss present.....22
- Second sector of costa shorter than the third sector ; only 1 ss present.....24
22. Second sector of costa equal to the third sector ; trochanters and fore and mid tibiae wholly, femora, but for brownish black two-thirds their lengths basally, and hind tibia except for broad blackish brown median part, yellow.....*amnoni*, sp. n.
- Second sector of costa longer than the third sector ; trochanters and femora wholly and all tibiae entirely or predominantly black to brownish black.....23
23. Head as long as high ; long axis of eye oblique ; tibiae black, atmost with yellow tinge at the apical ends of fore and mid tibiae ; mid tibial spine black.....*foveata* (Lamb)
- Head higher than long ; long axis of eye vertical ; tibiae brownish black except for brownish yellow bases of fore and mid tibiae and distal one-third of fore, distal one-fourth of mid and apex of hind tibiae ; mid tibial spine yellow.....*nangpoensis*, sp. n.
24. Frontal triangle greenish blue ; terminal section of m 1+2 strongly convex above a little beyond base ; arista relatively short ; fourth and fifth segments of fore tarsi and apical one of mid and hind tarsi fuscous, the rest of the tarsal segments yellow.....*elagiriensis*, sp. n.
- Frontal triangle black or bluish black ; terminal section of m 1+2 straight or very slightly convex above a little beyond base ; arista normally developed ; all tarsi yellow or last tarsus of one or all legs partly or wholly brownish 25
25. Fore tibia entirely yellow.....26
- Fore tibia broadly in the middle black or brownish black.....27

26. Frontal triangle very broadly obtuse at apex ; mid and hind tibiae predominantly brownish black ; r-m cross-vein nearly in the middle of discal cell*nitidifrons* (Becker)
- Frontal triangle very narrowly obtuse at apex ; mid tibia entirely and hind tibia, but for slight infuscation in the middle, yellow ; r-m crossvein proximad of the middle of discal cell, opposite 0.45 of its length.....*intermedia*, sp. n.
27. Frontal triangle shiny black with broadly obtuse apex ; r-m cross-vein proximad of the middle of discal cell, third sector of costa only 1.5 x as long as the fourth sector ; ss 1, 0.4 x as long as *as**mirae*, sp. n.
- Frontal triangle bluish black, with pointed apex ; r-m cross-vein in the middle of discal cell ; third sector of costa 2.2 x as long as the fourth ; ss 1 together with its tubercle 0.2 x as long as *as*.....*kodayarensis*, sp. n.
28. Atleast femora wholly or predominantly black or brownish black.....29
- Legs predominantly yellow, atmost some tarsi and very rarely fore and hind tibiae blackish brown 39
29. Hind femur extraordinarily thickened with a row each of well developed black spines along anteroventral and posteroventral margins in the distal half and a little beyond forming a crib, into which the greatly bowed hind tibia fits 30
- Hind femur not thickened, if very rarely somewhat thickened, not with row of spines along anteroventral and posteroventral margins though with denticulate hairs ventrally.....34
30. Head greatly sloping ; ant 3 longer than wide ; ocellar triangle with a tuft of white hairs ; head and thoracic bristles white to whitish yellow ; r-m cross-vein distad of the middle of discal cell, opposite 0.65 of its length ; ss 1 well developed, 0.6 x as long as *as**sanctijohani* Cherian
- Head normally sloping ; ant 3 longer than wide ; ocellar triangle without tuft of hairs ; head and thoracic bristles black ; r-m cross-vein in the middle or almost in the middle of discal cell ; ss 1 usually absent, when present not more than 0.25 x the length of *as* 31
31. Fore tibia blackish to blackish brown but for yellow base and one-third its length distally 32
- Fore tibia entirely yellow.....33
32. Two humeral bristles present ; abdominal hairs white.....*bihumeralis*, sp.n.
- Only one humeral bristle present ; abdominal hairs dark brown to black.....*travancorensis*, sp. n.

33. ss 1 present, 0.25 x as long as *as*, borne on small tubercle....*mizoramensis*, sp. n.
 ss 1 absent.....*himalayensis* Cherian
34. Frontal triangle purple ; hind femur thickened with two spines near base and fine denticles mostly in the distal half ventrally ; three fore tarsal segments infuscated ; second sector of costa 0.5 x the third sector ; terminal sector of m 1+2 prominently convex above a little beyond base.....*quadrilineata*, sp. n.
 Frontal triangle blue or black ; hind femur not thickened and without spines and denticles ventrally ; atmost apical fore tarsus infuscated ; second sector of costa equal to or longer than the third sector ; terminal sector of m 1+2 straight or only very slightly covex above a little beyond base..... 35
35. Lower facial margin greatly projecting, subtriangular in outline ; *h* 2, outer one a little shorter than the inner ; *if* much shorter and slender than *orb* ; legs short and stumpy ; scutellum large, greatly sloping.....*brevipedalis*, sp. n.
 Lower facial margin not greatly projecting, straight or slightly convex in outline ; only 1 *h* present ; *if* normally developed ; legs not short and stumpy ; scutellum moderately developed, not greatly sloping..... 36
36. Frontal triangle slightly rounded or obtuse at apex ; r-m cross-vein in the middle of discal cell ; thoracic hairs brown or black ; tarsi yellow..... 37
 Frontal triangle truncate or subtruncate apically ; r-m cross-vein distad of the middle of discal cell ; thoracic hairs white or whitish yellow ; last tarsus of each leg partly brownish..... 38
37. Scutellum subtrapezoidal, with flattened disc ; scutellar bristles borne on small tubercles ; all tibiae broadly infuscated leaving base and tip orange ; wing with yellow veins.....*planiscutellata* (Lamb)
 Scutellum triangular, with arched disc ; scutellar bristles not borne on tubercles ; fore tibia yellow ; wing with brown veins.....*nana* (Duda)
38. Frontal triangle with two small depressions, one on each side, and one large one in front of ocellar triangle ; gena about one-third as wide as ant 3 ; two pairs of ss present.....*bhutanensis* Cherian
 Frontal triangle without depressions ; gena sublinear ; only one pair of ss present*kholaensis* Cherian

39. Frontal triangle slightly obcampanulate with small, short depression a little behind apex ; only 1 ss present.....*obcampanulata*, sp. n.
 Fronal triangle normally developed, without depression a little behind apex ; 2 ss present.....40
40. Atleast fore or hind tibia wholly or predominantly dark to blackish brown....41
 All tibiae yellow 42
41. Frontal triangle very narrow, reaching only three-fourths length of frons and ending with nearly pointed apex ; fore and hind tibiae and fore tarsi blackish brown ; hind femur not thickened ; r-m cross-vein slightly distad of the middle of discal cell ; scutellum with convex disc*meghalayensis*, sp. n.
 Frontal triangle normally developed, reaching anterior margin of frons and ending with broadly obtuse to almost subtruncate apex ; fore tibia and fore tarsi predominantly dark brown ; hind tibia yellow ; hind femur distinctly thickened and with a row each of 10-15 denticulate hairs along its anteroventral and posteroventral margins ; r-m cross-vein almost in the middle of discal cell ; scutellum with flattened disc*kalinga* Cherian
42. Head bristles very slender but for extraordinarily developed *out* ; thoracic pubescence very short and slender.....43
 Head bristles normally developed ; *out* only slightly longer than other head bristles as is usual for the genus ; thoracic pubescence normal.....44
43. *out* more than 3 x as long as *ivt* or *pvt* ; ss 1 nearer to ss 2 than to *as* ; scutum moderately and scutellum very coarsely punctate, the latter with very convex disc ; arista basally yellow, distally dark brown, length more than 2 x that of antennal segments.....*brevipilosa*, sp. n.
out 1.5 x as long as *pvt* and 2 x as long as *ivt* ; ss 1 nearer to *as* than to ss 2 ; scutum finely and scutellum less densely and coarsely punctate, the latter with less convex disc ; arista uniformly dark brown, less than 2 x as long as antennal segments.....*deciorbitalis*, sp. n.
44. Second sector of costa distinctly shorter than the third sector.....45
 Second sector of costa distinctly longer than the third sector 46
45. Abdomen as long as wide, suboval in outline ; three basal abdominal segments brownish yellow ; r-m cross-vein in the middle of discal cell....*lungleiensis*, sp.n.
 Abdomen longer than wide, conspicuously narrowing distally ; only two basal abdominal segments brownish yellow ; r-m cross-vein distad of the middle of discal cell*khasiensis*, sp. n.

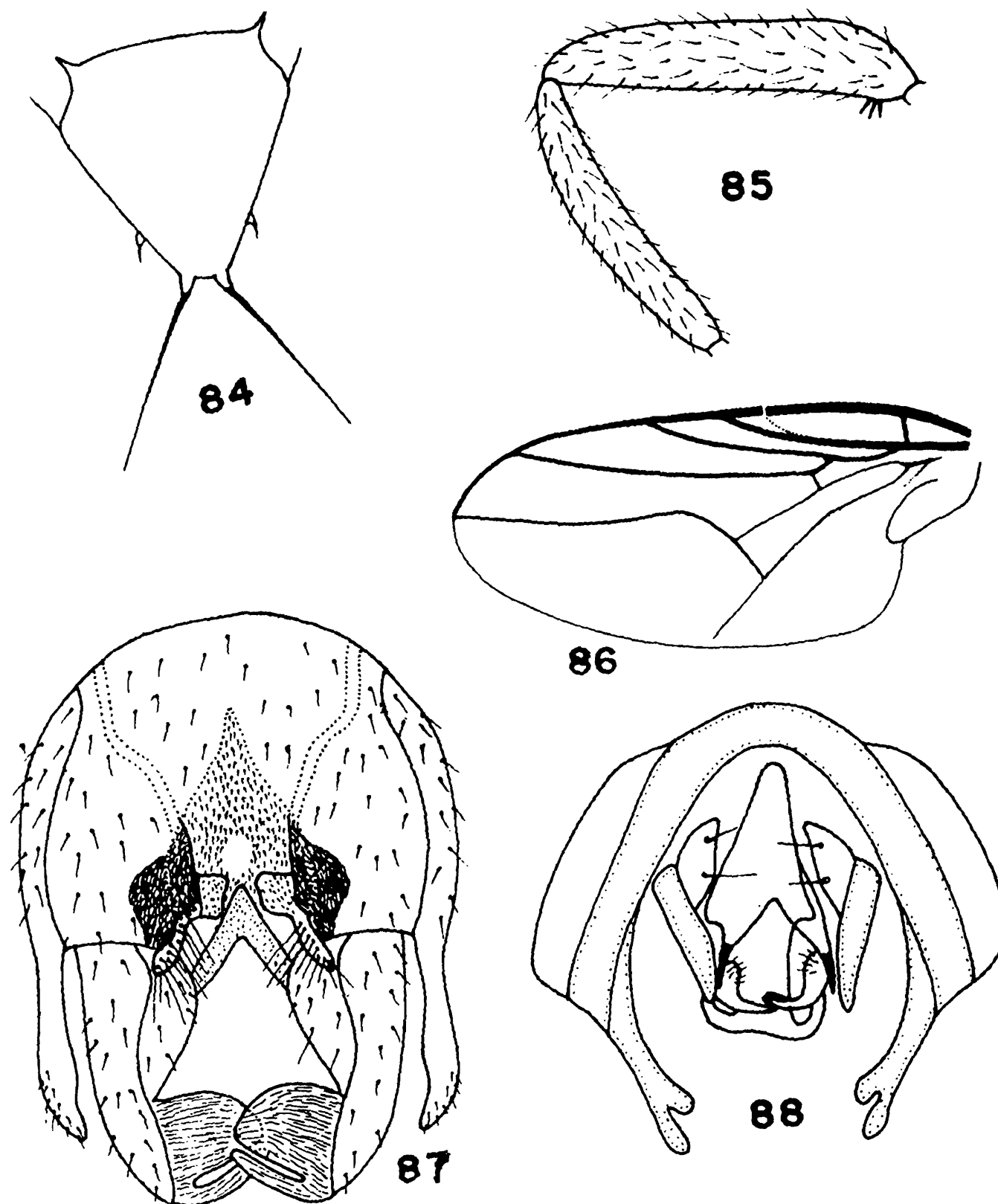
46. Frons brownish yellow in front and dark brown behind ; legs long and very slender ; last three tarsi of fore leg and distal part of first and whole of second and fifth tarsi of hind leg dark brown*rubrofrontata*, sp. n.
Frons dark brown ; legs not very slender ; atmost last tarsus of hind leg dark brown.....47
47. Frontal triangle pointed at apex ; ant 3 longer than wide ; legs including all tarsi yellow ; disc of scutellum more or less flattened*sahyadriensis*, sp. n.
Frontal triangle with broadly obtuse apex ; ant 3 wider than long ; last tarsus of hind leg dark brown ; disc of scutellum greatly convex*manii* Cherian
48. Knob of haltere blackish brown ; *as* relatively approximated at base ; *ss* 1 very short or almost indistinct*dimidiata* (Becker)
Haltere yellow ; *as* not approximated at base ; *ss* 1 distinct, 0.2–0.5 x as long as *as* 49
49. Frontal triangle with seven small, rounded or oval depressions in the anterior half, one medially in front of pimple-like elevation and three each inner to lateral margins ; mid and hind coxae and femora predominantly brownish black*depressa*, sp. n.
Frontal triangle without rounded depressions along lateral margin in anterior half though at times with irregular elevations on surface and several impressed lines ; hind coxae and femora yellow or predominantly yellow.....50
50. Frontal triangle irregularly elevated in some areas with broad shallow sulcus on each side of ocelli and a deep, somewhat interrupted, impressed longitudinal line extending from in front of anterior ocellus to anterior margin ; two apical fore tarsi black*orientalis*, sp. n.
Frontal triangle smooth, not irregularly elevated and without impressed lines ; fore tarsi wholly yellow or apical one or two segments with brown tinge or apical four segments black 51
51. Frontal triangle glossy blue black, without depression in front of pimple-like elevation ; apical four fore tarsal segments black.....*nigrimana* (Malloch)
Frontal triangle metallic blue green or violet blue, with an oval depression in front of pimple-like elevation ; fore tarsi yellow or atmost apical one or two segments with brown tinge.....*elegantula* (Becker)

10. *Rhodesiella trispinosa*, sp. nov. (Figs. 84-88)

Male, Female : Head : Higher than long, length, height and width ratio 15 : 17 : 24. Frons black, anteriorly becoming narrower, projecting above but not beyond margin of eye, maximum width 0.85 x its own length and 0.42 x the width of head ; frontal triangle large, glabrous, shiny greenish blue, subtrapezoidal and reaching anterior margin of frons. Face much narrower than anterior part of frons, shiny black, slightly concave, surface rather uneven ; facial carina indistinct, limited to area between antennal bases ; lower facial margin dark tomentose. Antenna completely black, erect ; ant 2 distally almost as wide as ant 3, the latter 0.6 x as long as wide ; basal arisal segments slightly thickened, arista of medium size, slender, black with well developed, fairly dense, black pubescence. Eye very large, occupying much of the area of head in profile, bare, with vertical long axis. Gena linear, almost inconspicuous, black, with well developed oral vibrissa ; postgena black, with a few slender black hairs of which a few posteriorly in a row in continuation of short, fine, postocular row of setae which around *out* are more developed. Proboscis of medium size, black but for dark to deeply brownish distal part ; palpi short, black. Head bristles black, of medium size ; *out* a little longer than the convergent *pvt* ; *ivt* three-fourths as long as *out* ; *oc* proclinate, 0.8 x the *out* ; *orb* 10, recumbent, anterior most two very fine, longest about half the *out* ; *if* 8-9, in a row outside the triangle along each lateral margin, posterior ones less developed.

Thorax : Wholly shiny black. Scutum almost as long as wide and as wide as head, with convex disc bearing densely and finely punctate, well developed white hairs ; humeral callus well developed ; scutellum (Fig. 84) triangular, 1.3 x as long as wide, with flattened disc which is white pubescent like but more coarsely punctate than scutum. Pleura wholly shiny ; *anepst* with many and *kepst* in the upper half with a few and near lower margin with many short, slender white hairs. Thoracic bristles pale yellow or black ; *h* 1, very slender, pale yellow ; *npl* 1+1, anterior one slender, a trifle longer than *h*, posterior one black, as long as but slightly stouter than the anterior ; *pa* 1 black, 1.5 x as long as and stouter than posterior *npl* ; *pa* 2 hair-like ; 1 *dc* pale yellow, a little shorter than anterior *npl* ; *as* black, 0.9 x as long as scutellum, borne on short tubercle ; *ss* 1 black, only a little longer than the fine tubercle on which it is borne, length together with that of its tubercle 0.15 x that of *as*.

Wing (Fig. 86) : 2.4 x as long as wide, in male nearly as long as body, hyaline with yellowish brown veins ; costal sectors 2 to 4 in the ratio 10 : 14 : 9 ; terminal sectors of veins *r* 2+3 and *r* 4+5 curving anteriorly toward costa distally ; terminal sector of *m* 1+2 greatly convex above basally as in *scutellata* (Becker) and distally this and that of *r* 4+5 greatly diverging ; *r-m* cross vein proximad of the middle of discal cell, opposite 0.43 of its length ; anal angle fairly well developed. Stalk of haltere deeply brownish, knob black.



Figs. 84-88 : *Rhodesiella trispinosa*, sp. n. 84, Scutellum, 85, Hind femur, male. 86, Wing. 87, Epandrium, dorsal view. 88, Phallic complex, dorsal view.

Legs : Slender with fairly dense white hairs ; all coxae, trochanters and femora shiny brownish black ; all tibiae, except for their brownish yellow distal ends, brownish black ; hind femur (Fig. 85) not swollen, with 2-3 black spines ventrally near base in males ; mid tibia with 3-5 long erect hairs in a row middorsally of which 2-3 more prominent and with long white apical spur which is a little less than half the length of first tarsal segment of middle leg ; all tarsi brownish yellow except for deeply infuscated three last segments of fore and last segment each of mid and hind legs.

Abdomen : Shiny black, much broader than long and as broad as thorax, with fairly dense, slender white hairs. Female cerci slender, of medium size, brownish black with slender hairs of which 2-4 a little longer. Male genitalia (Figs. 87-88) fairly large in comparison to size of abdomen, with numerous white hairs ; epandrium wider than long, laterodistal end produced in the form of a long, slender lobe ; surstylus greatly developed, distally divided into a large and a small lobe ; hypandrium widened laterally and suborbicular at basal end ; postgonite rather short, hook-like ; distiphallus only 2 x as long as wide in the middle, uniformly thickened along two-fifths its length, whence it widens abruptly and gradually narrows towards distal end.

Length : Male 2.2 mm, wing 2.1 mm, female 2.3 mm, wing 2.1 mm

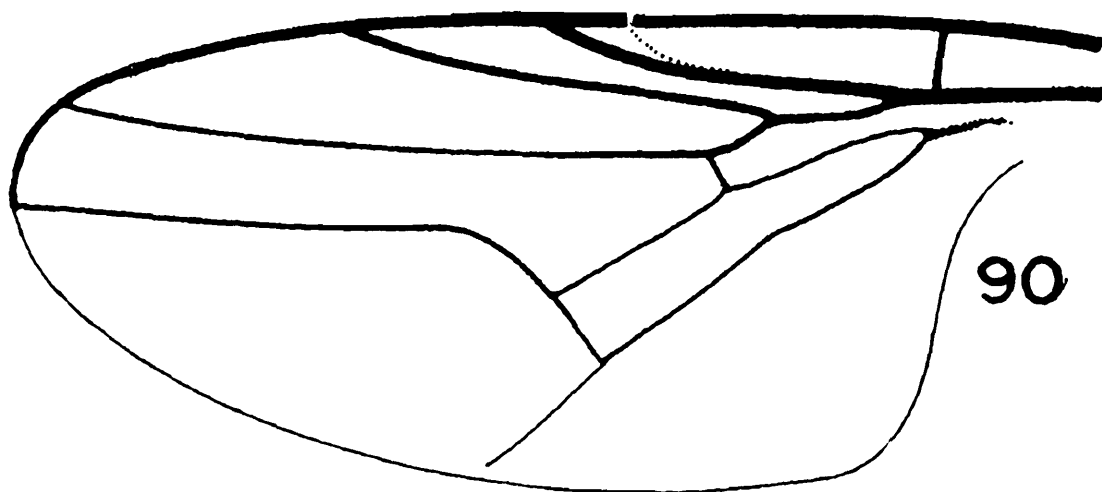
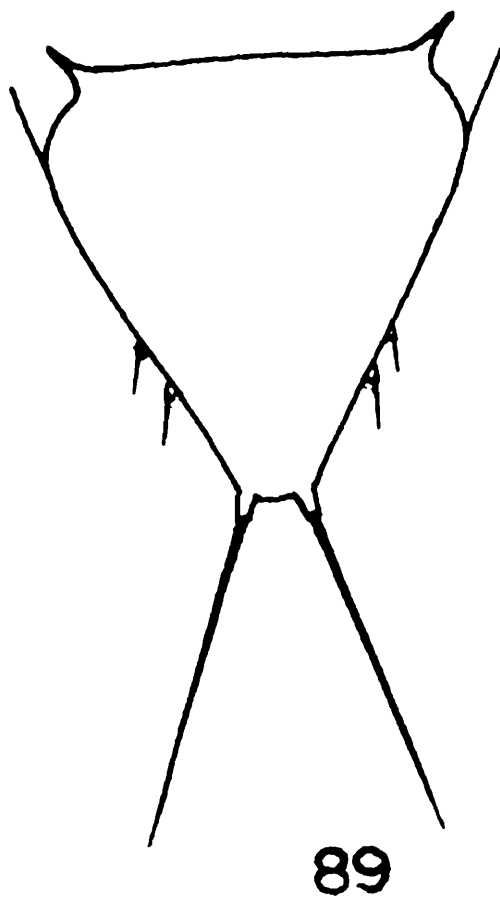
Holotype : Male, Meghalaya ; Nangpo, 10.iv.1979, Coll. P.T. Cherian.

Paratypes : 2 males, 3 females, data same as of holotype ; 2 males, Meghalaya : Shillong : Elephant Falls, 1620 m, 21.iv.1980, Coll. P.T. Cherian. The two specimens collected from a much higher altitude at Elephant Falls in Shillong are not in good condition and are partly damaged. All the characters that could be observed on these agree with those of the holotype and other paratypes from Nangpo but for shiny violet black colouration of the frontal triangle of the two from Shillong unlike the greenish blue frontal triangle of the rest of the specimens. An entirely different species may be involved here but they are all now treated under the same species because of the apparent similarities. The name *trispinosa* refers to the three spines on the hind femur of the male.

This species shows affinities to *R. pernigra* Kanmiya but can be differentiated by its white thoracic hairs, colouration of fore and hind tarsi, number of hind femoral spines, convexity of terminal sector of m 1+2 and differences in the male genitalia.

11. *Rhodesiella nepalensis*, sp. nov. (Figs. 89-90)

Female : Head : Only a trifle higher than long, length, height and width ratio 15 : 16 : 24. Frons dull black, width at vertex 0.47 x that of head, equal to its own length and 1.2 x the width near anterior margin ; frontal triangle large, polished, shiny



Figs. 89-90 : *Rhodsiella nepalensis*, sp. n. 89, Scutellum. 90, Wing.

bluish black, subtrapezoidal in outline, reaching anterior margin of frons and ending with truncate apex. Eye large, bare with vertical long axis. Face deeply concave, subshiny black; lower facial margin a little raised up. Antenna wholly black; ant 2 with black spine; ant 3 three-fourths as long as wide; arista black, of medium size with fairly dense black pubescence. Gena narrow, black, width one-fifth that of ant 3; vibrissal corner merging with the projecting lower facial margin and appearing to extend a little beyond lower anterior eye margin; postgena of medium size, with short, finely punctate, black hairs. Palpi black; proboscis predominantly yellowish brown with dark tinge along inner margin. Head bristles black, similar to those in *scutellata* (de Meijere); *ovt* a trifle longer than *ivt*, the latter and *pvt* subequal; *oc* a little shorter than *ivt*; *orb* about 9, sequentially anterior ones becoming shorter and slender, longest about two-thirds as long as *ovt*; *if* 9, in a row outside triangle along each lateral margin; postocular row of setae short but well developed.

Thorax : Shiny black; scutum nearly as long as wide and as wide as head with convex disc bearing fairly dense punctae and black hairs; scutellum (Fig. 89) 1.35 x as long as wide, triangular with flattened disc which is slightly convex in the middle and thickened side margin as in *scutellata*, more coarsely punctate than but pubescent like scutum; pleura shiny with a few black hairs on *anepst* and lower part of *kepst*. Thoracic bristles black, of medium size; *h* 1, a trifle shorter than *ivt*; *npl* 1+1 subequal and equal to *ivt*; *pa* 1 distinctly longer and stouter than and *pa* 2 half as long as *npl*; 1 *dc* subequal to *npl*; *as* much nearer to each other than to *ss* 1, 0.9 x as long as scutellum, borne on well developed black tubercle; *ss* 1 one-fifth the *as*; *ss* 2 a trifle shorter than *ss* 1; both pairs of lateral scutellar bristles borne on short black tubercles.

Wing (Fig. 90): 2.5 x as long as wide and as long as the body, hyaline with pale brown veins and pale brown pubescence; costal sectors 2 to 4 in the ratio 12:17:7; r-m cross-vein in the middle of the discal cell; terminal sector of m 1+2 greatly convex above a little beyond base as in *scutellata*, whence this and that of r 4+5 nearly parallel but for the distal end where the latter is gently curving toward costa; anal angle moderately developed. Stalk of haltere yellowish brown, knob black.

Legs : Coxae, femora and tibiae black except for yellowish tinge confined to the distal ends of the tibiae; trochanters dark brown; hind femur in female not thickened but with area near base in the anterodorsal aspect with a group of warts; mid tibial spine short, yellow; last three tarsi of fore legs and last one tarsus each of mid and hind legs infuscated, the rest of the tarsi yellow.

Abdomen : Nearly as wide as thorax and as wide as long, subshining brownish black with short, black hairs. Female cerci short, rather stout, wholly black.

Length : Female 2.3 mm wing 2.3 mm

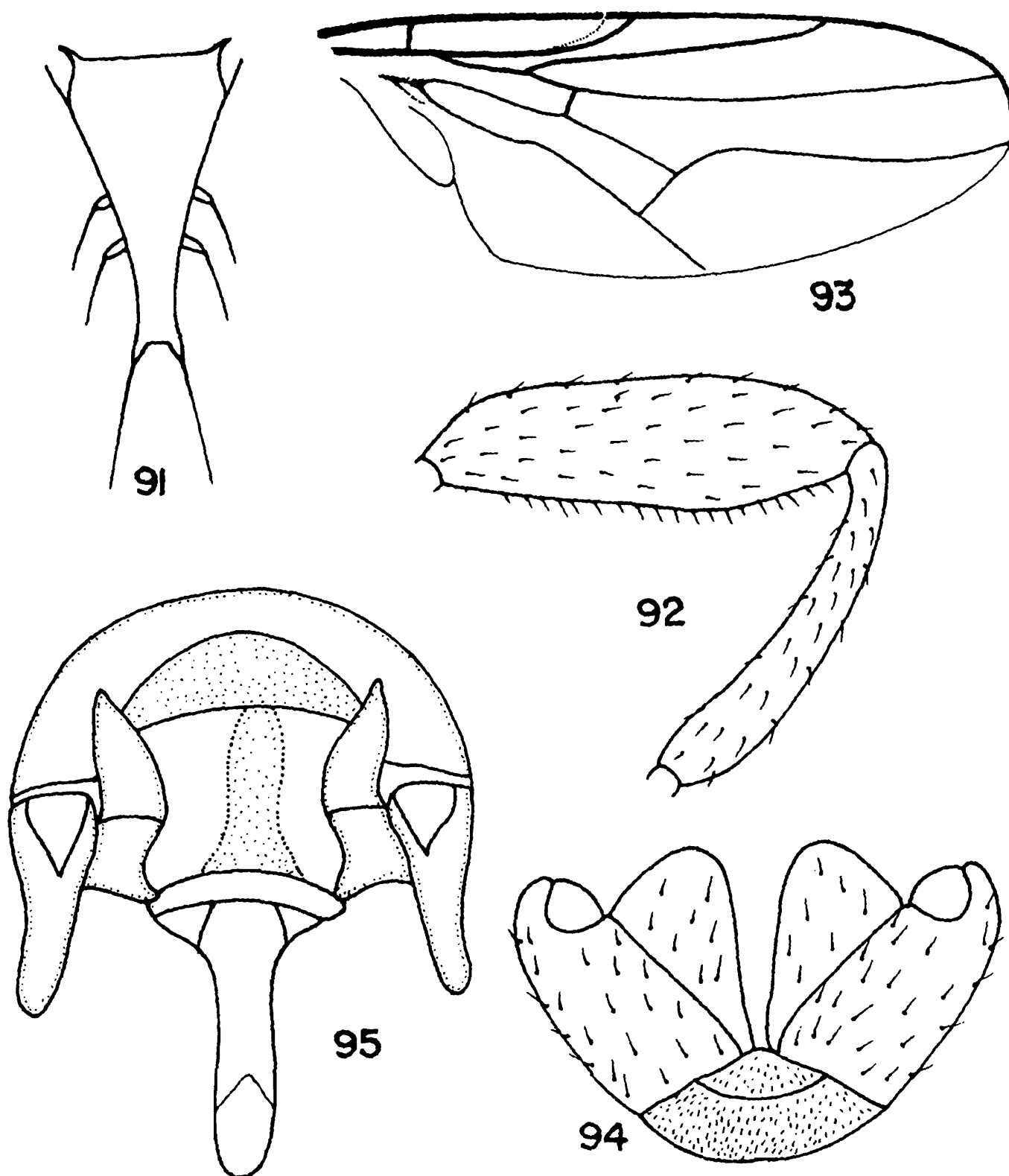
Holotype : Female, Nepal : Bakhri Kharka, 5500 ft., 24.iv.1954, Coll. J. Quinlan.

R. nepalensis closely resembles *aeneifrons* (Lamb) from Seychelles and probably S. Africa and S. Rhodesia in the black colouration of antennae, thorax and scutellar bristles and general colouration of legs but *nepalensis* has dark violet-blue and not steel-blue frontal triangle and relatively longer second sector of costa. Besides, while in *aeneifrons* last two tarsal segments each of mid and hind legs are infuscated, in *nepalensis* only the last tarsus of these legs are infuscated.

12. *Rhodesiella numeralis* sp. nov. (Figs. 91-95)

Male : Head : As long as wide and a trifle wider than thorax, length, height and width ratio 19:19:28. Frons depressed, wider at vertex than in front, width at vertex 0.4 x and anteriorly 0.3 x that of head, length 1.4 x maximum width, surface distinctly below eye margin except at the slightly raised anterior part, not reaching anterior margin of eye, subshiny blackish brown ; frontal triangle large, glabrous, shiny black, reaching anterior margin of frons and ending with very broadly obtuse apex, in high magnification appearing finely and very thinly partly pubescent, recalling in some measure the condition prevailing in *Amnonella* Cherian. Face a little narrower than anterior part of frons, concave, shiny black except for dark brown lower halves of sides and lower facial margin, the latter pale yellow distally ; facial carina linear, very low, reaching almost lower facial margin, which is gray tomentose and slightly raised up. Antenna of medium size ; ant 1 dark brown ; ant 2 yellow with dark tinge and fine hairs ; ant 3 as long as wide, length more in lower half, with fine white pubescence ; arista very slender, dark brown with fine, scattered pubescence. Eye very large, projecting above frons, occupying much of head in profile, with vertical long axis. Gena sublinear, dull black except for brownish anterior part which is partly grey tomentose on inner margin in continuation of lower facial margin ; postgena rugulose, dull black, with short hairs borne on granulae. Proboscis short, brownish black ; palpi predominantly dull black but for brownish margin distally. Head bristles slender, of medium size, yellow ; *out* longer than the rest of the bristles ; *ivt*, the cruciate *pvt* and proclinate and divergent *oc* subequal ; *orb* about 15, reclinate, sequentially anterior ones becoming shorter, less than half as long as *out* ; *if* in a row of about 15 outside the triangle along each lateral margin ; oral vibrissa short and slender.

Thorax : Shiny black ; scutum longer than wide, length and width ratio 15 : 13, disc nearly flattened posteriorly and slightly convex in front, very coarsely and densely punctate with yellowish white hairs of medium size ; humeral callus prominent as in *Amnonella* and neck region also reminescent of that genus ; scutellum (Fig. 91) 2 x as long as wide at base and 0.87 x as long as scutum, disc flattened and subtriangular



Figs. 91-95 : *Rhodesiella numeralis*, sp. n. 91, Scutellum. 92, Hind femur, male. 93, Wing. 94, Epandrium, dorsal view (part). 95, Phallic complex, dorsal view.

three-fifths the length anteriorly and cylindrical posteriorly, more coarsely and densely punctate and hairy than scutum ; pleura coarsely punctate with short dense hairs on *anepst* and *kepst* and with more shiny and smooth propleuron except its anterior part which has an uneven surface with ridges. Thoracic bristles yellow except for dark brown *pa* 1 and black scutellar bristles ; *h* 1, hair-like ; *npl* 1+1, subequal, much shorter than *ovt* ; *pa* 1 1.4 x as long as *npl* ; *pa* 2 indistinct ; 1 *dc* shorter than *npl* ; *as* including the large tubercle at its base half as long as scutellum, tubercles nearly approximated at base but divergent distally ; *ss* 1 located at two-thirds the length of scutellum from base, nearer to *ss* 2 and far removed from *as*, its length including that of its prominent basal tubercle three-fourths that of *as* ; *ss* 2 nearly in the middle of lateral margin, its length with that of its tubercle 0.55 x that of *as* ; the shape and arrangement of bristles of scutellum reminiscent of the condition prevailing in *Amnonella plumofrontata* Cherian.

Wing (Fig. 93) : 2.4 x as long as wide, pale brown with deeply brown veins ; costal sectors 2 to 4 in the ratio 17 : 14 : 6 ; r-m cross-vein distad of the middle of discal cell, opposite 0.54 of its length ; terminal sector of vein r 4+5 nearly straight, that of m 1+2 distinctly convex above near base, slightly sinuate along its entire length so that the maximum distance between this and r 4+5 in the middle than distally ; anal angle well developed. Haltere yellow.

Legs : Wholly yellow except for blackish brown fore tibia, all fore tarsi and the last two tarsal segments of hind legs ; last tarsal segment of mid leg rather brownish ; fore femur rather spindle-shaped ; hind femur (Fig. 92) distinctly thickened ; mid tibial terminal spine and hairs on all legs pale yellow.

Abdomen : Longer than wide and narrower than thorax ; two basal segments pale yellow ; third segment dark brown but for yellowish distal margin with the colour extending medially on the next segment ; rest of abdomen brownish black. Male genitalia (Figs. 94-95) comparatively small in relation to size of the body, externally dark brown, except for yellowish distal part of epandrium ; surstylus articulating with inner side of epandrium ; hypandrium semicircular ; pregonite very large ; distiphallus small, about one-fifth as wide as long, almost uniformly cylindrical.

Length : Male 3mm wing 2.4 mm

Holotype : Male, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian.

Paratype : 1 Male, collection data same as of holotype.

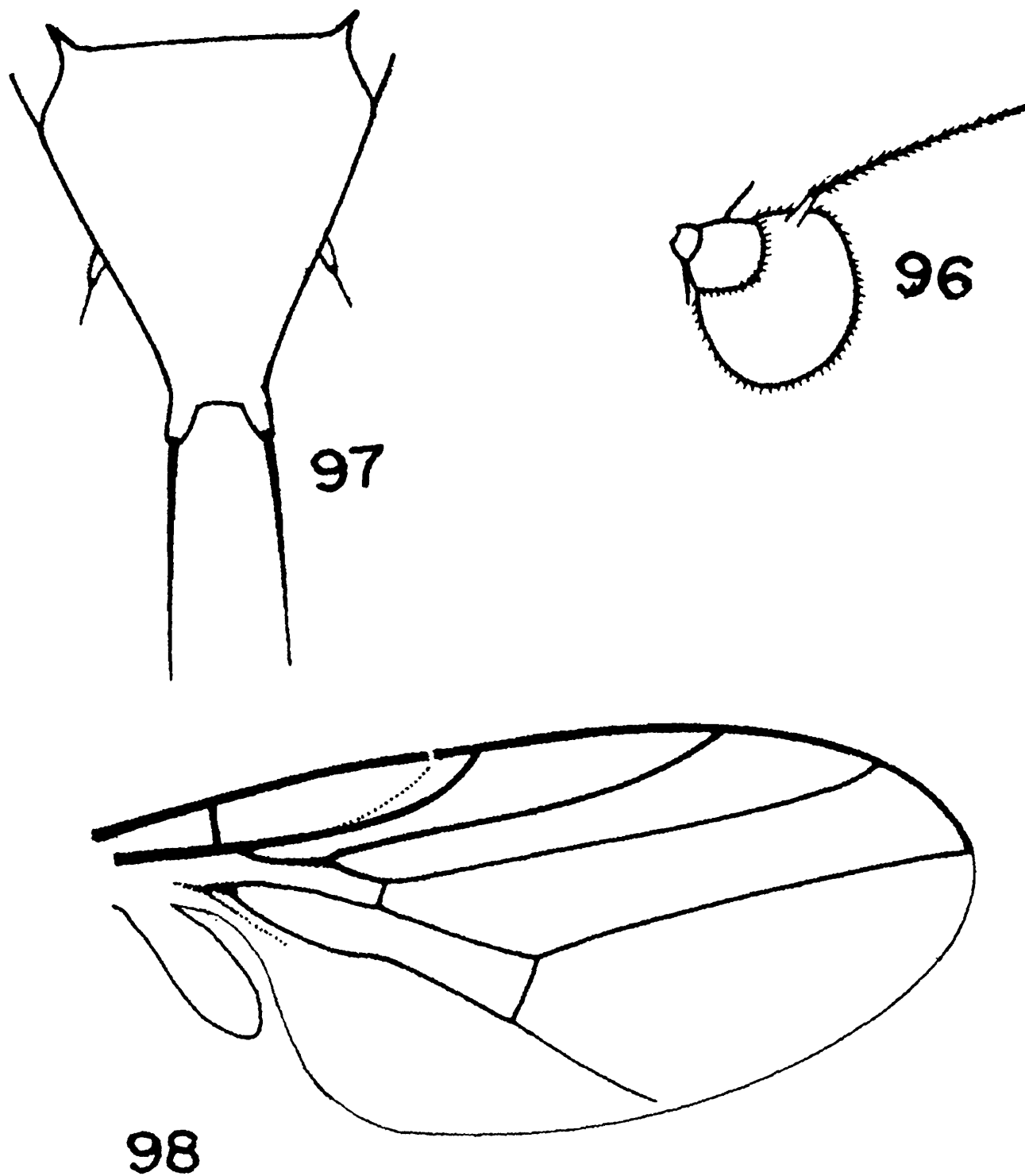
This species differs from all other species of *Rhodesiella* in having about 15 orb,

partly finely pubescent frontal triangle and very long scutellum which is twice as long as wide at base and is distally cylindrical. In many respects this species shows affinities to *Amnonella plumofrontata* Cherian but in the latter genus scutellum is much more elongated, pubescence on frontal triangle is more developed and male genitalia is of different build. This species is intermediate between genera *Rhodesiella* and *Amnonella* Cherian.

13. *Rhodesiella terminalis*, sp. n. (Figs. 96-98)

Male : Head : A little higher than long, length, height and width ratio 14:15:22. Frons parallel sided, width at vertex half that of head and equal to its own length, dull black, slightly projecting above eyes anteriorly and in profile reaching anterior margin of eyes, with a few short *fr*; frontal triangle large, glabrous, shiny black, reaching anterior margin of frons and ending with very broadly obtuse apex; ocellar triangle with a few short hairs. Face almost perpendicular, only very slightly concave, smooth, shiny black with two prominent broad midlongitudinal furrows one each on either side; facial carina not developed; lower facial margin not raised, finely tomentose, nearly on level with face and with uneven margin. Antenna (Fig. 96) extraordinarily developed unlike in other species of the genus, erect, wholly yellow; ant 2 short, slightly wider than long; ant 3 greatly flattened, large, 1.75 x as wide as long, broader below than above, finely whitish grey tomentose and with very fine white pubescence; arista almost terminal from upper anterior angle, yellowish brown with fine concolorous hairs. Gena sublinear, narrower in the middle than in front and behind, dull black with a row of slender hairs along oral margin; vibrissal corner projecting a trifle beyond lower anterior corner of eye margin, with vibrissa of medium-size; postgena rather reduced, dull black, with a few slender hairs dull dark brown; palpi slightly flattened, proboscis short, dark brown. Head bristles of moderate size, blackish to deeply brownish; *ovt* a trifle longer and stouter than other head bristles; *ivt* and *pvt* subequal; *oc* slightly shorter than *pvt*; *orb* 7-8 recumbent, none outstanding, sequentially anterior ones becoming shorter and slender, longest about two-thirds as long as *ivt*; *if* 7-8 in a row outside triangle along each lateral margin.

Thorax : Shiny black. Scutum as wide as head and 1.1 x as wide as long, with convex disc bearing dense, coarse, piliferous punctae and brownish yellow hairs. Scutellum (Fig. 97) triangular, 1.4 x as long as wide, with convex disc which is pubescent like but more coarsely punctate than scutum except for a narrow, smooth and very shiny area along anterior margin; pleura very shiny with yellowish hairs on *anepst* and lower part of *kepst*. Thoracic bristles of moderate size, at least some brownish to brownish yellow except for black scutellar bristles; *h* 1, almost equal to



Figs. 96-98 : *Rhodesiella terminalis*, sp. n. 96, Antenna. 97, Scutellum. 98, Wing.

ivt ; *npl* 1+1, subequal, a little longer than *h* ; *pa* 1 slightly longer than *npl*, borne on wart ; *pa* 2 about half as long as *pa* 1 ; 1 *dc* shorter than *pa* 1 ; *as* widely diverging, 0.68 x as long as scutellum, borne on very prominent black tubercle, the tubercles of *as* greatly diverging distally ; *ss* 1 0.22 x as long as *as*, located on lower margin laterally at about two-fifths the length of scutellum from the distal end, borne on short but very distinct tubercle.

Wing (Fig. 98) : Almost as long as body, 2.5 x as long as wide, with slight brownish tinge and yellowish brown veins ; proportions of costal sectors 2 to 4 in the ratio 15:9:7 ; r-m cross-vein slightly proximad of the middle of discal cell, opposite 0.47 of its length ; terminal sectors of veins r 4+5 and m 1+2 slightly diverging distally, the latter a little concave below basally ; anal angle well developed. Haltere with green stalk and yellowish white knob.

Legs : Of medium size and thickness ; coxae and trochanters yellow ; femora yellow except for dark to brownish black distal half of mid femur excluding its distal end and a diffused incomplete small band a little behind distal end of fore femur ; hind tibia black but for yellow base and tip ; fore tibia almost entirely brownish black except for their bases and tips or nearly wholly yellow with a tinge of diffused darkening in one specimen ; mid tibial spine short, slender, yellow ; hind femur, mid tibia and all tarsi yellow ; all legs with short yellowish white hairs.

Abdomen : Slightly narrower than thorax and 1.1 x as long as wide, brownish black with deeply brownish tinge on basal segments. Male genitalia of medium size.

Length : Male 2 mm wing 2 mm

Holotype : Male : Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian.

Paratypes : 2 males (in one, head is broken) collection data same as of holotype.

This species differs from others in possessing greatly broadened and large ant 3 with the arista located terminally on its upper margin. Besides, the pattern of colouration of legs is very distinctive in this species.

14. *Rhodesiella manipurensis* Cherian (Figs. 99-103)

1977. *Rhodesiella manipurensis* Cherian, *Oriental Insects*, 11 (4) : 189-191.

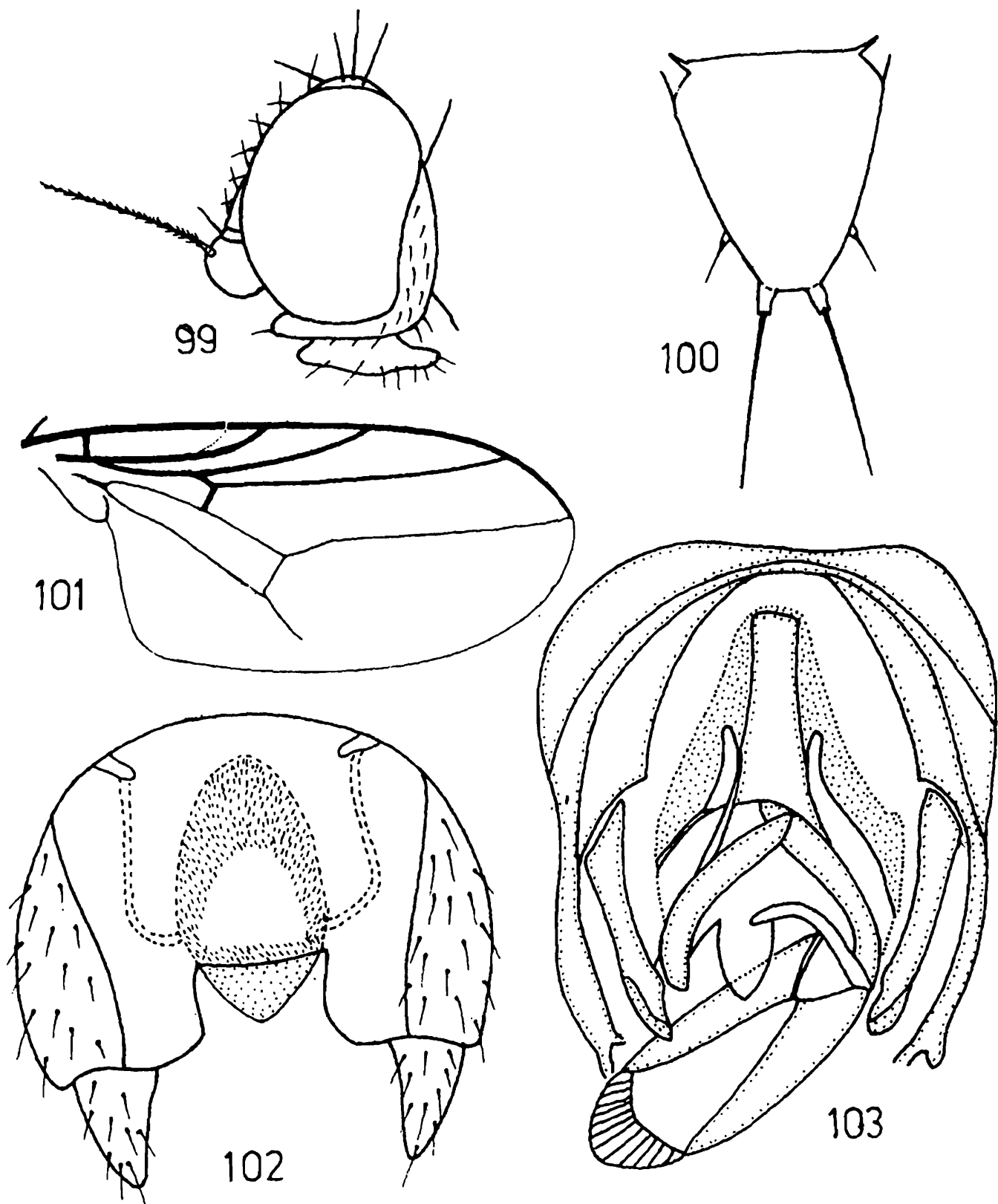
Type localities : Manipur : Ukhrul, Mao.

Male and female : Head (Fig. 99) : A trifle higher than long, length, height and width ratio 15 : 17 : 23 ; frons slightly narrowing anteriorly, subshiny black, width at

vertex 0.44-0.46 x that of head and equal to its own length, anteriorly projecting slightly above but not beyond eye margins ; frontal triangle glabrous, shiny black with distinct violet to violet-blue tinge (not greenish as indicated in the original description), reaching anterior margin of frons and ending with nearly pointed to, at times distinctly, obtuse apex. Eye large, bare, in profile occupying almost the entire head and with vertical long axis. Face much narrower than frons, concave, subshiny black ; facial carina low and linear, not extending beyond bases of antennae ; lower facial margin raised up, slightly thickened, finely tomentose. Antenna small ; two basal segments brownish black to blackish brown ; ant 3 0.8 x as long as wide, predominantly yellow to brownish yellow but darkened along anterior and dorsal margins ; arista slender but for basal part, of medium length, brownish black with slender, fairly dense conspicuous, concolorous hairs. Gena linear, black with a row of slender hairs along oral margin ; vibrissal corner rather receding, merging with raised lower facial margin ; postgena weakly developed, black with short black hairs. Palpi wholly black ; proboscis, brown to dark brown. All head bristles and frontal hairs black ; *out* only a trifle longer than the cruciate *put* and widely divergent *oc* ; *ivt* two-thirds as long as *out* ; *orb* 6, sequentially anterior ones becoming shorter, longest almost two-thirds as long as *out* while anterior ones hardly longer than hairs and only one-third as long as the posterior most ; *if* 6, in a row outside frontal triangle along each lateral margin, all nearly subequal and equal to anterior *orb* ; vibrissa weakly developed, black.

Thorax : Shiny black ; scutum as long as wide, with convex disc bearing fine, dense punctae and slender brownish black hairs ; scutellum (Fig. 100) triangular, 1.17 x as long as wide as base and half as long as scutum with flattened disc which is slightly convex medially, pubescent like but more coarsely punctate than scutum ; pleura smooth and shiny with a few short brownish black hairs on *anepst* and a few such hairs mostly confined to around lower margin of *kepst*. Thoracic bristles black ; *h* 1, slender, almost as long as *ivt* ; *npl* 1+1, subequal, a trifle longer than *h* ; *pa* 1 a trifle longer than and 1 *dc* as long as *npl* ; *pa* 2 hardly distinguishable from thoracic hairs ; *as* as long as scutellum, equidistant from each other and *ss* 1, borne on short but distinct black tubercle ; *ss* 1, very short, 0.2 x as long as *as*, very slender, borne on fine tubercle which has the form of a well developed wart.

Wing (Fig. 101) : Hyaline, with brown veins and fine brown pubescence, 2.5 x as long as wide ; costal sectors 2 to 4 in the ratio 13:18:11 but in some specimens, including one of the paratypes second sector only slightly longer than the fourth and only about half the third sector ; r-m cross-vein in the majority of specimens in the middle of the discal cell while in a few slightly distad of the middle, opposite 0.54 of



Figs. 99-103 : *Rhodesiella manipurensis* Cherian. 99, Head, lateral view. 100, Scutellum, 101, Wing. 102, Epandrium, ventral view. 103, Phallic complex, ventral view.

its length ; terinal sectors of veins r 4+5 and m 1+2 diverging distally, the former slightly bent towards costa terminally and the latter conspicuously convex above a little beyond base as in *scutellata* (de Meijere) ; posterior marginal cell correspondingly expanded ; anal angle well developed. Haltere brownish black.

Legs : Slender, of medium length ; all coxae, femora and tibiae black with a tinge of yellowish brown at the distal ends and extreme bases of tibiae in some specimens ; fore femur slightly thickened with a row of erect, prominent hairs on anteroventral margin ; hind femur not thickened ; tarsi yellow except for dark brown last four tarsi of fore legs and last two segments of mid leg ; in the holotype and one of the paratypes last three tarsi of hind legs also dark brown and basal two segments yellow while in others only last two hind tarsi dark brown ; in some of the specimens only last tarsal segment of mid and hind legs appearing to be distinctly brown while the fourth segment under certain angles of illumination appears to be dark brown because of the dark hairs.

Abdomen : Wholly brownish black, only slightly narrower than thorax and longer than wide, with slender black hairs. Female cerci short, slender, with very fine dense hairs. Male genitalia (Figs. 102-103). Epandrium wider than long ; cercus in the form of a small subtriangular lobe ; surstylus of medium-size, subtriangular ; distiphallus subcylindrical, with obtuse apex ; phallapodeme not reaching hypandrium ventrally ; gonites well developed.

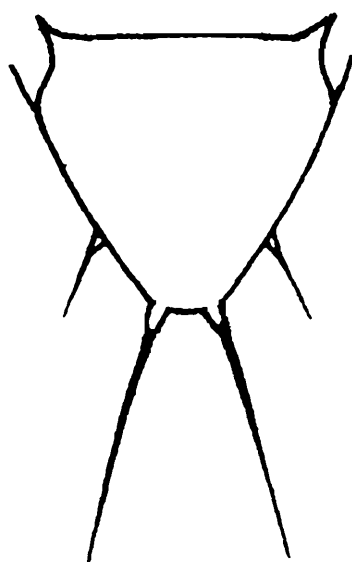
Length : Male 1.3-1.5 mm wing 1.2-1.4 mm Female 1.4-1.6mm wing 1.3-1.5mm.

Specimens studied : *Holotype*, male : Manipur : Ukhrul, Alt. 6200' : 4.iii.1975, Coll. P.T. Cherian. *Paratypes* : 1 male, data same as of holotype ; 1 male, Manipur : Mao, Alt. 5750' : 8.iii.1975, Coll. P.T. Cherian. *Other specimens* : 3 males, 5 females, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian ; 2 males, Meghalaya : Shillong : Elephant Falls, 21.iv.1980, Coll. P.T. Cherian.

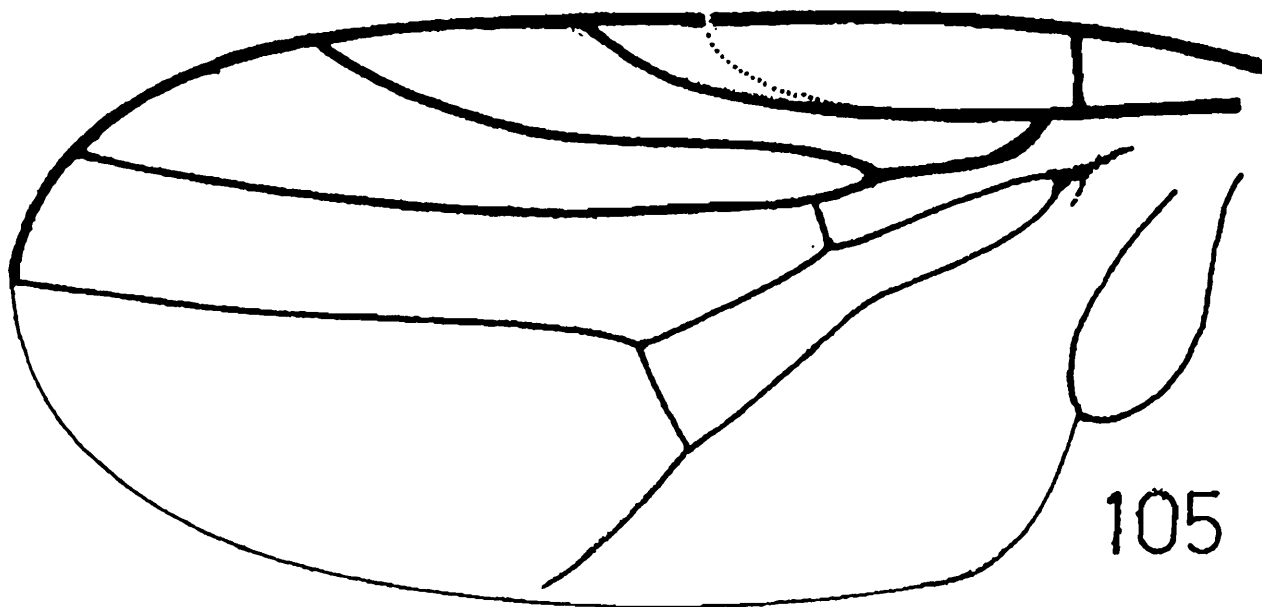
R. manipurensis shows affinities to *normalis* (Malloch) but in the former the last four fore tarsal segments are dark brown ; besides, in *manipurensis* frontal triangle is nearly pointed to obtuse apically, hind femora are not thickened, second sector of costa is more than half the third sector and r-m cross-vein is in the middle or distad of the middle of discal cell unlike in *normalis*.

15. *Rhodesiella proxima* sp. nov. (Figs. 104-105)

Female : *Head* : As long as high, length height and width ratio 11:11:18. Frons distinctly narrowing anteriorly, width at vertex half that of head and almost equal



104



105

Figs. 104-105 : *Rhodesiella proxima*, sp. n. 104, Scutellum. 105, Wing.

to its own length, dull black, very slightly projecting above level of eyes anteriorly and in profile reaching anterior margin of eye, with a few short black *fr*; frontal triangle greatly developed, polished shiny bluish green, very broadly truncate in front, subtrapezoidal in outline and occupying much of the area of frons. Face nearly perpendicular, only slightly concave, much narrower than anterior part of frons, subshiny black; facial carina not extending beyond bases of antennae but in continuation of it midlongitudinal area of face more shiny and appearing slightly raised above general surface of face; lower facial margin very finely brown tomentose, hardly projecting above level of face. Antenna rather erect, turned slightly outwards; basal segments brown with dark tinge; ant 3 1.5 x as wide as long, finely dark tomentose, yellowish brown with prominent dark brown tinge along upper and anterior margins; arista slender, basally black, otherwise dark brown with fine concolorous pubescence. Eye large, bare, with oblique long axis. Gena dull black, one-fourth as wide as ant 3, with a row of slender black hairs along oral margin; vibrissal corner projecting a little beyond lower anterior margin of eye, with short, black vibrissa; postgena moderately developed, dull black with a few short, black hairs of which outer ones are arranged almost in a row in continuation of postocular row of setae. Palpi short, slightly flattened, black, with short fine dark hairs; proboscis short, black but distal surface dark brown. Head bristles moderately developed, black, none extra-ordinarily developed; *ovt* slightly longer than other head bristles; *ivt* cruciate *pvt* and proclinate *oc* subequal; *orb* about 9, recumbent, anterior ones becoming shorter and slender, longest two-thirds as long as *ivt*; *if* in a row of 8-9 outside triangle along each lateral margin.

Thorax: As wide as head, shiny black. Scutum 1.1 x as wide as long, with convex disc bearing fairly dense coarse punctae and slender brownish black hairs of medium size; scutellum (Fig. 104) 1.1 x as long as wide with convex disc which is more coarsely punctate than but pubescent like scutum; *kepst* almost uniformly and *anepst* mostly in the upper half with short, slender, dark brown hairs. Thoracic bristles black; *h* 1, slender, slightly shorter than *ivt*; *npl* 1+1, subequal, a trifle longer than *h*; *pa* 1 a little longer than and *pa* 2 about half as long as *npl*; 1 *dc* a trifle shorter than *npl*; *as* almost equidistant from each other and *ss* 1, a little shorter than scutellum, borne on a short tubercle; *ss* 1 short, slender, 0.2 x as long as *as*, borne on very short tubercle.

Wing (Fig. 105): Half as wide as long, pale brown with dark brown veins; costal sectors 2 to 4 in the ratio 7:7:4; r-m cross-vein proximad of the middle of discal cell, opposite 0.42 of its length; terminal sector of vein r 4+5 slightly curving and bent toward upper margin of costa distally, that of m 1+2 very slightly convex above near base; anal angle well developed. Stalk of haltere dark brown, knob black.

Legs : Rather slender, of medium length ; all coxae, femora and tibiae dull black ; trochanters brown to dark brown ; tarsi yellow except for brownish black last four tarsal segments of fore and last two each of mid and hind legs.

Abdomen : Only a trifle narrower than thorax, dull black with short, fairly dense, slender brownish black hairs. Female cerci short, slender, dark brown.

Length : Female 1.6 mm wing 1.3 mm

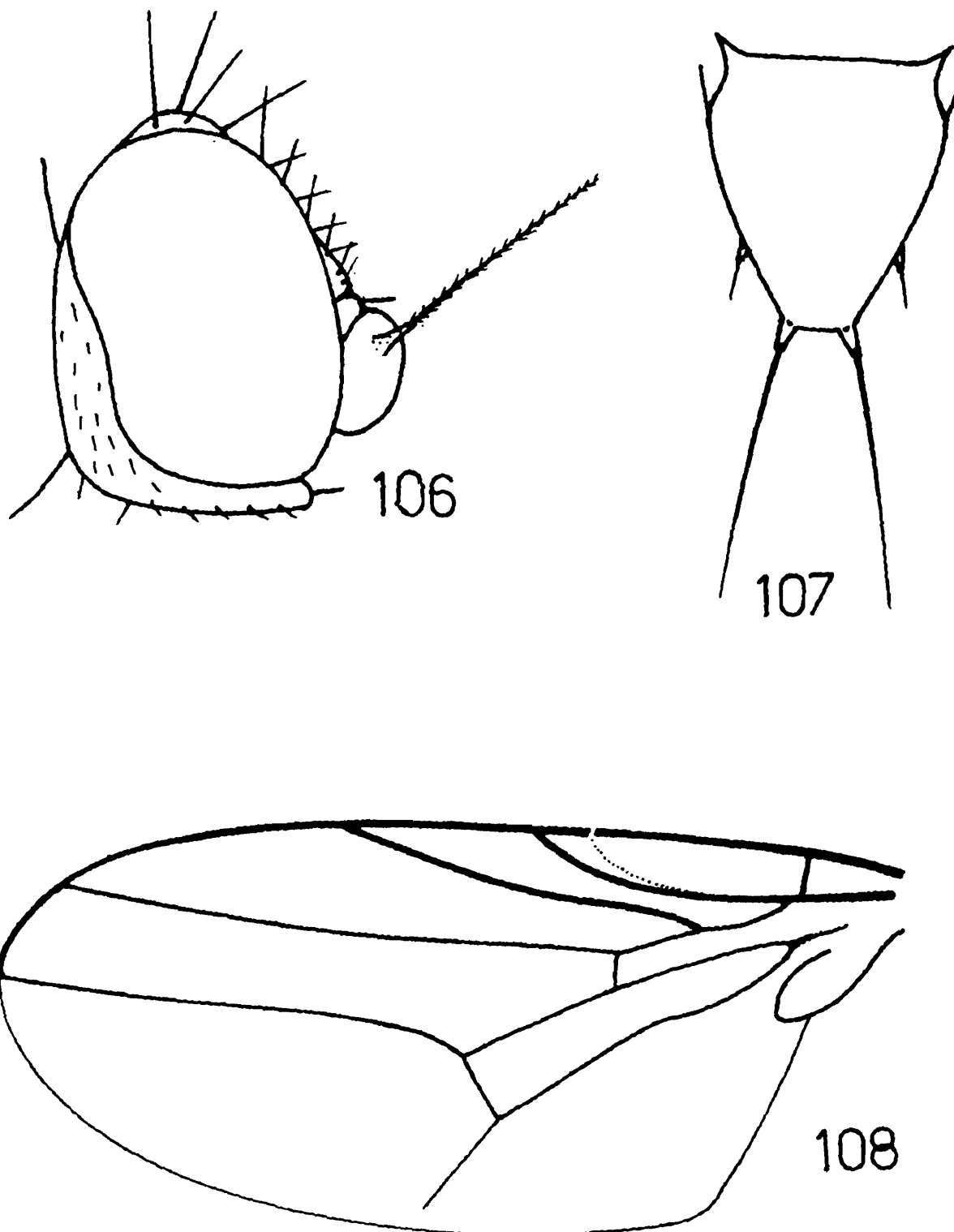
Holotype : Female, Meghalaya : Shillong, 1500 m, 8.ii.1979, Coll. P.T. Cherian.

R. proxima is closely related to *manipurensis* Cherian but differs in having large subtruncate frontal triangle, oblique eyes and 9 *orb*. Besides in *proxima* second sector of costa is equal to the third and r-m cross-vein is proximad of the middle of discal cell while in *manipurensis* frontal triangle is nearly pointed to obtuse at apex, long axis of eye is vertical, there are only 6 *orb*, r-m cross-vein is in the middle or distad of the middle of discal cell and second sector of costa is much shorter than the third sector.

16. *Rhodesiella sabroskyi* Cherian (Figs. 106-108)

1977. *Rhodesiella sabroskyi* Cherian, *Oriental Insects*, 11 (4) : 493-494. Type locality : Gujarat : Baroda.

Male : *Head* (Fig. 106) : As high as long, length height and width ratio 15 : 15 : 22 ; frons parallel sided, dull brownish black, width at vertex half that of head and equal to its own length, with a few dark brown *fr* ; frontal triangle glabrous, shiny black with a tinge of purple blue in certain angles of illumination, of medium size, reaching anterior margin of frons, and ending with broadly obtuse apex. Eye bare, occupying much of the area of head in profile, with vertical long axis. Face subshiny, brownish black, slightly narrower than frons, deeply concave ; facial carina low, linear, not reaching lower facial margin which is distinctly raised up. Antenna rather erect, directed outwards ; ant 2 dark brown ; ant 3 0.7 x as long as wide, yellowish brown with dark tinge along dorsal and anterior margins ; arista of medium-size, slender, dark brown with short, slender, concolorous pubescence. Gena sublinear, brownish black ; vibrissal corner hardly projecting beyond lower anterior margin of eye and merging with lower facial margin ; oral margin of gena with a row of slender dark brown hairs ; vibrissa of medium size ; postgena rather reduced, brownish black with short, slender, concolorous hairs. Palpi and proboscis brownish black. Head bristles black, rather weakly developed. slender ; *out* only a trifle longer than *ivt*, *pvt* convergent, subequal to *ivt* ; *oc* hardly longer than longest *orb*, the latter about 6, sequentially



Figs. 106-108 : *Rhodesiella sabroskyi* Cherian. 106, Head, lateral view. 107, Scutellum. 108, Wing.

anterior ones becoming smaller, anterior ones hardly longer than *fr*, longest about half as long as *out*; *if* 6, subequal to *orb*, in a row outside frontal triangle along each lateral margin.

Thorax : Shiny black ; scutum nearly as long as wide, with convex disc bearing fairly dense fine punctate and very short, slender dark brown hairs (hairs not brownish yellow as mentioned in the original description) ; scutellum (Fig. 107) subtriangular (not subtrapezoid as indicated in the original description) ; 1.2 x as long as wide at base and 0.6 x as long as scutum, with sloping convex disc which is more coarsely and densely punctate than but pubescent like scutum ; pleura subshiny ; *anepst* with a few short hairs ; *kepst* with a few short pale hairs confined mostly to lower margin. Thoracic bristles black ; *h* 1, slender, a trifle shorter than *ivt* ; *npl* 1+1, subequal and equal to *out* ; *pa* 1 a trifle longer than and 1 *dc* almost equal to *npl* ; *pa* 2 indistinct ; *as* 0.9 x as long as scutellum, nearer to each other than to *ss* 1, borne on short, slender tubercle ; *ss* 1 0.23 x as long as *as*, borne on very small tubercle.

Wing (Fig. 108) : 2.37 x as long as wide, hyaline with pale yellow veins ; costal sectors 2 to 4 in the ratio 5 : 7 : 3 ; r-m cross-vein almost in the middle of discal cell ; terminal sectors of veins r 4+5 and m 1+2 nearly parallel, the latter a trifle convex above a little beyond base, the former very little concave above apically ; anal angle very well developed. Stalk of haltere yellow, knob dark brown.

Legs : Coxae and trochanters yellow ; femora except for the pale apices black ; fore femur with a row of erect hairs on antero-ventral margin ; fore tibia yellow but more or less distinctly brownish in the middle ; mid tibia dark brown except for yellow one-third its length distally ; hind tibia, but for the pale base and distal end, blackish brown ; tarsi yellow except for brownish three distal segments of fore and last segment of mid and hind legs ; none of the femora and tibiae thickened ; mid tibial apical spine weakly developed.

Abdomen : Subshiny, brownish black, a trifle longer than wide and slightly narrower than thorax, with dark brown slender hairs. Male genitalia of medium size.

Length : Male 2 mm wing 2 mm

Specimen studied : *Holotype* : Male, India : Gujarat : Baroda, 28.xi.1973, Coll. P.T. Chorian.

R. sabroskyi belongs distinctly to *tarsalis* group. It shows affinities to *nitidifrons* (Becker) but differs in having very short *ss* 1 and nearly parallel terminal sectors of r 4+5 and m 1+2 veins. Besides, in *sabroskyi* fourth sector of costa is less than half

the third sector and only 0.6 x the second sector while in *nitidifrons* second and fourth sectors are equal and the latter is only slightly shorter than the third sector.

Remarks : This species has not so far been reported since it was originally described in 1977 and the female is not yet known.

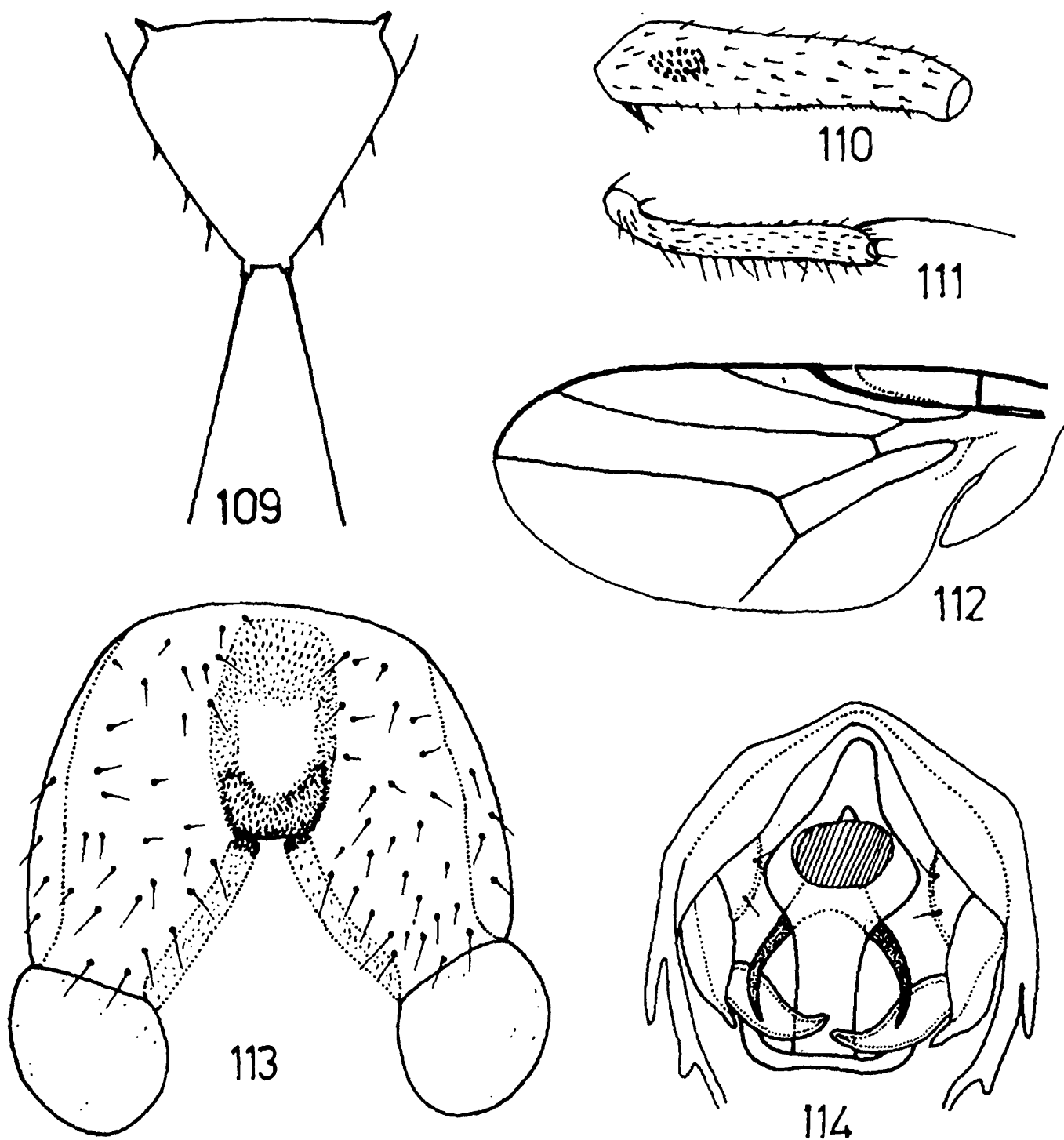
17. *Rhodesiella hirtimana* (Malloch) (Figs. 109-114)

1931. *Macrostyla hirtimana* Malloch, *Ann. Mag. nat. Hist.* (10) 8 : 60. Type locality : Java : Mt. Gede : Tjbodas.

1983. *Rhodesiella yamagishii* Kanmiya, *Mem. Ent. Soc. Washington*, 11 : 48-50. Type locality : Japan : Kyushu, Tsushima Is., Yakushima Is., Amami, Okinawa and Sahishima Is. N. Syn.

Male and female : Head : A trifle longer than high, length, height and width ratio 15 : 16 : 23 ; frons dull black, width at vertex 0.4 x that of head and 0.9 x its own length, distinctly narrowing anteriorly and not projecting above and beyond eyes in front ; frontal triangle large, subtrapezoid, polished and smooth, entirely violet, violet blue or steel blue, reaching anterior margin of frons and ending with widely truncate anterior margin. Eye large, occupying much of head in profile, with vertical long axis ; face much narrower than frons and narrower below, shiny black, distinctly concave ; facial carina very low linear, not reaching beyond bases of antennae ; lower facial margin raised up, dark tomentose. Antennae erect ; two basal segments black to brownish black ; ant 3 0.6 x as long as wide, subreniform, yellow with darkened dorsodistal margin ; arista slender, dark brown to brownish black with long, fairly dense concolorous pubescence. Gena linear, black with 8-9 well developed erect hairs along oral margin ; vibrissal corner subtriangular, merging with projecting lower facial margin ; postgena black with dense, rather long, erect hairs. Palpi flattened, black, with slender erect hairs ; proboscis dark brown, rim of distal margin with yellowish brown tinge. All head bristles black ; *ovt* distinctly longer than all other head bristles ; *ivt* three-fifths as long as *ovt* ; *pvt* cruciate, three-fourths the *ovt* ; *oc* a trifle longer than *ivt* ; *orb* 8, reclinate, posterior most 4-5 more developed, sequentially anterior ones becoming conspicuously shorter and slender, longest almost as long as *ivt* ; *if* 8, subequal and equal to fifth *orb*, in a row outside triangle along each lateral margin ; vibrissa of medium size ; vertex margin with a row of hairs ; postocular row of setae short but fairly dense.

Thorax : Shiny black ; scutum 1.1 x as wide as long and as wide as head with convex disc bearing fairly dense well developed dark brown hairs borne on fine punctae ;



Figs. 109-114 : *Rhodesiella hirtimana* (Malloch). 109, Scutellum. 110, Hind femur, male. 111, Mid tibia, male. 112, Wing. 113, Epandrium, dorsal view. 114, Phallic complex, ventral view.

scutellum (Fig. 109) conical 1.2 x as long as wide at base with slightly flattened disc, which is convex in the middle and gently sloping laterally, bearing coarse punctae and dense dark brown hairs; pleura shiny; *anepst* and *kepst* with dark brown hairs. Thoracic bristles black; *h* 1 almost as long as *ivt*; *npl* 1+1, anterior one subequal to *h*, posterior a trifle longer and stouter; *pa* 1 1.2 x as long as posterior *npl*; 1 *dc* equal to anterior *npl*; *as* nearly equidistant from each other and *ss* 1, borne on well developed, black tubercle, its length along with that of its tubercle equal to that of scutellum; *ss* 1 borne on a very short tubercle, its length along with its tubercle one-sixth that of *as*; *ss* 2 three-fourths as long as *ss* 1, borne on very fine tubercle.

Wing (Fig. 112): 2.2–2.4 x as long as wide, with very fine brown hairs and brown veins; costal sectors 2 to 4 in the ratio varying from 4 : 7 : 3 to 5 : 9 : 4 in the specimens studied; r-m cross-vein proximad of the middle of discal cell, opposite 0.37 to 0.4 of its length; terminal sector of r 4+5 concave above along its entire length; that of m 1+2 widely sinuate and greatly convex above at about one-fifth of its length from base; anal angle moderately developed. Knob of haltere black, stalk yellowish brown.

Legs: Of medium size; coxae, femora and tibiae black to brownish black; trochanters dark brown to yellowish brown; fore femur with a few erect black hairs of which a few along anteroventral margin almost in an irregular row; fore tibia progressively becoming thickened distally except for its distal end and with long black hairs which are more developed distally; mid tibia in male (Fig. 111) with very long spine which is as long as first tarsus of mid leg, becoming slender and hair-like apically; hind femur (Fig. 110) in male slightly thickened, with 2–3 short, black spurs ventrally a little beyond base and a group of warts on antero-dorsal surface near base; tarsi yellow except for dark brown three distal tarsi of fore leg and last tarsal segment of mid and hind legs; in one specimen subapical tarsus of mid and hind legs distinctly infuscated; all fore tarsi with prominent, erect black hairs; last two tarsi each of mid and hind legs also with a few erect hairs along their distal margins.

Abdomen: In male as wide as long and as wide as thorax, in female a little more longer, subshiny, basal segments brownish black, distal segments entirely black, wholly with slender, almost evenly distributed dark brown hairs. In one of the males on the ventral aspect of abdomen, posterolateral to left hind coxa there is an irregularly shaped raised structure from which projects a flattened, long, suboval, flap-like dark brown outgrowth covered with short dark hairs and terminating in a filamentous aristate extension bearing well developed black hairs. Such a structure has not so far been reported in Chloropidae, and not even in this species. As it is not found in the

other specimens of the same species before me and is found only on one side of the abdomen of only one male it is considered only an aberrant feature at present.

Male genitalia (Figs. 113-114). Epandrium broadened laterally, deeply incised ; cercus bare, shorter than in *nitidifrons* ; surstylus broad, rounded with a bone-shaped small process on its inner aspect ; hypandrium, large, broadened distolaterally and slightly projecting along ventrolateral margin ; distiphallus cylindrical at basal two-fifths, broadened medially and narrowing distally ; pre-and postgonites relatively short.

Length : Male 2-3 mm; wing 1.8-2.6 mm; female 2.2-2.9 mm; wing 1.8-2.6 mm

Specimens studied : 1 female, Kerala : Idukki, 10.ii.1982. Coll. P.T. Cherian ; 1 male, Kerala : Quilon Dist., Thenmala, 11.i.1989, Coll. P.T. Cherian ; 1 male, Tamil Nadu : Coimbatore Dist., Kunjapanai, 1200 m., 9.ii.1992, Coll. G. Thirumalai.

Remarks : This species has not been reported since it was originally described by Malloch (1931) based on four males. According to Malloch the frontal triangle is violet blue and only the last tarsal segment of mid and hind legs are infuscated while in the specimens before me in one, frontal triangle is entirely violet, in the second violet blue and in the third steel blue and in one of the specimens last two tarsi each of mid and hind legs are infuscated. But for these minor variations all the specimens agree entirely with Malloch's description of the species.

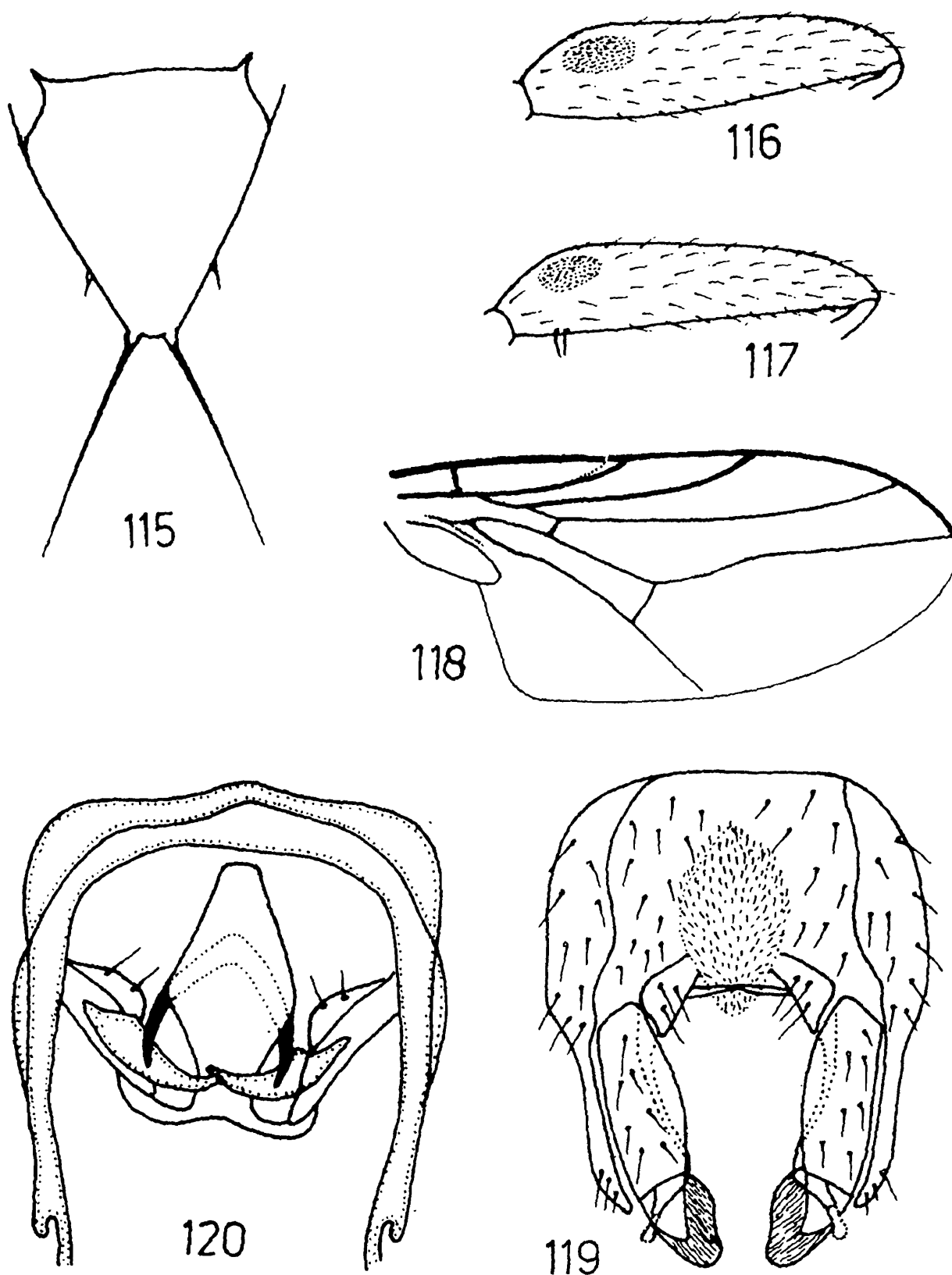
According to Kanmyia (1983) in *yamagishii* frontal triangle is steel-blue and last two tarsi of fore leg and first one each of mid and hind legs are infuscated. In one of the typical specimens of *hirtimana* before me frontal triangle is steel-blue while in others it is violet or violet-blue. Hence it is a variable character. In respect of all body characters, including male genitalia, *yamagishii* is identical with *hirtimana* but for differences in the colouration of some tarsi. While in the former only last two fore tarsi are infuscated, in the latter last three are infuscated. While the infuscation of tarsi is an important character in separating species in *Rhodesiella* yet part or whole darkening of an additional tarsal segment has been observed in typical specimens of a few species like *manii* Cherian. Even in *hirtimana* in one specimen last two tarsi of mid and hind legs are infuscated. Kanmyia's mention of first tarsus of mid and hind legs being infuscated and the rest being yellow needs verification, since in all the species of *Rhodesiella* so far known, including those described here, infuscation, when observed, is limited to one or more of distal tarsi or all the tarsal segments of a leg and not to the basal tarsus alone. Because of the observations given above and especially the identical nature of the male genitalia, *yamagishii* is here considered a junior synonym of *hirtimana* (Malloch).

18. *Rhodesiella triinfusata*, sp. nov. (Figs. 115-120)

Male, and *Female* : *Head* : Higher than long, length, height and width ratio 7 : 8 : 12 ; frons slightly narrowing anteriorly, width at vertex 0.46 x that of head and 0.9 x its own length and 1.2 x the width near anterior margin, dull black ; frontal triangle very large, glabrous, shiny violet blue to dark blue, reaching anterior margin of frons and ending with truncate apex. Eye very large, bare, occupying much of the area of head in profile and with vertical long axis. Face short, concave, shiny black ; facial carina low, not extending beyond bases of antennae ; lower facial margin a little raised up, only slightly thickened. Basal antennal segments blackish brown ; ant 3 0.7 x as long as wide, subreniform, predominantly yellow but distinctly infuscated along dorsodistal margin ; arista of medium size, blackish brown with short, slender concolorous pubescence. Gena sublinear, dull black with a row of about 10 black hairs along oral margin ; vibrissal corner appearing slightly projecting beyond lower eye margin because of its merging with the raised up lower facial margin, with a short black vibrissa ; postgena clearly rugulose, rather reduced with a few black hairs ; postocular row of setae very short and fine. Palpi black ; proboscis dull black but for distal margin having brown tinge. Head bristles of medium size, black ; *ovt* a trifle longer than *ivt* ; *pvt*, *ivt* and *oc* subequal ; *orb* 8, sequentially anterior ones becoming shorter, longest about half the *ovt* ; *if* 8, in a row outside frontal triangle along each lateral margin, subequal to *orb*.

Thorax : Shiny black ; scutum as long as wide, with convex disc bearing fine, fairly dense punctae and slender, blackish brown hairs as in *scutellata* and *normalis* ; scutellum (Fig. 115) 1.33 x as long as wide at base and two thirds as long as scutum, elongate conical with convex disc which is distinctly shagreened and more coarsely punctate than but pubescent like scutum ; pleura polished, with blackish brown hairs on *anepst* and lower part of *kepst*. Thoracic bristles black, mostly similar to those in *normalis* ; *h* 1, equal to longest *orb* ; *npl* subequal and equal to *ivt* ; *pa* 1 1.25 x as long as *npl* ; *pa* 2 half as long as *pa* 1 ; 1 *dc* subequal to *npl* ; *as* much nearer to each other than to *ss* 1, 0.7 x as long as scutellum, borne on prominent black tubercle ; *ss* 1 very short, one-fifth the *as*, borne on short but well developed tubercle located farther from the *as* than in *normalis*.

Wing (Fig. 118) : 2.3 x as long as wide, hyaline with yellow veins ; proportions of costal sectors 2 to 4 in the ratio varying from 10 : 13 : 6 to 11 : 12 : 6 ; r-m cross-vein proximad of the middle of discal cell, opposite 0.45 of its length ; terminal sector of r 4+5 slightly concave above along its entire length, that of m 1+2 nearly straight but for the flexure a little beyond base which is much less convex above than in *normalis* and *scutellata* ; proportions of penultimate and ultimate sections of m 1+2 in the ratio 10 : 27, the latter and that of r 4+5 diverging distally ; anal angle well developed,



Figs. 115-120 : *Rhodesiella triinfusata*, sp. n. 115, Scutellum. 116, Hind femur, female. 117, Hind femur, male. 118, Wing. 119, Epandrium, dorsal view. 120, Phallic complex, ventral view.

width of wing maximum in the area of anal angle than beyond. Haltere with yellowish brown stalk and blackish brown knob, which in some specimens has predominantly brown tinge.

Legs : All coxae, trochanters and femora black ; tibiae black but for yellow tinge at their distal ends ; tarsi yellow except for the dark brown to blackish brown last three fore tarsi and last tarsus each of mid and hind legs ; fore femur with a row of about 10 slender, erect, black hairs along its anteroventral surface and mid tibiae with a row of 5–6 longer hairs along its dorsolateral surface ; hind femur (Figs. 116–117) not thickened in both sexes, rather slender, without spines near base ventrally and warts or small denticles along ventral surface in the distal half but with distinct tibial organ like suboval area with warts a little lateral to dorsal surface near base ; mid tibial spine of medium size, yellow.

Abdomen : Wholly shiny, brownish black, as wide as thorax and a trifle wider than long, with a few slender dark brown hairs. Female cerci short, rather stout, with a few very fine hairs. Male genitalia (Figs. 119–120). Epandrium rather short, wider than long, laterodistal end produced in the form of a long, slender lobe as in *trispinosa* ; surstylus elongated with a bone-shaped small process and ending with an obtuse apex ; hypandrium subrectangular ; pregonite rather short ; post-gonite hook-like ; distiphallus almost spindle-shaped, width in the middle about its own length.

Length : Male 2 mm wing 1.8 mm female 2.2 mm wing 2 mm

Holotype : Female, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian. *Paratypes* : 1 female, data same as of holotype ; 2 females, Mizoram : Kolasib, 8.iii.1979, Coll. P.T. Cherian ; 2 females, Mizoram : Champhai, 18.iii.1979, Coll. P.T. Cherian ; 1 male, 1 female, Meghalaya : Kyrdukhulai, 29.iii.1979, Coll. P.T. Cherian ; 1 female, Meghalaya : Shillong : Mawphlang, 23.iv.1980, Coll. P.T. Cherian.

This species closely resembles *normalis* (Malloch), but can be distinguished by its slender hind femur, which is not thickened in both the sexes and is without denticles or spines on the ventral side as in the males of *normalis*. Besides while in *normalis* terminal sector of m 1+2 is greatly convex above a little beyond base, is only 2.2 x as long as the penultimate sector and slightly sinuate along its entire length, in *triinfusata* it is only slightly convex above a little beyond base, is 2.7 x as long as the penultimate sector and straight along its length beyond the flexure.

19. *Rhodesiella normalis* (Malloch) (Figs. 121-123)

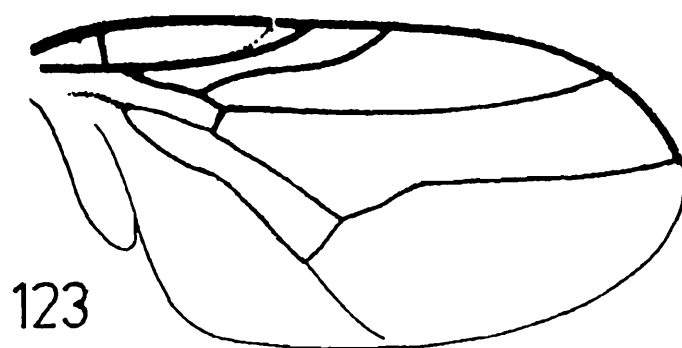
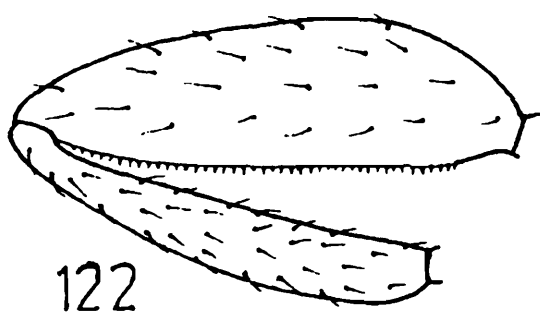
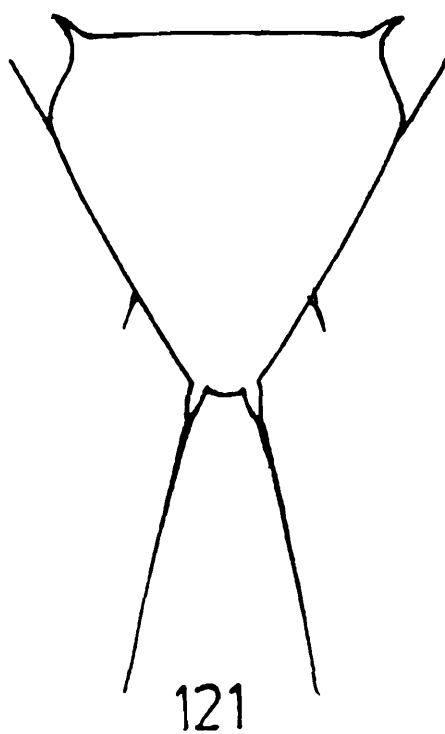
1931. *Macrostyla normalis* Malloch, *Ann. Mag. nat. Hist.* (10) 8 : 60. Type localities. : Philippines : Manila : Luzon ; Indonesia : Java : Mt. Gede : Tjibodas ; Ratoe : Pelaboean.

1977. *Rhodesiella normalis* (Malloch) Sabrosky, *Cat. Dipt. Orient. Region. 3* : 297.

Male and Female : Head : Higher than long, length, height and width ratio 13 : 15 : 21 ; frons dull black, distinctly narrowing anteriorly, width at vertex 0.43 x that of head, equal to its own length and 1.5 x the width near anterior end ; frontal triangle polished, shiny metallic blue to violet blue, relative width at anterior margin and vertex slightly varies in some specimens, reaching anterior margin of frons and ending with truncate apex. Eye large, bare, with vertical long axis. Face shiny black, concave ; facial carina very narrow and linear between bases of antennae ; lower facial margin thickened, only slightly raised up above level of face. Basal antennal segments brownish black ; ant 3 1.35 x as wide as long, subreniform, predominantly yellow but infuscated mostly along dorsodistal margin, with diffused dark tinge spreading on most of the surface in some specimens ; arista of medium size, dark brown with fairly dense, well developed, slender concolorous hairs. Gena sublinear, black, with a row of about 10–13 short slender hairs along oral margin ; vibrissal corner very slightly projecting beyond lower facial margin, with slender vibrissa of medium size ; postgena dull black with fairly dense, slender black hairs. Palpi black ; proboscis blackish brown. Head bristles well developed, black ; *out* and *pvt* subequal ; *ivt* three-fourths as long as *out* ; *oc* a trifle shorter than *ivt* ; *orb* 8, sequentially anterior ones becoming shorter and slender ; *if* about 8, in a row outside triangle along each lateral margin, a trifle shorter than longest *orb*.

Thorax : Shiny black ; scutum 0.9 x as long as wide, with convex disc which is densely and a little coarsely punctate and with well developed brownish black hairs ; scutellum (Fig. 121) 1.1–1.2 x as long as wide at base, with convex disc which has flattened appearance and thick sides, shagreened, very coarsely punctate than but pubescent like scutum ; pleura polished with a few brownish black hairs on *anepst* and much of the area of *kepst*. Thoracic bristles black, in development almost similar to those in *scutellata* ; *h* 1, only a trifle shorter than *npl* ; *npl* 1+1, subequal and equal to *ivt* ; *pa* 1 1.25 x and *pa* 2 two-thirds as long as *npl* ; 1 *dc* equal to *npl* ; *as* 0.9 x as long as scutellum, nearer to each other than to *ss* 1, borne on short, black tubercle ; *ss* 1 very short, 0.15 x as long as *as*, borne on very short tubercle.

Wing (Fig. 123) : 2.2 x as long as wide, hyaline with brownish yellowish veins ; costal sectors 2 to 4 in the ratio 6 : 13 : 6 ; r-m cross-vein proximad of the middle of discal cell, opposite 0.4 of its length ; terminal sector of r 4+5 concave above along its length, curving slightly forward toward costa distally, that of m 1+2 greatly convex above a little beyond base and weakly sinuate along its length, only 2.2 x as long as the penultimate sector ; anal angle well developed. Knob of haltere black, stalk yellowish brown to deeply brown.



Figs. 121-123 : *Rhodesiella normalis* (Malloch). 121, Scutellum. 122, Hind femur, female. 123, Wing.

Legs : Coxae, trochanters and femora black ; tibiae black but for their yellow distal ends ; tarsi yellow except for infuscated last three fore tarsi and last tarsus of mid and hind legs ; fore femur with a row of prominent erect hairs along anteroventral margin and mid tibia with a few similar hairs, along dorsolateral margin ; mid tibial spur yellow ; hind femur (Fig. 122) distinctly thickened in both sexes (unlike in the majority of species where hind femur only in the males is thickened) but less so in females, with numerous short, dense denticles ventrally in the distal half in both sexes ; many small black warts also present in a cluster anteroventrally a little beyond base in both sexes.

Abdomen : subshiny, black but for blackish brown tinge on basal segments, almost as wide as thorax and in female a trifle longer than wide, with blackish brown hairs. Female cerci short, with a few slender hairs.

Length : Female 2.1 mm wing 1.7 mm

Specimens studied : 1 female, Kerala : Trichur, 18.x.1967, Coll. P.T. Cherian ; 2 females, Orissa : Mayurbhanj Dt., Janabil, 20.iii.1973, Coll. S.K. Gupta ; 4 females, Kerala : Idukki, 10.ii.1982, Coll. P.T. Cherian ; 2 females, Kerala : Pathanamthitta Dt., Kakki, 30.xii.1983 Coll. P. T. Cherian. *R. normalis* shows affinities to *hirtimana* (Malloch) from Indonesia, Japan and India, but while the males of the latter species have erect hairs on posterior aspect of fore tarsi, thickened fore tibia and very long apical bristles on mid tibia, in *normalis* fore tarsi are without such hairs, fore tibia is normal and apical spur on mid tibia is short and similar to such spurs in other species of the genus. Besides, while in *hirtimana* there are two pairs of lateral scutellar bristles, in *normalis* there is only one pair of such bristles. Malloch in his key to the species had indicated that in the females of *hirtimana* frontal triangle is violet blue while in *normalis* it is bright blue. This cannot be used as a distinguishing feature since in some typical females of *normalis* frontal triangle is violet blue while in others it is bright blue.

20. *Rhodesiella scutellata* (de Meijere) (Figs. 124-128)

1908. *Meroscinis scutellata* de Meijere, *Tijdschr. Ent.* 51 : 177. Type localities : Java : Semarang, Batavia.

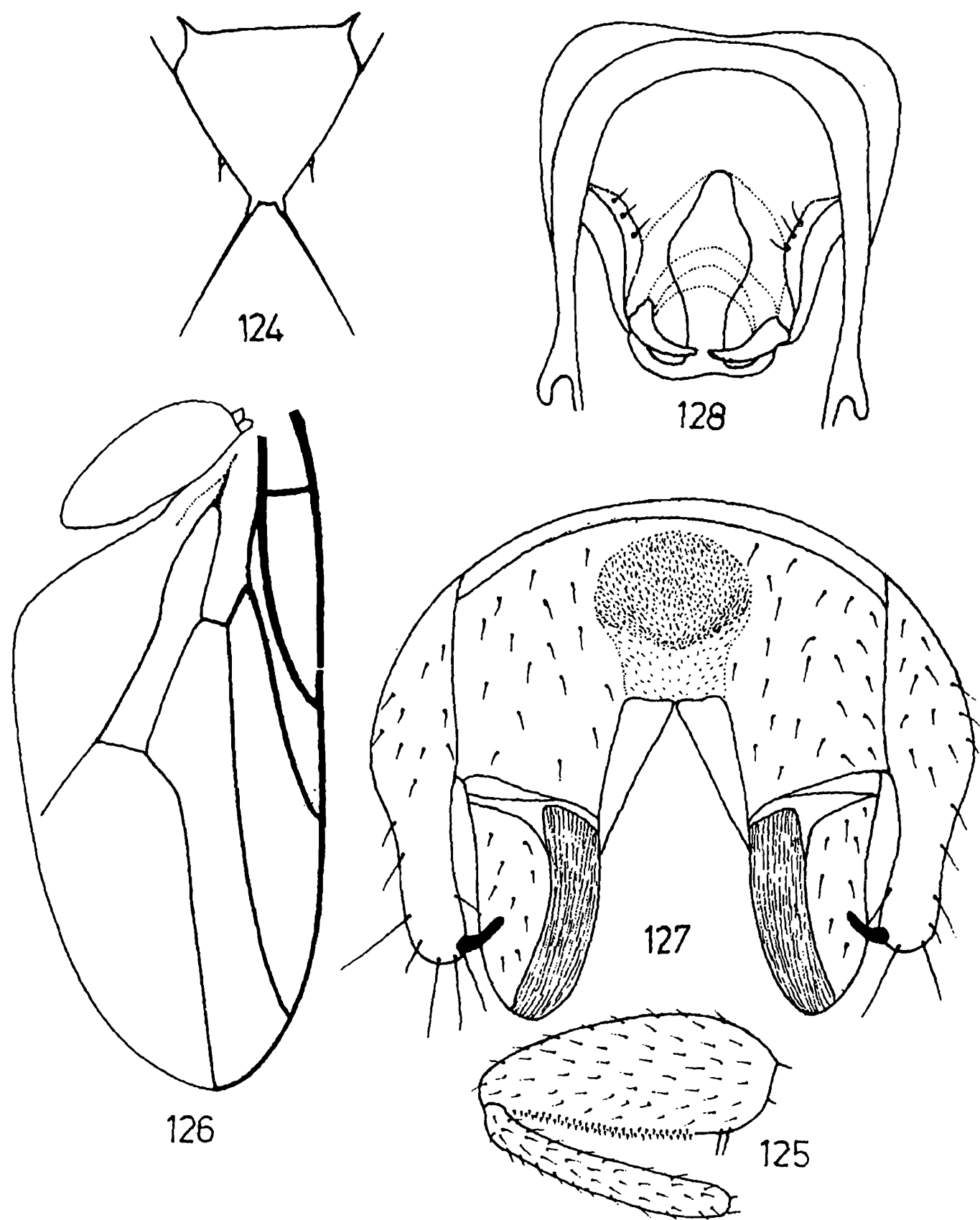
1940. *Rhodesiella scutellata* (de Meijere) : Sabrosky, *Ann. Mag. nat. Hist.* (11) 6 : 425.

Male and female : **Head :** Higher than long, length, height and width ratio 14 : 16 : 21. Frons dull black, width at vertex 0.48 x that of head, 0.9 x its own length and 1.2 x the width at anterior margin ; frontal triangle large, subtrapezoid, convex, projecting above eye margin, but in top front view not reaching anterior margin of eye, but

broadly extending to anterior margin and occupying much of the area of frons, steel blue, width at anterior margin about two-thirds its width at vertex. Face sloping, shiny black, concave with two submedian longitudinal furrows, one on each side; facial carina low, linear, reaching nearly middle of face; lower facial margin raised up, finely dark tomentose. Eye large, bare with vertical long axis. Antenna erect; basal segments black to brownish black; ant 3 three-fourths as long as wide, yellow to brownish yellow with dark tinge along dorsodistal margin; arista long, slender, dark brown with well developed, fairly dense, concolorous pubescence. Gena sublinear, dull black with a row of about 10 slender dark brown hairs along oral margin; vibrissal corner merging with the slightly projecting lower facial margin and appearing to extend a trifle beyond lower anterior margin of eye; postgena dull black, with slender, fairly dense dark brown hairs; postocular row of setae short and very slender but distinct. Palpi flattened, dull brownish black with dense short hairs; proboscis in male not with flattened distal margin as in most other species of the genus, in the male from Batavia laterally compressed, dull black and with dark hairs. Head bristles of medium size; *out* 1.2 x as long as *ivt*; a trifle longer than and *oc* subequal to *ivt*; *orb* 8-9, recumbent, sequentially anterior ones becoming shorter and slender, longest two-thirds as long as *out*; *if* 8-9, shorter than *orb*, in a row outside triangle along each lateral margin.

Thorax: Shiny black; scutum a trifle wider than long, with convex disc bearing dense rather coarse punctae and dark brown hairs; scutellum (Fig. 124) triangular, 1.3 x as long as wide at base with flattened disc which is very slightly convex medially and with rather distinctly drawn lateral margins, disc of scutellum very coarsely shagreened than but pubescent like scutum; pleura shiny black to brownish black with dark hairs on *anepst* and *kepst*, those on the latter not restricted to lower part as in some species. Thoracic bristles black; *h* 1, subequal to *ivt*; *npl* 1+1, subequal in length, anterior one more slender; *pa* 1 1.2 x as long as and *pa* 2 a little more than half as long as *npl*; 1 *dc* equal to *npl* but more slender; *as* 0.9 x as long as scutellum, borne on short black tubercle; *ss* 1 0.2 x as long as *as*, borne on very short but distinct tubercle; in one male in addition to *ss* 1 one or two prominent hairs are discernable, one above and the other below *ss* 1 but in others such hairs are absent.

Wing (Fig. 126): 2.2 to 2.3 x as long as wide, hyaline with brown to pale brown veins; costal sectors 2 to 4 in the ratio 7 : 14 : 6 but in some specimens second and fourth sectors nearly equal; r-m cross-vein greatly proximad of middle of discal cell, opposite 0.35 of its length; terminal sector of r 4+5 slightly bending towards costa, this and that of m 1+2 faintly diverging distally, the latter prominently concave behind a little beyond base and weakly sinuate along its length; anal angle moderately developed. Knob of haltere black to brownish black, stalk brown to dark brown.



Figs. 124-128 : *Rhodesiella scutellata* (de Meijere). 124, Scutellum. 125, Hind femur, male. 126, Wing. 127, Epandrium, ventral view. 128, Phallic complex, ventral view.

Legs : Coxae and femora black to brownish black ; fore femur with a row of erect hairs on outer surface ; trochanters pale to dark brown ; tibiae except for extreme brownish yellow distal ends black to brownish black ; mid tibia with a row of erect hairs ; hind femur in male (Fig. 125) thickened, length 3 x its maximum width, in female less thickened, 4 to a little more than 4 x as long as wide, in both sexes with small dark dense denticles on the ventral aspect, two-thirds its length distally and in male with 2–3 black spines basoventrally ; hind tibia curved corresponding to the thickening of hind femur ; tarsi yellow except for distinctly infuscated last two tarsi of fore leg and last one each of mid and hind legs.

Abdomen : As wide as or a little longer than wide and as wide as thorax, subshiny black with dark brown hairs. Female cerci dull black, rather slender, with slender black hairs. Male genitalia (Figs. 127-128) : Epandrium, unlike in other members of the complex, distolaterally produced into a long lobe which is nearly rounded and with a few well developed hairs apically ; surstylus large, deeply incised with longitudinal striae and with well developed bone-shaped sclerite ; cercus more developed than in other species of the complex ; hypandrium ventrally and ventrolaterally moderately developed ; distiphallus short, not longer than the short and broad phallapodeme, medially swollen, basal cylindrical part shorter than in other related species ; postgonite short, nearly pointed at apex.

Length : Male 2.3 mm wing 2 mm female 2.3 mm wing 2 mm

Specimens studied : 1 male (male genitalia, wings and one leg mounted), 1 female, Batavia, August, 1907. Coll. Jacobson. Det. de Meijere (in all probability belonging to the original type series) ; 1 female, Orissa : Mayurbhanj Dt., Janabil, 20.iii.1973, Coll. S. K. Gupta ; 2 females, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian ; 2 females, Tamil Nadu : Nilgiris : Naduvattom, 2160 m, 26.iii.1991. Coll. G. Thirumalai. Some of the distributional records of the species from beyond the limits of India needs verification since de Meijere had dealt with specimens belonging to more than one species under one species name and later authors like Malloch (1931) had reservations about the exact identity of some of the specimens before them which they had considered belonging to the species.

Three specimens, one female from Semarang and one male and a female from Batavia, collected by Jacobson and in all probability belonging to the original type series of *scutellata* (de Meijere) are deposited in the collections of the Zoological Survey of India. All the 3 had the original hand written labels of de Meijere indicating the species name as also those giving collection data. Of these the labels of two of the specimens from Batavia were badly damaged and could not be retrieved and I replaced them by deciphering the data using a microscope. The labels of the third specimen

are nearly intact. De Meijere (1908) in his original description of the species had not indicated the number of specimens he had before him. It is evident from Becker's (1911) observation that one or more of the specimens collected by Jacobson and probably belonging to the original type series are available in the Hungarian National Museum.

A detailed study of the above three specimens revealed that they belong to two distinct species of which two, one male and a female, from Batavia are closer to the description of the species by de Meijere. In the third from Semarang frontal triangle is not metallic blue and is much narrower anteriorly than in the other two. Besides, in this female hind femur is distinctly thicker than in the other two and it belongs to *lobulata* Cherian.

The figures of male genitalia, wing, legs and scutellum given here are of the male from Batavia. Malloch (1931) had difficulty in placing some specimens under the species as the original description incorporated characters of more than one species. Apart from *scutellata* there are several species belonging to the *scutellata* complex all of which appear apparently very much alike with thickened hind femur, nearly similar type of wing venation, identical pattern of colouration of tarsi and more or less similar build of scutellum. But in the shape and colouration of frontal triangle, minor, less discernable differences in the nature of hind femora, colouration of tibia and above all the build of male genitalia the species of this complex differ. The species belonging to this complex are *scutellata* (de Meijere), *lobulata* Cherian, *narendrani* Cherian, *longistyli*, sp. n., *luteoterminalis* sp. n., *quinguaginoso* sp.n., and *janabilensis*, sp. n. Though not represented in the Oriental Region, *tarsalis* (Adams) too may belong to this complex.

21. *Rhodesiella lobulata* Cherian (Figs. 129–133)

1973. *Rhodesiella lobulata* Cherian, *Oriental Insects*, 7 (2): 210-213. Type locality : Kerala : Trivandrum.

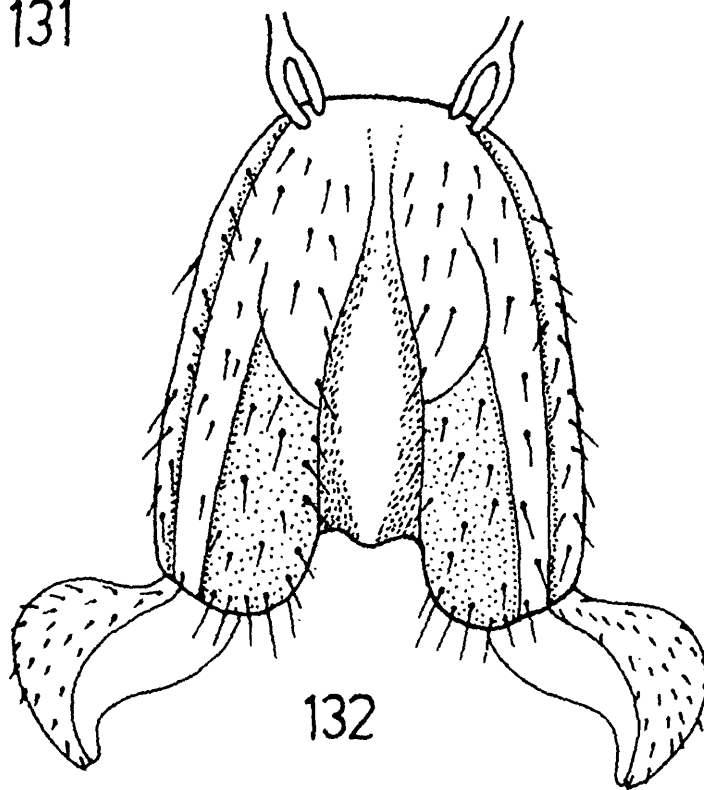
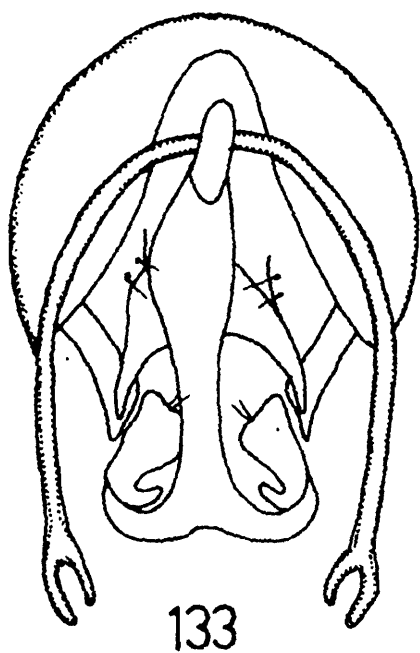
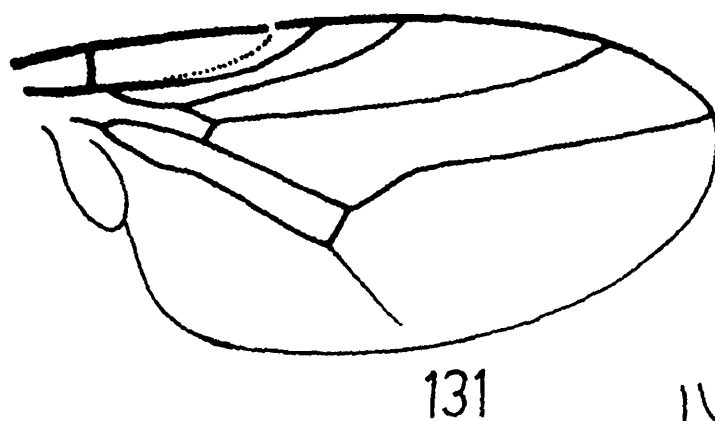
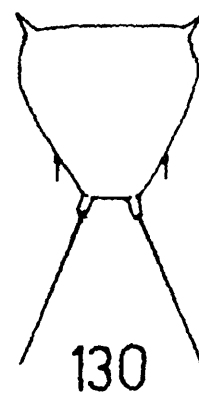
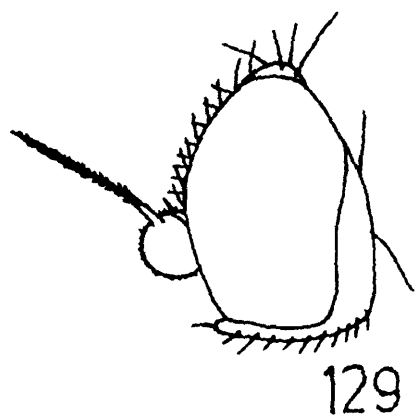
Male and female : Head (Fig. 129) : A trifle higher than long, length, height and width ratio 15 : 16 : 23. Frons sloping, dull black, width at vertex 0.49 x that of head, 0.8 x the width near anterior end and 0.9 x its own length ; frontal triangle glabrous, shiny purple to dark blue, reaching anterior margin of frons and ending with very broadly obtuse apex. Eye large, bare, in profile occupying almost the entire head and with distinctly vertical long axis. Face narrower than anterior part of frons, subshiny black, slightly concave medially and with depressed sides especially in some specimens ; facial carina not extending beyond bases of antenna ; epistomal margin dark tomentose,

only slightly raised above surface of face. Antenna rather erect ; ant 2 dark brown ; ant 3 two-thirds as long as wide, very finely pubescent, yellow with dark tinge confined mostly to dorsodistal margin ; arista slender, of medium length, dark brown with conspicuous concolorous pubescence. Gena linear, dull black ; vibrissal corner projecting a trifle beyond lower anterior margin of eye and merging with epistomal margin ; postgena rather reduced, dull black with short, black hairs. Proboscis and palpi dull black with a tinge of brown on proboscis especially in some specimens. Head bristles black ; *out* stout, nearly half as long as width of eye ; *ivt* slender, three-fourths the *out* ; *pvt* 0.8 x as long as *out* ; *orb* 9, recumbent, anterior most three shorter and slender, longest two-thirds the *out* ; *if* 9, in a row outside triangle along each lateral margin, as long as medium sized *orb* ; *oc* subequal to *ivt* ; vibrissa moderately developed ; postocular row of setae short but distinct ; a few erect hairs present along vertex margin and these are more in the area of *out* and *ivt*.

Thorax : Black to brownish black but rarely deeply brownish ; scutum convex, as wide as head and 0.9 x as long as wide, moderately coarsely and densely punctate with dark brown hairs ; scutellum (Fig. 130) elongate, subtriangular, with obtuse distal margin, 1.2 x as long as wide with moderately flattened but medially convex disc which is more coarsely punctate than but pubescent like scutum ; pleura concolorous with scutum, with short hairs on *anepst* and lower part of *kepst*. Thoracic bristles black ; *h* 1, shorter and slender than *ivt* ; *npl* 1+1, subequal, a trifle longer than *h* ; *pa* 1 1.2 x and *pa* 2 half as long as *npl* ; 1 *dc* subequal to *npl* ; *as* not approximated at base, widely divergent, almost as long as scutellum, borne on short but distinct black tubercle ; *ss* 1 one fifth as long as *as*, borne on very short, slender black tubercle.

Wing : (Fig. 131) : 2.5 x as long as wide, hyaline with deeply brown to dark brown veins and brown pubescence ; costal sectors 2 to 4 in the ratio 13 : 30 : 14 ; r-m cross-vein greatly proximad of middle of discal cell, opposite 0.38 of its length ; terminal sector of m 1+2 greatly convex above a little beyond base, its entire length weakly sinuate, this and that of r 4+5 diverging distally ; anal angle well developed. Stalk of haltere pale brown, knob black to brownish black.

Legs : Coxae, femora and tibiae dark brown to brownish black ; fore and mid tibiae with a row each of spinose hairs along dorsal margin ; hind femur in both males and females enlarged, its maximum width 3 x its own length, with numerous fine dark denticles confined to distal half of ventral margin and in males with 2 to 3 short black spines basoventrally ; hind tibia correspondingly curved ; tarsi yellow except for dark brown last two segments of fore and last segment each of mid and hind legs as in *scutellata*.



Figs. 129-133 : *Rhodesiella lobulata* Cherian. 129, Head, lateral view. 130, Scutellum, 131, Wing. 132, Epandrium, dorsal view. 133, Phallic complex, ventral view.

Abdomen : Almost as wide as long or a trifle longer in females, blackish brown basally and brownish black distally, set with dark brown hairs. Female cerci slender, with a few short hairs ; male genitalia (Figs. 132-133). Epandrium longer than wide, incised along one-fifth its length distally ; surstylus lobe-like with fairly dense small teeth like processes on outer surface and a few slender hairs ; hypandrium slightly broadened ventrolaterally ; distiphallus longer, more slender and submedially less thickened than in *scutellata* ; pregonite less developed than in *scutellata*.

Length : Male 2.2-2.3 mm wing 2-2.1 mm female 2.3-2.5 mm wing 2-2.2 mm.

Specimens studied : *Holotype* : female : Kerala : Trivandrum, 20.i.1967, Coll. P.T. Cherian. *Paratypes* : 6 males, 4 females, collection data same as of holotype. *Other examples* 1 female, Java : Semarang, Jan. 1906, Coll. Jacobson; 1 female, Kerala : Alleppey, 3.i.1984, Coll. M.S. Molly ; 1 male, Kerala : Idukki Dt., Kakki, 900 m, 30.xii.1983, Coll. P.T. Cherian ; 2 males, Idukki Dt., Painavu, 900 m, 24.ii.1984, Coll. P.T. Cherian ; 1 female, Tamil Nadu : Coimbatore Dt., Kunjapanai, 1200 m, 9.ii.1992, Coll. G. Thirumalai.

The one female from java is one of the three specimens (in all probability belonging to the original type series) of *scutellata* (de Meijere), with the hand written label of the species name by de Meijere and deposited with the collections of the Zoological Survey of India, Calcutta. Detailed study shows that while 2 of the specimens represent *scutellata* (de Meijere) the present one does not agree with the original description of the species and belongs to an entirely distinct species. When *lobulata* Cherian was described in 1973 this specimen was not studied and hence the clarification was not provided. Now it is found that it belongs to *lobulata* because, apart from other characters, of the nature of its frontal triangle and thickened nature of hind femur, since in *scutellata* hind femur is much less thickened in the female. *R. lobulata* closely resembles *scutellata* (de Meijere) but unlike in the latter the former has relatively narrower and anteriorly broadly obtuse and not broadly truncate frontal triangle. Besides, in *lobulata* frontal triangle is purple to dark blue and hind femur of female is prominently enlarged while *scutellata* has metallic blue frontal triangle and much less thickened hind femur in female. In addition male genitalia of the two species exhibit marked differences.

22. *Rhodesiella narendrani* Cherian (Figs. 134-138)

1973. *Rhodesiella narendrani* Cherian, *Oriental Insects*, 7 (2) : 207-208. Type locality : Uttar Pradesh, Agra : Taj Garden.

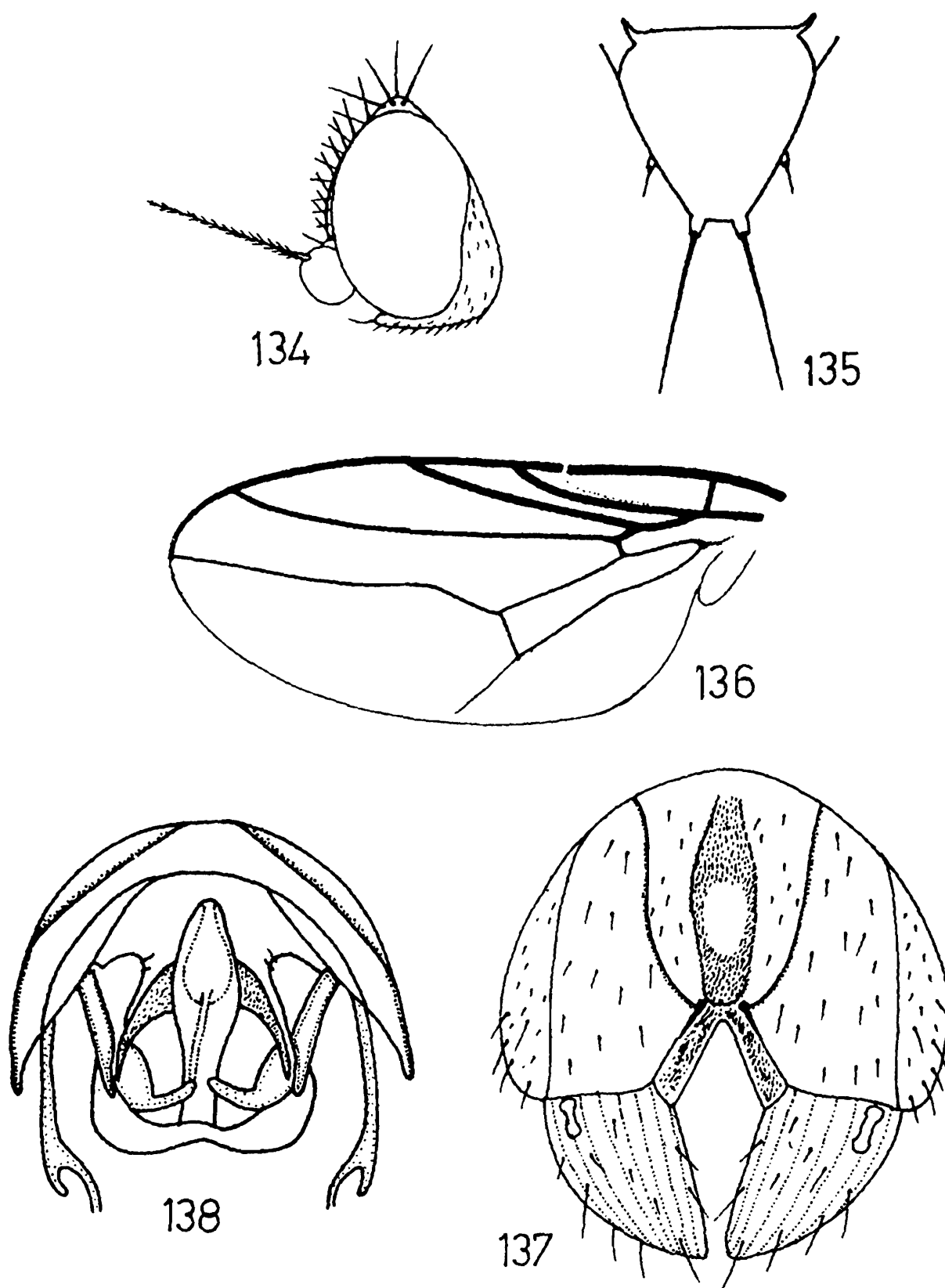
Male and female : **Head** (Fig. 134) : A trifle higher than long, length, height and width ratio 14 : 15 : 21. Frons subshiny black, narrowing anteriorly, width at vertex

half that of head, 1.2 x the width near anterior margin and 0.9 x its own length ; frontal triangle glabrous, shiny black with slight purple tinge in some specimens, reaching anterior margin of frons and ending with subtruncate apex, imparting subtrapezoidal outline to the triangle. Eye large, bare, with vertical long axis. Face much narrower than anterior part of frons, deeply concave, shiny black ; facial carina linear, restricted to area between bases of antennae ; lower facial margin a little raised up. Antenna very similar to that of *scutellata* ; basal segments brownish black ; ant 3 1.3 x as wide as long, yellow to brownish yellow ; arista slender, dark brown with concolorous pubescence as in *scutellata*. Gena sublinear, dull black ; vibrissal corner weakly developed ; postgena moderately developed, dull black with short hairs. Proboscis and palpi black. Head bristles black ; *out* a trifle longer and stouter than other head bristles ; *ivt* a little shorter than *out* ; *pvt* cruciate, only a trifle shorter than *out* ; *orb* 9, recumbent, sequentially anterior ones becoming shorter and thinner, longest two-thirds as long as *out* ; *oc* subequal to *ivt* ; *if* 9, in a row outside triangle along each lateral margin as in *scutellata*.

Thorax : Shiny black ; scutum 1.1 x as wide as long with convex disc which is moderately and densely punctate and with dark brown hairs of medium size ; scutellum (Fig. 135) 1.25 x as long as wide at base, subtriangular in outline with sloping sides and distinctly convex disc, which is more coarsely punctate than but pubescent like scutum ; pleura shiny black with short dark brown hairs on *anepst* and a few such hairs on part of *kepst*. Thoracic bristles black, very similar in development to that of *scutellata* ; *h* 1, slender, a little shorter than *ivt* ; *npl* 1+1, subequal in length but posterior one a trifle stouter ; *pa* 1 distinctly longer than *npl* ; *pa* 2 two-thirds as long as and 1 *dc* a trifle shorter than *npl* ; *as* nearer to each other than to *ss* 1, as long as scutellum, borne on well developed, black tubercle ; *ss* 1 0.2 x as long as *as*, borne on very short tubercle.

Wing (Fig. 136) : 2.3 x as long as wide, hyaline, with pale brown veins ; costal sectors 2 to 4 in the ratio 9 : 16 : 7 ; r-m cross-vein proximad of middle of discal cell, opposite 0.4 of its length ; terminal sector of r 4+5 slightly bending forward toward costa distally, that of m 1+2 concave behind a little beyond base as in *scutellata* and weakly sinuate along its length ; anal angle moderately developed. Stalk of haltere brown, knob brownish black.

gs : Coxae and femora black to brownish black ; trochanters dark brown with tinge especially in some specimens ; tibiae brownish black, except for their yellow to brownish yellow distal ends ; tarsi yellow but for dark brown last two segments of fore and last one each of mid and hind legs as in *scutellata* and *lobulata* ; mid tibial spine well developed, yellow ; hind femur thickened in both sexes, more so in male, its greatest thickness one-third and in some specimens a little more than



Figs. 134-138 : *Rhodesiella narendrani* Cherian. 134, Head, lateral view. 135, Scutellum, 136, Wing. 137, Epandrium, dorsal view. 138, Phallic complex, ventral view.

one-third its own length in males, with numerous fine black denticles confined to three-fifths its length ventrally and with 2 short black spines basoventrally in male ; hind tibia correspondingly curved.

Abdomen : Wholly smooth and shiny black to brownish black, as long as or a trifle longer than wide and as wide as thorax. Female cerci of medium length, dark brown with fine pubescence. Male genitalia (Figs 137-138) : Epandrium wider than long, not very deeply incised ; surstylus long, broad basally and narrowing and obtuse distally and with longitudinal striations ; hypandrium widened medially and distiphallus elongate and cylindrical basally, slightly swollen medially and in the form of an inverted V distally ; pre-and postgonites well developed.

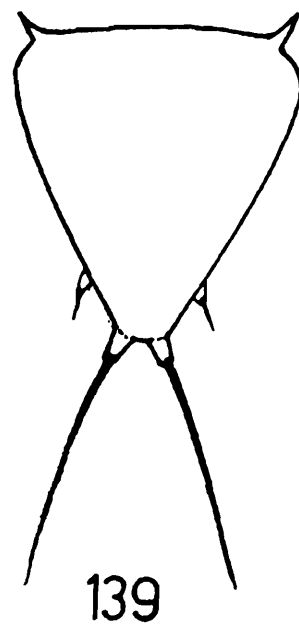
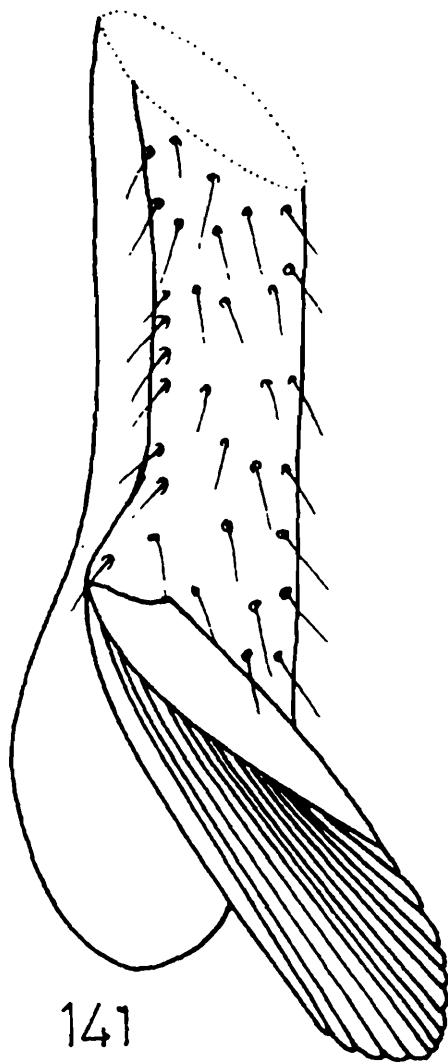
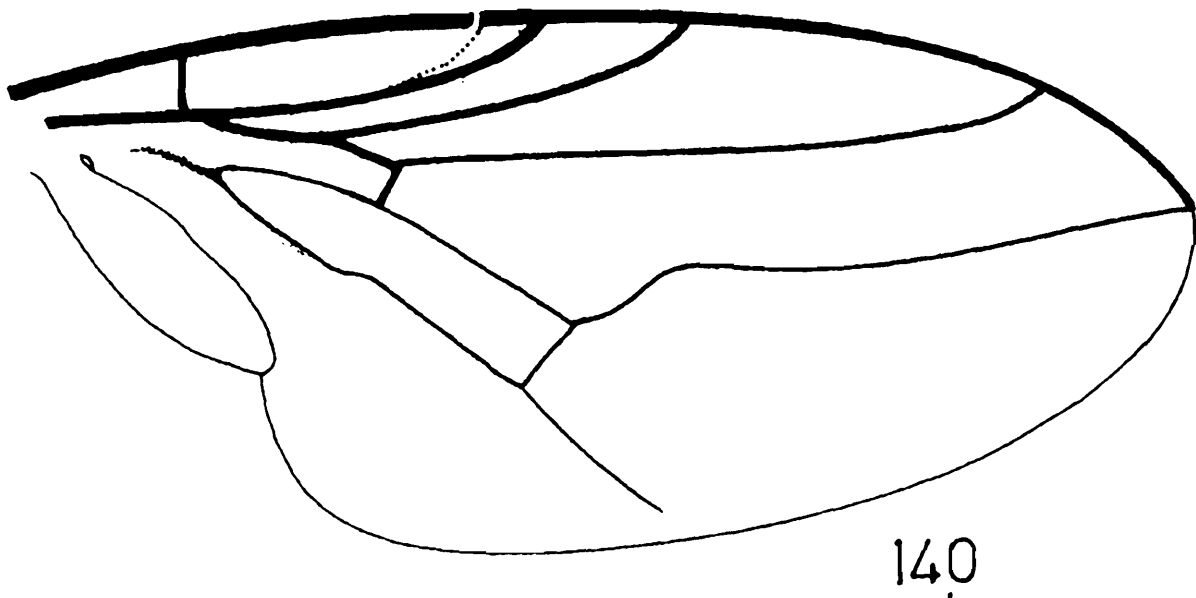
Length : Male 2.7-3 mm wing 2.4-2.7 mm Female 2.9-3.1 mm. wing 2.6-2.9 mm

Specimens studied : *Holotype* : Female, India : U.P., Agra : Taj Garden, 20.xi.1966, Coll. P.T. Cherian. *Paratypes* : 6 males, 2 females, collection data same as of holotype. *Other examples* : 12 males, 6 females, Orissa : Mayurbhanj Dist., Janabil, 20.iii.1973, Coll. S.K. Gupta ; 8 males, 17 females, West Bengal : Darjeeling Dist., Andhari Khola, 9.iv.1973, Coll. H.S. Sharma ; 3 males, 1 female, Mizoram : Kolasib, 8.iii.1979, Coll. P.T. Cherian ; 1 female, Calcutta, 5-6.i.1908, N. Anandale.

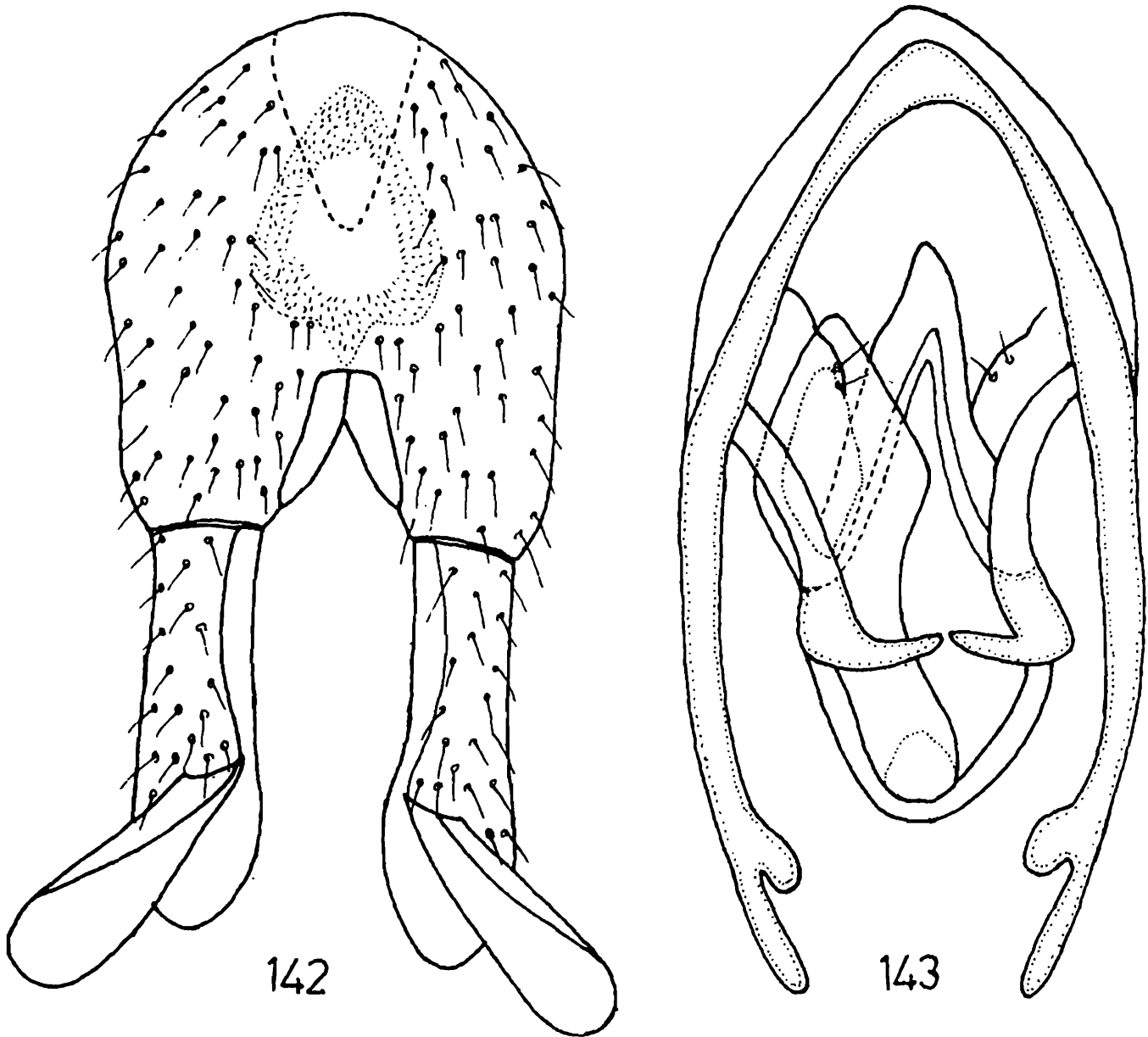
R. narendrani closely resembles *scutellata* (de Meijere) but while in the former frontal triangle is black and less truncate anteriorly, in the latter species the triangle is very broadly truncate in front and is steel blue. Besides, in *narendrani* the hind femur in both the sexes is greatly thickened but in *scutellata* hind femur in female is much less thickened than in the male. In addition, the male genitalia of the two species differ greatly in the relative development of surstylus, epandrium and other structures.

23. *Rhodesiella longistyli*, sp. n. (Figs. 139-143)

Male and female : *Head* : A little higher than long, length, height and width ratio 14 : 16 : 21. Frons sloping, dull black, width at vertex nearly half that of head, 0.9 x its own length and 1.3 x the width at anterior margin ; frontal triangle glabrous, shiny blackish blue, reaching anterior margin of frons and ending with rather truncate apex. Eye large, bare, with vertical long axis. Face concave, much narrower than anterior part of frons, shiny black ; lower facial margin slightly raised up, finely dark tomentose. Antenna directed outward and downward ; basal segments brownish black to wholly black ; ant 3 0.65 x as long as wide, yellow with very fine pubescence ; arista of medium length, dull blackish brown with fine concolorous pubescence. Gena sublinear, dull black, with a row of short hairs along oral margin ; vibrissal corner



Figs. 139-141 : *Rhodesiella longistyli*, sp. n. 139, Scutellum. 140, Wing. 141, Surstylus.



Figs. 142-143 : *Rhodesiella longistyli*, sp. n. 142, Epandrium, dorsal view. 143, Phallic complex, ventral view.

very slightly projecting, rather reduced; postgena of medium size, dull black with short black hairs. Proboscis and palpi dull black. Head bristles of medium size, similar in development to those of *scutellata*; *out* a trifle longer than and *ivt* a little shorter than *pvt*; *orb* 8-9, recumbent, sequentially anterior ones becoming shorter and slender, longest about two-thirds as long as *out*; *oc* subequal to *ivt*; *if* 8-9, in a row outside triangle, along each lateral margin; vibrissa of medium size; postocular row of setae very fine.

Thorax : Shiny black; scutum 1.1 x as wide as long and as wide as head, moderately convex, fairly densely punctate and blackish brown pubescent as in *scutellata*; scutellum (Fig. 139) subtriangular, 1.2 x as long as wide with nearly flattened and medially convex disc, less sloping sides than in *narendrani* and with thicker lateral margins, pubescent like but more coarsely punctate than scutum; pleura shiny with blackish brown hairs on *anepst* and part of *kepst* as in *scutellata*. Thoracic bristles black, very similar to those in *scutellata*, with 1 *h*, 1+1 *npl* which are subequal and equal to 1 *dc*, *pa* 1 which is 1.2 x as long as and *pa* 2 which is half as long as 1 *dc*; *as* 0.9 x as long as scutellum, nearer to each other than to *ss* 1, borne on tubercle which is less developed than in *narendrani*; *ss* 1, 0.15 x as long as *as*, very slender, borne on very short black tubercle.

Wing (Fig. 140): 2.2 x as long as wide, hyaline with pale brown veins; costal sectors 2 to 4 in the ratio 6 : 15 : 6; r-m cross-vein greatly proximad of the middle of discal cell, opposite 0.4 of its length; terminal sector of r 4+5 slightly bending forward toward costa distally, that of m 1+2 concave behind a little beyond base and weakly sinuate along its length as in *lobulata* and *narendrani*; anal angle more developed than in *narendrani*. Stalk of haltere yellowish brown, knob is completely black or brownish black.

Legs : Very similar to those of the *scutellata* complex of species; coxae and femora black to brownish black; trochanters brownish; tibiae brownish black but for yellow terminal ends; mid tibia with a row of rather long erect black hairs along dorsolateral margin as in *lobulata* and with yellow terminal spine; hind femur in male a little less thickened than in *scutellata* and other relatives, length 3.8-4 x its maximum width, with a group of warts on anterolateral aspect near base as in *scutellata*, fine denticles ventrally on the distal half which are less numerous than in *scutellata* and no distinct spines basoventrally; hind tibia slightly curved; tarsi yellow except for distinctly infuscated last two tarsi of fore and last tarsus each of mid and hind legs as in *lobulata*, *scutellata* and *narendrani*.

Abdomen : Nearly as wide as long, subshiny black to brownish black, with a few slender hairs. Male genitalia (Figs. 141-143) : Epandrium longer than wide, deeply

incised ; surstylus long and slender, distally divided into two lobes of which one is much longer and with longitudinal striae, bone-shaped sclerite near basolateral margin very short and less developed than in other related species ; distiphallus subcylindrical widened a little before apex ; gonites with hairs ; hypandrium much longer than wide, tapering ventrally ; when at rest surstyli crosses over each other distally.

Length : Male 1.9 mm wing 1.7 mm female 2 mm wing 1.8 mm

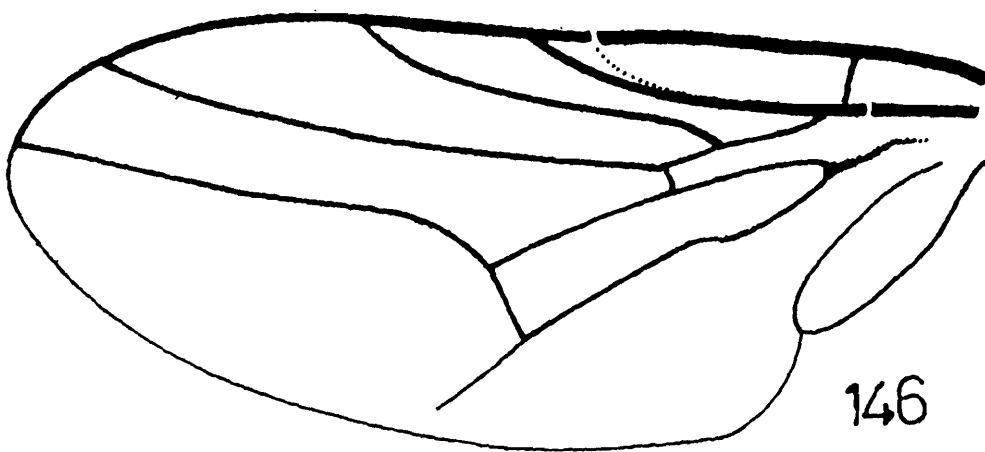
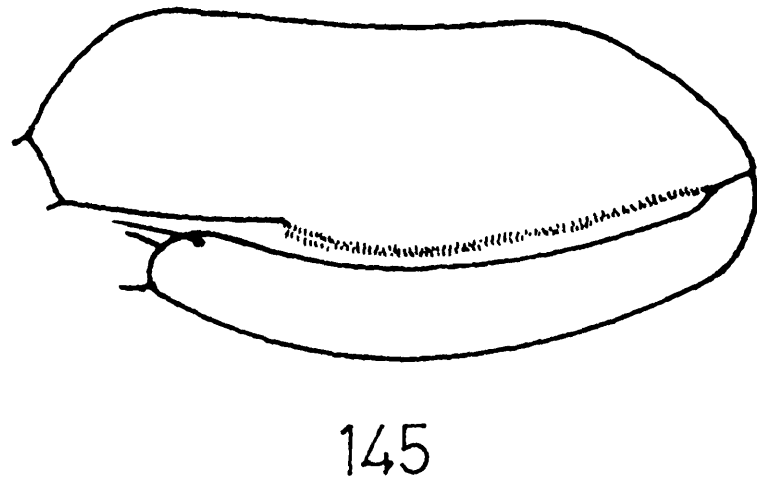
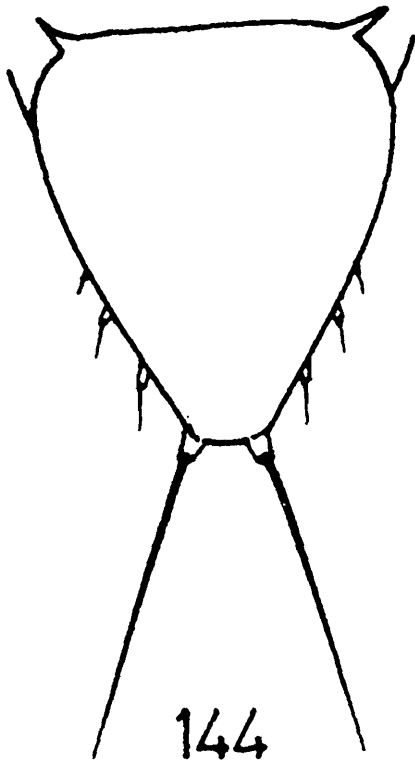
Holotype : Male, Orissa : Mayurbhanj Dist., Janabil, 20.iii.1973, Coll. S.K. Gupta.
Paratypes : 5 males, 2 females, collection data same as of holotype ; 2 males, Darjeeling Dt., Andhari Khola, 9.iv.1973, Coll. H. S. Sharma.

This species resembles *narendrani* Cherman but can be easily distinguished by its less thickened hind femur, partly yellowish brown knob of haltere, greatly elongated surstyli nature of its epandrium, hypandrium and phallic complex.

24. *Rhodesiella janabilensis* sp. nov. (Figs. 144-146)

Female : *Head* : Higher than long, length, height and width ratio 17 : 20 : 28. Frons greatly sloping, width at vertex 0.42 x that of head, 1.3 x the width near anterior end and 0.85 x its own length, dull black ; frontal triangle polished, shiny bluish black, reaching anterior margin of frons and ending with truncate apex, width at anterior margin a little more than half its width at vertex. Eye very large, bare with distinctly vertical long axis. Face deeply concave, longer than wide, shiny black ; facial carina low, linear, restricted to area between bases of antennae ; lower facial margin raised up, inner surface finely tomentose. Basal antennal segments brownish black ; ant 2 with black dorsal spine ; ant 3 0.6 x as long as wide, finely pubescent, yellow to brownish yellow with dark tinge confined to dorsodistal margin ; arista brownish black with fairly dense concolorous pubescence of moderate size. Gena greatly reduced, linear, subshiny black with a row of 10-12 slender black hairs along oral margin ; vibrissal corner reduced, with short black vibrissa ; postgena reduced, dull black with black hairs. Proboscis dark brown along distal margin ; palpi dull brownish black with short black hairs. Head bristles black, of moderate size ; *ovt* longer and stouter than other head bristles ; *ivt* and *pvt* subequal ; *oc* a trifle shorter than *ivt* ; *orb* 10 sequentially anterior ones becoming shorter and slender, longest three-fourths as long as *ivt* ; *if* about 10, in a row outside triangle along each lateral margin.

Thorax : Shiny black ; scutum nearly as long as wide and as wide as head with prominently convex disc which is more coarsely and densely punctate than in *scutellata* and with black hairs of medium size ; scutellum (Fig. 144) 1.3 x as long as wide, disc distinctly more sloping and medially more convex than in *scutellata* and more coarsely punctate than and pubescent like scutum ; pleura with short, slender black hairs on *anepst* and lower part of *kepst*. Thoracic bristles black ; *h* 1, nearly as long as medium



Figs. 144-146 : *Rhodesiella janabilensis*, sp. n. 144, Scutellum. 145, Hind femur, female. 146, Wing.

sized *orb* ; *npl* 1+1, subequal, a little longer and stouter than *h* ; *pa* 1 1.3 x as long as *npl* ; *pa* 2 and 1 *dc* subequal, shorter and slender than *npl* ; *as* 0.9 x as long as scutellum, almost equidistant from each other and *ss* 1, borne on well developed black tubercle ; *ss* 1 nearly equidistant from *as* and *ss* 2, very short, 0.15 x as long as *as* ; *ss* 2 almost subequal to *ss* 1 ; both the lateral scutellars borne on very small but distinct tubercles ; a very small *ss* 3 borne on a wart is distinct in some specimens while in others it is less distinct and takes the form of a hair.

Wing (Fig. 146) : 2.5 x as long as wide and only a trifle shorter than body, hyaline with partly dark brown and partly brownish yellow veins and brown pubescence ; costal sectors 2 to 4 in the ratio 5 : 6 : 3 ; r-m cross-vein proximad of middle of discal cell, opposite 0.45 x its length ; terminal sectors of r 4+5 and m 1+2 nearly parallel beyond nearly one-third the length of the latter from base which is flexed and greatly convex above a little beyond base recalling the condition in *scutellata* ; anal angle of wing rather well developed. Knob of haltere brownish black, stalk brown to dark brown.

Legs : Coxae and femora black ; trochanters dark brown to brownish-black ; hind femur (fallen off in male) in female (Fig. 145) greatly thickened, its maximum thickness one-third its own length and with numerous, dense denticles ventrally (which are more developed than in *scutellata*) along three-fifths its length distally ; tibiae black but for their yellowish distal ends ; hind tibia distinctly bowed ; tarsi yellow except for infuscated last two tarsi of fore leg and last one each of mid and hind legs ; mid tibial apical spine slender, yellow.

Abdomen : As wide as thorax and almost as wide as long, subshiny black to brownish black with short black hairs. Female cerci of medium size, black, with a few short hairs.

Length : Female 3.2 mm wing 3 mm.

Holotype : Female, Orissa : Mayurbhanj Dt., Janabil, 20.iii.1973, Coll. S.K. Gupta.
Paratypes : 2 females, 1 male (?) (terminal part of abdomen damaged), data same as of holotype.

R. janabilensis closely resembles *scutellata* (de Meijere) but the two can easily be differentiated by the larger size, more convex scutellum, 2-3 pairs of *ss* and greatly thickened hind femur of the former.

25. *Rhodesiella quinquaginata*, sp. nov. (Figs. 147-151)

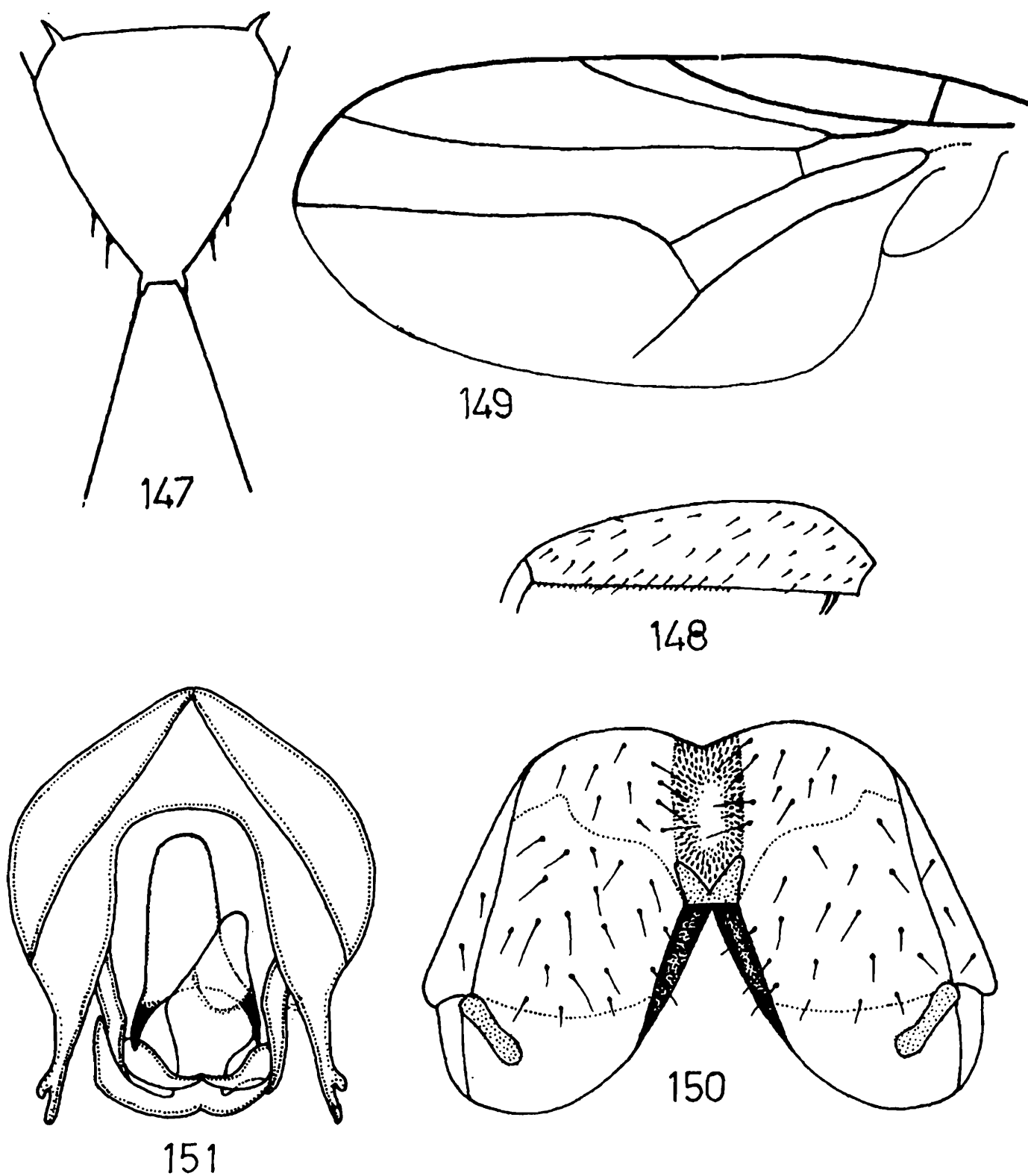
Male and female : *Head* : Higher than long, length, height and width ratio 13 : 16 : 22. Frons dull black, narrowing anteriorly, width at vertex 0.45 x the width of head, equal to its own length and 1.3 x the width near anterior margin ; frontal

triangle dark blue, polished and shiny, subtrapezoidal in outline and ending with truncate apex at anterior margin of frons. Eye large, bare with vertical long axis. Face much narrower than frons, concave, shiny black, with two submedian longitudinal grooves, one on each side ; facial carina rather indistinct ; lower facial margin slightly raised up, dark grey tomentose along inner margin. Basal antennal segments black ; ant 3 1.6 x as wide as long, yellow with dark tinge along dorsodistal margin ; arista slender, of medium length, brownish black with fairly dense concolorous pubescence. Gena black, linear, with a row of slender black hairs along oral margin ; vibrissal corner rather reduced ; postgena black with short black hairs. Palpi black ; proboscis distally dark brown. Head bristles black, almost similar in development to those in *scutellata* ; *out* 1.2 x as long as *ivt*, the latter and *put* subequal ; *oc* a trifle shorter than *ivt* ; *orb* about 9, anterior ones sequentially becoming shorter and much slender, longest 0.55 x as long as *out* ; *if* in a row of about 9 outside frontal triangle along each lateral margin.

Thorax : Shiny black ; scutum as wide as head and 0.9 x as long as wide, with convex disc which is rather densely and coarsely punctate as in *scutellata* and with brownish black hairs ; scutellum (Fig. 147) triangular, 1.2 x as long as wide at base with nearly sharp lateral margins as in *scutellata*, the disc convex medially and more coarsely punctate than and pubescent like scutum ; pleura shiny with a few black hairs on *anepst* and mostly confined to upper and lower margins of *kepst*. Thoracic bristles black ; *h* 1, a trifle shorter than longest *orb* ; *npl* 1+1, a little longer than 1 *dc* ; *pa* 1 equal to *out* ; *pa* 2 shorter than 1 *dc* ; *as* 0.9 x as long as scutellum, borne on short, black tubercle ; *ss* 1 1.2 x as long as *as*, borne on very short, slender wart-like tubercle ; *ss* 2 a trifle shorter than *ss* 1, borne on a very fine tubercle.

Wing (Fig. 149) : 2.3 x as long as wide, hyaline with brown pubescence and brown to dark brown veins ; costal sectors 2 to 4 in the ratio 13 : 28 : 10 ; r-m cross-vein a trifle proximad of the middle of discal cell, opposite 0.47 of its length ; terminal sector of r 4+5 slightly concave above its entire length, that of m 1+2 greatly flexed and convex above a little beyond base as in *scutellata*, weakly sinuate along its whole length ; anal angle moderately developed, a trifle reduced than in *scutellata*. Knob of haltere black ; stalk brown to dark brown.

Legs : All coxae, trochanters, femora and tibiae black ; fore femur with a row of erect slender hairs along anteroventral margin and mid tibia with slender erect hairs along lateral margin which are longer than on fore femur ; mid tibial spine black ; hind femur (Fig. 148) in both sexes only very slightly thickened, its maximum width about one-fourth its length, with very fine dense black denticles on the ventral aspect of distal half and these finer than in *scutellata* ; in a few specimens hind femur a trifle more swollen than in others ; hind femoral spine on the ventral aspect near



Figs. 147-151 : *Rhodesiella quiquaginosa*, sp. n. 147, Scutellum. 148, Hind femur, male. 149, Wing. 150, Epandrium, ventral view. 151, Phallic complex.

base in male rather stout and well developed and the number varies from one to two ; tarsi yellow except for infuscated last two tarsi of fore leg and last one each of mid and hind legs as in *scutellata*.

Abdomen : Nearly as long as wide and as wide as thorax, shiny black with fine black hairs. Female cerci of medium size, black. Male genitalia (Figs. 150-151). Epandrium well developed, broadened laterally and rather deeply incised ; surstylus short, much wider than long with rounded distal margin and with bone-shaped process articulating laterobasally with epandrium as in *hirtimana* (Malloch) ; hypandrium widened medially ; distiphallus of medium size, widened medially and narrow distally ; pre-and postgonites well developed, tapering distally, the latter hook-like ; phallapodeme well developed, not reaching hypandrium ventrally.

Length : Male 2 mm wing 1.8 mm Female 2.3 mm wing 2.1 mm.

Holotype : Male, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian.

Paratypes : 1 female, data same as of holotype ; 3 males, 3 females, Mizoram : Kolasib, 8.iii.1979, Coll. P.T. Cherian ; 5 males, 3 females, W. Bengal, Darjeeling Dist., Andhari Khola, 9.iv.1973, Coll. H.S. Sharma.

This species closely resembles *scutellata* (de Meijere) but while the latter has only one lateral scutellar bristle, in *quinguaginosa* there are two. Besides, in this species hind femur is less thickened and denticles are finer than in *scutellata* and the male genitalia of the two show many differences.

Name : This being the fiftieth species of the genus described from India, it has been named *quinguaginosa*.

26. *Rhodesiella achala*, sp. nov. (Figs. 152-156)

Male and female : *Head* : Much wider than high, length, height and width ratio 12 : 13 : 19. Frons slightly narrowing anteriorly, dull black, width at vertex 0.48 x that of head, 0.9 x its own width and 1.2 x the width near anterior end ; frontal triangle very similar to that of *kodayarensis*, shiny, polished, blackish blue, reaching anterior margin of frons and ending with narrowly obtuse apex. Eye large, bare, with vertical long axis. Face much narrower than frons, concave, shiny brownish black ; facial carina low, linear, reaching nearly lower facial margin, the latter slightly raised up, dark tomentose along inner margin. Antenna very similar to *scutellata* ; basal segments dull black, with short black hairs ; ant 3 0.7 x as long as wide, brownish yellow with dark tinge along dorsodistal margin, with very fine, pale pubescence ; arista of medium size, much shorter than in *kodayarensis*, almost similar to that of *scutellata*, dark brown with short, fairly dense concolorous pubescence. Gena sublinear, dull black with a row of black hairs along oral margin ; vibrissal corner not projecting beyond

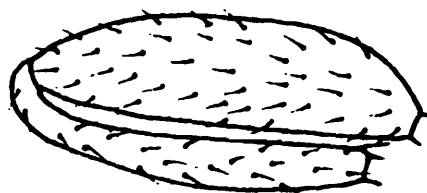
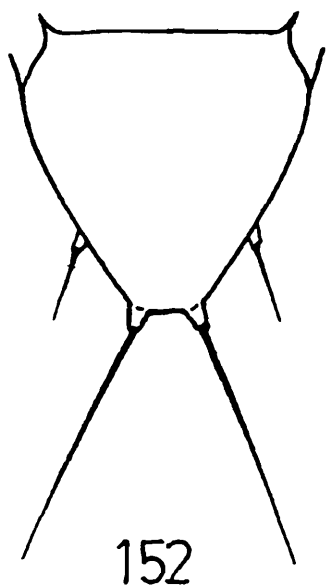
lower anterior eye margin ; postgena moderately developed, black, with black hairs. Proboscis and palpi dull brownish black. Head bristles black, of moderate size ; *out* a little longer than other head bristles ; *ivt* and *pvt* subequal ; *orb* 8-9, sequentially anterior ones becoming shorter and slender, longest three-fifths as long as *out* ; *if* 8, in a row outside triangle along each lateral margin ; vibrissa rather slender, of medium size ; vertex margin in the area of *out* and *ivt* with a few short black hairs.

Thorax : Shiny black ; scutum as wide as head, moderately convex, densely and coarsely punctate with blackish brown hairs which in some angles of illumination appear pale ; scutellum (Fig. 152) 1.2 x as long as wide, subtriangular, disc more convex than in *scutellata*, more coarsely punctate than and pubescent like scutum ; pleura polished with short hairs on *anepst* and part of *kepst*. Thoracic bristles black, of moderate size ; *h* 1, a little shorter than *ivt* ; *npl* 1+1, a little longer than *h* and equal to 1 *dc* ; *pa* 1 a little longer than and *pa* 2 half as long as *npl* ; *as* 0.9 x as long as scutellum, closer to each other than to *ss* 1, the latter 0.35 to 0.4 x as long as *as* ; *ss* 1 in one of the specimens is a trifle longer and stouter than in the other ; both pairs of scutellars borne on distinct tubercles.

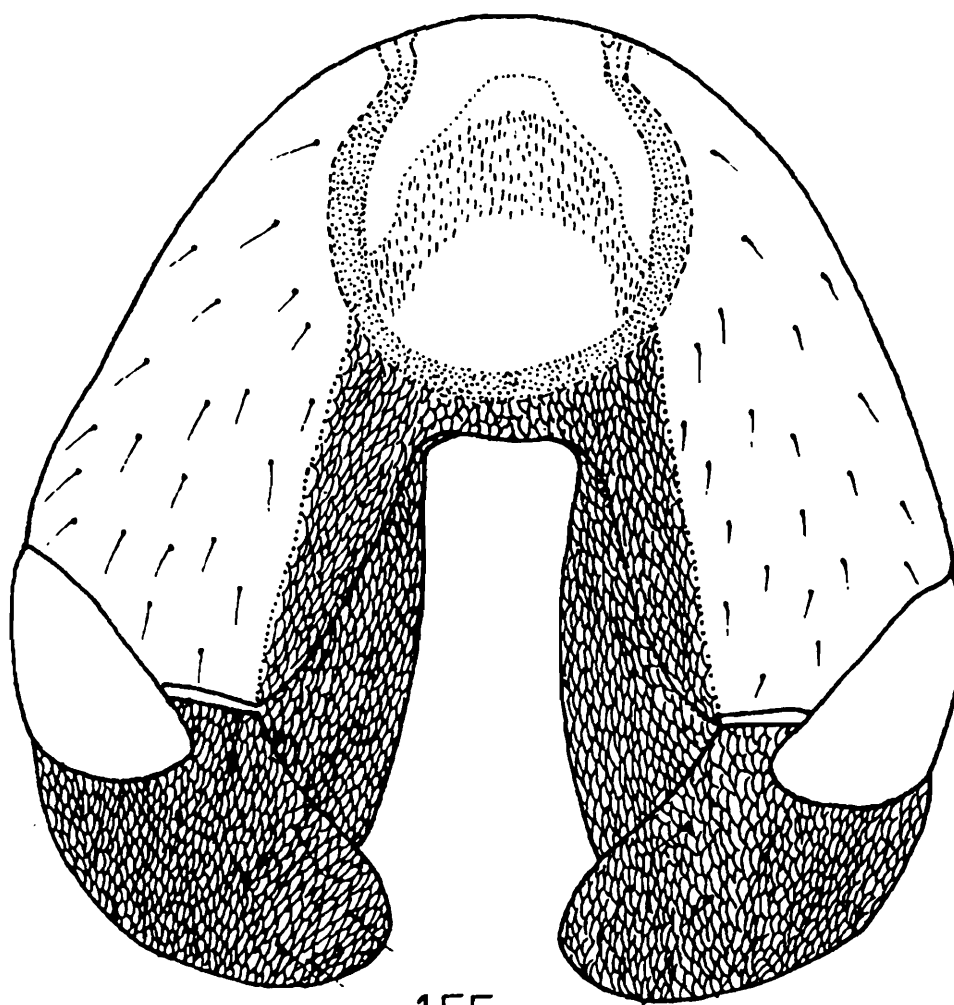
Wing (Fig. 154) : 2.33 x as long as wide, hyaline with pale brown tinge unlike the distinctly hyaline wing of *kodayarensis* ; costal sectors 2 to 4 in the ratio 8 : 11 : 6 to 10 : 12 : 7 ; r-m cross-vein slightly proximad of middle of discal cell, opposite 0.45 of its length ; terminal sector of r 4+5 gently curving forward toward costa distally, that of m 1+2 almost straight along nearly its entire length and only slightly convex above a little beyond its base unlike in *scutellata* where it is greatly convex above ; anal angle moderately developed. Stalk of haltere brownish yellow, knob brownish black.

Legs : Coxae and femora brownish black ; hind femur in male (Fig. 153) Slightly thickened but much less so than in *scutellata* ; fore femur with a row of erect black hairs along anteroventral surface ; trochanters yellowish brown ; hind tibia almost entirely and fore and mid tibiae but for their yellow distal ends brownish black ; tarsi yellow except for the infuscated last two fore tarsi and last tarsus each of mid and hind legs.

Abdomen : Nearly as wide as thorax and longer than wide, dull brownish black with diffused yellowish brown tinge on some areas of two basal segments and with dark brown hairs. Female cerci slender, dull black with slender, well developed black hairs. Male genitalia (Figs. 155-156). Epandrium greatly incised, widening distally ; surstylus subcylindrical, with gently curving inner and very broadly obtuse distal margin ; whole of surstylus and part of epandrium with dense scales as in fig. 155 ; hypandrium subcylindrical ; distiphallus gently narrowing toward distal end ; pre and postgonites and phallapodeme well developed.

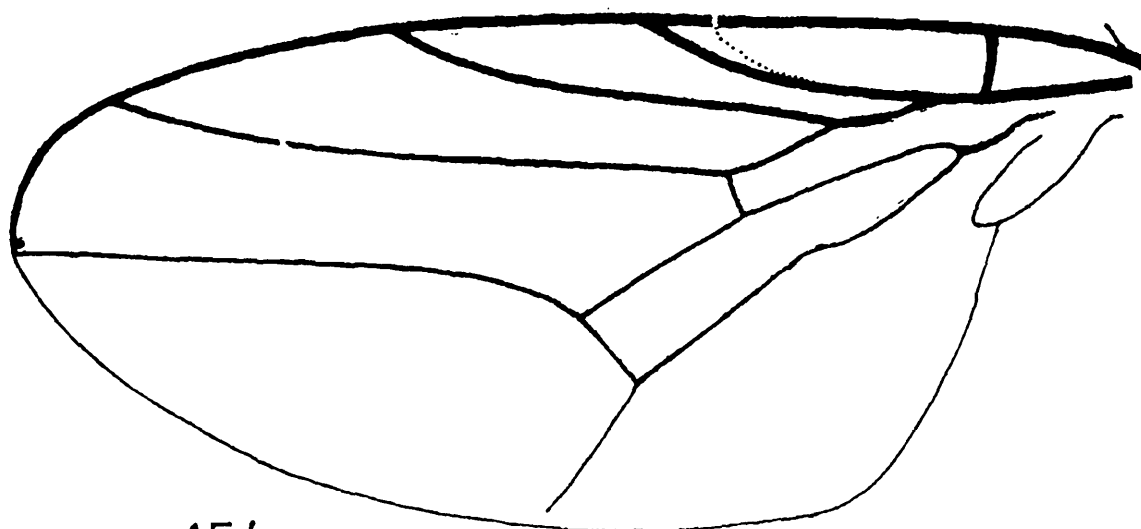


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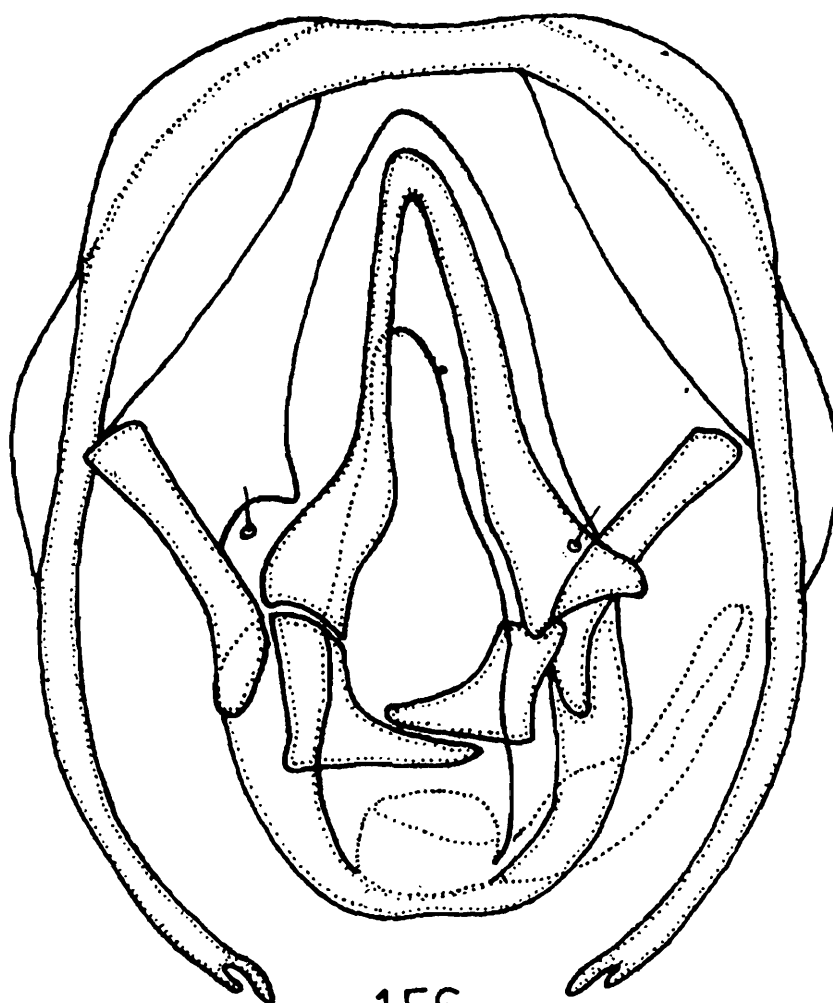


155

Figs. 152, 153, 155 : *Rhodesiella achala*, sp. n. 152, Scutellum. 153, Hind femur, male. 155, Epandrium, ventral view.



154



156

Figs. 154, 156 : *Rhodesiella achala*, sp. n. 154, Wing. 156, Phallic complex, ventral view.

Length : Male 2 mm wing 1.7 mm female 2.2 mm wing 1.8 mm.

Holotype : Male, Kerala : Idukki : Painavu, 900 m. 24.ii.1984, Coll. P.T. Cherian.

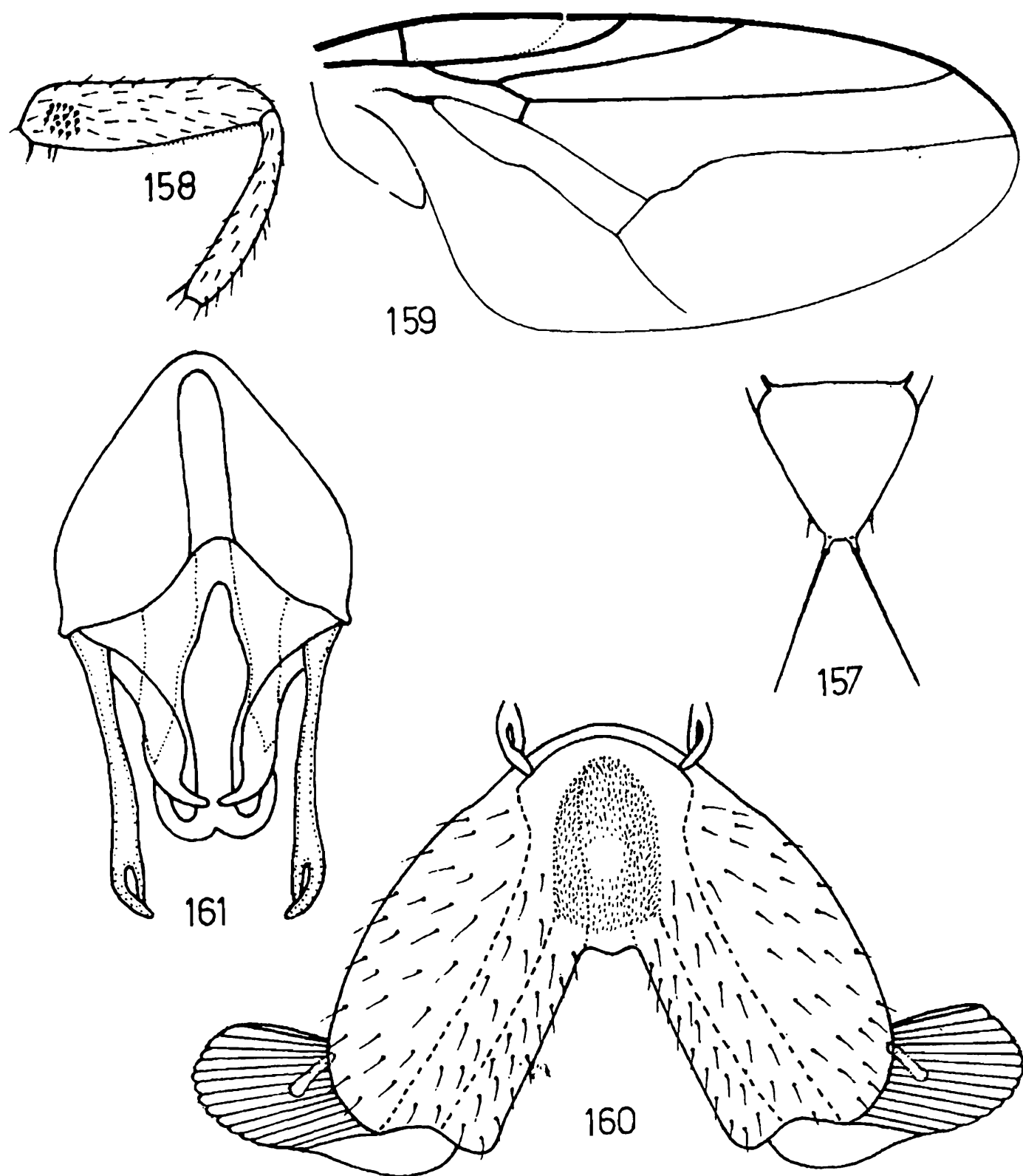
Paratype : 1 female, data same as of holotype.

This species shows affinities to *kodayarensis* in the shape and colouration of frontal triangle, and general nature of wing venation but has shorter arista, brownish black basal antennal segments, thickened hind femur in male and infuscated distal tarsal segments. In the nature of frontal triangle, relative size and position of *ss* 1, proportions of costal sectors, nature of *m* 1+2 and relative thickness of hind femur in male and the build of male genitalia this species differs from *scutellata* (de Meijere).

27. *Rhodesiella luteoterminalis*, sp. nov. (Figs. 157-161)

Male and female : *Head* : A little higher than long, length, height and width ratio 14 : 16 : 21. Frons dull black, width at vertex 0.45 x that of head, 0.9 x its own length and 1.2 x its width at anterior margin ; frontal triangle glabrous, shiny bluish green, reaching anterior margin of frons and ending with truncate apex. Eye large, bare, with vertical long axis. Face only a little narrower than width of frons at its anterior margin, concave, shiny black ; facial carina very low and linear, not extending beyond bases of antennae ; lower facial margin raised up, finely brownish grey tomentose. Antenna very similar to *scutellata* ; basal segments black to brownish black ; ant 3 0.7 x as long as wide, yellow with dark tinge along dorsodistal margin ; arista slender, of medium length as in *scutellata*, dark brown with fairly dense slender concolorous pubescence as in *narendrani* and *scutellata*. Gena dull black, sublinear, with a row of 11-12 slender hairs along oral margin ; vibrissal corner merging with the raised up lower facial margin and hence appearing projecting a little beyond lower anterior margin of eye ; postgena of medium size, black with slender, fairly dense hairs. Palpi dull black with slender black erect hairs ; proboscis brownish black. Head bristles slender, black ; *out* 1.2 x as long as *ivt*, the latter subequal to the cruciate *pvt* and divergent *oc* ; *orb* 11-12, anterior most 5 much shorter and slender than the rest, sequentially anterior ones becoming shorter, longest two-thirds as long as *out* ; *if* 11, in a row outside triangle along each lateral margin, equal to medium sized *orb* ; vibrissa slender, as long as longest *orb*.

Thorax : Shiny black ; scutum 1.1 x as wide as long and as wide as head with convex disc bearing dense punctae and slender dark brown hairs similar to those in *scutellata* ; scutellum (Fig. 157) 1.2 x as long as wide at base, triangular with nearly flattened disc which is slightly convex medially and with less sloping and more clearly defined side margin than in *narendrani* ; pleura mostly glabrous, with a few hairs on *anepst* and part of *kepst*. Thoracic bristles black ; *h* 1, slender, equal in



Figs. 157-161 : *Rhodesiella luteoterminalis*, sp. n. 157, Scutellum. 158, Hind femur, male. 159, Wing. 160, Epandrium, dorsal view. 161, Phallic complex, ventral view.

length to *npl* ; *npl* 1+1, anterior one more slender than posterior one ; *pa* 1 1.3 x as long as *npl* ; *pa* 2 half as long as and 1 *dc* equal to *npl* ; *as* 0.9 x long as scutellum, borne on small black tubercle ; *ss* 1 relatively nearer to *as* than in *scutellata*, slender, 0.15 x as long as *as*, borne on very fine tubercle.

Wing (Fig. 159) : 2.4 x as long as wide, entirely hyaline with pale yellow veins ; costal sectors 2 to 4 in the ratio 7 : 14 : 6 to 8 : 13 : 6 ; r-m cross-vein greatly proximad of the middle of discal cell, opposite 0.34 of its length ; terminal sectors of r 4+5 and m 1+2 nearly subparallel but for the distal end of the former, the latter concave behind a little beyond base and weakly sinuate along its length ; anal angle moderately developed. Stalk of haltere yellowish brown, knob black to brownish black.

Legs : Coxae and femora black ; trochanters dark to yellowish brown ; tibiae black except for distinctly yellow colouration extending to nearly one-fifth their lengths distally ; mid tibial spine yellow ; hind femur in both sexes less thickened than in *scutellata*, *narendrani* and *lobulata*, length in male (Fig. 158) 4 x and in female 4.5 x its maximum width, with fine black denticles in the distal half ventrally in both sexes and with a group of warts on anterobasal aspect and 2 black spines basoventrally in males ; tarsi yellow but for infuscated last two tarsi of fore and last tarsus each of mid and hind legs as in *scutellata* and other related species.

Abdomen : In some specimens appearing a little wider than thorax, as long as or longer than wide, shiny black with short, slender dark brown hairs. Female cerci short, black, with very slender hairs. Male genitalia (Figs. 160-161) : Epandrium long, very deeply incised ; cercus absent ; surstylus longer than broad with longitudinal striations as in *scutellata* (de Meijere) ; the bone-shaped process slender than in *quinguaginosa* ; distiphallus basally cylindrically elongate, slightly swollen medially and narrowed distally ; hypandrium widened lateroventrally and long and narrow distally ; pregonites rather enlarged but tapering off distally ; postgonites abruptly narrowing beyond middle and ending with narrowly obtuse apex.

Length : Male 2.1 mm wing 1.8 mm ; female 2.3 mm wing 1.9 mm.

Holotype : Female, Tamilnadu : Madurai : Alagarkovil, 7.xi.1989, Coll. P.T. Cherian, *Paratypes* : 1 female, Kerala : Pallivasal, 7.xi.1983, Coll. M.S. Molly ; 1 female, Kerala : Alleppey, 3.i.1984, Coll. M.S. Molly ; 1 male, 4 females, Coimbatore Dt., Kunjapanai, 1200 m, 9.ii.1992, Coll. G. Thirumalai ; 1 male, Tamil Nadu : North Arcot Dt., Elagiri, Coll. K.R. Rao.

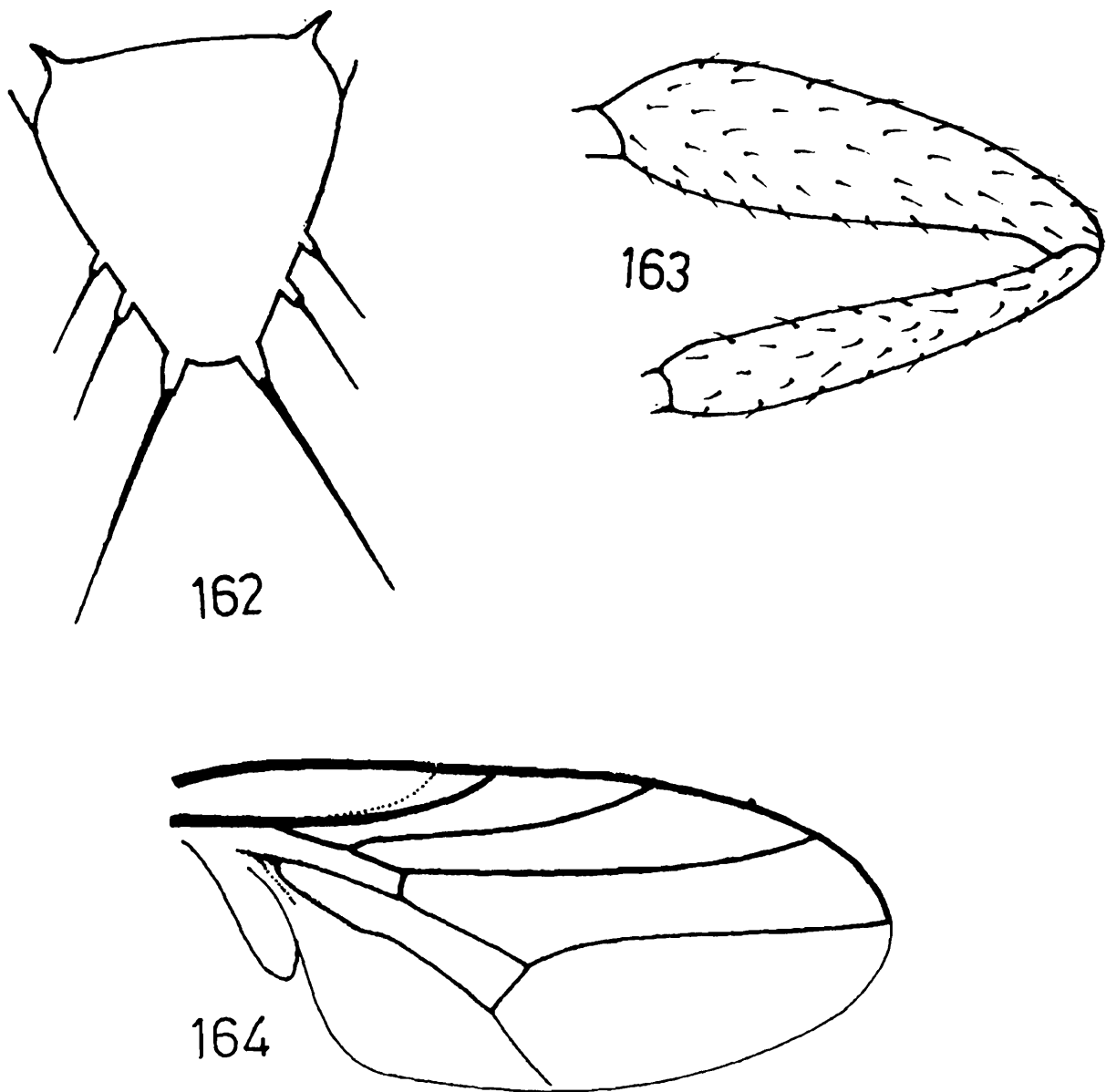
R. luteoterminalis closely resembles *scutellata* and its relatives but can be distinguished by its bluish green frontal triangle, more number of *orb*, relatively less thickened hind femur and differences in male genitalia.

28. *Rhodesiella amnoni*, sp. nov. (Figs. 162-164)

Male, Head : Much higher than long, length, height and width ratio 15 : 18 : 25. Frons slightly narrowing anteriorly, width at vertex 0.44 x that of head and equal to its own length, subshiny black and greatly sloping ; frontal triangle of medium size, glabrous, shiny black, reaching anterior margin of frons and ending with pointed apex in holotype and obtuse apex in the paratypes. Face only slightly narrower than the anterior part of frons, smooth, shiny black, with two fairly broad midlongitudinal depressions which do not reach the lower facial margin ; lower facial margin only slightly raised up, finely tomentose ; facial carina not developed. Antenna directed downward, yellow to whitish yellow, finely pale white tomentose ; ant 2 with short white pubescence ; ant 3, 1.3 x as wide as long ; arista slightly thickened and yellow at base, otherwise slender, dark brown with conspicuous, fairly dense, concolorous, slender hairs. Eye very large, in profile occupying most of head, bare, with vertical long axis. Gena narrow, sublinear, black, with a row of slender black hairs along oral margin ; vibrissal corner reduced, with black vibrissa of medium size ; postgena dull black, reduced with short black hairs. Palpi short, yellow ; proboscis black. Head bristles black, moderately thickened ; *out* stouter and distinctly longer than other head bristles, with a prominent hair lateral to it on vertex margin ; *put* cruciate, four-fifths the *out* ; *ivt* two-thirds as long as *out* ; *oc* subequal to *ivt* ; *orb* 7, recumbent, sequentially anterior ones becoming shorter and slender, longest two-thirds as long as *ivt* ; *if* 7-8, outside the triangle along each lateral margin, shorter than longest *orb*.

Thorax : Shiny black. Scutum 1.25 x as wide as long and as wide as head with convex disc bearing dense, coarse punctae and prominent yellowish white hairs ; scutellum (Fig. 162) triangular, 1.33 x as long as wide with thick, prominently convex disc, which is more coarsely punctate than and pubescent like scutum except along its anterior margin ; pleura with short white hairs on *anepst* and part of *kepst*. Thoracic bristles black, but in some specimens some bristles, especially 1 *dc* and *h* brownish ; in some specimens a row of prominent prescutellar hairs are developed ; *h* 1, slightly shorter than *ivt* ; *npl* 1+1 subequal, shorter than *out* ; *pa* 1 a little longer than *npl* but shorter than *out*, borne on a small wart ; *pa* 2 half as long as *pa* 1 ; 1 *dc* two-thirds as long as *pa* 1 but much slender and hair-like ; *as* not approximated at base though closer to each other than to *ss* 1, 0.8 x as long as scutellum, borne on black tubercle of medium size ; *ss* 1, 0.4 x as long as *as*, borne on small but distinct tubercle ; *ss* 2, 0.75 x as long as *ss* 1, borne on a short but very conspicuous tubercle ; at least in one specimen a short, hair-like *ss* 3, borne on a wart is discernable.

Wing (Fig. 164) : Almost as long as body and 2.4 x as long as wide, hyaline with yellowish brown veins ; costal sectors 2 to 4 in the ratio 3 : 3 : 2 ; r-m cross-vein proximad of middle of discal cell, opposite 0.42 of its length ; terminal sectors of veins



Figs. 162-164 : *Rhodesiella amnoni*, sp. n. 162, Scutellum. 163, Hind femur, male. 164, Wing.

r 4+5 and m 1+2 diverging distally, the latter slightly convex above near base ; anal angle well developed. Haltere with yellow to whitish yellow stalk and dark to brownish black knob.

Legs : Of medium thickness ; coxae black to brownish black ; trochanters yellow ; femora brownish black except for yellowish one-third the length of each distally ; fore and hind femora (Fig. 163) slightly thickened, the former with three to four prominent dark hairs in a row distally along its antero-ventral margin ; fore and mid tibiae and all tarsi yellow ; hind tibia blackish brown along two-thirds its length medially, otherwise yellow ; mid tibial spine short, whitish yellow.

Abdomen : Short, broader than long, brownish black. Male genitalia partly damaged.

Length : Male 2.2 mm wing 2.2 mm

Holotype : Male, Meghalaya : Nangpo, 25.iv.1980, Coll. Amnon Friedberg.

Paratypes : 3 males? (in one specimen head and all three abdomen missing), collection data same as of holotype.

R. amnoni keys near *foveata* (Lamb) but differs in having wholly yellow fore and mid tibiae, predominantly yellow hind tibia and partly yellow femora while in *foveata* femora are wholly and tibiae are predominantly black or brownish black. Besides, in *amnoni* second sector of costa is equal to the third and r-m cross-vein is proximad of the middle of discal cell while in *foveata* second sector of costa is longer than the third sector and r-m cross-vein is in the middle of the discal cell.

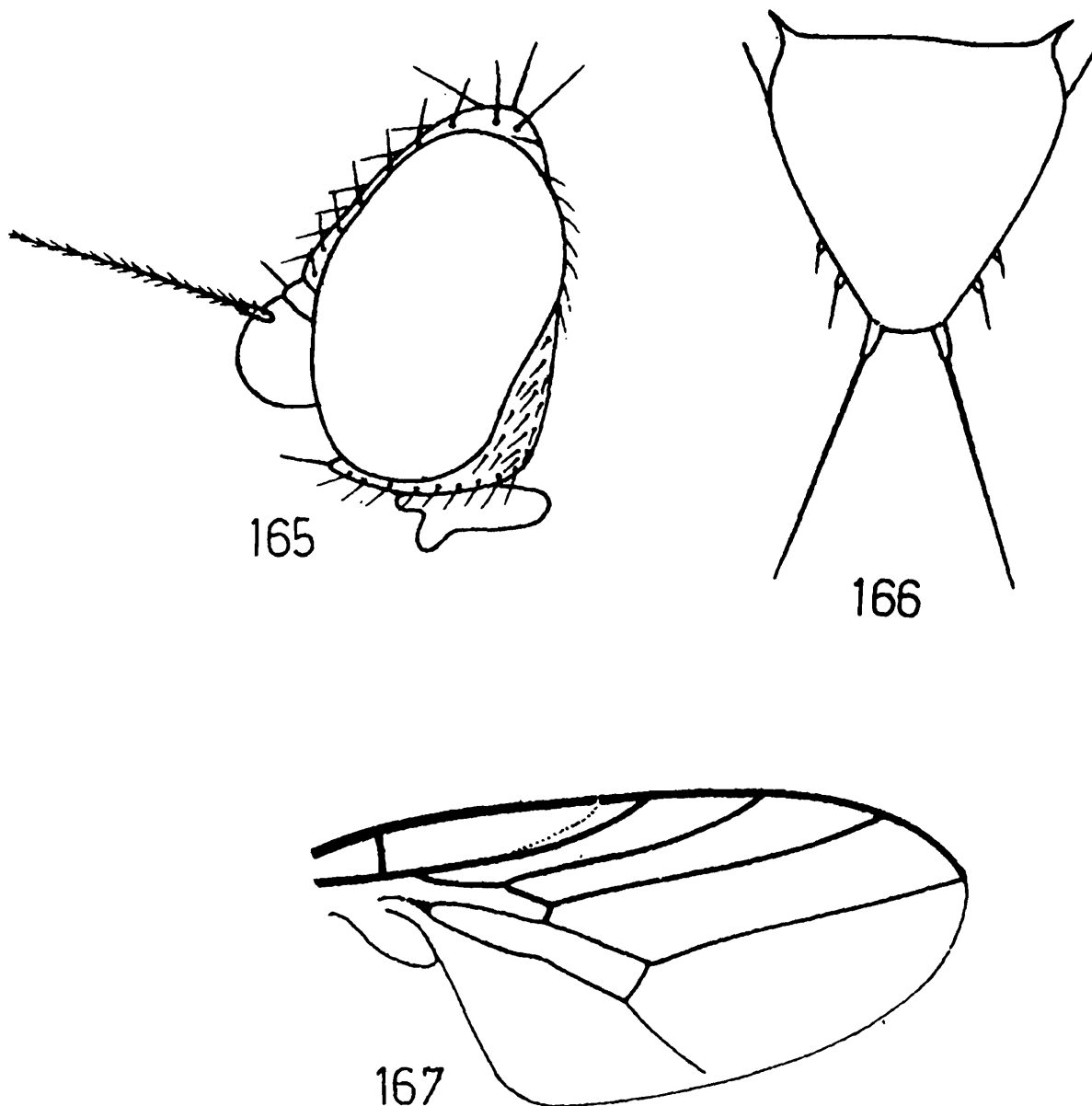
29. *Rhodesiella foveata* (Lamb) (Figs. 165-167)

1918. *Meroscinis foveata* Lamb, *Ann. Mag. nat. Hist.*, (10) 1 : 133. Type locality : Sri Lanka : Peradeniya.

1977. *Rhodesiella foveata* (Lamb) : Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 296.

Female : *Head* (Fig. 165) : As long as high, length, height and width ratio 2 : 2 : 3. Frons only slightly sloping, nearly parallel sided, width, at vertex 0.4 x that of head and almost equal to its own length, dull black, projecting slightly above eye margins and ending far behind anterior margin of eye ; frontal triangle of medium size, glabrous, shiny black, reaching anterior margin of frons and ending with obtuse apex. Face only slightly narrower than anterior part of frons, shiny black, concave in the middle ; facial carina linear, not extending beyond bases of antennae ; lower facial margin distinctly raised, not thickened, dark brown tomentose. Antenna nearly erect, directed slightly outward ; basal segments deeply brownish yellow with fairly dense very short concolorous hairs ; ant 3 0.8 x as long as wide, suborbicular in outline, yellow, finely silvery dusted with very fine pubescence and distinctly darkish tinge in upper half below and beyond base of arista ; arista slender, of medium length, dark brown with fairly dense concolorous hairs of medium size. Eye very large, occupying much of area of head in profile, bare, with oblique long axis. Gena narrow, width less than one-fourth that of ant 3, deeply black with a row of 7-8 well developed slender hairs along oral margin ; vibrissal corner only very slightly projecting a little beyond lower anterior margin of eye ; vibrissa well developed, that of both sides converging and separated by a distance less than half length of a vibrissa ; postgena greatly reduced, pitch black, with well developed, fairly dense black hairs ; postocular row of setae short but

well developed. Palpi deeply black with short, dense black hairs ; proboscis distally flattened, and pale brown and basally deeply black. Head bristles well developed, fairly stout, black ; *out* a little longer than *ivt* and the cruciate *pvt* ; *oc* almost as long as *ivt* but a trifle slender ; *orb* 6, recumbent, anteriormost very short, slender and hairlike, of the rest, anterior ones only slightly becoming shorter sequentially, longest two-thirds as long as *ivt* ; *if* 5, turned inward and forward, shorter and more slender than *orb*, arranged in a row outside triangle along each lateral margin ; *fr* a few, black ; vertex margin with well developed black hairs nearly in a row of which one each on outer side of *out* curved and directed over eye.



Figs. 165-167 : *Rhodesiella foveata* (Lamb). 165, Head, lateral view. 166, Scutellum. 167, Wing.

Thorax : Shiny black. Scutum almost as long as wide, with convex disc, which is very coarsely and densely punctate and with well developed black hairs ; scutellum (Fig. 166) 1.2 x as long as wide at base and 0.57 x as long as scutum, greatly convex and thickened with sloping sides, subtriangular in outline, more coarsely shagreened than and pubescent like scutum ; pleura with black hairs on *anepst* and *kepst*. Thoracic bristles black ; *h* 1, almost as long as *ivt* but slightly slender, *npl* 1+1, subequal, stouter and a trifle longer than *h* ; *pa* 1 a little longer than and *pa* 2 three-fifths as long as *npl* ; 1 *dc* a little shorter than *npl* ; *as* nearer to *ss* 1 than to each other, two-thirds as long as scutellum, rather stout, borne on short tubercle ; *ss* 1 one-third as long as *as*, borne on very short tubercle, nearer to *ss* 2 than to *as* ; *ss* 2 about half as long as *ss* 1, borne on a fine tubercle.

Wing (Fig. 167) : Hyaline, much shorter than body and 2.25 x as long as wide with pale veins but for brownish costa and *r* 1 ; costal sectors 2 to 4 in the ratio 12 : 9 : 7 ; r-m cross-vein in the middle of discal cell ; terminal sector of vein *m* 1+2 with a deflection a little beyond base and concave below and very weakly sinuate along its length, this and terminal sector of *r* 4+5 diverging distally ; anal angle greatly developed, almost a right angle. Knob of haltere black, stalk yellow.

Legs : Of medium size ; coxae, trochanters, femora and tibiae black with dark brown to black hairs ; fore femur with a row of erect, fairly long black hairs along anteroventral margin ; hind femur slightly thickened ; mid tibial spine of medium size, black ; tarsi yellow with short, white, dense hairs except for brownish tinge on last segment of each leg.

Abdomen : As wide as thorax and distinctly wider than long, subshiny brownish black with short, dense, black hairs. Female cerci very slender in relation to size of the body, deeply brownish yellow with short, slender, brown hairs.

Length : Female 2.2 mm wing 2.0 mm

Specimen studied : 1 Female, T. Nadu : Nilgiris : Daddhahalli, 1040 m ; 14.ii.1992, Coll. G. Thirumalai.

According to Lamb (1918) this species is related to *albiseta* (Becker). The two are entirely different since the latter has white thoracic pubescence and yellow haltere while in *foveata* thoracic hairs are dark brown, knob of haltere is black and scutellum is very coarsely shagreened than in *albiseta*.

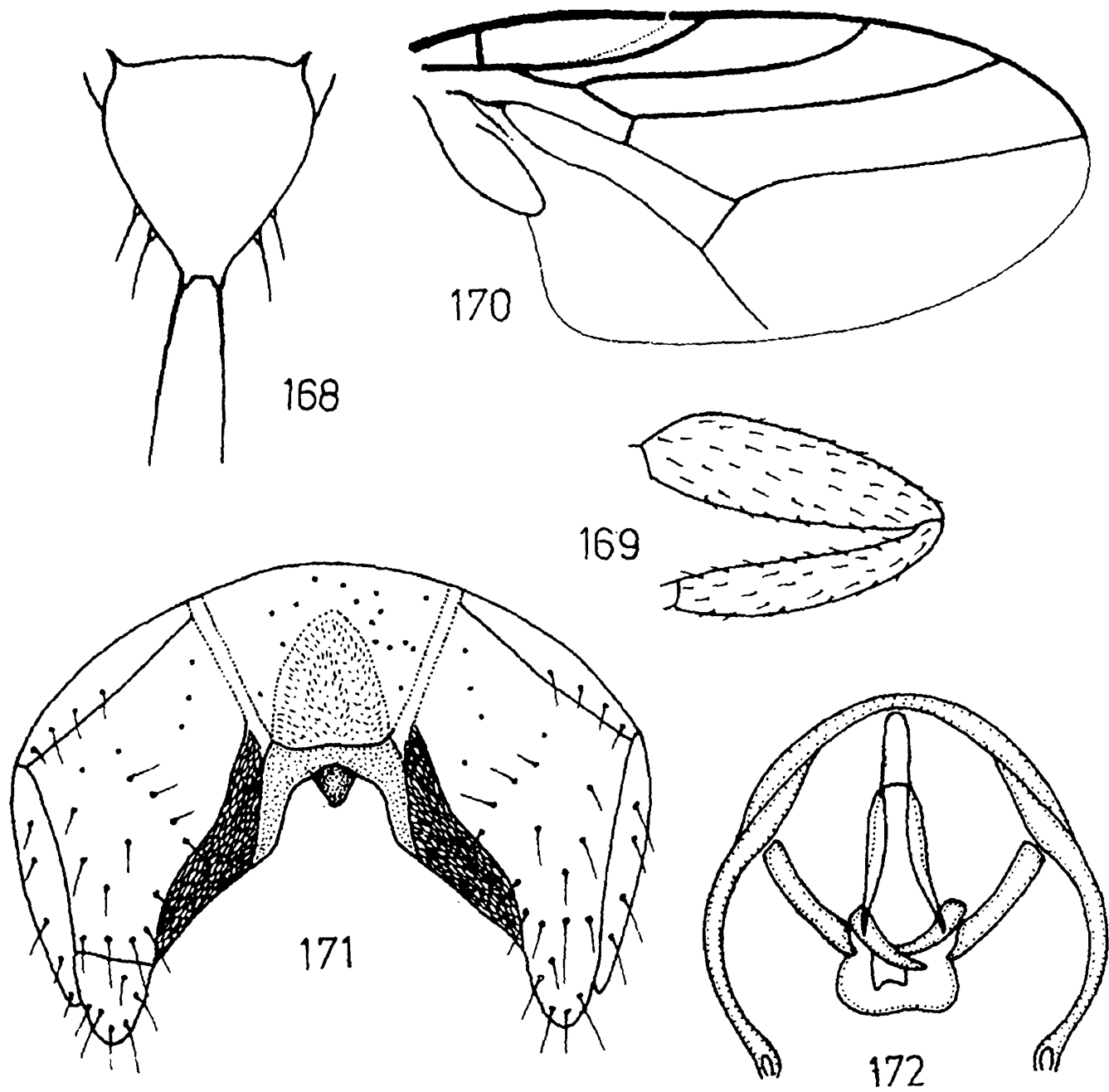
Remarks : *R. foveata* is hitherto known only by one type specimen, the sex of which is not indicated in the original description. Most of the characters of the

species were not described earlier. In the specimen before me the body characters entirely agree with the original description of the species and the diagrams provided by Lamb except that scutellum is much more coarsely punctate than scutum as is the case in other species of the genus.

30. *Rhodesiella nangpoensis*, sp. nov. (Figs. 168-172)

Male and female : Head : Much higher than long, length, height and width ratio 13 : 16 : 22. Frons gradually narrowing anteriorly, width at vertex equal to its own length and 0.42 x the width of head, projecting hardly above eyes and reaching far short of anterior margin of eye, dull black with short black *fr* ; frontal triangle glabrous, shiny black, width at vertex half or less than half the width of frons (in two specimens the triangle is more narrow than in the other two) reaching anterior margin of frons and ending with obtuse apex. Face shiny black, very deeply concave, much less oblique than in *foveata* ; facial carina very narrow between and not extending beyond bases of antennae, lower facial margin distinctly raised, rather thin, very finely dark tomentose. Antenna brownish yellow but infuscated especially along upper and anterior margin of ant 3 ; ant 2 wider than long ; ant 3, 1.3 x as wide as long, with dark tinge confined mostly to upper half ; arista slender, dark brown but for yellowish brown base, with very fine, fairly dense dark pubescence. Eye large, occupying much of head in profile with distinctly vertical long axis. Gena subshiny black, sublinear with 8 slender hairs in a row along oral margin ; vibrissal corner almost as in *foveata*, finely dark tomentose, with well developed vibrissa and a few erect hairs behind it ; postgena with a few short hairs of which those on posterior margin in a row in continuation of postocular setae. Oral opening short, fairly wide ; palpi short, black with fine hairs ; proboscis dark brown. Head bristles black ; *out* and the cruciate *pvt* subequal ; *ivt* four-fifths as long as *out* ; *oc* a trifle shorter than *ivt* ; *orb* 7, recumbent, all rather well developed, sequentially anterior ones becoming progressively shorter as is typical of the genus ; *if* 6-7, subequal to *orb*, in a row outside triangle along each margin, postocular setae short and slender.

Thorax : As wide as head ; scutum 1.2 x as long as wide, subshiny black, with convex disc bearing coarsely and densely punctate brownish black hairs of medium size ; scutellum (Fig. 168) subtriangular, 1.2 x as long as wide with convex disc which is more coarsely shagreened than but pubescent like scutum as in *foveata* ; pleura subshiny, black ; *anepst* with short and *kespst* mostly in the lower half with more developed black hairs. Thoracic bristles black ; *h* 1, a little shorter and slender than *out* ; *npl* 1+1, subequal ; *pa* 1 a trifle longer than and 1 *dc* equal to *npl* ; *pa* 2 hair-like ; *as* as long as scutellum, equidistant from each other and *ss* 1, borne on short



Figs. 168-172 : *Rhodesiella nangpoensis*, sp. n. 168, Scutellum. 169, Hind femur, male. 170, Wing. 171, Epandrium, dorsal view. 172, Phallic complex, ventral view.

tubercle ; ss 1, 0.4 x as long as *as*, closer to ss 2 than to *as*, borne on very short but conspicuous tubercle ; ss 2 three-fourths as long as ss 1, borne on fine tubercle.

Wing (Fig. 170) : 0.48 x as wide as long and only a trifle shorter than body, hyaline with brown pubescence and yellowish brown to dark veins ; costal sectors 2 to 4 in the ratio 11 : 9 : 7 ; terminal sector of veins, r 4+5 slightly bent toward upper costal margin distally, that of m 1+2 ending at apex of wing and with a flexure at base ; r-m cross-vein nearly in the middle in three specimens and proximad of the middle of discal cell opposite 0.47 of its length in one ; vein *m* 3+4 prominently sinuate along its entire length ; anal angle well developed. Stalk of haltere brownish yellow, knob brownish black.

Legs : Coxae and femora brownish black ; fore femur with more conspicuous hairs on anterolateral surface of which those along anteroventral margin are more or less in a row and more developed ; trochanters dark brown ; hind femur slightly swollen and in male (Fig. 169) very slender with 2-3 short black spines ventrally near base ; tibiae brownish black except for brownish yellow bases of fore and mid tibiae and distal one-third of fore, distal one-fourth of mid and apex of hind tibiae ; all legs with fairly dense black hairs but for yellow ones on brownish yellow areas of tibiae and all tarsi ; tarsi brownish yellow to whitish yellow but for brownish tinge on the distal part of apical tarsus of some legs (in one specimen fourth and fifth fore tarsi deeply brownish in certain angle of illumination) ; midtibial spine yellow.

Abdomen : Widened in the middle, brownish black with deeply yellowish brown tinge on basal terga except for their margins ; all terga with fairly dense dark brown to brownish black hairs. Male genitalia : (Figs. 171-172) : Epandrium much wider than long, very deeply incised ; cersus well developed ; hypandrium widened in the middle ; pregonite ending with pointed apex ; postgonite rather short ; distiphallus subcylindrical, ending with obtuse apex ; phallapodeme almost reaching hypandrium, not widened.

Length : Male 1.9 mm wing 1.7 mm female 2.1 mm wing 1.8 mm

Holotype : Male, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian ;

Paratypes : 1 Female, 1 male (fore and middle legs and head and scutellar bristles fallen off) collection data same as of holotype ; 1 female (head broken off), Meghalaya : Kyderumkulai, 29.iii.1980, Coll. P.T.Cherian.

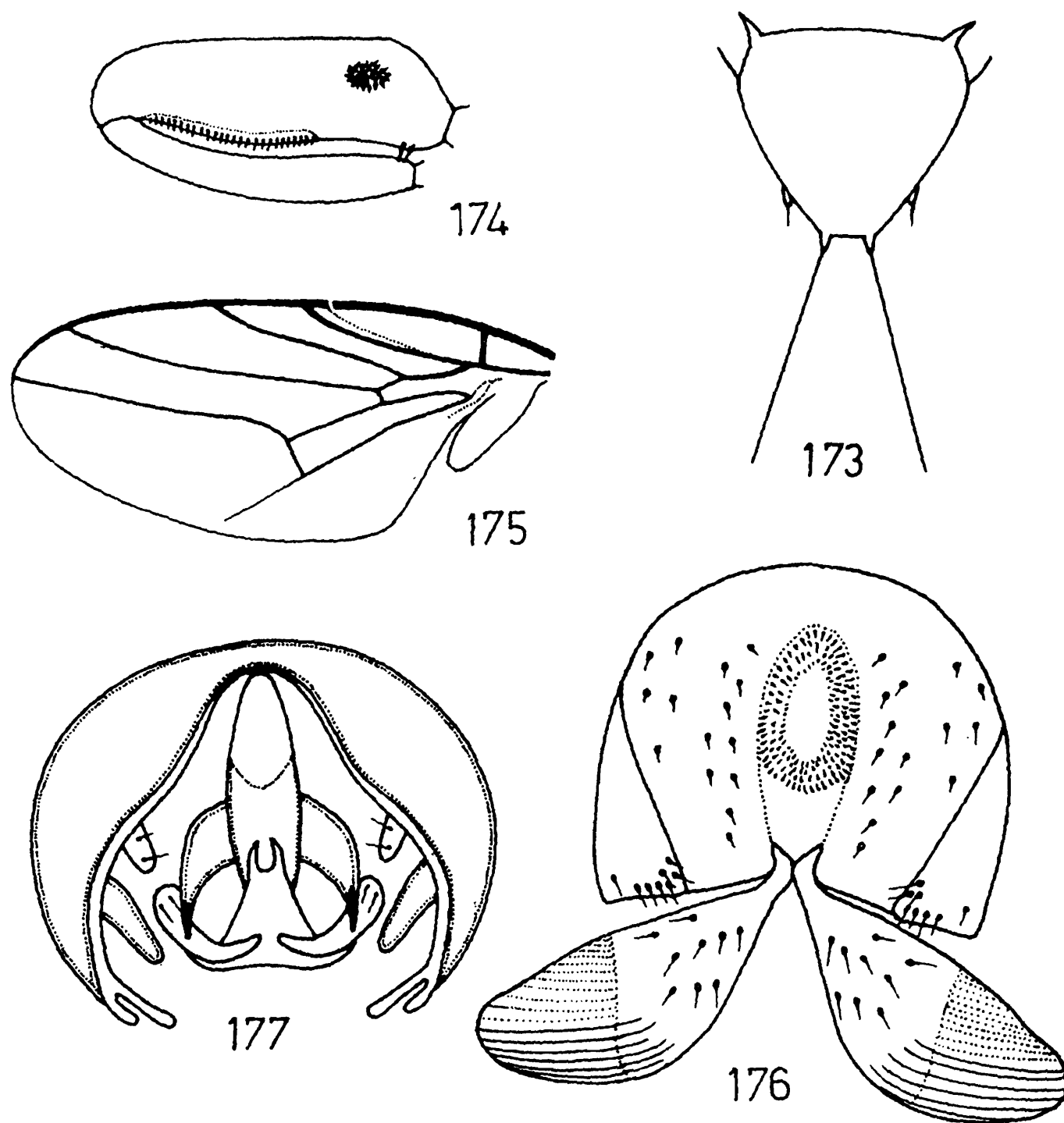
R. nangpoensis closely resembles *foveata* (Lamb) but unlike in the latter, in the former long axis of eye is vertical, head is higher than long, fore and mid tibiae are yellow distally and mid tibial spine is yellow.

31. *Rhodesiella elagiriensis*, sp. nov. (Figs. 173-177)

Male and female : *Head* : Higher than long, length, height and width ratio 15 : 17 : 22. Frons dull black, narrowing anteriorly, width at vertex nearly half that of head, equal to its own width and 1.3 x the width near anterior margin ; frontal triangle very large, glabrous, greenish blue, subtrapezoidal. Eye large, bare, with vertical long axis. Face concave, much narrower than anterior part of frons, brownish black with three longitudinal black linear striae and two short sublongitudinal depressions, one on each side below the antenna and reaching almost middle of face ; lower facial margin distinctly raised up, finely dark tomentose along inner margin ; facial carina low, linear restricted to area between bases of antennae ; ant 2, 0.6 x as wide as ant 3, yellow but appearing a little darkened, especially in some specimens because of the presence of short, black hairs ; ant 3, 1.3 x as wide as long and much wider than ant 2 unlike in *scutellata* in which it is only a trifle wider than ant 2, yellow with dark tinge along dorsodistal margin ; arista distinctly shorter than in *scutellata*, wholly brownish black with slender, fairly dense concolorous pubescence. Gena sublinear, dark brown but for blackish oral margin which bears about 10 well developed black hairs ; vibrissal corner appearing projecting a trifle beyond lower anterior margin of eye because of its merging with the slightly projecting lower facial margin ; vibrissa slender, only a trifle longer than hairs on oral margin ; postgena black with slender black hairs. Palpi black with slender black hairs ; proboscis blackish brown especially distally. Head bristles black ; *out* longer than other head bristles ; *ivt* three-fourths as long as *out* and subequal to *pvt* ; *oc* trifle shorter than *ivt* ; *orb* about 9, anteriormost two very short and slender, sequentially anterior ones becoming shorter and slender, longest four-fifths as long as *ivt* ; *if* about 9, a trifle shorter and slender than medium sized *orb* ; vertex margin in the area of *ivt* and *out* with a few short, slender hairs.

Thorax : Shiny black ; scutum almost as long as wide, with convex disc bearing somewhat coarse punctae as in *scutellata* and brownish black hairs ; *scutellum* (Fig. 173) 1.33 x as long as wide, subtriangular, with flattened disc which is slightly convex in the middle, more coarsely punctate than but pubescent like scutum ; pleura with short black hairs on *anepst* and part of *kepst*. Thoracic bristles black ; *h* 1, shorter than *ivt* ; *npl* 1+1, subequal and equal to *ivt* ; *pa* 1 almost as long as *out* ; *pa* 2 a trifle shorter than *h* ; 1 *dc* subequal to *npl* ; *as* almost as long as *scutellum*, closer to each other than to *ss* 1, the latter 0.2 x as long as *as* ; *as* borne on short but stout and *ss* 1 on short and slender black tubercles.

Wing (Fig. 175) : 2.3 x as long as wide, hyaline with fine brown pubescence and dark brown veins ; costal sectors 2 to 4 in the ratio 4 : 6 : 3 ; r-m cross-vein proximad of the middle of discal cell, opposite 0.44 x its length ; terminal sectors of r 4+5 and



Figs. 173-177 : *Rhodesiella elagiriensis*, sp. n. 173, Scutellum. 174, Hind femur, male. 175, Wing. 176, Epandrium, dorsal view. 177, Phallic complex, ventral view.

m 1+2 slightly diverging distally, the latter distinctly convex above a little beyond its base; anal angle of wing rather well developed. Knob of haltere brownish black, stalk dark brown.

Legs : Very much similar to those in *scutellata*; coxae and femora black; trochanters yellowish brown to dark brown; fore femur with a row of erect hairs; along anteroventral margin; hind femur in both males (Fig. 174) and females thickened, greatest thickness 0.3 x its own length and with numerous fine denticles confined to distal half on the ventral aspect in both sexes and with two black spines ventrally a little beyond base and a group of warts anterolaterally near base in male as in *scutellata*; tibiae black except for the yellow distal ends; mid tibia with a row of erect fairly long slender black hairs along mostly basal half of anterolateral margin; mid tibial spine black; tarsi yellow but for infuscated last two tarsi of fore leg and last tarsus each of mid and hind legs.

Abdomen : Almost as wide as thorax and a trifle longer than wide. Female cerci short, dark brown with slender black hairs. Male genitalia (Figs. 176-177): Epandrium wider than long; surstylus widened medially and with longitudinal striations distally; hypandrium U-shaped; distiphallus tapering distally; gonites well developed.

Length : Male 2.2 mm, wing 1.9 mm; female 2.4 mm, wing 2.1 mm.

Holotype : Male, Tamil Nadu : N. Arcot Dt., Elagiri, 7.xii.1992, Coll. K.R. Rao.

Paratypes : 2 males, 2 females, data same as of holotype.

This species closely resembles and apparently appears identical to *luteoterminalis* (de Meijere) especially in the nature of thorax, scutellar bristles and colour and nature of legs but unlike in the latter species, *elagiriensis* has yellow ant 2, relatively wider and larger ant 3, shorter arista and more thickened hind femur in both sexes. Besides, in the nature and development of phallapodeme, gonites, hypandrium and surstylus the two species exhibit various differences.

32. *Rhodesiella nitidifrons* (Becker) (Figs. 178-181)

1911. *Meroscinis nitidifrons* Becker, *Ann. hist. nat. Mus. nat. Hungarici*, 9 : 93. Type localities : India : "Mittel-Assam" : Taiwan : Tainan.

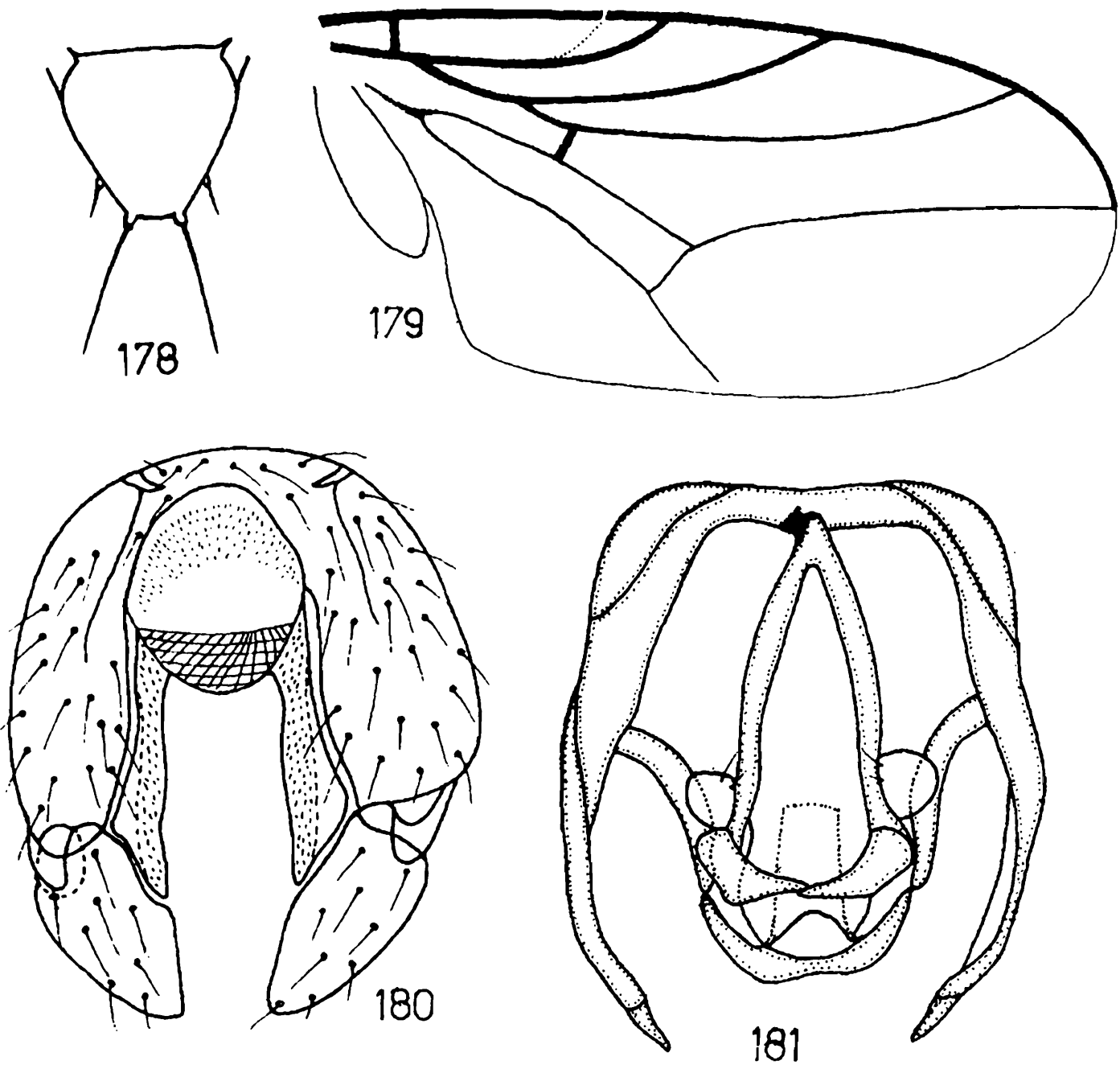
1977. *Rhodesiella indica* Cherian, *Oriental Insects*, 11 (4) : 491-493. Type locality : West Bengal : Darjeeling Dist., Andhari Khola. N. Syn.

Male and female : **Head :** Higher than long, length, height and width ratio 15 : 17 : 23; frons slightly narrowing anteriorly, width at vertex 0.44 x that of head

and equal to its own length, dull black, projecting a trifle above eye margins anteriorly and hardly reaching anterior margin of eye; frontal triangle glabrous, shiny black with purple or steel blue tinge in some specimens, reaching anterior margin of frons and ending with broadly obtuse apex. Eye very large, bare, in profile occupying much of the area of head, with vertical long axis. Face slightly concave shiny black, almost as wide as width of frons anteriorly, with two faint longitudinal furrows, one each submedially; lower facial margin not raised up. Antennae somewhat approximated at base; ant 2 brownish yellow but in some specimens deeply brown; ant 3 0.7 x as long as wide, predominantly yellow but in some specimens with dark tinge along anterodorsal margin and with very fine pubescence; arista moderately long, dark brown with fairly dense, fine concolorous pubescence. Gena sublinear, dull black with a row of slender dark brown hairs along oral margin; vibrissal corner not projecting, with well developed brownish black vibrissa; postgena rather reduced, dull black with fine concolorous hairs. Palpi dull brownish black; proboscis predominantly brownish black with brown distal margin and dense slender hairs. Head bristles and hairs black; *out* half as long as width of eye; *ivt* slightly shorter than *out*; *orb* 7, anteriormost three, much shorter than the rest, longest three-fourths as long as *out*; cruciate *pvt* and widely divergent *oc* equal to *ivt*; *if* 7, subequal, shorter than longest *orb*, in a row outside frontal triangle along each lateral margin.

Thorax: Shiny black; scutum nearly 1.1 x as wide as long, with convex disc bearing dense fine punctae and conspicuous dark brown hairs; scutellum (Fig. 178) 1.1-1.3 x as long as wide at base, subtriangular with convex disc which is more densely and coarsely punctate than but pubescent like scutum; pleura shiny, *anepst* with short and *kepst* with a few brownish black hairs. Thoracic bristles black; *h* 1, short and slender, shorter than longest *orb*; *npl* 1+1, posterior one a little longer and equal to *ivt*; *pa* 1 a trifle more developed than *npl*; *pa* 2 hardly distinguishable from hairs; 1 *dc* shorter than *pa* 1; *as* widely separated at base, 1.1 to 1.2 x as long as scutellum, borne on very short black tubercle; *ss* 1 0.33-0.4 x as long as *as* but more slender, borne on a fine black tubercle which is having the form of a well developed wart.

Wing (Fig. 179): 2.4 x as long as wide, hyaline with fine brown pubescence and pale brown veins; costal sectors 2 to 4 in the ratio 4 : 5 : 4 - 10 : 15 : 8; r-m cross-vein very slightly proximad of the middle of discal cell, opposite 0.48 of its length; terminal sector of r 4+5 distinctly curving toward upper margin of costa distally, this and that of m 1+2 diverging distally, the latter slightly convex above a little beyond its base; anal angle well developed; wing widest in the area of anal angle than beyond. Stalk of haltere brown to yellowish brown, knob black to brownish black.



Figs. 178-181 : *Rhodesiella nitidifrons* (Becker). 178, Scutellum. 179, Wing. 180, Epandrium, dorsal view. 181, Phallic complex, ventral view.

Legs : Coxae and femora brownish black ; trochanters yellowish brown ; fore tibia yellow to brownish yellow ; mid tibia blackish brown except the yellow proximal end and one-third its length distally ; hind tibia blackish brown but for yellow proximal and distal ends ; fore femur with a row of about 6 black well developed hairs confined mostly to distal half of anteroventral margin (unlike in the original description of *indica*, no row of conspicuous erect hairs on anteroventral surface of fore tibia) ; terminal mid tibial spine short and yellow ; though all tarsi are yellow (as indicated by Becker) in the majority of specimens, yet in one or two at least the last tarsal segment of each leg shows some signs of infuscation. According to Kanmiya (1983) in *nitidifrons* two distal tarsi of fore and last one each of mid and hind legs are infuscated, but such coloration has not been noted by Becker in his original description of the species nor was it observed in any of the 14 specimens before me.

Abdomen : Almost as wide as thorax and wider than long, subshiny brownish black with slender dark brown hairs. Female cerci short, rather stout, dark brown to yellow, with slender dark brown hairs. Male genitalia (Figs. 180-181) : Epandrium widely opened ; cercus long, produced ventrad, the two nearly parallel-sided ; surstylus in profile as wide as long ; distiphallus rather short, subcylindrical ; phallapodeme extending to ventral margin of hypandrium ; postgonite short, curved inward and narrowing distally ; pregonite longer than postgonite, slender.

Length : Male 1.8 -2.1 mm, wing 1.8-2.0 mm ; female 2.0-2.2 mm, wing 2.0-2.1 mm.

Specimens examined : Holotype of *indica*, male, West Bengal : Darjeeling Dist., Andhari Khola, 9.iv.1973, Coll. H.S. Sharma. *Paratypes* : 1 male, 4 females, data same as of holotype.

Other examples : 1 male, 1 female, Mizoram : Kolasib, 8.iii.1979, Coll. P.T. Cherian ; 4 males, 1 female, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian ; 1 male, Kerala : Idukki, 1.xii.1982, Coll. P.T. Cherian.

Remarks : *R. indica* Cherian (1977) was considered distinct from *nitidifrons* (Becker) because of the differences in the relative lengths of costal sectors, relative length and width of scutellum and the colouration of distal tarsal segments as confirmed through a communication based on a study of the types of the latter. Male genitalia of the latter was not available then for comparison. From a study of more specimens from different localities, the range of variations exhibited by them and the comparison of the male genitalia of the two now made possible after the description of that of *nitidifrons* by Kanmiya (1983), I am convinced that only one species is involved and *indica* Cherian is a junior synonym of *nitidifrons* Becker.

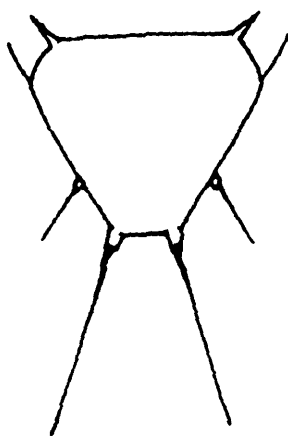
33. *Rhodesiella intermedia* sp. nov. (Figs. 182-185)

Male : Head : Higher than long, length, height and width ratio 6 : 7 : 9. Frons dull black, width at vertex equal to its own length and nearly half the width of head, progressively becoming narrower anteriorly, not projecting above eye nor reaching anterior margin of eye, with short, slender *fr* ; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with narrowly obtuse apex. Face concave, shiny black ; facial carina low, linear not extending beyond middle of face ; lower facial margin a little raised, not thickened. Antenna erect ; ant 2 brownish yellow, with well developed dorsal spine ; ant 3, 1.5 x as wide as long, yellow ; arista slender, fairly long, dark brown with dense, well developed pubescence. Eye large, in profile occupying much of head, bare with vertical long axis. Gena linear, black, row of hairs on oral margin short and slender ; oral vibrissa slender, hair-like ; postgena black, not well developed, with a few short hairs. Palpi brownish black ; proboscis well developed, dark brown. Head bristles black ; *out* well developed, distinctly longer and stouter than other head bristles ; *ivt* two-thirds the *out* ; *pvt* cruciate, equal to and *oc* a little shorter than *ivt* ; *orb* 6, recumbent, subequal except for very short anteriormost one, longest two-thirds the *ivt* ; *if* about 6, equal to *orb*.

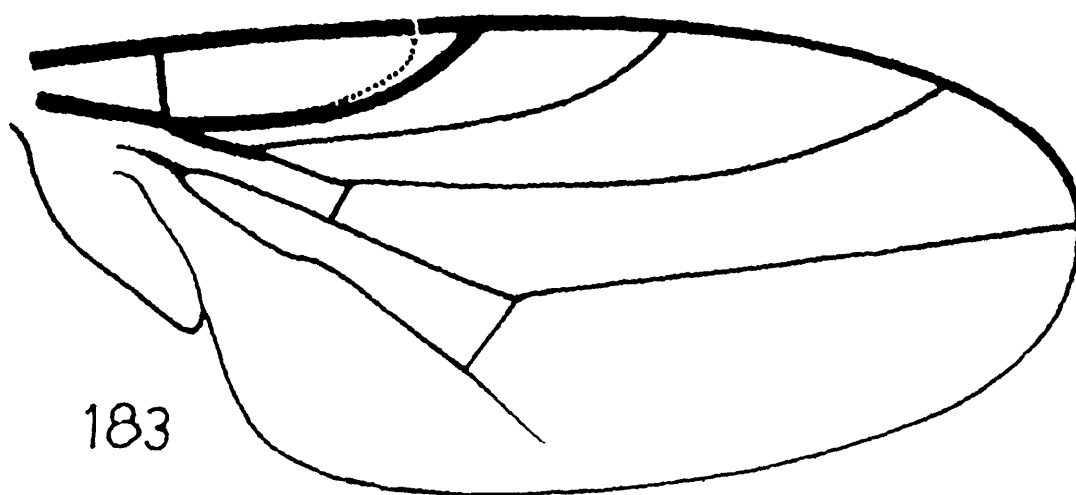
Thorax : Shiny black, almost as wide as head ; scutum 0.9 x as long as wide, with convex disc bearing fairly dense punctae and brownish black hairs of medium size ; scutellum (Fig. 182) 1.1 x as long as wide, subtriangular with convex disc which is very coarsely punctate than but pubescent like scutum ; pleura very shiny with a few short hairs on *anepst* and a little more longer hairs on *kepst*. Thoracic bristles well developed ; *h* 1, distinctly shorter and more slender than *ivt* ; *npl* 1+1, subequal, 0.8 x the *out* ; *pa* 1 equal to and *pa* 2, 0.6 x as long as *npl*, the former borne on a wart ; 1 *dc* shorter and slender than *pa* 1 ; *as* fairly widely separated at base, but nearer to each other than to *ss* 1, almost as long as scutellum, borne on short but distinct tubercle ; *ss* 1, 0.4 x as long as *as*, borne on a short tubercle.

Wing (Fig. 183) : As long as body and 0.45 x as wide as long, hyaline with brown veins ; costal sectors 2 to 4 in the ratio 7 : 11 : 7 ; r-m cross-vein proximad of the middle of discal cell, opposite 0.45 of its length ; terminal sector of r 4+5 curving toward upper margin of costa along its entire length and hence not parallel to that of m 1+2, the latter very faintly convex above a little beyond base, otherwise straight ; anal angle developed. Stalk of haltere yellowish brown, knob brownish black.

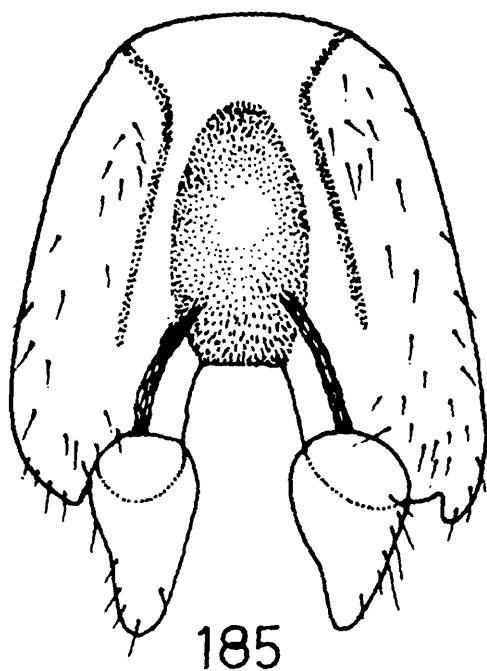
Legs : Rather slender ; coxae blackish brown ; trochanters dark brown with pale tinge ; femora brownish black except for the yellowish brown extreme ends of fore and hind and distal one-fifth of mid femora ; tibiae brownish yellow but for darkened median part of hind tibia ; tarsi brownish yellow with a tinge of infuscation on last tarsus of each leg especially under illumination in certain angles.



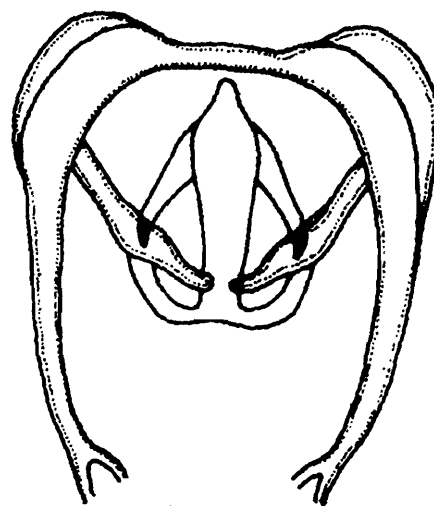
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Figs. 182-185 : *Rhodesiella intermedia*, sp. n. 182, Scutellum, 183, Wing. 184, Epandrium, dorsal view. 185, Phallic complex, ventral view.

Abdomen : Narrower than thorax, blackish brown but for yellowish brown colouration on two basal segments, with short, slender brownish black hairs. Male genitalia (Figs. 184-185) : Well Developed in comparison to the size of the body. Epandrium longer than wide, incised along one-fourth its length ; surstylus subtriangular ending with obtuse apex ; hypandrium widened ventrally and concave in the middle ; distiphallus long and slender, widened a little before narrowing distally ; gonites normally developed.

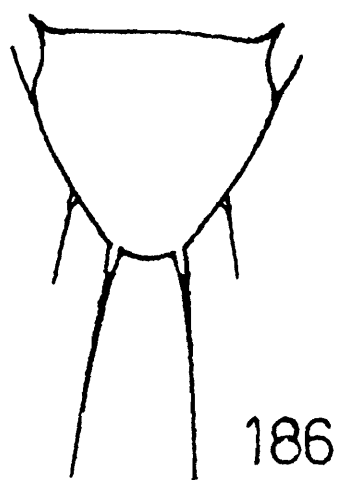
Length : Male 1.7 mm, wing 1.6 mm.

Holotype : Male, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian.

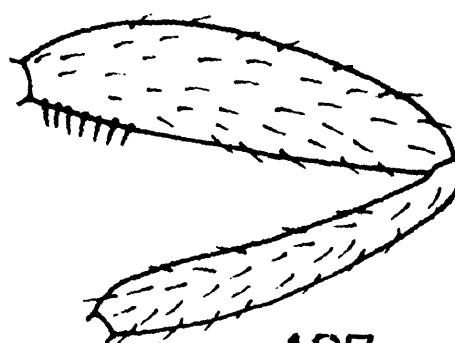
R. intermedia is related to *nitidifrons* (Becker) but the narrowly obtuse ending of frontal triangle, long scutellum, predominantly yellow tibiae (except for infuscation on hind tibia) and the differences in the male genitalia help to differentiate the two species.

34. *Rhodesiella mirae* sp. nov. (Figs. 186-190)

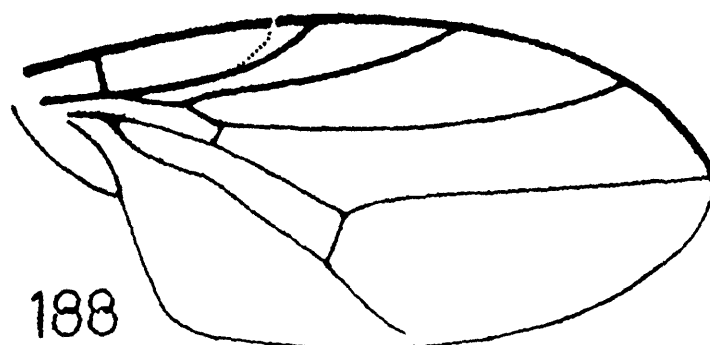
Male and female : *Head* : A little higher than long, length, height and width ratio 14 : 15 : 20. Frons narrowing anteriorly, width at vertex 0.4 x that of head, 0.9 x its own length and 1.2 x the width in front, dull black with a tinge of brown around anterior end ; frontal triangle polished, shiny black, reaching anterior margin of frons and ending with very broadly obtuse apex. Eye large, bare, with vertical long axis. Face distinctly sloping, concave, shiny black with longitudinal depression just inner to each lateral margin ; facial carina low, confined to area between bases of antennae ; lower facial margin finely tomentose along its inner margin. Antenna rather erect ; basal segments brownish yellow ; dorsal spine on ant 2 black very well developed ; ant 3 short, subreniform, 0.7 x as long as wide, brownish yellow with diffused dark tinge confined mostly to dorsodistal area and with fine pale pubescence ; arista slender, basal part brownish, distally dark brown with fine pubescence, arista and aristal pubescence shorter than in *nitidifrons* (Becker). Gena dull black, one-fifth as wide as ant 3, with a row of 8-9 short hairs along oral margin ; vibrissal corner appearing a little projecting beyond lower margin of eye because of its merging with the slightly projecting lower facial margin ; postgena moderately developed, dull black with black hairs. Proboscis and palpi brownish black with slender black hairs. Head bristles moderately developed, black ; *out* longer and stouter than other head bristles ; *ivt* and *pvt* subequal, 0.8 x as long as *out* ; *orb* 7 of which anteriormost two much shorter and slender than the rest and hardly distinguishable from *fr*, longest one two-thirds the *out* ; *oc* equal to longest *orb* ; *if* about 8, in a row outside frontal triangle along each lateral margin, subequal to medium-sized *orb* ; postocular setae very fine ; there are



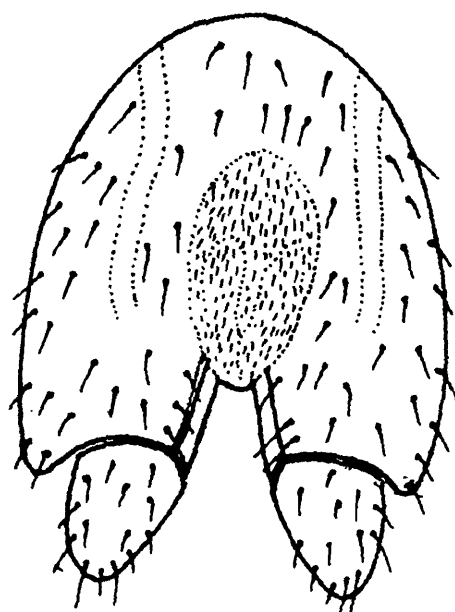
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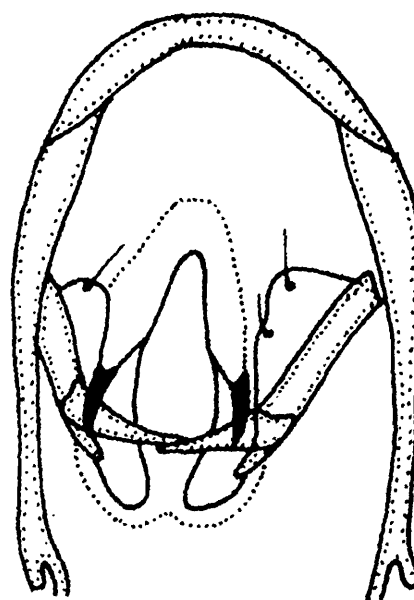
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Figs. 186-190 : *Rhodesiella mirae*, sp. n. 186, Scutellum. 187, Hind femur, male. 188, Wing. 189, Epandrium dorsal view. 190, Phallic complex, ventral view.

about 3-4 bristly hairs behind *out* and *ivt* on the vertex margin of which the outermost is very well developed and projects inward over the eye ; vibrissa of moderate size.

Thorax : Shiny black ; scutum a trifle wider than long, with convex disc bearing dense punctae and dark brown hairs of medium size ; scutellum (Fig. 186) 1.25 x as long as wide at base, subtriangular with prominently convex disc which is more coarsely punctate than but pubescent like scutum ; pleura shiny with a few dark brown hairs confined to part of *anepst* and mostly to lower areas of *kepst*. Thoracic bristles black ; *h* 1, a little shorter than *ivt* ; *npl* 1+1, subequal, a little longer and stouter than *h* ; *pa* 1, 1.2 x as long as *npl* ; *pa* 2, half as long as *pa* 1 but very slender and hair-like ; 1 *dc* a trifle shorter and slender than *npl* ; *as* slightly nearer to each other than to *ss* 1, 0.9 x as long as scutellum, borne on distinct black tubercle ; *ss* 1, 0.4 x as long as *as*, borne on short but distinct tubercle.

Wing (Fig. 188) : 2.4 x as long as wide, hyaline with brown pubescence and brown veins but for dark brown costa and distal part of *r* 1 vein ; costal sectors 2 to 4 in the ratio 9 : 11 : 8 ; *r-m* cross-vein proximad of middle of discal cell, opposite 0.47 of its length ; terminal sector of *r* 4+5 distinctly curving toward upper margin of costa distally, this and that of *m* 1+2 diverging distally, the latter nearly straight and less convex above a little beyond base than in *nitidifrons* (Becker) ; anal angle well developed ; wing widest at the area of anal angle than beyond. Stalk of haltere brown to yellowish brown, knob black to brownish black.

Legs : Coxae and femora brownish black ; trochanters yellowish brown ; fore femur with a row of 6-7 erect well developed black hairs confined to the distal half of anteroventral surface ; fore and mid tibiae brownish black except for their proximal ends and nearly one-third their lengths distally ; hind tibia predominantly brownish black but for yellow proximal and distal ends as in *nitidifrons* ; mid tibial spine yellow ; all tarsi yellow but the last tarsus of each leg appearing brownish distally in certain angles of illumination ; hind femur in male (Fig. 187) very slightly thickened, with 6-7 well developed hairs in a row a little beyond base along anteroventral margin.

Abdomen : Almost as wide as thorax and wider than long, subshiny brownish black with slender brownish black hairs but the basal two segments less blackish and with diffuse yellowish brown tinge except for area around their lateral margins. Female cerci rather short, yellowish brown with very slender, short dark hairs. Male genitalia (Figs. 189-190) : Epandrium suboval, incised along one-fourth its length distally ; surstylus subtriangular, a trifle longer than wide and ending with broadly obtuse apex ; hypandrium much longer than wide, rather subcylindrical but for the semicircular ventral margin ; gonites well developed ; distiphallus medially slightly widened, tapering toward distal end and ending with obtuse apex.

Length : Male 1.8 mm, wing 1.7 mm ; female 2.0 mm, wing 1.9 mm.

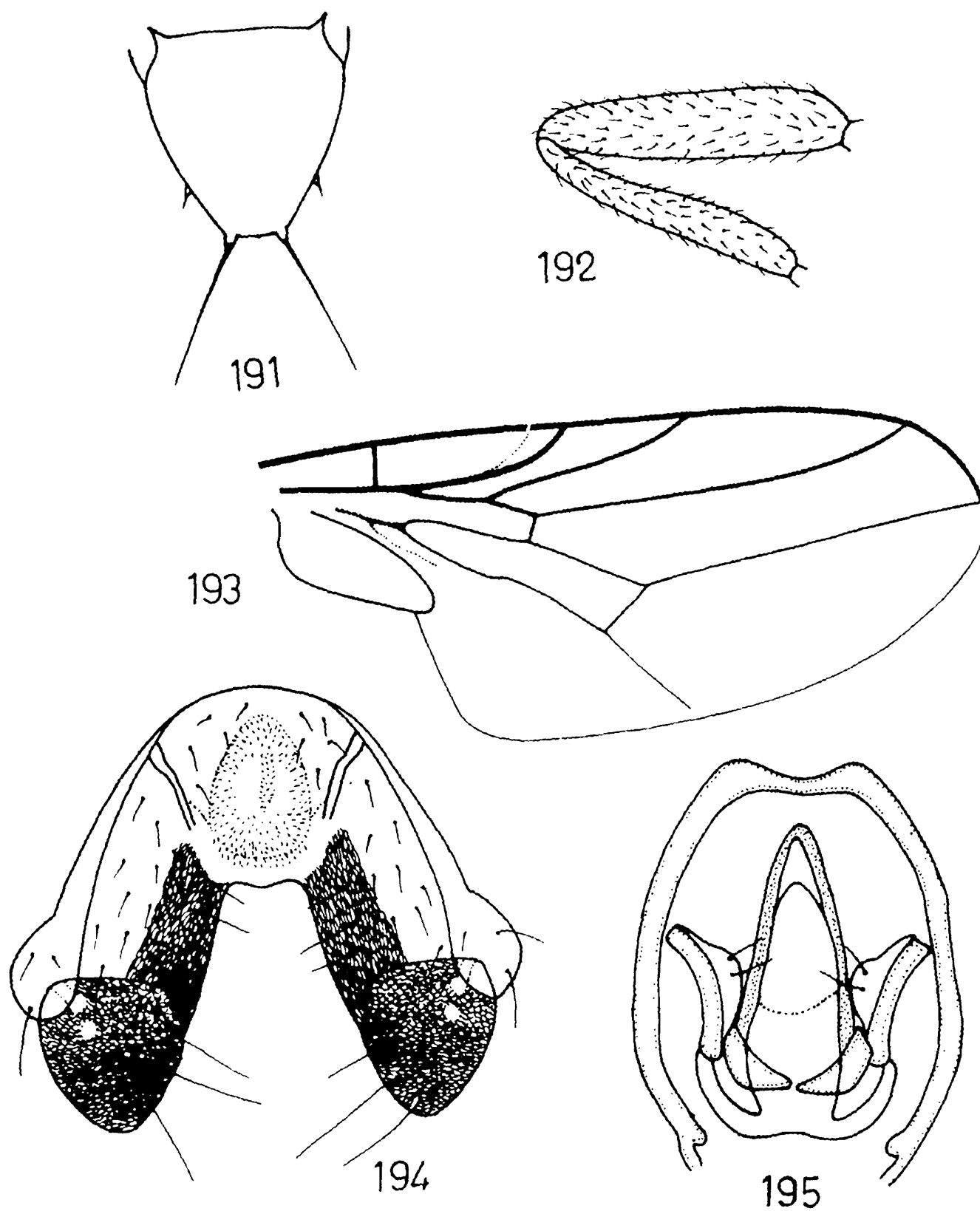
Holotype : Male, Kerala : Kakki, 900 m, 31.xii.1983. *Paratype* : 1 female, data same as of holotype.

This species is very closely related to *nitidifrons* (Becker) but while in the latter fore tibia is entirely yellow in *mirai* it is predominantly brownish black except for its yellow bases and one-third its length distally. Besides, the two species differs in the relative development of their male genitalia.

35. *Rhodesiella kodayarensis*, sp. nov. (Figs. 191-195)

Male : *Head* : Slightly higher than long ; length, height and width ratio 13 : 14 : 21. Frons parallel-sided, as long as wide and half as wide as head, subshiny black, slightly projecting above eye anteriorly but not reaching anterior margin of eye ; frontal triangle glabrous, shiny bluish black, reaching anterior margin of frons and ending with pointed apex. Face almost perpendicular, slightly narrower than frons, subshiny black and concave medially, facial carina distinct between antennae and tapering off below and nearly reaching lower facial margin which is slightly raised and dark tomentose. Antenna erect, ant 2 brownish yellow with fairly dense, short dark pubescence ; ant 3, 1.6 x as wide as long, brownish yellow with darkish tinge along upper and anterior margins ; arista about 3 x as long as antennal segments, basal segments short, yellowish brown, the rest gradually becoming more slender terminally, blackish brown with slender, fairly dense concolorous pubescence. Eye large, bare, with clearly vertical long axis. Gena 0.2 x as wide as ant 3, dull brownish black, dark tomentose, narrower in the middle, with a row of about 10 slender hairs along oral margin ; vibrissal corner faintly projecting a trifle beyond lower anterior eye margin ; vibrissa developed, two hairs on oral margin preceding vibrissa also nearly proclinate ; postgena moderately developed with very conspicuous, fairly dense black hairs. Palpi short, stumpy, black with slender black hairs ; proboscis short, dark brown to brown. Head bristles moderately developed, black ; *ovt* a little longer than *ivt* and equal to the cruciate *pvt* ; *oc* equal to *ivt* ; *orb* 8-9, anterior ones hair-like, longest two-thirds the *ivt* ; *if* 10, arranged in a row outside the triangle along each lateral margin, sequentially anterior ones becoming shorter, longest one a trifle shorter than longest *orb*.

Thorax : Wholly shiny black. Scutum 1.1 x as wide as long and as wide as head with convex disc bearing moderately dense punctae and slender brownish black hairs ; scutellum (Fig. 191) 0.8 x as wide as long, subtriangular, medially slightly convex and less coarsely punctate than distinctly compressed and very coarsely punctate sides and apex ; pleura shiny with prominent fairly dense black hairs on *anepst* and



Figs. 191-195 : *Rhodesiella kodayarensis*; sp. n. 191, Scutellum 192, Hind femur, male. 193, Wing. 194, Epandrium, dorsal view. 195, Phallic complex, dorsal view.

kepst. Thoracic bristles black ; *h* 1, slender a trifle shorter than *oc* ; *npl* 1+1, subequal, a little shorter and slender than *pa* 1 which is borne on prominent wart ; *pa* 2 hair-like ; 1 *dc* equal to *npl* ; *as* widely separated, closer to each other than to *ss* 1, 0.8 x as long as scutellum, borne on tubercle of medium size ; *ss* 1 very short, together with its tubercle 0.2 x as long as *as*.

Wing (Fig. 193): Much shorter than body, 0.45 x as wide as long, hyaline with yellow veins ; costal sectors 2 to 4 in the ratio 8 : 12 : 5 ; r-m cross-vein in the middle of discal cell ; terminal sectors of veins r 4+5 and m 1+2 nearly parallel along their lengths but the former faintly bent toward costa distally ; anal angle well developed. Knob of haltere black to brownish black, stalk dark brown.

Legs : Of medium size ; coxae black to brownish black ; trochanters dark brown to yellowish brown ; femora brownish black but in some specimens brownish yellow apically ; fore tibia broadly or narrowly in the middle and mid and hind tibiae very broadly in the middle brownish black, otherwise brownish yellow ; tarsi yellow but the black hairs impart dark tinge to the terminal segments in certain angles of illumination ; all legs with fairly dense prominent black hairs of which some on fore femur are more prominent along outer and anteroventral margins ; hind femur of male (Fig. 192) not thickened and without denticles or spines.

Abdomen : Suboval, width in the middle almost equal to that of thorax ; basal segments yellowish brown except for brownish black lateral margins ; last two visible segments brownish black ; all terga uniformly with well developed, fairly dense, slender, black hairs. Male genitalia (Figs. 194-195): Epandrium widening distally, deeply incised along half its length ; surstylus subtriangular almost as long as wide at base, ending with obtuse apex with small scales all over as also along the area around incised margins ; hypandrium narrowing towards both ends ; distiphallus subcylindrical but tapering distally ; phallapodeme does not reach hypandrium ventrally ; gonites well developed.

Length : Male 2.3 mm, wing 1.7 mm.

Holotype : Male, Tamil Nadu : Kanyakumari Dist., Kodayar, 26.iii.1988, Coll. Koshy Mathew ; *Paratypes* : 2 males, collection data same as of holotype ; 1 male, Tamil Nadu : Trichy Dist., Kovilpatti, 21.ii.1991, Coll. C. Radhakrishnan ; 1 male, Tamil Nadu : Nilgiris : Mukkuriti, 2200 m, 28.iii.1991, Coll. G. Thirumalai.

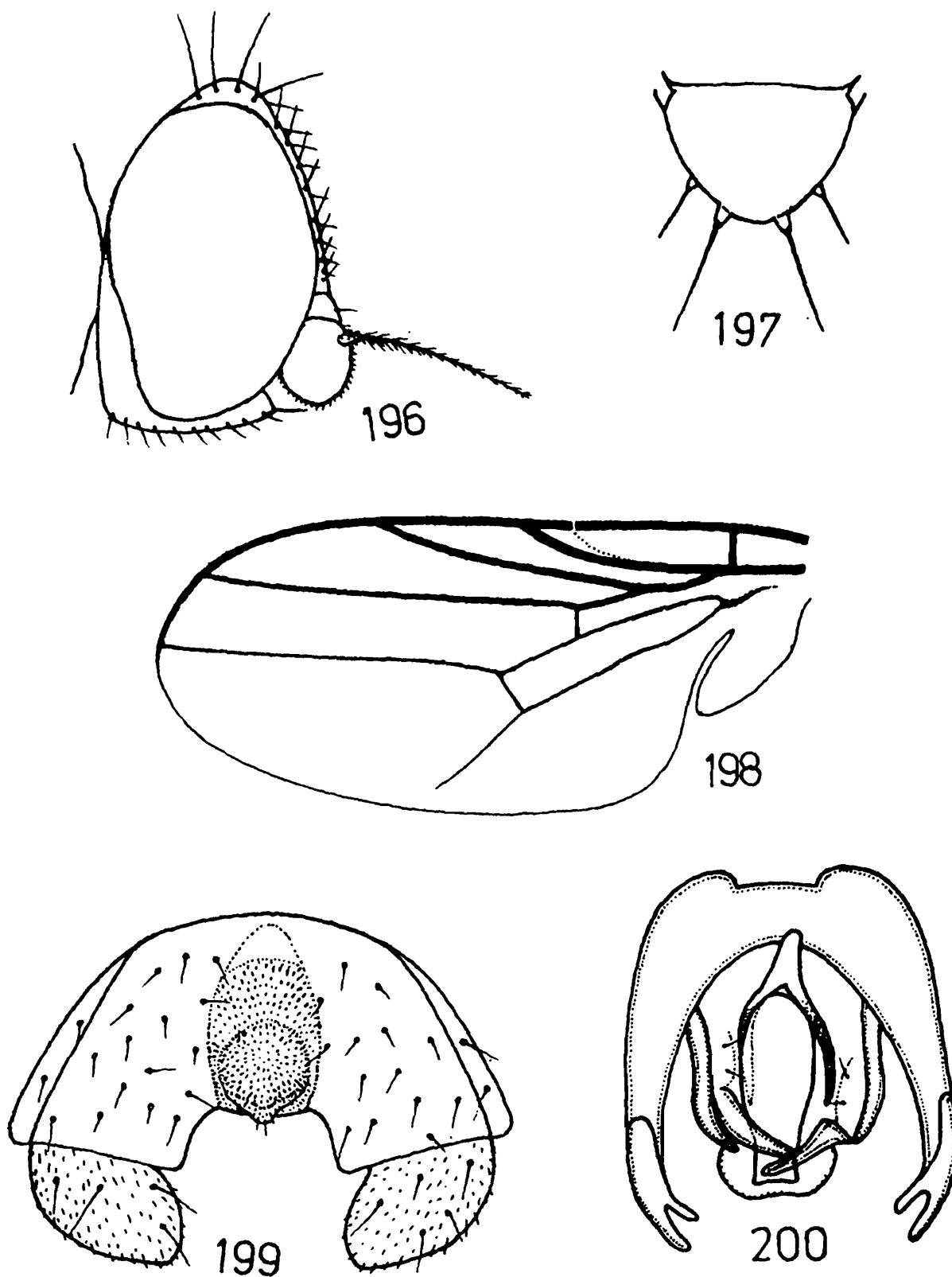
This species is related to *mirai* but differs in the shape and colouration of its frontal triangle, relative lengths of costal sectors, position of r-m cross-vein and the build of male genitalia.

36. *Rhodesiella sanctijohani* Cherian (Figs. 196-200)

1973. *Rhodesiella sanctijohani* Cherian, *Oriental Insects*, 7(2) : 204-206. Type locality : India : U.P., Agra.

Male, and female : Head (Fig. 196) : Greatly sloping, higher than long, length, height and width ratio 14 : 15 : 22. Frons parallel-sided, concave in front, not reaching anterior margin of eye, width 0.43 x that of head and nearly equal to its own length, subshining, very dark brown ; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with nearly pointed apex. Eye very large, in profile occupying almost entire head, with nearly vertical or slightly oblique long axis and a few very minute and scattered pubescence. Face distinctly sloping, glabrous, shiny brownish black and deeply concave ; facial carina somewhat developed, low, linear, reaching middle of face ; lower facial margin distinctly raised, concolorous with face, inner margin medially greatly thickened by the merging with it of the darkened clypeus. Antenna directed outwards and downwards, whitish yellow, small in comparison to size of head, set with fine, white pubescence ; ant 2 distally almost as wide as ant 3, distinctly wider than long and 3 subspherical, length and width ratio 6 : 5 ; arista 2 x as long as antenna, basally about one-fifth whitish yellow, the rest brown, set with slender, fairly dense dark brown pubescence. Gena sublinear, with about one-third that of ant 3, short, upper part deeply brownish, finely grey tomentose ; oral margin dark brown ; vibrissal corner slightly produced but not projecting beyond eye margin ; postgena rather well developed, dull black with very fine, fairly dense, pale hairs. Palpi and proboscis short, deeply brown to dark brown. All head bristles and hairs whitish yellow ; *out* stout, half width of eye ; *ivt* a little more than three-fourths the *out* ; *orb* 9-10, reclinate sequentially anterior ones becoming shorter ; *if* 8-10, set outside the triangle along each lateral margin ; *pvt* cruciate, slightly turned caudad, six-sevenths the *out* ; *oc* proclinate, widely divergent, a trifle longer than longest *orb* ; ocellar triangle with a tuft of 5-6 slender erect to slightly proclinate hairs ; *fr* a few nearly in a row and rest scattered, only a little shorter than anterior *orb*.

Thorax : Shiny black. Scutum convex, length and width ratio 22 : 25, shiny black with very dense stellate punctae and prominent white hairs. Scutellum (Fig. 197) 1.1 x as long as wide, distinctly thickened and sloping, narrowing distally and ending with broadly obtuse apex and the nearly convex disc pubescent like but more coarsely punctate than scutum ; in some specimens the scutellum is more convex than in others. Pleura wholly smooth and shiny ; hairs on *anepst* and a few on *kepst* shorter than on scutum. Thoracic bristles whitish yellow ; *h* 1, much shorter than *out* ; *npl* 1+1, subequal, 1.5 x the *h* ; *pa* 1 rather stout, 2 x the *h* ; *pa* 2 and 1 *dc* short, slender, hair-like, nearly equal to *h* ; *as* stout, two-thirds the length of scutellum, widely



Figs. 196-200 : *Rhodesiella sanctijohani* Cherian. 196, Head. lateral view. 197, Scutellum. 198, Wing. 199, Epandrium dorsal view. 200, Phallic complex, ventral view.

separated at base ; ss 1 three-fifths the *as*, separated from *as* by distance nearly equal to that between two *as* ; all scutellar bristles borne on short black tubercles.

Wing (Fig. 198) : Hyaline with brown veins ; first costal sector and vein r 1 with darkish tinge ; terminal sector of vein r 2+3 distinctly and that of r 4+5 slightly curving forwards apically, the latter and m 1+2 almost parallel ; costal sectors 2 to 4 in the ratio 5 : 7 : 4 ; discal cell narrow ; r-m cross-vein distad of the middle of discal cell, opposite 0.65 of its length ; terminal sector of vein m 1+2 a trifle concave behind basally, otherwise nearly straight. Anal angle well developed. Haltere white to milky white but in older specimens deeply brownish.

Legs : Coxae brownish black, trochanters usually yellow, at times with deeply brownish tinge ; fore and mid femora deeply brown to dark brown in most of the type specimens but in a few others distinctly darkened ; fore and mid tibiae brownish but the latter at distal one-third its length yellow to whitish yellow ; hind femur and tibia black, the former greatly enlarged, greatest thickness one-third its own length and 3 x the thickness of hind tibia ; basal part of hind femur, almost equal to entire length of hind tibia, along its anteroventral and posteroventral surfaces with a row each of 15-20 stiff black, tuberculate hairs as in *R. adamsi* Sabrosky, forming a crib into which fits in the strongly curved hind tibia ; all tarsi and hairs on legs whitish yellow ; part of inner surface of hind femur shiny and devoid of hairs.

Abdomen : Transverse, slightly narrower than thorax, subshiny reddish brown to dark brown but in some specimens two or three basal segments with distinct yellow tinge, with fairly dense short pale hairs. Female cerci slender, yellow. Male genitalia (Figs. 199-200). Epandrium much wider than long ; surstylus in the form of a large, subtriangular plate ; hypandrium subcylindrical, concave medially at base ; gonites well developed ; distiphallus of medium size ; phallapodeme well developed, reaching hypandrium.

Length : Male 2-2.3 mm, wing 2.1-2.4 mm ; female 2.3-2.5 mm, wing 2.2-2.4 mm.

R. sanctijohani resembles *nitidifrons* (Becker) from India but unlike the latter the former has wholly white head and thoracic bristles and hairs, whitish yellow antenna, long and well developed ss, greatly thickened hind femur and basally only slightly concave last sector of m 1+2. Besides the male genitalia of the two species are entirely different.

Specimens examined : *Holotype* : Male, India : U.P. ; Agra : St. John's College Garden, 31.x.1967, Coll. P.T. Cherian.

Paratypes : 36 males and females, data same as of holotype ; 21 males and females,

Agra, 13.xi.1967, Coll. P.T. Cherian ; 40 males and females, Agra, 8.iii.1968, Coll. P.T. Cherian.

Other examples : 4 males, 3 females, Goa : Margao, 23.iv.1966, Coll. K.S. Pradhan ; 1 male, Madhya Pradesh : Raipur Dist., Dhamtori, 22.iv.1975, Coll. S.K. Gupta ; 4 males, 2 females, Maharashtra : Ratnagiri Dist., Pophil Vashishti Valley, 400', Coll. F.M. Gravely ; 1 male, 2 females, T. Nadu : Krusadi Is., 8.iii.1989, Coll. C. Radhakrishnan ; 1 female, Kerala : Thenmala, 11.i.1989, Coll. P.T. Cherian ; 1 male, T. Nadu : S. Arcot Dist., Thiyaagathurgam, 16.iv.1993, Coll. T.S.N. Murthy.

Remarks : These flies are available in abundance during winter in Agra. They are rather lethargic in their movements and as many as 60 flies rest on the under surface of a single leaf of *Ixora coccinea* Linnaeus, *Quisqualis indica* Linnaeus, *Bougainvillea glabra* Choisy and *Citrus medica* Linnaeus. All the type specimens were collected from these leaves. Other examples, collected in subsequent years, were also from the leaves of shrubs. They usually congregate on leaves at a height of one to three metres above the ground.

37. *Rhodesiella himalayensis* Cherian (Figs. 201-205)

1977. *Rhodesiella himalayensis* Cherian, *Oriental Insects*, 11 (4) : 494–496. Type localities. : India : West Bengal : Darjeeling Dist., Goke F.R.M. ; Uttar Pradesh : Agra ; Assam : Haflong Jatinga Road.

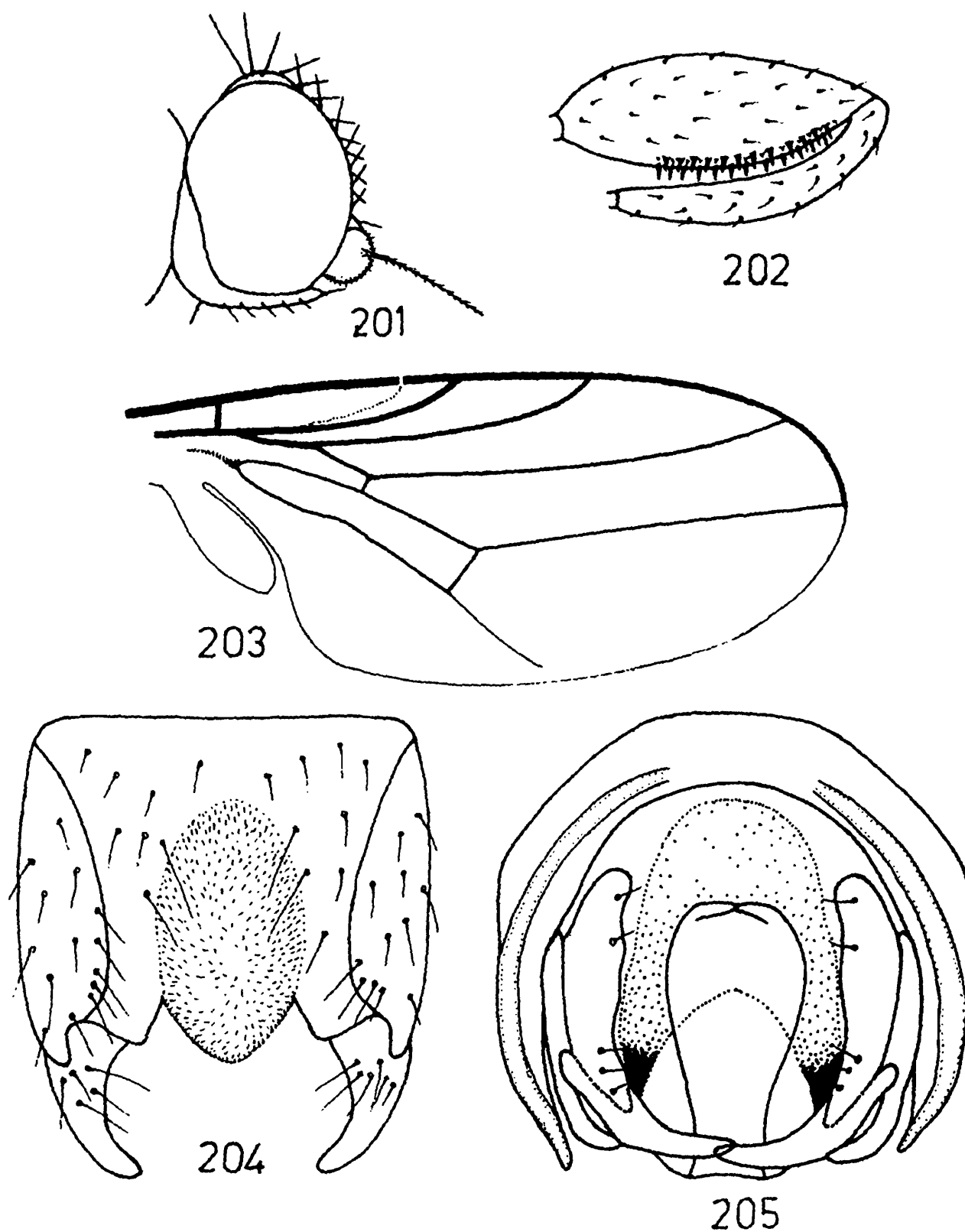
Male and female : *Head* (Fig. 201) : A trifle higher than long, length, height and width ratio 7 : 8 : 12. Frons nearly parallelsided, width at vertex about 0.44–0.46 x that of head and 1.1 x its own length, subshining, brownish black, slightly projecting above eyes anteriorly and in profile not reaching anterior margin of eye ; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with narrowly obtuse to nearly pointed apex (not truncate apically as indicated in the original description though in some specimens it appears more obtuse than in others). Face concave, smooth, shiny black to brownish black ; facial carina low, linear, reaching middle of face ; lower facial margin only a trifle raised up. Antenna directed outwards and partly downwards ; ant 2 two-thirds as long as ant 3, yellow to yellowish brown, rarely with dark tinge, with very fine pubescence ; ant 3 1.2 x as wide as long, yellow to brownish yellow, with distinct dark tinge, especially in some more mature specimens, confined mostly to upper and at times also distal margin, with very fine pale pubescence ; arista very slender, dark brown except for brownish yellow basal part, with short pubescence which are brownish yellow in the basal part and dark brown in the area beyond. Eye large, bare, with vertical long axis. Gena dull black, about

one-fourth as wide as ant 3, with a row of 7-8 slender, black hairs along oral margin ; vibrissal corner finely tomentose, with short, black vibrissa ; postgena moderately developed, dull black with black, fairly dense, short hairs. Palpi short, dark brown to black, with short, dense hairs, proboscis short, dark brown. Head bristles black, of medium size ; *out* three-fifths as long as width of eye ; *ivt* a trifle shorter than *out* and equal to *oc* ; *pvt* cruciate, subequal to *out* ; *orb* 7-8, recumbent, sequentially anterior ones becoming shorter and slender, longest one about two-thirds as long as *out* ; *if* about 8-9, in a row outside triangle along each lateral margin ; frons with a few short, black *fr*.

Thorax : Shiny black ; scutum 1.2 x as wide as long (the ratio of 9 : 18 given in the original description was wrong since it was a printing error), with strongly convex disc bearing dense stellate punctae and brownish black hairs of medium size ; scutellum as long as wide at base, rarely a trifle longer than wide and half as long as scutum, with convex disc faintly flattened medially, especially in some specimens, more coarsely punctate than but pubescent like scutum ; pleura polished, with short black hairs on *anepst* and a few similar hairs confined mostly to lower part and upper margin of *kepst*. Thoracic bristles black ; *h* 1, nearly as long as *ivt* ; *npl* 1+1, subequal, distinctly longer than *h*, anterior one more slender ; *pa* 1 1.2 x as long as *npl* ; *pa* 2 hair-like ; 1 *dc* shorter than *pa* 1 and almost as long as *npl* ; *as* widely separated at base, length, together with that of its tubercle, equal to that of scutellum ; *ss* 1 not developed, and in a few specimens basad of *as* along lateral margin 2-3 hairs, borne on fine warts, are often more prominent.

Wing : (Fig. 203) 2.4 x as long as wide, hyaline with brown pubescence and veins ; costal sectors 2 to 4 in the ratio 10 : 16 : 7 to 6 : 9 : 3 ; r-m cross-vein very slightly distad to almost in the middle of the discal cell ; terminal sectors of veins r 4+5 and m 1+2 subparallel, the former curving forward towards costa, the latter slightly curving and convex above a little beyond base ; anal angle moderately developed. Haltere yellow to whitish yellow, with brownish tinge in some specimens (in a few, probably because of the nature of preservation, knob of haltere appears brown to even dark brown).

Legs : Coxae black with dark brown, long, slender hairs ; trochanters yellowish brown ; femora black except for yellow tinge around distal ends of fore and mid femora ; fore femur with a row of erect, prominent slender hairs along anteroventral margin ; hind femur (Fig. 202) extraordinarily thickened, maximum width two-fifths its own length and 3.7 x the width of hind tibia, its anteroventral and posteroventral surfaces along three-fifths its own length basally with one row each of 8-10 short black spines, forming a crib into which fits in the strongly bowed hind tibia ; fore



Figs. 201-205 : *Rhodesiella himalayensis* Cherian. 201, Head, lateral view. 202, Hind femur, male. 203, Wing. 204, Epandrium, ventral view.

tibia wholly yellow, rarely with brown tinge in some specimens ; mid tibia, except for its yellow base and about one-third its length distally, blackish brown ; hind tibia wholly black, about two-thirds as long as hind femur ; mid tibial spine black, slender, fairly long ; all tarsi yellow.

Abdomen : Wider than long and only a trifle narrower than thorax, black to brownish black but in some specimens basal one or two segments reddish brown to yellowish brown and distal segments also with brownish tinge, though predominantly black. Female cerci short, rather stout, yellow, with slender hairs.

Male genitalia (Figs. 204-205) small in relation to size of the specimen. Epandrium wider than long, laterodistally produced ; surstylus curved, longer than wide, tapering distally and ending with an obtuse apex ; hypandrium suborbicular ; distiphallus club-shaped ; gonites well developed.

Length : Male : 2-2.5 mm, wing 1.9-2.4 mm ; female : 2.1-2.6 mm, wing 2-2.4 mm.

Specimens examined : Holotype : Male, India : W. Bengal : Darjeeling Dist., Goke F.R.H., 18.iv.1973, Coll. H.S. Sharma.

Paratypes : 81 males and females, data same as of holotype : 4 males, 1 female, Uttar Pradesh : Agra, 21.xi.1967, Coll. P.T. Cherian ; 1 female, Assam : Haflong-Jalinga Road, 28.iv.1968, Coll. Ipe M. Ipe.

Other specimens studied : 23 males, 20 females, W. Bengal : Darjeeling Dist., Andhari Khola, 9.iv.1973, Coll. H.S. Sharma ; 4 males, 4 females, Orissa : Mayurbhanj Dist., Janabil, 20.iii.1973, Coll. S.K. Gupta ; 12 males, 10 females, Mizoram : Kolasib, 8.iii.1980, Coll. P.T. Cherian ; 7 males, 4 females, Meghalaya : Kyrdukhlai, 29.iii.1980, Coll. P.T. Cherian ; 45 males, 52 females, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian ; 11 males, 10 females, Kerala : Pathanamthitta Dist., Kakki, 900m., 30.xii.1983 ; 1 male, 1 female, Kerala : Thenmala, 1.i.1989, Coll. P.T. Cherian ; 3 males, 5 females, Tamil Nadu : Coimbatore Dist., Kovaicourtalam, 600m, 7.2.1992, Coll. C. Radhakrishnan.

The extraordinarily thickened hind femur, bearing two rows of spines, bowed hind tibia, wholly yellow tarsi, absence of ss 1, relative length of scutellum, nature of last section of m 1+2 and differences in male genitalia distinguish this species from the Indian *nitidifrons* (Becker), to which *himalayensis* shows some affinities.

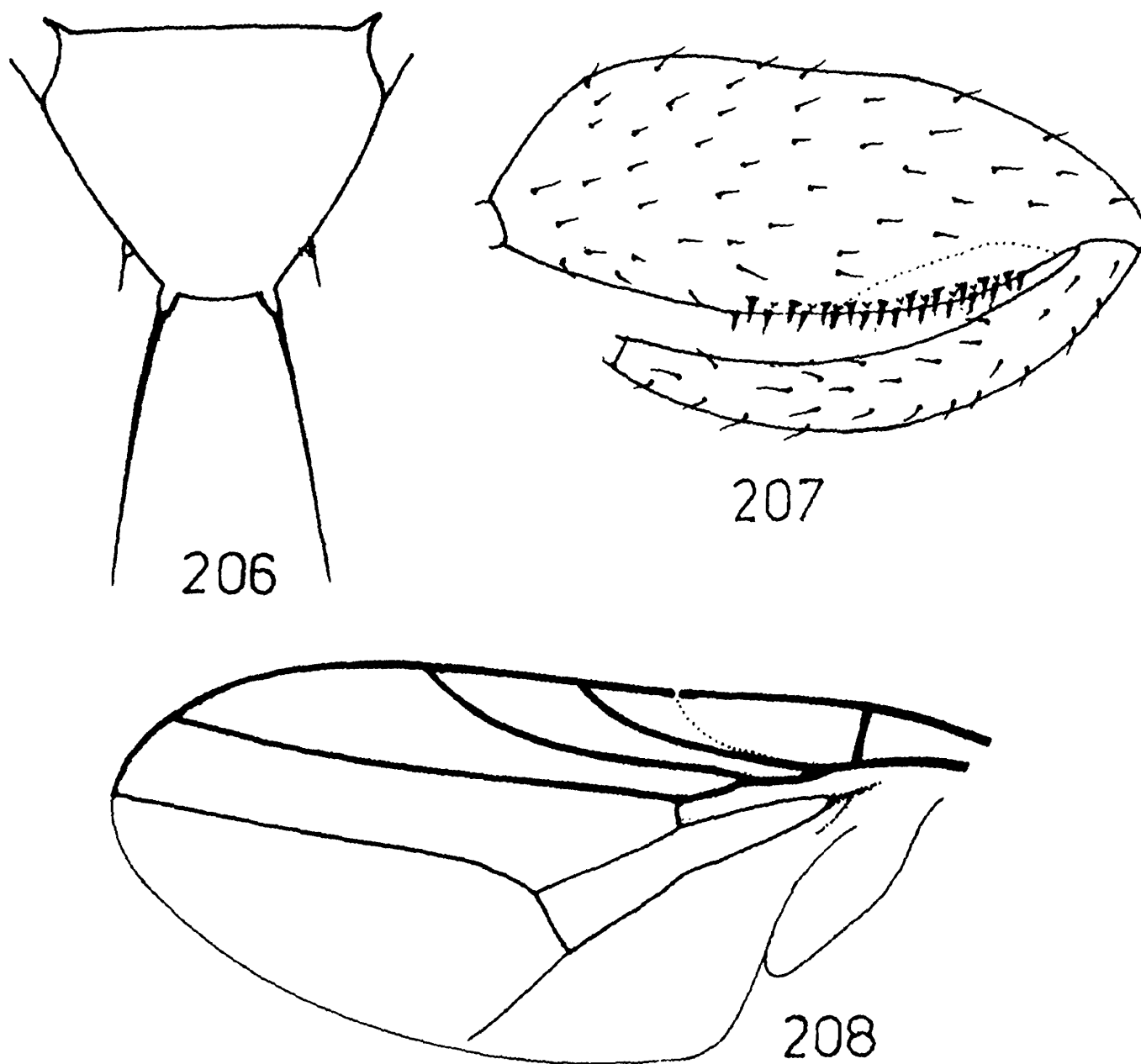
This is the most common species of *Rhodesiella*, collected so far from India and often is found on the leaves of shrubs and annuals, mostly in forest areas but rarely in cultivated fields also.

38. *Rhodesiella mizoramensis* sp. nov. (Figs. 206-208)

Male, female: Head: A trifle higher than long, length, height and width ratio 7:8:12. Frons nearly parallel sided, width at vertex 0.46 x that of head and 1.1 x its own length, subshining brownish black, slightly projecting above eyes anteriorly and in profile not reaching anterior margin of eye; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with very narrowly obtuse to nearly pointed apex. Face concave, glabrous, shiny black; facial carina low, linear, reaching middle of face; lower facial margin only a trifle raised up. Antenna directed outward and partly downward; ant 2 two-thirds as long as ant 3, yellow to yellowish brown (rarely with dark tinge), with very fine pubescence; ant 3 1.3 x as wide as long, brownish yellow with dark tinge confined mostly to upper and in some specimens also partly to distal margin, with very fine pale pubescence; arista very slender, dark brown except for yellowish brown basal part, with very short rather sparse dark brown pubescence. Gena dull black, about one-fourth as wide as ant 3, with a row of 7-8 black slender hairs along oral margin; vibrissal corner finely tomentose with short black vibrissa; postgena moderately developed, dull black with black, fairly dense, short hairs. Eye large, bare, with vertical long axis. Palpi short, dark brown with short, very dense hairs; proboscis short, dark brown. Head bristles black, of medium size; *out* and *put* subequal; *ivt* a little shorter than *out* and equal to *oc*; *orb* 7-8, recumbent, longest about two-thirds as long as *out*; *if* about 8, in a row outside triangle along each lateral margin; frons with a few short black *fr*.

Thorax: Shiny black; scutum 1.2 x as wide as long, with convex disc bearing dense stellate punctae and slender brownish black hairs of medium size; scutellum (Fig. 206) as long as wide, with convex disc which is faintly flattened medially, more coarsely punctate than but pubescent like scutum; pleura polished, with short black hairs, especially medially on *anepst* and a few similar hairs confined mostly to lower part and upper margin of *kepst*. Thoracic bristles black; *h* 1, slender, nearly as long as *ivt*; *npl* 1+1, anterior more slender, length subequal and distinctly longer than *h*; *pa* 1 1.2 x as long as *npl*; *pa* 2 hair-like; 1 *dc* two-thirds as long as *pa* 1; *as* widely separated at base, nearer to *ss* 1 than to each other, length together with that of its tubercle equal to that of scutellum; *ss* 1 short, borne on small tubercle, length together with that of its tubercle 0.2 x of *as*.

Wing (Fig. 208): 2.5 x as long as wide, hyaline with brown hairs and veins; costal sectors 2 to 4 in the ratio 9:14:6 to 6:9:3; r-m cross-vein in the middle of discal cell; terminal sectors of veins r 4+5 and m 1+2 subparallel, slightly curving towards costa, the former especially so distally, the latter curving and distinctly convex above basally; anal angle moderately developed. Haltere wholly yellow.



Figs. 206-208 : *Rhodesiella mizoramensis*, sp. n. 206, Scutellum. 207, Hind femur, male. 208, Wing.

Legs : Coxae black, with dark brown long slender hairs ; trochanters yellowish brown ; femora black except for yellow tinge around distal ends of fore and mid femora ; fore femur with a row of erect, prominent, slender hairs along antero-ventral margin ; hind femur (fig. 207) thickened, 2.5 x as long as wide, its antero-ventral and posteroventral surfaces along two-thirds its length distally with one row each of 8-10 short black spines forming a crib into which fits in the strongly bowed hind tibia as in *himalayensis*; fore tibia yellow ; mid tibia except for its yellow base and one-third the length distally blackish brown to dark brown; hind tibia black, about two-thirds as long as hind femur ; mid tibial spine black, slender, fairly long ; all tarsi yellow.

Abdomen : Wider than long and only a trifle narrower than thorax, black to brownish black but in some specimens basal one or two segments medially slightly paler. Female cerci short, rather stout, yellow with slender hairs. Male genitalia small in relation to size of the specimen.

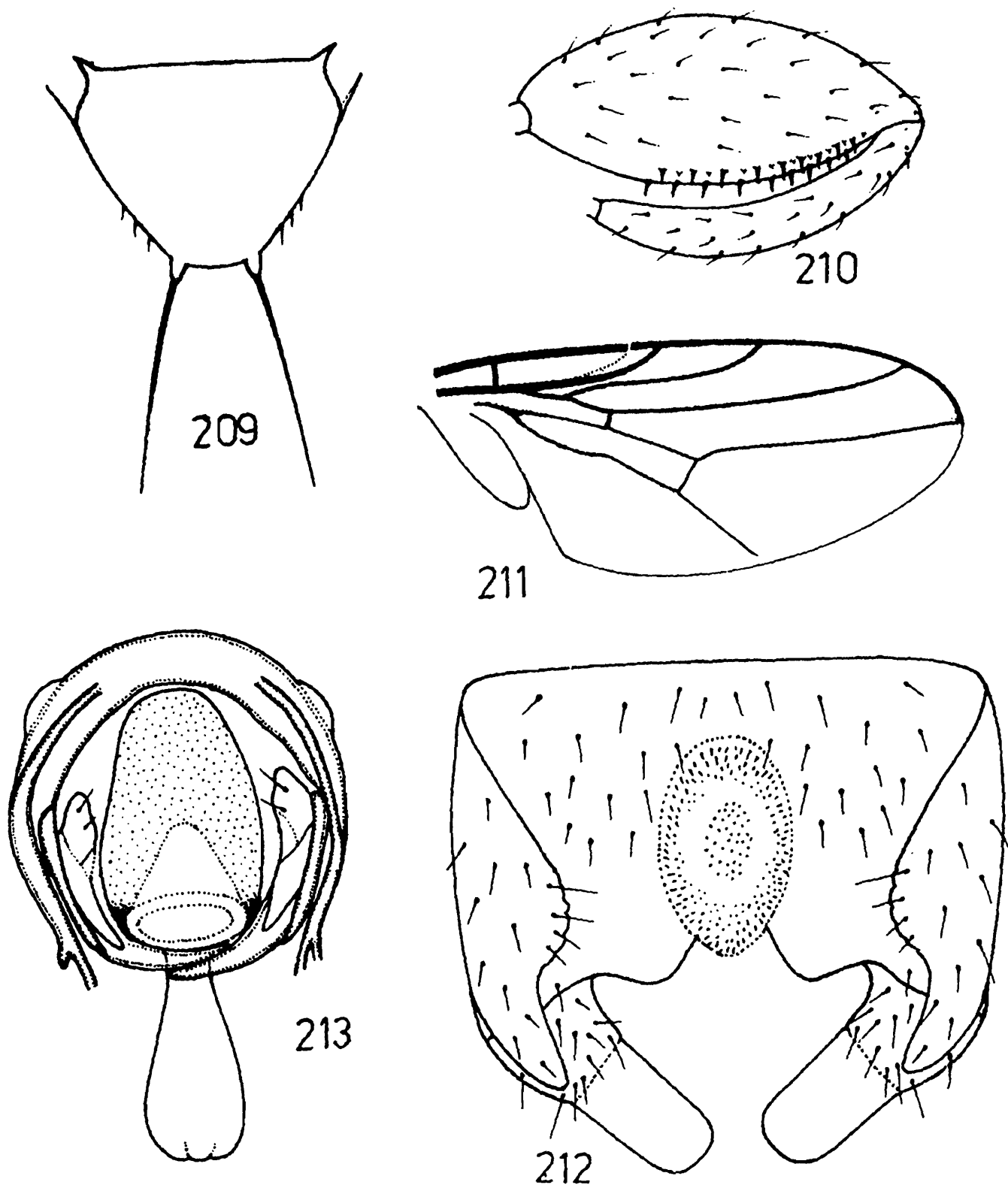
Length : Male 2 mm, wing 2 mm ; female 2.2 mm, wing 2 mm.

Holotype : Male, Mizoram ; Lunglei Dist., Zobowk, 22.iii.1979, Coll. P.T. Cherian, **Paratypes :** 4 males, 6 females, Collection data same as of holotype (male genitalia partly damaged).

R. mizoramensis closely resembles *himalayensis* Cherian, but differs in possessing distinct ss 1 borne on small tubercle, whereas ss 1 is absent in the latter species.

39. *Rhodesiella bihumeralis*, sp. n. (Figs. 209-213)

Male and female : Head : Higher than long, length, height and width ratio 5 : 6 : 9. Frons a trifle narrowing anteriorly, width at vertex 0.41 x that of head, 0.9 x its own length and 1.2 x the width at anterior margin, dull black, projecting only a trifle above eyes anteriorly and not reaching anterior margin of eye ; frontal triangle glabrous, shiny black, similar in shape and relative size to *himalayensis* and *mizoramensis*, reaching anterior margin of frons and ending with nearly pointed apex. Eye very large, bare, with vertical long axis. Face concave, polished, shiny black ; facial carina restricted to bases of antennae ; lower facial margin slightly raised, its inner margin finely pale grey tomentose. Antenna directed slightly outwards ; ant 2 yellow with short dark hairs imparting light dark appearance to surface especially in some specimens, and with black dorsal spine ; ant 3 subreniform, 0.8 x as long as wide, predominantly yellow to reddish yellow with dark tinge confined mostly to dorso-distal margin, wholly with very fine pale pubescence ; arista slender, basal part brownish yellow, distally dark brown with slender, fairly dense short hairs as in



Figs. 209-213 : *Rhodesiella bihumeralis*, sp.n. 209, Scutellum. 210, Hind femur, male. 211, Wing. 212, Epandrium, ventral view. 213, Phallic complex, ventral view.

himalayensis. Gena dull black, about one-fourth as wide as ant 3, with a row of about 8 well developed black hairs along oral margin; vibrissal corner in profile appearing slightly projecting beyond lower eye margin because of its merging with lower facial margin, with short, black vibrissa; postgena rather reduced, with a few black hairs. Palpi dull black; proboscis black with very short, dense golden brown pubescence on distal surface. Head bristles black, of medium-size and stoutness; *out* subequal to the cruciate *put*; *ivt* a little shorter than *out*; *orb* 8, anterior ones sequentially becoming shorter and slender, longest 0.7 x as long as *out*, anterior most two very short and slender; *oc* subequal to longest *orb*; *if* 8-9, subequal to medium sized *orb*; postocular setae well developed, those around vertical bristles longer and stouter than the rest.

Thorax: Shiny black, very similar to that of *himalayensis* and *mizoramensis*; scutum 1.1 x as wide as long, with strongly convex disc which is punctate like and with brownish black hairs as in *himalayensis*; scutellum (Fig. 209) as long as wide at base and nearly half as long as scutum, with convex disc, more coarsely punctate than and pubescent like scutum as in *himalayensis* and *mizoramensis*; pleura polished with short black hairs on *anepst* and confined mostly to lower part and central area of upper half of *kepst*. Thoracic bristles black; *h* 2, outer one subequal to *orb*, inner a little shorter but distinct; *npl* 1+1, subequal, 1.2 x as long as outer *h*; *pa* 1 1.4 x as long as *npl*; *pa* 2 well developed, only a trifle shorter than *h*; 1 *dc* three-fifths as long as *pa* 1; *as* widely separated at base, as long as scutellum, borne on distinct short tubercle as in *himalayensis*; *ss* not developed but 2-3 often prominent hairs basad of *as* are present as in *himalayensis*.

Wing (Fig. 211): 2.6 x as long as wide, hyaline with deeply brownish to pale brown veins; costal sectors 2 to 4 in the ratio 10 : 13 : 6; r-m cross-vein in the middle of the discal cell; terminal sectors of veins r 4+5 and m 1+2 subparallel, the latter gently curving and slightly convex above a little beyond base; anal angle moderately developed. Haltere yellow.

Legs: Very similar to those in *himalayensis* and *mizoramensis*; coxae black with dark brown to black hairs of which a few on fore and mid coxae and at least one on hind coxa are more prominent; trochanters dark brown to yellowish brown; all femora and hind tibia black; hind femur (Fig. 210) greatly thickened and with one row each of short black 8-9 spines, confined to the basal half on anteroventral and posteroventral surfaces along three-fifths its length basally, forming a crib as in *himalayensis* and *mizoramensis*, into which fits in the greatly bowed tibia; fore and mid tibiae black to blackish brown but for their yellow bases and one-third their lengths distally; mid tibial spine yellow; all tarsi yellow but the last segment at least in some specimens, appears brownish distally.

Abdomen : Almost as wide as long and narrower than thorax, almost wholly brownish black or basal two segments distinctly yellowish, wholly with short white hairs, of which those on genitalia are longer. Female cerci short and slender, yellow with dense slender white hairs. Male genitalia (Fig. 212-213) : Very similar to that of *himalayensis* except that epandrium is wider, surstylus is retangular in distal half, and distiphallus is more narrow in basal part.

Length : Male, 2.2 mm, wing 2.1 mm ; Female 2.3 mm, wing 2.2 mm

Holotype : Male, Kerala : Idukki ; Painavu, 900 m, 24.ii.1984, Coll. P.T. Cherian.
Paratypes : 4 males, 3 females, data same as of holotype.

This species closely resembles *himalayensis* Cherian, but differs in the fore tibia being blackish to blackish brown, except for the yellow base and about one-third its length distally. Besides, in *bihumeralis* abdominal hairs are white and there are 2 *h* whereas *himalayensis* has brownish black abdominal hairs and only one humeral bristle. In the presence of 2 *h* the present species differs from all other related species of *Rhodesiella* except for *brevipedalis* from which it differs in the nature and colouration of legs, position of r-m cross-vein, nature of flexure of m 1+2, nature of lower facial margin and *if* and nature of scutellum and number of scutellar bristles.

40. *Rhodesiella travancorensis* sp. nov. (Figs. 214-218)

Male and female Head : Higher than long, length, height and width ratio 5 : 6 : 9. Frons slightly narrowing anteriorly, width at vertex 0.42 x that of head and 0.9 x its own length and 1.2 x the width at anterior margin, dull black, in profile projecting a little above eye margin anteriorly and not reaching anterior margin of eye ; frontal triangle glabrous, shiny black, similar in shape and relative size to that of *bihumeralis*, reaching anterior margin of frons and ending with nearly pointed apex. Eye very large, bare, with vertical long axis. Face concave, polished shiny black, in some specimens submedian areas more concave than sides ; facial carina as in *bihumeralis* ; lower facial margin finely tomentose along its inner margin. Antenna directed slightly outwards and downwards ; ant 2 yellow to yellowish brown, with short dark hairs imparting light dark appearance to surface, especially in some specimens, and with black dorsal spine ; ant 3 subreniform, longer below than above, maximum length 0.8 x the width, yellow with dark tinge confined mostly to dorsodistal area and fine dense yellowish white pubescence all over ; arista of medium size, slender, basal part brownish yellow, distally dark brown with slender, fairly dense short pubescence as in *bihumeralis* and *himalayensis*. Gena dull black, about one-fourth as wide as ant 3, with a row of about 8 very well developed black hairs along oral margin ; vibrissal corner finely tomentose ; vibrissa only a trifle longer than genal hairs on oral margin ;

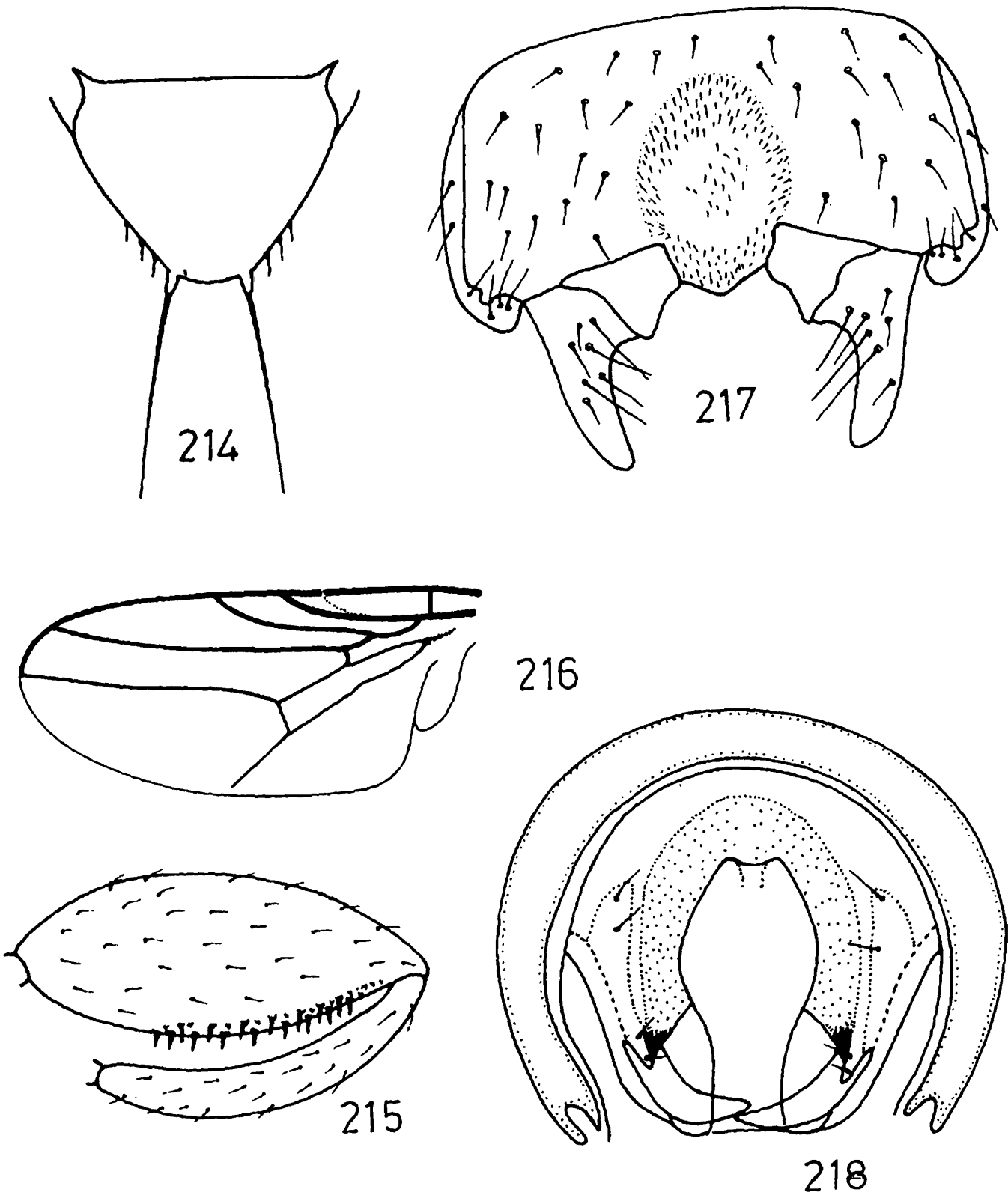
postgena rather reduced as in *bihumeralis*, with a few black hairs. Palpi dull black with conspicuous dark brown hairs; proboscis concolorous with palpi but for grey distal margin, with short dark hairs. All head bristles black, similar to those in *bihumeralis*; *out* and *pvt* subequal; *ivt* shorter than *out*; *orb* 8-9, anterior ones sequentially becoming shorter and slender as in other species of the genus, longest threefourths as long as *out*; *oc* subequal to longest *orb*; *if* about 8, subequal to medium-sized *orb*; postocular row of setae short and slender; hairs around vertical bristles along vertex margin well developed.

Thorax : Shiny black, very similar to that of *bihumeralis* and *himalayensis*; scutum 1.1 x as wide as long, with strongly convex disc which is punctate like and with brownish black hairs as in *bihumeralis* and *himalayensis*; scutellum (Fig. 214) as long as wide at base and nearly half as long as scutum, with convex disc which is more coarsely punctate than and pubescent like scutum as in *bihumeralis* and related species; pleura polished with short black hairs on part of *anepst* and confined mostly to lower part of *kepst*. Thoracic bristles black; *h* 1, subequal to *orb*; *npl* 1+1, 1.2 x as long as *h*; *pa* 1 1.4 x as long as *npl*; *pa* 2 only a trifle shorter than *h*; 1 *dc* 0.6 x as long as *pa* 1; *as* widely separated at base, as long as scutellum, borne on short, black, tubercle as in *bihumeralis*; 2-3 hairs basad of *as* often along lateral scutellar margin often more prominent.

Wing (Fig. 216): 2.5 x as long as wide, hyaline with pale brown veins; costal sectors 2 to 4 in the ratio 10 : 14 : 7-11 : 15 : 7; r-m cross vein in the middle of discal cell; terminal sectors of veins r 4+5 gently concave above along its entire length, that of m 1+2 nearly straight to weakly curving and slightly convex above a little beyond base, distally the two veins nearly subparallel but in some specimens the former more diverging than in others; anal angle moderately developed. Haltere yellow to whitish yellow but in some the stalk almost wholly and knob partly with brown tinge.

Legs : Almost identical in colour pattern and development to those of *bihumeralis*, with black coxae, dark brown to yellowish brown trochanters, black femora and hind tibia, greatly thickened hind femur (Fig. 215) with 8-9 short black spines confined to the basal half along anteroventral and posteroventral margins and bowed hind tibia; fore and mid tibiae blackish to blackish brown but for their yellow bases and about one-third their lengths distally; mid tibial spine yellow; tarsi yellow but the last segment atleast in some specimens appears brownish distally; in some specimens femora and hind tibia less black than in others and with deeply brownish tinge.

Abdomen : Almost as wide as long and narrower than thorax; in the majority of specimens basal segments brownish yellow and distal segments brownish black, in many others the whole abdomen predominantly black to brownish black while in a



Figs. 214-218 : *Rhodesiella travancorensis*, sp.n. 214, Scutellum. 215, Hind femur, male. 216, Wing. 217, Epandrium, ventral view. 218, Phallic complex, ventral view.

few even distal segments predominantly brown ; abdominal hairs short, dark brown to black but in some specimens basal segments partly pale grey tomentose. Female cerci short, yellow, with slender pale to dark hairs.

Male genitalia (Figs. 217-218) : Very similar to that of *bihumeralis* except for less produced laterodistal margin of epandrium and curving, nearly subtriangular surstylus.

Length : Male 2.2 mm, wing 2.1 mm ; Female 2.2 mm, wing 2.1 mm.

Holotype : Male, Kerala : Idukki : Painavu, 900 m, 24.ii.1984, Coll. P.T. Cherian. *Paratypes* : 11 males, 10 females, data same as of holotype : 1 male, Kerala : Pallivasal, 7.xi.1983, Coll. M.S. Molly ; 6 males, 4 females, Kerala : Pathanamthitta Dist., Kakki, 900 m, 30.xii.1983, Coll. P.T. Cherian ; 1 male, Kerala : Thenmala, 1.i.1989, Coll. P.T. Cherian ; 2 males, Tamil Nadu : Tirunelveli Dist., Mundanthurai, 10.i.1989, Coll. P.T. Cherian ; 10 males, 3 females, Tamil Nadu : Coimbatore Dist., Kunjapanai, 600 m., 7.ii.1992, Coll. G. Thirumalai.

This species very closely resembles *bihumeralis* but differs in possessing only one humeral bristle and dark brown to black abdominal hairs, whereas in the latter species there are two distinct humeral bristles and the abdominal hairs are white. In addition, in *travancorensis* the laterodistal margins of epandrium are less produced than in *bihumeralis*. Besides, while in *bihumeralis* surstylus is rectangular distally, in *travancorensis* it is nearly subtriangular.

41. *Rhodesiella quadrilineata* sp. nov. (Figs. 219-222)

Male : *Head* : Higher than long, height and width ratio 16 : 19 : 27. Frons longer than wide, width at vertex 0.9 x its own length and 0.4 x that of head, distinctly narrowing anteriorly, not projecting above eye margins and anteriorly reaching much behind anterior margin of eye, dull black ; frontal triangle large, glabrous, shiny purple, truncate in outline, reaching anterior margin of frons and ending with very broad apex, the width of which is more than half its maximum width at vertex. Face smooth, shiny black, concave, with four shallow, linear longitudinal furrows ; facial carina linear, not extending beyond bases of antennae ; lower facial margin slightly raised up, rather narrow, brown tomentose. Antenna erect, turned slightly outwards ; basal segments black ; ant 2 with black dorsal spine and short black hairs ; ant 3 0.6 x as long as broad, brownish yellow but blackish brown along upper and anterior margins ; arista black, basally thickened, otherwise slender, wholly with slender, black, fairly dense hairs of medium size. Eye very large, occupying much of head in profile, with vertical long axis. Gena linear, black, with a row of 7-8 black hairs along oral margin ; vibrissal corner hardly projecting beyond lower anterior margin of eye,

with rather erect, slender vibrissa ; postgena reduced in size, black, with well developed black hairs of which some are in a row in continuation of postocular row of setae. Palpi black ; proboscis distally dull brown. Head bristles of medium size, black ; *out* and the cruciate *pvt* subequal ; *ivt* a little shorter than *out* and almost equal to *oc* ; *orb* about 8, sequentially anterior ones becoming shorter and slender, anterior most subequal to *fr*, longest two-thirds as long as *ivt* ; *if* 10, subequal, much shorter than longest *orb*, in a row outside triangle along its margin ; vertex margin with short black hairs nearly in a row behind *out* and *ivt*.

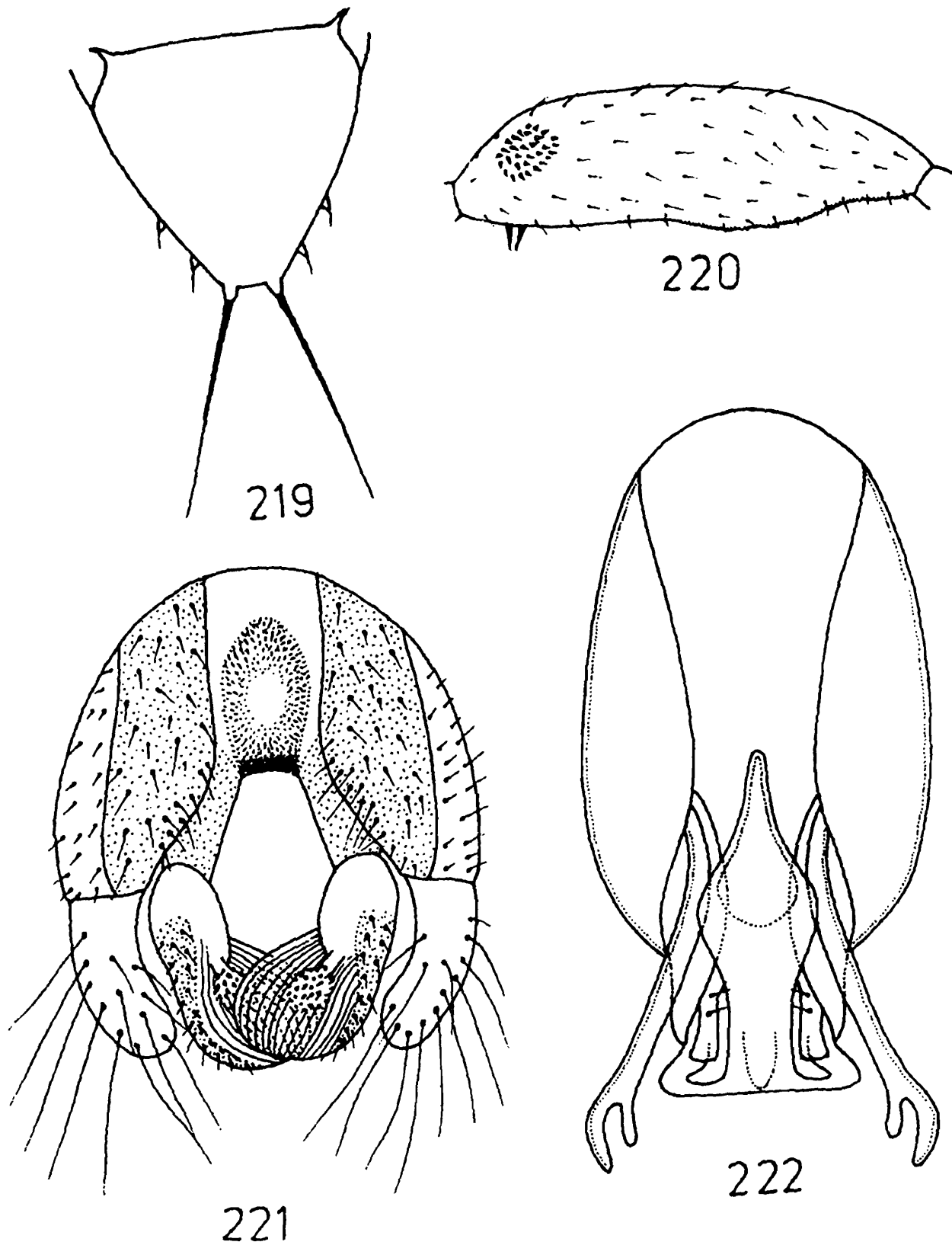
Thorax : Shiny black. Scutum nearly as long as wide, with convex disc, densely and coarsely punctate and with slender brownish black hairs ; scutellum (Fig. 219) subtriangular, 0.6 x as long as scutum and 1.25 x as long as wide at base, with convex disc slightly flattened, more coarsely punctate than but pubescent like scutum ; pleura with black hairs on *anepst* and *kepst*. Thoracic bristles black ; *h* 1, nearly as long as but slender than *npl* ; *npl* 1+1, subequal in length but posterior one more stout ; *pa* 1 a little longer and stouter than posterior *npl* ; *pa* 2 half as long as *h* ; 1 *dc* a little shorter than *npl* ; *as* not approximated at base, equidistant from each other and *ss* 1, 0.8 x as long as scutellum, borne on distinct tubercle ; *ss* 1 one-fifths as long as *as*, equidistant from *as* and *ss* 2, borne on a small tubercle ; *ss* 2 only a trifle shorter than *ss* 1, borne on very small tubercle.

Wing : Shorter than body, hyaline with brown hairs and dark brown veins ; proportions of costal sectors 2 to 4 in the ratio 4 : 8 : 3 ; r-m cross-vein proximad of middle of discal cell, opposite 0.43 of its length ; terminal sectors of veins r 4+5 and m 1+2 slightly diverging distally, the latter prominently convex above a little beyond base as in *scutellata* (de Meijere) and a little sinuate along its entire length ; anal angle well developed. Haltere yellow.

Legs : Of medium size ; coxae shiny black ; trochanters dark brown ; femora entirely black ; hind femur (Fig. 220) thickened, maximum thickness one-third its own length, with two black spines ventrally near base and with small, numerous black denticles on ventral surface of distal half into which can fit in the bowed tibia ; tibiae black with yellow tinge at distal ends ; tarsi yellow to whitish yellow except for brownish black last three segments of fore and last one segment each of mid and hind legs.

Abdomen : Narrower than thorax and wider than long, subshiny black but for slight brown tinge on basal terga and wholly with fairly dense black hairs.

Male genitalia (Figs. 221-222). Laterodistal ends of epandrium produced as a long lobe bearing long hairs ; surstylus suborbicular distally with a circular, bone-shaped process bearing dense, fine teeth and a basal stalk without tooth, basal part of



Figs. 219-222 : *Rhodesiella quadrilineata*, sp.n. 219, Scutellum. 220, Hind femur, male. 221, Epandrium, dorsal view. 222, Phallic complex, ventral view.

surstylus less thickened and articulating with inner aspect of epandrium ; distiphallus swollen in the middle and narrowing towards distal end ; hypandrium large, subcylindrical ; pregonite well developed ; postgonite short, not hook-like. The build of the male genitalia is entirely different from that of all other species of the genus.

Length : Male 2.3 mm, wing 2 mm.

Holotype : Male, T. Nadu : Coimbatore Dist., Kunjapanai, 1200 m, 9.ii.1992, Coll. G. Thirumalai.

This species shows affinities to *scutellata* (de Meijere), but differs in having yellow haltere and two pairs of lateral scutellar bristles. Besides, in *quadrilineata* three fore tarsal segments are infuscated but in *scutellata* only two fore tarsi. In the build of the genitalia, especially of hypandrium and phallic complex and the nature of surstylus this species differs from all others of the genus.

42. *Rhodesiella brevipedalis* sp. nov. (Figs. 223-225)

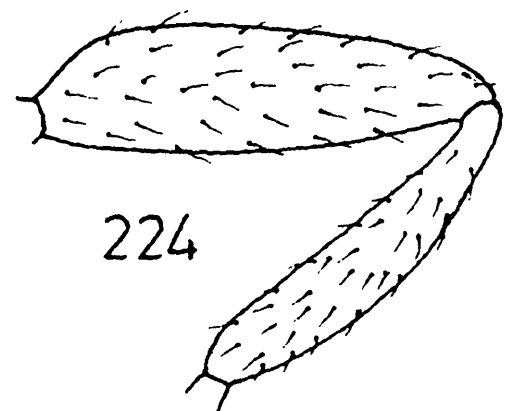
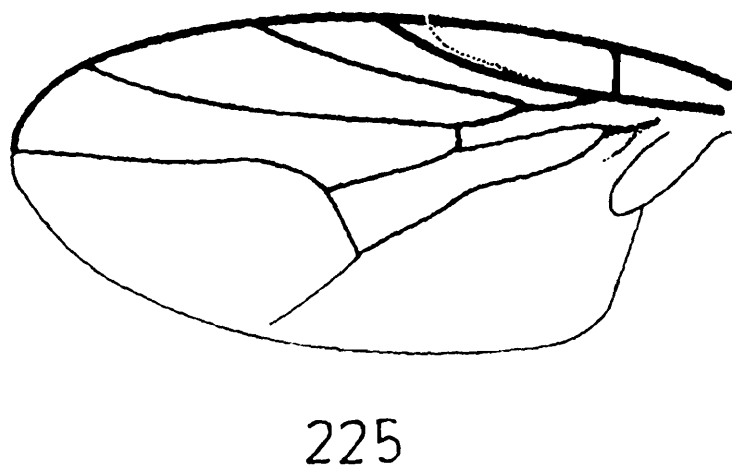
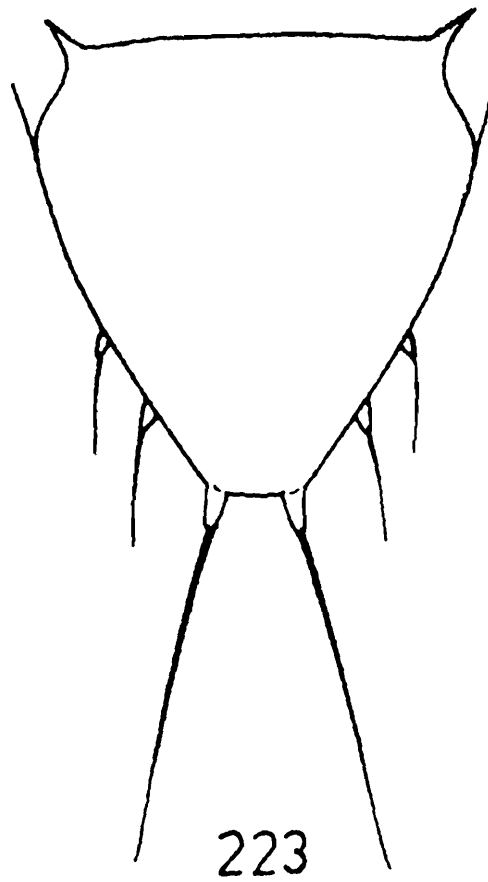
Male : Head : A trifle narrower than thorax and as long as high because of prolonged lower facial margin, length, height and width ratio 17 : 17 : 24. Frons distinctly sloping, nearly, parallel-sided, width at vertex half that of head and 1.1 x its own length, shiny black, hardly projecting above eye margins and ending far behind anterior margin of eye ; frontal triangle very large, very smooth and shiny black, reaching anterior margin of frons, subtruncate in outline and projecting slightly above surface of frons especially in the anterior part. Face greatly sloping, glabrous, shiny black, midlongitudinally more shiny and slightly convex, with sloping sides and no trace of facial carina ; lower facial margin conspicuously projecting especially in the median area imparting to it subtriangular appearance and helping in separating the species from other species of the genus. Antenna very short, directed outward, and partly downward ; basal segments brownish yellow ; ant 3 1.33 x as wide as long, and only a trifle longer than ant 2, brownish yellow with distinctly darkened upper half ; arista slender, of medium size, yellowish brown with yellow base and well developed, fairly dense, brown hairs. Eye very large, occupying most of the area of head in profile, bare, with vertical long axis. Gena sublinear, dull brown, with blackish oral margin on which are present a row of about 8 slender, very conspicuous black hairs ; vibrissal corner slightly projecting beyond lower anterior margin of eye and merging with the projecting lower facial margin, shiny black with distinct short vibrissa ; postgena reduced, dull black with numerous well developed black hairs of which those along posterior margin are arranged in continuation of postocular row of hairs. Palpi short, dull black with black hairs ; proboscis pale whitish brown. All head

bristles black and well developed ; *out* a trifle longer and more developed than other head bristles ; *ivt*, the cruciate *pvt* and proclinate and divergent *oc* subequal, fairly stout, only a little shorter than *out* ; *orb* 7, sequentially anterior ones becoming shorter and slender, anterior most very short and hair-like, posterior most one three-fifths as long as *out* ; *if* 7-8, much shorter and slender than *orb*, longest one about half as long as longest *orb*, arranged in a row outside the triangle along each lateral margin ; *fr* a few, slender, black.

Thorax : Shiny black. Scutum much wider than long, length and width ratio 21 : 26, with greatly convex disc bearing large, dense, stellate punctae and well developed brownish black hairs ; scutellum (Fig. 223) greatly developed, 0.75 x as long as scutum and 1.23 x as long as wide at base, with greatly convex and thickened disc, is conspicuously sloping distally and ends with broadly obtuse apex, pubescent like but more coarsely and densely punctate than scutum, especially laterally and along and above distal margin ; pleura with fairly dense black hairs medially on *anepst* and more slender and scattered such hairs on *kepst* ; neck region well developed, conspicuously projecting a little beyond scutum. All thoracic bristles black, of medium size ; *h* 2 (unlike in other species of the genus except for *bihumeralis*), inner one almost equal to longest *orb*, outer one about three-fifths as long as the inner ; *npl* 1+1, subequal, equal to *ivt* ; *pa* 1 a trifle longer than *npt* ; *pa* 2 well developed, 0.57 x as long as *pa* 1 but more slender ; 1 *dc* a trifle shorter than *npl* ; *as* three-fourths as long as scutellum, distinctly curved, equidistant from each other and *ss* 1, borne on well developed black tubercle ; *ss* 1 nearer to *ss* 2 than to *as* bowed along its entire length, two-thirds as long as *as*, borne on well developed tubercle, which is only a little shorter than that at base of *as* ; *ss* 2 set on lower lateral margin like *ss* 1, only slightly curved, 0.85 x as long as *ss* 1, borne on well developed tubercle.

Wing (Fig. 225) : Hyaline, with brownish tinge and brown veins of which costa along its first sector and *r* 1 distally darkened ; proportions of costal sectors 2 to 4 in the ratio 9 : 11 : 7 ; *r-m* cross-vein proximad of middle of discal cell, opposite 0.43 of its length ; terminal sector of vein *m* 1+2 convex above a little beyond base ; anal angle well developed. Haltere brownish yellow.

Legs : Short and stumpy ; coxae brownish black ; trochanters yellowish brown ; fore femur wholly and mid and hind femora except for yellowish distal ends brownish black ; fore femur with a row of elongate slender hairs along anteroventral margin ; tibiae brownish black but for yellowish distal end of fore and extreme bases and distal ends of mid and hind tibiae, with the yellow colour extending to nearly one-third length of hind tibia distally ; tarsi yellow to brownish yellow except for the



Figs. 223-225 : *Rhodesiella brevipedalis*, sp.n. 223, Scutellum. 224, Hind femur, male. 225, Wing.

distinctly darkened last tarsus of each leg with fourth tarsus, especially of hind leg, appearing darkened under certain angles of illumination ; mid tibial spine almost terminal, well developed, black and extending to nearly one-third length of first tarsal segment ; hind femur (Fig. 224) not thickened.

Abdomen : Only a little narrower than thorax and wider than long, brownish black but for two basal terga which are yellowish brown except for their sides and wholly with slender black hairs. Male genitalia of medium size.

Length : Male 1.9 mm, wing 1.8 mm.

Holotype : Male, Kerala : Idukki : Painavu, 24.ii.1984, Coll. P.T. Cherian.

R. brevipedalis differs from other species of *Rhodesiella* in possessing 2 humeral bristles and conspicuously projecting lower facial margin which is subtriangular in outline. Besides, in this species *if* are much shorter and slender than *orb*. It can easily be differentiated from *bihumeralis* which has 2 *h* by the nature of lower facial margin and *if*, apart from other characters like the curvature of *m* 1+2, proportions of costal sectors, nature of scutellum, scutellar bristles and legs.

43. *Rhodesiella planiscutellata* (Lamb)

1918. *Meroscinis planiscutellata* Lamb, *Ann. Mag. nat. Hist.* (9) 1 : 335. Type locality : Sri Lanka : Peradeniya.

1977. *Rhodesiella planiscutellata* (Lamb) Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 298.

"The second species is more normal in punctation and general form but has the scutellar disc flattened like in *Chloropisca*.

Head (top front view) : Black, eye margins dull, triangle shining, its base nearly extending across vertex, sides straight, top extending to antennae and slightly rounded ; antennae with brown basal joints, clear orange third and dark pubescent arista. Side view : all bristles prominent, including the vibrissa ; jowls narrowly linear, shining black, as is the hind head.

Thorax : Dorsum all shining black, the hairs standing in tiny punctures and showing brown against the background ; scutellum subtrapezoidal, flattened on the disc and covered there with coarse, shallow shagreening ; long terminal bristles on small tubercles, a smaller one on each side on a smaller tubercle and a few bordering hairs.

Wing : Clear with yellow veins, 4th ending before tip, 1st posterior cell but little widened at base. Haltere dull orange.

Legs : All alike ; coxa black, trochanter just visibly orange, femur black except the knee, tibia with broad infusate belt leaving base and tip orange, tarsi all orange.

Abdomen : Shining black. size 2 mm. Ceylon : Peradeniya (A. Rutherford.)"

This species was not studied by me, but the original description of Lamb is reproduced here. This description followed that of *R. foveata* (Lamb) and hence "the second species" is in relation to the description of *foveata*. Malloch (1931) did not include this species in his comprehensive key, but Duda without examining the species keyed it near *nana* (Duda) on the basis of similarities between the two. From the original description the species appears to belong to the *scutellata* group. Sabrosky (1977) referred to the distribution of *planiscutellata* in Malaya and Philippines, apart from the type locality in Sri Lanka.

44. *Rhodesiella nana* (Duda)

1930. *Meroscinis nana* Duda, *Stettin. ent. Ztg.*, 91 : 298. Type-Locality : Sri Lanka : Peradeniya.

1977. *Rhodesiella nana* (Duda), Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 297.

"According to Lamb's description this species is very close to *planiscutellata* though the scutellum is not "flattened as in *Chloropisca*" but arched. Also in this species distinct scutellar marginal tubercles are absent so that even in the key to the species of *Lioscinella* I have mentioned this. Finally it is not 2 mm long but only 1.5 mm long. The placement in *Meroscinis* is based only on the relative lengths of the scutellum and the nature of the fourth vein. Head, thorax and abdomen wholly black ; frons a little longer than wide, narrowed in front, dull black with black bristles ; orbital bristles numerous, more than half as long as outer vertical and ocellar bristles ; frontal triangle smooth and shiny, unsculptured, somewhat with blue sheen, behind a little over half as wide as the vertex, laterally less concave, in front reaching anterior margin of frons ; eyes large, naked ; gena very narrow, oral margin very distinctly and richly bristled ; vibrissa a little longer than these bristly hairs ; antenna small, reddish yellow ; arista black, slender, distinctly hairy. Mesonotum and scutellum shiny with dense black hairs ; scutellum arched, triangular, about as long as wide, faintly transversely rugose, bristles without tubercles ; apical scutellar bristle nearly as long as scutellum ; first subapical bristle somewhat 1/3 as long as apical scutellar bristle. Abdomen as wide as thorax, shiny with black hairs. Coxae and femora black ; tibiae and tarsi yellow, though second and third tibiae with broad black patches. Wing broad, hyaline ; veins brown ; second sector of costa equal to the third ; second longitudinal vein strongly curved towards costa at tip ; third and fourth longitudinal

veins largely parallel ; terminal sector of fourth vein concave behind basally, the posterior cross-vein behind the formation of the very obtuse angle somewhat thickened ; middle and posterior cross-veins convergent ; middle cross-vein in the middle of the discal cell ; end sector of fifth vein as long as distance between the cross-veins. Haltere reddish yellow. Body length 1.5 mm." 2 ♀♀ "Paradna, W. Horn, 1899"

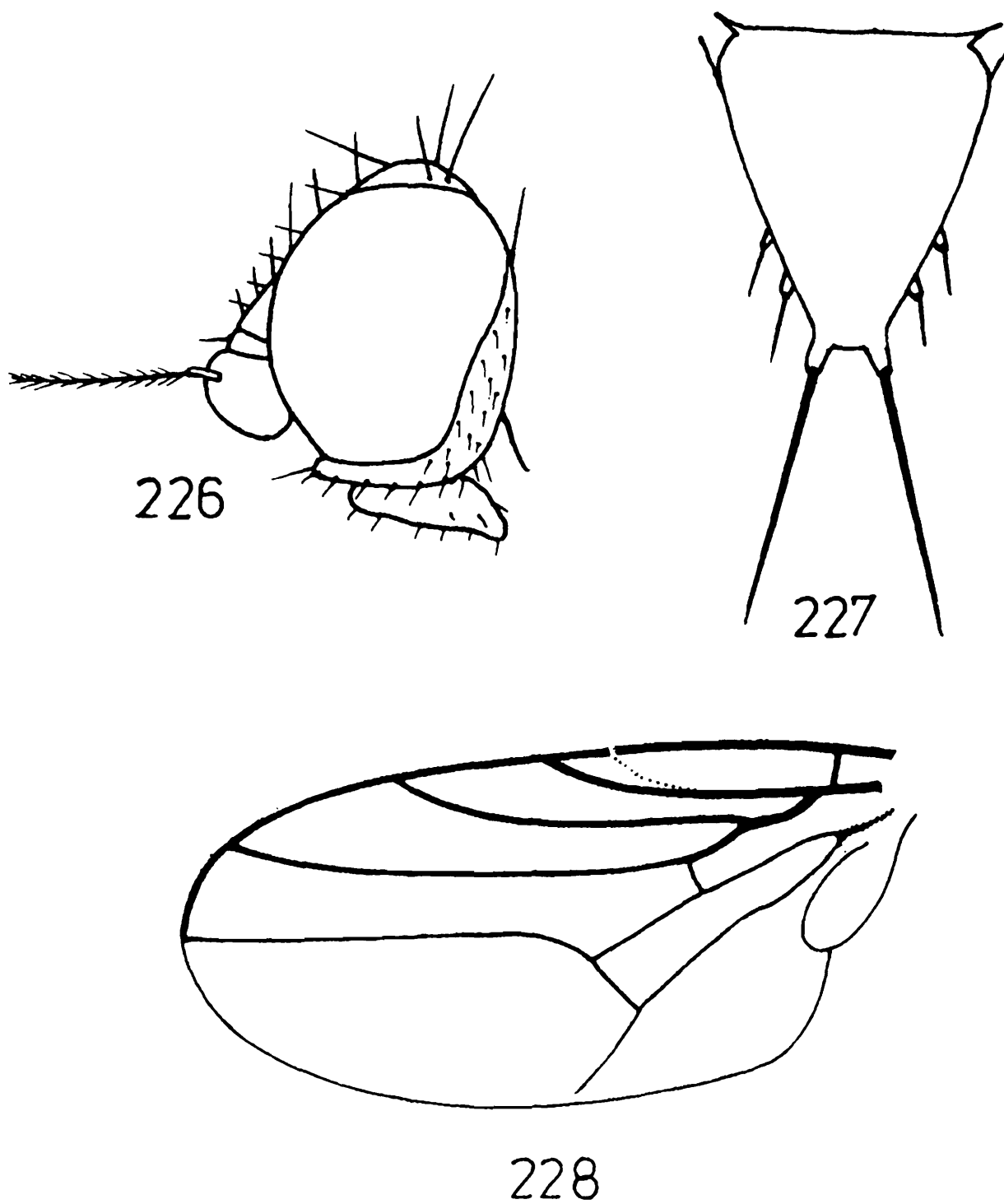
Remarks : This species is not represented in my collections nor was it available for study. Hence a free English translation of the original description by Duda is given here.

45. *Rhodesiella bhutanensis* Cherian (Figs. 226-228)

1977. *Rhodesiella bhutanensis* Cherian, *Oriental Insects*, 11 (4) : 488-489. Type locality : Bhutan : Pultiber.

Female : Head (Fig. 226) : As long as high, length, height and width ratio 2 : 2 : 3. Frons black, almost parallel sided, width at vertex 0.44 x that of head and 0.87 x its own length ; frontal triangle glabrous, shiny black, subtruncate, reaching anterior margin of frons and with two small depressions, one on each side and one large one in front of ocellar triangle. Face concave, shiny black ; facial carina linear, not extending beyond bases of antennae ; lower facial margin only slightly raised. Basal antennal segments brownish yellow ; ant 3 1.2 x as wide as long. Brownish yellow below and dark brown above ; arista of medium size, dark brown with conspicuous concolorous hairs. Eye large, bare with nearly vertical long axis. Gena black, about one-third as wide as ant 3, with a row of about 8 slender, black hairs along oral margin ; vibrissal corner only very slightly projecting beyond lower anterior margin of eye ; vibrissa short ; postgena rather well developed, black, with short black hairs. Proboscis dark brown ; palpi black with a few black hairs. Head bristles and *fr* blackish brown ; *out* half as long as width of eye ; *ivt* about three-fourths the *out* ; *pvt* cruciate, subequal to *ivt* ; *oc* widely divergent, equal to *ivt* ; *orb* 6, sequentially anterior ones becoming shorter and slender, longest two-thirds as long as *out* but more slender ; *if* 6-7, in a row outside triangle along each lateral margin ; *fr* a few, short, slender.

Thorax : Shiny brownish black. Scutum, nearly as long as wide, with the convex disc bearing fairly dense, fine punctae and slender white hairs ; scutellum (Fig. 227) nearly triangular, 1.3 x as long as wide, with the convex disc more coarsely punctate than and pubescent like scutum ; pleura with *anepst* and *kepst* bearing short white hairs and more brownish than rest of thorax. Thoracic bristles brownish black except for *h* and *npl* which are paler ; *h* 1, as long as *ivt* ; *npl* subequal, a trifle longer than *h* ; *pa* 1 longer than and 1 *dc* subequal to *npl* as long as scutellum, widely divergent,



Figs. 226-228 : *Rhodesiella bhutanensis* Cherian. 226, Head, lateral view. 227, Scutellum. 228, Wing.

nearer to each other than to ss 1, set on prominent tubercle ; ss 1 one third as long as *as* but very slender, borne on short and slender tubercle ; ss 2 two-thirds as long as ss 1, set on very short, slender tubercle.

Wing (Fig. 228) : Hyaline with brown hairs and veins ; costal sectors 2 to 4 in the ratio 10 : 10 : 7 ; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.54 of its length ; terminal sectors of veins r 4+5 and m 1+2 slightly diverging distally, the latter convex above near base ; anal angle moderately developed. Haltere brownish yellow, grey dusted, with dark tinge at apex of knob.

Legs : Rather slender ; coxae blackish brown ; trochanters yellow ; femora blackish brown except for the yellow distal ends and the extreme bases of fore and hind femora ; fore tibia entirely, mid tibia but for brownish tinge in proximal half and hind tibia except for broad blackish brown band in the middle, yellow ; fore femur with a row of erect white hairs on anteroventral margin ; tarsi yellow except for faint brownish tinge on last segment of each leg ; hairs on legs predominantly white.

Abdomen : Narrower than thorax, slightly longer than wide, brownish black with yellowish brown tinge medially on basal terga, covered with slender whitish yellow to pale brown hairs. Female cerci yellowish brown, rather short and stumpy.

Length : Female 1.6 mm, wing 1.75 mm.

Specimen examined : *Holotype* : Female, Bhutan : Pultiber, 7.iii.1969, Coll. S.K. Mitra.

R. bhutanensis comes near *kholaensis*, but it has two pairs of lateral scutellar bristles and slightly wider gena.

Remarks : No additional specimen was collected since it was originally described and the males are still not known.

46. *Rhodesiella kholaensis* Cherian (Figs. 229-233)

1977. *Rhodesiella kholaensis* Cherian, *Oriental Insects*, 11 (4) : 486-487. Type locality : West Bengal : Darjeeling Dist., Andhari Khola.

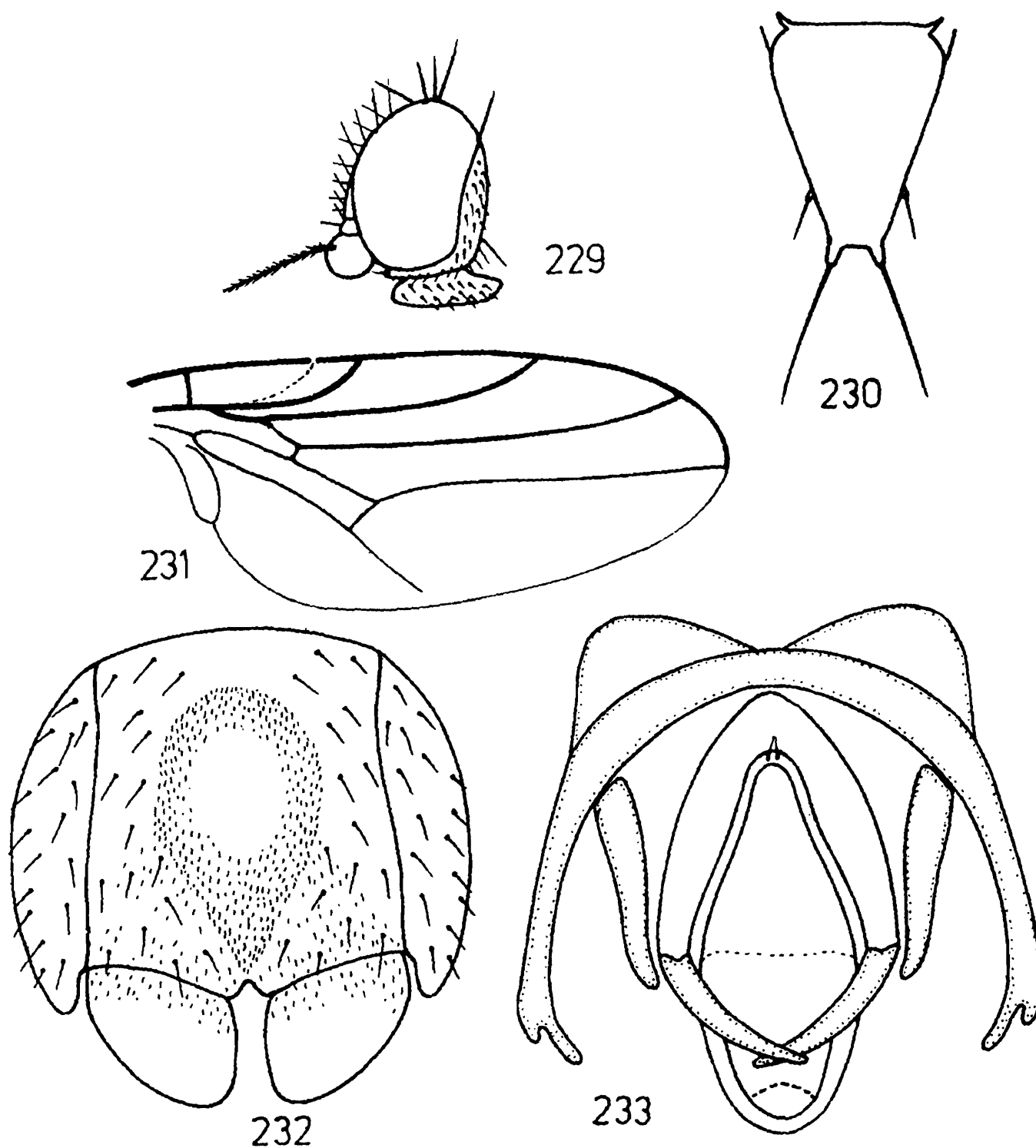
Male : *Head* (Fig. 229) : Almost as long as high, length, height and width ratio 16 : 17 : 24. Frons nearly parallel sided, width at vertex 0.45 x that of head and nearly equal to its own length, shiny black, projecting only a little above eyes anteriorly and not reaching anterior margins of eyes ; frontal triangle narrower in front than posteriorly, glabrous shiny brownish black, occupying much of the area of frons,

reaching its anterior margin and ending with truncate apex. Face concave, shiny brownish black; facial carina not developed; lower facial margin raised up, rather thin. Antenna small; ant 2 only a trifle shorter than ant 3, deeply brownish with dark tinge; ant 3 0.7 x as long as wide, brownish yellow in lower half and base, dark brown above; arista slender, dark brown with slender conspicuous, fairly dense, short pubescence. Eye large, bare with oblique long axis. Gena sublinear, brownish black; vibrissal corner not clearly demarcated from corners of lower facial margin; postgena well developed, concolorous with gena, with a few very fine pubescence. Palpi short, stumpy, brownish black; proboscis very short, shiny brownish black with a few shiny slender hairs. Head bristles and frontal hairs black; *out* half as long as width of eye; *ivt* three-fourths the *out*; *pvt* cruciate, almost equal to *out*; *oc* equal to *ivt*; *orb* about 8, recumbent, longest one about two-thirds the *out*; *if* about 7, subequal and equal to *orb*, in a row outside triangle along each lateral margin; vibrissa short and slender.

Thorax : Shiny brownish black. Scutum nearly as long as wide, with convex disc bearing dense piliferous punctae and well developed whitish yellow hairs; scutellum (Fig. 230) 1.2 x as long as wide, triangular with the convex disc more coarsely punctate than but pubescent like scutum; pleura with a few, short, white hairs on *anepst* and some longer hairs confined mostly to lower part of *kepst*. Thoracic bristles black, except for some of the bristles on scutum which have distinct brown tinge; *h* 0.7 x as long as *out*; *npl* 1+1, subequal, equal to *out*; *pa* 1 equal to and *pa* 2 half as long as *npl*; 1 *dc* slender, slightly shorter than *npl*; *as* well developed, as long as scutellum, nearer to each other than to *ss* 1, borne on small but very distinct tubercle; *ss* 1 including its small tubercle one-third as long as *as*.

Wing (Fig. 231): 0.4 x as wide as long, hyaline with brown to yellowish brown veins; proportions of costal sectors 2 to 4 in the ratio 18:16:9; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.55 of its length (in the original description the ratio indicating position of r-m cross-vein is wrongly given as 16:5 but should be 6:5, the ratio found in the holotype); terminal sectors of r 4+5 and m 1+2 gradually diverging distally, the latter slightly convex above a little beyond base and weakly sinuate along its entire length; anal angle weakly developed. Stalk of haltere yellow, knob brown to brownish yellow.

Legs : Slender; coxae and trochanters blackish brown; femora blackish brown except for about one fifth the length of each distally which is yellow; fore tibia wholly and mid tibia, except for slight infuscation medially, yellow; hind tibia basally and one-third its length distally yellow, rest of the area blackish brown; all tarsi yellow except for brownish tinge on last segment of each leg.



Figs. 229-233 : *Rhodesiella kholaensis* Cherian. 229, Head, lateral view. 230, Scutellum. 231, Wing. 232, Epandrium, ventral view. 233, Phallic complex, ventral view.

Abdomen : Blackish-brown (removed from holotype and mounted for study of male genitalia) : Male genitalia (Figs. 232-233) : Epandrium wider than long ; surstylus broadly obtuse distally ; postgonite long and sharply pointed distally ; pregonite well developed ; distiphallus stumpy and of medium size, greatly widened in the middle ; phallapodeme reaching hypandrium ventrally, the latter with well developed wings ventrolaterally.

Length : Male 2.5 mm, wing 2.5 mm

Specimen examined : *Holotype*, Male, India : West Bengal : Darjeeling Dist., Andhari Khola, 9.iv.1973, Coll. H.S. Sharma.

R. kholaensis resembles *sauteri* Duda from Formosa but differs in having whitish yellow thoracic hairs and shorter scutellum which is only 1.2 x and not more than 1.5 x as long as wide as in *sauteri*.

Remarks : This species is so far known only by the holotype and females have still not been recorded.

47. *Rhodesiella ceylonica* (Frey)

1917. *Oscinella ceylonica* Frey, *Ofvers finska vet. Soc. Forh.* 59A, 20 : 29. Type-locality : Sri Lanka : Anuradhapura.

1977. *Rhodesiella ceylonica* (Frey) Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 296.

“Shiny black with the abdomen basally reddish yellow and legs pale yellow.

Head : Uniformly dull black. Frons relatively narrow, in front somewhat reduced, above the antennae just as wide as the eye. Frontal triangle large, shiny bluish black, behind occupying almost the whole width of frons and in front almost reaching the antennae. Antenna very short, first two segments blackish brown, third segment bright yellow, globose, with rather short, brownish yellow, finely pubescent arista. Eye large occupying the side of the head so that the gena is rather very narrow. Oral margin not projecting. Gena and proboscis uniformly dull black.

Thorax : Uniformly shiny blue black dorsally, rather long and with dense brown pubescence ; pleura naked. Scutellum metallic bronze shiny, often with brownish hairs and with 2 long, diverging black bristles at apex.

Abdomen : Shiny black, the first two segments predominantly reddish yellow.

Legs : Pale yellow ; femora almost upto the tip black.

Wings : Completely hyaline with very fine, pale veins ; the last sector of fifth longitudinal vein 4 to 5 times as long as the distance between the cross-veins. *Haltere* dirty white. Body length about 1 mm. Wing length about 1 mm. 1 example Anuradhapura, 19-21. 12.

This little beautiful species appears to stay very close to *Oscinella nigrifrons* Becker (*Annal. Mus. Nat. Hung.* 4 : 151, 1911) from New Guinea but is separated by differences in antennal colour, scutellar bristles, width of frons etc."

Remarks : This species was not available for study and hence the original description is reproduced here. As the description is inadequate and silent on some vital characters it is not included in the key to the species.

48. *Rhodesiella manii* (Figs. 234-238)

1977. *Rhodesiella manii* Cherian, *Orental Insects*, 11 (4) : 481-483. Type locality : India : West Bengal : Darjeeling dist., Slip forest.

Male, female : *Head* (Fig. 234) : Higher than long, length, height and width ratio 16 : 18 : 27. Frons parallel-sided, width at vertex nearly half that of head and 1.15 x to equal to its own length, subshiny brownish black, rather depressed but anteriorly slightly projecting above eyes and in profile reaching anterior margin of eye ; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with broadly to very broadly obtuse apex. Face polished, shiny black, medially concave with prominently raised lower facial margin which is finely tomentose ; facial carina not extending beyond bases of antenna. Antenna directed outward and downward ; ant 2 brownish to brownish yellow, with fairly dense, slender white hairs and short, white spine ; ant 3 almost wholly yellow to brownish yellow or in some specimens dark brown in upper half and yellow in lower half, subspherical in outline, width 1.2 x its own length ; arista dark brown with conspicuous concolorous hairs. Eye large, bare, in profile occupying almost the whole of head and posteriorly in most specimens projecting a little above frons and with vertical long axis. Gena sublinear, brownish black, with a row of about 10 to 12 white slender hairs along oral margin ; vibrissal corner projecting a little beyond lower anterior margin of eye and bearing long yellow vibrissa ; postgena moderately developed, dull black with short whitish yellow hairs which are more developed around oral margin. Palpi dark brown to yellowish brown ; proboscis brown with yellowish tinge distally in some specimens. Head bristles and hairs well developed, yellow to whitish yellow. *Ovt* 0.76 x as long as width of eye ; *ivt* nearly two-thirds as long as *ovt* ; *orb* 8, recumbent, longest half the *ovt* ; *pvt* cruciate, equal to *ivt* ; *oc* widely divergent, two-thirds as long as *ovt* ; *if* about 9, in a row

outside triangle along each lateral margin, slightly shorter and slender than *orb* ; *fr* a few confined to anterior part of frons ; ocellar triangle and vertex margin, especially behind *out*, with a few conspicuous hairs.

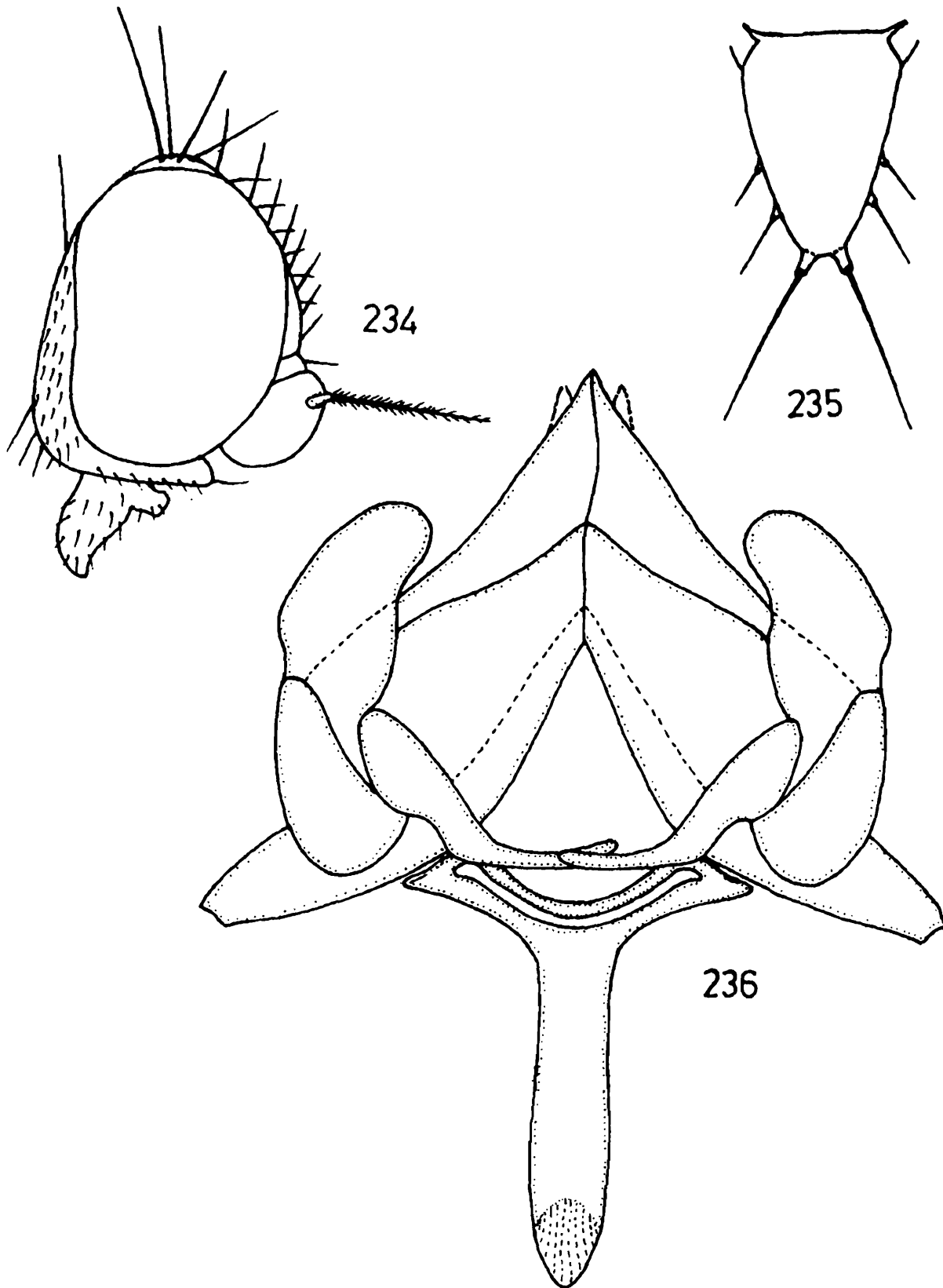
Thorax : Shiny black. Scutum nearly as long as wide, with convex disc bearing dense, coarse punctae and long yellowish white hairs ; scutellum (Fig. 235) thick, subtriangular (not subtrapezoidal as mentioned in the original description), 1.5 x as long as wide and 0.6-0.8 x as long as scutum with greatly convex disc which is more coarsely (except for shiny area along anterior margin) punctate than but hairy like scutum. Pleura with short slender white hairs on *anepst* and longer hairs, except in the median part, on *kepst*. Thoracic bristles yellow ; *h* 1, slender, two-thirds as long as *out* ; *npl* 1+1, equal, a trifle longer than *h* ; *pa* 1 a little longer than *npl* ; *pa* 2 hair-like ; 1 *dc* shorter and slender than *pa* 1 ; a row of prominent prescutellar hairs are present ; *as* stout, 0.82 x as long as scutellum, borne on very prominent diverging tubercles that are nearer to each other than to *ss* 1 ; *ss* 1, 0.62 x the *as*, nearer to *ss* 2 than to *as*, borne on prominent tubercles ; *ss* 2, 0.43 x as long as *as*, borne on well developed tubercle ; all the scutellar tubercles black basally and yellow distally.

Wing (Fig. 237) : Hyaline, 2.3 x as long as wide, with yellowish brown to brown veins ; proportions of costal sectors 2 to 4 in the ratio 21 : 13 : 8 ; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.54 of its length ; terminal sectors of veins r 4+5 and m 1+2 subparallel, the latter slightly convex above near base ; anal angle well developed. Haltere yellow.

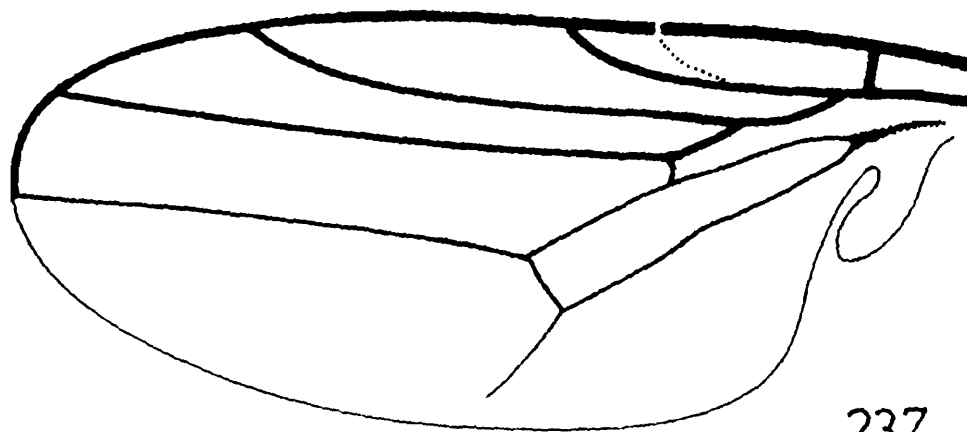
Legs : Of medium length and thickness with dense white hairs, wholly yellow except for the dark brown last tarsal segment of hind leg.

Abdomen : Elongate, much narrower than thorax, blackish brown except for two basal yellowish brown segments which in some specimens have diffused dark tinge in certain areas. Female cerci rather long, slender, yellow with fine yellow hairs. Male genitalia (Figs. 236, 238) strongly developed, length more than one-third that of abdomen ; epandrium, wider than long ; surstylus extraordinarily large, nearly as wide as long, nearly uniformly widened but for the distal part which ends with very broadly obtuse apex ; hypandrium subtriangular ; pregonites very broad, human ear-shaped ; postgonite long, distal half gradually narrowing towards apex ; distiphallus subcylindrical but for narrowing apex. The male genitalia of *manii* is unique in many respects and is entirely different from that of all other species of the genus hitherto known.

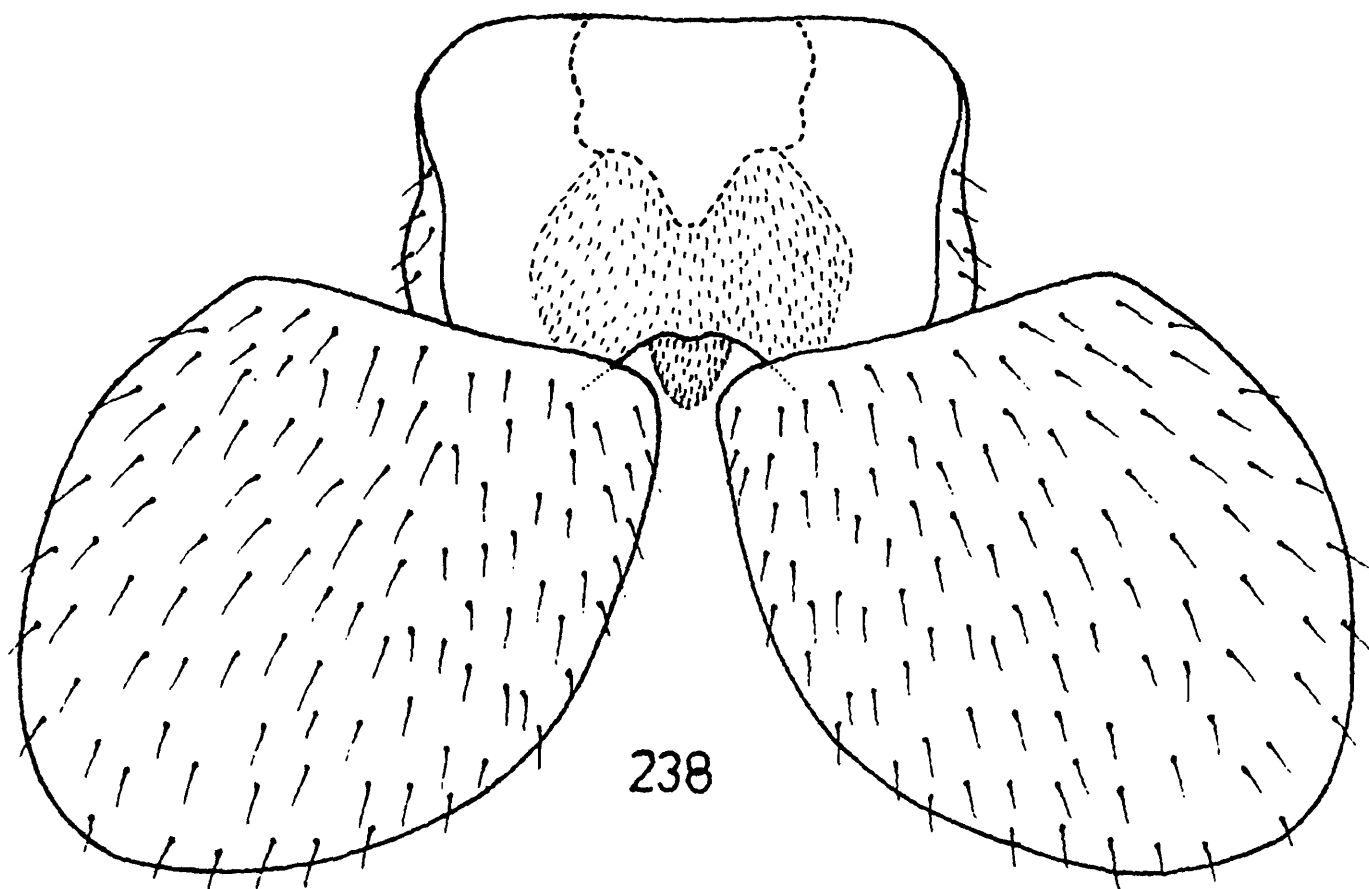
Length : Male 2.6-2.8 mm, wing 2.55-2.70 mm ; female 2.7-2.9 mm wing 2.65-2.80 mm.



Figs. 234-236 : *Rhodsiella manii* Cherian. 234, Head, lateral view. 235, Scutellum. 236, Phallic complex, ventral view.



237



238

Figs. 237-238 : *Rhodesiella manii* Cherian. 237, Wing. 238, Epandrium, dorsal view.

Specimens studied : Holotype : Male, W. Bengal : Darjeeling Dist., Slip forest, 24.iii.1973, Coll. H.S. Sharma. *Paratypes* : 5 males, 5 females, data same as of holotype.

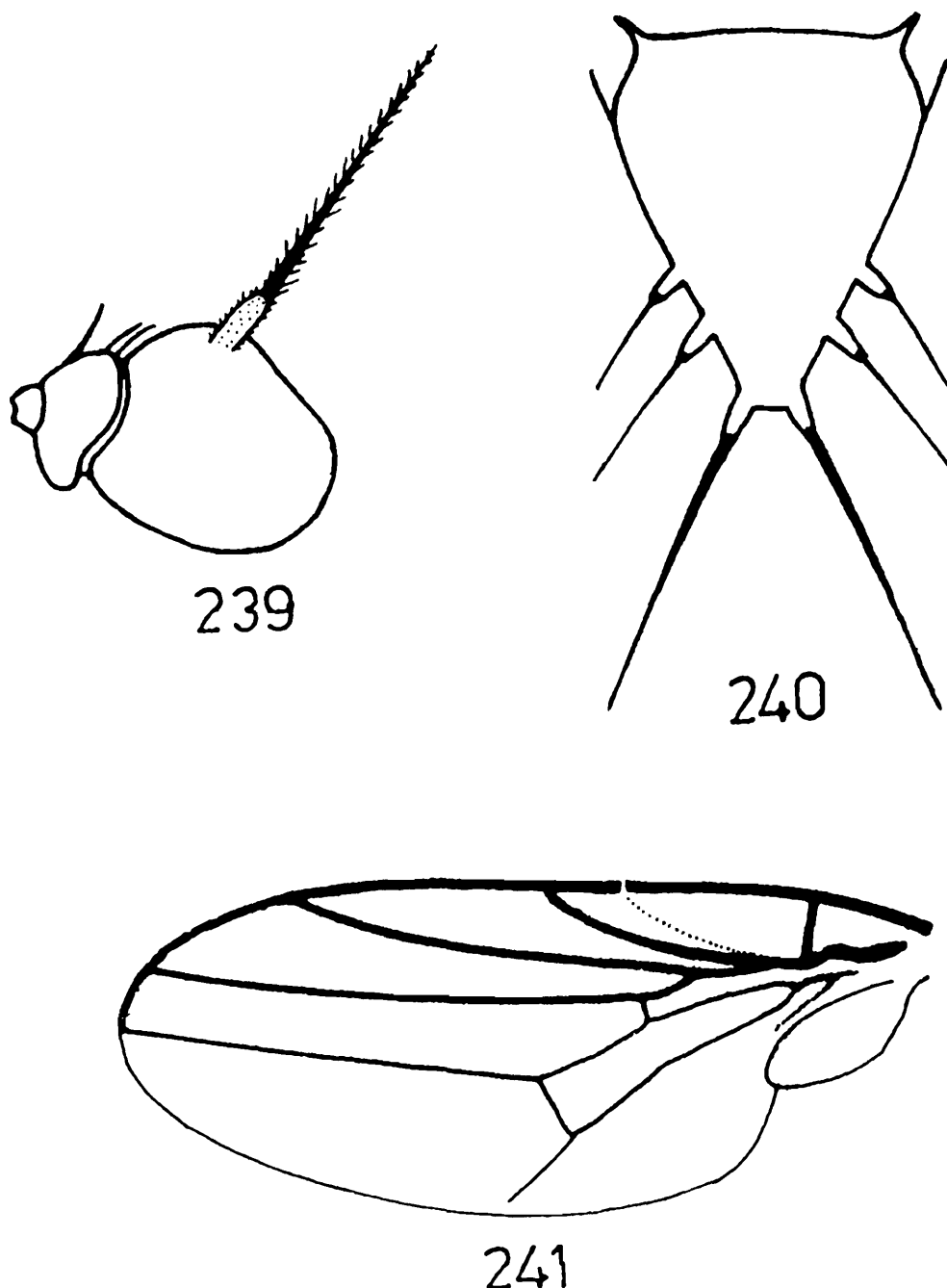
Other specimens examined : 1 male, Uttarpradesh : Kumaun Hill : Raniket, 24.i.1930, Coll. H.S. Purthi ; 6 males, 1 female, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian ; 1 male, 1 female, Kerala : Idukki : Uppukunnu, 1.xii.1982, Coll. P.T. Cherian ; 1 male, 3 females, Mizoram : Lunglei Dist., Zobawk, 22.iii.1979, Coll. P.T. Cherian ; 1 female, Meghalaya : Chirapunji, 5.iii.1980, Coll. P.T. Cherian ; 1 female, Meghalaya : Shillong, 12.xii.1979, Coll. P.T. Cherian.

Remarks : Some specimens from different localities and a few from the same locality exhibit differences in some of the body characters, especially in respect of colouration of legs, relative lengths of scutum and scutellum and colour of wings. In two females veins are almost wholly dark brown and wings are faintly infuscated and in one male and another female r_{4+5} and m_{1+2} are a little more curved upward. In two females from Mizoram last tarsal segment of fore and midlegs distinctly and in the male from the same locality faintly dark brown. Again in the three females from Mizoram hind tibia except for its base and tip brownish black and hind femur is with pale brown tinge distally. These differences are considered only intraspecific variations especially because even the three females with predominantly brownish black tibia do not show uniformity in the colouration of last tarsi of fore and mid legs since in two of them these are dark brown whereas in the third specimen it is yellow as in the types and other specimens. The strongly developed male genitalia, slender and elongated abdomen and very prominent scutellar tubercles brings *manii* under *Lonchonotus* group which Sabrosky considered a subgenus of the genus. It can easily be differentiated from the rest of the group by the colouration of legs and differences in male genitalia.

49. *Rhodesiella sahyadriensis*, sp. nov. (Figs. 239-241)

Female : Head : Almost as long as high, length, height and width ratio 15 : 16 : 26. Frons nearly parallel-sided but slightly widening at vertex, width at vertex 0.42 x that of head and 0.9 x its own length, projecting above eyes anteriorly and in profile reaching anterior margin of eye, subshiny black behind and deeply brownish to brownish black in front ; frontal triangle polished, shiny black, reaching anterior margin of frons and ending with nearly pointed apex. Face concave, shiny black ; facial carina triangular between and not reaching beyond bases of antennae ; lower facial margin distinctly raised up, not broad, finely tomentose. Eye large, bare with slightly oblique long axis. Gena one-fourth as wide as ant 3, black ; vibrissal corner projecting slightly

beyond lower anterior margin of eye, with short vibrissa ; postgena well developed, subshiny black with short black hairs ; postocular row of hairs short, slender and fairly dense. Antenna (Fig. 239) not erect ; ant 2 yellow, less than half as long as ant 3, with very fine yellow hairs ; ant 3 longer than wide, width four-fifths the length, broader basally than at apex, yellow but for faint dark tinge around base of arista with very fine yellowish white pubescence ; arista slender, of medium size, dark brown with concolorous pubescence of medium size. Palpi dark to yellowish brown ;



Figs. 239-241 : *Rhodesiella sahyadriensis*, sp.n. 239, Antenna. 240, Scutellum. 241, Wing.

proboscis dark brown. Occiput black, rugulose. Head bristles slender, yellow; *out* a little longer and stouter than other head bristles; *pvt* cruciate, only a trifle longer than *ivt*, the latter subequal to *oc*; *orb* about 10, recumbent, sequentially anterior ones becoming shorter and slender, longest two-thirds as long as *oc*; *if* about 10, in a row outside triangle along each lateral margin, anterior 2 to 3 on the edge of the triangle.

Thorax: Shiny black; scutum 1.2 x as wide as long with convex disc bearing dense granulate punctae and yellowish white hairs of medium size and are shorter and more slender than those on the scutum of *manii* Cherian; scutellum (Fig. 240) triangular, 0.4 x as wide as scutum and 1.3 x as long as wide, disc more or less flattened and more coarsely punctate than and pubescent like scutum; pleura with fairly dense yellowish white hairs on *anepst* and similar hairs mostly in the lower half of *kepst*. Thoracic bristles yellow; *h* 1, subequal to *ivt*; *npl* 1+1, a trifle longer and stouter than *h*; *pa* 1 a little longer than *npl*, borne on a wart; *pa* 2 hair-like, 1 *dc* two-thirds as long as *pa* 1; *as* together with tubercle at its base almost as long as scutellum; *ss* 1 two-fifths as long as *as*, nearly equidistant from *as* and *ss* 2, borne on well developed tubercle; *ss* 2 four-fifths as long as *ss* 1, borne on short but very distinct tubercle; scutellar tubercles black; scutellar bristles located in the distal half of scutellum.

Wing (Fig. 241): 2.36 x as long as wide, hyaline with pale brown tinge and brown to yellowish brown veins; costal sectors 2 to 4 in the ratio 16:10:5; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.53 of its length; terminal sectors of veins r 4+5 and m 1+2 nearly parallel; anal angle moderately developed. Haltere yellow.

Legs: Moderately developed, wholly yellow.

Abdomen: Longer than broad and much narrower than thorax, almost long and slender, two basal segments brownish yellow, distal segments dark brown to brownish black; female cerci rather short, yellow.

Length: Female 2.3 mm, wing 2.2 mm.

Holotype: Female, Kerala: Idukki: Uppukunnu, 1.xii.1982, Coll. P.T. Cherian.

R. sahyadriensis is closely related to *manii* Cherian but unlike in the latter, in the former frontal triangle is pointed at apex, ant 3 is longer than wide, thoracic hairs are shorter, more slender and more dense, terminal sectors of veins r 4+5 and m 1+2 are nearly parallel and legs are entirely yellow.

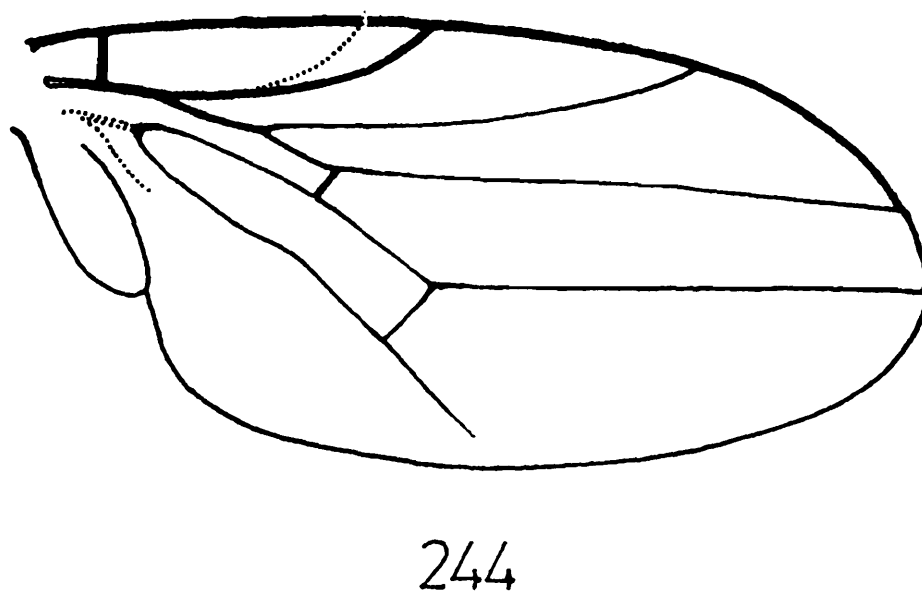
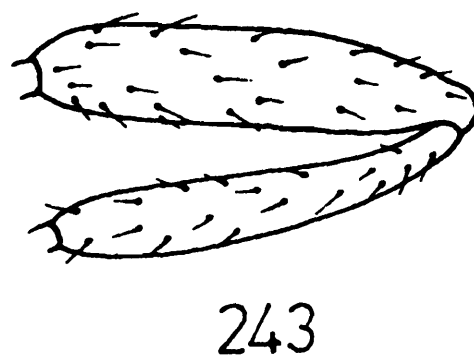
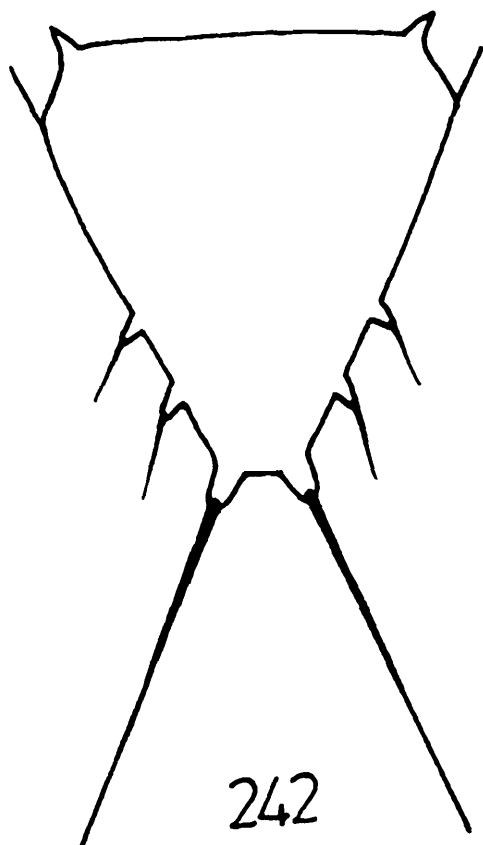
50. *Rhodesiella meghalayensis*, sp. nov. (Figs. 242-244)

Female : Head : Higher than long, length, height and width ratio 16 : 18 : 25. Frons subshiny black, width at vertex 0.44 x that of head and 0.91 x its own length, slightly narrowing and distinctly sloping anteriorly, eye margin not projecting above level of frons behind but slightly above in front; frontal triangle shiny black, very narrow, width at vertex less than half that of frons, unlike in most of the other species of the genus distinctly reaching only three-fourths length of frons and ending with nearly pointed apex, whence becoming indistinct. Face concave in the middle, subshiny black except for brownish lower facial margin and the area immediately behind; facial carina low, fading off near middle of face. Antenna directed outward and downward; basal segments brownish yellow; ant 3 as long as wide, yellow; arista of medium size, dark brown with slender concolorous short pubescence. Eye large, with vertical long axis. Gena one-fourth as wide as ant 3, dull black with a row of pale hairs along oral margin; vibrissa yellow, of medium size; postgena well developed, dull black with short hairs. Proboscis and palpi dark brown. Head bristles yellow, none outstanding; *ovt* a little longer than the cruciate *pvt*; *ivt* a trifle shorter than *pvt*; *oc* almost as long as *ivt*; *orb* about 10, recumbent, longest two-thirds as long as *ivt*; *if* in a row of about 10 outside triangle along each lateral margin; *fr* punctate, confined mostly to anterior half of frons.

Thorax : Shiny black, as wide as head; scutum as long as wide, with convex disc bearing dense punctate yellow hairs of medium size; scutellum (Fig. 242) three-fifths as long as scutum and 1.4 x as long as wide at base, triangular with convex disc which is very coarsely and densely punctate than and hairy like scutum; *anepst* in upper half and *kepst* partly with yellow hairs; propleuron smooth and shiny. Thoracic bristles of medium size; *h* 1, hair-like; *npl* 1+1, subequal, a trifle longer than 1 *dc* and a little shorter than *pa* 1; *pa* 2 hair-like; *as* nearer to each other than to *ss* 1, its length along with that of basal tubercle 0.8 x that of scutellum; *ss* 1 nearer to *as* than to *ss* 2, 0.35 x as long as *as*; *ss* 2, 0.8 x as long as *ss* 1; all scutellar bristles borne on tubercles which are yellow distally and black basally.

Wing (Fig. 244) : Shorter than body, 2.4 x as long as wide, hyaline with brown tinge and deeply brown veins; costal sectors 2 to 4 in the ratio 17 : 14 : 6; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.53 of its length; terminal sectors of veins r 4+5 and m 1+2 nearly parallel distally, the latter almost straight, without flexure near base; anal angle moderately developed. Haltere yellow.

Legs : Of medium length, pale reddish yellow except for blackish brown fore and hind tibiae and all fore tarsi; last tarsal segment of hind leg brownish; mid tibial spine well developed, almost half as long as first tarsal segment of mid leg, yellow; hind femur (Fig. 243) not thickened.



Figs. 242-244 : *Rhodesiella meghalayensis*, sp. n. 242, Scutellum. 243, Hind femur, male. 244, Wing.

Abdomen : Narrower than thorax and longer than wide, two basal segments yellowish, the rest of the segments blackish brown; female cerci slender, yellow.

Length : Female 2.7 mm, wing 2.3 mm.

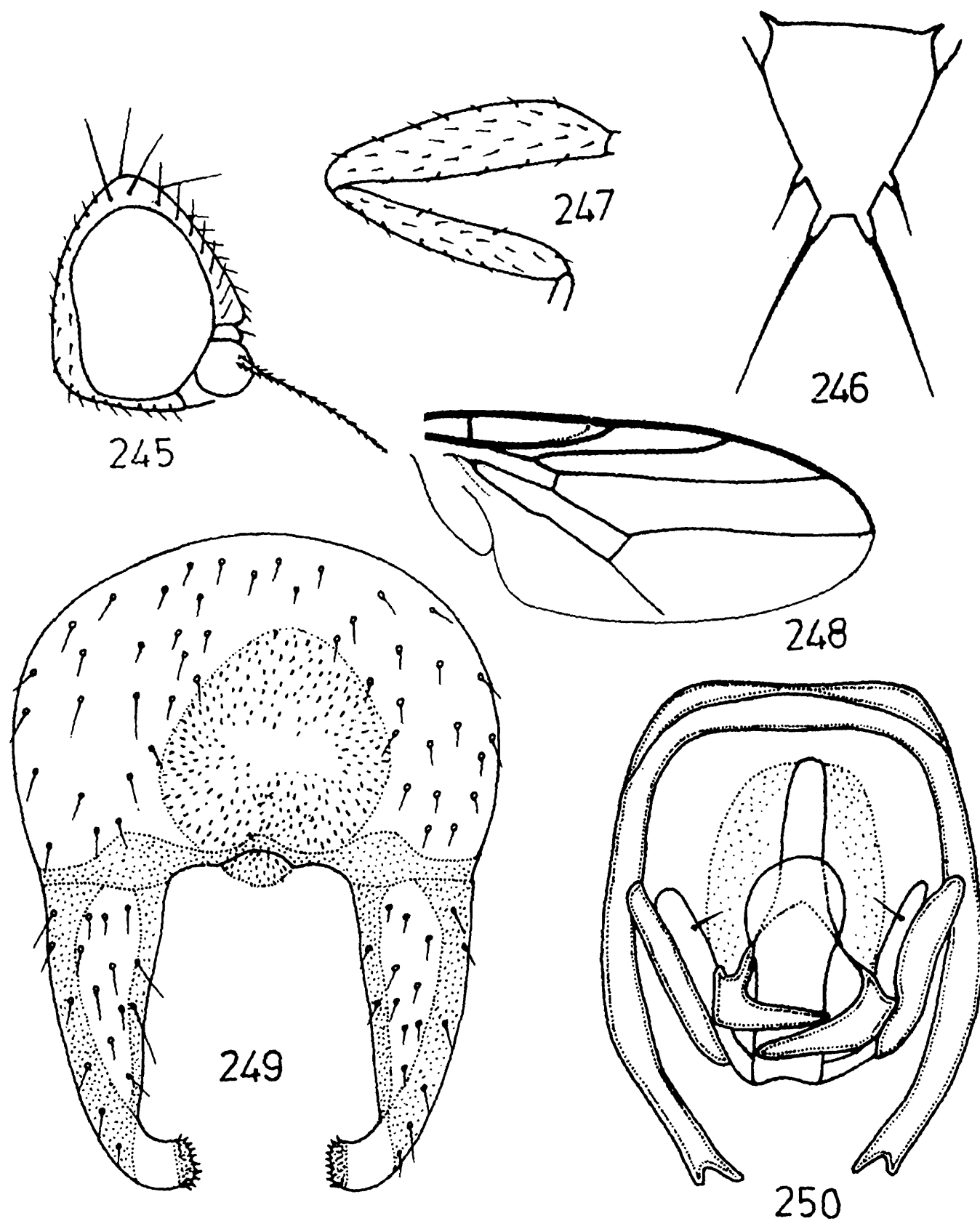
Holotype : Female, Meghalaya : Shillong : Botanical Garden, 15.iv. 1980, Coll. P.T. Cherian.

This species shows affinities to *albicapilla* (de Meijere) from Sumatra, but differs in possessing yellow mid tibia, while in the latter species mid-tibia is largely blackened. Besides, in *meghalayensis* two pairs of lateral scutellar bristles are well developed and frontal triangle is narrow and only indistinctly reaching anterior margin of frons unlike in *albicapilla*.

51. *Rhodesiella obcampanulata*, sp. nov. (Figs. 245-250)

Male : *Head* (Fig. 245) : As long as high, length, height and width ratio 7 : 7 : 10; frons subshiny black, width at vertex 0.55 x that of head and 1.2 x its own length, very slightly becoming narrower anteriorly, anterior half projecting above eye margins; frontal triangle large, glabrous, shiny black, appearing slightly obcampanulate especially in certain angles of illumination, reaching anterior margin of frons and ending with nearly pointed apex and with a short, small depression a little behind its apex. Eye large, bare with oblique long axis. Face concave, smooth, shiny black; facial carina very low and linear, not extending beyond middle of face; lower facial margin not thickened, distinctly raised up and finely tomentose. Antenna well developed with fine white pubescence, directed outward and downward, basal segments yellow; ant 3, 0.8 x as long as wide, yellow except for dark brown tinge along dorsodistal area; arista slender, dark brown but pale basally with fine fairly dense dark brown pubescence. Gena narrow, dark brown above and with thin, black, carinate oral margin bearing a few slender hairs; vibrissal corner extending slightly beyond lower anterior margin of eye and merging with the raised lower facial margin; postgena rather weakly developed, rugulose, subshiny black with a few slender hairs. Palpi short, dark brown; proboscis flattened at apex, dull brown. Head bristles slender, whitish yellow; *out* only a trifle longer than *ivt*, the latter subequal to cruciate *pvt*; *oc* about three-fourths as long as *ivt*; *orb* 7, reclinate, none outstanding, anteriormost 3 sequentially becoming shorter, longest one two-thirds as long as *ivt*; *if* 7, in a row outside the triangle along each lateral margin; vibrissa short, only a trifle longer than hairs on oral margin; ocellar triangle with a few, short yellow hairs.

Thorax : Subshiny black; scutum almost as wide as head and nearly as long as wide, with convex disc bearing dense very coarse stellate punctae and whitish yellow hairs of medium size; humeral calli prominently developed, distinctly marked off



Figs. 245-250 : *Rhodesiella obcampanulata*, sp. n. 245, Head, lateral view. 246, Scutellum. 247, Hind femur, male. 248, Wing. 249, Epandrium, dorsal view. 250, Phallic complex, ventral view.

from scutum; scutellum (Fig. 246) two-thirds as long as scutum and 1.33 x as long as wide with fairly thick, slightly convex disc which is more coarsely punctate than but pubescent like scutum; *anepst* with a few, finely punctate short yellow hairs and *kepst* with more developed yellow hairs which are dense around lower margin. Thoracic bristles yellow but *as* of one side yellowish brown; *h* 1, shorter than *ivt*; *npl* 1+1, subequal and equal to *ivt*; *pa* 1 well developed, a trifle longer than *npl*, borne on fine wart; *pa* 2 not distinct; 1 *dc* well developed, equal to *npl*; *as* well separated at base, its length together with that of its well developed basal tubercle equal to that of scutellum; *ss* 1 borne on distinct tubercle, length along with that of its tubercle 0.4 x that of *as*; scutellar tubercles black.

Wing (Fig. 248) : 2.42 x as long as wide, hyaline with yellowish brown veins and brown pubescence; costal sectors 2 to 4 in the ratio 5 : 5: 3; r-m cross-vein slightly proximad of the middle of discal cell, opposite 0.47 of its length; terminal sectors of veins r 4+5 and m 1+2 diverging distally, the latter slightly sinuate along its length and convex above a little distance from base; anal fold distinct; anal angle fairly well developed as also alula. Haltere yellow.

Legs : Of medium size, wholly whitish yellow with short yellow hairs except for dark brown last tarsal segment of fore and hind legs; hind tibia with short, slender, yellow terminal spine; hind femur (Fig. 247) not thickened.

Abdomen : Long and slender, 2 x as long as wide, much narrower than thorax, with terga of two basal segments predominantly brownish yellow and having dark brown lateral margins and rest of the segments subshiny brownish black and with slender, scattered hairs. Male genitalia (Figs. 249-250) well developed, occupying about one-fifth of the length of abdomen and showing affinities to that of *R. orientalis*. Epandrium much wider than long; surstylus much longer than in *orientalis*, narrowing distally and ending with two rows of short, sharp, black teeth; hypandrium longer and more uniformly widened than in *orientalis*; pregonites longer, slender and with less hairs than in *orientalis*; distiphallus cylindrical along two-thirds its length and bulbous distally; phallapodeme shorter than in *orientalis* and not reaching ventral margin of hypandrium.

Length : Male 2.1 mm, wing 1.8 mm.

Holotype : Male, Meghalaya : Shillong, 1350 m, 21.iv. 1980, Coll. P.T. Cherian.

This species shows affinities to *meghalayensis* from Shillong, but can be easily distinguished by the shape of its frontal triangle, reduced number of *orb* and position of r-m cross-vein. Besides, in *obcampanulata* there is only one pair of lateral scutellar bristles, third sector of costa is equal to the second and legs are entirely yellow except

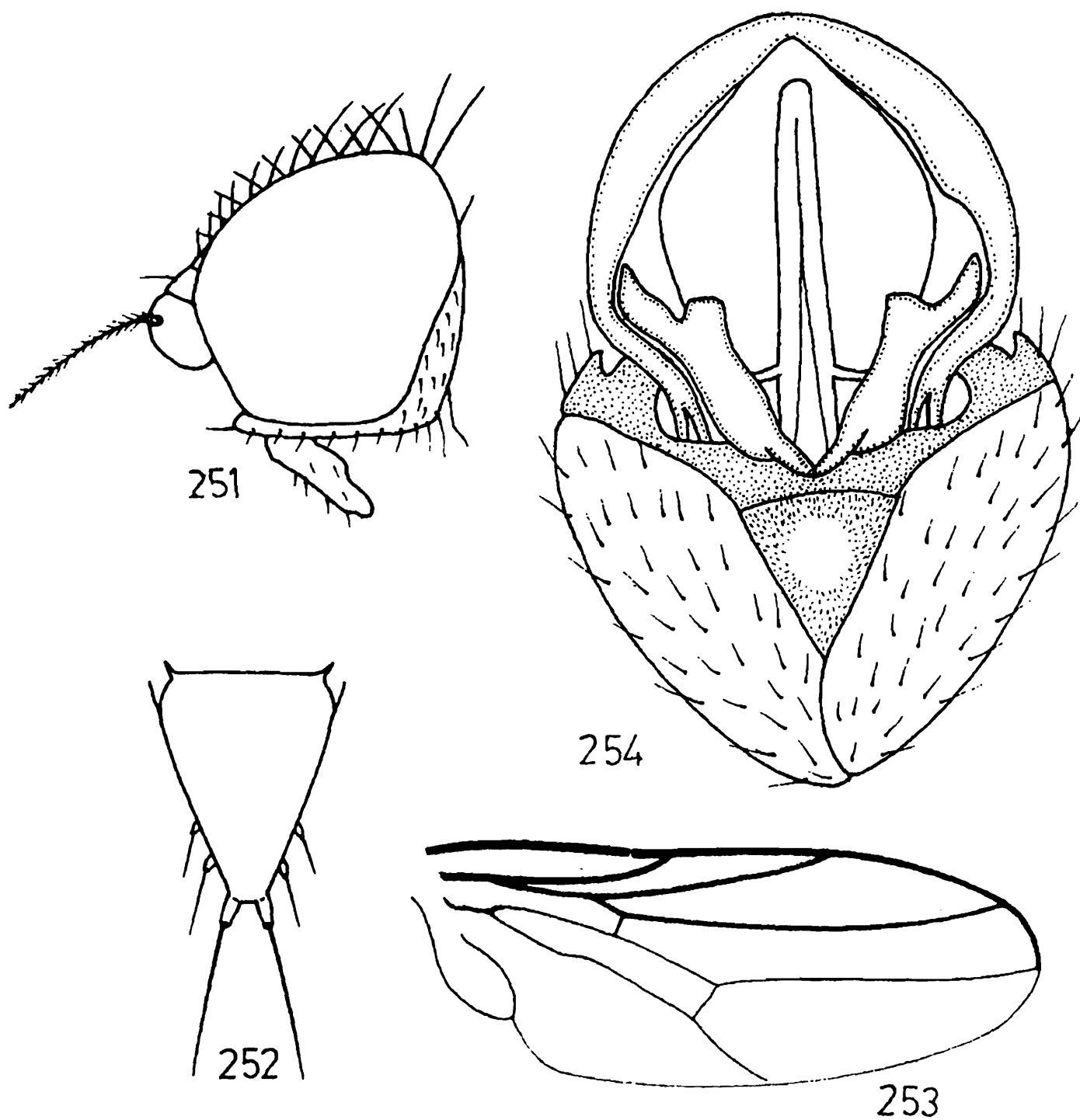
for the dark brown last tarsal segment of fore and hind legs unlike in *meghalayensis*. In the shape of frontal triangle this species differs from other related species of the group. In the build of the male genitalia *obcampanulata* shows affinities to *orientalis* but the relative development of surstylus, hypandrium, pregonites, phallapodeme and phallus helps to distinguish the two.

52. *Rhodesiella kalinga* Cherian (Figs. 251-254)

1977. *Rhodesiella kalinga* Cherian, *Oriental Insects*, 11 (4) : 483-487. Type locality : India : Orissa : Mayurbhanj Dist., Janabil.

Male and Female : Head : (Fig. 251) : Sloping, slightly longer than high, height, length and width ratio 9 : 10 : 15; frons slightly narrowing anteriorly, width at vertex 0.45 x that of head and almost equal to its own length, subshining, brownish black with brown tinge anteriorly, not reaching anterior margin of eye; frontal triangle glabrous, smooth, shiny black, reaching anterior margin of frons and ending with broadly obtuse to almost subtruncate apex. Eye large, bare, in profile occupying almost the entire head, projecting above and slightly beyond eye margin and with vertical or slightly oblique long axis. Face narrower than anterior part of frons, concave along midlongitudinal area, shiny dark brown, densely and conspicuously white tomentose in the area around vibrissal angles and partly along lower facial margin which is only very slightly raised up. Antenna directed outward and downward; first segment brown; ant 2 yellow with brown tinge; ant 3 yellow with receding upper and slightly produced lower distal margin, maximum length 0.8 x the width; arista slender, fairly long, dark brown, basal part a little paler, with short, dark brown, slender pubescence. Gena linear, black, vibrissal corner not projecting beyond lower anterior margin of eye, white tomentose; postgena rather well developed, partly smooth and shiny, wholly black rugulose posteriorly. Palpi brownish black; proboscis dark brown. Head bristles and *fr* white to yellowish white; *out* a little longer than half width of eye; *ivt* two-thirds the *out*; *orb* 10-12, slender, reclinate, sequentially anterior ones becoming shorter, longest about half as long as *out*; *oc* proclinate, divergent, three-fourths the *out*; *put* cruciate, equal to *ivt*; *if* about 10-12, in a row outside the triangle along each lateral margin; vibrissa rather weakly developed.

Thorax : shiny black; scutum 1.2 x as long as wide and as wide as head with flattened disc which is slightly convex medially and with fairly dense hairs borne on stellate coarse punctae; humeral callus prominently developed and distinctly marked off. Scutellum (Fig. 252) elongate, triangular, more narrow and tapering than in *manii*, 1.55 x as long as wide at base and two-thirds as long as scutum, with flattened disc which is pubescent like but more coarsely punctate than scutum; pleura shiny black; *anepst* with coarsely punctate pubescence, *kepst* with fairly dense pubescence



Figs. 251-254 : *Rhodesiella kalinga* Cherian. 251, Head, lateral view. 252, Scutellum. 253, Wing. 254, Male genitalia.

confined mostly to lower half and of these, those along posterior margin more developed. All thoracic hairs and bristles white or golden yellow except for *as* and at times *ss*; *h* 1, well developed, equal to *ivt*; *npl* 1+1, equal and almost equal to *h*; *pa* 1 a little larger than *npl*; *pa* 2 not distinct; 1 *dc* slender and shorter than *pa* 1; *as* stout, three-fourths as long as scutellum, borne on prominent tubercle which is one-eighth as long as scutellum; *ss* 1 slender, one-third as long as scutellum, borne on well developed tubercle which is a trifle shorter than that at base of *as*; *ss* 2 slender, one-fourth as long as scutellum, borne on distinct tubercle which is nearly half as long as the one at base of *ss* 1; *as* nearer to each other than to *ss* 1, the latter almost equidistant from *as* and *ss* 1; all scutellar tubercles and *as* black; *ss* 1 and *ss* 2 at times black, often one or both yellow.

Wing (Fig. 253) : Much shorter than body and as long as wide, hyaline with brown hairs and brown to pale brown veins; costal sectors 2 to 4 in the ratio 21 : 18 : 7 (not 21 : 8 : 7 as given in the original description which was a printing error); r-m cross-vein almost in the middle of discal cell; terminal sectors of r 4+5 and m 1+2 diverging distally, the latter slightly convex above near base; anal angle moderately developed. Haltere yellow to brownish yellow.

Legs : Moderately long and slender, yellow with yellow to whitish yellow hairs, except for dark brown fore tibia, fore tarsi and last tarsal segments of mid and hind legs; mid tibia with fairly long, slender yellow apical spine; hind femur distinctly thickened, its maximum thickness more than twice that of hind tibia; the anteroventral and posteroventral surfaces of hind femur with a row each of 10-15 tuberculate, yellow, short and slender spinous hairs forming a crib into which fits in the curved hind tibia.

Abdomen : Long and narrow, length more than 2 x the maximum width in male, subshiny black with slender yellow hairs but for almost wholly yellow to brownish-yellow two basal segments. Female cerci short and slender; male genitalia (Fig. 254) small in relation to the size of the body; epandrium wider than long; surstylus developed; much smaller than in *manii*; hypandrium widened medially and narrowing ventrally; pregonite large; phallapodeme well developed.

Length : Male 3.5-3.8 mm, wing 2.6-2.9 mm; female 3.8 mm, wing 2.8 mm.

Specimens examined : *Holotype* : Male, India : Orissa : Mayurbhanj Dist., Janabil, 20.iii. 1973, Coll. S.K. Gupta. *Paratypes* : 5 males, 1 female, data same as of holotype.

Other examples : 1 male, Mizoram : Kolasib, 8.iii. 1979, Coll. P.T. Cherian; 1 male, 1 female, Mizoram : Lunglei Dist., Hanahthial, 25.iii. 1979, Coll. P.T. Cherian; 1 male, Meghalaya : Nangpo, 25.iv. 1980, Coll. P.T. Cherian.

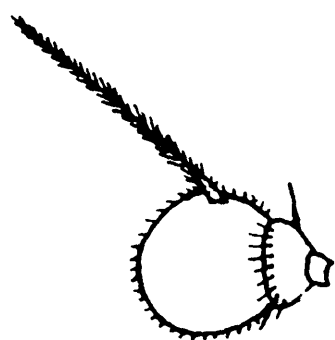
Remarks : In the specimen from Kolasib scutellum is shorter, scutellar bristles are yellow and scutellar tubercles are smaller, while, in the specimen from Meghalaya all scutellar bristles are black; in the number of *orb* and *if* also some of the specimens show minor differences.

The long, narrow abdomen and prominent scutellar tubercles bring *kalinga* under the *Lonchonotus* group of species. But unlike in other members of the group in *kalinga* male genitalia are not large. It comes close to *manii* from which it differs mainly in having relatively small genitalia, black scutellar tubercles, thickened hind femur and partly dark brown fore leg.

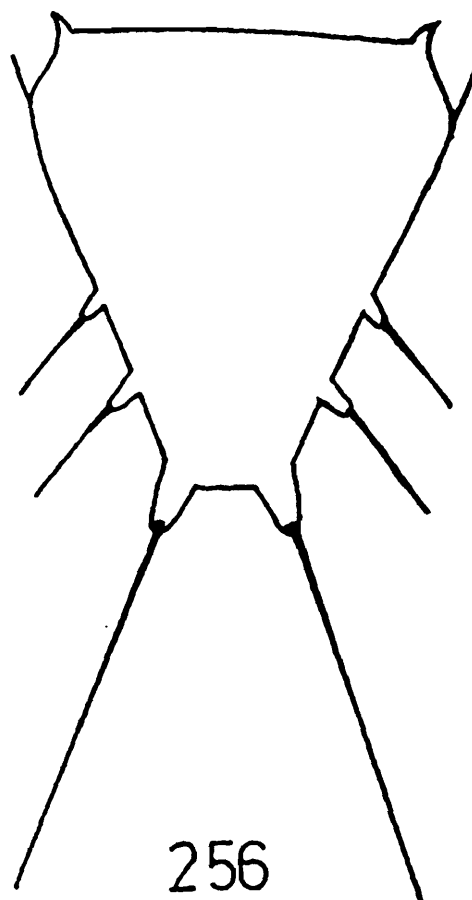
53. *Rhodesiella brevopilosa*, sp. nov. (Figs. 255-257)

Male : Head : As long as high, length, height and width ratio 18 : 18 : 19. Frons nearly parallel sided, width at vertex 0.41 x that of head and 0.86 its own length, subshiny brownish black behind and reddish brown and projecting a little above eyes anteriorly, in profile reaching anterior margin of eye, with a few yellow *fr*; frontal triangle narrower than in *manii*, glabrous, shiny black, reaching anterior margin of frons and ending with nearly pointed apex. Face concave, shiny black, only a trifle narrower than anterior part of frons; facial carina not developed; lower facial margin a little raised up, deeply brownish. Antenna (Fig. 255) with very fine yellowish white pubescence; ant 2 brownish yellow; ant 3, 1.25 x as wide as long, suborbicular, yellow with faint brown tinge; arista uniformly slender but for thickened extreme base, basal half yellow with almost yellow hairs and distal half dark brown with concolorous hairs. Eye large, bare, with vertical long axis. Gena a little more developed than in *manii*, its relative width almost one third that of ant 3, black but for deeply brownish, grey tomentose area around vibrissal corner which is nearly triangular and projects a trifle beyond lower anterior margin of eye; oral margin with a row of 8-9 slender, whitish yellow hairs; vibrissa of medium size, whitish yellow; postgena rather well developed, rugose, dull black with fairly dense fine pubescence. Oral opening subsquarish, small in comparison to size of head; palpi short, a little flattened, yellow; proboscis very short, distally blackish brown. All head bristles yellow, very short, and slender but for extraordinarily developed *ovt*, a condition not met in any other species of *Rhodesiella* known, borne on distinct wart; *ivt* and *pvt* a little less than one-third length of *ovt*; *oc* almost equal to *pvt*; *orb* 12, sequentially anterior ones becoming shorter and slender, longest about two-thirds the *ivt*; *if* 13, subequal to *orb*, borne in a row outside the frontal triangle along each lateral margin.

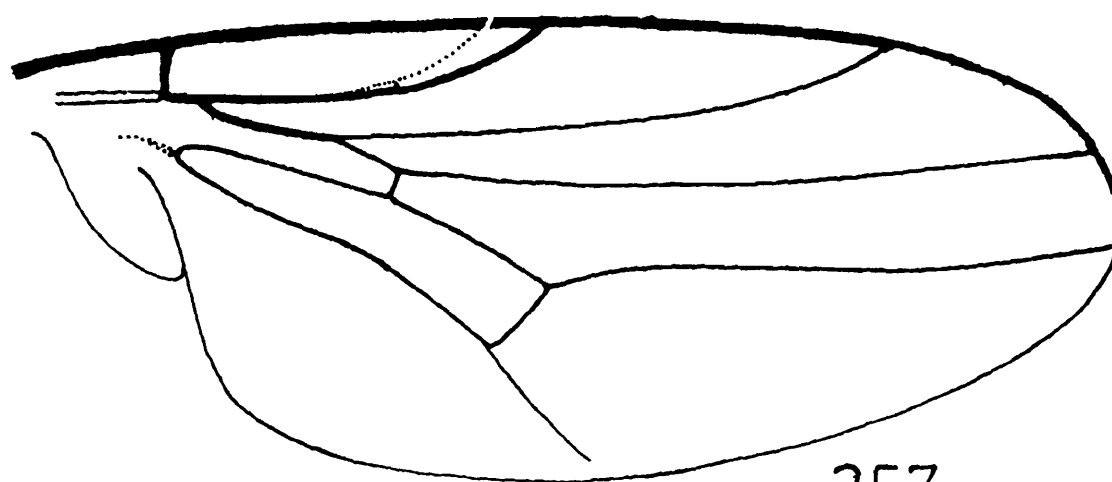
Thorax : Shiny black; scutum as wide as head and a trifle longer than wide, disc moderately convex with very dense granulate punctae, bearing very short yellowish white hairs; scutellum (Fig. 256) of the *manii* -type, 1.4 x as long as wide at base,



255



256



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Figs. 255-257 : *Rhodesiella brevopilosa*, sp. n. 255, Antenna, 256, Scutellum. 257, Wing.

triangular in outline, greatly thickened with convex disc bearing punctae which are much coarser than but pubescent like scutum; pleura shiny; *anepst* with dense and *kepst* mostly in lower half with a few short yellowish white hairs. Thoracic bristles yellow; *h* 1, only a little longer than humeral hairs; *npl* 1+1 subequal, about 0.33 x as long as *out*; *pa* 1, 1.5 x as long as *npl*, borne on small wart; *pa* 2 and 1 *dc* shorter and more slender, a row of eight long hairs forming a prescutellar row present; *as* 0.75 x as long as scutellum, nearer to each other than to *ss* 1, the latter about half as long as the former, nearer to *ss* 2 than to *as*; *ss* 2 two-thirds the length of *ss* 1; scutellar bristles borne on black well developed tubercles of which those at bases of *as* very large, those of *ss* 1 of medium size, the basal ones of *ss* 2 small.

Wing (Fig. 257) : As long as body and 2.53 x as long as wide, hyaline with brownish yellow veins; costal sectors 2 to 4 in the ratio 21 : 14 : 6; *r-m* cross-vein distad of the middle of discal cell, opposite 0.53 of its length; terminal sectors of *r* 4+5 and *m* 1+2 parallel but for the basal part of the latter where it is concave below; anal angle well developed. Haltere wholly yellow.

Legs : Wholly yellow but for the dark brown last tarsal segment of all the legs; mid tibial spine small, slender, whitish; all legs with yellowish white short hairs.

Abdomen : Small in relation to size of the body with yellow hairs; two basal segments brownish yellow, rest of the segments brownish black. Male genitalia moderately developed.

Length : Male 2.3 mm, wing 2.3 mm.

Holotype : Male, Mizoram : Kolasib, 8.iii. 1979, Coll. P.T.Cherien.

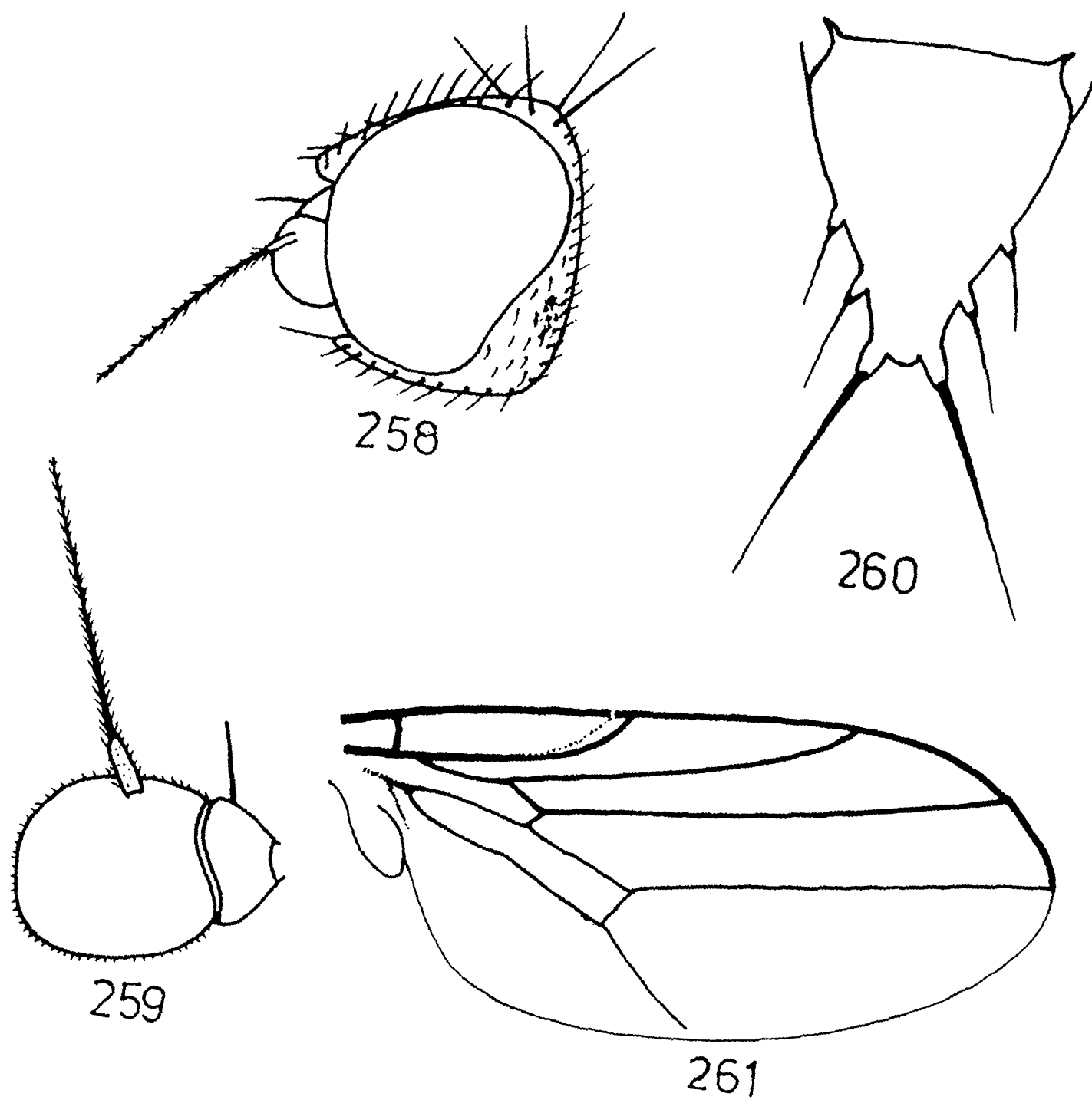
R. brevipilosa differs from its nearest relative *manii* Cherian in possessing more number of *orb* and *if*, very short head bristles except for extraordinarily developed *out*, apically nearly pointed frontal triangle, very short throacic hairs, short abdomen and small male genitalia. Moreover in *brevipilosa* arista is yellow basally, frons is longer than wide and less than half as wide as head and gena is not linear.

54. *Rhodesiella deciorbitalis*, sp. nov. (Figs. 258-261)

Female : *Head* (Fig. 258) : Almost as long as high, length, height and width ratio 14 : 15 : 21. Frons depressed posteriorly and slightly projecting above eyes in front, not reaching anterior margin of eye, width at vertex almost half and anteriorly 0.4 x that of head, subshiny dark brown in anterior half and blackish behind; frontal triangle of medium size, glabrous, shiny black, reaching the anterior margin of frons and ending with nearly pointed apex. Face almost as wide as anterior part of frons,

deeply concave, shiny brownish black; facial carina linear between antennae and not extending beyond middle of face; lower facial margin nearly straight, finely grey tomentose. Antenna (Fig. 259) directed outward and downward, well developed; ant 2 about one-third as long as ant 3, faintly brownish yellow; with well developed dorsal spine and short, fine, erect hairs especially along distal margin; ant 3 yellow, as long as wide with very fine fairly dense white hairs; arista short in comparison to most other species, length less than 2 x that of antennal segments, slightly thickened basally and progressively becoming thinner distally, wholly dark brown with slender, well developed, fairly dense concolorous hairs. Eye large, occupying much of head in profile, with vertical long axis and scattered very fine pubescence. Gena black, width about one-fourth that of ant 3, with a row of about 9 slender white hairs along oral margin; vibrissa well developed; postgena normally developed with white, fairly dense, slender, punctate hairs of which some are arranged in a row in continuation of the row of postocular setae. Proboscis yellowish brown with dark tinge and with slender white hairs; palpi short, concolorous with proboscis. All head bristles and hairs slender, yellowish white; *out* much longer than other head bristles; *pvt* cruciate, two-thirds as long as *out*; *ivt* about half as long as *out*; *oc* widely divergent, a trifle longer than *ivt*; *orb* 10, sequentially anterior ones becoming shorter, longest one a little less than half the *out*; *if* 11-13 in a row outside the triangle along each lateral margin, subequal to *orb*; vertex margin with short hairs almost in a row; the area of occiput behind ocellar triangle white tomentose, at its sides and below postocular setae there are fine hairs arranged in three to four rows.

Thorax : Wholly black; scutum as long as wide and 1.1 x as wide as head, with convex disc which is slightly flattened on dorsum, subshiny, wholly covered with dense fine punctae and very slender fine white hairs; scutellum (Fig. 260) elongate, triangular, 1.5 x as long as wide, disc thickened and slightly flattened dorsally but medially convex and sloping laterally, more coarsely punctate than but pubescent like scutum; the punctae on scutum and scutellum less dense and much less concave than in *brevipilosa*; pleura smooth and shiny; *anepst* medially and in the upper half and *kepst* in the lower half with slender white hairs. Thoracic bristles white or yellow, rather slender but for scutellar bristles; *h* 1, hair-like; *npl* 1+1, sub equal, five-eighths as long as *out*; *pa* 1 a little longer than and *pa* 2 much shorter than *npl*; 1 *dc* shorter than *npl*; almost hair-like; *as* together with its basal tubercle almost as long as scutellum, closer to each other than to *ss* 1, borne on black diverging tubercles; *ss* 1 closer to *as* than to *ss* 2, together with its tubercle about half as long as *ss* 1; *ss* 2 five-eighths as long as *as*; *ss* 2 five-eighths as long as *ss* 1, borne on prominent tubercle set on the lower margin laterally in the distal half; all scutellar tubercles black.



Figs. 258-261 : *Rhodesiella deciorbitalis*, sp. n. 258, Head, lateral view. 259, Antenna. 260, Scutellum. 261, Wing.

Wing (Fig. 261) : 2.4 x as long as wide but shorter than body, hyaline with faint brown tinge and deeply brown veins; costal sectors 2 to 4 in the ratio 19 : 14 : 7; r-m cross-vein distad of the middle of discal cell, opposite 0.54 of its length; terminal sectors of veins r 4+5 and m 1+2 slightly diverging distally, the latter a little convex above near base; anal angle slightly receding; wing more wide in the middle than in the area of anal angle. Haltere brownish yellow with dark brown tinge on stalk and upper part of basal half of knob.

Legs : Rather long and slender, yellow but for dark tinge on coxa and slightly infuscated last tarsal segment of hind leg; all legs with short yellowish white hairs; mid tibia with short slender apical spine which in one specimen is dark, while in the other yellow.

Abdomen : Longer than wide and almost half as long as body, wholly brownish black in one specimen while in the other, basal segments with distinct yellow tinge; female cerci short, rather slender, yellow to brownish yellow and with very slender hairs of which three to four distal ones are more conspicuous.

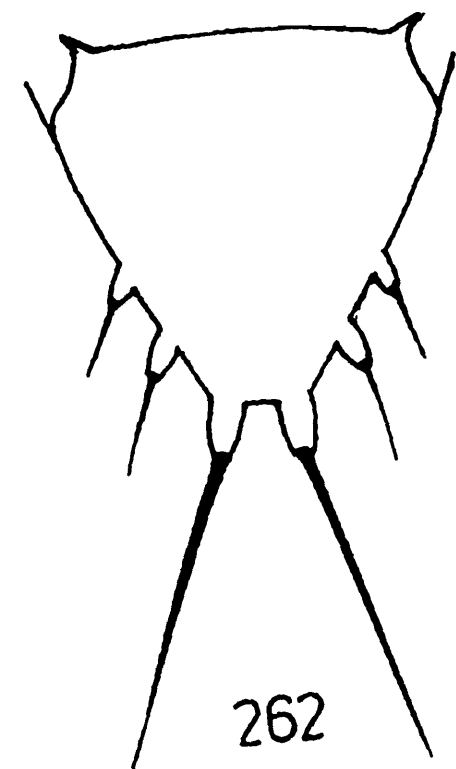
Length : Female 3.2 mm, wing 2.6 mm.

Holotype : Female, Meghalaya : Nangpo, 18.iv. 1980, Coll. P.T. Cherian. *Paratype* : 1 female, data same as of holotype.

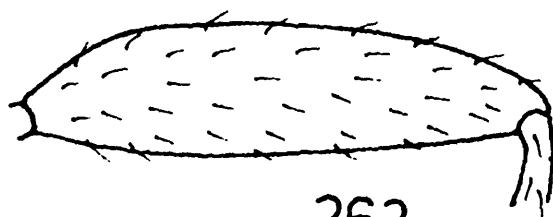
This species is closely related to *chui* Kanmiya but differs in the colouration of haltere, comparative length of scutellum and colour of ant 2. Besides, in *deciorbitalis*, *ivt* is only about half as long as *ovt* while in *chui* it is comparatively longer and the two species differ in the nature of punctae on thorax.

55. *Rhodesiella lungleiensis*, sp. nov. (Figs. 262-266)

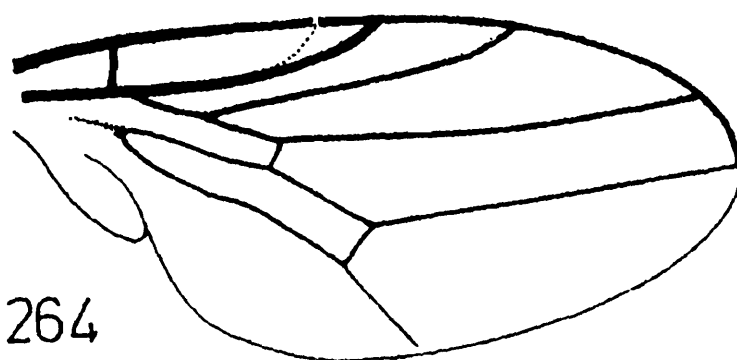
Male : *Head* : A little higher than long, length, height and width ratio 15 : 17 : 26. Frons very prominently narrowing anteriorly, width at vertex half that of head and a little more than its own length, subshining blackish brown, in front slightly projecting above and reaching almost anterior margin of eye, with a few yellow *fr*; vertex margin with a few yellow hairs; frontal triangle large, glabrous, shiny black with faint brownish tinge, reaching anterior margin of frons and ending with nearly pointed apex; ocellar triangle tomentose, with a few short yellow hairs. Face much narrower than anterior part of frons, concave, shiny brownish black; facial carina low, linear, not extending beyond middle of face; lower facial margin a little raised up, yellowish brown. Antenna pale yellow tomentose, almost wholly yellow with basal segments having brownish tinge; ant 3 subsquarish, a little wider than long with very fine pale white pubescence; arista slender, dark brown with concolorous hairs



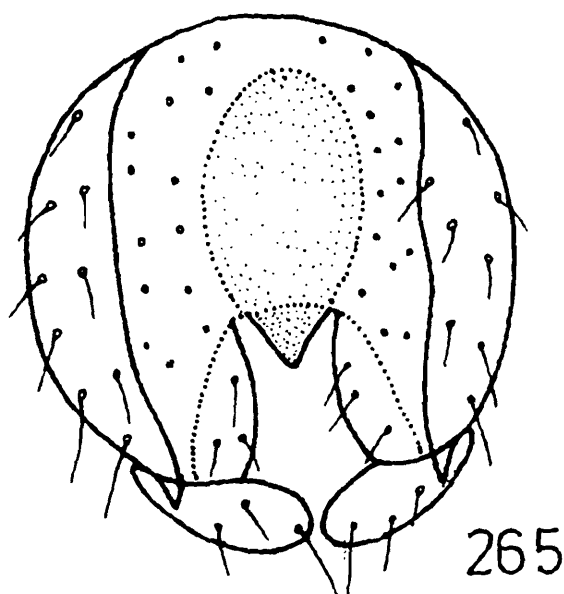
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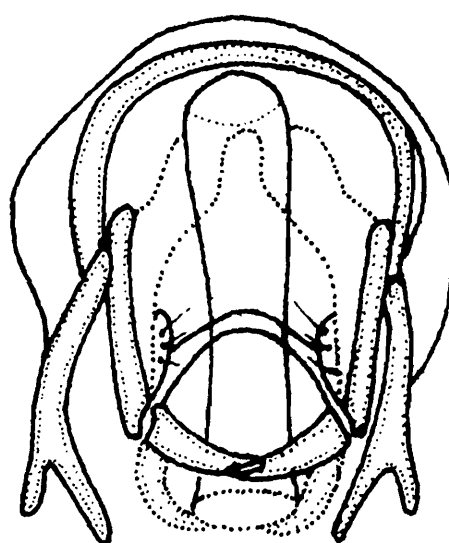
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265



266

Figs. 262-266 : *Rhodesiella lungleiensis*, sp. n. 262, Scutellum. 263, Hind femur, male. 264, Wing.

but for thickened yellow base. Eye large, bare, with vertical long axis. Gena sublinear, shiny black behind and along lower margin and yellowish brown in front and with a row of 8-9 slender hairs along oral margin; vibrissal corner projecting a trifle beyond lower anterior margin of eye and merging with the raised up lower facial margin; vibrissa well developed; postgena moderately developed, black with short, slender, whitish hairs. Palpi brownish black; proboscis distally brownish yellow with slender concolorous hairs. Head bristles well developed, yellow; *out* and the cruciate *pvt* subequal; *ivt* two-thirds the *out*; *oc* a trifle longer than *ivt*; *orb* 8, sequentially anterior ones becoming shorter and slender, longest a little shorter than *ivt*; *if* about 9, a little shorter than longest *orb*, arranged in a row outside triangle along each lateral margin.

Thorax : Shiny black. Scutum as wide as head and a trifle wider than long, with convex disc bearing coarse, dense punctae and long golden yellow hairs; scutellum (Fig. 262) of the *manii*-type but a trifle shorter, 1.3 x as long as wide at base, triangular, greatly thickened with prominently convex disc, more densely and coarsely punctate than and pubescent like scutum. Pleura shiny; *anepst* with very dense and *kepst* in the lower part with a few short golden yellow hairs. Thoracic bristles yellow; *h* 1, hardly longer than humeral hairs; *npl* 1+1, posterior one a little longer and stouter than the anterior; *pa* 1 longer than posterior *npl*, borne on a wart; *pa* 2 and 1 *dc* subequal, much shorter and slender than *pa* 1; a row of prescutellar hairs, are present which are longer and more conspicuous than other thoracic hairs; scutellar bristles and tubercles of the *manii*-type; *as* nearer to each other than to *ss* 1, a little shorter than scutellum; *ss* 1 0.6 x as long as *as*, nearer to *ss* 2 than to *as*; *ss* 2, 0.4 x as long as *as*; all scutellar bristles borne on prominent tubercles of which the one at base of *as* is very well developed and all tubercles are black basally and yellow distally.

Wing (Fig. 264) : Much shorter than body, 2.7 x as long as wide, hyaline with brown veins; costal sectors 2 to 4 in the ratio 9 : 12 : 5; r-m cross-vein in the middle of discal cell; terminal sector of vein m 1+2 very slightly curved a trifle beyond base; anal angle well developed. Haltere yellow.

Legs : Of moderate size, wholly with whitish yellow hairs, except for slightly brownish mid and hind coxae; mid tibia with a short yellow spine; hind femur (Fig. 263) not thickened.

Abdomen : Suboval, only a little narrower than thorax and as wide as long; three basal segments brownish yellow, distal segments brownish black; abdominal hairs dark brown and yellow. Male genitalia (Figs. 265-266) : Epandrium suboval, laterodistally slightly projecting; cercus developed; surstylus suboval, with a few hairs; hypandrium medially slightly widened; pregonite long and slender; distiphallus

long, reaching ventral margin of hypandrium, nearly cylindrical three-fourths its length, slightly swollen distally and ending with broadly obtuse apex.

Length : Male 2.4 mm, wing 1.8 mm.

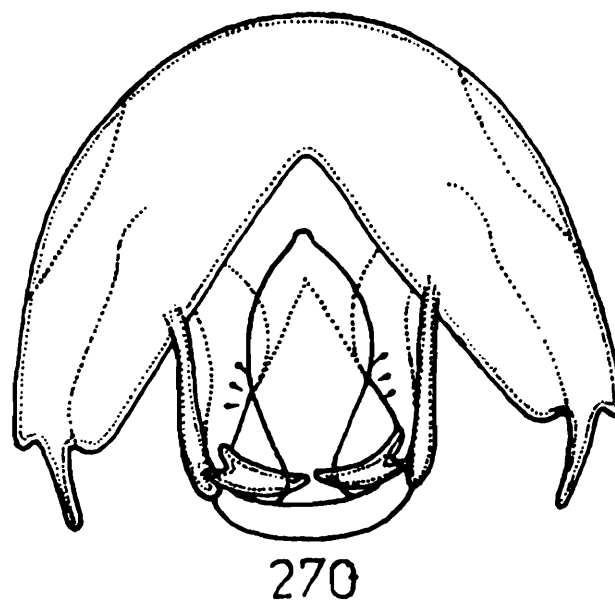
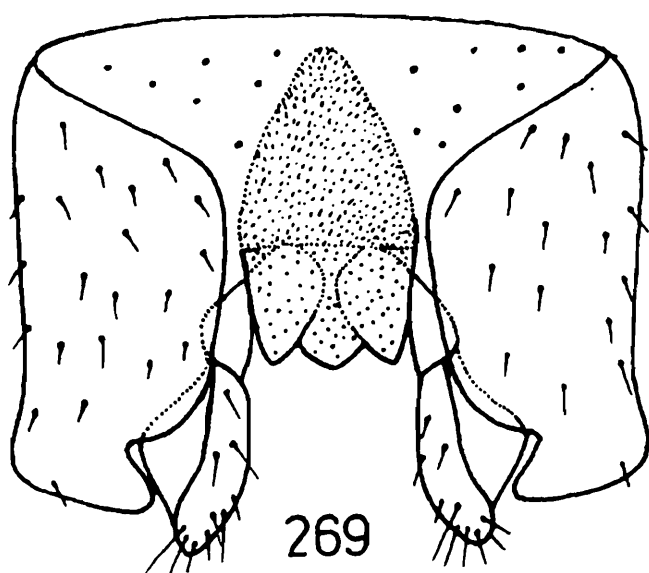
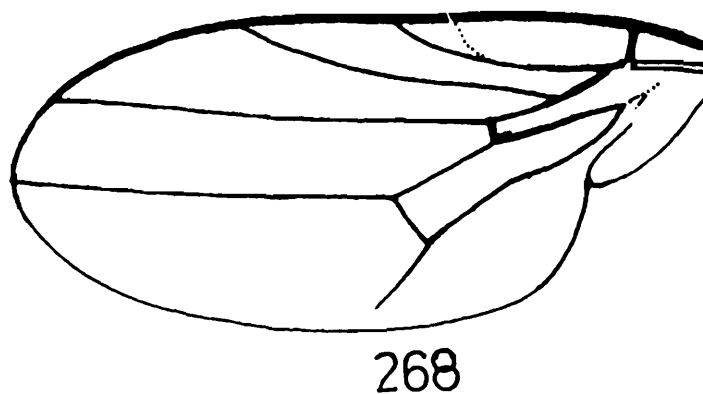
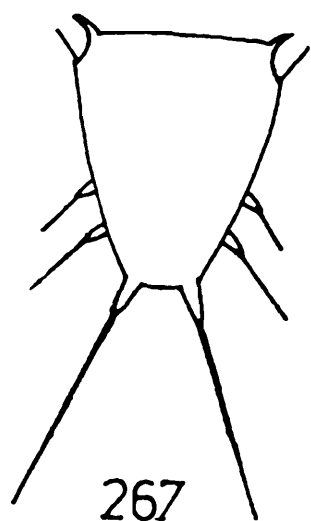
Holotype : Male, Mizoram : Lunglei Dist., Zobawk, 23.iii. 1979, Coll. P.T. Cherian.

R. lungleiensis is related to *manii* Cherian, but differs in possessing apically nearly pointed frontal triangle, short wing and wholly yellow legs. In addition, in *lungleiensis* second sector of costa is shorter than the third sector and abdomen is much broader than in *manii* and is with three completely brownish yellow basal segments. Besides in the nature of epandrium, surstylus, hypandrium, gonites and phallus the two species exhibit marked differences.

56. *Rhodesiella khasiensis* sp. nov. (Figs. 267-270)

Male : Head : Only a trifle higher than long, length, height and width ratio 16 : 17 : 25 ; frons dull brownish black, parallel-sided, width at vertex 0.48 x that of head and equal to its own length, in dorsal view not reaching anterior margins of eyes and projecting very slightly above eyes anteriorly ; frontal triangle large, polished, shiny black, reaching anterior margin of frons and ending with very broadly obtuse apex. Eye very large, bare, with vertical long axis. Face narrower than frons, moderately concave, midlongitudinal more polished and shiny black broad area slightly marked off from the rest of the area by two submedian longitudinal shallow furrows, one on each side, and the areas lateral to these subshiny blackish brown ; lower facial margin white tomentose, rather thin, slightly raised up above face; facial carina very low and not extending beyond bases of antennae. Antenna rather thick ; ant 2 yellow to brownish yellow ; ant 3, 0.8 x as long as wide, brownish yellow with dark tinge along anterodistal margin ; arista slender, dark brown with fine, fairly dense, concolorous pubescence. Gena linear, brownish black with a row of slender oral setae; vibrissal corner dark brown, not projecting, merging with the slightly raised up lower facial margin ; postgena rather reduced, dull black with short slender hairs. Palpi and proboscis short, blackish brown. Head bristles mostly black ; *out* a little stouter and longer than other head bristles ; *ivt* three-fourths as long as *out*; *pvt* cruciate, slightly shorter than *out* ; *oc* almost as long as *ivt* ; *orb* about 6, sequentially anterior ones becoming shorter, longest about two-thirds as long as *ivt* ; *if* 6, subequal, a little shorter than posterior *orb*, in a row outside triangle along each lateral margin; postocular setae short but distinct, black; vibrissa moderately developed.

Thorax : Shiny black ; scutum 1.1 x as wide as long with convex disc bearing fairly dense coarse punctae and golden yellow slender hairs of medium size ; scutellum (Fig. 267) thick, elongate, triangular, length two-thirds that of scutum and 1.5 x its



Figs. 267-270 : *Rhodesiella khasiensis*, sp. n. 267, Scutellum. 268, Wing. 269, Epandrium, ventral view. 270, Phallic complex, ventral view.

own width at base with convex disc which is more coarsely punctate than but pubescent like scutum ; pleura subshiny with short fairly dense hairs on *anepst* and a few such hairs confined mostly to lower margin on *kepst*. Thoracic bristles yellow; *h* 1, two-thirds as long as *ivt* ; *npl* 1 + 1, posterior a trifle longer than anterior one, the former almost as long as *ovt* ; *pa* 1 stouter and a trifle longer than posterior *npl*; *pa* 2 not distinct ; 1 *dc* shorter and slender than *pa* 1; scutellar bristles borne on lower margin of distal half of scutellum ; *as* borne on large tubercle, its length together with that of its tubercle, 0.9 x that of scutellum, nearer to each other than to *ss* 1; *ss* 1 almost equidistant from *as* and *ss* 2, about half as long as *as*, borne on well developed tubercle ; *ss* 2, 0.8 x as long as *ss* 1, borne on small tubercle ; all scutellar tubercles wholly yellow.

Wing : (Fig. 268) 2.5 x as long as wide, hyaline with brown veins and hairs ; costal sectors 2 to 4 in the ratio 22 : 28 : 11 ; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.54 of its length; terminal sectors of veins r 4+5 and m 1+2 subparallel, the latter very faintly convex above near base ; anal angle moderately developed. Haltere yellow with brown tinge on knob.

Legs : Of medium size, wholly yellow with deeply brownish tinge on parts of fore coxa, and all femora and tibiae ; hind tibial spine subterminal, shorter than half the length of first tarsal segment of middle leg; all tarsi entirely yellow.

Abdomen : Longer than wide, width 0.8 x its own length and the width of thorax, two basal segments yellowish brown with dark tinge in certain areas, rest of the segments predominantly blackish brown with fine yellow hairs ; third segment submedially concolorous with basal segments. Male genitalia (Figs. 269-270) : Epandrium much wider than long, laterodistally produced ; cercus well developed ; surstylus subtriangular with a few prominent hairs especially around distal margin; hypandrium nearly semicircular, greatly thickened; gonites moderately developed; distiphallus suboval, abruptly narrowing at distal end.

Length : Male 2.3 mm, wing 2.1 mm.

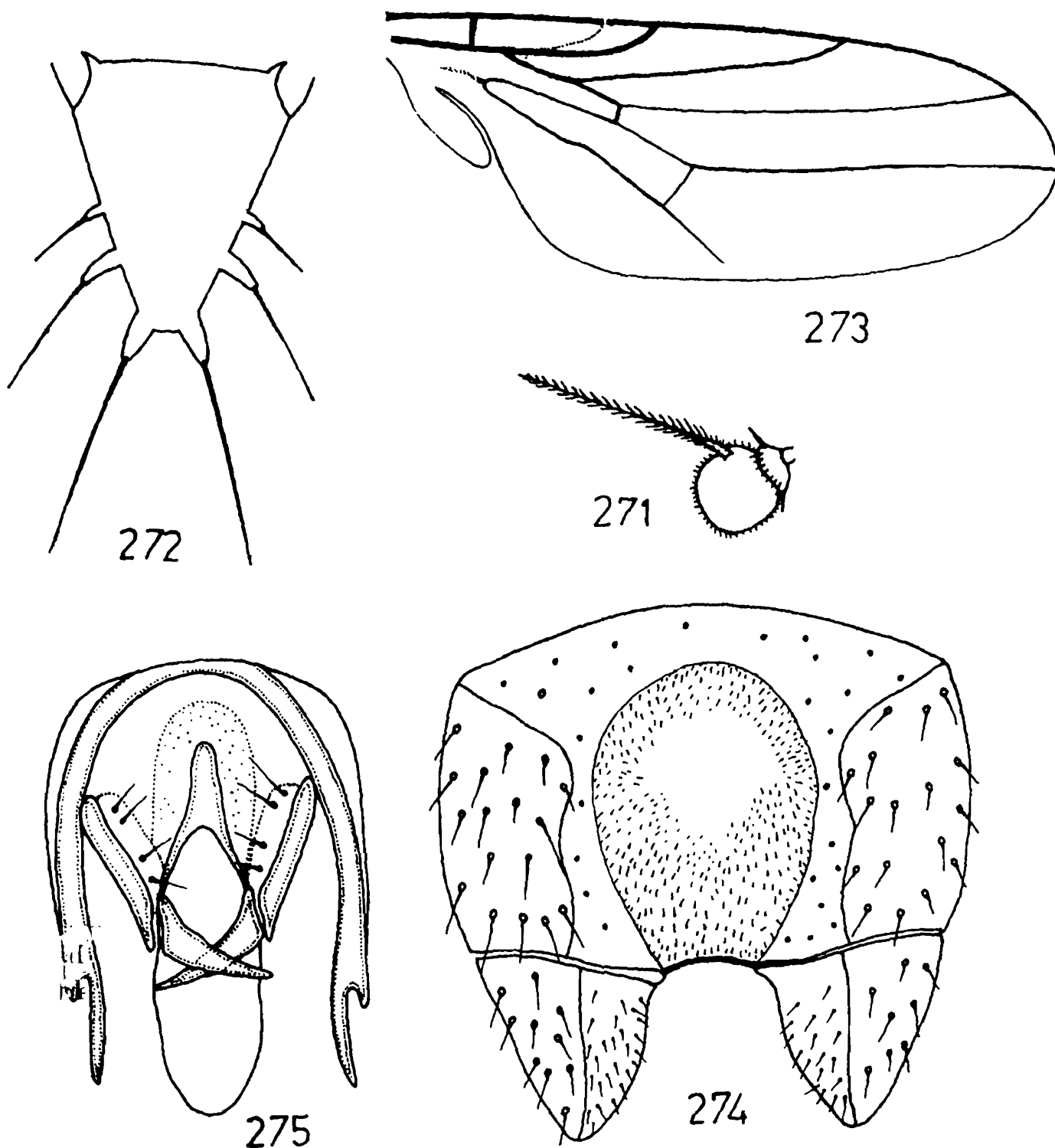
Holotype : Male, Meghalaya : Shillong, 1750 m, 12.xii.1979, Coll. P.T. Cherian.

This species is closely related to *manii* Cherian, but in this species third sector of costa is much longer than the second sector while in *manii* second sector is much longer than the third. Besides, in *khasiensis* scutellar tubercles are yellow, *ss* 1 is equidistant from *ss* 2 and *as*, abdomen is only slightly longer than wide, head bristles are mostly black, all hind tarsi are yellow and male genitalia is less strongly developed while in *manii* scutellar tubercles are partly yellow, *ss* 1 is nearer to *ss* 2 than to *as*, abdomen is long and narrow, head bristles are yellow, last hind tarsal segment is dark brown and male genitalia is extraordinarily developed.

57. *Rhodesiella rubrofrontata*, sp. nov. (Figs. 271-275)

Male : Head : As long as high, length, height and width ratio 2 : 2 : 3. Frons widening at vertex margin, parallel-sided beyond ocellar triangle where its width is half that of head and equal to its own length, subshiny brownish yellow in front and dark brown behind, slightly projecting above and in profile reaching anterior margin of eye ; frontal triangle of medium size, glabrous, shiny brownish black, reaching anterior margin of frons and ending with nearly pointed brownish apex. Face wide, almost as wide as frons anteriorly, finely tomentose especially along lower part of sides, shiny yellowish brown but predominantly black along midlongitudinal area ; facial carina not developed ; lower facial margin a little raised up, finely tomentose. Antenna (Fig. 271) directed outward and downward ; basal segments brownish yellow ; ant 3, 1.4 x as wide as long, densely and finely whitish grey tomentose, yellow ; arista blackish brown, slender but for thickened basal area, with fairly dense blackish brown hairs of medium size. Eye large, in profile occupying much of the area of head, bare with vertical long axis. Gena 0.2 x as wide as ant 3, yellowish brown in front and black behind, with a row of slender yellow hairs along oral margin ; vibrissal corner triangular, projecting a little beyond lower anterior corner of eye with yellow vibrissa of medium size ; postgena somewhat reduced, black, with a few hairs of which those along posterior part are in continuation of the well developed row of postocular setae. Palpi short, brownish yellow with dark tinge medially ; proboscis short, brownish black. Head bristles of medium thickness and length, yellow ; *out* and the cruciate *pvt* subequal ; *ivt* slightly shorter than *out* and equal to *oc* ; *orb* about 8, longest two-thirds as long as *ivt* ; *if* 8, in a row outside triangle along each lateral margin ; *fr* a few, yellow.

Thorax : Shiny black, scutum as wide as head and almost as long as wide, with very prominently convex disc bearing fine punctae which are much less dense than in *manii* and with yellow hairs ; scutellum (Fig. 272) triangular, 1.5 x as long as wide and 0.7 x as long as scutum with thick greatly convex disc which is with yellow as on but very densely and coarsely punctate than scutum but for median part basal half where punctae are rather scattered ; pleura subshiny, *anepst* mostly in median area and *kepst* with scattered yellow hairs. Thoracic bristles yellow ; *h* 1, little shorter than *ivt* ; *npl* 1+1, subequal, more developed than *ivt* ; *pa* 1 equal to *npl*, borne on fine wart ; *pa* 2 short, half as long as *pa* 1 ; 1 *dc* shorter than *pa* 1 ; *as* closer to each other than to *ss* 1, two-thirds as long as scutellum, borne on very prominent tubercle which is one fourth as long as *as*, tubercles of both the *as* greatly diverge distally ; *ss* 1 four-fifths as long as *as*, borne on prominent tubercle which is 0.2 x as long as *ss* 1 ; *ss* 2 one-third as long as *as*, borne on tubercle which is 0.3 x as long as *ss* 2 ; tubercle at base of *ss* 1 equidistant from those at bases of *as* and *ss* 2.



gs. 271-275 : *Rhodesiella rubrofrontata*, sp. n. 271, Antenna. 272, Scutellum. 273, Wing. 274, Epandrium, ventral view. 275, Phallic complex, ventral view.

Wing (Fig. 273) : As long as body and much longer than wide, hyaline with yellowish brown veins and brown hairs ; costal sectors 2 to 4 in the ratio 19 : 15 : 10 ; r-m cross-vein slightly distad of the middle of discal cell, opposite 0.54 of its length ; terminal sectors of veins r 4+5 and m 1+2 parallel but for slightly diverging distal part, the latter without any flexure near base ; anal angle slightly reduced. Haltere yellow.

Legs : Longer and slender than in *manii*, almost wholly brownish yellow except for deeply brownish linear markings especially on femora and tibiae and dark brown last three tarsal segments of fore leg, last tarsus of mid leg and distal part of first and whole of second and last tarsi of hind leg.

Abdomen : Narrow and slender, half as wide as thorax and 0.4 x as long as body, much shorter than in *manii*, brownish black. Male genitalia (Figs. 274-275) much shorter than in *manii* in comparison to the size of the body ; epandrium wider than long ; cercus not developed ; surstyus large, subtriangular, with numerous hairs ; hypandrium subcylindrical ; distiphallus suboval, ending with obtuse apex ; gonites well developed ; phallapodeme moderately developed, not reaching ventral margin of hypandrium.

Length : Male 2.5 mm, wing 2.5 mm.

Holotype : Male, Meghalaya : Shillong, 12.xii.1979, Coll. P.T. Cherian.

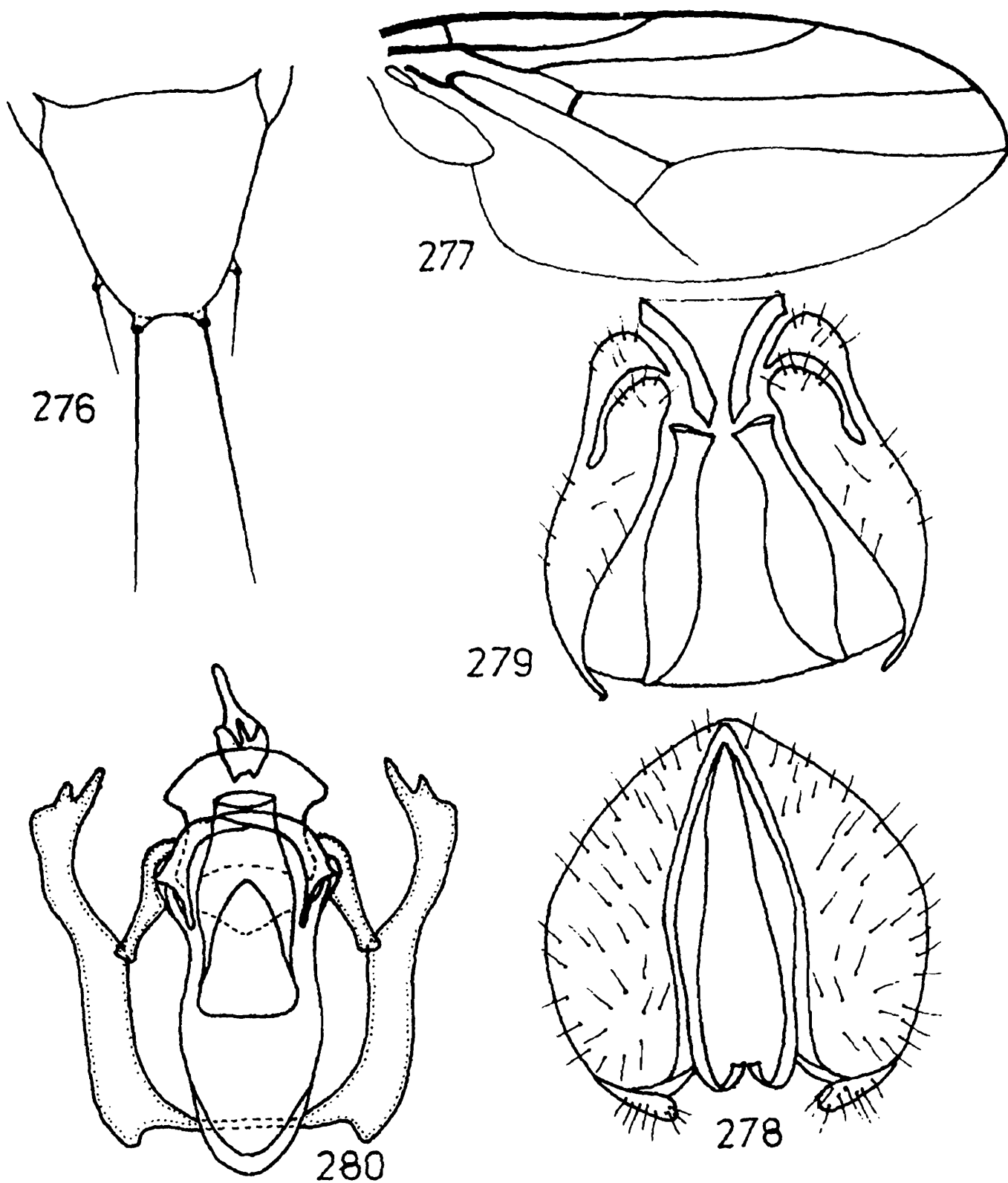
This species is related to *manii* Cherian but differs in the nature and colouration of frons, shape of frontal triangle, colour of face, nature of thoracic punctae, proportions of costal sectors and nature of abdomen. Besides, the male genitalia of the two species show marked differences.

58. *Rhodesiella elegantula* (Becker) (Figs. 276-280)

1911. *Meroscinis elegantula* Becker, *Ann. hist. nat. Mus. nat. Hung.* 9 : 89. Type Localitie. : Taiwan : Chip-Chip, Kozempo, Koshun.
1913. *Meroscinis quadriseta* de Meijere, *Tijdschr. Ent.*, 56 : 296. Type Locs. : Java : Salatiga, Sron dol (Semarang).
1931. *Macrostyla affinis* Malloch, *Ann. Mag. nat. Hist.* (10) 8 : 67. Type Loc. : Java : Pelaboean.
1931. *Macrostyla elegantula* var. *hawaiiensis* Malloch, *Ann. Mag. nat. Hist.*, (10) 8 : 66. Type Loc. Hawaiian Islands : Waimea, Kauai.
1977. *Rhodesiella elegantula* (Becker) : Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 296.
1977. *Rhodesiella quadriseta* (de Meijere) : Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 292. N. Syn.

Male and female : Head : Higher than long, length, height and width ratio 14 : 17 : 24 ; frons slightly narrowing and projecting above but not beyond eye margins anteriorly, width at vertex half that of head and 0.9 x its own length, subshiny black ; frontal triangle polished metallic blue green to violet blue, with a slight pimple-like elevation near centre, immediately anterior to which is a shallow rounded to oval depression and in some specimens the area immediately posterior and lateral to the pimple-like elevation clearly depressed which is especially more distinct in some angles of illumination. Eye large, bare with vertical long axis. Face deeply concave, mid longitudinal area shiny black with finely rugulose subshiny sides ; facial carina very low, linear and reaching middle of face ; lower facial margin raised up (in one specimen very prominent in the form of a semicircular projection) with very fine dark pubescence and appearing tomentose. Antenna with basal segments usually yellow but in some specimens with dark tinge ; ant 3 about as long as wide, predominantly yellow to reddish yellow but for dark brown dorsodistal area but in a few specimens nearly dark brown except for base and ventrodiscal ferruginous areas ; arista of medium length, gradually becoming more slender distally, with short, dark brown pubescence. Gena linear, black, with a row of white hairs along oral margin ; vibrissal corner subtriangular, appearing projecting beyond lower facial margin because of its merger with lower facial margin ; postgena weakly developed, with yellowish white hairs. Palpi black ; proboscis black but for paler distal surface. Head bristles usually yellow to whitish yellow but in a few *ovt*, *ivt* and *pvt* and in two specimens even *orb* black ; *ovt* and *pvt* subequal ; *ivt* three-fifths as long as *ovt* ; *oc* equal to *ivt* ; *orb* 8, recumbent, sequentially anterior ones becoming shorter and slender, posterior most equal to *oc* ; *if* about 8, equal to medium-sized *orb*, in a row outside triangle along each lateral margin ; vibrissa of medium-size, usually whitish yellow but in a few specimens black.

Thorax : Almost as wide as head and as long as wide, shiny black ; scutum with convex disc bearing very coarse and dense punctae with golden to whitish yellow hairs ; scutellum (Fig. 276) elongate subtriangular, 1.2-1.3 x as long as wide at base, with rounded apex, which is nearly transverse between *as*, and flattened disc which is distally thin and bearing hairs and punctae as on scutum ; pleura shiny and polished with propleuron much less rugulose than in *dimidiata* ; *anepst*, *anepm* and *kepst* with whitish yellow hairs. Usually *h*, *pa* 1 and *as* black and the rest yellow to whitish yellow but in a few, *ss* 1 also black and in one specimen *as* of one side black and the other yellow ; *h* 1, subequal to *ivt* ; *npl* 1+1, a trifle longer than *h* and equal to 1 *dc* ; *pa* 1 distinctly longer than *npl* ; *pa* 2 hair-like but distinct ; *as* 1.2 x as long as scutellum, usually equidistant from each other and *ss* 1, borne on well developed black tubercle ; *ss* 1 0.2-0.3 x as long as *as*, borne on small, black tubercle.



Figs. 276-280 : *Rhodesiella elegantula* (Becker). 276, Scutellum. 277, Wing. 278, Epandrium, posterior view, 279, Epandrium, ventral view. 280, Phallic complex, ventral view.

Wing (Fig. 277) : 2.4 x as long as wide, hyaline with brown veins and pubescence ; proportions of costal sectors 2 to 4 in the ratio 11 : 16 : 6 but in one specimen in the ratio 12 : 12 : 5 ; r-m cross-vein in the middle of discal cell ; terminal sectors of r 4+5 and m 1+2 subparallel in the distal half, the former nearly straight, the latter slightly convex above a little beyond base ; anal angle moderately developed. Haltere yellow.

Legs : Predominantly yellow with two distal tarsi of hind leg deeply brown to dark brown and in most of the specimens distal one or two tarsi each of fore and mid legs also with deeply brownish tinge ; mid tibial spine short, yellow ; hind femur not thickened.

Abdomen : A little narrower than thorax and longer than wide, black to brownish black but for paler tinge on two basal segments. Female cerci slender, black. Male genitalia (Figs. 278-280) : Epandrium deeply incised, in profile as broad as long ; hypandrium narrow medially at base ; pregonite rather slender ; postgonite with a process near base which is much shorter than in *Neorhodesiella* ; phallapodeme extends beyond hypandrium.

Length : Male 2.5-3 mm, wing 2-2.5 mm; female 2.8-3.2 mm, wing 2.2-2.5 mm.

Specimens studied : 1 female, 2 females (?) (abdomen partly damaged), W. Bengal : Darjeeling Dist., Goke F.R.M., 18.iv.1973, Coll. H.S. Sharma ; 5 males, 4 females, Meghalaya : Shillong : Elephant Falls, 21.iv. 1980, Coll. P.T. Cherian ; 1 male, 2 females, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian; 1 male, Meghalaya : Shillong, 26.iv.1980, Coll. P.T. Cherian ; 1 female, Kerala : Idukki : Painavu, 24.ii.1984, Coll. P.T. Cherian.

Remarks : Typical specimens of *elegantula* show differences in the colouration of some head and thoracic bristles, one or two distal tarsi of fore and mid legs and relative sizes of *as* and *ss* 1, as discussed above, which are characters used by de Meijere, Malloch and others in separating *quadriseta* (de Meijere) from *elegantula*. These differences are considered to be of intraspecific nature because at times some specimens show such variations in the colouration of bristles of both sides. Besides, the male genitalia of these specimens showing variations are identical and hence *quadriseta* is only a junior synonym of *elegantula*.

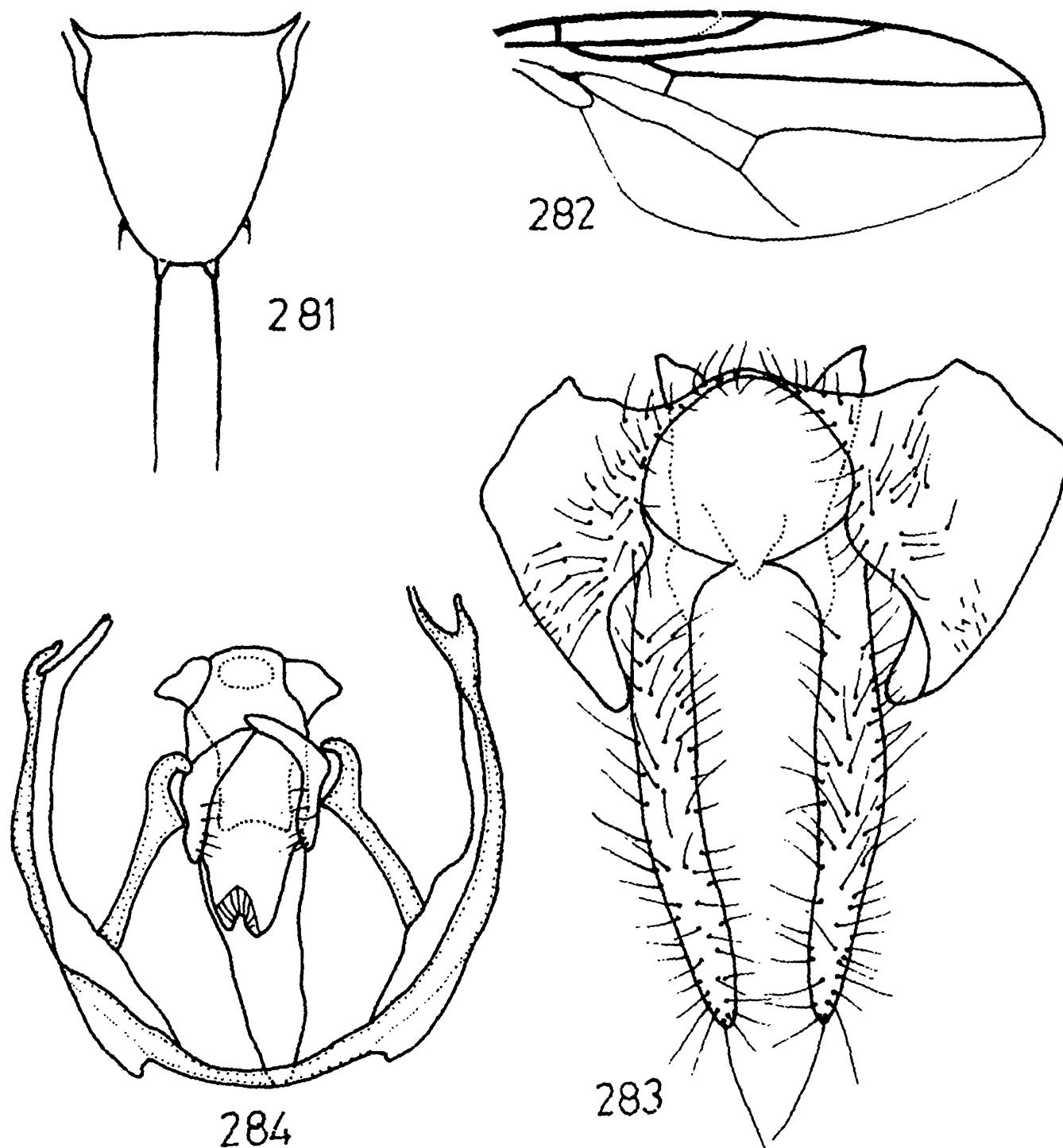
59. *Rhodesiella dimidiata* (Becker) (Figs. 281-284)

1911. *Meroscinis dimidiata* Becker, *Ann. hist. nat. Mus. nat. Hung.* 9:91. Type Locality : Taiwan : Yentempo.

1977. *Rhodesiella dimidiata* (Becker): Sabrosky, *Cat. Dipt. Orient. Region, 3* : 296. (Taiwan, Malaya).

Male and female: Head : Higher than long and much wider than high, length, height and width ratio 9 : 10 : 14 ; frons dull brownish black, width at vertex 0.46 x that of head and 0.78 x its own length, nearly parallel-sided, projecting slightly above and distinctly beyond eye margins in front with well developed yellowish white *fr* confined mostly to anterior part ; frontal triangle polished black, with a small pimple-like elevation at centre, reaching anterior margin of frons and ending with broadly obtuse apex. Eye, large, bare, in profile occupying much of the area of head, with distinctly oblique long axis. Frons deeply concave, shiny black but longitudinally submedian area finely rugulose ; facial carina distinct between antenna, low, linear, not extending beyond middle of face ; lower facial margin distinctly raised up, medially depressed and more broadened than at the sides, upper part light brown, lower half brownish black. Frons forms a short roof over bases of antennae ; basal antennal segments yellow, with a dark tinge in some specimens ; ant 2 with a row of short yellowish white hairs along distal margin ; ant 3 as wide as long, predominantly yellow to brownish yellow except for infuscated dorsodistal area, in some specimens infuscation covers the entire dorsal half ; arista slender, basal part brownish yellow, distal part dark brown with short, fairly dense, concolorous pubescence. Gena sublinear, width 0.2 x that of ant 3, dull black with a row of whitish hairs along oral margin ; vibrissal corner subtriangular, projecting a little beyond lower margin of eye, with yellowish white vibrissa of medium size ; postgena rather reduced, black with a few white hairs. Palpi flattened, black, with a few black hairs ; proboscis concolorous with palpi but for upper rim. All head bristles white to yellowish white ; *out* longer and stouter than other head bristles ; *ivt* 0.7 x as long as *out* ; *pvt* cruciate, 0.85 x as long as *out* ; *oc* slender, almost as long as *ivt* ; *orb* 10-11, recumbent, sequentially anterior ones becoming shorter and slender, anterior most three hair-like, longest subequal to *ivt* ; *if* about 10, directed inward and slightly forward, subequal to *orb*.

Thorax : Shiny black ; scutum medially flattened, more so posteriorly, almost as wide as long with very coarse dense punctae bearing golden yellow to yellowish white hairs ; scutellum (Fig. 281) 1.25 x as long as wide, with flattened disc which is thin distally and with narrowly rounded apex, pubescent and densely punctate like scutum with the hairs along lateral and distal margins very dense. Pleura more polished and shiny in certain areas with the area anterior to *anepst* mostly rugulose, *anepst*, *kepst* and *anepm* with short white hairs. Thoracic bristles white to yellow ; *h* 1, shorter than longest *orb* ; *npl* 1+1, subequal, longer than *h* ; *pa* 1 a little longer than and 1 *dc* as long as *npl* ; *pa* 2 distinct, a trifle shorter than *npl* ; *as* equidistant from each



Figs. 281-284 : *Rhodesiella dimidiata* (Becker). 281, Scutellum. 282, Wing. 283, Epandrium, dorsal view. 284, Phallic complex, ventral view.

other and ss 1 but in a few specimens distinctly nearer to each other than to ss 1, length excluding that of tubercle 0.8-0.9 x that of scutellum, borne on small black tubercle ; ss 1, 0.15-0.2 x as long as as, borne on a very short black tubercle ; in a few specimens ss 1 very small and borne on a wart.

Wing (Fig. 282) : Much shorter than body, 2.5 x as long as wide, hyaline, with pale brown tinge and brown veins ; costal sectors 2 to 4 in the ratio 14 : 14 : 5 ; r-m cross-vein in the middle to slightly proximad of the middle of discal cell, opposite 0.47 of its length ; terminal sector of r 4+5 nearly straight, that of m 1+2 weakly sinuate and distinctly convex above at about one-fifth of its length from base ; anal angle moderately developed. haltere with brown to yellowish brown stalk and blackish brown knob.

Legs : Predominantly yellow, with yellow hairs and yellow mid tibial spine, except for infuscated last tarsal segment of each leg ; in some specimens two distal tarsi of fore leg distinctly and last two tarsi of hind leg partly infuscated and in a few all tarsi of mid leg yellow ; hind femur not thickened.

Abdomen : 1.3-1.5 x as long as wide and much narrower than thorax, subshiny brownish black with slender pale hairs. Female cerci short and very slender. Male genitalia (Fig. 283-284) : Epandrium deeply incised ; cercus well developed, greatly prolonged posteroventrally, nearly as long as width of epandrium, with long setae ; phallapodeme much narrower than in *elegantula* ; gonites and phallic complex showing affinities to those of *elegantula*.

Length : Male 2.7-3.2 mm, wing 2-2.4 mm ; female 2.7-3.2 mm, wing 2-2.6 mm.

Distribution : Taiwan, Malaya, Japan, India.

Specimens studied : 4 males, 4 females, Tamil Nadu : Krusadi Is., 8.iii. 1989, Coll. C. Radhakrishnan.

Remarks : *R. dimidiata* differs from *elegantula* in its blackish brown knob of haltere, anteriorly projecting frons, black frontal triangle which is without any depression in front of the pimple-like elevation while in the latter species haltere is yellow, frons does not project beyond eyes, frontal triangle is bluish green and with a small depression in front of the pimple-like projection which is located a little beyond the centre. Besides, while in *dimidiata* second sector of costa is equal to the third sector, in *elegantula* second is shorter than the third.

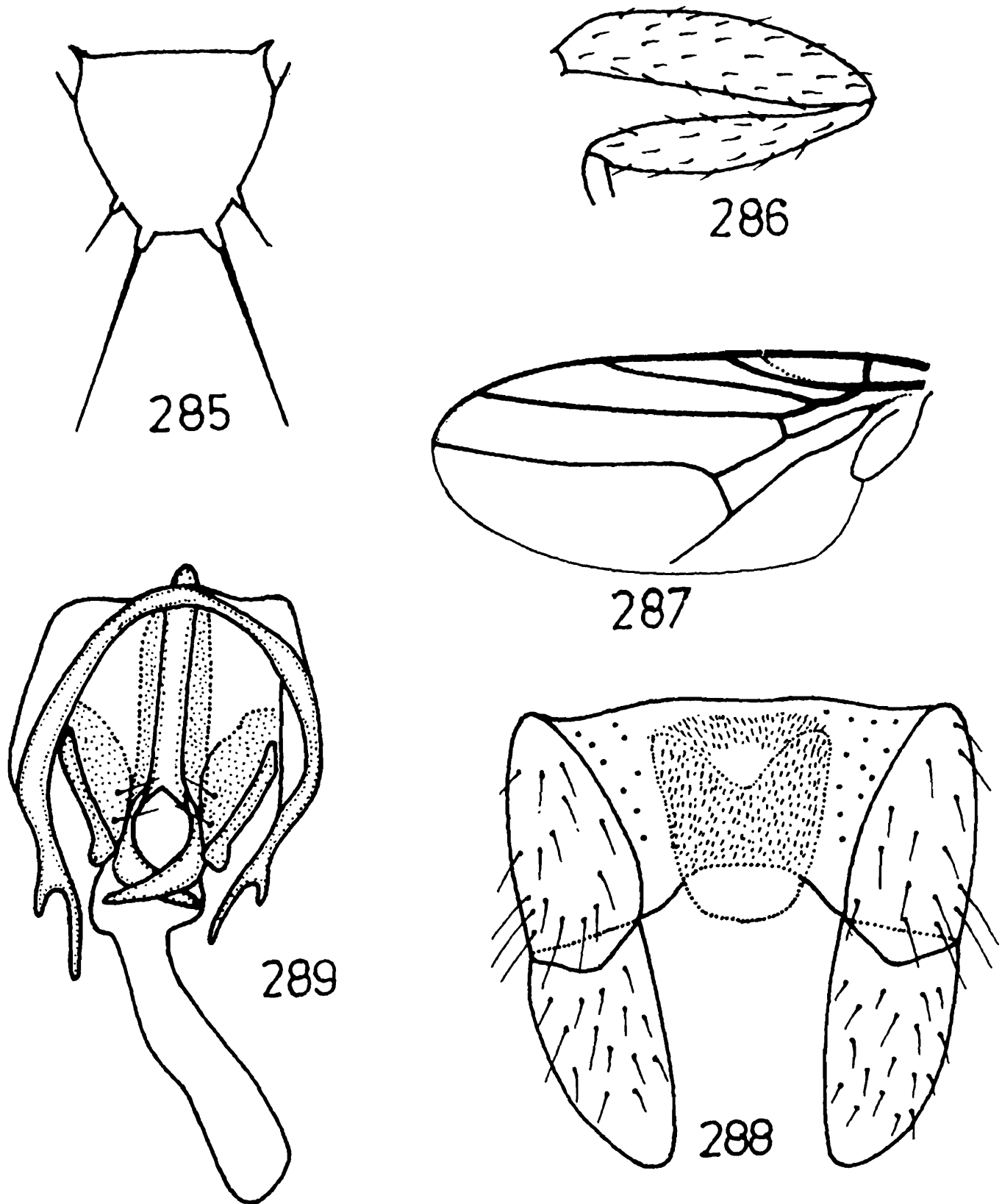
60. *Rhodesiella depressa* sp. nov. (Figs. 285-289)

Male : Head : A trifle higher than long, length, height and width ratio 6 : 7 : 9 ; frons very slightly narrowing anteriorly, nearly parallel sided, width at vertex about

half that of head and $0.9 \times$ its own length, subshiny black, projecting slightly above but not beyond anterior margins of eye and with a few short *fr*; frontal triangle glossy greenish blue, reaching anterior margin of frons, subtrapezoidal, width anteriorly about half that at vertex, with prominent pimple-like elevation in the centre at two-thirds its length from vertex margin immediately anterior to which is an oval large depression and at each side inner to lateral margin and confined to anterior half, three smaller rounded depressions. Eye large, bare with vertical long axis. Face shiny brownish black, concave, with two submedian longitudinal low and linear elevations, one on each side, reaching nearly lower facial margin which is a little up. Antenna with basal segments yellow and with fine yellow pubescence; ant 3 almost as long as wide, yellow but anterodistal area slightly infuscated; arista of medium-size, dark brown with short, fairly dense, concolorous pubescence. Gena linear, black, vibrissal corner merging with lower facial margin and appearing slightly projecting; postgena rather reduced, black, with a few fine hairs. Palpi and proboscis brownish black. Head bristles of medium size; *out* $1.2 \times$ as long as the cruciate *pvt*; *ivt* three-fifths as long as *out*; *oc* subequal to *ivt*; *orb* about 8, sequentially anterior ones becoming shorter and slender, longest equal to *ivt*; *if* 8, in a row outside triangle along each lateral margin; vibrissa of medium-size.

Thorax: Shiny black; scutum as long as wide, disc a trifle more convex than in *elegantula*, densely and coarsely piliferous punctae with whitish yellow hairs of medium size; scutellum (Fig. 285) half as long as scutum and $1.15 \times$ as long as wide at base with flattened disc, which is thin distally and broadly rounded and transverse between *as* along distal margin, pubescent and punctate like scutum; pleura mostly smooth and shiny; propleuron not so rugulose as in *dimidiata* and *atrifrons*; *anepst* and some areas of *kepst* and *anepm* with short whitish yellow hairs. Thoracic bristles black; *h* 1, equal to longest *orb*; *npl* 1+1, subequal and a trifle longer than *ivt*; *pa* 1 longer than *npl*; *pa* 2 a trifle shorter than *h*; 1 *dc* subequal to *npl*; *as* widely separated at base, nearer to *ss* 1 than to each other, $1.2 \times$ as long as scutellum, borne on well developed black tubercle; *ss* 1 one-third as *as*, borne on small but distinct black tubercle.

Wing: (Fig. 287): $2.5 \times$ as long as wide, hyaline with brown veins and fine, brown pubescence; costal sector 2 to 4 in the ratio 8 : 10 : 5; r-m cross vein slightly proximad of the middle of discal cell, opposite 0.47 of its length; terminal sectors of r 4+5 and m 1+2 nearly parallel in the distal half, the former concave below along its entire length, the latter distinctly sinuate with a flexure at around one-fifth its length from base and convex above in that area; anal angle moderately developed. Haltere pale yellow.



Figs. 285-289 : *Rhodesiella depressa*, sp.n. 285, Scutellum. 286, Hind femur, male. 287, Wing. 288, Epandrium, dorsal view. 289, Phallic complex, ventral view.

Legs : Fore coxa rusty yellow but partly with a tinge of infuscation ; mid and hind coxa brownish black ; fore trochanters yellow ; mid and hind trochanters deeply brown ; fore femur brownish yellow ; mid femur brownish black but one-third its length proximally and one-fifth its length distally yellow ; hind femur in male (Fig. 286) predominantly brownish black except for yellow basal and distal ends ; all tibia yellow but for very faint tinge of infuscation ; all tarsi yellow except for deeply brownish to slightly infuscated last two tarsi each of all legs ; mid tibial spine short, hair-like, yellow ; hind femur not thickened.

Abdomen : Slightly narrower than thorax and 1.3 x as long as broad, brownish black with diffused yellowish brown tinge confined to median areas of two basal segments.

Male genitalia (Figs. 288-289). Epandrium short, much wider than long ; cercus developed ; hypandrium a trifle longer than wide ; distiphallus elongated, club-shaped ; phallapodeme extending beyond hypandrium, much narrower than in *elegantula* ; pregonite slender, ending with a knob ; postgonite hook-like.

Length : Male 1.7 mm, wing 1.5 mm.

Holotype : Male, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian.

This species is related to *elegantula* (Becker), but is much smaller. It can be easily distinguished by the presence of 7 depressions on frontal triangle unlike one in *elegantula*. Besides, while in the latter all coxae and femora are yellow, in *depressa* mid and hind coxae and femora are predominantly brownish black. Besides, the male genitalia of the two species exhibit marked differences.

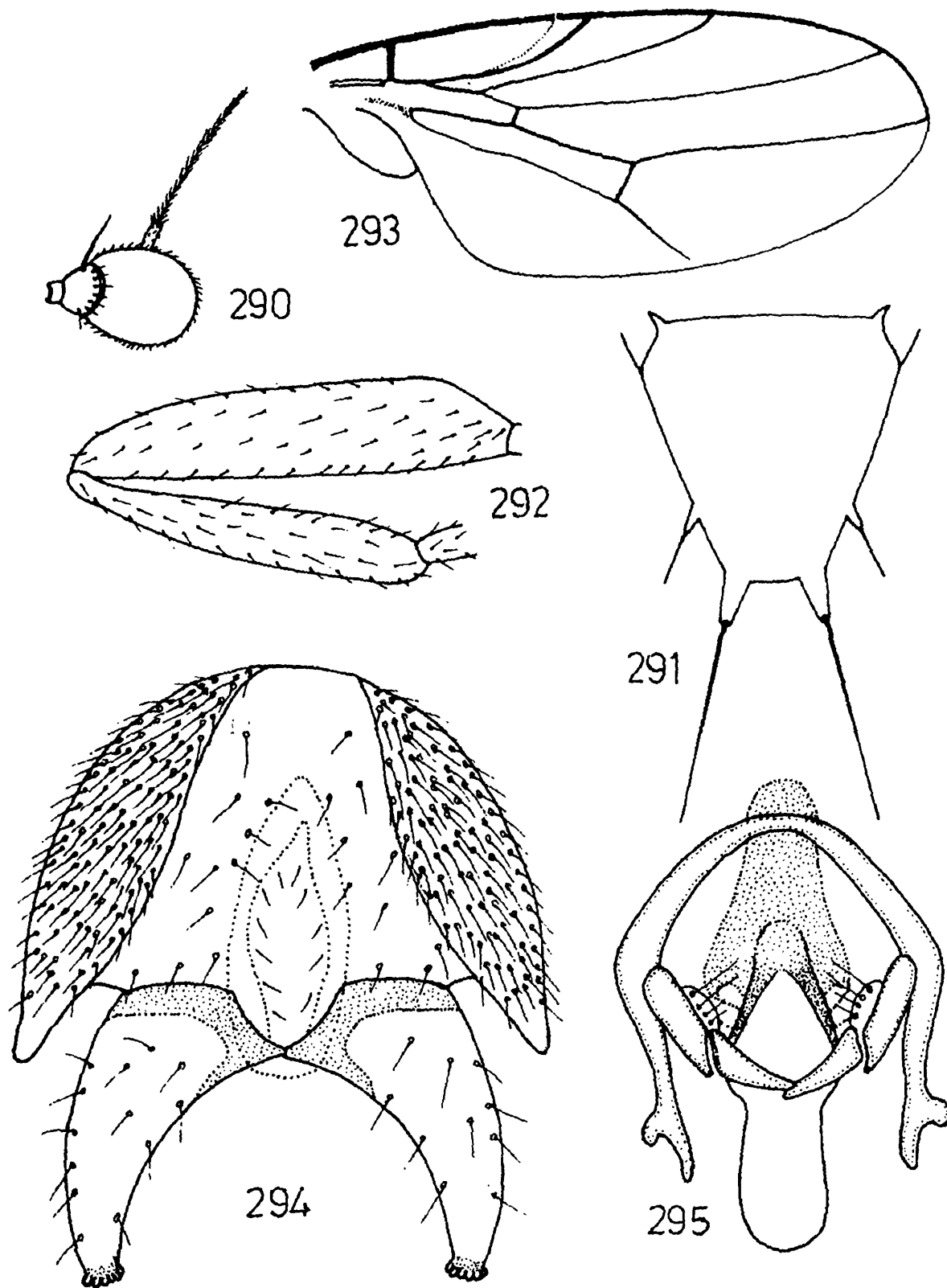
61. *Rhodesiella orientalis*, sp. nov. (Figs. 290-295)

Male : *Head* : Only a trifle higher than long and much wider than high, length, height and width ratio 17 : 18 : 30 ; frons nearly parallel sided, width at vertex half that of head and equal to its own length, dull brownish black with a few yellow *fr* and projecting a trifle above eyes anteriorly ; frontal triangle glossy blackish blue, irregularly elevated in parts, with a broad shallow sulcus on each side of ocelli extending from vertex margin to about two-fifths the length of frons, a deep somewhat interrupted impressed longitudinal line from in front of anterior ocellus to anterior extremity, a large pimple-like projection midlongitudinally at four-fifths the length from the vertex and this divided into two by the midlongitudinal impressed line and a transverse line just behind anterior margin extending nearly whole width of frons, triangle reaching this transverse line anteriorly and ending with broadly obtuse,

rather rounded apex. Eye large, bare with oblique long axis. Face deeply concave, black broad area midlongitudinally glossy and lateral parts finely rugulose; facial carina limited to area between bases of antennae and not extending beyond; lower facial margin sharply protuberant with finely yellowish tomentose thickened margin. Antenna (Fig. 290) rather erect; basal segments yellow; ant 2 with fine yellow pubescence and black dorsal spine; ant 3 almost as long as wide, yellow with anterodistal area blackish brown; arista one-third its length basally brownish yellow, the rest dark brown with fine dark brown pubescence which is more dense than in most other species of the genus. Gena 0.2 x as wide as ant 3, black with a row of yellowish white hairs along oral margin; vibrissal corner merging with the raised up lower facial margin and appearing projecting beyond lower anterior margin of eye; postgena rather reduced, black, with a few conspicuous yellowish white hairs. Palpi dull black, flattened; proboscis short and stumpy, black with brownish distal margin. Head bristles well developed, pale to golden yellow; *out* longer than other head bristles; *ivt* three-fifths and the cruciate *put* three-fourths as long as *out*; *oc* equal to *ivt*; *orb* about 9, recumbent, sequentially anterior ones becoming shorter and slender, anterior most two *fr*-like, longest subequal to *ivt*; *if* about 9, in a row outside triangle along each lateral margin; vibrissa slender, of medium size.

Thorax: Shiny black, with bluish tinge; scutum as wide as long, disc more convex than but very coarsely and densely punctate like and with yellowish white hairs as in *elegantula*; neck region very prominent with transverse markings; humeral callus clearly marked off from scutum and very prominent; scutellum (Fig. 291) 1.2 x as long as wide and half as long as scutum, thinner distally, narrowly rounded at apex, transverse between *as*, with flattened disc which is punctate and pubescent like scutum; pleura glossy, propleuron less rugulose than in *dimidiata*; *anepst* with dense and *kepst* with a few yellowish white hairs. Thoracic bristles yellow, except for black posterior *npl* and scutellar bristles; *h* slender, equal to longest *orb*; *npl* 1+1, posterior a little stouter and longer, a little longer than *ivt*; *pa* 1 and 1 *dc* subequal and a little longer than posterior *npl*; *pa* 2 distinct, equal to *h*; *as* equidistant from each other and *ss* 1, 0.9 x as long as scutellum, black, borne on a very prominent black tubercle; *ss* 1, 0.43 x as long as *as*, brownish yellow, borne on a well developed black tubercle which is about half as long and stout as the one at base of *as*.

Wing (Fig. 293): 2.5 x as long as wide, hyaline with brown veins and pubescence costal sectors 2 to 4 in the ratio 14:15:7; r-m cross-vein very slightly proximad of the middle of discal cell, opposite 0.48 of its length; terminal sectors of veins r 4+5 and m 1+2 nearly parallel, the former faintly concave below its entire length, the latter slightly convex above at around one-fifth its length from base; anal angle moderately developed. Haltere yellow.



Figs. 290-295 : *Rhodesiella orientalis*, sp. n. 290, Antenna. 291, Scutellum. 292, Hind femur, male. 293, Wing. 294, Epandrium, dorsal view. 295, Phallic complex, ventral view.

Legs : Including coxae honey-yellow except for black last two tarsi each of fore and hind legs, unlike in *atrifrons* (Malloch) in which all fore tarsi also are yellow ; hind femur (Fig. 292) slightly thickened especially in basal half a little beyond base, without ventral denticles, ventral surface practically straight ; mid tibial spine short, yellow ; hind femur with darkish tinge longitudinally in some areas and appearing distinct in certain angles of illumination.

Abdomen : Suboval, only a little narrower than thorax and slightly wider than long, basal segments brownish yellow with darker sides and yellow hairs, distal segments brownish black with dark hairs. Male genitalia (Figs. 294-295) : Epandrium much wider than long ; surstylus long, narrowing distally and ending with obtuse apex bearing many short black teeth ; hypandrium widened medially ; phallapodeme large, extending beyond hypandrium ; pregonite short and stumpy, tapering distally ; postgonite short ; distiphallus short, subcylindrical, ending with obtuse apex.

Length : Male 3 mm, wing 2.4 mm.

Holotype : Male, Meghalaya : Nangpo, 18.iv.1980, Coll. P.T. Cherian.

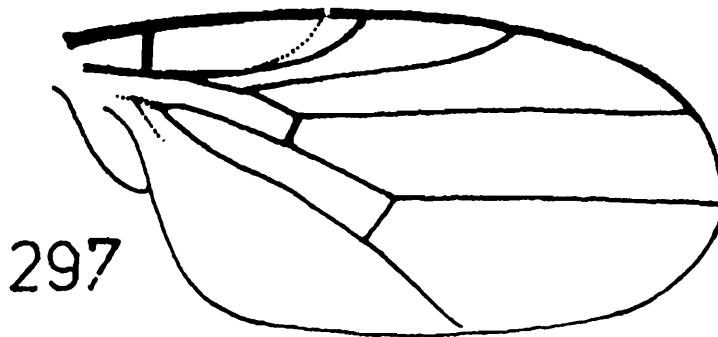
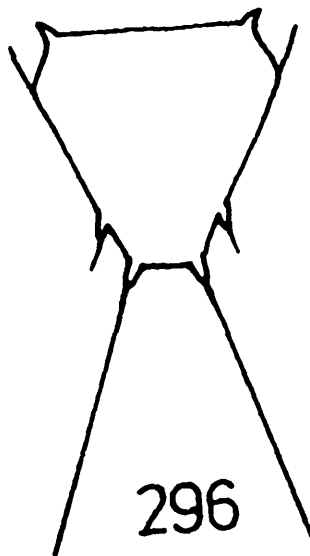
This species is closely related to *atrifrons* (Malloch) from Philippines but unlike the latter it has uniformly dull black frons, blackish blue frontal triangle, predominantly brownish yellow basal abdominal segments, no bluish tinge on abdomen and relatively thickened hind femur with darkish tinge longitudinally in some areas under certain angles of illumination. Besides, in *orientalis* last two fore tarsi are black and arista is with very dense hairs of medium size while in *atrifrons* all fore tarsi are honey yellow and arista hairs are very short.

62. *Rhodesiella nigrimana* (Malloch) (Figs. 296-297)

1931. *Macrostyla nigrimana* Malloch, *Ann. Mag. nat. Hist.*, (10) 8 : 63. Type locality : Philippines : Manila.

1977. *Rhodesiella nigrimana* (Malloch) : Sabrosky, *Cat. Dipt. Orient. Region*, 3 : 297.

Female : Head : Higher than long, length, height and width ratio 11 : 13 : 17 ; frons very slightly narrowing anteriorly, width at vertex half that of head and 0.85 x its own length, dull brownish black, projecting slightly above eyes anteriorly and reaching anterior margin of eyes ; frontal triangle glossy blue black with a small pimple-like elevation in the centre but unlike in *elegantula*, without depression in front of the elevation, reaching anterior margin of frons and ending with nearly transverse apical margin where its width is about half that at vertex. Eye large, bare, with oblique long



Figs. 296-297 : *Rhodesiella nigrimana* (Malloch). 296, Scutellum. 297, Wing.

axis. Antenna yellow ; ant 2 with a row of fine yellow hairs along distal margin ; ant 3 as long as wide, anterodistal area narrowly darkened ; arista fuscous with fairly dense rather short hairs as in *dimidiata*. Face slightly concave, glossy black but for less shiny sides ; facial carina low and linear between antennae and not reaching beyond middle of face ; lower facial margin slightly raised up, finely tomentose. Gena linear, black ; vibrissal corner slightly projecting beyond lower margin of eye and merging with the raised lower facial margin ; postgena rather reduced, with a few short hairs. Palpi and proboscis dark brown, the latter partly with ferruginous tinge. Head bristles yellow ; *out* a trifle longer than the cruciate *pvt* ; *ivt* three-fifths as long as *out* ; *oc* subequal to *ivt* ; *orb* about 8, recumbent, longest subequal to *ivt*, anterior ones sequentially becoming shorter ; *if* 8, in a row outside frontal triangle, along each lateral margin.

Thorax : Shiny black with slight greenish tinge ; scutum about as wide as long with convex disc, which is a little flattened especially in the posterior half, bearing coarse densely piliferous punctae (less dense than in *elegantula*) and yellow hairs of medium size ; scutellum (Fig. 296) half as long as scutum and 1.15 x as long as wide, thinner distally, broadly rounded and transverse between *as* and having distinctly flattened disc which is more coarsely punctate than and pubescent like scutum ; propleuron partly rugulose ; *anepst*, *kepst* and *anepm* with short hairs. Thoracic bristles, and scutellar tubercles yellow ; *h* 1, subequal to *ivt* ; *npl* 1+1, subequal, a trifle longer than *h* ; *pa* 1 slightly longer than and 1 *dc* nearly as long as *npl* ; *pa* 2 a trifle shorter than *h*, hair-like ; *as* 1.25 x as long as scutellum borne on short but distinct tubercle which is nearer to that at base of *ss* 1 than to that of its pair ; *ss* 1 one-fourth as long as *as* but much slender, borne on very short, fine tubercle.

Wing (Fig. 297) : 2.4 x as long as wide, hyaline with brown veins ; costal sectors 2 to 4 in the ratio 4 : 5 : 3 ; r-m cross-vein nearly in the middle of discal cell ; terminal sector of r 4+5 slightly concave below its entire length, that of m 1+2 distally straight, hardly flexed around one fifth its length from base ; anal angle moderately developed. Haltere yellow.

Legs : Wholly yellow except for black four apical tarsi of fore legs and deeply brownish to infuscated fifth tarsus of mid and hind legs ; mid tibial spine short, yellow ; hind femur without denticles.

Abdomen : Much narrower than thorax and longer than wide, brownish black but for the yellowish median areas of two basal segments. Female cerci short, with a few slender hairs.

Length : Male 1.75 mm (from earlier description) ; female 1.9 mm, wing 1.5 mm.

Specimen studied : 1 female, Mizoram : Lunglei Dist., Tuipui, 23.iii.1979, Coll. P.T. Cherian.

Remarks : This species was hitherto known only by the type specimen, a male, from Manila in Philippines. This is the first record of the female and also the first report of the species after it was originally described. The specimen agrees with the type but for some differences in the proportions of the length of costal sectors. According to Malloch second and fourth sectors of costa are equal while in the specimen before me second sector is 1.33 x as long as the fourth. *R. nigrimana* can readily be differentiated from related species like *elegantula* (Becker), *atrifrons* (Malloch) and others by the colouration of fore tarsi and the relative lengths of *as* and scutellum.

Genus 5 *Neorhodesiella*, gen. nov.

Type species : *Neorhodesiella typica* (Cherian) (= *Rhodesiella typica* Cherian; 1973)
Oriental Insects, 7 (2) : 208- 210

A genus closely related to *Rhodesiella* Adams but differing in having usually short and rounded scutellum, long 1 *dc*, only very fine tubercle or wart at base of *as* and the build of the male genitalia.

Head slightly to distinctly higher than long and wider than high with black hairs and bristles. Frons shiny or subshiny with a few *fr*; frontal triangle broad at vertex, smooth, very rarely rugulose, shiny black or bluish black, reaching anterior margin of frons and ending with pointed obtuse or very broadly obtuse apex. Eye large, bare, with vertical or oblique long axis. Face usually narrow, flat or concave; facial carina usually not developed, very rarely low and linear. Antenna partly yellow or dark brown; ant 3 small, subreniform and wider than long; arista long, slender, with long rather dense hairs. Gena narrow to linear; postgena with short hairs. Proboscis short or of medium size; palpi short, cylindrical. Head bristles well developed; *out* longer than other head bristles; *ivt* and *put* at times subequal; *orb* 4-6, reclinate, longest one about two-thirds the *out*; *oc* long, proclinate, widely divergent; oral vibrissa moderately developed.

Thorax shiny black to dark brown with dark or yellow hairs and bristles. Scutum generally convex, wider than long with dense to fairly dense hairs arising from coarse or fine punctae; pleura glabrous with hairs on *anepst* and *kepst*; scutellum usually much wider than long, very rarely as long as wide, almost always with convex disc and rounded in outline, pubescent like scutum. Thoracic bristles comprising 1 *h*, 1+1 *npl*, *pa* 1 and very long 1 *dc* (only very rarely 1 *dc* a little shorter); scutellar bristles borne on very fine tubercles or warts; *as* equal to or longer than scutellum; *ss* 1, exhibiting various degrees of development.

Wing of medium size; terminal sector or r 4+5 usually distinctly bent forward apically, that of m 1+2 straight or nearly straight. Haltere usually yellow, very rarely dark brown.

Legs wholly or mostly partly black and partly yellow; unlike in many species of *Rhodesiella* hind femur not thickened and without spines or warts at anteroventral and posteroventral surfaces; tibial organ not developed.

Abdomen : of medium size, black or partly yellow. Female cerci usually slender. Male genitalia mostly of medium size; epandrium usually with short surstyli; postgonites with sclerotized long processes; distiphallus greatly elongate, slender,

arched or bent and almost uniformly cylindrical; hypandrium concave medially at the usually narrowing basal end.

Distribution : The distributional records of this genus are not clearly known since species of this genus were earlier dealt with under *Rhodesiella*. This genus is fairly abundant in the Oriental Region and some species may occur in the other Regions also.

Remarks : The short and usually rounded scutellum, long 1 *dc*, very fine tubercles or-warts at the bases of the scutellar bristles, greatly elongated, slender, arched and almost uniformly cylindrical phallus, presence of sclerotized processes on postgonites and the nature of the build of the hypandrium serve to distinguish *Neorhodesiella* from *Rhodesiella*, a genus to which it is closely related and under which all the hitherto known species of this genus were included. Generic transfer of all the species belonging to this genus from *Rhodesiella* should await detailed study of individual species, especially the genitalia. Out of the species described under *Rhodesiella* at least *tibiella* (Becker), *latipennis* (de Meijere), *finitima* (Becker), *flavitibia* (Duda), *varicornis* (Malloch), *typica* Cherian, *longicosta* Cherian, *rubrohalterata* Cherian, *nigritibia* Cherian and *lutea* Cherian known from the Oriental Region, *africana* (Malloch) recorded from the Afrotropical Region and *fedtshenkoi* Nartshuk from the Palaearctic Region belong to *Neorhodesiella* and are hence transferred to this genus.

Biology : Nothing is so far known about the biology of this genus and the immature stages are unknown.

Key to the species of *Neorhodesiella* from India and adjacent countries

1. Knob of haltere brownish black*rubrohalterata* (Cherian)
 Knob of haltere yellow to brownish yellow 2
2. Legs yellow except for last one or two tarsal segments of each leg 3
 Atleast femora partly or wholly black or brownish black 4
3. Thoracic hairs whitish yellow; *orb* 6; 1 *dc* shorter than *pa* 1; two apical fore tarsal segments brown*brevidorsalis*, sp. n.
 Thoracic hairs dark brown; *orb* 4; 1 *dc* distinctly longer than *pa* 1; only last fore tarsal segment brown*lutea* (Cherian)
4. Frontal triangle distinctly rugulose; terminal sector of *m* 1+2 slightly convex above along its entire length; mid tibial spine more than half as long as first tarsus of mid leg*rugulosa*, sp. n.

- Frontal triangle smooth and shiny; terminal sector of m 1+2 not convex above along its entire length though at times slightly flexed a little beyond its base; mid tibial spine not more than half as long as first tarsus of mid leg.....5
5. Second sector of costa longer than the third sector 6
- Second sector of costa equal to or shorter than the third sector 7
6. r-m cross-vein slightly proximad of middle of discal cell; scutum with very fine and less dense punctae; scutellum greatly convex; *as* borne on very fine tubercle; *as* 1, very short and slender, borne on a wart*atypica*, sp. n.
- r-m cross-vein slightly distad of middle of discal cell; scutum with dense and less fine punctae; scutellum with slightly convex to at times nearly flattened disc; *as* and *ss* 1 well developed and borne on well developed tubercles
.....*longicosta* (Cherian)
7. All tibiae entirely yellow.....8
- Atleast hind tibia partly brownish black 9
8. Frons at vertex more than half as wide as head and wider than long; frontal triangle with obtuse apex; arista relatively long with long pubescence; thoracic hairs golden brown to brownish yellow; scutellum much wider than long and semicircular in outline; third sector of costa longer than the second or the fourth sector*typica* (Cherian)
- Frons at vertex less than half as wide as head and as long as wide; frontal triangle with pointed apex; arista relatively short and with short pubescence; thoracic hairs deeply brown to dark brown; scutellum nearly as long as wide and subtriangular in outline; costal sectors 2-4 equal*dravida*, sp. n.
9. Frons with two to three short, faint, linear longitudinal depressions on each side of which outer most almost extending to vertex margin; frontal triangle with two short shallow sulci, one on each side of posterior ocelli, becoming sharply narrowed anteriorly and ending with sharply pointed apex; ant 3 very dark brown with yellowish tinge around base; knob of haltere reddish yellow with dark tinge at base dorsally*keralaensis*, sp. n.
- Frons without longitudinal linear depressions; frontal triangle without sulci, not sharply narrowing anteriorly and not ending with sharply pointed apex; ant 3 yellow to reddish yellow; knob of haltere wholly yellow 10

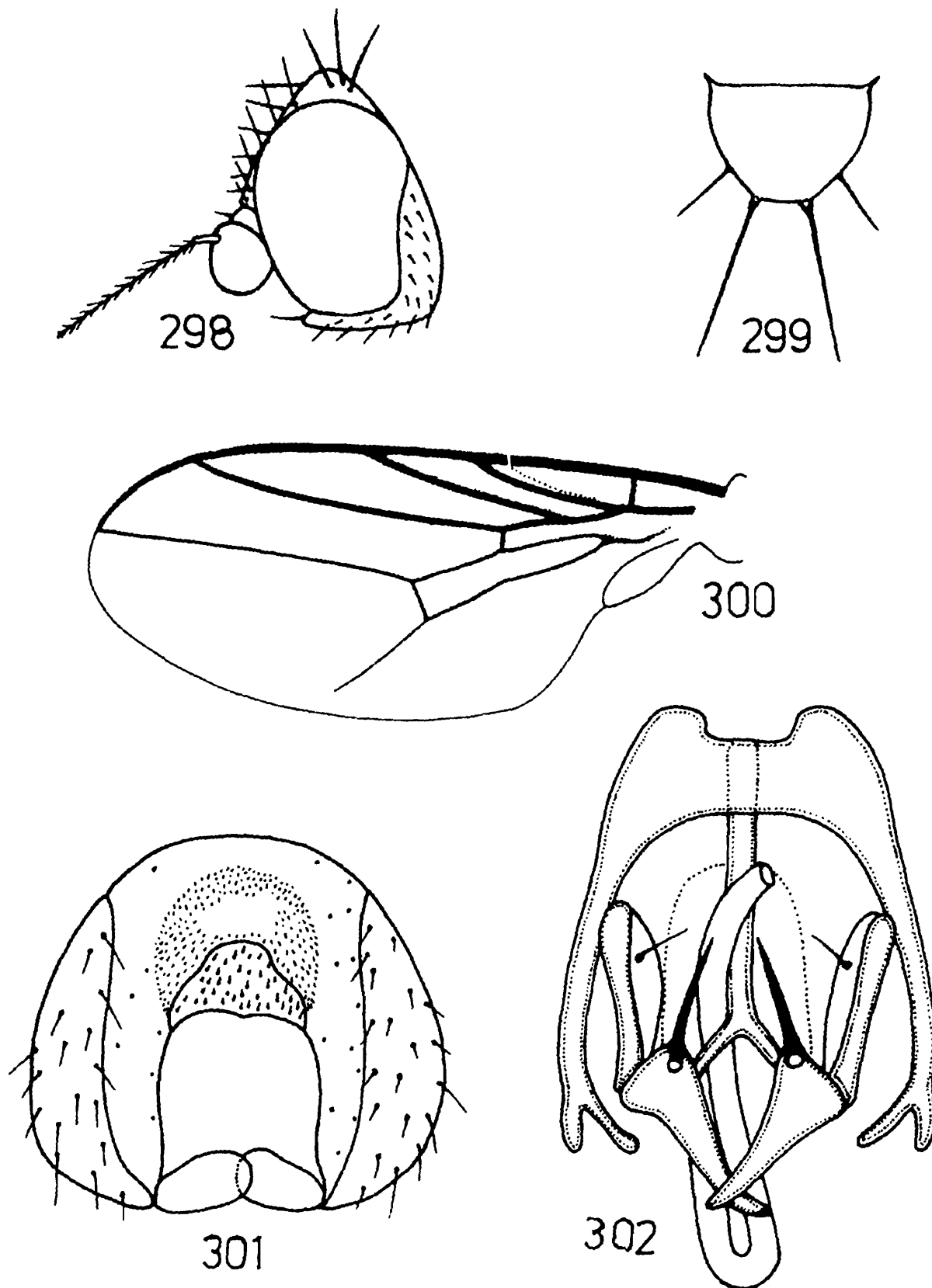
10. Scutellum with almost flat to slightly convex disc; all tibiae partly dark to brownish black; thoracic hairs dark brown *nigritibia* (Cherian)
 Scutellum with distinctly convex disc; fore and mid tibiae yellow; thoracic hairs pale yellow *tibiella* (Becker)

63. *Neorhodesiella typica* (Cherian) N. Comb (Figs. 298-302)

1973. *Rhodesiella typica* Cherian, *Orient Insects*, 7 (2) : 208-210. Type locality : India : Uttar Pradesh : Agra.

Male, and Female : Head (Fig. 298) : 1.2 x as high as long and 1.5 x as wide as high; frons very slightly narrowing anteriorly, width at vertex 0.57 x that of head and a little more than its own length, dull black to brownish black and with a few *fr*; frontal triangle glabrous, black to brownish black, reaching anterior margin of frons and ending with obtuse (in some of the types appearing slightly short and transverse) apex. Eye large, with very minute, scattered pubescence visible under high magnification (not bare as mentioned in the original description) and with vertical long axis. Face concave, smooth, shiny black to brownish black; facial carina low, linear, reaching a little beyond middle of face; lower facial margin slightly raised up. Antenna short; basal segments black to brownish black; ant 3, 0.75 x as long as wide, yellow; arista long, blackish brown with well developed concolorous pubescence. Gena one fourth as wide as ant 3, black to brownish black with a tinge of grey discernible in some specimens and a row of 6 hairs on oral margin; vibrissal corner slightly projecting, subtriangular; postgena rather well developed, concolorous with gena, with a few dark hairs. Palpi and proboscis black to brownish black. Head bristles black; *out*, *ivt* and the cruciate *pvt* subequal; *oc* a trifle shorter than *out*; *orb* 5, posteriormost one more than two-thirds as long as *out* and 1.6-1.8 x as long as the one next to it, the rest sequentially becoming shorter, anteriormost very short, slender and hair-like; *if* 5, subequal to second *orb*, in a row outside triangle along each lateral margin; vibrissa very well developed, more than 2 x as long as hairs on oral margin.

Thorax : Shiny black to brownish black; scutum 0.9 x as long as wide with convex disc bearing fine punctae and golden brown hairs of medium size (in certain angles of illumination hairs appear brown to yellow; scutellum (Fig. 299) short, semicircular, 1.5 x as wide at base as long with slightly convex disc (which appears a little flattened especially in some specimens), which is more coarsely punctate than but pubescent like scutum; pleura shining; *anepst* and *kepst* with a few short hairs. Thoracic bristles black; *h* 1, 0.7 x as long as *out*; *npl* 1+1, subequal, a trifle longer than *h*; *pa* 1, 1.5 x as long as *npl*; *pa* 2.06 x as long as *pa* 1; 1 *dc* very well developed 1.5 x as long as *out* and distinctly longer than *pa* 1; *as* 1.2-1.5 x long as scutellum, set on a very



Figs. 298-302 : *Neorhodesiella typica* (Cherian). 298, Head, lateral view. 299, Scutellum. 300, Wing. 301, Epandrium, ventral view. 302, Phallic complex, ventral view.

short tubercle which is equidistant from each other and ss 1, the latter 0.25-0.45 x as long as as, borne on a wart; in some specimens ss 1 very short and slender while in others more stout and longer.

Wing (Fig.300) : 2.4 x as long as wide, hyaline with brown to pale brown veins and brown pubescence; costal sectors 2 to 4 in the ratio 10 : 14 : 10-10 : 12 : 8; r-m cross-vein almost in the middle or very slightly distad of the middle of discal cell, opposite 0.53 of its length; terminal sectors of r 4+5 and m 1+2 diverging distally, the former strongly curving towards costa, the latter straight along its entire length; anal angle moderately developed. Haltere yellow to whitish yellow.

Legs : Coxae and femora blackish brown to brownish black except for the yellow distal ends of the latter; trochanters yellow; all tibiae and four basal tarsi of all legs yellow, the last tarsus of each leg infuscated; mid tibial spine of medium size, black,

Abomen : Only a trifle narrower than thorax, subshiny brownish black, with scattered slender hairs. Female cerci short, slender, black. Male genitalia (Figs. 301-302) Epandrium small, in profile nearly as broad as long; surstylus short, articulated with inner side of epandrial incision, 1.5 x as long as broad and weakly narrowed basally; hypandrium narrowing towards basal end where it is deeply concave (rather cup shaped) medially; postgonite with a large, elongated sclerotized process; basiphallus greatly elongated, greatly arched, in some specimens U-shaped, slender and of uniform width.

Length : Male 1.3-1.5 mm; wing 1.1-1.3 mm; female 1.5-1.7 mm, wing 1.2-1.4 mm.

Specimens studied : Holotype : Male, India : U.P. Agra, grass-sweepings, 24.vii. 1968, Coll. P.T. Cherian; paratypes : 8 males, 11 females, data same as of holotype. *Other examples* : 3 males, 3 females, Kerala : Trichur, grass-sweepings, 19.x. 1967, Coll. P.T. Cherian; 3 males, 5 females, Kerala : Pathanamthitta Dist., Thalachera, grass-sweepings, 8.vi. 1968; 2 males, 2 females, Kerala : Pathanamthitta Dist., Eraviperoor, 20.ix. 1968, Coll. P.T. Cherian; 1 male, 1 female, U.P. Gorakhpur, 27.xi. 1967 Coll. Ipe M. Ipe; 1 female, West Bengal : Madhpur, 13.x. 1909, Coll. C. Paiva; 2 females, Nicobar : Campbell Bay 4.iii. 1966, Coll. A. Daniel; 1 male, 3 females, Orissa : Mayurbhanj Dist., Baripada, 18.iii. 1973, Coll. S.K Gupta; 1 male, 1 female Gujarat : Mehsana, 25.xii. 1973, Coll. P.T. Cherian; 3 females, Kerala : Pathanamthitta Dist., Kakkad, 31.xii. 1983, Coll. P.T. Cherian; 2 males, Kerala : Pathanamthitta Dist. Kakpad, 31. xiii. 1983, Coll. P. T. Cherian; 5 males, 7 females, Kerala : Idukki, 24.ii. 1984, Coll. P. T. Cherian; 1 female, Kerala : Cochin, 28.ii. 1984, Coll. P.T. Cherian; 1 female, Tamil Nadu : Chengalpet, 25. xi. 1987, Coll. P.T. Cherian; 1 male, Tamil Nadu : Kanyakumari Dist., Kodayar, 30.iii. 1988, Coll. Koshy Mathew; 3 females, Kerala : Quilon Dist., Thenmala, 11.i. 1989, Coll. P.T. Cherian.

N. typica (Cherian) resembles *latipennis* (de Meijere) in having semicircular scutellum and four scutellar bristles. Besides, in both the species r 4+5 distinctly curves forward apically but unlike in *latipennis* in this species frontal triangle is without a median sulcus, tibiae are entirely yellow, ant 3 is yellow and not blackish brown and basal antennal segments are darkened and not pale. This species exhibits a wide range of variations in respect of proportions of costal sectors, nature of convexity of scutellum and relative size of ss 1. In one specimen from Nicobar Islands, thorax is dark ferruginous with brownish yellow pleura and legs dark, rather predominantly yellowish brown to partly darkish brown coxae and femora. In this specimen the head and mouthparts also have a light brown tinge. But for these differences in colouration this specimen agrees with the types of *typica* as does another specimen from the same locality (partly damaged), in which general colouration of head and thorax is more like that of typical specimens of *typica*. In both the specimens all tarsi are yellow but in a few typical specimens of *typica* last tarsal segment of each leg is at times, only faintly brown. Hence all are considered belonging to the same species.

64. *Neorhodesiella longicosta* (Cherian) N. Comb. (Figs. 303-307)

1973. *Rhodesiella longicosta* Cherian, *Oriental Insects*, 7 (2) : 215-216. Type locality : India : Meghalaya : Chirapunji.

Male and Female : Head : (Fig. 303) : A trifle higher than long, length, height and width ratio 17 : 18 : 25. Frons wider than long and wider at vertex than in the middle, width in the middle 0.53 x that of head, anteriorly projecting distinctly above but not beyond eye margin, shiny black; frontal triangle glabrous, shiny black with brown tinge in some specimens, reaching anterior margin of frons and ending with broadly to narrowly obtuse apex (not truncate apex as mentioned in the original description). Eye large, bare, suboval with vertical long axis. Face concave, shiny brownish black, narrower than anterior part of frons and progressively becoming narrower below; facial carina very low, linear, nearly reaching distinctly raised, rather thin, lower facial margin. Antenna short, directed outward and downward; basal segments dark brown; ant 3 yellow, 1.5 x as wide as long; arista dark brown with dense, well developed, concolorous pubescence. Gena black, sublinear; vibrissal corner subtriangular, not reaching anterior margin of eye; postgena black, with fine hairs; palpi short, dull black; proboscis dark brown to pale brown. Head bristles and *fr* black to brownish black; *out* slender, almost three-fifths as long as width of eye; *ivt* nearly equal to or in a few trifle longer than *out*; *orb* 6, recumbent, successively anterior ones becoming shorter, posteriormost in many specimens 0.75 x to nearly as long as *out* and the rest very short, slender and less than half the first; *if* 6-7, in a row outside frontal triangle along each lateral margin, longest about half the *out*; *oc* proclinate,

strongly divergent, equal to *ivt*; *put* cruciate, subequal to *ivt*; vibrissa more developed than the fine hairs along oral margin.

Thorax : Shiny black; scutum 1.21 x as wide as long, with convex disc bearing dense, fine punctae and slender long white hairs; scutellum (Fig. 304) thickened 1.1 x as wide at base as long, with somewhat flattened (especially in some specimens) or slightly to more distinctly convex disc which is much coarsely punctate than and pubescent like scutum; pleura shiny black to brownish black; *anepst* with a few finely punctate yellowish white hairs; *kepst* with a few hairs as on *anepst*. Thoracic bristles rather slender, black; *h* 1, distinctly shorter than *out*; *npl* 1+1, anterior equal to and posterior one a little longer than *h*; *pa* 1 well developed, as long as *out*; *pa* 2 short, slender, hair-like; 1 *dc* very well developed, 1.5 x as long as *pa* 1; *as* widely separated at base, but nearer to each other than to *ss* 1, 1.6 x as long as scutellum, borne on well developed tubercle; *ss* 1, 0.4 x as long as *as*, borne on very short tubercle.

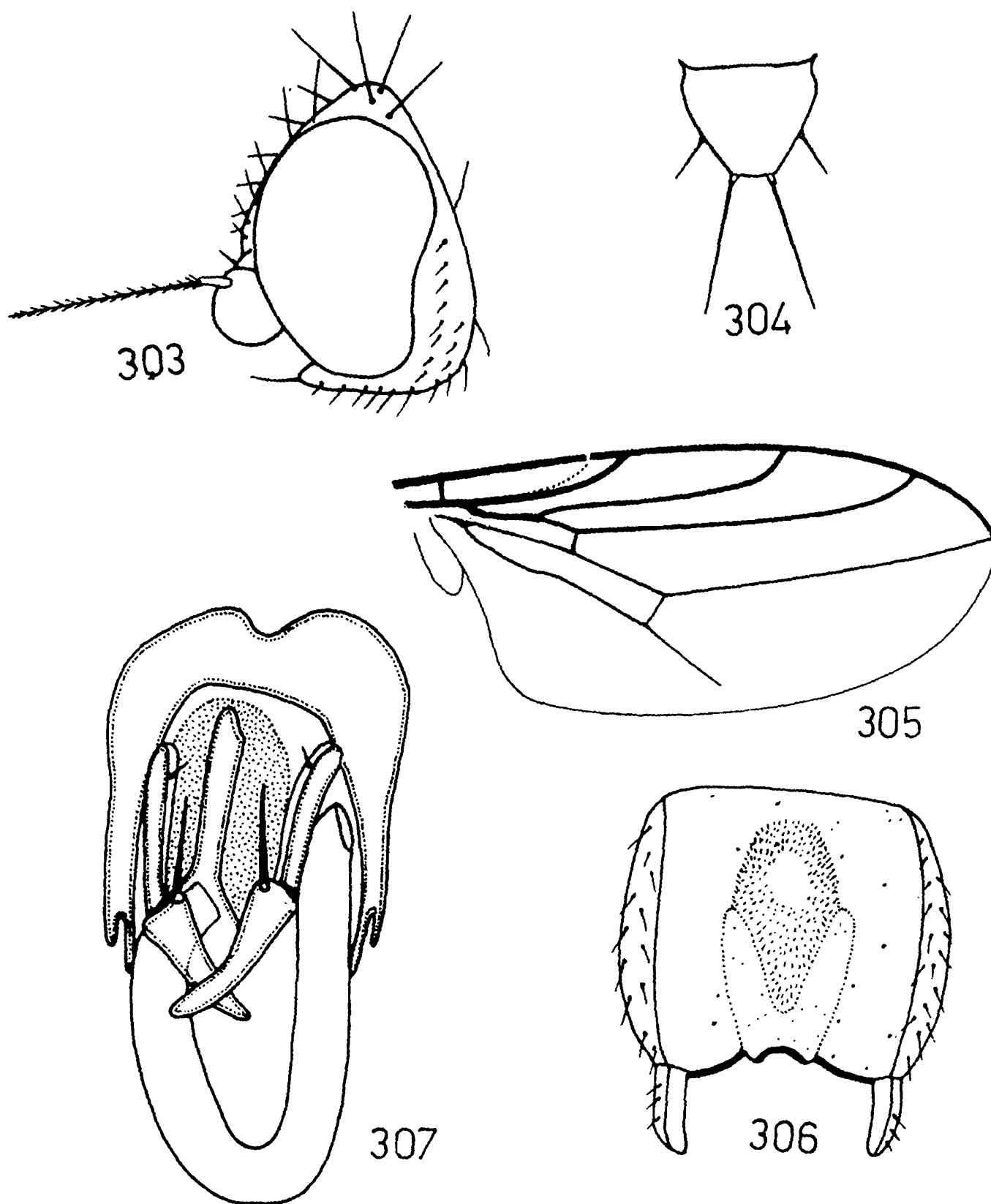
Wing (Fig. 305) : Hyaline, 2.4 x as long as wide, with brown to pale brown veins; costal sectors 2 to 4 in the ratio 38 : 32 : 23; *r* 4+5 concave above and curved towards anterior margin of costa apically; last sector of *m* 1+2 nearly straight; *r-m* cross-vein slightly distad of middle of discal cell, opposite 0.53 of its length; anal angle of wing moderately developed. Haltere yellow.

Legs : Coxae wholly black to brownish black but in some specimens with yellowish brown tinge distally; trochanters brown to yellow; femora except for yellow distal ends black to brownish black; tibiae yellow to whitish yellow; tarsi yellow except for brownish black to dark brown last two tarsi of fore leg and last tarsus each of mid and hind legs; mid tibial apical spine well developed, black, half as long as first tarsal segment of mid leg.

Abdomen : Short, almost as wide as long and not so wide as thorax, shiny black to brownish black. Female cerci brownish yellow to deeply brown. Male genitalia (Figs. 306-307) : Epandrium wider than long; surstylus narrower than in *typica*; gonites narrowly elongate; postgonite with a large sclerotized process; hypandrium slightly broadened basally and concave medially at basal end; distal end of pregonite articulating with distal end of laterobasal process of basiphallus, the latter greatly elongated, extraordinarily arched, of uniform width but relatively distinctly wider than in *typica*.

Length : Male 2.0-2.3 mm, wing 2.1-2.4 mm, female 2.3-2.5 mm; wing 2.3-2.5 mm.

Specimens examined : Holotype : Male, Meghalaya : Chirapunji, 22. iv. 1968, Coll. Ipe M. Ipe. *Other examples* : 1 female, Himachal Pradesh : Simla 7000 ft., 23.v. 1908, Coll. N. Annandale; 1 female, West Bengal : Darjeeling, 7000 ft., 23.v. 1910, Coll. Brunetti; 1 male, 1 female U. P. Nainital, 6500-8000 ft., 9.v. 1930, Coll. H.S. Pruthi;



Figs. 303-307 : *Neorhodesiella longicosta* (Cherian). 303, Head, lateral view. 304, Scutellum. 305, Wing. 306, Epandrium, ventral view. 307, Phallic complex, ventral view.

1 male, 1 female, W. Bengal : Darjeeling Dist., Rangli, 25.iii. 1973, Coll. H.S. Sharma; 5 males, 6 females, Darjeeling Dist., Andhari Khola, 9.iii. 1973, Coll. H.S. Sharma; 2 males, 3 females, Darjeeling Dist., Lava, 10.v. 1974, Coll. J. K. Jonathan; 2 males, 1 female, Arunachal Pradesh : Bomdila, 18.iii. 1973, Coll. A.N.T. Joseph; 4 males, 2 females, Mizoram : Kolasib, 8.iii. 1979, Coll. P.T. Cherian; 1 female, Mizoram : Champhai, 18. iii. 1979, Coll. P.T. Cherian; 1 male, Meghalaya : Kyodumkhulai, 29.iii. 1979, Coll. P.T. Cherian; 4 male, 1 female, Meghalaya; Chirapunji, 4.iii. 1980, Coll. P.T. Cherian; 7 males, 6 females, Meghalaya : Nangpo, 10. iv. 1979, Coll. P.T. Chrian; 1 male, 1 female, Kerala : Idukki, 24.ii. 1984, Coll. P.T. Cherian; 2 males, Tamil Nadu : Periyar Dist., Gathesal, 5.i.1990, Coll. P.T. Cherian; 4 males, 5 females, Tamil Nadu : Nilgiri Dist., Mudumalai, 1100 m, 13.ii. 1992, Coll. C. Radhakrishnan.

N. longicosta (Cherian) is closely related to *N. typica* (Cherian) but the former has more well developed scutellar tubercles and stouter ss. Besides, in *longicosta* second sector of costa is longer than the third and the fourth sectors while in *typica* the second sector is shorter than the third and equal to the fourth sector. Besides, the nature of hypandrium, epandrium, relative size of surstylus, and relative width of distiphallus serve to distinguish the two species.

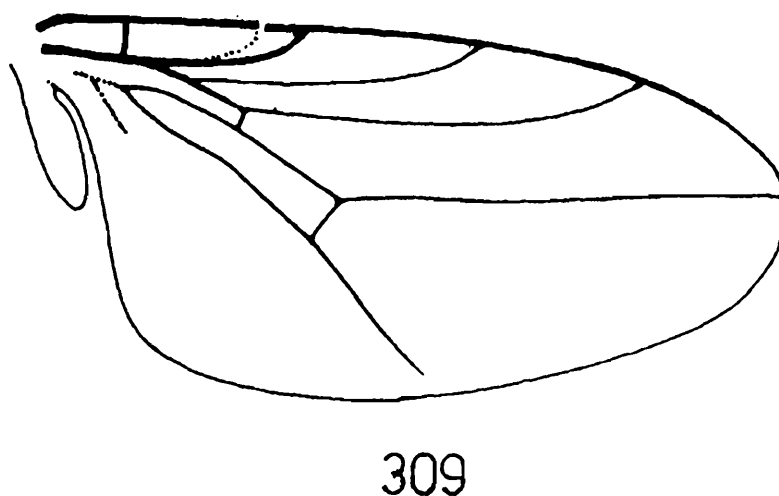
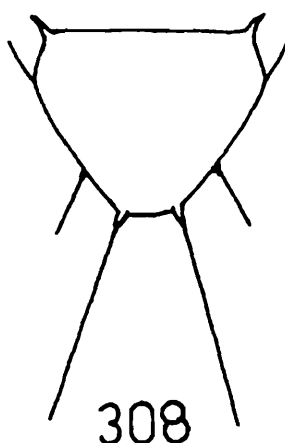
Remarks : This species was hitherto known by the holotype, a male. It is a very widely distributed species in India. Besides recording the female for the first time here, the male genitalia also is described and range of development of a few characters on the basis of study of many specimens available now is also given.

65. *Neorhodesiella dravida* sp. nov. (Figs. 308-309)

Female : *Head* : Distinctly higher than long, length, height and width ratio 12 : 14 : 17; frons narrowing anteriorly, width at vertex 0.47 x that of head, equal to its own length and 1.3 x the width near anterior end, subshiny black, projecting a trifle above eyes in front and in side view reaching anterior margin of eye; frontal triangle glabrous, shiny black, a little narrower than in *typica*, reaching anterior margin of frons and ending with pointed apex unlike in *typica*. Eye large, bare, not narrowing below steeply as in *typica*, and with vertical long axis. Face deeply concave, shiny brownish black; facial carina low, linear, reaching a little beyond middle of face; lower facial margin raised up, with yellowish brown rim, not projecting forwards in the middle as in *typica*. Antenna short; basal segments dark brown; ant 3, 1.4 x as wide as long, brownish yellow with dark tinge but for area around base; arista slender, brownish black, with concolorous pubescence, relatively shorter and pubescence finer than in *typica*. Gena sublinear, dull black with a row of about 10 short slender hairs along oral margin; vibrissal corner appearing a trifle projecting beyond lower

margin of eye because of its merging with lower facial margin and with well developed vibrissa; postgena narrower than in *typica*, with short dark brown hairs. Palpi dull black; proboscis dull black with pale brown rim. All head bristles black; *out* a trifle longer than other head bristles; *ivt*, the cruciate *pvt* and widely divergent *oc* subequal; *orb* 6, none outstanding unlike in *typica*, sequentially anterior ones becoming shorter and slender, longest two-thirds as long as *out*; vertex margin around *out* with a row of well developed hairs in continuation of short and fine ocular setae; *if* 6, in a row outside frontal triangle along each lateral margin, a trifle shorter than longest *orb*.

Thorax : As wide as head, shiny black; scutum 1.15 x as wide as long, with convex disc bearing fine, fairly dense punctae and relatively long, slender, deeply brown to dark brown hairs; scutellum (Fig. 308) nearly subtriangular, almost as long as wide at base with convex disc which is more coarsely punctate than and pubescent like scutum; pleura shiny; *anepst* and *kepst* with a few hairs. Thoracic bristles black; *h*



Figs. 308-309 : *Neorhodesiella dravida*, sp. n. 308, Scutellum. 309, Wing.

1, as long as longest *orb*; *npl* 1+1, subequal and nearly as long as *ivt*; *pa* 1 a trifle longer than and *pa* 2 two-thirds as long as *npl*; 1 *dc* 1.3 x as long as *pa* 1; *as* 1.4 x as long as scutellum, equidistant from each other and *ss* 1, borne on short slender tubercle; *ss* 1, 0.35 x as long as *as*, borne on a very fine tubercle which has more of the form of a wart.

Wing (Fig. 309) : 2.4 x as long as wide, hyaline, with yellow veins; costal sectors 2 to 4 in the ratio 1 : 1 : 1; r-m cross-vein a trifle proximad of middle of discal cell, opposite 0.48 of its length; terminal sector of r 4+5 curving towards costa distally, that of m 1+2 appearing very faintly convex above a little beyond its base and nearly straight along its entire length so that this and the former diverging distally; anal angle well developed. Knob of haltere yellowish white, stalk yellow.

Legs : Coxae almost entirely and femora, but for their yellow distal ends, brownish black; all tibiae and tarsi wholly yellow; claws and a few short hairs along distal margin of last tarsal segment black; midtibial spine black, of medium size.

Abdomen : Almost as wide as thorax and longer than wide, subshiny brownish black but for the two basal segments which have partly yellowish brown tinge. Female cerci short, brownish yellow, with a few slender dark hairs.

Length : Female 1.6 mm; wing 1.4 mm.

Holotype : Female, Tamil Nadu : Tanjore Dist., point Calimere, 27.ii. 1991, Coll. C. Radhakrishnan. This species closely resembles *typica* (Cherian) but can easily be differentiated by the nature of its scutellum which is nearly as long as wide and subtriangular in outline while in the latter species it is much wider than long and nearly semicircular in outline. Besides, in *dravida* frons is less than half as wide as head and as wide as long, arista is shorter and with shorter pubescence, frontal triangle is pointed at apex, thoracic hairs are deeply brown to dark brown, all tarsi are yellow and costal sectors 2-4 are equal while in *typica* frons is more than half as wide as head and wider than long, arista is relatively long and with longer pubescence, frontal triangle is obtuse at apex, thoracic hairs are golden brown to brownish yellow, last tarsus of each leg is deeply brown to dark brown and third costal sector is longer than the second or the fourth.

66. *Neorhodesiella nigritibia* (Cherian) N. Comb. (Figs. 310-314)

1973. *Rhodesiella nigritibia* Cherian, *Oriental Insects*, 7 (2) : 217-219. Type locality : Assam : Haflong-Jatinga Road.

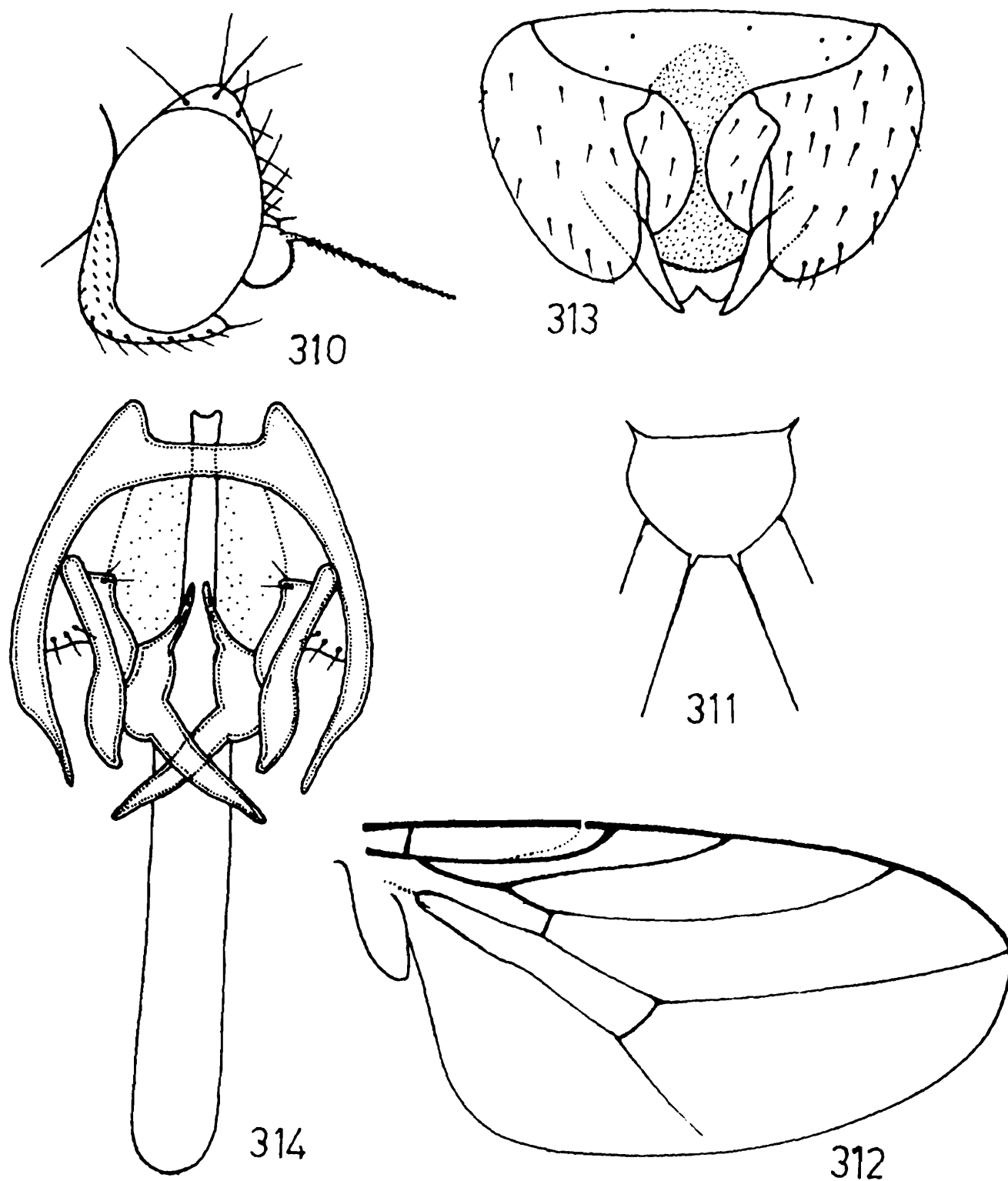
Male and Female : *Head* : (Fig. 310) : Higher than long, length, height and width ratio 11 : 12 : 17. Frons subshining black, width at vertex half that of head and 1.1

x its own length, projecting a little above eye margins anteriorly and reaching far behind anterior margin of eye; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with nearly truncate apex in most of the specimens with width at apex almost one-third the width at base while in some specimens it appears only very broadly obtuse at apex in certain angles. Face glabrous, shiny black, concave; lower facial margin distinctly raised; facial carina low, linear, reaching beyond bases of antennae and merging with lower facial margin where it becomes indistinct. Basal antennal segments black; ant 3 five-sevenths as long as wide, yellow; arista 3.43 to 3.5 mm long, dark brown with very well developed concolorous pubescence. Eye large, bare with slightly oblique long axis. Gena sublinear, black with a row of 6-7 slender black hairs along oral margin; vibrissal corner merging with lower facial margin and bearing well developed, black vibrissa. Palpi short, dark brown to black; proboscis dark brown to brown. Head bristles black; *out* about half as long as width of eye; *ivt*, the cruciate *pvt* and widely divergent *oc* all subequal and a trifle shorter than *out*; *orb* 6, anteriormost very short, slender and *fr* -like, the rest well developed, none outstanding, sequentially anterior ones becoming shorter, longest one two-thirds as long as *out*.

Thorax : Shiny black. Scutum convex, 1.3 x as wide as long and as wide as head, with five, fairly dense piliferous punctae bearing dark brown hairs (not pale white hairs as mentioned in the original description which was based on its appearance in certain angles of illumination; a detailed examination of types and other specimens reveals the real colour of hairs); scutellum (Fig. 311) almost flat to slightly convex, 1.3 x as wide as long, coarsely to very coarsely (especially in some specimens) punctate than and pubescent like scutum; pleura with dark brown hairs on *anepst* and lower part of *kepst*. Thoracic bristle black; *h* 1, slightly shorter and slender than *out*; *npl* 1+1, subequal, a little shorter and longer than *h*; *pa* 1 more developed than *npl*; *pa* 2 about half as long as *npl*; 1 *dc* stout, 1.5 x as long as *pa* 1; *as* 1.25 x as long as scutellum, equidistant from each other and *ss* 1, borne on well developed wart which has the form of a small tubercle; *ss* 1, 0.4-0.5 x as long as *as*, borne on a distinct wart.

Wing (Fig. 312) : Hyaline, 0.47 x as wide as long, with brown veins and hairs; costal sectors 2 to 4 in the ratio 10 : 13 : 10 (in some specimens the three sectors are subequal); terminal sectors of veins *r* 2+3 and 4+5 strongly curving forward apically (in one specimen less so), the latter and that of *m* 1+2 nearly straight but at least in one specimen it is faintly convex above a little beyond base; *r-m* cross-vein proximad of middle of discal cell, opposite 0.43-0.46 of its length; anal angle moderately developed. Haltere yellow.

Legs : Coxae brownish black; trochanters dark to yellowish brown; femora wholly black to brownish black, rarely with pale tinge at distal ends; extreme bases and



Figs. 310-314 : *Neorhodesiella nigritibia* (Cherian). 310, Head, lateral view. 311, Scutellum. 312, Wing. 313, Epandrium, ventral view. 314, Phallic complex, ventral view.

nearly half to one-third the length of tibiae distally yellow, rest of the area dark to brownish black; tarsi except for dark brown last segment of each leg yellow; in some specimens last two tarsi of fore leg dark brown; mid tibial spine black, well developed, about half as long as basal tarsal segment of mid leg.

Abdomen : Oval, forming about one-third length of body, black to brownish black with slender black hairs. Female cerci short, rather stout with very slender hairs. Male genitalia (Figs. 313-314) : Epandrium much broader than long; surstylus longer than wide, narrowing towards distal end; phallapodeme well developed, extending beyond hypandrium; postgonite elongated, with large sclerotized processes which are shorter than in *typica*; distiphallus relatively shorter and wider than in *typica*, arched in natural condition (in the diagram drawn after straightening), uniformly thickened.

Length : Male 1.5 mm, wing 1.4 mm, female 1.7-1.9 mm, wing 1.6- 1.8 mm.

Specimens examined : Holotype : Female, grass-sweeping, India : Assam : Haflong—jatinga Road, 28.iv. 1968, Coll. Ipe M. Ipe. Paratype : Female (head broken), data same as of holotype. *Other examples* : 1 male, West Bengal : Darjeeling Dt., Andhari Khola, 6.iv. 1973, Coll. H.S. Sharma; 1 female, Tamil Nadu : Coimbatore Dist., Kondapanaikapatty, 12.xii. 1975, Coll. A.N.T. Joseph; 1 female, Mizoram : Kolasib, 8.iii. 1979, Coll. P.T. Cherian; 1 male, Meghalaya : Nangpo, 18.iv. 1980, Coll. P.T. Cherian; 1 female, Meghalaya : Shillong : Maphalang, 2.iv. 1980, Coll. P.T. Cherian; 1 male, 1 female, Tamil Nadu : Periyar Dist., Gathisal, 5.i. 1990, Coll. P.T. Cherian 2 males, Tamil Nadu : Coimbatore Dist., Kovaicourtalam, 600 m, 7. ii. 1992, Coll. C. Radhakrishnan.

The relative lengths of costal sectors and nature of convexity and punctae of scutellum exhibit differences in different specimens. But it appears they are within the range of intraspecific variations since all other characters are nearly identical. Hence all the specimens are considered belonging to the same species. One specimen from Mizoram is markedly different in respect of nature of wing, but the specimen is not in good condition as the abdomen is broken off. Therefore it is provisionally placed in the same species.

N. nigritibia is closely related to *typica* (Cherian) but the position of r-m cross-vein, differences in the colouration of tibiae, nature of epandrium, surstylus, gonites, phallapodeme, hypandrium and distiphallus help to distinguish the two species.

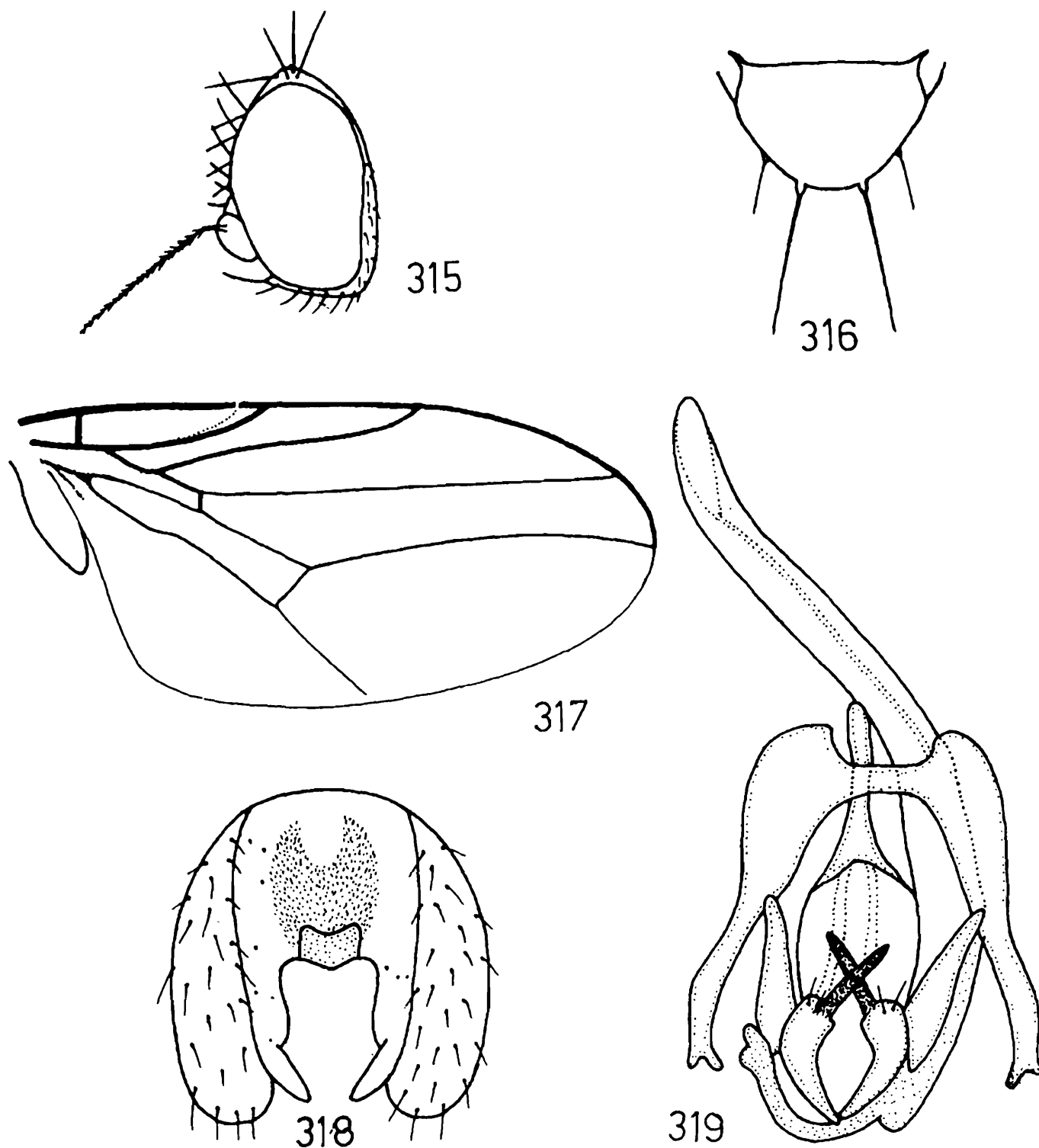
67. *Neorhodesiella rugulosa*, sp. nov. (Figs. 315-319)

Male : Head : (Fig. 315) : Compressed, higher than long, length, height and width ratio 12 : 14 : 19. Frons only slightly sloping, dull black, slightly narrowing anteriorly,

width at vertex, 0.45 x that of head and 1.1 x its own length, ending much behind anterior margin of eye, with slightly concave anterior margin; frontal triangle of medium size, shiny black, not smooth but rugulose unlike in other species of the genus, reaching a little behind anterior margin of frons and ending with obtuse apex. Face narrower than frons and narrowing progressively towards lower facial margin, deeply concave, shiny brownish black; facial carina low, linear, reaching a trifle beyond bases of antennae; lower facial margin very narrowly projecting in the middle, finely tomentose. Antenna small; ant 2 almost as long as and distally nearly as wide as ant 3, dark brown; ant 3 nearly reniform, 1.5 x as wide as long, yellow; arista more than 3 x as long as antennal segments, basally thickened, the rest progressively becoming more slender anteriorly, dark brown with fairly dense, very conspicuous concolorous pubescence. Eye very large, occupying much of the area of head in profile, with distinctly oblique long axis. Gena linear, dull black with a row of 5-6 slender hairs along oral margin; vibrissal angle not well developed, merging with lower facial margin; vibrissa fairly long and slender, that of two sides nearly touching each other distally; postgena greatly sloping, somewhat developed, concolorous with gena and with a few short, black hairs; oral opening subsquarish, distinctly narrowing towards lower facial margin. Palpi short, brownish black with fairly dense short concolorous hairs; proboscis rather slender, almost concolorous with palpi. All head bristles black; *out*, cruciate *put* and widely divergent *oc* subequal; *ivt* a little shorter than *out*; *orb* 6, reclinate, sequentially anterior ones becoming shorter and slender, longest three-fifths as long as *oc*; *if* in a row of 6 outside frontal triangle, along each lateral margin, distinctly shorter than *orb*; *fr* a few between *orb* and *if*.

Thorax : Wholly shiny black. Scutum a trifle narrower than head, width 1.1 x the length, with convex disc bearing fairly dense piliferous punctae and brownish black hairs of medium size. Scutellum (Fig. 316) 0.8 x as long as wide, broadly obtuse distally, with shiny convex disc which is pubescent like but more coarsely punctate than scutum and with thick side margins which are darkly and densely tomentose in their lower halves and distally; pleura wholly shiny; *anepst* with many and *kepst* with a few brownish black hairs. All thoracic bristles black; *h* 1, hair-like; *npl* 1+1, subequal and equal to *pa* 1; *pa* 2 short and hair-like; 1 *dc* well developed, distinctly longer than all other thoracic bristles except *as*; *as* 1.25 x as long as the scutellum, equidistant from each other and *ss* 1, the latter one third as long as the former; *as* borne on a small, fine tubercle and *ss* 1 on a well developed wart.

Wing (Fig. 317) : 0.42 x as wide as long, with brown tinge; costal sectors 2 to 4 in the ratio 9 : 14 : 4; r-m cross-vein proximad of middle of discal cell., opposite 0.4 of its length; terminal sector of r 4+5 nearly straight, that of m 1+2 slightly convex



Figs. 315-319 : *Neorhodesiella rugulosa*, sp.n. 315, Head, lateral view. 316, Scutellum. 317, Wing. 318, Epandrium, ventral view. 319, Phallic complex, ventral view.

above along its entire length with convexity more pronounced near base; anal agree well developed. Haltere brownish yellow.

Legs : Coxae brownish black; trochanters yellowish brown; hind femur wholly and fore and mid femora, except for their yellowish brown distal ends, brownish black; tibiae blackish brown but for brownish yellow bases and one third of their lengths distally; mid tibia with black apical spine which is longer than half the length of basal tarsal segment; tarsi yellow except for slightly infuscated last segment, especially of fore and hind legs.

Abdomen : Shiny black with short finely punctate, fairly dense, slender, brownish black hairs of medium size. Male genitalia (Figs. 318-319) : Epandrium much narrower than in *nigritibia*; surstylus small, longer than wide, articulated with inner side of epandrial incision; pregonite broadened distally and articulating with distal end of laterobasal process of basiphallus; postgonite shorter than in *typica* hook-like, with one long and a small sclerotized processes; distiphallus greatly arched and elongated, rather slender, almost uniformly thickened.

Length : Male 1.9 mm; wing 1.7 mm.

Holotype : Male, Kerala : Quilon Dist., Thenmala, 11.i. 1998, Coll. P.T. Cherian.

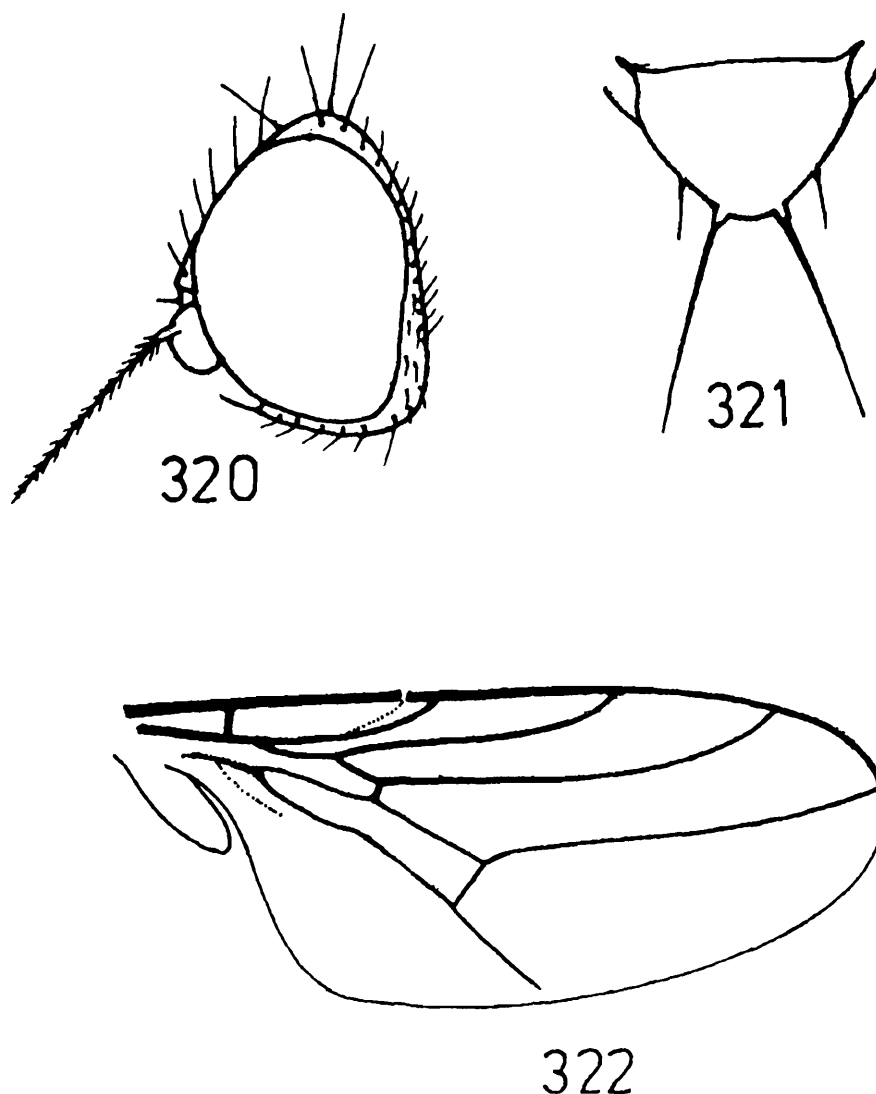
This species is closely related to *tibiella* (Becker) but unlike in the latter species *rugulosa* has compressed head, rugulose frontal triangle, and well developed ss 1. Besides, in *rugulosa* terminal sector of m 1+2 is slightly convex above along its entire length unlike in *tibiella* and related species.

68. *Neorhodesiella atypica*, sp. nov. (Figs. 320-322)

Male : *Head* : (Fig. 320) : Distinctly higher than long, length, height and width ratio 5 : 6 : 8; frons greatly sloping, width at vertex 0.47 x that of head and 0.9 x its own length, narrowing anteriorly and very slightly projecting above but not beyond eye margins in front, subshiny black with a few *fr*; frontal triangle relatively wider at vertex than in *dravida*, smooth, polished bluish black, reaching anterior margin of frons and ending with obtuse apex. Eye large, bare, not prominently narrowing below unlike in *typica*, a little raised up. Antenna short; basal segments very dark brown; ant 3, 1.4 x as wide as long, brownish yellow; arista not long as in *typica*, very slender, with short, dark pubescence. Gena 0.2 x as wide as ant 3, dull black with fine hairs and a row of 6-8 very slender hairs along oral margin; vibrissal corner not projecting beyond lower margin of eye; postgena black, not so wide as in *typica*, with a few short hairs. Palpi dull black; proboscis dark brown with faint pale tinge on part of distal margin. Head bristles shorter and much slender than in *typica*, *dravida* and

other related species, brownish black but some *orb* and *if* with pale tinge; *out* a trifle longer than *ivt* and subequal to *pvt*; *oc* equal to *ivt*; *orb* 6, recumbent, none outstanding, sequentially anterior ones becoming more short and slender, longest two-thirds as long as *out*; *if* 6 in a row outside frontal triangle along each lateral margin, subequal to 3rd *orb*; vibrissa of medium size; postocular setae very short; vertex margin in the area of *out* with a few short hairs.

Thorax : Mostly shiny black with blue tinge; scutum greatly convex, 1.14 x as wide as long, with very fine punctae, which are much finer and less dense than in *typica* and *dravida*, bearing slender, pale, yellowish white hairs of medium size; scutellum (Fig. 321) 1.1 x as wide at base as long, subtriangular, disc distinctly more convex and much less coarsely and densely punctate than in *typica* and *dravida*, with slender



Figs. 320-322 : *Neorhodesiella atypica*, sp. n. 320, Head, lateral view. 321, Scutellum. 322, Wing.

yellowish white hairs as on scutum; pleura brownish black; *anepst* and *kepst* with a few short yellowish white hairs. Throacic bristles slender, brownish black but for *ss* 1; *h* 1, equal to longest *orb*; *npl* 1+1, subequal, equal to *ivt*; *pa* 1 longer than *npl*; *pa* 2 hair-like; 1 *dc* 1.25 x as long as *pa* 1; *as* 1.14 x as long as scutellum, borne on very short, slender black tubercle, nearer to *ss* 1 than to each other; *ss* 1 very slender, more in the form of a prominent hair, 0.25 x as long as *as*, borne on a black wart.

Wing : (Fig. 322) : 2.4 x as long as wide, hyaline with pale yellow veins; costal sectors 2 to 4 in the ratio 7 : 6 : 5; r-m cross-vein slightly proximad of middle of discal cell, opposite 0.48 of its length; terminal sector of r 4+5 curving forward toward costa distally, that of m 1+2 slightly convex above near base and faintly sinuate along its length; anal angle moderately developed. Haltere with yellow stalk and white knob.

Legs : Very similar to those of *typica* and *dravida*; coxae almost wholly and femora but for yellow distal ends brownish black; trochanters, and all tibiae and tarsi yellow; mid tibial spine well developed, blackish brown.

Abdomen : A little longer than wide and slightly narrower than thorax, brownish black except for brownish yellow basal segment and upper half of second segment. Male genitalia (partly damaged) : Surstylus longer and broader than in *typica*; phallus slender, elongated and arched as in other species of the genus.

Length : Male 1.4 mm; Wing 1.3 mm.

Holotype : Male, Tamil Nadu : Tanjore Dist., Papanasam, 23.iv.1989, Coll.K.R. Rao.

This species shows affinities to *typica* (Cherian) and *dravida*, but differs in the shorter and very slender head bristles, bluish black frontal triangle, very fine and less dense punctae on scutum, greatly convex, subtriangular scutellum having less coarse punctae, yellowish white thoracic hairs and short and very slender *ss* 1.

69. *Neorhodesiella tibiella* (Becker) N. Comb.

1911. *Meroscinis tibiella* Becker, *Ann. hist. nat. Mus natn. Hungarici*, 9 : 90 Type-locality : Sri Lanka : Pattipola.

1977. *Rhodesiella tibiella* (Becker) Sabrosky. *Cat. Dip. Orient. Region*, 3 : 298.

"Thorax and scutellum shiny black, relatively finely punctate and with pale yellow hairs. Scutellum wide, relatively short and rounded with only two distinct tubercles. Pleura shiny. The dull black vertex with rather large shiny black distinctly plumose arista. Palpi reddish. Haltere yellowish. Abdomen blackish brown. Legs black; coxal

joints, knee, tibiae and tarsi with the exception of last segment yellow; hind tibia with distinct ring in the middle, mid tibia with a black ring. Wing pale brownish; second longitudinal vein short, the third curved and directed towards front margin; third and fourth diverging apically. $1\frac{1}{2}$ mm. long.

1 example from Ceylon : Pattipola, 200 m height (BIRO), Ungar. N. Mus."

This species is not available to me for study and hence a free translation of the original description by Beckey is given.

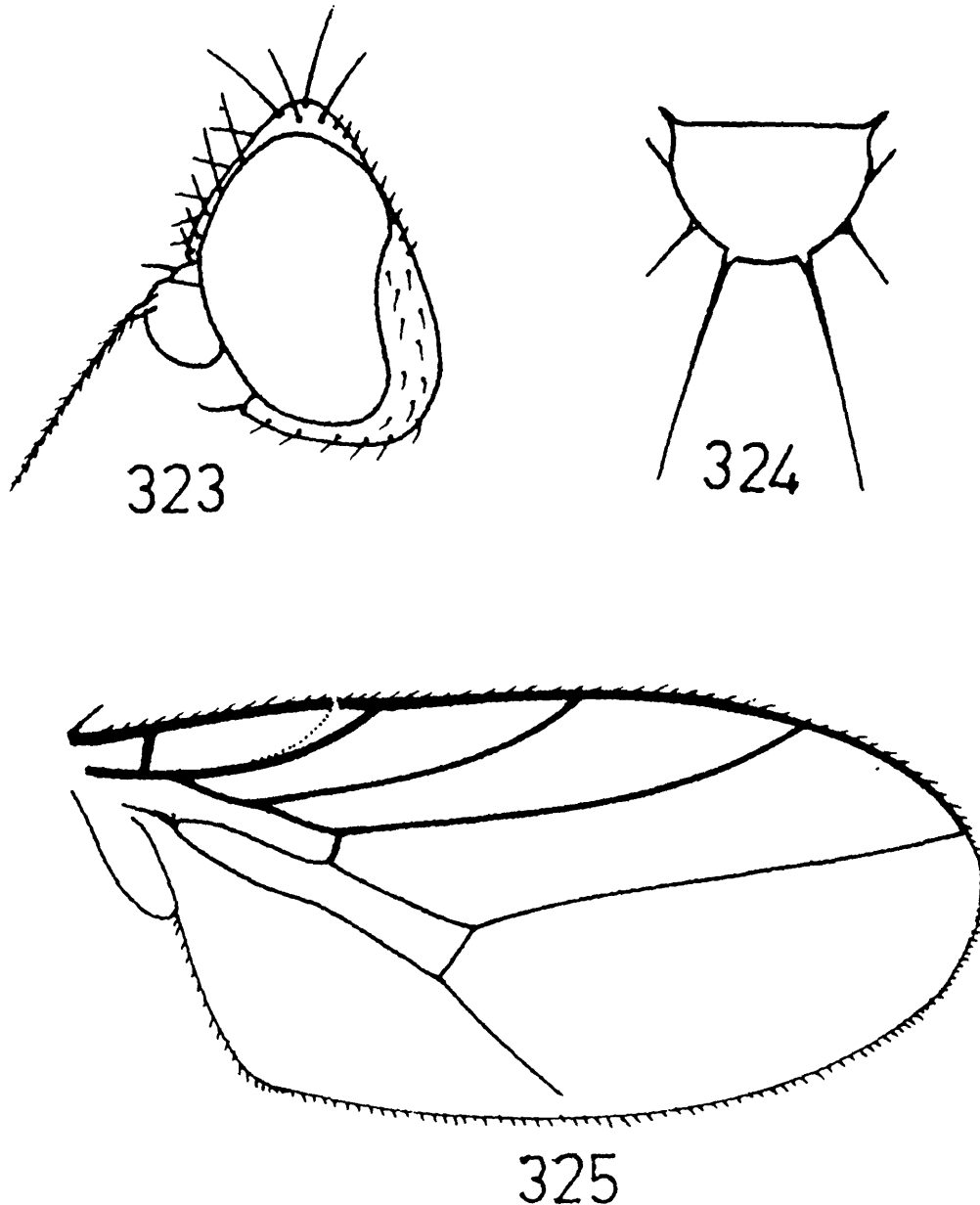
70. *Neorhodesiella rubrohalterata* (Cherian) N. Comb. (Figs. 323-325)

1973. *Rhodesiella rubrohalterata* Cherian, *Orient Insects*, 7 (2) : 215-217. Type locality : India : Kerala : Quilon Dist., Thalachera.

Female: Head (Fig 323) : Higher than long, length, height and width ratio 14 : 17 : 21; frons distinctly sloping, projecting slightly above eyes, subshiny black, width at vertex 0.55 x that of head and 1.1 x its own length; frontal triangle glabrous, shiny black, reaching anterior margin of frons and ending with narrowly obtuse apex. Eye large, bare with vertical long axis. Face deeply concave, only slightly narrower than anterior part of frons, subshiny black; facial carina low, linear, reaching nearly the distinctly raised lower facial margin. Antenna directed outwards; two basal segments short, dull black; ant 3, 0.8 x as long as wide, brownish yellow, with reddish tinge and very fine pale pubescence; arista slender, black, 0.36 mm long, with long pale brown pubescence. Gena sublinear, rugulose, subshiny black, with a row of fine slender hairs along oral margin; vibrissal corner merging with the raised lower facial margin; postgena dull black, very conspicuous, with slender dark hairs. Palpi black; proboscis brownish black. Head bristles and frontal hairs black; *out* about 0.6 x the width of eye; *ivt* turned inwards, five-sixths the *out*; *pvt* erect, cruciate, almost as long as *out*; *oc* widely divergent, a trifle shorter than *pvt*; *orb* 6, sequentially anterior ones becoming shorter, longest 0.75 x as long *out*; *if* 6, in a row outside the triangle along each lateral margin, posterior 4 directed inwards, anteriormost 2 nearly proclinate, nearly equal to *orb*; occipital margin of vertex with 6 to 8 projecting hairs; vibrissa short but distinct.

Thorax : Shiny black; scutum slightly wider than long, convex, densely and finely punctate with short, dark brown hairs; scutellum (Fig. 324) 0.63 x as long as wide at base and five-twelfths as long as scutum, nearly semicircular as in *typica*, with convex disc which is more coarsely punctate than but pubescent like scutum; *anepst* with short, dense dark hairs; *kepst* with a few hairs confined mostly to lower part. Thoracic bristles black; *h* 1, 0.67 x as long as *out*; *npl* 1 + 1 nearly equal, 0.8 x the

out; *pa* 1 almost as long as *out*; *pa* 2 a trifle shorter than *h*; 1 *dc* 1.2 x as long as *out*; *as* long, equidistant from *ss* 1 and each other, 1.5 x as long as scutellum, borne on wart (not tubercle as indicated in the original description); *ss* 1 slender, one-third as long as *as*, borne on a fine wart.



Figs. 323-325 : *Neorhodesiella rubrohalterata* (Cherian). 323, Head, lateral view. 324, Scutellum. 325, Wing.

Wing (Fig. 325) : Hyaline, 2.4 x as long as wide, with pale brown pubescence and brown veins; costal sectors 2 to 4 in the ratio 10 : 13 : 9; terminal sectors of *r* 2+3 and *r* 4+5 strongly curving forward apically, that of *m* 1+2 straight; *r-m* cross-vein nearly in the middle of discal cell; posterior marginal cell not expanded; anal angle

moderately developed. Knob of haltere brownish black (not red as indicated in the original description), stalk yellowish brown.

Legs : Of medium size; coxae dark reddish brown; femora ferruginous black, none enlarged; trochanters, tibiae and tarsi, except for the dark brown last two tarsi of fore leg and last one tarsus each of mid and hind legs, ferruginous yellow.

Abdomen : Only a trifle narrower than thorax and a little longer than wide, subshiny brownish black with slender dark brown hairs. Female cerci brownish black.

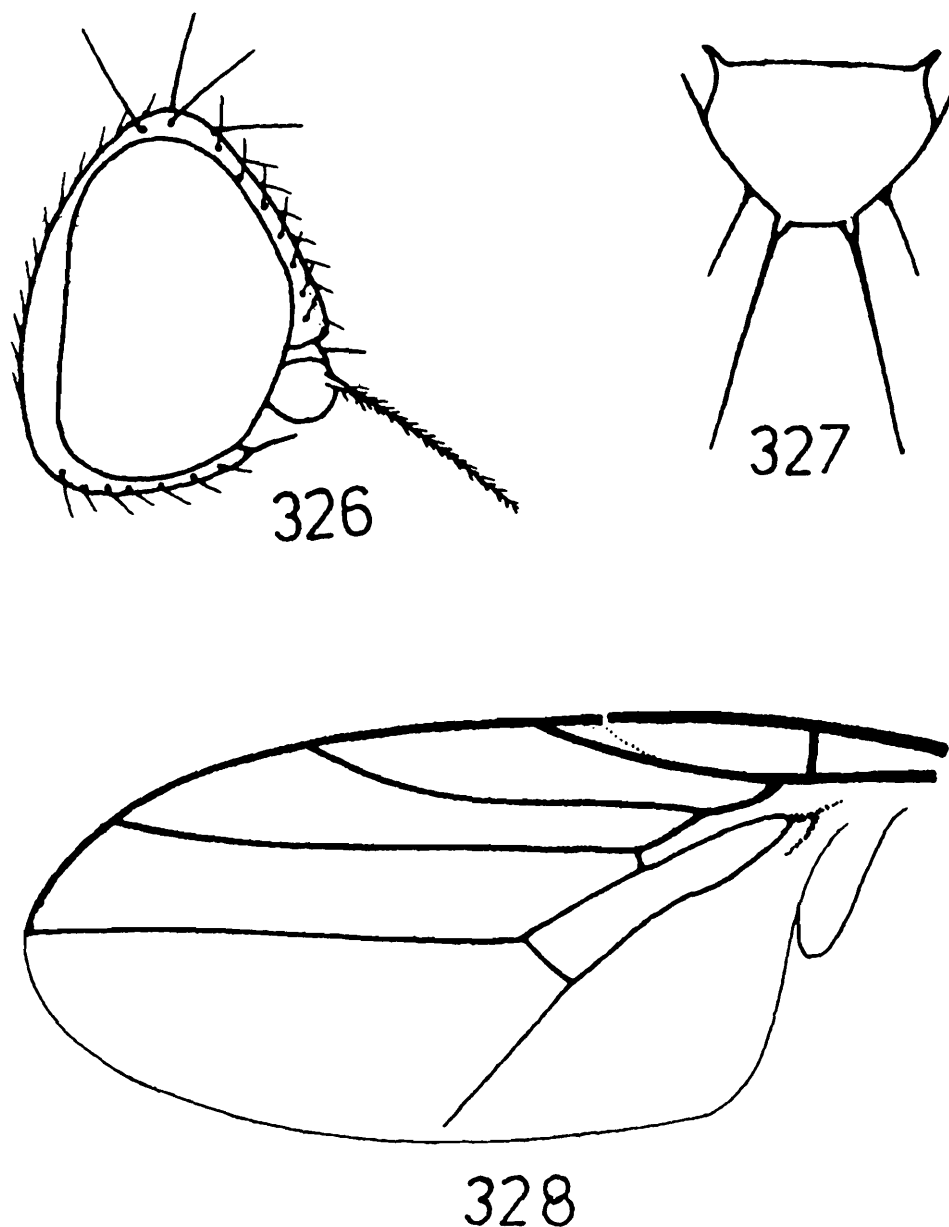
Length : Female 1.6 mm; wing 1.32 mm.

Specimen studied : Holotype, female, Kerala : Quilon Dist. Thalachera, 8.vi. 1968, Coll. P.T. Cherian. At present Thalachera is coming under Pathanamthitta Dist.

N. rubrohalterata is closely related to *typica* (Cherian) but differs in having brownish black haltere while in the latter species halteres are yellow or whitish yellow.

71. *Neorhodesiella keralaensis* sp. nov. (Figs. 326-328)

Female : *Head* (Fig. 326) : Higher than long, length height and width ratio 12 : 14 : 17. Frons nearly parallel sided, 1.1 x as long as wide and half as wide as head, subshiny brownish black, projecting slightly above eyes in front and reaching anterior margin of eye and with 2 to 3 very faint, short, linear longitudinal depressions on each side of which the outermost almost reaching vertex margin; frontal triangle glabrous, with two faint sulci, one on each side of posterior ocelli, shiny brownish black, conspicuously becoming sharply narrowed anteriorly, reaching anterior margin of frons and ending with sharply pointed apex. Face deeply concave, shiny brownish black; facial carina very low, linear, almost reaching lower facial margin which is rather thin and distinctly raised. Antenna small; ant 2 much shorter than ant 3, dark brown; ant 3, 1.3 x as wide as long, very dark brown with yellowish brown tinge around base, especially in lower part; arista slender, wholly dark brown with slender, fairly dense concolorous pubescence. Eye large, suboval, bare, with vertical long axis. Gena dull brownish black, width one-fourth that of ant 3, with a row of slender hairs along oral margin; vibrissal corner faintly projecting beyond lower anterior margin of eye; oral vibrissa slender but well developed; postgena of medium size, concolorous with gena, with a few slender hairs of which outer are more or less in a row in continuation of the slender, very short postocular row of setae. Palpi and proboscis short, dull black. Head bristles slender, black; *ovt* and the cruciate *pvt* subequal; *ivt*. a trifle shorter than *ovt* and equal to *oc*; *orb* 6, posteriormost two subequal, two thirds as long as *ivt*, next three a little shorter, anteriormost hair-like; *if* 6, in a row outside



Figs. 326-328 : *Neorhodesiella keralaensis*, sp. n. 326, Head, lateral view. 324, Scutellum, 328, Wing.

the triangle along its margin, all subequal and almost equal to longest *orb*; *fr* a few, dark brown.

Thorax : Shiny black; scutum as wide as head and 1.2 x as wide as long with convex disc bearing fairly dense fine punctae and short, slender brownish black hairs; scutellum (Fig. 327) broadly obtuse distally, 1.1 x as wide as long with convex disc which is more coarsely punctate than and pubescent like scutum; pleura with very short hairs on *anepst* and a few, more developed hairs on *kepst*. Thoracic bristles black; *h* 1, slightly shorter than *out*; *npl* 1+1, subequal and equal to *pa* 1; *pa* 2

distinct, half as long as *pa* 1; 1 *dc* a little longer than *pa* 1; *as* 1.3 x as long as scutellum, nearer to *ss* 1 than to each other, borne on a small wart; *ss* 1 one-third the *as*, borne on a fine wart.

Wing (Fig. 328) : Much shorter than body, 0.43 x as wide as long, hyaline with brown veins; costal sectors 2 to 4 in the ratio 4 : 4 : 3; r-m cross-vein in the middle of discal cell; terminal sectors of veins r 4+5 and m 1+2 nearly parallel except for the terminal part of the former which is bent toward upper margin of costa, the latter nearly straight along its length; anal angle well developed. Stalk of haltere pale brown, knob reddish yellow with dark tinge at base dorsally.

Legs : Of normal size; coxae and trochanters blackish brown; femora brownish black except for yellow tinge at extreme tip; fore tibia yellow but for slight infuscation confined mostly to basal half; mid tibia at base and one third its length distally yellow, otherwise blackish brown; hind tibia brownish black but for yellow base and distal end; mid tibial spur well developed, black, about half as long as first hind tarsal segment; all tarsi yellow.

Abdomen : Almost as wide as thorax, shiny brownish black with slight pale tinge on two basal segments, especially the first. Female cerci black with short, fine hairs.

Length : Female 1.6 mm; wing 1.4 mm.

Holotype : Female, Kerala; Pallivasal, 7.xi.1983, Coll. M.S. Molly. This species closely resembles *nigritibia* (Cherian) from India but while in the former ant 3 is predominantly dark brown, frontal triangle has two short shallow sulci one each lateral to posterior ocelli, is sharply narrowed anteriorly and ends with sharply pointed apex, in the latter ant 3 is yellow, frontal triangle is without sulci and ends with broadly obtuse to nearly truncate apex. Besides, while in *keralaensis* r-m cross vein is in the middle of the discal cell and second and third sectors of costa are equal and longer than the fourth, in *nigritibia* r-m cross-vein is proximad of the middle of discal cell and second and fourth sectors of costa are equal and shorter than the third.

72. *Neorhodesiella lutea* (Cherian) N. Comb. (Figs. 329-333)

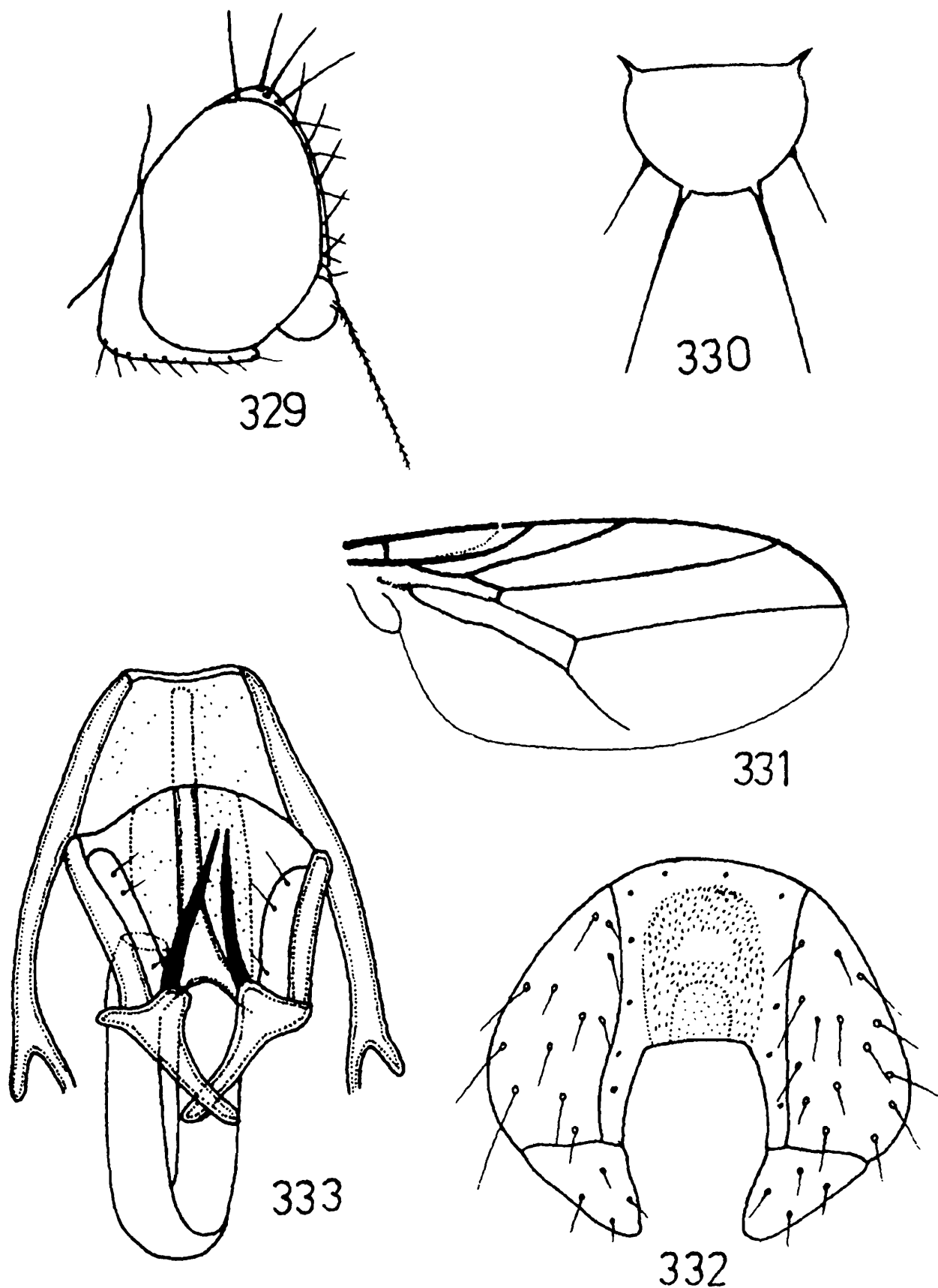
1973. *Rhodesiella lutea* Cherian, *Oriental Insects*, 7 (2) : 211-214. Type locality : India : Uttar Pradesh : Agra.

Male : *Head* (Fig. 329) : Slightly higher than long, length, height and width ratio 17 : 20 : 25. Frons distinctly sloping, ending much behind anterior margin of eye, width at vertex 0.53-0.55 x that of head and 1.1 x its own length, shiny brownish black with a few well developed black *fr*; frontal triangle glabrous, shiny black,

reaching anterior margin of frons and ending with obtuse apex (not obtusely truncate as given in the original description based on holotype in which the apex was hidden by the lunule; in another specimen before me the character is very clear). Face glabrous, shiny blackish brown except for black sides, concave to deeply concave; facial carina low, almost reaching lower facial margin which is slightly raised. Eye large, occupying much of head in profile, with vertical long axis and very fine, scattered pubescence discernable in high magnification (in the original description pubescence could not be observed as the eyes in holotype were shrunk and withdrawn). Antenna directed outward and downward, basal segments dark brown to brownish black, with short, fine hairs; ant 2 with black spine; ant 3 yellow, 1.4 x as wide as long; arista 0.43 mm long, dark brown with well developed dense, concolorous pubescence. Gena sublinear, matt black with a row of 5-6 short, slender hairs in a row along oral margin; vibrissal corner slightly projecting beyond lower eye margin; oral vibrissa black, very distinct; postgena dull black, with fine dark hairs especially along posterior margin. Palpi short, dull black with short, fine, black hairs; proboscis short, dark brown. Head bristles well developed, black; *out* a trifle shorter than half width of eye; *ivt* only a little shorter than *out*; *pvt* cruciate, equal to *ivt*; *oc* proclinate with tips turned nearly upwards, equal to *pvt*; *orb* 4, (not 5 as mentioned in the original description since the anteriormost one considered an *orb* is only an *fr* as is evident from the other example also), posteriormost 1.5 x as long as the next one, all sequentially becoming shorter; *if* 5-6, none outstanding, subequal and nearly equal to anterior *orb*.

Thorax : Shiny black. Scutum 1.1 x as wide as long and as wide as head, with convex disc bearing moderately dense dark brown hairs which in certain angles of illumination appears yellowish at tips; scutellum (Fig. 330) broadly rounded apically, 1.4 x as wide as long, with almost flattened disc which is very coarsely punctate than but pubescent like scutum; *anepst* with some and *kepst* with a few short, slender hairs; Thoracic bristles black; *h* 0.4 x as long as width of eye; *npl* 1+1, subequal, a little longer than *h*; *pa* 1 equal to and 1 *dc* distinctly longer than *npl*; *pa* 2 short, a little more than half the *pa* 1; *as* not approximated, closer to *ss* 1 than to each other, 1.6-1.8 x as long as scutellum, borne on very short tubercle; *ss* 1, 0.33-0.4 x as long as *as*, but very slender, borne on a wart.

Wing (Fig. 331) : Hyaline, 2.14 x as long as wide, with brown hairs and veins; costal sectors 2 to 4 in the ratio 12 : 15 : 10; r-m cross-vein in the middle of discal cell; terminal sectors of veins r 2+3 and r 4+5 strongly curving forward apically; terminal sector of m 1+2 nearly straight except for being very faintly concave below a little beyond base; anal angle very moderately developed. Haltere yellow.



Figs. 329-333 : *Neorhodesiella lutea* (Cherian). 329, Head, lateral view. 330, Scutellum. 331, Wing. 332, Epandrium, ventral view. 333, Phallic complex, ventral view.

Legs : Wholly yellow except for brownish last tarsal segment of each leg and somewhat distinct, almost linear infuscation on fore femur.

Abdomen : Much narrower than thorax, slightly longer than wide, two basal segments dark to yellowish brown, rest of the segments brownish black with some pale and many dark slender hairs. Male genitalia (Figs. 332-333) : Epandrium wider than long; surstylus broadly articulating with epandrium, narrowing distally and with obtuse apex; hypandrium uniformly narrowing towards basal end, with less concave basal margin; postgonite with two sclerotized processes of which one is short and the other large and greatly elongated as in *typica*; distiphallus greatly arched, rather U-shaped, uniformly slender and thickened and relatively wider than in *typica*.

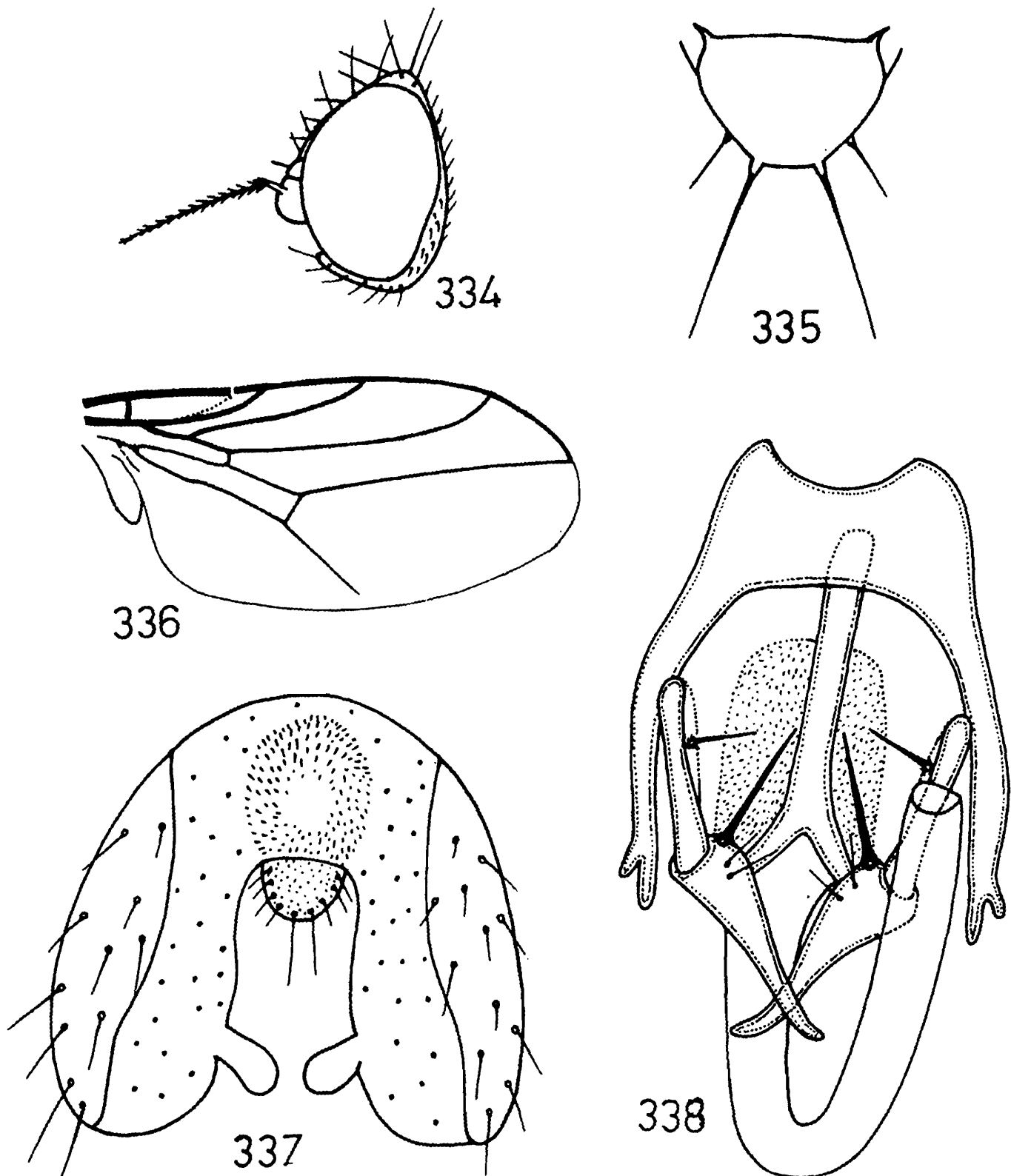
Length : Male 1.3-1.5 mm; wing 1.3-1.5 mm.

Specimens examined : Holotype, male, India : U.P. Agra : Taj Garden, 23.xi.1967, Coll. P.T. Cherian; 1 male, Kerala : Ernakulam Dist. Kakkad, 31.vii. 1983, Coll. P.T. Cherian.

N. lutea closely resembles *typica* (Cherian) but the former has yellow legs unlike the partly black and partly yellow legs of the latter. Besides, the two species differ in the build of epandrium, surstylus, nature of processes on postgonite and the relative length and thickness of distiphallus.

73. *Neorhodesiella brevidorsalis* sp. nov. (Figs. 334-338)

Male and female : *Head* (Fig. 334) : Slightly higher than long, length, height and width ratio 11 : 12 : 17. Frons nearly parallel sided, distinctly sloping anteriorly, width at vertex half that of head and equal to its own length, dull black with a few black *fr*; frontal triangle, glabrous, shiny black, reaching anterior margin of frons and ending with narrowly obtuse apex. Face shiny black, narrower than anterior part of frons, distinctly concave; facial carina low, linear, reaching almost lower facial margin, the latter a little raised up, thin, dark brown. Antenna projecting outwards and downwards; basal segments dark brown; ant 3, 1.4 x as wide as long, yellow with fine pubescence; arista slender, blackish brown with dense, well developed concolorous hairs. Eye large, in profile occupying much of the area of head, with vertical long axis and very minute scattered pubescence. Gena almost linear, brownish black with a row of 7-8 slender black hairs along oral margin; vibrissal corner slightly projecting beyond lower anterior margin of eye and merging with lower facial margin and with well developed oral vibrissa; postgena reduced in size, dull black with well developed black hairs of which the outermost are almost in a row in continuation of postocular setae. Proboscis short, dull black; palpi concolorous with proboscis, with a few short hairs. Head bristles well developed, black; *out* only a trifle longer than *ivt*, the latter



Figs. 334-338 : *Neorhodesiella brevidorsalis*, sp. n. 334, Head, lateral view. 335, Scutellum. 336, Wing. 337, Epandrium, ventral view. 338, Phallic complex, ventral view.

and the cruciate *pvt* and proclinate *oc* subequal; *orb* 6, recumbent, anteriormost very short and hair-like, posteriormost well developed, all sequentially becoming shorter and slender anteriorly, longest only a little shorter than *oc*; *if* 6, in a row outside triangle along each lateral margin.

Thorax : Shiny black. Scutum as wide as head and 1.3 x as wide as long with prominently convex disc bearing dense coarse punctae and well developed whitish yellow hairs; pleura with yellowish white hairs on *anepst* and on lower part of *kepst*. Scutellum (Fig. 335) 1.4 x as wide at base as long, very broadly obtuse apically with nearly flattened disc which is more coarsely punctate than but pubescent like scutum. Thoracic bristles well developed, black; *h* 1, very slender, brownish, only a little longer than thoracic hairs; *npl* 1+1, anterior one slender and less black; *pa* 1 longer and stouter than *npl*; *pa* 2 hair-like; 1 *dc* shorter than *pa* 1, almost as long as *npl*; *as* widely separated, nearer to *ss* 1 than to each other, stout, 1.7 x as long as scutellum, borne on very short tubercle; *ss* 1, 0.4 x as long as *as*, borne on very minute tubercle having the form of a wart.

Wing : (Fig. 336) : 2.3 x as long as wide, shorter than body, hyaline with brown veins; costal sectors 2 to 4 in the ratio 4 : 5 : 4; r-m cross-vein in the middle of discal cell; terminal sectors of veins r 2+3 and r 4+5 curving forward distally, that of m 1+2 slightly concave below basally, the last two not being parallel; anal angle faintly receding so that maximum width of wing around its middle than at anal angle. Haltere whitish yellow.

Legs : Of medium size, wholly whitish yellow except for the deeply brownish last two tarsal segments of fore and last one tarsus each of mid and hind legs; mid tibial spur slender, short, dark brown.

Abdomen : Slightly narrower than thorax and longer than wide, brownish black with median area of basal two to three terga in male and much of first and part of second terga in female deeply brown to yellowish brown. Female cerci well developed, dark brown with short, slender black hairs. Male genitalia (Figs. 337-338) : Epandrium widely opened with short, slender surstylus articulating with the inner side of epandrial incision; cercus well developed; postgonite with one short and one long sclerotized processes, relatively longer and more tapering terminally than in *typica*; distiphallus elongated, arched, uniformly thickened, slender but wider than in *typica* and nearly as wide as in *lutea*.

Length : Male 1.7 mm, wing 1.5 mm; Female 2.0 mm, wing 1.8 mm.

Holotype : Male, Tamil Nadu : Coimbatore Dist. Kunjapanai, 1200 m, 9.ii. 1992, Coll. G. Thirumalai. **Paratypes :** 2 females, collection data same as of holotype.

This species closely resembles *lutea* (Cherian) from India but differs in possessing 6 *orb* instead of 4 in *lutea*. Besides, in *brevidorsalis* 1 *dc* is distinctly shorter than *pa* 1 unlike the long 1 *dc* in *lutea* and thoracic hairs are whitish yellow and not dark brown. In addition in the build of the epandrium, nature of surstylus and relative development of hypandrium and postgonites the two species exhibit marked differences. This is the only species so far known under the genus in which 1 *dc* is shorter than *pa* 1 but all other features, especially the nature of the male genitalia, are characteristic of *Neorhodesiella* and hence it is included in this genus.

Genus 6 *Tachinoceros* de Meijere

1921. *Tachinoceros* de Meijere, *Tijdschr. Ent.* 64, Verslag : iii. Type species : *Tachinoceros longicornis* de Meijere, by subsequent monotypy (de Meijere *Tijdschr. Ent.* 67 : 45)
1924. *Tachinoceras* de Meijere, *Tijdschr. Ent.* 67. (Suppl.) : 45 (Probably intended spelling of *Tachinoceros*, 1921). Type species : *Tachinoceras longicorne* de Meijere, by monotypy.

Medium-sized (3.3-5 mm) species with erect and prolonged ant 2, horizontal eyes, hairy prosternum, flattened or nearly flattened scutum and long and flattened scutellum.

Head longer than high, black, with yellow hairs and bristles; frons slightly or distinctly projecting beyond eye in front, longer than wide, with a few *fr*; frontal triangle large, nearly subtruncate, reaching anterior margin of frons and with depressions and often a pimple-like projection. Face slightly or distinctly sloping; facial carina short, restricted to area between antennae, very rarely a pair of tubercular projections present arising from the corners of face and vibrissal angle. Antenna erect; ant 2 longer than wide and sometimes longer than ant 3; ant 3 longer than wide; arista slender, with distinct pubescence. Eye large, sometimes triangular in outline, rarely anterior ommatidia large, with horizontal long axis and with or without sparse minute pubescence. Gena linear to narrow, with hairs; vibrissal angle greatly receding; postgena well developed, with numerous, very conspicuous slender hairs. Parafacialia not developed. Proboscis short or of medium size; palpi fairly long. Head bristles well developed; *out* and *pvt* subequal, the latter cruciate; *ivt* and the proclinate and divergent *oc* subequal; *orb* 7-9, reclinate, usually shorter than *if* which are arranged in a row of 7-9 along margin of triangle; ocellar triangle often with a few slender, mostly proclinate hairs; ocular margin often with a row of hairs which are arranged in continuation with a few hairs found on vertex margin.

Thorax black with yellow to whitish yellow hairs. Scutum longer than wide, nearly flattened with dense hairs arising from stellate punctae; humeral callus clearly demarcated with dense hairs; *anepst* and *kepst* with dense to very dense hairs; prosternum with short or fairly long reasonably dense hairs; scutellum subtrapezoidal

to subtriangular, longer than wide with flattened disc which is pubescent like but more coarsely punctate than scutum. Thoracic bristles slightly reduced; *h* 1; *npl* 0+1, not longer than *h*; *pa* 1 much longer and 1 *dc* shorter than *npl*; *pa* 2 not developed; scutellar bristles well developed, borne on prominent tubercles; *as* longer than scutellum; *ss* 1 usually one-third to one fourth the length of *as*.

Legs long, slender, wholly or mostly yellow; tibial and femoral organs not developed; hind femur sometimes slightly thickened; mid tibia with apical spur.

Wing of the *Rhodesiella*-type; terminal sector of *r* 4+5 almost straight, that of *m* 1+2 slightly or distinctly sinuate and convex above at base; anal angle developed. Haltere mostly yellow.

Abdomen oval or a little elongated, wholly or partly yellow or brownish yellow with yellowish white or dark hairs. Male genitalia (Figs. 343-344) small in comparison to size of abdomen; phallapodeme forms a large sclerite which may or may not reach hypandrium; pre- and postgonites well developed, usually obtuse at apex; cerci short, blunt at apex; surstylus in the form of a large plate.

Biology : Nothing is so far known about the biology of the genus. The two species from India were collected from the leaves of shrubs.

Distribution : Oriental Region.

This genus is so far known only by three species, including the type species *longicornis* de Meijere from Sumatra and two other species, *chirapunjiensis* Cherian and *triangularis* Cherian from north-eastern India. The last two are described here and the status of the genus is also discussed.

Discussion on the status of *Tachinoceros*

Ever since this monotypic genus was described by de Meijere in 1921, with the type species *longicornis* de Meijere, it was considered a separate genus until Sabrosky (1977) synonymised it with *Rhodesiella* Adams, probably because of its close affinity to species of *elegantula* group of *Rhodesiella*. Many of the head and other body features, like nature and development of frons, depressions or pimple-like projections on frontal triangle, nearly flattened scutum and flattened scutellum, reduced thoracic bristles (0+1 *npl* and absence of *pa* 2) and nature of legs and wings are reminiscent of the *elegantula* group of species. But because of its long ant 2, greatly receding vibrissal angle, horizontal eye and hairy prosternum Andersson (1977) agreed with de Meijere in *Tachinoceros* being given a separate generic status. This was followed by Nartshuk (1987). If *longicornis* alone is studied in isolation the prolonged ant 2, horizontal eye and hairy prosternum stand out as distinctive characters. But in *Rhodesiella* there are various characters like the relative development of 1 *dc*, length

and convexity of scutellum, thickness of hind femur, relative length of abdomen, size of male genitalia and many others which exhibit various degrees of development. If so *longicornis* could be considered only an aberrant species of *Rhodesiella* having a few special features. But the study of *longicornis* along with the other two species, which are its close relatives, all of which have erect antennae with prolonged ant 2, horizontal eyes and hairy gena, postgena and prosternum reveals a definite trend in the evolution of the group from the *elegantula* group of species. Thus in the first species *chirapunjiensis* Cherian ant 2 is 1.65 x as long as wide, face is not sloping, frons does not extend beyond eye in front, gena and postgena are less hairy and prosternum is with only a few short hairs. In *longicornis* ant 2 is 2.5 x as long as wide, frons extends slightly beyond eye in front, face is slightly sloping and gena, postgena and prosternum are with prominent hairs. In the third species *triangularis* Cherian frons extends far beyond eye in front and forms a roof over bases of antennae and face is greatly sloping. As for the hairiness of gena, postgena and prosternum it is almost similar to that of *longicornis* though ant 2 is shorter and only 1.5 x as long as wide. Though in all the three species, eye is horizontal, yet in *chirapunjiensis* and *longicornis* it is broadened in front, while in *triangularis* it is narrow in front and almost triangular in outline, recalling the condition in some genera of Chloropinae. Again *triangularis* has a pair of tubercular projections, each arising from the junction of virbissal angle and lower facial margin, a character very rarely found in other genera of Chloropidae. Hence but for the comparative length of ant 2, most of the other characters exhibit a progressive evolutionary trend, taking *triangularis* farthest from the ancestral stalk. Because of the presence of all the major characters peculiar to the genus in all three species with a progressive trend in their evolution, Cherian (1992) considered these belonging to a distinct valid genus *Tachinoceros*.

Key to the species of *Tachinoceros*

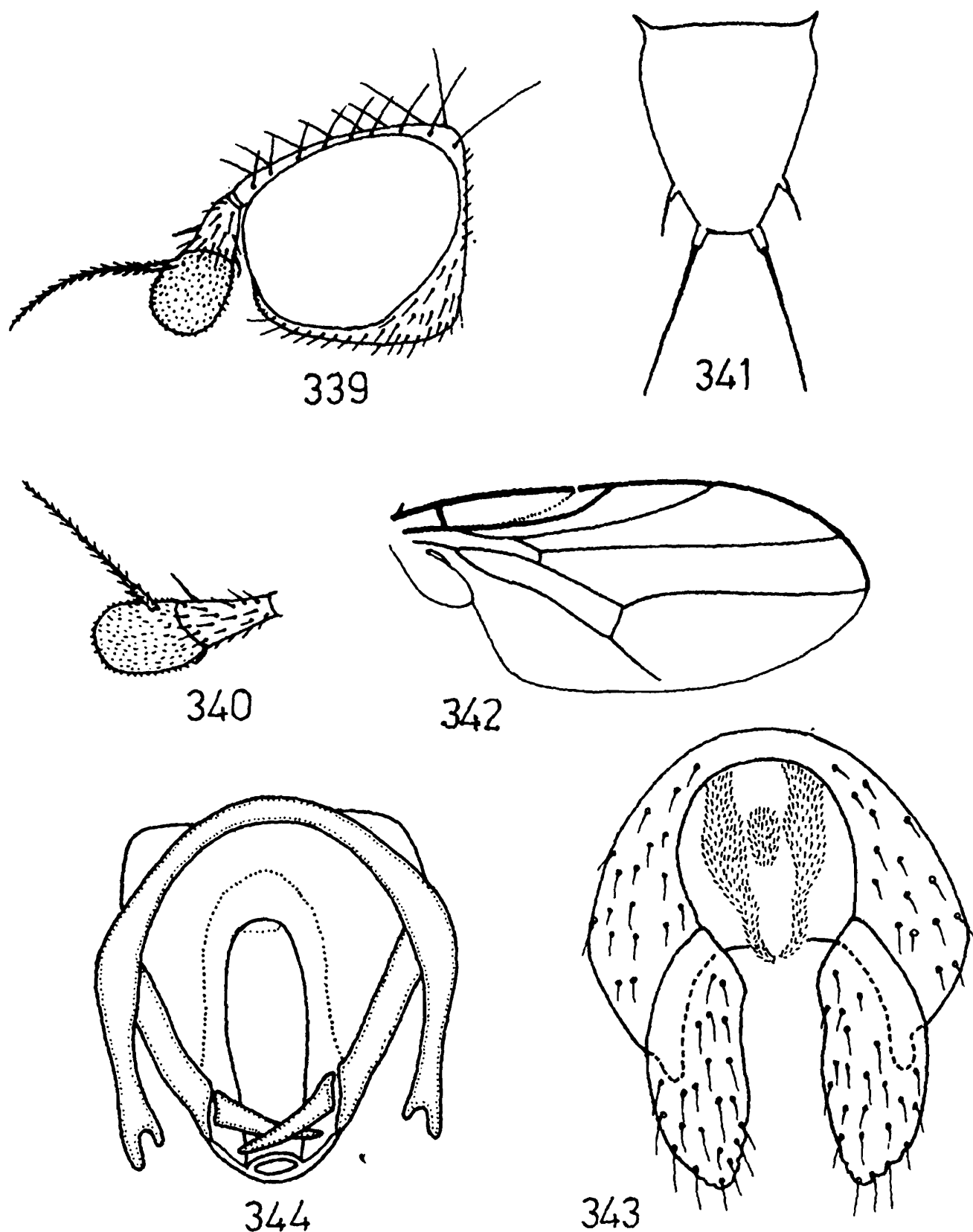
1. Frontal triangle with pimple-like projection a little behind anterior end ; ant 2 not more than 1.65 x as long as wide ; eye naked ; ommatidia of equal size 2
- Fontal triangle without pimple-like projection; ant 2, 2.5 x as long as wide; eye with a few fine hairs; ommatidia in anterior part larger*longicornis* de Meijere.
2. Frons not projecting beyond eye in front; vibrissal angle only slightly reduced; face without tubercular projections at corners of lower facial margin; antennae not hidden by frons; eye though horizontal yet somewhat broadened anteriorly; hairs on gena, postgena and prosternum short and less numerous; all tarsi yellow*chirapunjiensis* Cherian

Frons greatly projecting beyond eye in front and forming a roof over bases of antennae; vibrissal angle greatly reduced; face with a pair of tubercular projections at corners of lower facial margin; eye narrow anteriorly and almost triangular in outline; hairs on gena, postgena and prosternum long and more numerous; last two tarsal segments of hind leg brownish black
*triangularis* Cherian

74. *Tachinoceros chirapunjiensis* Cherian (Figs. 339-344)

1992. *Tachinoceros chirapunjiensis* Cherian, *Hexapoda*, 4 (2) : 190-191. Type locality : India : Meghalaya : Chirapunji.

Male : Head (Fig 339) : As long as high, length, height and width ratio 7 : 7 : 12. Frons 1.1 x as long as wide, not projecting beyond eye, slightly narrowing anteriorly, width at vertex half that of head, dull blackish brown, with a few short punctate *fr* between *orb* and *if*; frontal triangle large, glabrous, shiny blackish green, with linear depression on either side of ocellar triangle, almost a pimple-like projection in the middle which is at two-thirds its length from ocellar triangle and a depression medially in front of the pimple-like projection, reaching anterior margin of frons and ending with very broadly obtuse apex, almost imparting subtruncate shape to the triangle. Antenna (Fig 340) erect; ant 2 as long as ant 3 and 1.65 x as long as wide, broader anteriorly than at base, yellow, with prominent yellow hairs, a conspicuous black spinous hair anterodorsally behind which a few dark hairs are seen on dorsal margin; ant 3, 1.2 x as long as wide, black with very fine dense pubescence; arista slender, fairly long, brownish black with fairly dense conspicuous concolorous hairs but for slightly yellow basal part. Face only slightly concave, shiny black except for slightly rugulose longitudinal depressions on either side of midlongitudinal area; facial carina low, linear, hardly reaching middle of face; lower facial margin slightly raised. Eye large, naked, with ommatidia of uniform size and horizontal long axis. Gena narrow, narrowest in the middle than in front and behind, width in the middle one-fifth that of ant 3, black but for brownish tinge in area around vibrissal angle, with a row of conspicuous yellow hairs on oral margin; vibrissal angle receding; postgena well developed, subshiny black with slender, fairly dense pale hairs; parafacialia not developed. Oral opening suboval; proboscis short, brownish yellow; palpi well developed with fine, dense, slender hairs. Head bristles well developed, yellow; *out* and the convergent *pvt* subequal; *ivt* 0.8 x as long as *out*; *oc* proclinate, divergent, equal to *ivt*; *orb* about 8, recumbent, anterior ones sequentially becoming shorter, longest one a little shorter than longest *if*; *if* about 8, well developed, in a row along margin of triangle, turned inwards and forwards; oral vibrissae distinct.



Figs. 339-344 : *Tachinoceros chirapunjiensis* Cherian. 339, Head, lateral view. 340, Antenna. 341, Scutellum. 342, Wing. 343, Epandrium, dorsal view. 344, Phallic complex, ventral view.

Thorax : Shiny black. Scutum a trifle longer than wide, with slightly convex disc, evenly covered with dense whitish yellow hairs arising from stellate punctae; humeral callus clearly demarcated, hairy; *anepst* and *kepst* with hairs which are shorter than those on scutum; prosternum with a few short hairs. Scutellum (Fig 341) 1.2 x as long as wide, sub-triangular with flattened disc, pubescent like but more coarsely punctate than scutum. Thoracic bristles fairly well developed; *h* 1 slender, black, a trifle shorter than *out*; *npl* 0+1, yellow, stouter but not longer than *h*; *pa* 1 black, about 1.5 x as long as *npl*; *pa* 2, indistinct; 1 *dc* yellow, hair-like; *as* black, stout, longer than scutellum, borne on prominent tubercle; *ss* 1 yellow, 0.25 x as long as scutellum, borne on distinct black tubercle; distance between bases of *as* a little less than that between *as* and *ss* 1.

Legs : Long and slender, wholly yellow but for brownish hind coxa; mid tibia with fairly dense whitish yellow hairs of medium size; mid tibia with yellow apical spur; tibial and femoral organs absent; hind femur not thickened and without tubercles ventrally near base; unlike in *longicornis* de Meijere, first metatarsi not greatly prolonged.

Wing (Fig. 342) : 2.5 x as long as wide, hyaline with deeply brown veins; proportions of costal sectors 2 to 4 in the ratio 11 : 13 : 5; r-m cross-vein proximad of middle of discal cell, opposite 0.45 of its length; terminal sector of r 4+5 nearly straight, that of m 1+2 very weakly sinuate with the area just a little beyond its base slightly convex above; anal angle well developed. Haltere with yellow stalk and yellowish brown knob.

Abdomen : Much longer than wide, brownish black, with short black hairs, except the two basal yellowish brown segments and excluding distal margin of second segment.

Male genitalia (Figs. 343-344) : Phallapodeme forms a large sclerite which extends beyond hypandrium; pregonites and postgonites well developed, the latter with hairs near middle of inner margin; cerci short, slender, blunt at apex; surstylus in the form of a large, subtriangular plate.

Length : Male 3.3 mm; wing 2.38 mm.

Specimen examined : *Holotype* : Male, Meghalaya : Chirapunji, 5.v.1979, Coll. P.T. Cherian.

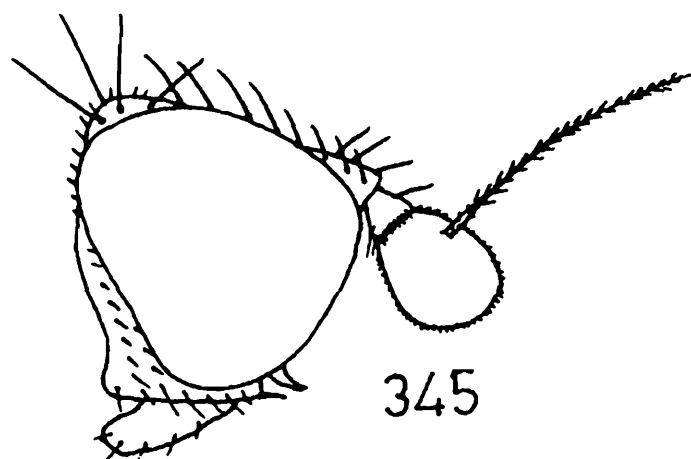
This species is closely related to *Tachinoceros longicornis* de Meijere but differs in having naked eye, a little widened vibrissal corner, pimple-like projection on frontal triangle, slightly convex scutum and long, mostly brownish black abdomen. Besides, in *chirapunjiesis* ant 2 is only 1.65 x as long as wide and is not longer than ant 3.

75. *Tachinoceros triangularis* Cherian (Figs. 345-349)

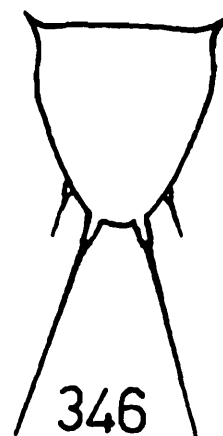
1992. *Tachinoceros triangularis* Cherian, *Hexapoda*, 4 (2) : 191-193. Type locality : Assam : Garampani.

Male : Head (Fig. 345) : Longer than high and much wider than thorax; height length and width ratio 7:8:14. Frons narrowing anteriorly, width at vertex 0.45 x that of head and 1.25 x its own length, brownish black, distinctly compressed, projecting beyond eyes in front and forming a roof over bases of antennae, with a few erect hairs, which are more in the form of a cluster along vertex margin behind *out*; frontal triangle large, glabrous, shiny blackish green, subtruncate, reaching anterior margin of frons and with a pimple-like projection medially at two-thirds its length from vertex margin and two long depressions at lateral margins, one on each side of the median projection. Face more concave than in *chirapunjiensis*, midlongitudinal area shiny, two sides rugulose and more depressed longitudinally and with fine closely arranged transverse parallel lines; lower facial margin thin, raised up, medially convex and with very fine plumose pubescence; at the junction of lower facial margin and vibrissal angle there is an yellow tubercular projection which terminates with black, nearly pointed apex, a character so far not reported in *Tachinoceros* and very rarely found in other genera. Eye large, naked, nearly triangular with distinctly horizontal long axis and ommatidia of equal size. Antenna erect, basal segment wholly and ant 2 partly hidden by projecting frons; ant 2, 1.5 x as long as wide, yellow, with very conspicuous yellowish white hairs which are more dense and long at slightly broadened distal part; ant 3 brownish black but for yellow tinge basally, 1.25 x as long as wide, with extremely minute dense pubescence; arista slender, dark brown with conspicuous concolorous hairs but for the brownish yellow base where hairs are shorter and finer. Gena linear with fine yellowish white hairs which are more numerous around greatly receding vibrissal angle; postgena with numerous slender hairs as on gena and almost recalling the condition in *longicornis* de Meijere except for its reduced size. Proboscis well developed, brownish yellow with fine hairs; palpi club-shaped, deeply brownish with slender pale hairs; a row of ocular setae present on margin of eye in continuation of hairs on vertex margin. Head bristles well developed, yellow; *out* and the cruciate *pvt* long and subequal; *ivt* two-thirds the *out*; *oc* proclinate, divergent, equal to *ivt*; a few slender proclinate yellowish white hairs present on ocellar tubercle; *orb* about 8, sequentially anterior ones becoming shorter and more slender, longest a little shorter than *oc*; *if* in a row of 8 along margin of frontal triangle, anterior most proclinate.

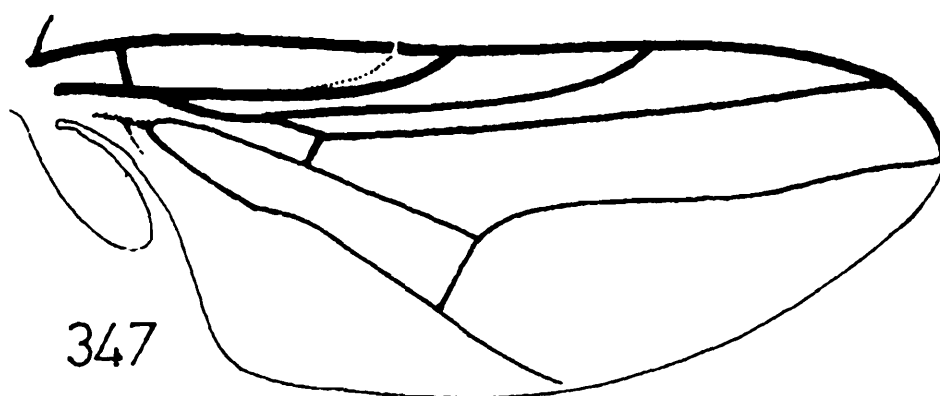
Thorax : Wholly black. Scutum longer than wide, with nearly flattened disc and evenly covered with dense (more dense than in *chirapunjiensis*) golden yellow hairs



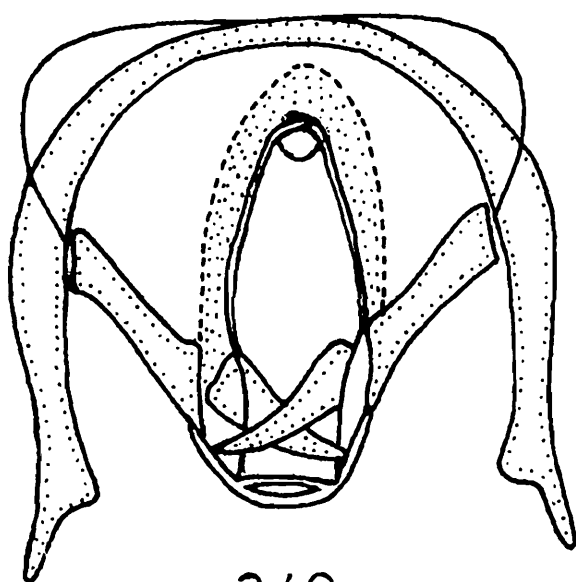
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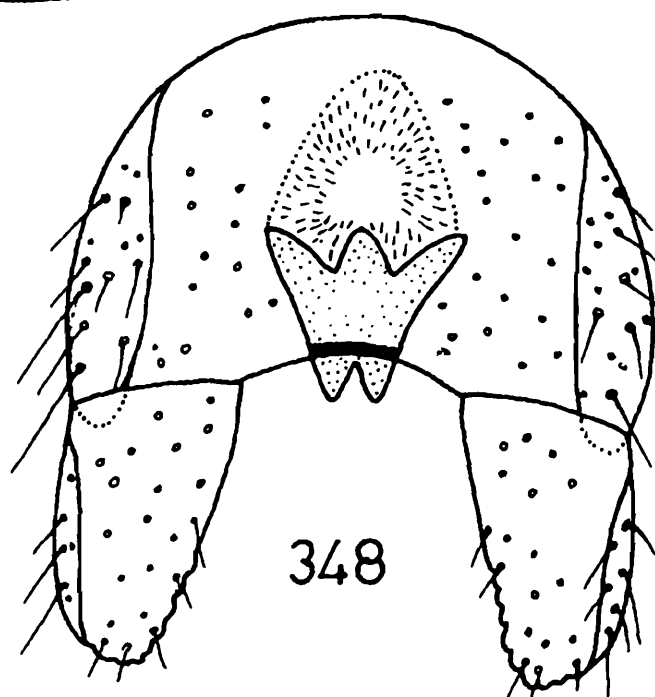
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Figs. 345-349 : *Tachinoceros triangularis* Cherian. 345, Head, lateral view. 346, Scutellum. 347, Wing. 348, Epandrium, ventral view. 349, Phallic complex, ventral view.

arising from stellate punctae; humeral callus well demarcated, with dense hairs; *anepst* and *kepst* almost wholly covered with dense, yellowish white hairs; prosternum with prominent, fairly dense hairs as on *kepst*. Scutellum (Fig 346) 1.2 x as long as wide, sub-triangular with flattened disc, pubescent like but more coarsely punctate than scutum. Thoracic bristles, except *pa* 1, reduced in size; *h* 1, slender, black, almost equal to *out*; *npl* 0+1, yellow, equal to *h*; *pa* 1 black, about 1.5 x as long as *npl*; *pa* 2 not developed; 1 *dc* yellow, shorter than *npl* and only a little longer than hairs on scutum; *as* black, borne on prominent black tubercle, length, together with that of its tubercle, 1.2 x that of scutellum; *ss* 1 black, together with its tubercle 0.25 x as long as *as*; distance between bases of *ss* 1 and *as* almost equal to that between two *as*.

Legs : Long and slender, yellow except for brownish black last two tarsal segments of hind leg and traces of deep brownish tinge on hind femora and tibiae; mid tibia with yellow, slender apical spur; hind femur very slightly thickened, without tubercles near base; tibial and femoral organs absent.

Wing (Fig. 347) : Much shorter than body, hyaline with yellowish brown veins; costal sectors 2 to 4 in the ratio 12:16:5; r-m cross-vein proximad of middle of discal cell, opposite 0.48 of its length; terminal sector of r 4+5 nearly straight, that of m 1+2 sinuate along its entire length and convex above near base; anal angle moderately developed. Haltere yellow with brown tinge on knob.

Abdomen : Elongate oval, much narrower than thorax, brownish yellow except for blackish brown terga of third and fourth segments, with slender pale hairs; sterna of four basal segments prominently developed with midlongitudinal depression. Male genitalia (Figs. 348-349) small in comparison to body; phallapodeme short, much smaller than in *chirapunjiensis*, not reaching hypandrium; pregonites much shorter than and postgonites narrower than in *chirapunjiensis*; cerci short, triangular; surstylus broadly obtuse at apex with medially concave inner margin.

Length : Male, 4 mm; wing 3.1 mm.

Specimen examined : *Holotype* : Male, Assam : Garampani, 19.ix.1979, Coll. P.T.Cherien. This species is closely related to *longicornis* de Meijere, but can be distinguished by the triangular shape of eye, which is also naked, the absence of depression medially near the anterior end of frontal triangle but instead the presence of a pimple-like projection, shorter ant 2, presence of two tubercular projections, one each at the junction of vibrissal angle and face and darkened last two tarsal segments of each hind leg.

Genus 7 *Euthyridium* Frey

1923. *Euthyridium* Frey, *Notulae Ent.*, 3 : 98. Type species : *Euthyridium nobile* Frey, 1923, By original designation and monotypy.

Medium sized black flies, with *Rhodesiella* like wings, pitted or sculptured frontal triangle and large, squarish, flat scutellum bearing scutellar bristles on four large tubercles.

Head higher than long, black with distinct black or yellow hairs and bristles. Frons not projecting, longer than wide, slightly narrowing anteriorly and without *fr*; frontal triangle large, broadly reaching anterior margin of frons, glabrous, metallic-blue, pitted or sculptured and often with large grooves and ridges; *if* arising from grooves, in one row along margin of triangle or with another longitudinal, inner to the first, on each side. Face flat or concave, black and shiny; facial carina, when distinct, very low, linear and reaching middle of face. Antenna dark brown to yellow; ant 2 small with distinct bristle; ant 3 pubescent, longer than or as long as wide; arista slender with sparse or fairly dense pubescence as in *Rhodesiella*. Eye large, bare, oval, with almost vertical or oblique long axis. Gena almost linear, with a few hairs; parafacialia not developed. Proboscis and palpi short. Head bristle well developed; *out* and *pvt* subequal; *ivt* shorter than *out*; *orb* 7-9, reclinate; *oc* proclinate, divergent, a little shorter than *if*.

Thorax shiny. Scutum nearly as long as wide, deeply punctate, densely pubescent with hairs arising from stellate warts. Scutellum very prominent, almost rectangular, longer than or as long as wide, disc nearly flat with punctae and pubescence similar to those on scutum. Pleura shiny; *anepst* with numerous and *kepst* with a few hairs. Thoracic bristles slender; *h* 1; *npl* 1+1; *pa* 2 shorter than *pa* 1; *as* and *ss* 1 borne on very prominent tubercles.

Wing of *Rhodesiella*-type with short, curved r 2+3, basally curved last sector of m 1+2, oblique m-m cross-vein and well developed anal angle.

Legs short and fairly stout; tibial and femoral organs absent.

Abdomen oval with short hairs. Female cerci short, rather slender. Male genitalia with large surstylus, well developed gonites, fairly long phallus and long phallapodeme. The nature and development of gonites somewhat recall the armature at the base of distiphallus in species of *Scoliophthalmus* Becker.

Flies of this genus have the general appearance of species of *Rhodesiella* Adams. Sabrosky (1977) in his catalog on Oriental Chloropidae considered *Euthyridium* a synonym of *Rhodesiella* because of its wings and similarities in many of the other body characters but Andersson (1977) and Nartshuk (1987) considered it a separate

genus because, apart from other characters, of its large, flat and squarish scutellum. Because of the distinctive nature of scutellum and characters like pitted, grooved or sculptured frontal triangle with one or two rows of *if* (pitted or sculptured triangle with two rows of *if* is not seen in any species of *Rhodesiella*) on the triangle and differences in male genitalia not known before, Cherian (1992) agreed with Nartshuk and others in assigning the group a separate generic status.

Distribution : *Euthyridium* is a comparatively small genus, hitherto known to be represented only in the Oriental and Australian Regions. From the former it is so far known only by the type species *nobile* Frey from Philippines and probably from Myanmar (Andersson, 1977) and *indicum* Cherian from India. Since the availability of *nobile* in Myanmar is doubtful the only species *indicum* known from India is described here.

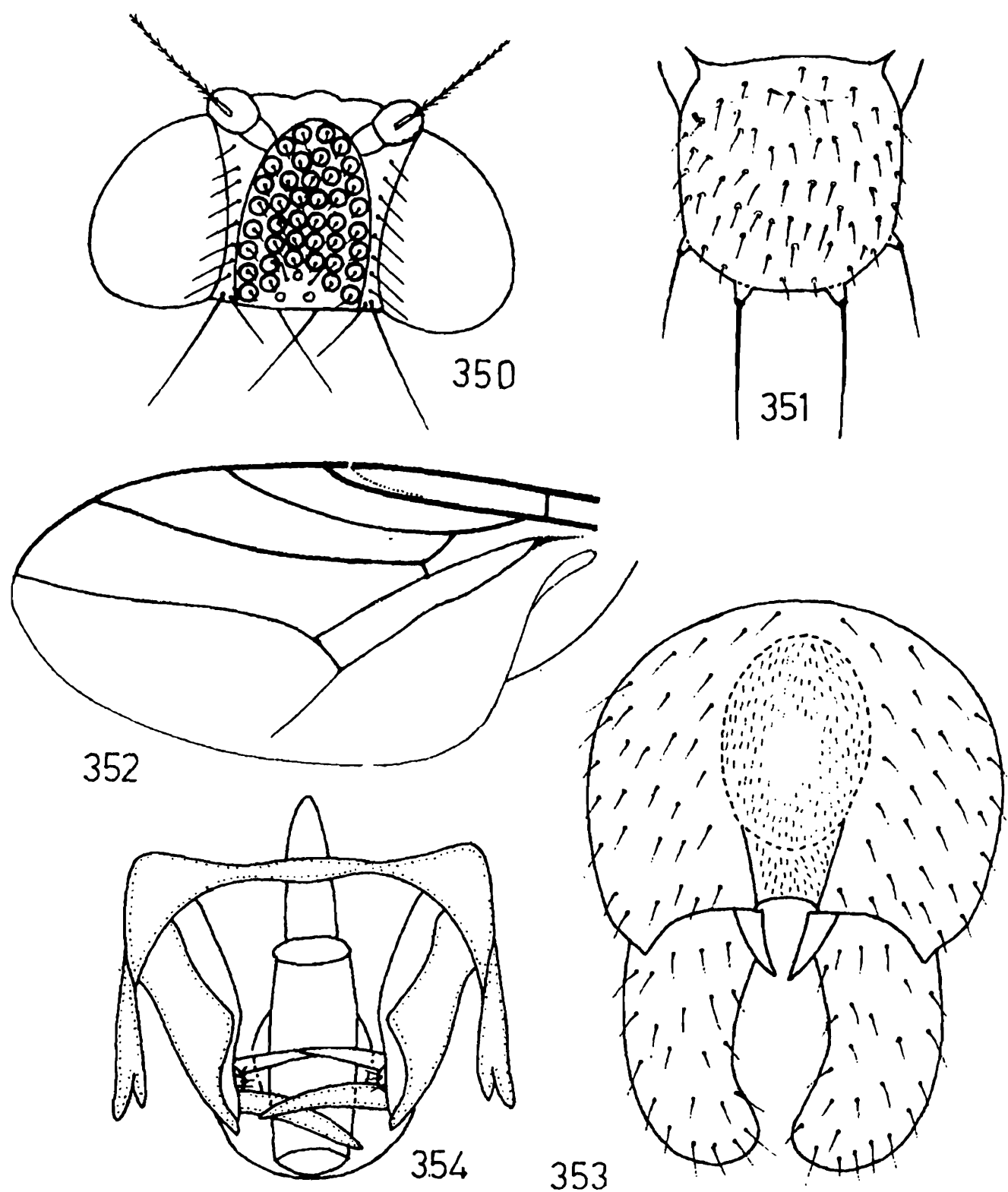
Biology : Nothing is known about the biology or ecology of this genus or of its immature stages ; *indicum* was collected along with three species of *Rhodesiella* from leaves of shrubs.

76. *Euthyridium indicum* Cherian (Figs. 350-354)

1992. *Euthyridium indicum* Cherian, *Hexapoda*, 4 (1) : 58-59. Type locality : India : Orissa : Mayurbhang Dist., Janabil.

Male : Head (Fig. 350) : Sloping, length, height and width in the ratio 14 : 15 : 24. Frons brownish black, width a trifle more than half that of head and 0.9 x its own length, not projecting above or beyond eyes ; frontal triangle large, glabrous, metallic-blue, truncate at apex, whole surface with closely knit, nearly rounded depressions from which arise yellow *if*. Face concave ; carina very low, linear, reaching middle of face; lower facial margin projecting. Second and third antennal segments with fine pubescence ; ant 3 nearly as long as wide, yellowish brown in lower half and dark brown above ; arista slender, basally yellow, otherwise predominantly dark brown, with concolorous pubescence of medium-size. Gena black; postgena well developed with fine, dense hairs. Eye large, occupying much of head in profile; long axis nearly oblique. Proboscis dark brown; palpi brownish black. Head bristles yellow ; *out* a little shorter than half width of eye ; *ivt* three-fourths the *out* ; *orb* about 8, sequentially anterior ones becoming shorter, longest two-thirds the *out* ; *oc* a little shorter than longest *orb* ; *pvt* cruciate ; *if* in 2 rows of 8-9 on the triangle on each side; about 8 hairs present at oral margin of gena of which the one at vibrissal angle more developed ; ocellar tubercle with a few short, yellow hairs.

Thorax : Shiny black. Scutum wider than long, width and length ratio 12 : 11, with dense, coarse punctae bearing yellowish white hairs ; *anepst* and *kepst* with yellowish



Figs. 350-354 : *Euthyridium indicum* Cherian. 350, Head, dorsal view. 351, Scutellum. 352, Wing. 353, Epandrium, dorsal view. 354, Phallic complex, ventral view.

white hairs as on scutum. Scutellum (Fig. 351) as long as wide, length three-fourths that of scutum, rectangular but for corners of distal margin, pubescent like but more coarsely punctate than scutum. Thoracic bristles yellow ; *h* 1, equal to *orb* ; *npl* 1+1, subequal, a little longer than *h* ; *pa* 1 equal to and *pa* 2 shorter and much slender than *npl* ; 1 *dc* fallen off in the specimen before me ; *as* widely separated, borne on prominent tubercle, length including that of tubercle 0.65 x that of scutellum ; *ss* 1 very prominent, length together with that of tubercle 0.78 x that of *as*.

Legs : Fore legs missing ; hind coxa entirely and mid and hind femora, but for their yellow bases and tips, black ; rest of the areas of all legs yellow.

Wing (Fig. 352) : Hyaline with brown hairs and dark brown veins ; width and length in the ratio 19 : 41 ; costal sectors 2 to 4 in the ratio 6 : 9 : 7 ; r-m cross-vein slightly proximad of middle of discal cell, opposite 0.47 of its length ; terminal sector of vein m 1+2 basally curved and convex above as in some species of *Rhodesiella* Adams ; anal angle well developed. Haltere whitish yellow.

Abdomen : Broader than long, shiny, brownish black with tinge of yellow, especially on basal segments. Male genitalia (Figs. 353-354) : Surstylus very broad and large, broadly obtuse apically ; phallapodeme projecting far beyond posterior margin of hypandrium ; distiphallus of medium-size, longer than broad ; gonites well developed, bent and prolonged terminally and nearly encircle base of distiphallus.

Length : Male 2 mm ; wing 1.7 mm.

Specimen examined : Holotype : Male, India : Orissa : Mayurbhang Dist., Janabil, 20.ii.1977, Coll. S. K. Gupta.

E. indicum comes close to *nobile* Frey from Pilippines but differs in the number of rows and arrangement of *if*, presence of closely knit rounded depressions on frontal triangle and yellow colour of head bristles. Besides, in *indicum* scutellum is as wide as long and is shorter than scutum.

Genus 8 *Amnonella* Cherian

1992. *Amnonella* Cherian, *Hexapoda*, 4 (1) : 59. Type species : *Amnonella plumofrontata* Cherian, 1992. By original designation and monotypy.

A genus closely related to *Rhodesiella* Adams, but differing in having finely punctate hairs on the frontal triangle, distinctly depressed frons, extraordinarily long scutellum, which is narrow and cylindrical in the distal half and in the male genitalia.

Head slightly narrower than thorax, black ; frons less than half as wide as head, depressed ; frontal triangle large, glabrous but for finely tomentose anterolateral

margins, reaching anterior margin of frons and with finely punctate, almost evenly distributed slender hairs which are confined mostly to anterior half and sides of ocellar triangle, leaving area in front of ocellar triangle bare. Eye large, bare with ommatidia of uniform size, projecting distinctly above and slightly beyond frons, with vertical long axis. Face flattened with low carina reaching distinctly raised and plumose lower facial margin ; ant 3 almost as wide as long ; arista slender, pubescent. Gena narrow, rugulose ; vibrissal angle blunt ; postgena with hairs. Proboscis and palpi short. Head bristles with distinct *out*, *ivt* and *pvt*, short proclinate *oc*, recumbent *orb* and 1 row of *if* along margin of triangle.

Thorax shiny black ; scutum nearly flattened especially in distal half, densely and very coarsely punctate with yellowish white hairs ; humeral callus prominent with carinate ridge extending from its posterolateral corner to wing base and this carina forms the upper margin of *anepst* and propleuron ; *anepst* and *kepst* with prominent, dense hairs ; a tuft of fine, erect, plumose white hairs present at anteroventral corner of propleuron just above base of fore coxa near neck region ; scutellum extraordinarily developed, much longer than scutum, width at base less than half its own length, flat and triangular in basal half and narrow and cylindrical in distal half, pubescent and punctate like scutum basally and less densely punctate in distal half. Thoracic bristles with hair-like *h*, 0+1 *npl*, well developed *pa* 1, indistinct *pa* 2 and slender 1 *dc*; scutellars borne on prominent tubercles ; *as* not widely separated ; *ss* 1 a little below basal half and *ss* 2 in basal half.

Wing of *Rhodesiella*-type with sinuate last sector of *m* 1 + 2 and yellow halteres.

Legs with thickened fore coxa and femur, greatly thickened hind femur with spines along its anteroventral and posteroventral surfaces, bowed hind tibia and no tibial and femoral organs.

Abdomen less than half as long as body, much longer than wide with yellow basal and blackish brown distal segments. Male genitalia : Phallus short and broad, much shorter and stumpier than in species of *Rhodesiella* and other related genera. Besides, unlike in other genera, distiphallus is not bent upwards and is not demarcated from the rest of phallic complex but forms a continuous structure.

Amnonella belongs to the *Rhodesiella* group of genera, with affinities to *Rhodesiella* Adams and *Tachinoceros* de Meijere. In its general appearance and body and wing characters *Amnonella* resembles *Rhodesiella*, but differs in the former possessing depressed frons with finely punctate hairs on frontal triangle. Besides, in *Amnonella* facial carina is indistinct and reaches lower facial margin, anterior *npl* is absent, scutellum is longer than scutum and extraordinarily developed with flattened and

triangular basal part and narrow, elongated and cylindrical distal part and distiphallus is short, not bent upwards and continuous with the rest of phallic structure. In the nature of scutum with its reduced chaetotaxy and such other characters *Amnonella* shows affinities to *Tachinoceros* de Meijere, but can be distinguished by the former having pubescent frontal triangle, short ant 2 and extraordinarily developed and peculiarly shaped scutellum. Besides, the male genitalia of the two genera exhibit marked differences.

Gender and derivation : Feminine, from the name of Amnon, the collector of the type species plus the termination-ella.

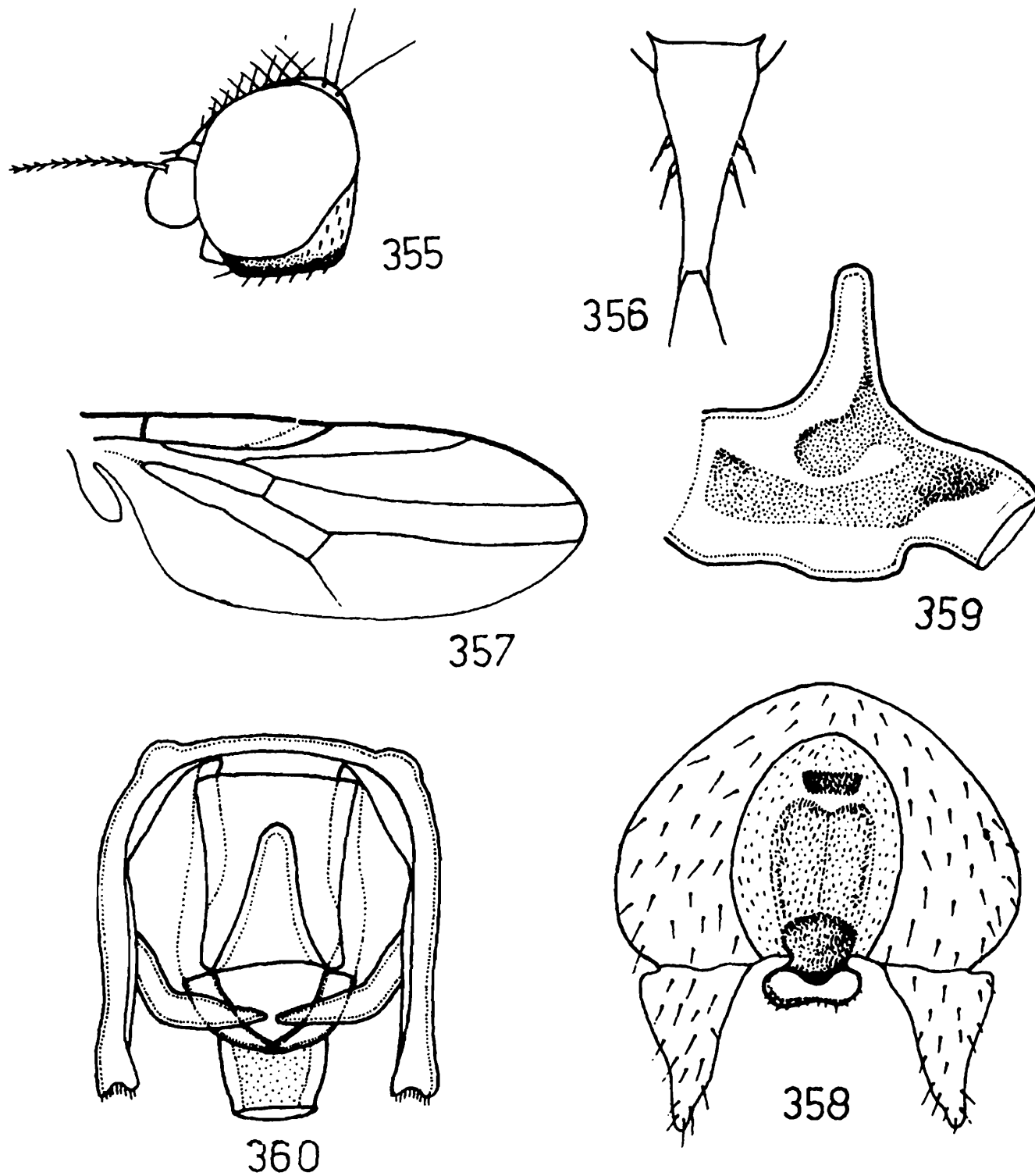
Distribution : *Amnonella* is a very small genus so far known only by the type species *plumofrontata* Cherian from the Oriental Region. The species is described here.

Biology : So far nothing is known about the biology and ecology of this genus. The type species was collected, along with members of some related genera, from the leaves of shrubs in a thick forest.

77. *Amnonella plumofrontata* Cherian (Figs. 355-360)

1992. *Amnonella plumofrontata* Cherian, *Hexapoda*, 4(1) : 60-62. Type locality : India : Meghalaya : Nangpo.

Male : *Head* (Fig. 355) : Only a trifle higher than long, length, height and width ratio 17 : 18 : 32. Frons depressed, blackish brown, as long as wide, width at vertex 0.4 x that of head, slightly narrowing anteriorly and not reaching anterior margin of eye; frontal triangle large, occupying much of area of frons, shiny black, glabrous but for anterolateral corners, reaching anterior margin of frons and ending with narrowly obtuse apex. Face only slightly concave, yellowish brown ; facial carina in the form of a low but distinct black ridge, reaching lower facial margin which is a little raised up. Antennae of medium size, brownish yellow, with fine pubescence ; ant 2 about half as long as ant 3, the latter suborbicular ; arista slender, of medium size, basal part naked and concolorous with ant 3, distal part with short, very slender hairs. Eye large, bare, with ommatidia of equal size, projecting distinctly above and a little beyond frons, long axis vertical. Gena one-third as wide as ant 3, shiny black but for the yellowish brown vibrissal angle, which is blunt, not raised and merges with lower facial margin ; postgena dull back with a few hairs ; parafacialia not developed. Proboscis and palpi short, dark brown with fine, slender hairs. Head bristles whitish yellow ; *out* well developed, longer than rest of head bristles ; *pvt* convergent, slightly shorter than *out* ; *ivt* much shorter than *out* ; *oc* proclinate, divergent, not longer than



Figs. 355-360 : *Amnonella plumofrontata* Cherian. 355, Head, lateral view. 356, Scutellum. 357, Wing. 358, Epandrium, dorsal view. 359, Phallus. 360 Phallic complex, ventral view.

longest *orb*; *orb* about 8, recumbent, anterior ones sequentially becoming shorter ; *if* in a row of about 8 just outside margin of frontal triangle, equal to *orb*; frontal triangle with finely punctate short hairs confined mostly to anterior half besides a few at sides of ocellar triangle, leaving area in front of ocellar triangle practically bare.

Thorax : Wholly shiny black. Scutum nearly as wide as long, with nearly flattened disc especially in distal half, coarsely and densely punctate with yellowish white, prominent hairs ; humeral callus prominent with carinate ridge extending from its posterolateral corner to base of wing and this carina forms upper margin of propleuron and *anepst* ; *anepst* and *kepst* with dense, yellowish white punctate hairs ; a tuft of fine white hairs present at anteroventral corner of propleuron just above base of fore coxa near neck region. Scutellum (Fig. 356) extraordinarily developed, 1.2 x as long as scutum, width at base 0.43 x the length, distinctly flattened and triangular in basal half and cylindrical in distal half with cylindrical part progressively becoming less thick distally, basal part very coarsely punctate and pubescent like scutum while distal part more shiny and with less dense punctae and hairs. Thoracic bristles slender but for *pa* 1 and scutellars ; *h* 1, hardly distinguishable from humeral hairs; *anpl* not developed; *pnpl* and 1 *dc* slender, subequal; *pa* 1 well developed, borne on prominent wart; *pa* 2 indistinct ; all scutellar bristles borne on prominent tubercles; *as* not widely separated at base, length, together with that of its tubercle, one-third that of scutellum; *ss* 1 located at 0.54 the length of scutellum from its base, a little below the junction of its flattened basal part and cylindrical distal part, its length with the tubercle 0.75 x that of *as*; *ss* 2 at two-fifths length of scutellum from base, its length with the tubercle 0.6 x that of *ss* 1 ; all thoracic tubercles black and bristles yellow.

Wing (Fig. 357) : 0.37 x as wide as long, hyaline with yellowish brown veins; proportions of costal sectors 2 to 4 in the ratio 22 : 20 : 7; r-m distad of middle of discal cell, opposite 0.6 of its length ; terminal sector of m 1+2 distinctly sinuate and convex above basally, that of r 4+5 nearly straight so that the two not parallel with maximum distance between the two nearly around the middle part of the former; anal angle slightly receding. Haltere yellow.

Legs : Fore and hind coxae well developed and distinctly thickened ; fore femur rather spindle-shaped ; mid femur normal; hind femur greatly thickened, its maximum width 0.31 x the length, with a row each of about 10 very conspicuous, tuberculate yellow spines and 10 much smaller hair-like spines on anteroventral and posteroventral margins which form a crib into which fits in the basal part of the bowed tibia; fore coxa with fine white plumose hairs ; tibial organ absent ; legs yellow but for distinctly darkened fore tibia, all fore tarsi, last tarsal segment of hind leg and partly infuscated

hind tibia; mid and hind coxae also with a tinge of diffused infuscation; mid tibia with distinct, slender, terminal yellow spine.

Abdomen : Much longer than wide, width 0.65 x the length, basal segments distinctly and third partly yellow, rest of the segments shiny blackish brown with fine yellowish white hairs. *Male genitalia* (Figs. 358-360) : Small in relation to body; epandrium medium sized ; mesolobus distinct; surstylus longer than broad, pointed at apex; phallapodeme short, not reaching the posterior margin of broad hypandrium; pregonite well developed, narrowly obtuse apically; postgonite long, pointed apically; distiphallus short, stumpy, not bent upwards, much broader than phallapodeme from which it is not clearly demarcated.

Length : Male 3.8 mm; wing 3.6 mm.

Specimen examined : Holotype : Male, India : Meghalaya : Nangpo, 18.iv.1980, Coll. F. Amnon.

The species shows some affinities to *Tachinoceros longicornis* de Meijere in the development of thoracic bristles (except for scutellars) and nature of scutum, but differs in having short ant 2 and hairs on frontal triangle. Besides, in the shape and development of scutellum and the nature of male genitalia also the two species differ markedly.

Genus 9 *Pseudonomba* Cherian

1989. *Pseudonomba* Cherian, *Oriental Insects*, **23** : 224. Type species : *Pseudonomba typica* Cherian, 1989. By original designation and monotypy.

A very small genus of black flies, with inconspicuous gena, *if* in a row on the frontal triangle on each side and six pairs of scutellar bristles borne on warts.

Head higher than long. Frons longer than wide, of *Rhodesiella* type; frontal triangle glabrous, reaching anterior margin of frons. Face short, concave ; facial carina low but broad ; lower facial margin thickened. Antenna erect; ant 2 much shorter than ant 3, the latter wider than long; arista slender, with long, dense pubescence. Eye large, naked, occupying much of head in profile, with vertical long axis. Gena and vibrissal angle almost inconspicuous; postgena greatly reduced. Palpi and proboscis short; oral opening greatly narrowing towards lower facial margin. Head bristles prominent with proclinate and divergent *oc*, well developed *ovt*, short *ivt*, cruciate *pvt*, 6 *orb* and *if* in a row on the margin of the triangle on each side.

Thorax shiny black; scutum convex, with dense piliferous punctae and black hairs; scutellum suboval to subtriangular, longer than wide, pubescent and punctate like

scutum; *anepst* and *kepst* with hairs. Thoracic bristles slender with 1 *h*, 1+1 *npl*, *pa* 1, 1 *dc*, approximated *as* and 6-7 *ss*; scutellar bristles borne on small warts.

Legs slender; midtibia with slender apical spur; tibial organ absent.

Wing infuscated, of *Rhodesiella*-type ; r-m cross-vein proximad of middle of discal cell; m-m cross-vein not oblique; anal angle developed. Haltere brownish black.

Abdomen as wide as thorax. Female cerci slender. Male genitalia : Epandrium very broad; surstylus large, subrectangular; phallapodome short, not extending beyond hypandrium; basiphallus basally with short sclerotized armature; gonites well developed.

Cherian (1990) included *Pseudonomba* in the tribe Scolioptthalmi because of the presence of spiny and sclerotized armature at the base of distiphallus. On the basis of detailed study of the genitalia of many new and little known species of *Scolioptthalmus*, *Rhodesiella* and related genera it is however felt that this character is not to be the only criterion for including it under that tribe and the genus otherwise exhibits more similarities to the genera of Rhodesiellini to which the genus is here transferred. *Pseudonomba* resembles *Nomba* Walker in the nature of scutellar bristles, which are borne on prominent warts but can be distinguished by the normal size of scutellum, length of which is less than half of scutum unlike the large scutellum of *Nomba*. Besides, in *Pseudonomba* *if* are arranged on frontal triangle and eye is so large as to leave the gena inconspicuous. In the arrangement of *if*, nature of gena and number and nature of scutellar bristles, *Pseudonomba* differs from *Rhodesiella*.

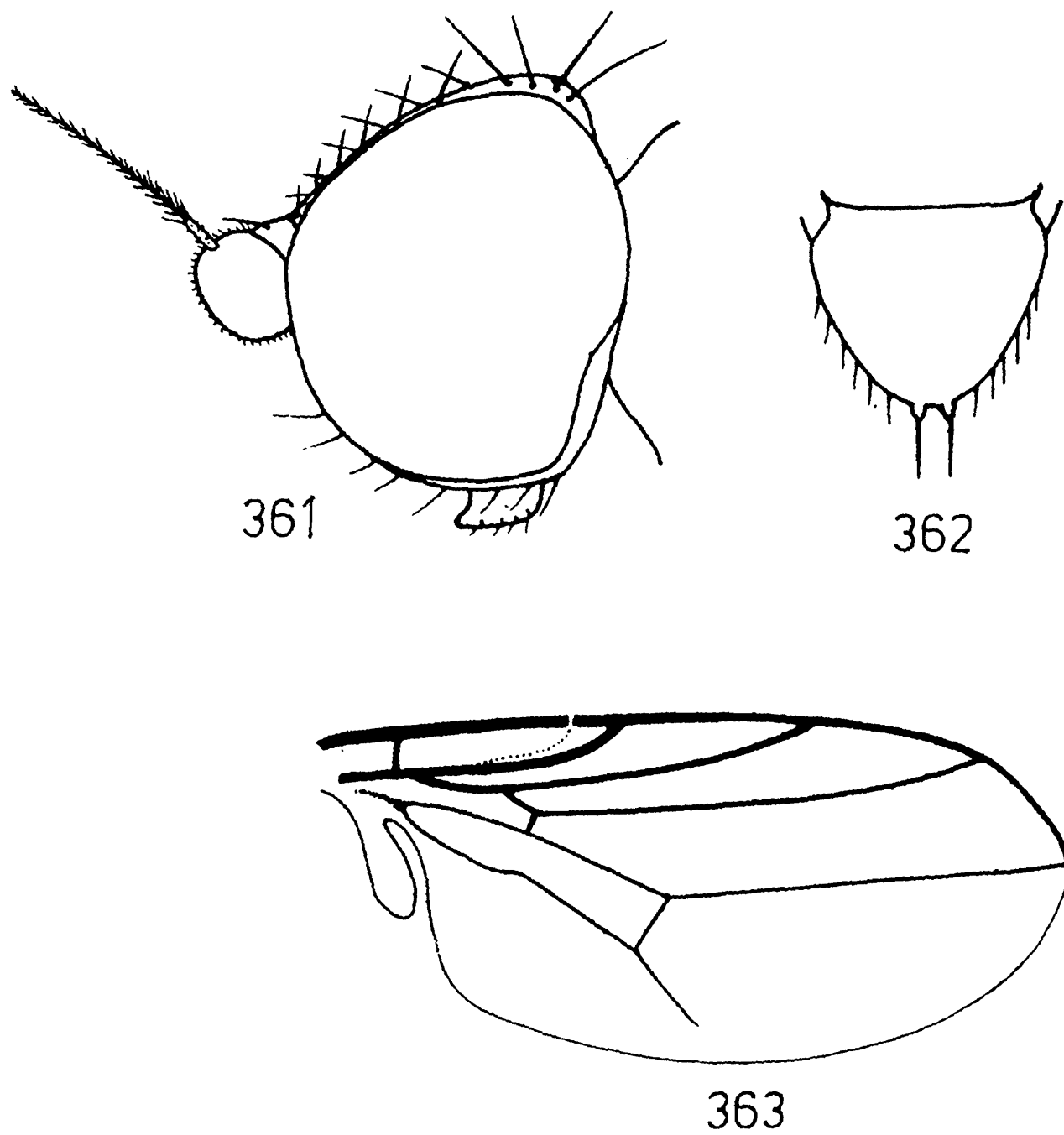
Distribution : Oriental Region. It is a very small genus hitherto known by the type species *typica* from India.

Biology : Nothing is so far known about the biology or ecology of the genus nor of its immature stages. The specimens of *typica* were collected along with those of other chloropids from the leaves of shrubs around a small spring.

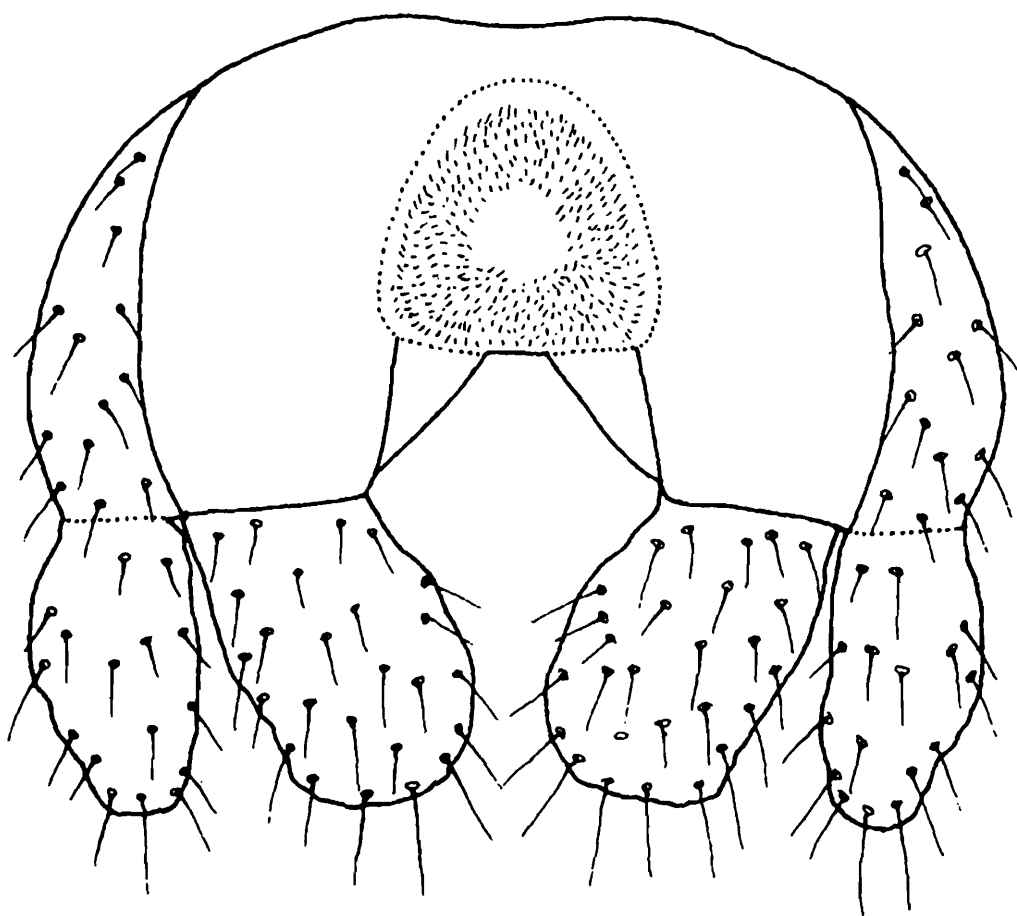
78. *Pseudonomba typica* Cherian (Figs. 361-365)

1989. *Pseudonomba typica* Cherian, *Oriental Insects*, **23** : 224-225. Type locality : India : Mizoram : Kolasib.

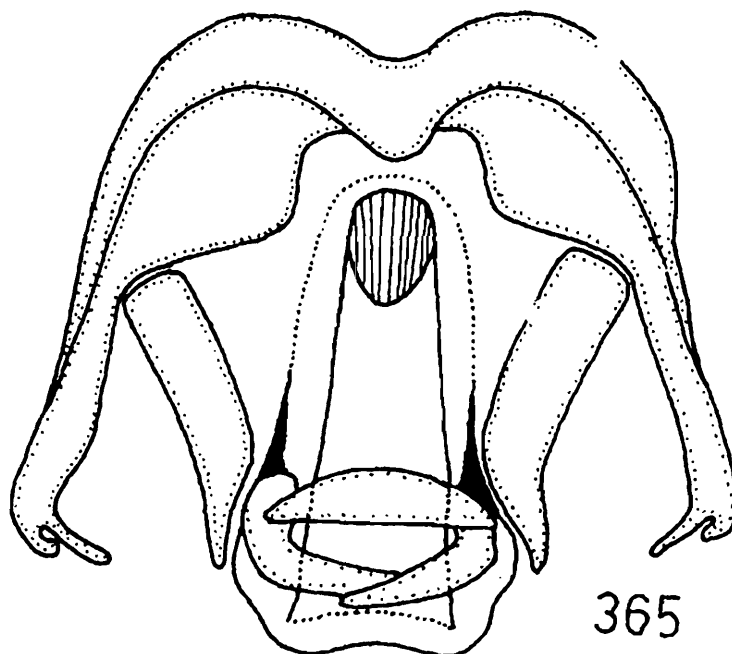
Male and female : *Head* (Fig. 361) : Black with black hairs and bristles ; length, height and width in the ratio 11 : 14 : 17 ; frons with a few *fr* in front, length and width in the ratio 20 : 17; frontal triangle of *Rhodesiella*-type, glabrous, shiny, reaching anterior margin of frons and ending in a pointed apex; *if* in a row of 8 on



Figs. 361-363 : *Pseudonomba typica* Cherian. 361, Head. 362, Scutellum. 363 Wing.



364



365

Figs. 364-365 : *Pseudonomba typica* Cherian. 364, Epandrium, Dorsal view. 365, Phallic complex.

triangle near its lateral margin. Face concave, narrow, more narrowing below because of development of eye ; carina low, broad, reaching lower facial margin, the latter very broad, flat and glabrous. Antenna erect, with short pubescence ; ant 2 a little more than half as long as ant 3, the latter wider than long, length and width in the ratio 16 : 11; arista slender, black with fairly long concolorous hairs; antennal segments brownish black but for yellowish brown tinge at basal part of ant 3. Eye very large, bare; extraordinary development of the eye reduces gena to a very narrow inconspicuous line ; about 10 prominent hairs present along oral margin ; postgena much reduced; vibrissal angle almost inconspicuous. Palpi and proboscis short, with distinct hairs; oral opening greatly narrowing towards lower facial margin, width there about half that at opposite end. Head bristles prominent ; *out* longer than *ivt* ; *orb* 6, reclinate, longest one about two-thirds *out*, those in front progressively becoming shorter; *oc* and *pvt* almost equal to *out*.

Thorax : Black and shiny ; scutum convex, width and length subequal with dense piliferous punctae bearing slender, black hairs ; pleural region shining ; *anepst* with distinct hairs and *kepst* with a few hairs ; scutellum (Fig. 362) slightly longer than wide, length and width in the ratio 7 : 6, suboval to subtriangular in outline with convex disk bearing coarse punctae and slender hairs. Thoracic bristles slender ; *h* 1, a trifle shorter than *out* ; *npl* 1+1, subequal, equal to *out* as also to *pa* and 1 *dc*; *as* approximated at base, borne on prominent wart; *ss* 6-7, borne on small warts; all scutellar bristles short, very slender, hair-like and arranged in lower part of convex lateral margin.

Wing (Fig. 363) : Distinctly infuscated, especially in upper half, with dark brown veins; length and width in the ratio 40 : 11; costal sectors 2 to 4 as 21 : 16 : 15; r-m cross-vein proximad of middle of discal cell, opposite 0.43 of its length; terminal sectors of r 4+5 and m 1+2 veins divergent, the former bent upward and the latter distinctly convex above especially in distal half; m-m cross-vein not oblique. Knob of haltere brownish black, stalk brown.

Legs : Slender, with distinct black hairs. Coxae and femora black; trochanters with brownish tinge; tibiae brownish black but for yellowish tinge at bases and tips of all tibiae, especially fore tibia; midtibia with a slender apical spur; last two tarsal segments of all legs dark brown and rest of the tarsal segments yellow; tibial organ absent.

Abdomen : As wide as thorax, flat, with conspicuous black hairs and brownish black disk. Female cerci fairly long, slender, with a few slender hairs. Male genitalia (Figs. 364-365) : Epandrium much wider than long, laterodistally produced in the form of a large lobe; surstylus large, subrectangular, with numerous hairs; hypandrium much wider than long, gradually narrowing towards medially concave basal margin;

distiphallus uniformly narrowing towards distal end, with armature around base; gonites well developed.

Specimens examined : *Holotype* : Female, India : Mizoram : Kolasib, 1250 m, 8.iii.1979, Coll. P.T. Cherian. *Paratype* : Male (antennae fallen off), data as in holotype. 1 female, Meghalaya : Nangpo, 10.iv.1979, Coll. P.T. Cherian.

Remarks : This species has not been recorded since 1979.

Genus 10. *Bharathella* Cherian

1990. *Bharathella* Cherian, *Oriental Insects*, **24** : 369-370. Type species : *Bharathella mizoramensis* Cherian. By original designation and monotypy.

The genus is related to *Scoliophthalmus* Becker and *Rhodesiella* Adams but differs in the eye, frontal triangle with microchaetae, gena, scutellum and male genitalia.

Head wider than thorax, black with white or yellow hairs and bristles. Frons almost parallel-sided, width less than half that of head; frontal triangle large, shiny, with fine scattered microchaetae, reaching anterior margin of frons and ending with obtuse apex. Face deeply concave, low, somewhat broad. Antenna of medium size; ant 3 almost suborbicular; arista very slender, with a few fine pubescence. Eye with very scattered, minute pubescence, long axis oblique. Gena shiny, width a little less than half that of ant 3, with fairly dense, prominent white hairs; postgena well developed, shiny, hairy like gena; area near neck rugulose. Palpi stout and flattened; proboscis short. All head bristles well developed; *oc* proclinate, divergent, shorter than *out* and the cruciate *pvt*; *orb* 5, reclinate; *if* in a row on frontal triangle, along its margin; *out*, *ivt* and *pvt* borne on small warts.

Thorax shiny black. Scutum longer than wide, not greatly convex, a trifle flattened in the middle of lower half; pleura glabrous, shiny; *anepst* and *kepst* with hairs; scutellum nearly trapezoidal, with flat disc. Thoracic bristles well developed, arising from prominent warts or tubercles; *h* 1, longer than *out*; *npl* 1+1, anterior longer and equal to *h*; *pa* 1 and 1 *dc* slightly longer than *h*; *as* widely separated at base, longer than scutellum, borne on large tubercle; *ss* 1 much shorter than *as*, borne on distinct tubercle.

Wing of *Scoliophthalmus*-type, much shorter than body ; m-m cross-vein of *Rhodesiella*-type; discal cell broadened distally; anal angle developed. Haltere whitish yellow.

Legs long, fairly stout; fore and hind femora swollen; distinct spines present at base of hind femur as is rarely seen in some species of *Rhodesiella* but besides these,

and unlike in other Chloropids, hind trochanter is with tuberculate projection topped with 3-4 small spines; this may probably be having some sensory function ; nature of femora recalls the condition in species of *Dactylothyrea*.

Abdomen narrow and elongated; female cerci short. Male genitalia : Basiphallus with sclerotized armature as in species of *Scoliophthalmus* Becker; distiphallus long and arched as in some species of *Rhodesiella*; phallapodeme of medium-size, comparatively narrow; epandrium showing much similarities to those of species of *Scoliophthalmus*.

Bharathella is intermediate between *Scoliophthalmus* and *Rhodesiella*, and is closely related to *Scoliophthalmus* but the narrow and hairy gena, fine microchaetae on frontal triangle, hairy postgena, pubescent arista, flat and nearly trapezoidal scutellum, nature of m-m cross-vein and differences in the male genitalia of the former sets it apart from the latter genus. From *Rhodesiella* Adams, it is separated by the build of gena, postgena, arista and pubescence on arista, nature of discal cell, arrangement of *if* and presence of fine microchaetae on frontal triangle and differences in male genitalia. Cherian (1990) included *Bharathella* under Scoliophthalmini because, apart from other characters, of the nature of armature at the base of distiphallus. Detailed studies of the male genitalia of may new and less known species of *Scoliophthalmus*, *Rhodesiella* and related genera in combination with the nature of gena, arista, scutellum and such other characters of *Bharathella* shows that, though intermediate between the two tribes Scoliophthalmini and Rhodesiellini, the genus shows more affinities to the latter tribe and hence it is transferred to it.

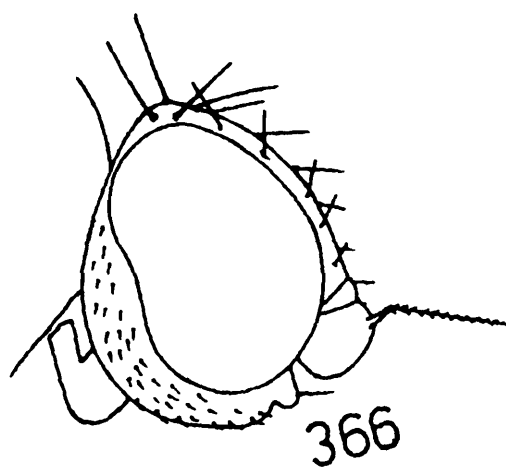
Distribution : Oriental Region. The genus is so far known by only the type species *B. mizoramensis* Cherian from Mizoram in north-eastern India and is described here.

Biology : Nothing is so far known about the biology of this genus.

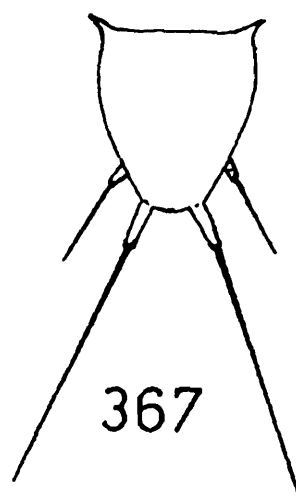
79. *Bharathella mizoramensis* Cherian (Figs. 366-370)

1990. *Bharathella mizoramensis* Cherian, *Oriental Insects*, **24** : 369-373. Type locality : India : Mizoram : Aizawl Dist., Melthum.

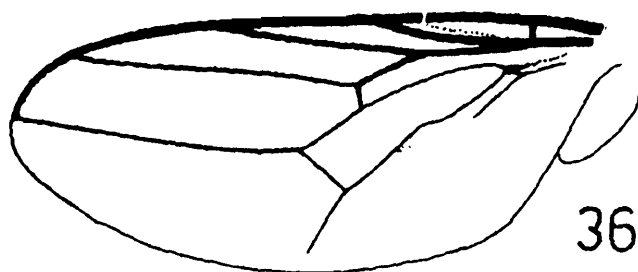
Male and female : *Head* (Fig. 366) : Length, height and width in the ratio 15 : 16 : 24. Width of frons a trifle lesser than its own length and 0.46 x width of head, dull velvety brownish black with a few very conspicuous yellowish white *fr* ; frontal triangle glabrous, shiny black with fine scattered microchaetae, reaching the anterior margin of frons and ending in obtuse apex. Face deeply concave, black; facial carina distinct, low but somewhat broad and reaching almost lower facial margin; lateral to facial carina and running longitudinally almost entire length of face are two, low,



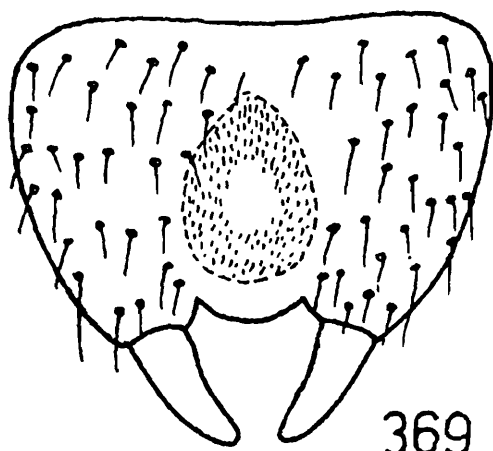
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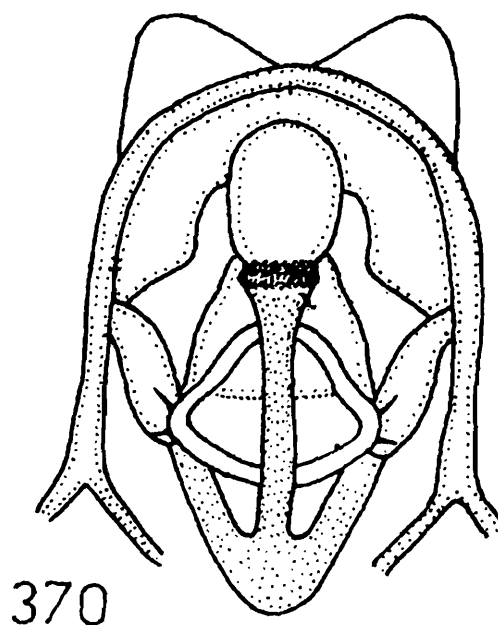
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Figs. 366-370 : *Bharathella mizoramensis* Cherian. 366, Head, lateral view. 367, Scutellum. 368, Wing. 369, Epandrium, dorsal view. 370, Phallic complex.

carinate ridges which also reach lower facial margin, ant 2 brownish yellow to brown, with short, white hairs; ant 3 a trifle wider than long, yellowish brown in lower half and dark brown above, with a few, minute, white pubescence; arista dark brown but for white base, with very fine scattered dark pubescence. Eye fairly large. Gena shiny, width about half of ant 3, with prominent, fairly dense, punctate white hairs; postgena concolorous with and pubescent like gena; vibrissae developed. Palpi flattened, brownish yellow; proboscis dark brown at base and yellow at apex, with slender white hairs. All head bristles and frontal hairs white or yellow; *out* and *put* long, subequal, the latter cruciate; *ivt* $0.66 \times out$; *orb* 5, anterior ones progressively becoming shorter, longest one a little shorter than *ivt*; *oc* almost equal to *ivt*; *if* in a row of about 6.

Thorax : Shiny black. Scutum somewhat flattened in middle in lower half, a trifle longer than wide, with fairly dense, yellowish white punctate hairs; *anepst* with short and *kepst* with long yellowish white hairs. Scutellum (Fig. 367) longer than wide, length and width in the ratio 5 : 4, with flat disc bearing very coarse punctae and yellowish white hairs. Thoracic bristles long, slender, yellow, arising from conspicuous warts except those on scutellum which are tuberculate. *h* 1, $1.3 \times out$; anterior *npl* a trifle longer than posterior one and equal to *h*; *pa* 1 and 1 *dc* a little longer than *h*; *as* widely separated at base, length $1.5 \times$ that of scutellum, arising from prominent tubercle which is $0.2 \times$ length of scutellum; *ss* 1, about $0.25 \times as$, borne on distinct tubercle which is about half that at base of *as*.

Wing (Fig. 368) : Hyaline; costal sectors 2 to 4 as 4 : 3 : 2; r-m cross-vein distad of middle of discal cell, opposite 0.63 of its length; distance between terminal sectors of r 4+5 and m 1+2 veins more in middle than at their apices as the former is a little convex above in the middle; anal angle developed. Haltere whitish yellow with brown tinge on stalk in some specimens.

Legs : Long, fairly stout, recalling mostly the condition in species of *Dactylothyrea* Meijere, especially *hyalipennis* Meijere; fore and hind coxae wholly and mid coxa partly yellow; femora black; fore and hind femora distinctly enlarged and thickened; hind femur long, length $4 \times$ maximum width; mid femur slender; hind femur in distal 0.33 of its antero-ventral and postero-ventral surfaces with very short tuberculate hairs arranged in a row each and at base with three to four erect and prominent yellow, spiny projections; hind trochanter with short but very conspicuous yellow tubercular projection which furcates at its tip into three or four short, spiny processes; fore tibia blackish brown except at its yellow base and tip; hind tibia entirely and mid tibia, except at its yellow extreme base and tip, black, the former slightly bowed; tarsal segments yellow but for last four black to brownish black segments of hind leg.

Abdomen : Somewhat elongated, half the body ; basal segment mostly, second broadly in the middle and third narrowly in the middle, brownish yellow, otherwise terga black. Female cerci slender.

Male genitalia (Figs. 369-370) : Epandrium of *Scoliophthalmus*-type ; surstylus medially curved, with many long hairs; pregonite and postgonite well developed; distiphallus narrow, arched and elongated; resembling those in some species of *Rhodesiella*; pregonite with a tuft of prominent hairs on flattened basal plate.

Length : Male : 3.0 mm, wing 1.65 mm. Female : 3.1 mm, wing 1.73 mm.

Specimens examined : *Holotype* : Male, India : Mizoram : Aizawl Dist. : Melthum, 13.iii.1979, Coll. P. T. Cherian. *Paratypes* : 3 males, 1 female, data same as of holotype.

Genus 11. *Indophthalmus*, gen. nov.

Type species : *Indophthalmus trilineatus*, sp. nov.

A genus related to *Scoliophthalmus* Becker and *Rhodesiella* Adams but differing in having narrow and hairy gena and postgena, tomentose frontal triangle which have the form of microchaetae and showing differences in the male genitalia.

Head a trifle higher than long and much wider than high ; frons longer than wide, narrowing anteriorly, a little raised above but not beyond margins of eyes, dull black, dark grey tomentose, with short, finely punctate *fr*; frontal triangle clearly demarcated, subshiny, reaching anterior margin of frons, pointed apically and with fine microchaetae which are more dense along mid-longitudinal area, especially in front of ocellar triangle ; *if* in one row on frontal triangle along its margin or in two to three regular rows on the triangle on each side and arising from deep punctae which are more in the form of fine pits. Face concave, subshiny black, dark tomentose; facial carina triangular between antennae and reaching lower facial margin as a low, linear ridge. Antennae short; ant 2 almost as long as ant 3, the latter rather subtriangular in outline as in some species of *Scoliophthalmus*; arista of medium size, slender, with fairly dense, conspicuous, dark pubescence. Eye large, naked, occupying much of the area of head in profile and with vertical long axis. Gena narrow, 0.2 x as wide as ant 3, dark tomentose, often hairy, with a row of 8-16 slender hairs along oral margin; vibrissal angle rounded with distinct oral vibrissae; postgena hairy, not so well developed as in *Scoliophthalmus*, tomentose like gena; parafacialia not developed. Proboscis short, flattened, with fine hairs. Head bristles well developed, black; *out* and the cruciate *pvt* subequal; *ivt* shorter than *out*; orb 6-7, recumbent, sequentially anterior ones shorter.

Thorax black, as wide as head ; scutum as wide as long with somewhat flattened disk bearing short, dense, punctate hairs ; scutellum wider than long with flattened disk bearing punctate hairs as on scutum ; pleura subshining, with fine, fairly dense hairs on *anepst* and *kepst*. Thoracic bristles well developed with 1 *h*, 1+1 *np1*, well developed *pa* 1, short but distinct *pa* 2 and well developed 1 *dc*; scutellar bristles borne on small warts; *as* longer than scutellum ; *ss* about 4 of which *ss* 1 more prominent than the rest.

Legs of *Scoliophthalmus*-type, short, rather, stumpy, with short, dense hairs; fore femur slightly thickened ; tibial organ absent.

Wings hyaline, of *Rhodesiella*-type ; costal-break absent ; terminal sectors of *r* 2+3 and *r* 4+5 bent toward costa ; m-m cross-vein not so oblique as in species of *Scoliophthalmus* but reminiscent of species of *Rhodesiella* ; anal angle well developed. Haltere black.

Abdomen only slightly longer than broad, subshining black with slender, fairly dense black hairs. Female cerci short, rather stout with numerous short, slender hairs. Male genitalia of *Scoliophthalmus*-type with broad epandrium having triangular surstylus ; hypandrium broader than long ; distiphallus short, broad and uniformly thickened ; pregonites very broad at base and long and tapering distally ; postgonites well developed and tapering apically ; phallapodeme slightly projecting beyond hypandrium ; spiny armature not developed around base of distiphallus unlike in some species of *Scoliophthalmus*.

In the general appearance of head, ant 3, thorax and legs *Indophthalmus* shows affinities to *Scoliophthalmus* but the two genera can be easily distinguished as the former is having narrow gena, vertical eyes, pubescent arista and rather tomentose (which have the form of fine microchaetae) frontal triangle. Besides, in *Indophthalmus* m-m cross-vein is not so oblique as in *Scoliophthalmus* and male genitalia also exhibit marked differences in their structural details. In the presence of microchaetae on frontal triangle, nature of ant 3, gena, arrangement of *if*, nature of scutellum and scutellar bristles and build of male genitalia *Indophthalmus* differs from *Rhodesiella*. Of the two species coming under this genus, in the type species, *trilineatus* sp., nov., *oc* are short, slender and almost subparallel though proclinate. Besides, in this species *if*, which arise from small pit-like punctae, are arranged in 2-3 somewhat regular rows on the triangle on each side. In the second species, *kolasibensis*, sp. nov., *oc* are well developed, proclinate and divergent and *if* are arranged in a row on the triangle along its margin, characters recalling the condition in other genera of *Rhodesiellinae*. The nature of *oc* and number of rows and position of *if* are important generic characters in which the two species differ. But for those two characters, both the species are very much similar except for differences in colour, especially of legs. Because of the general

similarities of the two species and the fact that differences in the number of rows and arrangement of *if* in *Euthyridium indicum* Cherian, coming under Rhodesiellini, also shows similar development and deviation from the type species of that genus, both *trilineatus* and *kolasibensis* are considered at present to belong to a single genus. Availability of more species of *Indophthalmus* and the males of *trilineatus* and their genitalia may ensure whether both the species belong to the same genus or not.

Distribution : India.

Remarks : Both the species coming under this genus were collected by sweeping shrubs and grass around a very small pool, on a hillock at Kolasib in Mizoram, into which water was falling in droplets from a tiny spring. This vegetation attracted insects of various groups since a dry spell was prevailing in the area and there was no other source of water for miles around. More than 45 species of Chloropids, belonging to 15 genera, were collected from the spot through 4 hours in a single day. There was an abundant representation of various genera and species of other insect groups also in the day's collection, but most of these are yet to be studied.

Biology : Nothing is so far known about the biology of this genus and the immature stages are unknown.

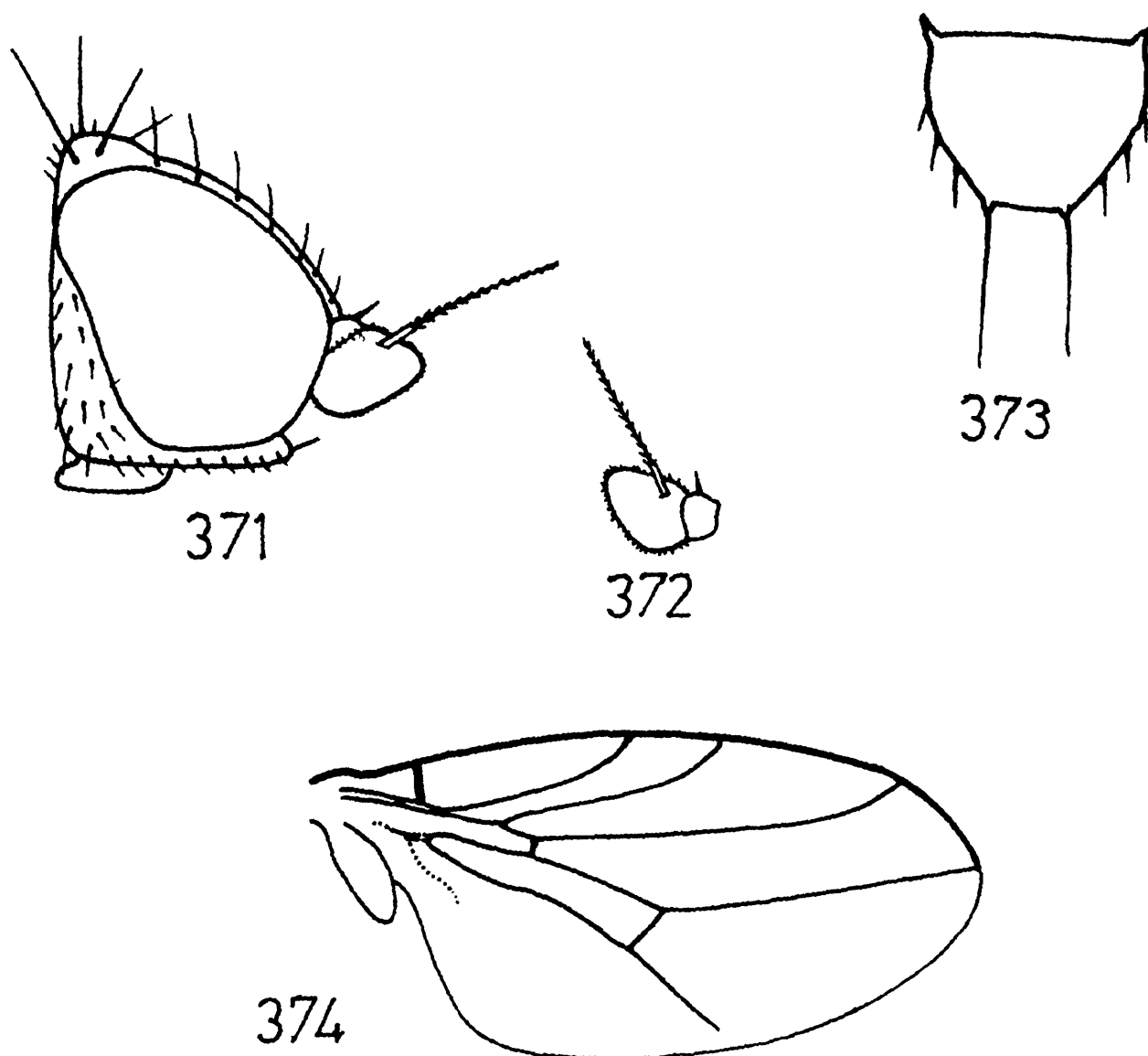
Key to the species of *Indophthalmus*

Only one row of *if* arranged on the frontal triangle along the margin which do not arise from pits ; *oc* well developed, proclinate and divergent ; palpi yellow; fore femur yellowish brown ventrally ; all tarsi yellow*kolasibensis*, sp. n.

if in 2-3 somewhat regular rows on the frontal triangle on each side which arise from pit-like punctae ; *oc* short, slender, subparallel though proclinate ; palpi dark brown ; fore femur brownish black ; last one or two segments of fore leg and last tarsus of hind leg darkened*trilineatus*, sp. nov.

80. *Indophthalmus trilineatus*, sp. nov. (Figs. 371-374)

Female : *Head* (Fig. 371) : As long as high, length, height and width ratio 13 : 13 : 20. Frons 1.2 x as long as wide and at vertex half as wide as head, dull black, dark tomentose, narrowing anteriorly, projecting a trifle above but not beyond margins of eye and with short punctate black *fr* ; frontal triangle clearly demarcated, subshiny black, dark tomentose (more in the form of fine microchaetae which are more dense along mid-longitudinal area, especially in front of ocellar triangle), reaching anterior margin of frons and ending with pointed apex. Face concave, shiny black, dark tomentose ; besides facial carina, face on each side margined longitudinally by linear



Figs. 371-374 : *Indophthalmus trilineatus* sp. n. 371, Head, latera view. 372 Antenna. 373, Scutellum. 374, Wing.

carinate ridge ; facial carina well developed, triangular between antennae and reaching lower facial margin as a low, linear ridge; lower facial margin a little raised up. Antenna (Fig. 372) small ; ant 2 almost as wide as long, dark brown with ferruginous tinge ; ant 3, 1.2 x as wide as long, upper margin subtriangularly produced distally as in species of *Scoliophthalmus*, blackish brown with ferruginous tinge around base; arista of medium size, slender but for slightly thickened base, very dark brown with fine, fairly dense concolorous pubescence. Eye large, naked, occupying much of area of head in profile, with vertical long axis. Gena dull black, dark tomentose, one-fourth as wide as ant 3, with a row of 14-16 slender hairs along oral margin and some dark punctate hairs above the margin ; vibrissal corner receding, blunt with two, more prominent, subequal hairs forming oral vibrissae ; postgena well developed, concolorous with and tomentose like gena and with punctate hairs. Proboscis flattened at apex, dull dark brown ; palpi short, rather slender, a little darker than proboscis. Head bristles well developed, black ; *out* and the cruciate *pvt* subequal ; *ivt* two-thirds the *out* ; *oc* slender, proclinate, subparallel, shorter than *orb* ; *orb* 7, recumbent, sequentially anterior ones becoming shorter and slender, anterior most one hardly distinguishable from *fr*, longest three-fifths the *out* ; *if* numerous, arranged in 2-3 somewhat regular rows on the surface of the triangle on each side and these arise from deep punctae which almost have the shape of small pits.

Thorax : Wholly black, as wide as head. Scutum subshiny, as wide as long, with flattened disk bearing short, slender, dense punctate brown hairs. Scutellum (Fig. 373) 0.7 x as long as wide with fairly sharp margins and flat disk bearing hairs and punctae as on *scutum*; pleura subshiny; *anepst* and *kepst* with fairly dense, short, black slender hairs; propleuron tomentose as frontal triangle. Throacic bristles well developed; *h* 1, shorter and slender than *out*; *npl* 1+1, subequal, a little longer and stouter than *out*; *pa* 1 equal to and *pa* 2 two-thirds as long as *npl*; 1 *dc* a trifle shorter than *pa* 1; *as* fairly widely separated at base, nearer to *ss* 1 than to each other, slender, as long as scutellum, borne on fine wart; *ss* 1 one-third as long as *as*, borne on fine wart; *ss* 2 and *ss* 3 hardly distinguishable from scutellar hairs.

Legs : Short with short dense hairs; fore femur slightly thickened as in species of *Scoliophthalmus*, with a row of prominent bristly hairs anterodorsally; coxae and femora brownish black; trochanters yellowish brown; tibiae brownish black except for a tinge of yellow at the distal ends especially of fore tibiae; tarsi brownish yellow but for dark last one or two segments of fore leg and last segment of hind leg; tibial organ not developed.

Wing (Fig. 374) : Of *Rhodesiella*-type, 0.45 x as wide as long, hyaline with distinctly brownish tinge and brown veins but for darkish *r* 1 and costa; proportions of costal sectors 2 to 4 in the ratio 7:12:8; *r-m* cross-vein proximad of middle of distal cell,

opposite 0.38 of its length; terminal sectors of veins $r\ 2+3$ and $r\ 4+5$ distinctly curving towards costa along their whole lengths; terminal sector of $m\ 1+2$ nearly straight so that this and $r\ 4+5$ diverging distally; shape of distal cell as in species of *Scoliophthalmus* but for areas of $m-m$ cross-vein which is only slightly oblique unlike the greatly oblique condition found in species of *Scoliophthalmus*; anal angle well developed. Knob of haltere brownish black, stalk dark brown.

Abdomen : Almost as broad as long and $0.45 \times$ as long as body, wholly brownish black, dark tomentose with short, slender black hairs which are more dense on sterna. Female cerci short, rather stout with very fine dense hairs.

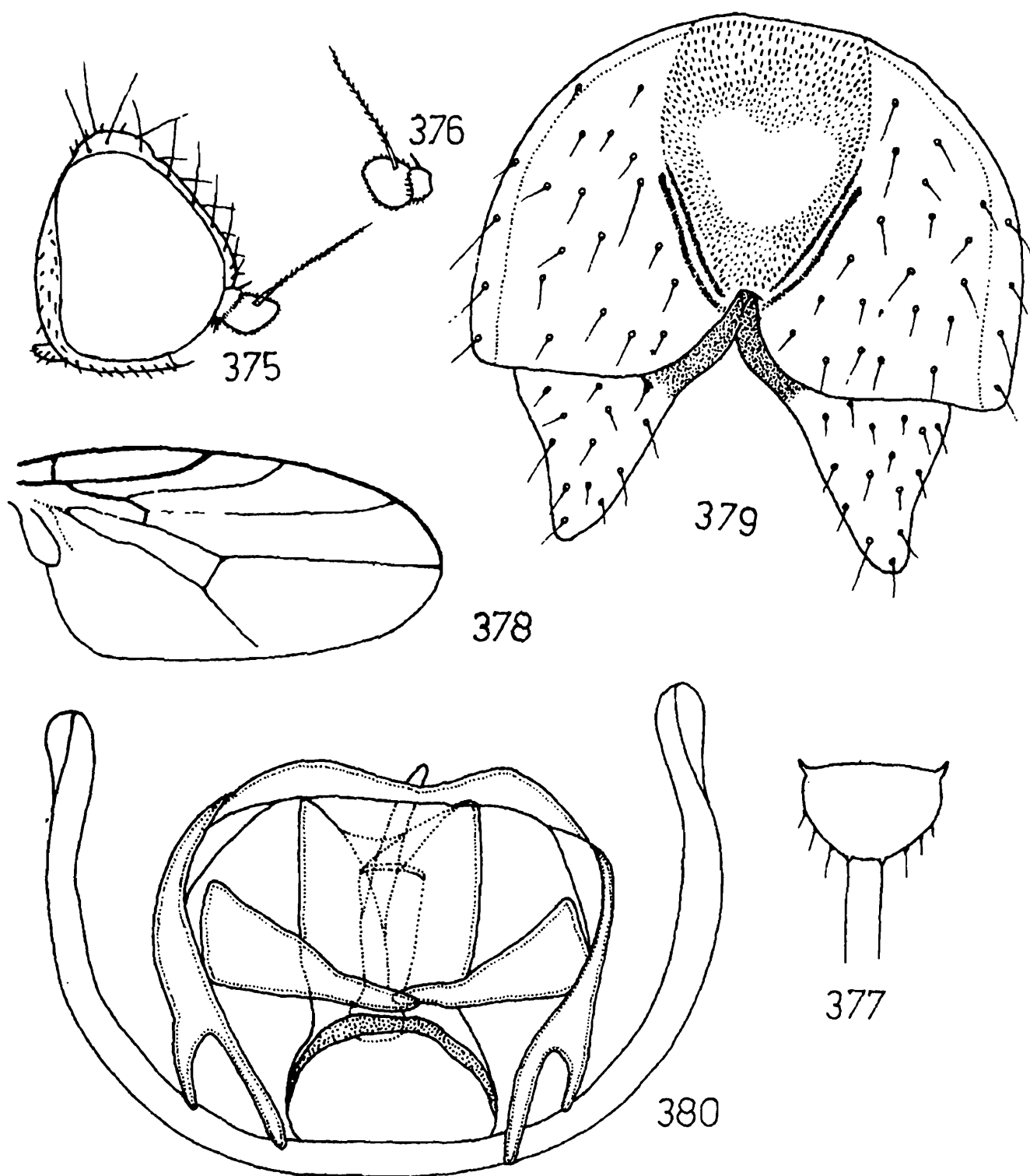
Length : Female 2.15 mm, Wing 1.85 mm.

Holotype : Female, India : Mizoram : Kolasib, 8.iii. 1979, Coll. P.T. Cheiran.

81. *Indophthalmus kolasibensis* sp. nov. (Figs. 375-380)

Male : *Head* : (Fig. 375) : A trifle higher than long, length, height and width ratio 13 : 14 : 20. Frons $1.2 \times$ as long as wide, width at vertex half that of head, dull brownish black with brownish tinge around anterior end, projecting a little above but not beyond anterior margin of eye, gradually but distinctly narrowing anteriorly and with fairly dense and finely punctate black *fr*; frontal triangle distinctly demarcated, subshiny black, tomentose (which under high magnification appears to have the form of fine microchaetae), reaching anterior margin of frons and ending with pointed apex. Face concave, subshiny brownish black, partly dark tomentose; facial carina less developed than in *trilineatus*, triangular between antennae and extending to nearly a little beyond middle of face; lower facial margin a little raised above level of face, each of its lateral corner with a very small tubercular projection. Antenna (Fig- 376) erect; ant 2 nearly as long as wide, yellowish brown; ant 3 a trifle wider than long, upper margin slightly subtriangularly produced distally as in *trilineatus*, basally yellowish brown and distally dark brown; arista slender but for base, of medium size, dark brown with fairly dense concolorous pubescence which are a trifle longer than those in *trilineatus*. Eye very large, naked, occupying much of the area of head in profile, long axis vertical. Gena a trifle narrower than in *trilineatus*, almost linear, dull black with a row of about 8 prominent hairs along oral margin; vibrissal angle receding; vibrissae hardly longer than other hairs on oral margin; postgena narrower than in *trilineatus*, black with distinct short, black hairs; parafacialia not developed. Head bristles well developed, black; *out* and the cruciate *pvt* sub-equal; *ivt* a little shorter than *out*; *oc* proclinate, widely divergent, equal to *out*; *orb* 7, recumbent, sequentially anterior ones becoming shorter and slender, the last two hardly distinguishable from *fr*; *if* 11, in a row on the triangle along its margin.

Thorax : Wholly black and as wide as head. Scutum as wide as long with flat disk bearing short, dense, yellowish brown, punctate hairs; scutellum (Fig. 377) $0.6 \times$ as long as wide with flattened disk which is more coarsely punctate than but pubescent



Figs. 375-380 : *Indophthalmus kolasibensis*, sp. n. 375, Head, lateral view. 376, Antenna, 377, Scutellum. 378, Wing. 379, Epandrium, dorsal view. 380, Phallic complex.

like scutum; pleura subshiny; *anepst* and *kepst* with short, dense hairs; propleuron partly tomentose. Thoracic bristles well developed; *h* 1, distinctly shorter than *out*; *npl* 1+1, sub-equal and equal to *out*; *pa* 1 equal to and *pa* 2 three-fifths as long as *npl*; 1 *dc* almost equal to *npl*; *as* 1.1 x as long as scutellum, borne on a distinct wart, distance from each other equal to that between *ss* 1 and *as* of each side; *ss* 1 three sevenths as long as *as* but much more slender; *ss* 2-4 very slender, less than half as long as *ss* 1, hardly longer than scutellar hairs.

Legs : Short with short, mostly yellow, dense hairs; fore femur slightly thickened and with a row of bristly hairs anterodorsally as in *trilineatus*; coxae, except for the yellowish and more densely short hairy lower half of the fore coxae, entirely dark brown; femora blackish brown except that fore femur is yellowish brown ventrally; tibiae blackish brown but for paler distal ends; all tarsi yellow; tibial organ absent.

Wing (Fig. 378) : 0.45 x as wide as long, hyaline with brown veins; proportions of costal sectors 2 to 4 in the ratio 7:12:7; r-m cross-vein proximad of middle of distal cell, opposite 0.35 of its length; m-m cross-vein only very slightly oblique as in species of *Rhodesiella*; terminal sectors of veins r 2+3 and r 4+5 concave above and bent towards costa, that of m 1+2 straight; anal angle well developed. Knob of haltere black, stalk pale brown with dark tinge.

Abdomen : As wide as thorax and only 1.1 x as long as wide, dull brownish black with short, slender black hairs; sterna more distinctly grey tomentose. Male genitalia (Figs. 379-380) : Epandrium broader than long; surstylus triangular; hypandrium broader than long; phallopodeme slightly projects beyond hypandrium; phallus short, broad and thickened; pregonite very, broad at base and long and tapering distally; postgonites shorter than pregonites, sharply pointed distally.

Length : Male 2 mm, Wing 1.8 mm

Holotype : Male, India : Mizoram : Kolasib. 8.iii. 1979, Coll. P.T. Cherian.

I. kolasibensis is related to *trilineatus* but differs in having only one row of *if* which are arranged along the margin of frontal triangle unlike the 2-3 rows of *if* on the triangle on each side, in the latter. Besides, in *kolasibensis* *oc* are well developed and divergent and palpi and part of proboscis are yellow. The two species also exhibit differences in the colouration of legs.

Tribe 2. SCOLIOPHTHALMINI Nartshuk

1983. *Scoliophthalmi* Nartshuk, *Ent. Oboz.*, 62 (3) : 641. Type genus : *Scoliophthalmus* Becker, 1903.

A small tribe of medium-sized black flies with oval, horizontal and naked eyes, very broad gena, slender and naked arista, femoral organ, strongly oblique m-m and cylindrical or conical distiphallus articulating with phallopodeme.

Head with straight posterior margin and long hairs and bristles. Frons longer than board, with a few *fr*; frontal triangle large, glabrous, reaching anterior margin of frons. Face concave; facial carina low, reaching middle of face or a little beyond. Antenna usually yellow; ant 3 usually slightly or distinctly produced dorso-distally; arista slender and naked. Gena very broad, smooth and polished, with a row of hairs along oral margin; postgena broadened; vibrissal angle not projecting beyond eye; parafacialia linear. Eye oval, naked with horizontal or slightly oblique long axis. Proboscis of medium size; palpi short. Head bristles long and slender; *out* longer than *ivt*; *put* upright, convergent or cruciate; *oc* proclinate and divergent; *orb* 8-14, sequentially anterior ones becoming shorter and slender; *if* in a row outside frontal triangle, along its margin.

Thorax shiny black; scutum moderately convex, with short hairs arising from stellate granulae; scutellum with flattened or convex disc, hairy like scutum; *anepst* and *kepst* with hairs. Thoracic bristles with 1 *h*, 1+1 *npl*, 1 *pa*, 1 *dc*, long and slender *as* and 1-3 *ss*.

Legs : fore-femur weakly thickened; femoral organ present; tibial organ absent; midtibia with slender apical spur.

Wing hyaline or faintly brownish; m-m cross-vein strongly oblique; discal cell broadened distally. Haltere black or yellow.

Abdomen finely tomentose, broadly oval or long and slender; synsternite 7+8 broadly attached to lateral margin of hypandrium. Female cerci slender; eighth tergite forming a single plate or bifurcated. Male genitalia with large epandrium, no cercus, narrowly elongate surstylus, variously modified gonites, elongated basiphallus and bowl-shaped phallopodeme.

Nartshuk (1983) proposed the tribe Scoliophthalmini for the genus *Scoliophthalmus* Becker because of the characters special to the group enumerated above. Cherian (1990) included the genera *Pseudonomba* Cherian and *Bharathella* Cherian under the tribe because, apart from other characters, of the nature of sclerotized armature at the base of basiphallus in all the three genera. But on the basis of detailed study of the male genitalia of many new and little known species of *Scoliophthalmus*, *Rhodesiella* Adams and related genera, including the new genus *Indophthalmus*, it is felt that *Bharathella*, though intermediate between the two tribes Scoliophthalmini and Rhodesiellini, and *Pseudonomba* show more affinities to the latter tribe and hence are hereby transferred to it, leaving only *Scoliophthalmus* under the tribe Scoliophthalmini.

Genus 12. *Scoliophthalmus* Becker

1903. *Scoliophthalmus* Becker, *Mitt. zool. Mus. Berlin*, 2 : 147. Type species : *Scoliophthalmus trapezoides* Becker. By monotypy.

Small to medium-sized shiny black species measuring 1.5-3.5 mm, with oval, horizontal, naked eyes, very broad gena, slender and naked arista, femoral organ, strongly oblique m-m and cylindrical or conical distiphallus with its base elongated laterad and articulated with phallapodeme.

Head with straight posterior margin and long hairs and bristles. Frons slightly projecting, longer than broad, shiny with a few *fr* ; frontal triangle large, posteriorly about two-thirds as broad as frons, smooth, shiny black with slightly convex side margins and reaching anterior margin of frons. Face shiny black, concave ; facial carina low, rather broad, reaching middle of face or a little beyond ; lower facial margin a little raised up, straight or uneven at corners. Antennae mostly yellow, with or without dark tinge ; ant 2 short ; ant 3 usually slightly broader than long and slightly or distinctly produced dorso-distally, very rarely apically rounded (some African species) ; arista very slender and without pubescence. Gena very broad, broader than ant 3, smooth and polished, with a row of long hairs along oral margin ; vibrissal angle not projecting beyond eye ; postgena broadened, with a row of postocular setae ; parafacialia linear. Eye oval, naked with horizontal or slightly oblique long axis. Clypeus black, shiny ; proboscis of medium size ; Palpi short, black or dark brown. Head bristles long, mostly black ; *out* longer than *ivt* ; *put* upright, convergent and cruciate ; *oc* prominent, proclinate and divergent ; *orb* 8-14, sequentially anterior ones becoming shorter and more slender ; *if* in a row of 9-14, outside frontal triangle, along its margin, slightly proclinate and turned inwards ; oral vibrissae developed.

Thorax shiny black or brownish black and rarely with a blue sheen. Scutum moderately convex, more or less flattened behind, as wide as long and as wide as head, clothed with short black, yellow or white hairs arising from small stellate granulae. Scutellum shiny black, relatively long, rounded marginally with more densely punctate hairs borne on somewhat flattened or convex disc. Pleura smooth, shiny black to brownish black ; *anepst* with many and *kepst* with a few hairs. Thoracic bristles long and slender ; *h* 1, distinct ; *npl* 1+1, subequal ; *pa* 1 well developed ; *pa* 2 indistinct ; 1 *dc* subequal to *pa* 1 ; *as* long and slender, borne on distinct wart ; *ss* 1-3, much shorter than *as*, borne on small warts ; a row of more developed and prominent bristly prescutellar hairs in the area of prescutellar bristles are seen in some species.

Legs mostly short and slender but fore femur weakly thickened in most of the species ; femoral organ present, formed by a group of small warts ; tibial organ absent ;

mid tibia with a slender apical spur ; some of the tarsal segments often with more developed, stout, dark hairs along ventrodistal margin in some species.

Wing hyaline or with faint brown tinge ; second costal sector much longer than the third ; m 1+2 often weakly or distinctly sinuate ; m-m strongly oblique ; discal cell broadened distally. Knob of haltere black, pale brown or yellow.

Abdomen finely tomentose, broadly oval or rarely long and slender ; tergites evenly shiny or subshiny black or brown, synsternite 7+8 of male broad and darkly sclerotized, often with stout black setae and broadly attached to each lateral margin of hypandrium. Female cerci slender, eighth tergite forming a single plate or divided into two plates.

Male genitalia : Epandrium large, black or dark brown with a deeply incised and broad posterodistal notch, clothed with fairly dense stout hairs ; laterodistal bulging of epandrium sometimes narrowly produced ventrally ; cercus not developed, only its sockets of setae are seen on membrane ; surstylus attached to each inner ventral side of epandrium, narrowly elongate or shortened and basally broadened with some narrow processes ; pregonites and postgonites variously developed, the former rarely absent ; basiphallus narrowly elongate laterad and articulates with phallapodeme, the latter short bowl-shaped, highly broadened and attached to hypandrium on dorsal plate and with weak basal stalk ; hypandrium well developed.

Remarks : As in *Rhodesiella*, the members of this genus are generally similar in most characters. Therefore it is necessary to study the genitalia to decide the correct identity of the species. Male surstylus, basiphallus, gonites and armature of males and female tergites 8-9 and cercus are variously modified and are useful in the determination of the species. Kanmiya (1983) described the genitalia of some of the species hitherto known from the Oriental Region.

One of the long established conceptions was that one of the generic characters of *Scoliophthalmus* is the acute upper apical angle of ant 3. Sabrosky (1951) slightly broadened the usually accepted generic diagnosis of the genus to include some African species in which the ant 3 is apically rounded. Besides, in some species the discal cell is apically subtruncate and the m-m cross-vein is not oblique. According to Sabrosky, the angulate nature of ant 3 is a character of specific rather than generic importance. However in all the Oriental species known so far, the nature of ant 3, discal cell and m-m cross-vein conform to the pattern occurring in the type species *trapezoides* Becker.

Distribution : *Scoliophthalmus* is a relatively small genus so far known to be represented in the Oriental, Afrotropical and Australian Regions. From the Oriental Region it is hitherto known by five species of which only *micans* Lamb is reported from India. Three new species from India are described here as also *micans* the male genitalia of which was not described before.

Biology and ecology : Not much is so far known about the biology of species belonging to this genus. According to Kanmiya (1983) in *S. japonensis* Kanmiya, known from Japan, the larvae are saprophagous, feeding on decayed shoots of *Phragmites communis* Trin and on *consimilis* Kanmiya, also known only from Japan, "the anterior tergites of the specimens are more or less covered with many ectoparasitic Acarina" Sabrosky (1951) mentioned that in *S.femorata* Becker, from Uganda, the pose of the two males, he studied "is raptorial though it is not known whether their adults have that habit" The note appended to the type specimens of *micans* Lamb, deposited in the British Museum, reads "From larvae in rotten cholam-stems and in Cholan stubble" All the four species described here were collected through sweepings of grass and leaves of small shrubs.

Key to the Oriental species of *Scoliophthalmus* Becker

1. Knob of haltere yellow 2
 Knob of haltere black 5
2. Scutum with blackish brown hairs ; distiphallus apically narrowed, conical and as long as wide ; surstylus complicated with four large and small processes*pallidinervis* Becker
 Scutum with brassy yellow or white hairs ; distiphallus cylindrically elongate, apex with or without narrow processes ; surstylus simple, without processes 3
3. Scutum and scutellum with dense, white, short hairs ; abdomen narrow, much longer than wide ; apex of distiphallus simple*indicus*, sp.nov.
 Scutum and scutellum with brassy yellow hairs ; abdomen oval ; apex of distiphallus with narrow processes 4
4. Frons projecting half the length of eye in front ; first tarsal segment yellow*prominens* Becker
 Frons not projecting beyond eye in front ; all tarsi black ..*angustifrons* (Duda)
5. Frontal triangle without depressions and ridges ; *if* and *orb* numerous, 13-14*numeralis*, sp. nov.
 Frontal triangle with depressions and ridges ; *if* and *orb* 9-10 6
6. Distiphallus gradually narrowing distally, not convex on sides in dorsal view, with three pairs of apical processes*formosanus* ((Duda)

Distiphallus with convex sides in dorsal view, with four pairs of apical processes 7

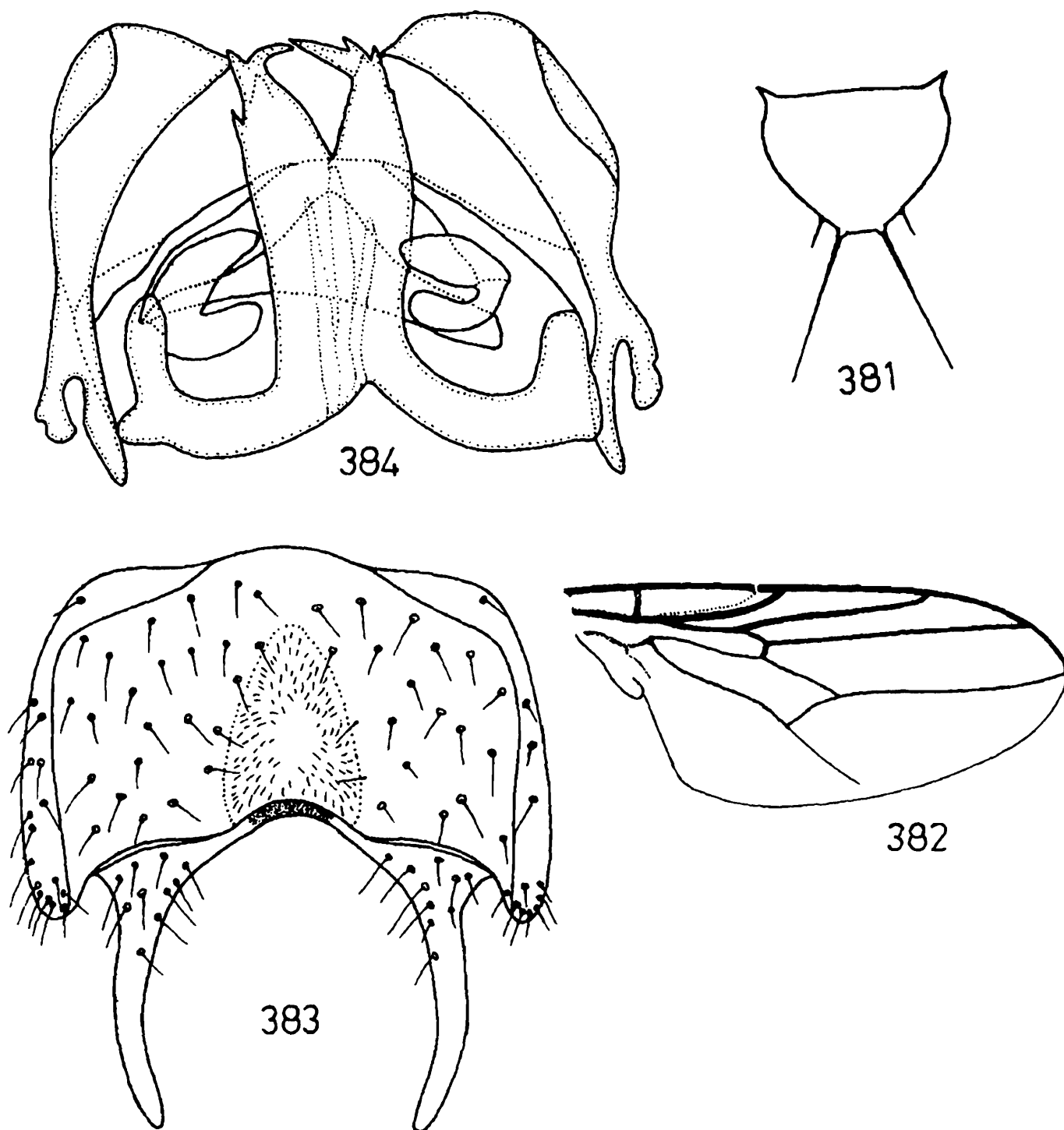
7. Median pair of depressions on frontal triangle deep, and terminating in front of ocellar triangle ; distiphallus broad distally *micans* Lamb

Median pair of depressions on frontal triangle less deep and extending to vertex margin ; distiphallus abruptly narrowing distally *darjeelingensis*, sp. nov.

82. *Scoliophthalmus micans* Lamb (Figs. 381-384)

1918. *Scoliophthalmus micans* Lamb, *Ann. Mag. nat. Hist.* (9), 1 : 331. Type locality : India : Tamil Nadu : Coimbatore.

Male : female : Head : Higher than long, length, height and width ratio 8 : 9 : 14. Frons black with brownish tinge, especially so in some specimens, half as wide as head and 0.87 x as wide as long, projecting very slightly beyond and distinctly above margin of eye anteriorly ; frontal triangle large, shiny black, reaching anterior margin of frons and ending with nearly pointed apex and with three longitudinal parallel ridges of which the median extends from anterior ocellus to three-fourths the length of the triangle while each lateral one from near vertex margin to a little behind anterior ending of the median one, the corresponding longitudinal depressions on either side of the median ridge is deep, each commencing from in front of ocellar triangle on each side and extending to and joining with the lateral marginal ridge ; in addition, another small, oval, median depression is present in front of anterior end of the ridge. Face concave, shiny black with brown tinge on the area between antennae and around distolateral corners ; facial carina low, brown, distinct between antennae and tapering off around middle of face. Antennae orange with dark tinge on much of the area, especially dorsodistal margin of ant 3 ; ant 3, 0.9 x as wide as long with acute upper apical angle as in other species of the genus known from the Oriental Region ; arista slender, naked and dark brown. Gena shiny black, becoming broader in the area of postgena, width in the middle 0.4 x that of head and 1.4 x that of ant 3 ; vibrissal corner nearly rounded, not projecting beyond anterior margin of eye ; parafacialia linear, black, concolorous with gena ; oral vibrissae stout. Eye subsquarish oval, naked with horizontal long axis. Proboscis and palpi short, brownish black, the latter entirely inside mouth. Head bristles well developed, black ; *out* and *pvt* subequal, more developed than all other head bristles, the latter cruciate ; *ivt* and the proclinate and divergent *oc* subequal, two-thirds the *out* ; *orb* about 8-9, short, none outstanding, sequentially anterior ones becoming shorter and more slender ; *if* 8-9, subequal to *orb*, in a row outside the triangle along each lateral margin ; a few brownish black *fr* are present especially in the anterior half of frons.



Figs. 381-384 : *Scolioptthalmus micans* (Lamb). 381, Scutellum. 382, Wing. 383, Epandrium, dorsal view. 384, Phallic complex, ventral view.

Thorax : Wholly shining black ; scutum as wide as head and 1.1 x as wide as long with convex disc bearing not dense, brown to dark brown hairs arising from distinct punctae ; scutellum (Fig. 381) roundly truncate triangular, half as wide as scutum and 1.25 x as wide as long with slightly convex disc which is pubescent like but more coarsely and densely punctate than scutum. Pleura shining ; *anepst* with many and *kepst* with a few punctate brown hairs. Thoracic bristles well developed ; *h* 1, only a little longer than hairs on humeral callus ; *npl* 1+1, subequal and equal to 1 *dc* ; *pa* 1, 1.2 x as long as *npl* ; *pa* 2 not developed ; a row of about 8 bristly prescutellar black hairs are present as in some of the other species of the genus ; *as* divergent, well developed, as long as scutellum, nearer to *ss* 1 than to each other, borne on distinct wart ; *ss* 1 very short, slightly stouter than scutellar hairs, borne on fine wart ; *ss* 2 hardly distinguishable from marginal hairs of scutellum.

Legs : Coxae entirely and femora, but for their pale bases and tips, brownish black ; trochanters yellowish brown ; tibiae very broadly in the middle brownish black, otherwise brownish yellow ; tarsi brownish yellow but for the infuscated distal four segments of fore leg and last one or two segments each of mid and hind legs ; femoral organ developed.

Wings (Fig. 382) : 2.5 x as long as wide, hyaline with brownish yellow veins but for slightly infuscated costa ; proportions of costal sectors 2 to 4 in the ratio 16 : 10 : 5 ; r-m cross-vein greatly distad of middle of discal cell, opposite 0.62 of its length ; discal cell broadened distally ; m-m cross-vein greatly oblique ; terminal sector of vein m 1+2 very slightly sinuate ; anal angle moderately developed. Knob of haltere shining brownish black, stalk brownish.

Abdomen : Almost as broad as thorax, flattened oval, 0.8 x as wide as long, shining brownish black with a few black brown hairs. *Male genitalia* (Figs. 383-384) : Epandrium much broader than long, with scattered, short, stout hairs ; surstylus gradually narrowing anteriorly, with a few fairly long hairs confined mostly to basal half and ending with nearly pointed apex ; hypandrium well developed ; distiphallus with convex sides in dorsal view, 0.4 x as long as broad with four pairs of apical processes (two pairs on each side) ; pregonite apically narrowed.

Length : Male, 2.8-3.0 mm, wing 2.2-2.3 mm, Female, 3.1 mm, wing 2.3 mm.

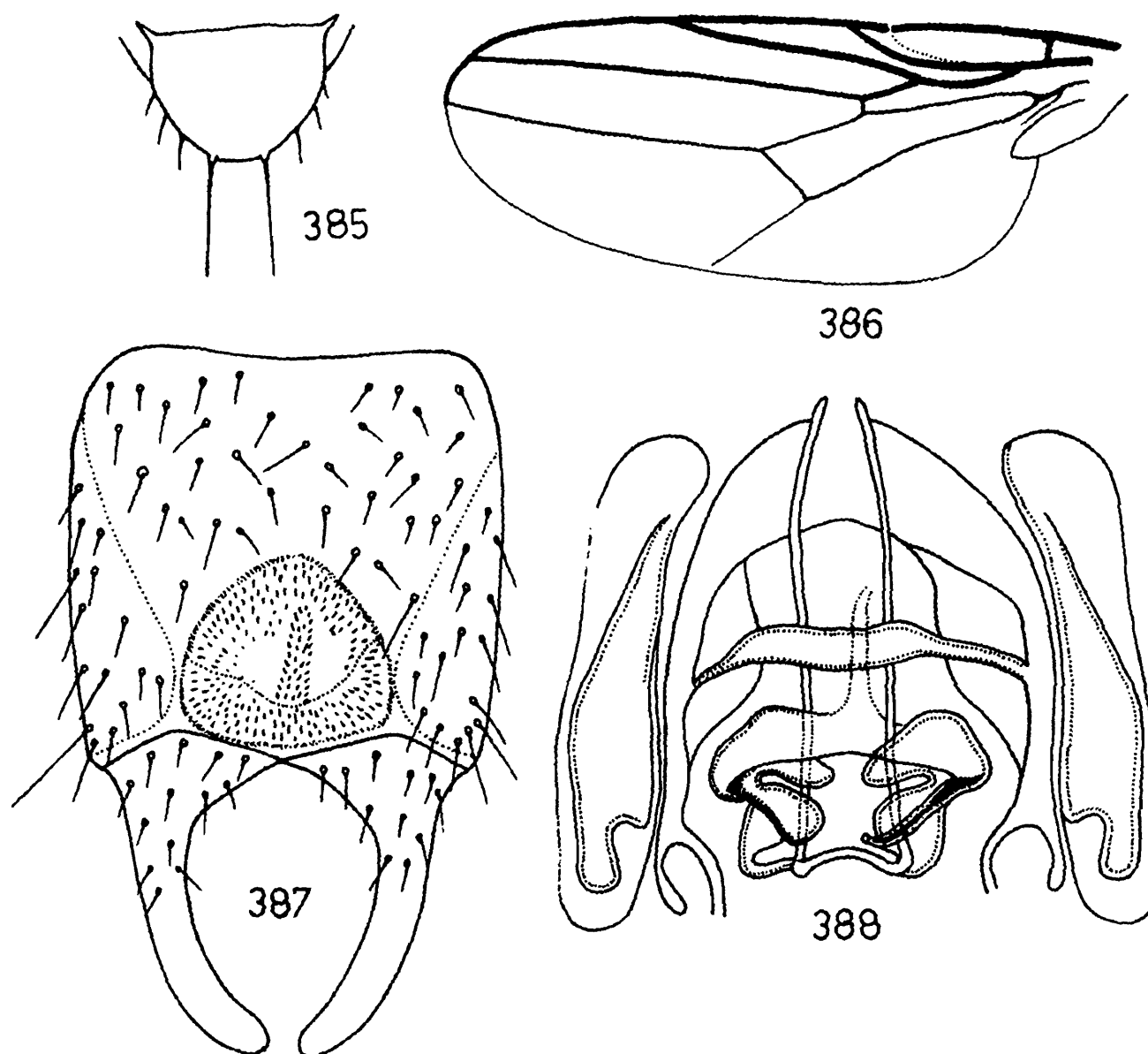
Specimens studied : 2 males, India : Maharashtra : Kholapur Dist., Kagal, 21.xii.1971, Coll. K.S. Pradhan ; 1 male, India : Lumbu, Dec. 1971, Coll. M.M.S. ; 2 males, 1 female, Gujarat : Baroda, 30.xi.1973, Coll. P.T. Cherian ; 1 male, Tamil Nadu : Tanjore Dist., Papanasam, 23.iv.1989, Coll. K.R. Rao.

Distribution : India : Tamil Nadu, Assam, Karnataka, Orissa, Maharashtra, Gujarat ; Malaysia ; Sri Lanka ; Philippines ; Luzon, Leyte, Negros.

83. *Scoliophthalmus indicus* sp. nov. (Figs. 385-388)

Male : Head : A trifle longer than high, height, length and width ratio 18 : 19 : 26. Frons dull black, 1.5 x as long as wide, width at vertex 0.47 x that of head, projecting a little above and slightly beyond anterior margin of eye and somewhat forming a roof over bases of antennae ; frontal triangle shiny black, extending right over frons, base about three-fifths cross vertical breadth, tip narrowly obtuse with straight side margins and under side illumination with three broad longitudinal ridges of which median one extends from ocellar triangle to nearly three fourths its length while each lateral one extends from vertex margin and tapers off anteriorly a little behind the median, the corresponding depressions reaching vertex margin posteriorly. Face shiny black with brownish tinge submedially on each side ; facial carina distinct between antennae and extending sublinearly almost to lower facial margin. Antenna erect ; ant 2 a little wider than long, darkish orange ; ant 3 a trifle longer than wide, darkish orange with dark tinge more pronounced dorsodistally and with acute upper apical angle as in other Oriental species of the genus ; arista very slender, dark brown and without pubescence. Gena very broad, width in middle 1.5 x that of ant 3 and 0.4 x height of head, shiny black ; vibrissal angle rounded, projecting a little beyond eye margin ; postgena well developed ; parafacialia linear, black. Eye oval, naked with horizontal long axis. Proboscis short, mostly dark brown ; palpi entirely inside mouth, short, rather slender, yellowish brown. Head bristles well developed, predominantly black ; *out* and upright, cruciate *pvt* subequal ; *ivt* only a trifle shorter than *out* ; *c* proclinate, divergent, almost as long as *ivt* ; *orb* about 9, posterior most 2-3 most developed, longest one two-thirds as long as *ivt* and sequentially anterior ones becoming shorter and more slender ; *if* in a row of about 10, outside frontal triangle, along each lateral margin, all more developed than anterior *orb* ; oral vibrissae developed.

Thorax : Wholly shining black. Scutum almost as wide as long and as wide as head, moderately convex, evenly covered with fairly dense, short, white hairs arising from small stellate granulae. Scutellum (Fig. 385) roundly truncate triangular, 0.75 x as long as wide, with slightly convex disc which is pubescent like but more coarsely punctate than scutum. Pleura shining, *anepst* with many and *kepst* with a few punctate hairs. Thoracic bristles of medium size, black ; *h* 1, short, only a trifle longer than hairs on humeral callus ; *npl* 1+1, subequal, a little longer than *out* ; *pa* 1 longer than and 1 *dc* as long as *npl* ; *pa* 2 indistinct ; a row of 6 to 8 black bristly prescutellar hairs which are only a little shorter than 1 *dc* present as in some other species of *Scoliophthalmus* ; *as* a trifle longer than scutellum, borne on distinct wart, equidistant from each other and *ss* 1, the latter 0.4 x as long as *as* ; *ss* 2 nearly half as long as *ss* 1 but more slender ; *ss* 3 slightly distinguishable from scutellar hairs ; all lateral scutellars borne on fine warts.



Figs. 385-388 : *Scolioophthalmus indicus*, sp. n. 385, Scutellum. 386, Wing. 387, Epandrium, dorsal view. 388, Phallic complex.

Legs : Coxae mostly rustly yellow ; forecoxa with dark, oblique band ; fore femur slightly thickened, rather spindle-shaped, with longitudinal row of bristly hairs anteroventrally ; all femora black ; tibiae black but for their brownish yellow basal and distal ends ; tarsi brownish yellow except for blackish brown distal three segments of each leg ; femoral organ present.

Wing (Fig. 386) : Shorter than body, 0.31 x as wide as long, hyaline with pale brown tinge, dark costa and yellowish brown veins ; proportions of costal sectors 2 to 4 in the ratio 4 : 3 : 1 ; r-m cross-vein distad of middle of discal cell, opposite 0.6 of its length ; m-m cross-vein greatly oblique ; discal cell broadened distally ; anal angle normally developed. Haltere yellow.

Abdomen : Dull black, unlike in other species 2 x as long as wide, in both the specimens anterior terga deeply depressed probably due to drying. *Male genitalia* (Figs. 387-388) : Epandrium in dorsal view a trifle longer than broad, rather squarish, with fairly dense, stout hairs ; surstylus only slightly widened basally, narrowed and gently curved inward distally and ending with narrowly obtuse apex ; hypandrium well developed ; distiphallus cylindrically elongate, width in middle 0.2 x its length, gradually narrowing distally, extending beyond hypandrium and ending with nearly pointed apices on either side which are turned slightly inwards ; pregonite broadened basally and narrowing and broadly obtuse distally ; postgonite broadened distally ; phallic complex at base with armature developed mostly from postgonite.

Length : Male, 3.0 mm, wing 2.6 mm.

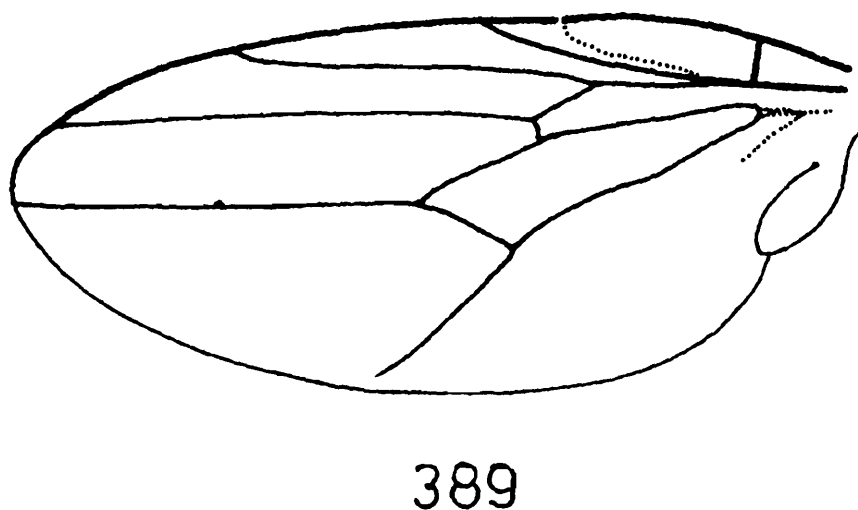
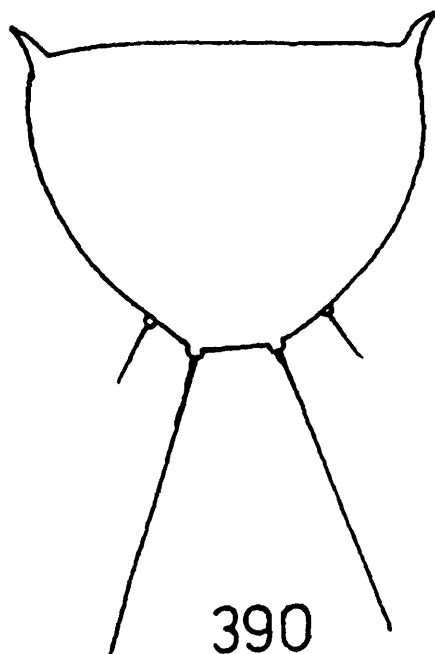
Holotype : Male, India : Kerala : Idukki Dt., Ayyappan Kovil, 29.v.1981, Coll. P.T. Cherian. *Paratypes* 2 males, collection data same as of holotype.

S. indicus is related to *angustifrons* (Duda) but differs in having white and not yellow thoracic hairs and long and narrow abdomen. Besides, in *indicus* distiphallus is simple distally and not with narrow processes as in *angustifrons*.

84. *Scoliophthalmus numeralis*, sp. nov. (Figs. 389-390)

Female : *Head* : As long as high, length, height and width ratio 9 : 9 : 14. Frons subshining black at vertex 0.78 x as wide as long and half as wide as head, projecting a little above and slightly beyond eye margin, with a few, slender dark *fr* ; frontal triangle large, shining black, without distinct ridges and depressions unlike in *micans* Lamb though under side illumination it appears to have two submedian and two short lateral, one on each side, depressions which are very faint and far different from those in *micans*, reaching anterior margin of frons and ending with narrowly

obtuse apex. Face concave, subshining brownish black but for yellowish brown area between antennae and extending longitudinally on either side of facial carina and



Figs. 389-390 : *Scoliophthalmus numeralis*, sp. n. 389, Scutellum. 390, Wing.

reaching almost lower facial margin ; facial carina low, subtriangular between antennae whence becoming broadened and flattened and extending to lower facial margin. Antennae erect, brownish yellow with dark tinge confined mostly to dorsodistal part

of ant 3 ; ant 2 wider than long ; ant 3 reniform at base, as wide as long with acute upper apical angle as in *micans* Lamb and other Oriental species of the genus ; arista dark brown, slender, naked with short, thickened basal part blackish brown. Gena shiny black, in the middle 1.4 x as broad as ant 3 and becoming much more broadened in the area of postgena, the latter with about two rows of setae in continuation of postocular setae ; vibrissal corner rounded, not extending beyond margin of eye ; parafacialia linear but distinct. Eye oval, naked with distinctly horizontal long axis. Proboscis short, mostly dark brown ; palpi entirely inside mouth, short, blackish brown. Head bristles well developed, predominantly black ; *out* and upright, cruciate *put* subequal ; *ivt* a little shorter than *out* ; *oc* proclinate, widely divergent, equal to *ivt* ; *orb* about 13, recombent, two or three posterior ones more developed than the rest, sequentially anterior ones becoming shorter, longest one two-thirds length of *out* ; *if* in a row of 13-14 outside the triangle, along each lateral margin, subequal and equal to anterior *orb* ; a row of about 10 hairs present along oral margin.

Thorax : 1.1 x as wide as head, wholly shiny black but for some area of pleura. Scutum distinctly wider than long, width and length ratio 15 : 13, disc convex, evenly covered with short, slender, brownish black hairs arising from small stellate granulae that are not dense ; scutellum (Fig. 389) roundly truncate triangular, at base half as wide as scutum and 1.25 x as wide as long, pubescent like but much more coarsely and densely punctate, especially on the distal half, than scutum. Pleura shining but for subshining propleuron ; *anepst* with many and *kepst* with a few punctate, short, slender black hairs. Thoracic bristles well developed ; *h* 1, a little shorter than *ivt* ; *npl* 1+1, subequal and equal to *out* ; *pa* 1 more prominent than other bristles, 1.2 x as long as *npl* ; *pa* 2 not distinct ; 1 *dc* almost as long as *npl* ; a row of about 8 prominent, prescutellar bristly hairs are present as in some of the other species of the genus ; *as* somewhat approximated at base, almost as long as scutellum, borne on prominent wart ; *ss* 1 one-third as long as *as*, borne on distinct wart ; distance between *as* and *ss* 1 at base almost equal to that between the two *as* ; other lateral scutellars hardly distinguishable from scutellar hairs.

Legs : Coxae black ; trochanters ferruginous ; femora black but for yellowish brown distal ends ; tibiae black except for bases and tips ; tarsi yellow except for dark brown last four segments of fore legs and last three segments each of mid and hind legs.

Wing (Fig. 390) : Much shorter than body, 2.5 x as long as wide, hyaline with dark costa and distal end of subcosta ; proportions of costal sectors 2 to 4 in the ratio 15 : 12 : 5 ; r-m cross-vein greatly distad of middle of discal cell, opposite 0.64 of its length ; m-m cross-vein greatly oblique ; discal cell broadened distally, terminal sector

of m 1+2 slightly sinuate ; anal angle well developed. Stalk of haltere yellow, knob black.

Abdomen : Subshining brownish black, finely dark grey tomentose, 0.9 x as wide as long and 1.2 x as wide as thorax, with fairly dense, short, slender dark brown hairs. Female cerci short, with very fine, dense, pale hairs.

Length : Female 3.2 mm, wing 2.4 mm.

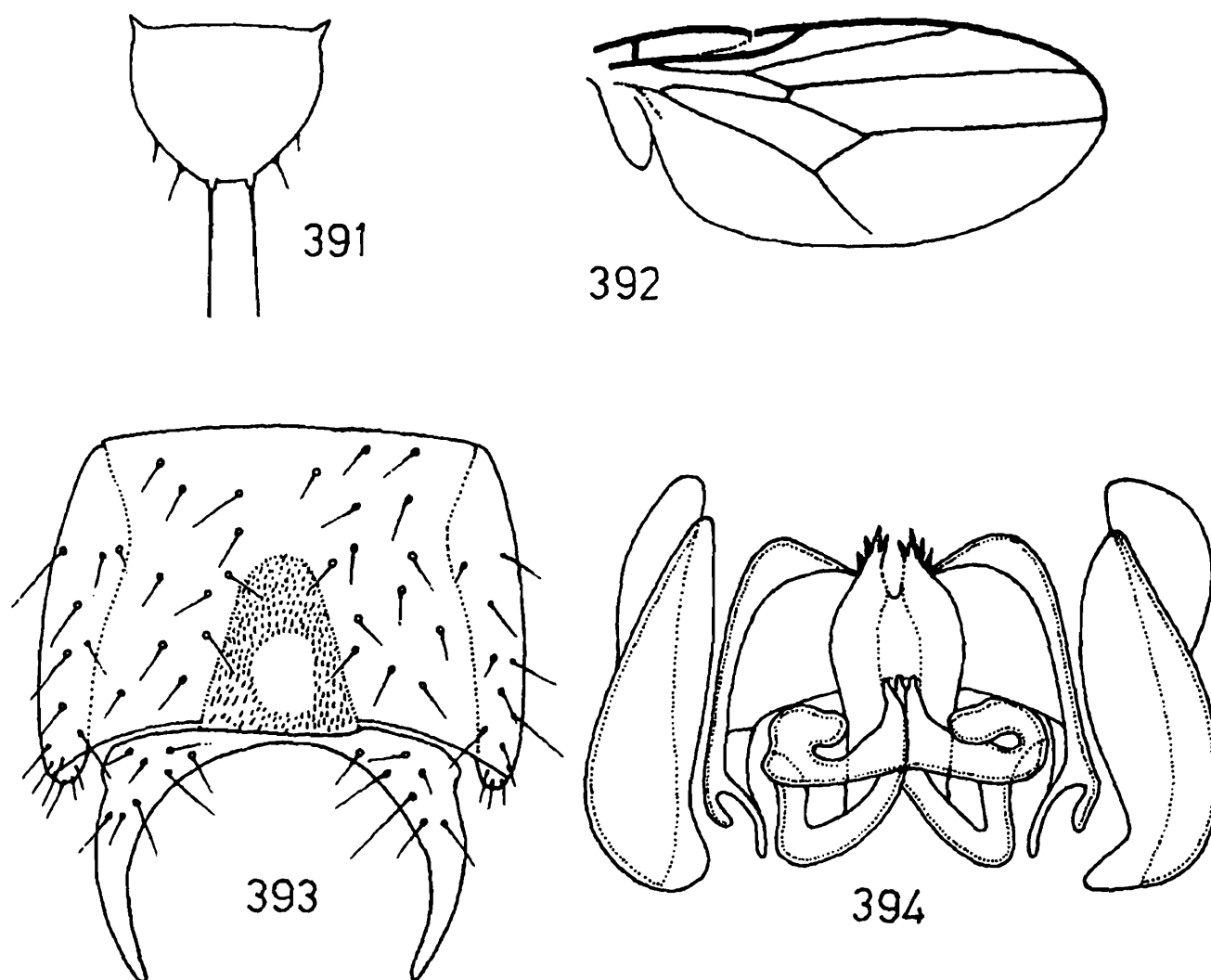
Holotype : Female, India : U.P., Ghaziabad, 11.vi.1989, Coll. M.S. Shishodia.

Paratype : 1 female, collection data same as of holotype.

S. numeralis is closely related to *micans* Lamb but differs in the absence of distinct ridges on frontal triangle. Besides it can be differentiated by the number of *orb* and *if*, and colouration of tarsal segments.

85. *Scoliophthalmus darjeelingensis*, sp. nov. (Figs. 391-394)

Male : *Head* : Higher than long, length, height and width ratio 15 : 16 : 24. Frons dull brownish black, 1.25 x as long as wide, width at vertex half that of head, projecting a little above but not beyond eye margin, with convex anterior margin and a few black *fr* ; frontal triangle shiny black, with one median and two lateral ridges, the former extending from ocellar triangle to about three-fourths the length of and each lateral one from vertex to half the length of the triangle, the corresponding depressions less deep than in *micans* Lamb. Face concave, subshining brownish black except for brownish area between antennae and the two lateral margins, including the parafacialia. Antennae erect, brownish yellow except for darkish dorso-distal margin of ant 3 ; ant 3 as long as wide, with acute upper apical angle as in other Oriental species of the genus ; arista slender, dark brown, naked with short, slightly thickened basal part. Gena shiny black, width in the middle 1.6 x that of ant 3 and 0.43 x height of head, slightly narrowing in front and broadening behind in the area of postgena, the latter with a row of black setae in continuation of postocular setae ; oral margin with a row of short, black hairs ; vibrissal corner blunt, not projecting beyond eye margin. Eye suboval, slightly narrower anteriorly, naked with horizontal long axis. Proboscis and palpi entirely inside mouth, dark brown, the latter short and slender. Head bristles well developed, black, all a little shorter than in *micans* and other species from India ; *ovt* and the upright and cruciate *pvt* subequal ; *ivt* shorter than *ovt* ; *oc* proclinate, divergent, almost equal to *ovt* ; *orb* about 11, none outstanding, recumbent, sequentially anterior ones becoming shorter, longest about half the *ovt* ; *if* about 12, in a row outside margin of triangle, along its margin, subequal to *orb* ; oral vibrissae fairly well developed.



Figs. 391-394 : *Scolioophthalmus darjeelingensis*, sp. n. 391, Scutellum. 392, Wing. 393, Epandrium, dorsal view. 394, Phallic complex.

Thorax : Subshiny black. Scutum as wide as head and 1.1 x as wide as long, with convex disc bearing short, black punctate hairs that are distinctly denser than in *micans* Lamb and *numeralis*. Scutellum (Fig. 391) roundly truncate triangular, 0.75 x as long as wide, with convex disc, which is pubescent like but more coarsely and densely punctate than scutum except for the area around base. Pleura black with brownish tinge in lower half; *anepst* and *kepst* with black hairs. All thoracic bristles black; *h* 1, slightly shorter than *ivt*; *npl* 1+1, subequal, equal to *ovt*; *pa* 1 a little longer than *npl*; *pa* 2 indistinct; 1 *dc* almost equal to *npl*; a row of black, bristly, prescutellar hairs present as in *numeralis* and most of the other species of the genus; *as* less approximated at base than in *numeralis*, almost as long as scutellum, equidistant from each other and *ss* 1, the latter less than one-third as long as *as*, much shorter and slender than in *micans*, borne on small wart; *ss* 2 minute, hardly distinguishable from marginal hairs of scutellum.

Legs : Coxae and femora black; trochanters yellow to yellowish brown; fore and mid tibiae broadly in the middle black, otherwise yellow; hind tibia, but for the two yellow ends, black; all tarsi yellow but for slight infuscation on distal segments of hind leg; tibial organ absent; femoral organ distinct, in the form of a few slender, spiny warts; basal four tarsal segments of each leg with 1-3 short dark, spiny hairs along ventrodistal margin.

Wing (Fig. 392) : Hyaline with pale brown veins of which costa upto the ending of *r* 2+3 darkish; proportions of costal sectors 2 to 4 in the ratio 15 : 9 : 4; *r-m* cross-vein distad of middle of discal cell, opposite 0.6 of its length; *m-m* cross-vein greatly oblique; discal cell broadened distally; terminal sector of *r* 4+5 a little convex above and that of *m* 1+2 slightly sinuate along its entire length so that the maximum distance between the two veins a little more in the middle than near their apices; anal angle normally developed. Stalk of haltere yellowish brown, knob dark brown.

Abdomen : Elongate oval, a little narrower than thorax, brownish black with short, slender fairly dense dark hairs. **Male genitalia** (Figs. 393-394) : Epandrium in dorsal view 0.7 x as long as wide with a few stout hairs of medium size; surstylus broadened at base, gradually narrowing anteriorly, with a few fairly long hairs which are confined mostly to basal half and ending with nearly pointed apex; hypandrium well developed; aedeagus cylindrically elongate, much broader than in *indicus*, gradually widening distally, maximum width half its own length, abruptly becoming narrow at three-fourths its length from base and with about 4 very short, dark brown, chitinous, spinous processes on each of the apico-lateral corners and the area behind; pregonite

larger than postgonite, with broadly obtuse apex ; postgonite in the form of a small sub-triangular plate.

Length : Male 2.0 mm, wing 1.6 mm.

Holotype : Male, India : W. Bengal : Darjeeling, 10.iv.1974, Coll. J.K. Jonathan.

S. darjeelingensis is closely related to *micans* Lamb from India but can be distinguished by the nature of ridges and depressions on frontal triangle. Besides, in the former species hairs on scutum are shorter and more dense and distiphallus is narrow distally while in *micans* distiphallus is broad distally and thoracic hairs are relatively less dense.

Tribe 3. STENOSCININI Nartshuk

1983. *Stenoscinini* Nartshuk, *Ent. Oboz.*, 62 (3) : 641. Type genus : *Stenoscinis* Malloch, 1918.

A tribe of medium-size having proclinate and divergent *oc*, linear to well developed gena, usually long *r* 2+3, greatly reduced or even well developed anal area of wing and characteristic male genitalia with high hypandrium, large gonites and broad and rounded distiphallus.

Head usually rounded ; frons usually slightly narrowing anteriorly ; frontal triangle glabrous, clearly demarcated or even short and indistinct, rarely finely tomentose ; gena linear to nearly as wide as ant 3, with or without hairs ; eye orbicular to suborbicular with fine pubescence and vertical long axis ; ant 3 suborbicular with pubescent arista. Head bristles with proclinate and divergent (very rarely erect and cruciate) *oc*, well developed *ovt* and *ivt*, cruciate *pvt*, 3-10 *orb* and 2-3 *if* ; thorax as wide as long or longer than wide ; scutum with or without longitudinal vittae and with fairly dense hairs ; transverse suture often cuts more deeply into the disk of scutum than in most other tribes ; pleura with or without spots and maculae ; *kep*st sometimes with a bristle ; *anep*st without hairs ; thoracic bristles with 1 *h*, 1+1 or 1+2 *npl*, *pa* 1, 1 *dc*, long *as* and *ss* 1 ; wing with elongate *r* 2+3 (except in a few species of *Stenoscinis*), well developed or greatly reduced anal area and with or without infuscation ; legs long and slender or short and stout ; abdomen sometimes elongated or even oblong, often grey tomentose ; female cerci slender ; male genitalia with high hypandrium, large gonites, broad and rounded distiphallus and *Oscinella*-type cerci.

Distribution : Oriental, Neotropical, Afrotropical and Nearctic Regions.

Remarks : Nartshuk (1987) included the genera *Psilacrum* Becker, *Oscinella* Malloch, *Stenoscinis* Malloch and *Javanoscinis* Andersson under the tribe *Stenoscinini*.

Nartshuk as all of them possess proclinate and divergent *oc*, non hairy *anepst* and elongate *r* 2+3 (except in a few species of *Stenoscinis*) and thereby the long second sector of costa. Besides, in all the four genera the male genitalia are very much identical.

Characters like the comparative width of gena, nature of transverse suture, which usually cuts deeply into the disk of the scutum, number of *npl*, relative development of anal area of wing and general habitus of body, abdomen and legs exhibit differences in various species. This has led to the defining of generic limits rather difficult. Ismay (1986) synonymised *Oscinoides* Malloch with *Psilacrum* Becker because of the presence of major characters of *Psilacrum* found in different combinations in species of *Oscinoides*, a view endorsed by Kanmiya (1987) also because of the similarities in their male genitalia. Sabrosky also appears to consider the species of both the genera congeneric, especially because of the nature of transverse suture which cuts deeply into the disk of the scutum in the species of both the genera (Kanmiya, 1987).

The Oriental species of *Stenoscinis* Malloch have many characters like narrow habitus of body, abdomen and legs, elongate *r* 2+3, 1+1 *npl*, reduced anal area of wing, reduced gena and transverse suture which cuts deeply into the disk of scutum found in species of *Psilacrum* as understood by Ismay. Andersson (1977) who did not make any comments on *Stenoscinis* and other related genera erected his monotypic genus *Javanoscinis* to include *meijerei* (Becker), a typical *Stenoscinis* species belonging to its Oriental category. On the basis of information available on the group of species described so far under the tribe *Stenoscinis* and the study of a few others before me, it is felt that the generic name *Psilacrum* should be restricted to *gigantium* (Enderlein) and its relatives, including species earlier dealt with under *Oscinoides* and having the following characters : frontal triangle reaching middle or anterior end of frons ; gena rarely narrow, usually even as wide as ant 3, *oc* proclinate and divergent, transverse suture often cutting deeply into scutum ; *r* 2+3 elongate ; *npl* 1+1 or 1+2, anal area not reduced, fairly well developed and body, abdomen and legs rather stout and not narrow and elongated. As for species now considered belonging to *Stenoscinis*, those from the Oriental Region with linear gena, proclinate and divergent *oc*, 1+1 *npl* and transverse suture cutting deeply into scutum and elongated *r* 2+3 and showing affinities to *meijerei* (Becker) can be transferred to the genus *Javanoscinis* Andersson while the name *Stenoscinis* should be restricted to species from the Nearctic, neotropical and Afrotropical Regions with rarely linear gena, proclinate and divergent or even erect and cruciate *oc*, 1+2 *npl* and normally developed transverse suture which do not cut deeply into scutum. Drawing generic limits on a group known so far by only a small number of species and possessing diverse characters exhibiting various ranges

of development is admittedly not a sound proposition, especially when the genitalia of the various genera do not provide much clue to their generic relationships. The generic limits drawn on the basis of our understanding of the various species dealt with under the tribe is expected to remove much of the confusion existing today. A clearer picture may emerge as more species become available from different niches in various zoogeographical realms.

Key to the genera of **STENOSCININI**

1. Front relatively short and broad ; body, abdomen and legs not narrow and elongated, rather stout ; gena usually well developed ; anal area of wing not reduced, rather broad *Psilacrum* Becker 2

Front relatively not short and broad ; body, abdomen and legs narrow and elongated ; gena usually linear, rarely more developed ; anal area of wing narrow, sometimes the anal margin almost parallel to m 3+4 2

2. *oc* proclinate and divergent ; gena linear ; *npl* 1+1 ; transverse suture almost always cutting deeply into scutum ; r 2+3 always elongated ; mg 2 much longer than mg 3 *Javanoscinis* Andersson

oc proclinate and divergent but sometimes erect and cruciate ; gena often more developed ; *npl* 1+2 ; transverse suture not cutting deeply into scutum ; r 2+3 not always elongated ; mg 2 sometimes shorter than mg 3 *Stenoscinis* Malloch

Only two species belonging to this tribe are so far known from India and adjacent countries and a third one also is described here. Two of these belong to *Psilacrum* and the third to *Javanoscinis*.

Genus 13. *Javanoscinis* Andersson

1977. *Javanoscinis* Andersson, *Ent. Scand., Suppl.*, 8 : 65.

Type-species : *Javanoscinis meijerei* (Becker) (= *Meroscinis meijerei* Becker). By original designation and monotypy.

A small genus closely related to *Stenoscinis* Malloch but differing in possessing invariably proclinate and divergent *oc*, long r 2+3 and only 1+1 *npl*, besides transverse suture cutting deeply into disc of scutum.

Head rounded in profile ; frons wide at vertex, silvery or grey tomentose ; frontal triangle distinct or indistinct, usually glabrous and shiny ; face slightly receding ;

facial carina low and linear. Antennae erect ; ant 2 short ; ant 3 suborbicular ; arista slender, with conspicuous pubescence. Gena linear ; parafacialia not developed. Eye large, finely pubescent with vertical long axis. Proboscis short ; palpi black. Head bristle well developed ; *out*, *ivt* and *oc* much longer than the rest ; *oc* proclinate and divergent ; *orb* 5-6 ; *pvt* short, slender, proclinate ; *if* in a row outside margin of frontal triangle.

Thorax narrower than head ; scutum usually shiny but sometimes tomentose, with short, dense hairs ; pleura partly or wholly shiny ; *kepst* sometimes with a few hairs near lower margin ; *anepst* without hairs. Scutellum with convex disk bearing short hairs. Thoracic bristles developed ; *h* 1 ; *npl* 1+1 ; *pa* 1+1 ; *dc* 1 ; *as* longer than scutellum, widely separated at base ; *ss* 1, short.

Wing long, narrow basally and broad apically, of *Stenoscinis* type with reduced anal area ; second sector of costa very long as also *r* 2+3.

Legs long and slender ; tibial organ present.

Abdomen long and narrow with long sternites ; female cerci slender ; male cerci of Oscinellinae-type ; hypandrium high ; gonites large ; distiphallus often broad and rounded.

Javanoscinis Andersson is a very small genus with only three species, *meijerei* (Becker) *indica* Cherian and *convexa* Cherian described under it so far. Of these *indica* and *convexa* were reported from India. On the basis of generic limits discussed earlier *convexa* Cherian belongs to *Psilacrum* Becker whereas most, if not all, species under *Stenoscinis* Malloch known from the Oriental Region may belong to *Javanoscinis*. Detailed examination of individual species is needed before the generic transfer is made.

Distribution : Oriental Region.

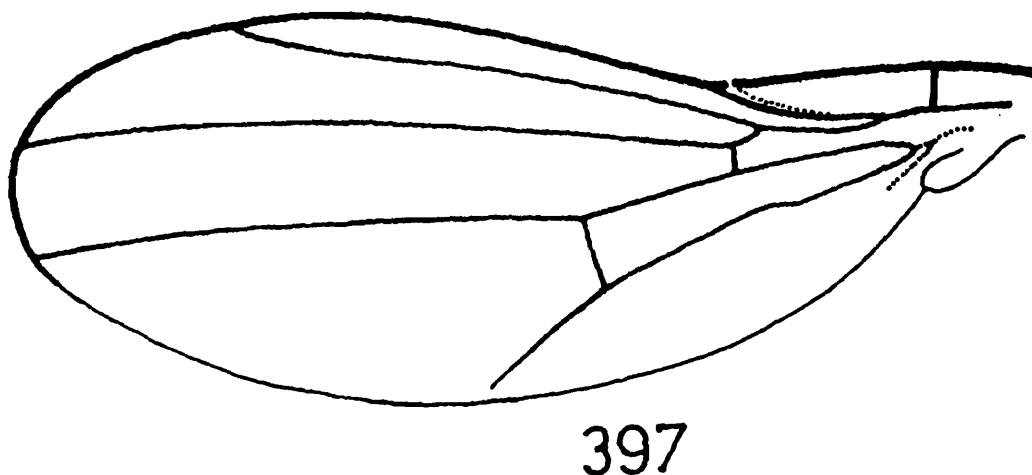
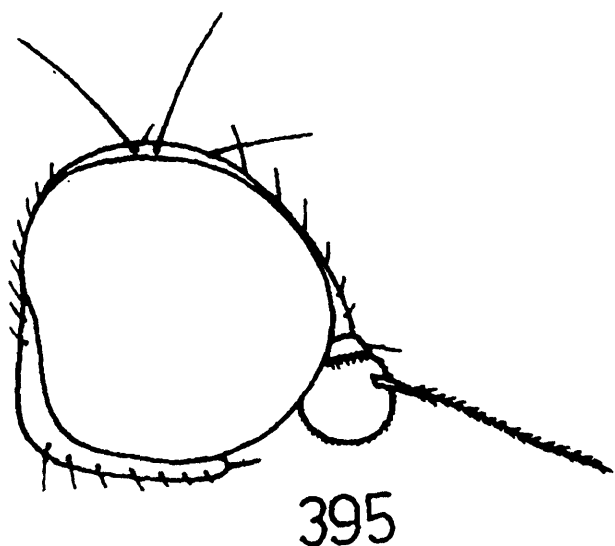
Nothing is so far known about the biology of this genus. Only one species, *indica* Cherian is so far known from India.

86. *Javanoscinis indica* Cherian (Figs. 395-397)

1990. *Javanoscinis indica* Cherian, *Hexapoda*, 2 (1&2) 16-18. Type locality : India : Mizoram : Kolasib.

Female : *Head* : (Fig. 395) : Large, nearly rounded in profile, length, height and width ratio 12 : 13 : 19 ; frons wider at vertex, otherwise parallel sided, a trifle longer than wide and half as wide as head, grey tomentose, brownish black with yellow tinge and with a few frontal hairs in front ; frontal triangle distinct, glabrous, shiny black, broadly obtuse at apex and reaching anterior margin of frons, maximum width half

that of frons. Face slightly receding, dull brownish black ; facial carina distinct, reaching lower facial margin. Part of carina between antennae yellowish brown. Antenna erect ; ant 2 short, yellowish brown with dark tinge ; ant 3 suborbicular, width 1.2 x the length, flat, yellow with dark tinge ; arista yellow, slightly thickened at base, flagellum black with very conspicuous concolorous pubescence. Eye large, nearly rounded, with short dense hairs and vertical long axis. Gena linear, with a few hairs ; vibrissal angle not prominent, behind anterior margin of eye ; oral vibrissae



Figs. 395-397 : *Javanoscinis indica* Cherian. 395, Head, lateral view. 396, Scutellum. 397, Wing.

slender, distinct. Proboscis and palpi brownish black. Head bristles black, very prominent; *ovt* fairly stout, nearly half width of eye; *ivt* a little shorter than *ovt* as also the proclinate, divergent *oc*; *orb* about 6, short, slender, reclinate, longest one about 0.2 x the *ovt*; *if* a few outside margin of frontal triangle, almost equal to *orb*, two anterior ones projecting forwards; *pvt* slender, proclinate, only a little longer than *orb*.

Thorax : Shiny black. Scutum narrower than head, width and length in the ratio 16 : 19, with dense setigerous punctae, almost recalling the condition in species of *Rhodesiella*, and short yellow hairs; humeral callus prominent; transverse suture cuts deeply into disc of scutum. Scutellum (Fig. 396) suborbicular, width 1.2 x the length, with convex disc, punctae less coarser than but pubescent like scutum. Pleura shiny; *kepst* with a few hairs near lower margin of which one is in the form of a bristle. Thoracic bristles black; *h* 1, slender; *npl* 1+1, posterior one a little shorter than the anterior; *pa* 1 longer than posterior *npl*; *pa* 2 short; 1 *dc* a little shorter than *pa* 1; *as* stout, very long, 2 x length of scutellum, widely separated at base, borne on small wart; *ss* 1 short, slender, one-fourth the *as*, placed half way between scutellar apex and base laterally.

Wing (Fig. 397) : Long with dark brown veins; length nearly 3 x the width, narrow basally and broad apically; apical third dark brown, especially in upper half; costal sectors 2 to 4 in the ratio 29 : 14 : 7; r-m cross-vein in the middle of discal cell; terminal sector of r 4+5 vein slightly convex above and that of m 1+2 vein almost straight; discal cell a little broad apically. Haltere yellow.

Legs : Long, slender, yellow; tibial organ present.

Abdomen : Long and narrow; tergites black but for brownish tinge on whole of basal segment and in the middle of second segment; dorsum with fairly dense, long, slender hairs except on basal segment. Female cerci very slender, fairly long, yellow. This species is so far known by the holotype from north-eastern India.

Length : Female 2.15 mm, wing 2.54 mm.

Specimen examined : *Holotype* : Female, India : Mizoram : Kolasib, 1250 m, 8.iii.1979, Coll. P.T. Cherian.

J. indica differs from the type species *meijerei* (Becker) in possessing distinct frontal triangle, wholly black thorax and yellow thoracic hairs.

Remarks : The type specimen was collected, together with many other species of Chloropidae, from a valley between two hill ranges. They were found on leaves of

shrubs around a spring from which water was trickling in droplets. The place was found to be a haven for insects of various groups, especially because collection was made in summer and there was no other source of water anywhere around for miles.

Genus 14. *Psilacrum* Becker

1977. *Psilacrum* Becker, *Ann. Mus. natl. Hung.* 10 : 240. Type species : *Psilacrum giganteum* (Enderlein) (= *Aprimetopsis gigantea* Enderlein). By monotypy.

1916. *Oscinoides* Malloch, *Bul. Brooklyn Ent. Soc.*, 11 : 86. Type species ; *Oscinoides arpidia* Malloch. By original designation and monotypy.

A genus closely related to *Stenoscinis* Malloch but differing in having rather stout body and legs and broad anal area of wing.

Head nearly broadly rounded in outline, frons as long as wide or shorter ; frontal triangle usually glabrous, rarely finely tomentose, narrow, reaching a little beyond middle or anterior margin of frons ; ocellar triangle prominent. Face flat; facial carina low, reaching middle of face. Gena usually well developed, sometimes as wide as ant 3, with or without hairs in lower half ; vibrissal corner not projecting beyond eye ; parafacialia linear to indistinct ; a row of postocular setae often distinct. Eye suborbicular with fine pubescence and vertical long axis. Third antennal segment suborbicular ; arista pubescent. Proboscis and palpi short. Head bristles with proclinate and divergent *oc*, well developed *out* and *ivt*, cruciate *pvt*, 3-10 *orb* of which usually 3 prominent and 2-3 *if* of which anterior most proclinate.

Thorax as wide as or wider than head ; scutum longer than wide with longitudinal vittae, fairly dense hairs and transverse suture which cuts more deeply into the disc of scutum than in most other genera. Pleura with shiny black spots and maculae ; *kepst* often with a bristle ; scutellum wider than long with convex disc. Thoracic bristles well developed with 1 *h*, 1+1 *npl*, *pa* 1, 1 *dc*, long *as* and *ss* 1.

Wing with elongate *r* 2+3 and broad anal area. Haltere yellow.

Legs usually rather stout. Some areas, especially some tarsal segments, black ; tibial organ developed.

Abdomen narrower than thorax, rather oblong, mostly shiny blackish brown and with black hairs. Female cerci slender. Male genitalia shows similarities to those in species of *Stenoscinis* Malloch and *Javanoscinis* Andersson. Male cerci distinct, of Oscinellini-type ; hypandrium high ; gonites large ; distiphallus often broad and rounded.

Distribution : Oriental, Afrotropical, Australian and Nearctic Regions.

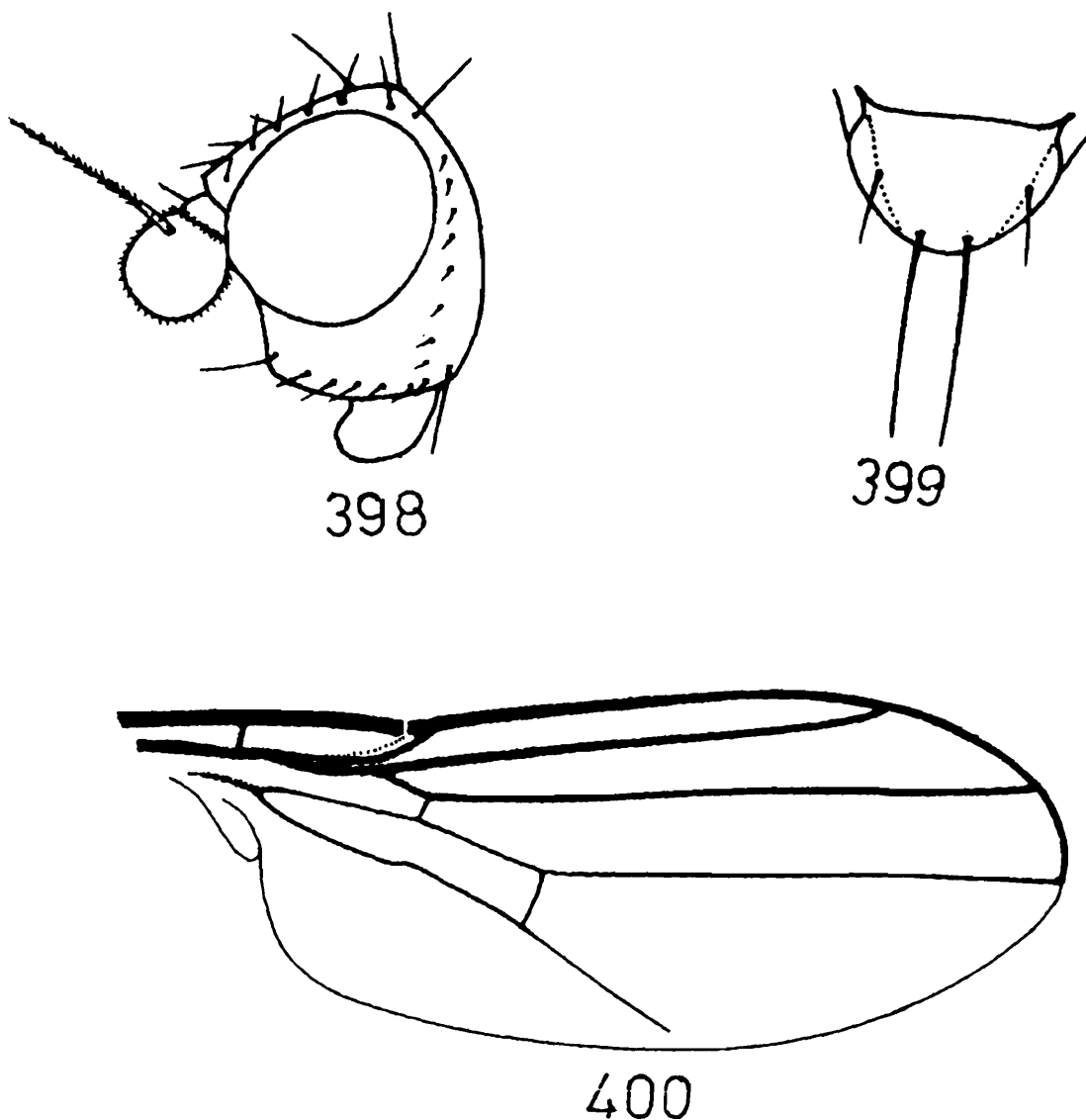
Two species from India are described here of which one, a typical *Oscinoides*-like species, is new while the other *convexa* (Cherian) is being transferred to this genus from *Javanoscinis*. The latter is more of a *Psilacrum*-like species on the basis of the generic limits drawn earlier.

87. *Psilacrum amnoni*, sp. nov. (Figs. 398-400)

Female : *Head* (Fig. 398) : Nearly broadly rounded in outline, length, height and width ratio 12 : 14 : 19. Frons nearly parallel sided, grey tomentose, as long as wide, yellow to yellowish brown with dark tinge especially in anterior half and conspicuous dark *fr* ; frontal triangle subshiny, somewhat indistinct but discernable, narrow, reaching a little beyond middle of frons and ending with pointed apex, finely grey tomentose, yellow to dull yellow with dark tinge at sides of ocellar triangle (in two specimens almost wholly blackish brown) ; ocellar triangle a trifle raised, deeply black ; occiput weakly depressed, yellowish brown to dark brown with nearly V-shaped linear black striation, each arm of V extending from base of *ivt* to junction of head and thorax. Face flat, nearly as wide as frons, yellow to yellowish brown ; facial carina low, broad at base and reaching middle of face. Gena well developed, almost as wide as ant 3, yellow with scattered black hairs in lower half ; vibrissal corner rounded, not projecting beyond eye ; oral vibrissae distinct ; postgena well developed, concolorous with gena ; parafacialia linear, almost indistinct ; postocular setae in a row reaching postgena. Eye almost suborbicular, with scattered, fine pubescence and vertical long axis. Antenna yellow ; ant 2 with short, black dorsal spine ; ant 3 only a trifle wider than long, nearly orbicular ; arista basally slightly thickened, otherwise slender, wholly dark brown with short, fairly dense, concolorous pubescence. Proboscis blackish brown ; palpi short, yellow, with dark hairs. Head bristles brownish black ; *out* a little longer than the cruciate *pvt* ; *ivt* three-fifths the *out* ; *oc* proclinate, divergent, slightly longer than *out* ; *orb* 6, at least one outcurved, 3 anterior ones hardly distinguishable from *fr*, longest only one-third the *out* ; *if* 2-3 of which anterior most is prominent, proclinate, longer than longest *orb* and projects beyond frons.

Thorax : Slightly wider than head ; scutum convex, 1.1 x as long as wide, shiny yellow with fairly long dense black hairs and with three broad shiny black longitudinal vittae of which the median extends the whole length and is narrowed posteriorly, especially in one specimen, while each lateral one extends from the level of inner lower margin of humeral callus to a little above base of 1 *dc* and is broken off in one specimen at transverse suture ; a short, faint, dark brown band is seen below the lateral vitta on each side which is more developed in some specimens ; transverse suture cuts deeply into disc of scutum as in many species of *Psilacrum* ; humeral

callus yellow with black hairs. Scutellum (Fig. 399) wider than long, subconical in outline, length and width ratio 3 : 4, subshiny yellow with darkish tinge, except in the midlongitudinal area in some specimens, disc convex with a few black hairs. Pleural region in one of the specimens, shiny yellow with shiny black patches covering much of *kepst*, part (especially upper half) of *anepst* and part of *anepm* but in the others appearing almost wholly shiny black with indistinct yellow areas ; *kepst* with a distinct bristle near lower margin. All thoracic bristles well developed, black ; *h* 1, equal to *out* ; *npl* 1+1, equal, a trifle longer than *h* ; 1 *dc* equal to and *pa* 1 a little shorter than *npl* ; *as* well separated at base, 1.5 x as long as scutellum ; *ss* 1 two-fifths the *as*, placed nearly half way between scutellar base and apex on the disc, a little inner to lateral margin.



Figs. 398-400 : *Psilacrum amnoni*, sp. n. 398, Head, lateral view. 399, Scutellum. 400, Wing.

Wing (Fig. 400) : Hyaline with dark brown veins and brownish tinge in upper half ; length and width in the ratio 35 : 13 ; costal sectors 2 to 4 as 31 : 13 : 7 ; r-m cross-vein in the middle of discal cell ; terminal sectors of r 4+5 and m 1+2 nearly parallel ; anal area of wing not receding, of *sabroskyi* Kanmiya type. Haltere pale yellow, knob subtriangular and pointed terminally.

Legs : Rather long, slender with black hairs, almost wholly yellow except for all fore tarsal and the last three tarsal segments each of mid and hind legs which are black to brownish black ; in one of the specimens area around distal ends of mid and hind tibiae and much of fore tibia with a tinge of dark brown ; fore femur with 4-5 bristly hairs almost in a row arranged on dorsolateral margin ; tibial organ long, oval, very prominent.

Abdomen : In one of the specimens narrow, in others moderately broad, subshiny black to brownish black but for some paler patches on some segments and with slender black hairs. Female cerci slender with prominent slender hairs.

Length : Female : 2.4 mm, Wing 2.6 mm.

Holotype : Female, India : Meghalaya : Shillong, 1500m, 15.iv.1979, Coll. P.T. Cherian. *Paratypes* : 1 female, collection data same as of holotype : 2 females, Meghalaya : Shillong, 23.v.1980, Coll. Amnon Friedberg.

This species is related to *sabroskyi* Kanmiya but differs in the number of *orb*, relative width of gena, position of r-m cross-vein and colour pattern of scutum, pleura, scutellum and tarsal segments.

It differs from the other species *convexa* (Cherian) in the nature and colouration of frontal triangle, scutum with its longitudinal vittae and colour pattern of pleura, scutellum and tarsal segments. Besides, in *amnoni* gena is very broad, *npl* is 1+1, r-m cross-vein is in the middle of the discal cell and terminal sectors of veins r 4+5 and m 1+2 are parallel.

Remarks : The colour of frontal triangle, nature of vittae on scutum, colouration of pleura and comparative width of abdomen show differences in the specimens ; in one of the specimens abdomen is appearing narrow probably because it is more compressed and not livid with eggs. In two of the specimens frontal triangle is blackish brown, a character usually used for separating species in some chloropid genera but since all the other characters are more or less the same and there is also a tinge of brown on the sides of the triangle in one of the other specimens, all are considered belonging to the same species.

88. *Psilacrum convexa* (Cherian). N. Comb. (Figs. 401-405)

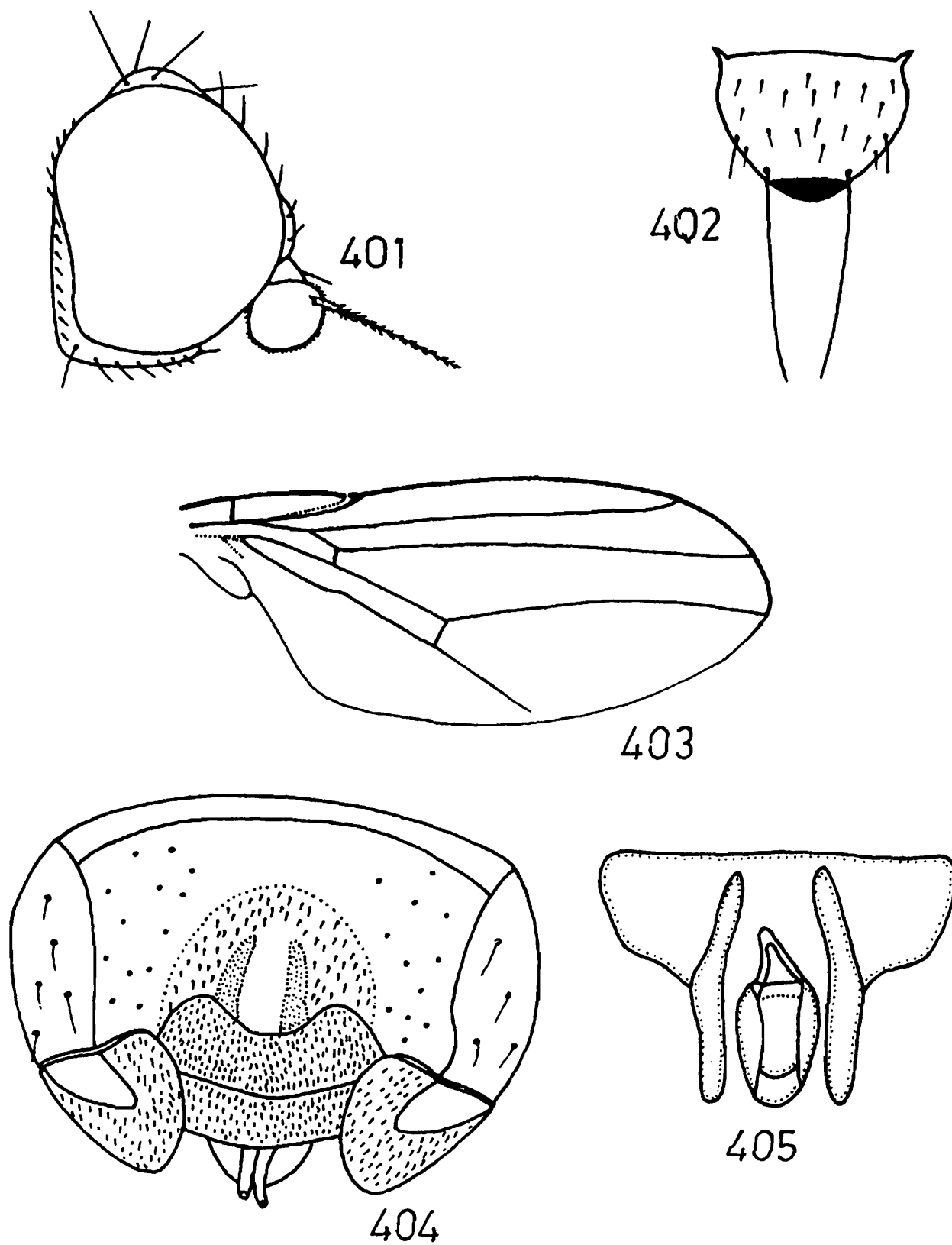
1990. *Javanoscinis convexa* Cherian, *Hexapoda*, 2 (1&2) : 18-19. Type locality : India : Kerala, Cochin, Idukki.

Male, female : Head (Fig. 401): Nearly rounded in profile, length, height and width ratio 13 : 14 : 16. Frons slightly wider at apex, 0.8 x as wide as long and half as wide as head, dark grey tomentose, dull black with rusty yellow tinge around area of lunule and a few frontal hairs of which two in front prominent and project forwards ; frontal triangle indistinct, concolorous with and tomentose like frons. Face deeply concave, grey tomentose, dull brownish black with rusty brown tinge around lower margin ; facial carina low, linear, reaching only middle of face ; lower facial margin raised ; ant 2 short, brownish black ; ant 3 suborbicular, width and length in the ratio 5 : 4, rusty yellow with dark tinge around upper and basal margins in males and almost wholly black in female ; arista thickened at base, blackish brown with short, dense, concolorous pubescence. Eye large, with short, dense pubescence and long vertical axis. Gena dull black, width one-fourth that of ant 3, with a row of short oral vibrissae ; vibrissal angle receding. Proboscis dull black basally and rusty yellow distally ; palpi slender, brownish yellow, with short black hairs. Head bristles black, rather well developed ; *out* fairly stout, a trifle longer than other head bristles ; *ivt* and the proclinate, divergent *oc* subequal, a trifle shorter than *out* ; *pvt* well developed ; *orb* 5, reclinate, longest one half the *oc* ; *if* in a row outside margin of frontal triangle, a trifle shorter than *orb*.

Thorax : Subshiny, grey tomentose, almost as wide as head. Scutum dull black, as wide as long, with short, dense blackish brown punctate hairs. Scutellum (Fig. 402) concolorous with scutum but for rusty yellow tinge around distal margin, 1.5 x as wide as long, very broadly subtriangular with somewhat convex disc and a few short, dark hairs. Pleural region dull black, grey tomentose but lower margin of *anepst* and much of *kepst* and *anepm* subshiny. Thoracic bristles well developed, black ; *h* 1, slender, slightly shorter than *oc* ; *npl* 1+2, equal to *oc* but for shorter, posterior one ; 1 *dc* equal to anterior *npl* ; *pa* 1 equal to and *pa* 2 much shorter than 1 *dc* ; *as* widely separated at base, 1.8 x length of scutellum ; *ss* 1 one-third the *as*.

Wing : (Fig. 403) : Hyaline, almost half as wide as long (9 : 20) with dark brown veins ; second sector of costa extraordinarily long ; costal sectors 2 to 4 in the ratio 22 : 7 : 4 ; r-m cross-vein before middle of discal cell, opposite 0.44 of its length ; terminal sector of *iv* vein greatly convex above ; anal angle not reduced. Stalk of haltere brown, knob dark brown to brown.

Legs : Of medium size, rather stout ; coxae brown to black ; femora, but for their rusty brown distal ends, black ; tibiae brownish black with brownish tinge at both ends ; tarsi yellow except for dark brown last two segments of each leg.



Figs. 401-405 : *Psilacrum convexa* (Cherian). 401, Head, lateral view. 402, Scutellum. 403, Wing. 404, Epandrium, ventral view. 405, Phallic complex.

Abdomen : Almost as wide as thorax, dull black, grey tomentose, with dark brown hairs. Female cerci short and slender. Male genitalia (Figs. 404-405) with high hypandrium (HY), distinct cerci (CRI), long gonites and broad, rounded distiphallus.

This species is so far known only by the types and is confined to Kerala.

Length : Male 1.76 mm, wing 1.3 mm; Female 1.9 mm, wing 1.6 mm.

Specimens examined : *Holotype* : Female, India : Kerala Cochin : Ambalamedu, 28.ii.1984, Coll. P.T. Cherian. *Paratypes* : 1 male, data same as of holotype ; 1 male, Kerala : Idukki, Painavu, 24.ii.1984, Coll. P.T. Cherian.

P. convexa differs from *amnoni*, the only other species of the genus known from India, in possessing a narrow gena. Besides, in *convexa* vittae on scutum are absent, terminal sector of m 1+2 is convex above, there are 3 *npl* and colour pattern of frontal triangle, pleura, scutellum and some tarsi also show differences.

REFERENCES

- Adachi, K. 1954. Studies on resistance in rice plant to stem maggot, *Chlorops oryzae* Matsumura. 1. Varietal difference in the occurrence of injured ears. *Jap. J. Breed.*, **4** : 56 (In Japanese).
- Adachi, K., A. Mikamori & M. Mitani, 1961. Studies on resistance in rice plant to rice stem maggot, *Chlorops oryzae* Matsumura, especially on variability of percentage in injured ears per plant. *Bull. Fac. Agric. Shimane Univ.*, **9** : 18-26. (In Japanese with English summary).
- Adams, C. F. 1904. Descriptions of new Oscinidae. *Ent. News Philad.*, **15** : 303-304.
- Adams, C. F. 1905a. On the North American species of *Oscinis* Latreille. *Ent. News Philad.*, **16** : 108-111.
- Adams, C. F. 1905b. Diptera africana, I. *Kans. Univ. Sci. Bull.* **3** (6) : 149-208.
- Agafonova, Z.J. 1962. New pests of Brome grass flies of the genus *Dicraeus* Loew (Chloropidae : Diptera) *Ent. Oboz. Moscow*, **41** (3) : 492-504.
- d'Aguilar, J. 1943. Contribution a l'etude des larves de *Chlorops* Meigen (Chloropidae : Diptera) *Bull. Soc. ent. France*, **48** : 153-155.
- d'Aguilar, J. 1953. Contribution a l'etude des Dipteres (9 note). La larve de *Calamoncosis minima* Strobl (Chloropidae : Diptera). *Bull. Soc. ent. France*. **58** : 72-76.
- Alam, M.Z. 1960. *Oscinella frit* (L.) (Chloropidae : Diptera) a new insect pest of aus paddy in East Pakistan. *Agric. Pakistan*, **11** (3) : 1-3.
- Aldrich, J. M. 1923. A new sugar-cane miner. *Bull. ent. Soc. Brooklyn*, **18** : 22-23.
- Aldrich, J. M. 1925. New Diptera or two-winged flies in the United States National Museum. *Proc. U. S. Nat. Museum*, **66** : 1-36.
- Aldrich, J.M. 1929. Notes on synonymy of Diptera, No. 3. *Proc. ent. Soc. Washington*, **33** : 69-72.
- Allen, M.W. & R.H. Painter 1937. Observations on the biology of wheat stem maggot in Kansas. *Jour. Agr. Res.* **55** : 215-238.
- Andreev, N. 1926. Le cycle biologique de *Oscinis frit* L. *Defense des plantes* Leningrad, **3** : 367-378, 8 figs. (In Russian).

- Andersson, H. 1963. A revision of the species of Oscinides described by C.F. Fallén in Diptera Sueciae (Diptera : Chloropidae). *Opuse. ent.*, **28** : 103-110.
- Andersson, H. 1966. A revision of the species of Oscinides described by J. W. Zetterstedt (Diptera : Chloropidae). *Opuse. ent.* **31** : 61-76, 3 figs.
- Andersson, H. 1977. Taxonomic and phylogenetic studies on Chloropidae (Diptera) with special reference to old World genera. *Ent. Scand. Suppl.*, **8** : 1-200, 119 figs.
- Andersson, H. 1979. Problem vid kladistisk analys av flugfamiljen Chloropidae. *Ent. Tidskr.*, **100** (3-4) : 180-187.
- Ashlock, P. D. 1971. Monophyly and associated terms. *Syst. Zool.*, **20** : 63-69.
- Ashlock, P. D. 1973. Monophyly again. *Syst. Zool.*, **21** : 430-438.
- Balachowsky, A. & L. Mesnil, 1935. Les insectes nuisible aux plantes cultivées. 1. Busson Paris, 1137 pp. 981 figs., 7 pls.
- Becker, T. 1903. Aegyptische Dipteren (Fortsetzung und Schluss). *Mitt. Zool. Mus. Berlin*, **2** : 67-195.
- Becker, T. 1907. Die Ergebnisse meiner dipterologischen Frühjahresreise nach Algier und Tunis 1906. *Zeit. Hym. Dipt.* **7** : 369-407
- Becker, T. 1908. Dipteren des Insel Madeira. *Mitt. Zool. Mus. Berlin*, **4** (1) : 147-150.
- Becker, T. 1909a. Myrmecomorpha Du four (1833) und *Elachiptera* Macquart (1835). *Wien. ent. Zeit.*, **28** : 91-95.
- Becker, T. 1909b. Collections recueillis par M. Maurice de Rothschild dans l' Afrique Orientale anglaise. Insectes : Dipteres nouveaux. *Bull. Mus. nation. d' Hist. nat. Paris*, **15** : 113-121.
- Becker, T. 1910a. Chloropidae. Eine monographische Studie. *Archivium Zoologicum Budapest*, **1** : 33-174, 2 pls.
- Becker, T. 1910b. Chloropidae. Eine monographische Studie. ii. Teil. Aethiopische Region. *Ann. hist. nat. Mus. natn. Hung. Budapest*, **8** : 377-443, Taf. 13.
- Becker, T. 1911. Chloropidae Eine monographische Studie. iii. Teil. Die Indo-Australische Region. *Ann. hist. nat. Mus. natn. Hung. Budapest*, **9** : 35-170, Taf. 1&2.

- Becker, T. 1912a. Chloropidae. Eine monographische Studie. iv. Teil. Nearktische Region. Nachtrag zu. i-iii. Teil. Paläarktische, Aethiopische und Australische Region. *Ann. hist. nat. Mus. natn. Hung.* Budapest, **10** : 21-256, Taf. 1.
- Becker, T. 1912b. Berichtigungen Zur Monographie der Chloropiden. *Ann. hist. nat. Mus. natn. Hung.* Budapest, **10** : 645-646.
- Becker, T. 1913. Chloropiden aus Abessynien. *Ann. hist. nat. Mus. natn. Hung.* Budapest, **11** : 147-167.
- Becker, T. 1914. Diptérés nouveaux récoltés par M. Ch. Alluaud et R. Jeannel en Affriques Orientale. *Ann. Soc. ent. France*, **83** : 120-130.
- Becker, T. 1916. Neue Chloropiden aus dem Ungarischen National Museum. *Ann. hist. nat. Mus. natn. Hung.* Budapest, **14** : 423-453, 5 figs.
- Becker, T. 1919. Bémerkungen über einige Getreideschädlinge aus der Familie der Chloropiden und ihre Schriftsteller. *Deutsche ent. z.* Berlin, pp. 241-256.
- Becker, T. 1924. H. Sauter's Formosa-Ausbeute. Chloropidae. *Ent. Mitt.* Berlin, **13** : 117-124.
- Becker, T. & J.C.H. de Meijere, 1913. Chloropiden aus Java. *Tijdschr. Ent.*, **56** : 283-307.
- Beschovski, V.L. 1968. Chloropidae (Diptera) unknown in the fauna of Bulgaria. *Izv. Zool. Inst. Sof.*, **26** : 33-38. (In Bulgarian with English Summary).
- Beschovski, V L. 1977. Investigations on the Chloropid flies (Diptera : Chloropidae) of Southwestern Bulgaria. *Acta. Zool. Bulg.*, **6** : 40-49. (In Bulgarian with English Summary).
- Beschovski, V.L. 1978. Faunistic and taxonomic investigations on the genus *Chlorops* Meigen, 1803 (Diptera : Chloropidae) from Bulgaria with description of a new species. *Nouv. Rev. Ent.*, **8** : 397-402, 1 fig.
- Beschovski, V.L. 1979. Contribution to the taxonomy of the genus *Chlorops* Meigen, 1803 (Diptera : Chloropidae). *Reichenbachia*, **17** : 219-223, 11 figs.
- Beschovski, V.L. 1980a. On the taxonomic structure of the genus *Chlorops* Meigen, 1803 (Diptera : Chloropidae). *Acta Zool. Bulg.*, **14** : 19-31, 8 pls.
- Beschovski, V.L. 1980b. *Elachiptera submediterranea*, sp. n. and a review of the species of the genus *Elachiptera* (Diptera : Chloropidae) from Bulgaria. *Acta Zool. Bulg.*, **16** : 57-62. 3 pls.

- Beschovski, V.L. 1981a. On the taxonomy of the genus *Cryptonerya* Lioy, 1864 (Diptera : Chloropidae). *Reichenbachia*, **19** : 51-54, 9 figs.
- Beschovski, V.L. 1981b. On the systematic status of *Oscinella* (*Microcercis*) *trigonella* Duda, 1933 (Diptera : Chloropidae). *Reichenbachia*, **19** : 59-61, 5 figs.
- Beschovski, V.L. 1981c. On the systematics of the genus *Tricimba* Lioy, 1864. (Diptera : Chloropidae). *Reichenbachia*, **19** : 119-122, 14 figs.
- Bezzi, M. 1895. Contribuzioni alla fauna ditterologica italiana. i. ditteri dalla Calabria. *Bull. Soc. ent. Ital.*, **27** : 39-78.
- Bezzi, M. 1906. Noch einige neue namen für Diptern gattungen. *Zeit. Syst. Hym. Dipt.*, **6** : 49-55.
- Bezzi, M. 1913. Studies in Philippine Diptera-1. *The Philippine Journal of Science*, **8** (4) : 305-332.
- Bezzi, M. 1919. *Rhodesiella* Adams, *Meroscinis* Meijere, taxonomy synonymy. *J. New York ent. Soc.*, **27** : 174-179.
- Bilkova, N.A. 1962. Steblebaya Mukha *Elachiptera cornuta* Fallen (Chloropidae : Diptera) i ee Znachenie kak Vreditelya kukuryzi., *Zool. J.* **41** (4) : 586-590.
- Birch, L.C. 1948. The intrinsic rate of natural increase of an insect population. *Jour. Anim. Ecol.*, **17** : 15-26.
- Bjerkander, C. 1778. Rag-dvergs-masken. *K. Vet. Acad. Handl.* Stockholm, **39** : 240.
- Brown, W.L. 1956. Drosophilid and Chloropid flies bred from skunk cabbage. *Psyche* (Camb. Mass.) **63** : 13.
- Brunetti, E. 1913. Zoological results of the Abor Expedition 1911-1912. XI. Diptera. *Rec. Indian Mus.*, **8** : 149-190.
- Brunetti, E. 1917. *Rec. Indian Mus.*, **13** : 101.
- Chaochien, M. 1959. Peculiarities of the development of *Oscinella frit* (L.) and *Oscinella pusilla* (Chloropidae : Diptera) on maize. *Zool. Zh.*, **38** : 727.
- Cherian, P. T. 1970. Descriptions of some new chloropidae (Diptera) from India. *Orient. Insects*, **4** (4) : 363-371, 12 figs.
- Cherian, P. T. 1973a. The genus *Rhodesiella* Adams from India (Diptera : Chloropidae). *Orient. Insects*, **7** (2) : 203-219, 27 figs.

- Cherian, P.T. 1973b. Descriptions of a few new species of Chloropidae (Diptera). *Orient. Insects*, **7** (4): 507-514, 10 figs.
- Cherian, P.T. 1975. Indian species of *Elachiptera* Macquart (Diptera : Chloropidae). *Orient. Insects*. **9** (1): 9-21, 16 figs.
- Cherian, P.T. 1976a. Studies on Indian Chloropidae (Diptera). *Orient. Insects*, **10** (2): 151-159, 15 figs.
- Cherian, P.T. 1976b. The genus *Tricimba* Lioy (Diptera : Chloropidae) from India. *Orient. Insects*, **10** (3): 421-429.
- Cherian, P.T. 1977a. The genus *Siphunculina* Rondani (Diptera : Chloropidae) from India. *Orient. Insects*. **11** (3): 363-368, 8 figs.
- Cherian, P.T. 1977b. Additions to *Rhodesiella* Adams (Diptera : Chloropidae) from India. *Orient. Insects*, **11** (44): 479-498, 31 figs.
- Cherian, P.T. 1977c. Descriptions of three new and records of two known species of Chloropidae (Diptera) from India. *Rec. Zool. Surv. India*, **73**: 179-187, 11 figs.
- Cherian, P.T. 1978. The genus *Platycephala* (Diptera : Chloropidae) from India. *Orient. Insects*, **12** (1): 137-141, 6 figs.
- Cherian, P.T. 1980a. Collection and preservation of mosquitoes (Diptera : Culicidae). Proc. Workshop Tech. *Parasitol. Zool. Surv. India*. pp 83-96, 12 figs.
- Cherian, P.T. 1980b. Biology and Ecology of *Oscinella fusidentata* Cherian (Diptera : Chloropidae) with notes on the external morphology of the immature stages. *Rec. Zool. Surv. India*, **76**: 221-248, 5 figs., 1 pl., 15 tables.
- Cherian, P. T. 1980c. State of Art Report : Zoology. Insecta : Diptera. Zoological Survey of India, Calcutta, 134-138.
- Cherian, P.T. 1984. The genus *Aragara* from India (Diptera : Chloropidae). *Orient. Insects*, **18**: 87-94, 15 figs.
- Cherian, P.T. 1989a. The Indian species of *Calamoncosis* (Diptera : Chloropidae). *Orient. Insects*, **23**: 209-218, 18 figs.
- Cherian, P.T. 1989b. Some new genera of Oriental Chloropidae (Diptera). *Orient. insects*, **23**: 219-229, 14 figs.

- Cherian, P.T. 1989c. The Indian species of *Tricimba* (Diptera : Chloropidae). *Orient. Insects*, **23** : 231-242, 15 figs.
- Cherian, P.T. 1989d. Genus *Pseudogaurax* Malloch (Diptera : Chloropidae) from India. *Hexapoda*, **1** : 31-36, 6 figs.
- Cherian, P.T. 1990a. The species of *Dasyopa* and *Oscinimorpha* (Diptera : Chloropidae) from the Oriental Region. *Orient. Insects*, **24** : 355-367, 22 figs.
- Cherian, P.T. 1990b. A new genus of Chloropidae (Diptera) from India. *Orient. Insects*, **24** : 369-373, 5 figs.
- Cherian, P.T. 1990c. The species of *Thaumatomyia* from India (Diptera : Chloropidae). *Orient. Insects*, **24** : 375-383, 13 figs.
- Cherian, P.T. 1990d. The species of *Javanoscinis* Andersson (Diptera : Chloropidae) from the Oriental Region. *Hexapoda*, **2** : 15-20.
- Cherian, P.T. 1991a. Studies on *Merochlorops* Howlett and *Paracamarota*, gen nov. (Diptera : Chloropidae) from India and adjacent countries. *Orient. Insects*, **25** : 53-68, 22 figs.
- Cherian, P.T. 1991b. A new genus *Parameijerella* (Diptera : Chloropidae) from the Oriental Region. *Hexapoda*, **3** (1 & 2) : 6-14, 15 figs.
- Cherian, P.T. 1991c. In animal resources of India. Protozoa to Mammalia : Diptera : Chloropidae : Edited Director Zoological Survey of India, Calcutta, pp. 415-417.
- Cherian, P.T. 1992a. Studies on *Amnonella*, gen. nov. and *Euthyridium* Frey (Diptera : Chloropidae) from the Oriental Region. *Hexapoda*, **4** (1) : 57-64, 11 figs.
- Cherian, P.T. 1992b. Studies on *Tachinoceros* de Meijere (Diptera : Chloropidae) from the Oriental Region. *Hexapoda*, **4** (2) : 187-196, 11 figs.
- Chrzanowsky, A. 1931. Pioniarka-mucha (*Oscinis frit* (L.)), jej biologja szkody zozadzane nia w rolnictwie i jej zwakzanic. *Chor. roslin*, **1** : 23-55.
- Chavala, M., J. Doskocil, J. H. Monk & V. Pokorny, 1974. The genus *Lipara* Meigen (Deptera : Chloropidae), systematics, morphology, behavior and ecology. *Tijdschr. Ent.*, **117** : 1-25, 7 pls.
- Cigankov, C.K. 1930. K. biologii Mukh Vrediteli zlevnim zlakam. *Trudi Poltavskoi C-kh. Op. Stansh. (Ent. Otd.)*, **16** : 1-53

- Coe, R. L. 1942. *Camarota curvipennis* Latereille (Chloropidae : Diptera) and its misquotation. *Proc. R. ent. Soc. London* (B) **11** : 141.
- Collin, J.E. 1918. A short summary of our knowledge of the fritfly. *Ann. appl. Biol. Cambridge*, **5** : 81-96.
- Collin, J. E. 1932. The British species of the genus *Haplegis* Loew (Chloropidae : Diptera), with descriptions of a new species. *Ent. mon. Mag. London*, **68** : 112-113.
- Collin, J. E. 1939. On various new or little-known British Diptera including several species bred from the nests of birds and mammals. *Ent. mon. Mag. London*, **75** : 134-154. 7 figs.
- Collin, J. E. 1946. The British genera and species of Oscinellinae (Chloropidae : Diptera). *Trans. R. ent. Soc. London*, **97** : 117-148, 6 figs.
- Collin, J. E. 1949. Results of the Armstrong College Expedition to Siwa Oasis (Libyan desert), 1935 under the leadership of Professor J. Omer Cooper. Diptera, Empididae, Dolichopodidae, Aschiza and Acalypterae. *Bull. Soc. Fouad les Ent. Cairo*, **33** : 175-225, 13 figs.
- Coquillett, D.W. 1898a. On the habits of Oscinidae and Agromyzidae reared at the United States Department of Agriculture. *Bull. Dept. Agri. Ent.*, **10** : 70-79.
- Coquillett, D. W. 1898b. Notes and descriptions of Oscinidae. *J. New York ent. Soc.*, **6** : 44-49.
- Coquillett, D.W. 1910. The types of the North American genera of Diptera. *Proc. U. S. Nat. Mus.*, **37** : 499-647.
- Corti, E. 1909. Contributo alla conoscenza del gruppo delle, "Crassiseta" in Italia. *Bull. Soc. Ent. Ital.*, **40** : 121-162.
- Crampton, G.C. 1941. The terminal abdominal structures of male Diptera. *Psyche*, **48** : 79-94.
- Crampton, G.C. 1942. The external morphology of the Diptera. In : Guide to the insects of Connecticut. *Bull. Connecticut State Geol. Nat. Hist Survery*, **6** (1) : 10-165.
- Crampton, G.C. 1944a. A comparative morphological study of the terminalia of the male calypterate cyclorrhaphous Diptera and their acalypterate relatives. *Bull. Brooklyn ent. Soc.*, **39** : 1-31.

- Crampton, G.C. 1944b. Suggestions for grouping the families of Acalypterate Cyclorrhaphous Diptera on the basis of the male terminalia. *Proc. ent. Soc. Washington*, **46** : 15-154.
- Crosskey. R.W. & G.B. White, 1977. The Afrotropical Region. A recommended term in Zoogeography. *J. Nat. Hist.*, **11** : 541-544.
- Cunliffe, M. 1921. Preliminary observations on the habits of *Oscinella frit* (Linn.) *Ann. appl. Biol. Cambridge*, **8** : 105-133.
- Cunliffe, M. 1924. Further observations on the prevalence and habits of *Oscinella frit* (Linn.) *Ann. appl. Biol. Cambridge*, **11** : 54-72, 3 charts.
- Curran, C.H. 1923. New Cyclorrhaphous Diptera from Canada. *Canad. Ent.*, **55** (12) : 271-279.
- Curran, C.H. 1928. Diptera of the American Museum Congo Expedition, Part II. *Bull. Amer. Mus. Nat. Hist.*, **56** : 327-399.
- Curran, C.H. 1934. The families and genera of North American Diptera. New York, 512 pp., 235 figs., 2 pls.
- Curran, C.H., C.P. Alexander, & E.T. Cresson, 1936. The Templeton Crocker Expedition to western Polynesian and Melanesian Islands, 1933, No. **30**, Diptera. *Proc. Calif. Acad. Sci.* (4) : **22** : 1-66, ii pls.
- Curtis, J. 1839. British Entomology, London, Vol. **16** : 722-769.
- Czerny, L. 1906. Zwei Palaearktische *Gaurax* Arten (Dipt.), *Wien. ent. Ztg.*, **25** : 299-301.
- Davis. C.J. 1958. *Chlorops* sp. damaging citrus. *Proc. Hawaii ent. Res.*, **16** : 339-340.
- Demming, J.C. 1979. A new species of *Dicraeus* Loew (Diptera : Chloropidae) attacking millet in West Africa, and its related species. *Bull. ent. Res.*, **69** : 541-551, 29 figs.
- Demming, J.C. 1981. A contribution to the study of afrotropical chloropine Diptera. *J. nat. Hist.*, **15** : 789-828, 102 figs.
- Dely-Draskovits, A. 1977. Neue Palaearktische Arten in der Gattung *Lasiosina* Becker, 1910 (Diptera : Chloropidae), *Acta Zool. Acad. Sci. Hung.* **23** : 267-278, 30 figs.

- Dely-Draskovits, A. 1978. Beitrage zur Kenntnis der Europäischen Arten der Gattung *Chlorops* Meigen, 1803. (Dipt. Chloropidae) *Acta Zool. Acad. Sci. Hung.* **24** : 27-99, 56 figs.
- Dely-Draskovits, A. 1979. Die *Lasiosina*-Arten der sammlung des Zoologischen Institutes in Leningrad (Diptera : Chloropidae). 1. *Acta Zool. Acad. Sci. Hung.* **25** : 221-234, 31 figs.
- Dely-Draskovits, A. 1981a. Revision der Palaearktischen Arten der Gattung *Aphanatrigonum* Duda, 1932 und *Aphanotrigonella* Nartshuk. 1964 (Diptera : Chloropidae). *Acta Zool. Acad. Sci. Hung.*, **27** : 115-138, 35 figs.
- Dely-Draskovits, A. 1981b. Neue Palaearktischen *Lasiosina*-Arten von Israel (Diptera : Chloropidae). *Acta Zool. Acad. Sci. Hung.* **27** : 265, 271, 17 figs.
- Dely-Draskovits, A. 1981c. The Chloropid (Diptera) fauna of the Hortobägy National Park. The fauna of the Horobägy National Park. *Adadëmiai Kiadó*, Budapest, pp. 229-236.
- Dely-Draskovits, A. 1982. Die *Lasiosina*-Arten Sammlung der Zoologisches Institutes in Leningrad (Diptera : Chloropidae) II. *Acta Zool. Acad. Sci. Hung.*, **28** : 23-29, 13 figs.
- Dorge, S.K., V.P. Dalaya & A.G. Pradhan, 1968. Parasites, predators and other natural enemies of sugarcane pest in Maharashtra. *J. Bombay nat. Hist. Soc.*, **65** (1) : 251-256.
- Doskocil, J. & M. Chvála, 1971. A revision of *Lipara* Meigen (Diptera : Chloropidae), including the description of a new species from Europe. *Acta ent. Bohemoslov*, **68** : 100-107, 8 figs.
- Duda, O. 1929. Die Ausbeute der dutchen Chaco expedition 1925-1926 (Diptera). vi. Sepsidae, X. Chloropidae. *Konowia* Vienna, **8** (1) : 33-50, 7 figs.
- Duda, O. 1930a. Die neotropischen Chloropiden (Dipt). *Folia Zool. Hydrobiol.* Riga, **2** (1) : 46-128.
- Duda, O. 1930b. Neue und bekannte orientalische Chloropiden (Dipt.) des Deutschen entomologischen Instituts in Berlin-Dahlem. *Stettin ent. Ztg.*, **91** : 278-304.
- Duda, O. 1931. Chloropidae, Drosophilidae. Dipterologischen Beitrag zu der von. H.J. Feuerborn, F. Ruttner und A. Thienemann im Jahre 1928 und 1929 nach java, Sumatra und Bali untergeonommenen limnologischen Forschungsreise. *Arch. f. Hydrobiol. Stuttgart Suppl.* **9** : 192-198.

- Duda, O. 1933a. Neue und bekannte Neotropischen Chloropiden des U.S. National Museums, Smithsonian Institution, *Konowia* Vienna, **12** : 192-209.
- Duda, O. 1933b. Die Neotropischen Chloropiden (Dipt.). 2. Fortssetzung. *Folia Zool. Hydrobiol. Rega*, **5** : 41-47.
- Duda, O. 1933c. Chloropidae In : *Lindner Die Fliegen der Palaearktischen Region*. 6 sect **61** : 1-248.
- Duda, O. 1934a. Weitere neue und wening bekannte Orientalische und Australische Chloropiden des Deutschen entomologischen Institut in Berlin-Dahlem. *Arb. Morph. Tax. Ent. Berlin-Dahlem, Band i. Nr. 1* : 39-60.
- Duda, O. 1934b. Fauna Sumatrensis, Bijdrage No. 74, Chloropidae (Diptera). *Tijdschr. Ent.*, **77** (1/2) : 55-161.
- Duda, O. 1934c. Neue und bekannte Neotropischen Chloropiden (Dipt.) des U.S. National Museums, Smithsonian Institution. *Konowia* Vienna, **13** : 58-69, 101-110.
- Duda, O. 1935a. Einige neue Afrikansche Akalyptrate Musciden (Dipt.) des British Museum. *Stylops* London, **4** : 25-34, 2 figs.
- Duda, O. 1935b. Entgegnung zu Sacks *Chloropisca* Loew und *Thaumatomyia* Zenker. *Ent. Rdsch.* Stuttgart, **53** : 50-52.
- Duda, O. 1935c. Weitere neue und wening bekannte exotische Akalyptraten (Dipt.) des British Museum. *Stylops* London, **4** : 238-240.
- Duda, O. 1936a. Weitere neue Afrikanische und Orientalische Akalyptrate Musciden (Dipt.) des British Museum. *Ann. Mag. nat. Hist.* London, (10) **18** : 337-351, 1 fig.
- Duda, O. 1936b. Ergebnisse einer Zoologischen sammelreise nach Brasilien, insbesondere in das Amazonasgebiet, ausgeführt von Dr. H. Zerny. xi. Teil (Chloropidae : Dipt.) *Ann. naturh. Mus. Wien*. **47** : 107-113.
- Emden, F. I. Van. 1951. The male genitalia of Diptera and their taxonomic value. In : *Ninth Internal Cong. Ent.* Amsterdam, **2** : 22-26.
- Emden, F. I. Van. 1965. The fauna of India and adjacent countries Diptera : Muscidae. *Zool. Surv. of India*, **7** (1) : 1-647.
- Enderlein, G. 1911a. Einige neue Gattungen und Arten aussereuropaischen Chloropinen. *Zool. Anz. Leipzig*, **38** : 122-126.

- Enderlein, G. 1911b. Analytische Tabelle der Gattungen der Chloropiden Subfamilie Oscinosominae. *Zool. Anz. Leipzig*, **38** : 10-13.
- Enderlein, G. 1911c. Klassifikation der Oscinosominen. *Berlin Sitz Ber. Ges. natf. Freunde*, pp. 185-244.
- Enderlein, G. 1934. Heringiinae eine neue minierende Chloropiden Unterfamillie. *Zool. Anz. Leipzig*, **105** : 191-194.
- Enderlein, G. 1936. Zweifliigler, Diptera. *Tierwelt Mitteleur. Leipzig*, **6** : 3 Teil, 2 Leif., **15** : 186-190.
- Fallén, C.F. 1810. *Specimen entomologicum*, etc. p. 19.
- Fallén, C.F. 1820. Diptera Sveciae II. Oscinides. *Lundae*, 1-12.
- Fedoseeva, L.I. 1960. The species of the genus *Meromyza* Mg. (Chloropidae : Diptera) in the environs of Moscow. (In Russian). *Ent. Oboz. Moscow*, **39** : 450-461, 12 figs.
- Fedoseeva, L.I. 1961. New Palaearctic species of the genus *Meromyza* Mg. (Chloropidae : Diptera). *Ent. Oboz. Moscow*. **40** : 704-709, 10 figs.
- Fedoseeva, L.I. 1962. Some European species of the genus *Meromyza* Mg. (Chloropidae : Diptera). *Ent. Oboz. Moscow*, **41** : 470.
- Fedoseeva, L.I. 1964. Review of the fauna of the genus *Meromyza* Mg. (Chloropidae : Diptera) in the asiatic part of the U.S.S.R. *Ent. Oboz. Moscow*, **43** (2) : 466-477.
- Fedoseeva, L.I. 1966. On the diagnostics of the larvae of grass flies of the genus *Meromyza* Mg. (Chloropidae : Diptera). *Ent. Oboz. Moscow*, **45** (1) : 197-209.
- Fedoseeva, L.I. 1967a. New species of *Meromyza* Mg. (Chloropidae : Diptera) from Transbaikalia. *Ent. Oboz. Moscow*, **46** (2) : 439-441.
- Fedoseeva, L.I. 1967b. K faune zlakovikh mukh *Meromyza* Mg. Severnoi Amerika. *Nauchnoi Dokl. Visshei. Shkoli. Biol, Naukh.*, **4** : 33-34.
- Forbes, S.A. 1884. Insects injurious to the strawberry. *Rep. Ins. Illin.*, **13** : 13-29, 8 figs.
- Frew, J.G.H. 1923. On the larval anatomy of the gout-fly of barley (*Chlorops taeniopus* Meig.) and two related Acalypterate Muscids, with notes on their winter host plants. *Proc. Zool. Soc. London*, pp. 783-821, 23 figs.

- Frew, J.G.H. 1924. On *Chloropis taeniopus* Meig. (The gout-fly of barley). *Ann. appl. Biol.* Cambridge, **11** (2) : 175-219.
- Frey, R. 1908-1909. Mitteilungen uber Finlandische Dipteren. *Acta Soc. Fauna et Fl. Fenn.* Helsingfors, **31** (9) : 1-24.
- Frey, R. 1921. Eine neue Palaearctische Chloropiden-Gattung (Schizophora : Diptera). *Notul. Ent.*, **3** : 80-81.
- Frey, R. 1923. Philippinische Diptere. 1. Fam. Chloropidae. *Notulae Ent.* Helsingfors, **3** : 71-83, 97-112.
- Frey, R. 1933. Forteckning over Finlands Chloropider bestamda av O. Duda. *Mem. Soc. Fauna et Flora Fenn.*, **9** : 128-139.
- Frey, R. 1961. Neue Orientalische Dipteren. *Notul. Ent.* Helsinki, **41** : 33-35.
- Gaidene, E.K. & E.P. Nartshuk, 1963. Biology of *Hapleginella larvifrons* Loew (Chloropidae : Diptera) inhabiting pine cones. *Ent. Oboz.* Moscow, **42** : 765.
- Gilbertson, G.I. 1925. The wheat-stem maggot. *S. Dakota Agric. Expt. Sta. Brookings Bull.*, **217** : 28, 8 figs.
- Goodliffe, F.D. 1942. Studies on insects bred from barley, wheat, maize and oats. *Bull. ent. Res.*, **32** (4) : 309-325.
- Graham-Smith, G.S. 1930. The Oscinidae (Diptera) as vectors of conjunctivitis, and the anatomy of their mouth parts. *Parasitology*, **22** : 457-467.
- Griffiths, G.C.D. 1972. The phylogenetic classification of Diptera cyclorrhapha, with special reference to the structure of the male post-abdomen. W. Junk. *Ser. Entomologica*, The Hague. **8** : 1-341, 154 figs, 2 pls.
- Hackman, W. 1964. On the reduction and loss of wings in Diptera. *Notulae Ent.* **44** (3) : 73-93.
- Hackman, W. & R. Vaisanen, 1982. Different classification systems in the Diptera. *Ann. Zool. Fennici*, **19** : 209-219.
- Hackman, W. & R. Vaisanen, 1985. The evolution and phylogenetic significance of the costal chaetotaxy in the Diptera. *Ann. Zool. Fennici*. **22** : 169-203.
- Hall, Jr. D.G. 1932. Some studies on the breeding media, development and stages of the eye gnat *Hippelates pusio* Loew (Chloropidae : Diptera). *Amer. J. Hyg.* Baltimore, **16** : 854-864, pl. i, 1 fig.

- Hall, D.G. 1937. The North and Central American spider parasites of the genus *Pseudogaurax* Malloch (Chloropidae: Diptera). *J. Washington Acad. Sci.* Menasha, **27** : 255-261. 7 figs.
- Hardy, D. E. 1952. Flies collected in bait traps. *Proc. Hawaii Ent. Soc.* **14** : 407-409.
- Hardy, D. E. & M.D. Delfinado. 1980. Diptera : Cyclorrhapha III. Univ. Press Hawaii. Honolulu. 1-451. 179 figs.
- Harrison, R.A. 1959. Acalypterate Diptera of New Zealand. *N. Z. Dept. Sci. Indust. Res. Publ.* **128** : 1-382.
- Hendel, Fr. 1910. Ueber die Nomenklatur der Acalyptraten Gattungen nach Th. Beckers Katalog der Palaearktischen Dipteren. Bd. 4. *Entomol. Ztg. Wien.* **29** : 307-313.
- Hendel, Fr. 1913. H. sauters Formosa-Ausbeute Acalypterate Musciden. 1. *Entom. Mitt.* **2** (2) : 33-43.
- Hendel, Fr. 1914. Eine neue Gattung der Oscinellinae. *Ann. his. nat. Mus. nat. Hung. Budapest.* **12** : 247-248.
- Hendel, Fr. 1916. Beitrage zur systematik der Acalyptraten Musciden (Dipt.). *Ent. Mitt.*, **5** : 294-299.
- Hendel, Fr. 1922. Die Palaearktischen Muscidae Acalyptratae Girsch-Haplostomata Fery nach ihren Familien und Gattungen. 1. Die Familien. *Konowia*, **1** : 145-160, 253-265.
- Hennig, W. 1941. Neues über parasitische Dipteren (Cecidomyiidae und Chloropidae). *Arb. Morph. taxon. Ent. Berlin Dahlem*, **8** : 196-200, 16 figs.
- Hennig, W. 1943. Die larve von *Haplegis nigratarsis* (Chloropidae: Diptera). *Arb. physiol. angew. Ent. Berlin-Dahlem.* **10** : 117-123, 11 figs.
- Hennig, W. 1952. Die Larvenformen der Dipteren Berlin, **3** : 1-628.
- Hennig, W. 1953. Zweiflügler oder Diptera in P. Soraueer. *Handbuch der pflanzenkrankheiten*, **5** : 111-121.
- Hennig, W. 1956. Die Acalyptratae des Battischen Bernsteins. *Stutt. Beitr. Naturkunde*, **145** : 1-215.
- Hennig, W. 1971. Neue Untersuchungen über die Familien der Diptera Schizophor (Diptera : Cyclorrhapha). *Stutt. Beitr. Naturkunde*, **226** : 1-76.

- Hirao, J. 1959. Studies on the local variation in the bionomics of the rice stem maggot *Chlorops oryzae* Matsumura. 1. Differences in some biological habits shown by two regional stocks of the rice stem maggot reared under the same natural conditions. *J. appl. Entomol. Zool. Japan*, **3**(2) : 107-114.
- Hirao, J. 1970. Comparative studies on the development of geographical populations from the 2-and 3-generation areas in the rice stem maggot *Chlorops oryzae* Matsumura. *Bull. Tohoku Nat. Agric. Exp. Stn.* **39** : 137-170 (in Japanese with English Summary).
- Hirao, J. 1972. Studies on the bionomics of wheat yellow fly, *Chlorops* sp. (Diptera : Chloropidae) a new pest of upland cereals. *Bull. Tohoku Nat. Agric. Exp. Stn.*, **43** : 59-112, 3 pls. (In Japanese with English Summary).
- Hirao, J. & T. Hasegawa, 1959. Studies on the wheat stem fly *Chlorops* sp. (Chloropidae : Diptera) (Preliminary report). *J. appl. Entomol. Zool. Japan*, **2** (3) : 215-222.
- Hirata, M. 1951. On the new injurious insect of wheat in Honshu (In Japanese). *Plant. Prot.*, **5** (10) : 385-389.
- Hodson, W.E.H. 1926. On the occurrence of *Centor myopinus* Meig. as a pest on Oats. *Ann. appl. Biol.* **13** : 226-230.
- Horber, E. 1950. Untersuchungen uber die galbe Getreidehalmfliege. *Chlorops pumilionis* (Bjerkander) 1778 and ihr Auftreten in verschiedenen Hohenlagen der Schweiz. *Landw. jrb. Schweiz*, **64** (9) : 887-1000.
- Horber, E. 1955. Oviposition preference of *Meromyza americana* Fitch for different small grain varieties under green house conditions. *Jour. Econ. Ent.* **48** (4) : 426-430.
- Howe, R.W. 1953. The rapid determination of the intrinsic rate of increase of an insect population. *Ann. appl. Biol.* **40** (1) : 134-151.
- Hutchinson, E.E. 1965. The ecological theatre and the evolutionary play. New Haven, London, 139 pp.
- Huxley, J.S. 1958. Evolutionary processes and taxonomy with special reference to grades. *Uppsala Univ. Arsskr.*, 21-39.
- Imms, A.D. 1930. Observations on some parasites of *Oscinella frit* (Linn.) Part I, *Parasitology*, **22** : 11-36.
- Ismay, J.W. 1975. Femoral combs-a secondary sexual character in British Oscinellinae (Diptera : Chloropidae). *Jour. Ent.*, **44** : 21-25.

- Ismay, J.W. 1976. The status and microhabitat of *Elachiptera uniseta* Collin (Diptera : Chloropidae). *Ent. monthly Mag.*, **111** (1331-1333) : 101-103.
- Ismay, J.W. 1986. New *Psilacrum* from the Old World (Diptera : Chloropidae). *Esakia*, **24** : 19-35.
- Iwata, T. 1959. Ecology of the larval growth of summer generations of the rice stem maggot *Chlorops oryzae* Matsumura in Takada Province. ii. On the growth of second generation larvae on various stages of host plants and difference of larval growth in the first and second generation. *J. appl. Entomol. Zool. Japan*, **3**(1) : 1-6.
- Jacob, K. 1949. Land connections between Ceylon and Peninsular India. *Proc. nat. Inst.Sci. India*, **15** (8) : 341-343.
- Jepson, W. F. & I.W.B. Nye, 1957. *Oscinella frit* L., and closely allied species in England and Germany. *Ztschr. Pflanzkrankh.*, **64** : (7-10) : 541-547.
- Jepson, W.F & A.J. Heard, 1959. The frit fly and allied stem-boring Diptera in winter wheat and host grasses. *Ann. appl. Biol.*, **47** (1) : 114-130.
- Jepson, W.F. & T.R.E. Southwood, 1960. The recognition of the immature stages of *Elachiptera cornuta* Fallen (Chloropidae : Diptera), with notes on its association with *Oscinella frit* (L.) in Oat fields. *Proc. R. ent. Soc., London* (A) **35** : 24-29, 3 figs.
- Kanmiya, K. 1971. Study on the genus *Dicraeus* Loew from Japan and Formosa. (Diptera, Chloropidae). *Mushi*, **45** : 157-180, 11 figs.
- Kanmiya, K. 1972. New record of a spider predator of the genus *Pseudogaurax* Malloch, 1915, from Japan, with a note on a European Species *Gaurax venustus* Czerny (Diptera, Chloropidae) *Mushi*, **46** : 39-43, 6 figs.
- Kanmiya, K. 1977. Notes on the genus *Mepachymerus* Speiser from Japan and Formosa, with descriptions of four new species (Diptera, Chloropidae). *Kurume Univ. J.* **26** : 47-65, 19 figs.
- Kanmyia, K. 1978a. Notes on the genus *Chlorops* Meigen (Diptera, Chloropidae) from Japan and Formosa. *Kontyu*, **46** : 52-76. 35 figs.
- Kanmiya, K. 1978b. New records of the Oriental genera of Chloropinae (Diptera, Chloropidae) from Japan and Taiwan with descriptions of two new species. *Kontyu*, **46** : 192-206, 19 figs.
- Kanmiya, K. 1978c. Revision of the genus *Meromyza* Mg. (Diptera, Chloropidae) in Japan with three newly recorded species. *Appl. Ent. Zool*, **13** : 231-242, 2 tables, 24 figs.

- Kanmiya, K. 1981a. Life of *Lipara* species. *Insectarium*, **18** : 140-148, 8 figs. (in Japanese).
- Kanmiya, K. 1981b. Mating behaviour in the genus *Lipara* Meigen (I). *Insectarium*, **18** : 224-229, 5 figs. (In Japanese).
- Kanmiya, K. 1981c. Mating behaviour in the genus *Lipara* Meigen (II). *Insectarium*, **18** : 260-267, 8 figs. (In Japanese).
- Kanmiya, K. 1981d. Records of two *Calamoncosis* species new to Japan (Diptera : Chloropidae). *Akitu* (n.s.) **42** : 1-8, 10 figs.
- Kanmiya, K. 1982a. Two new species and three new records of the genus *Siphunculina* Rondani from Japan (Diptera : Chloropidae). *Jap. J. Sanit. Zool.*, **33** : 111-121, 22 figs.
- Kanmiya, K. 1982b. The Japanese species of the genus *Lipara* Meigen (Diptera, Chloropidae), with descriptions of three new species and a new record. *Kurume Univ. J.*, **31** : 37-55, 52 figs.
- Kanmiya, K. 1983. A systematic study of the Japanese Chloropidae (Diptera). *Mem. ent. Soc. Washington*, **11** : 1-370.
- Kanmiya, K. 1985. Chloropidae (Diptera) of Panaitan and Krakatau Islands, Indonesia. *Kontyu Tokyo*, **153** (3) : 461-474.
- Kanmiya, K. 1987a. Records of Three Chloropid Genera New to Japan with Descriptions of Two New Species (Diptera). *Kontyu, Tokyo*. **5** (1) : 80-89.
- Kanmiya, K. 1987b. A study on the genus *Rhodesiella* Adams from Taiwan (Diptera : Chloropidae) *Sieboldia Suppl.*, pp. 11-30.
- Kapur, A.P. 1957. First record of *Oscinella frit* (L.) (Chloropidae : Diptera) from India. *Rec. Indian Mus.*, **55** : 1-4.
- Karsch, F. 1887. *Chlorops glabra* Meig., notes on habits. *Berliner ent. Zeits.*, **31** : 11.
- Keilin, D. 1915. Recherched sur les larves de Dipteres cyclorrhaphes. *Bull. Sci. France Belquique*, **49** : 1-16.
- Kertezs, K. 1914. *Myrmecosepsis*, a new genus of Diptera with very reduced wings. *Ann. his. nat. Mus. nat. Hung.*, **12** : 244-246.
- Khajuria, N. 1924. Mammalian fauna of the semi arid tracts of Deccan and its bearing on the appearance of aridity in the region. *Sci. Cult.*, **21** : 293-295.

- Kopp, A. 1926. Das loben der Weizenhalmfliege, *Chlorops taeniopus* Meig. *Fortschritte Landw. Vienna*, **1** : 337-339, 3 figs.
- Krasucki, A. 1933. Studja nad niezmiarka *Chlorops pumilionis* (Bjerk.) (with German summary). *Mem. Inst. Polon. Econ. rur. Pulaway*, **14** : 1-86, pls. iv.
- Kreiter, E.A. 1929. Dipterous larvae occurring on Graminous plants in the Leningrad Government. (In Russian). *Izv. Otd. Prikl. Ent.*, **111** (2) : 251-264.
- Krishnan, M.S. 1974. Geology In : Ecology and biogeography of India. Ed. M.S. Mani, Dr. W. Junk Publishers, Hague pp. 60-98.
- Kumm, H.W. 1935. The natural infection of *Hippelates pallipes* Loew with the Spirochaetes of yaws. *Trans. Rosyp. Soc. trop. Med. Hygiene*, **29** : 265-272.
- Kumm, H.W. 1936. The Jamaican Species of *Hippelates* and *Oscinella* (Chloropidae : Diptera). *Bull. ent. Res. London*, **27** : 307-329, pl. i, 6 figs.
- Lamb, C.G. 1917. Notes on exotic Chloropidae. *Ann. Mag. nat. Hist. London* (8) **19** : 33-58.
- Lamb, C.G. 1918. Notes on exotic Chloropidae. *Ann. Mag. nat. Hist. London* (9) **1** : 329-348, 385-399.
- Lamb, C.G. 1937. New species of Chloropidae. *Ann. Mag. nat. Hist. London* (10) **20** : 421-432, pl. i, 4 figs.
- Latreille, P.A. 1804. Tableau méthodique des Insectes,. In : *Nouveae Dictionnaire d'Hist. Nat.*, **24** : 149-200.
- Lattin, G. De. 1966. Grundrisse der Zoogeographie. Jena : Gustav Fisher, pp. 460, 170 figs.
- Legner, E.F. & E.C. Bay, 1965. Culture of *Hippelates pusio* Loew (Chloropidae : Diptera) in the West Indies for natural enemy exploration and some notes on behaviour and distribution. *Ann. ent. Soc. Amer.*, **58** (4) : 436.
- Lepson, W.F. & I.W.B. Nye, 1959. Die diagnostisch brauchbaren Körpermerkmale der larven von *Oscinella frit* (L.) und den ihr nahestehenden englischen und deutschen Arten. *Arten Verh. iv. int. Pflanzschutzhkongr Hamburg*, **1** : 695-700, 6 figs.
- Leuckart, R. 1863. Die Larvenzustände der. Musciden. *Arch. Naturgesch.*, **27** : 60-62.
- Lindner, E. 1958. *Batrachomyia mertensi* ein neuer Australischer Froschparasit (Chloropidae : Diptera). *Senckenbergiana Biol. Frankfurt a. M.* **39** : 191-196, 4 figs.

- Linnaeus, C. 1758. *Systema naturae per regna tria nature*. Holmiac, **1** : 1-824.
- Lioy, p. 1864. I ditteri distribuiti secondo no nuovo metodo di classificazione naturale. *Atti. Inst. Ist Veneto* (3) **9** : 1121-1126.
- Loew, H. 1845. *Dipterologische Beiträge* (1). *Posen*, 50+2 pp.
- Loew, H. 1850. Ueber der Bernstein und Bernsteinfauna.. Programm Realschule Meseritz. *Posen*, 44 pp.
- Loew, H. 1858a. Zwanzig neue Dipteren. *Wien ent. Monatschr*, **2** : 57-62, 65-79.
- Loew, H. 1858b. *Siphilus* and *Pachylophus*, zwei neue Gattungen der Osciniden. *Ber. ent. Ztschr*, **2** : 119-122, pl. 1, figs. 19-25.
- Loew, H. 1860. Bidrag till kannedomen om Afrikas Diptera (part). *Öfvers K. Vet. Akad. Forh.* **17** : 81-97.
- Loew, H. 1863. *Diptera Americae Septentrionalis indigena. Centuria tertia*. *Ber. ent. Ztschr*, **7** : 1-55.
- Mc Alpine, D.K. 1958. Key to the Australian families of Acalypterate Diptera (Insecta). *Rec. Austral. Mus.* **24** : 183-189.
- Mc Alpine, J.F. 1981. Morphology and terminology of adults. In : *Manual of Nearctic Diptera. Res. Branch. Agri. Monograph. Canada* **1** (27) : 9-64.
- Macquart, M. 1835. Suite a Buffon Dipteres ii. *Hist. nat. des Insectes Dipteres*, **2** : 1-103.
- Malloch, J.R. 1913a. The genera of flies in the subfamily Botanobiinae with hind tibial spur. Washington Smithsonian Institution. *Proc. U.S. Nation. Mus.* **46** : 239-266, pls. xxiii-xxiv.
- Malloch, J.R. 1913b. Notes on the synonymy of some genera and species in the Chloropidae (Diptera). *Canad. Ent*, **45** : 175-178.
- Malloch, J.R. 1913c. A new genus and two new species of Chloropidae. *Ins. Insc. Menstr. Washington*. **I** : 46-48.
- Malloch, J.R. 1913d. Four new species of North American Chloropidae. *Ins. Insc. Menstr. Washington*, **I** : 60-64.
- Malloch, J.R. 1914a. Four new North American Chloropidae. *Psyche*, Boston, **21** : 24-26.
- Malloch, J.R. 1914b. A synopsis of the genera in Chloropidae from North America. *Canad. Ent.* , **46** : 113-120.

- Malloch, J.R. 1915. Notes on North American Chloropidae. *Proc. ent.Soc. Washington*. **17** : 158-162.
- Malloch, J.R. 1916. A new genus and species of North American Chloropidae, *Bull. Brooklyn ent. Soc. New york*, **11** : 86-87.
- Malloch, J.R. 1918a. Notes on Chloropidae with descriptions. *Bull. Brooklyn ent. Soc. New York*, **13** : 19-21.
- Malloch, J.R. 1918b. Three new north American Chloropidae. *Bull. Brooklyn ent. Soc. New York*, **13** : 108-111.
- Malloch, J.R. 1923. Notes on Australian Diptera with descriptions. *Proc. Linn. Soc. N.S. W. Sydney*, **48** : 618-622.
- Malloch, J.R. 1924. Notes on Australian Diptera. Nos. ii-iv. *Proc. Linn. Soc. N.S.W. Sydney*. **49** : 329-338, 348-259, 9 figs.
- Maloch, J.R. 1925. Notes on Australian Diptera. v-vii. *Proc. Linn. Soc. N.S.W. Sydney*, **50** (2) : 94-97, **50** (4) : 335-340.
- Malloch, J.R. 1926a. Notes on Australian Diptera. x. *Proc. Linn. Soc. N. S.W. Sydney*, **51** (4) : 545-554.
- Malloch, J.R. 1926b. Notes on Oriental Diptera with descriptions of new species. *The Philipp. J. Sci.*, **31** (4) : 491-512.
- Malloch, J.R. 1927. Some Indian Chloropidae of economic importance. *Ann. Mag. nat. Hist. London* (9) **19** : 577-581
- Malloch, J.R. 1927b. Notes on Australian Diptera, xiii. *Proc. Linn. Soc. N.S.W. Sydney*. **52** : 428-446.
- Malloch, J.R. 1928a. Notes on Australian Diptera, xiv *Proc. Linn. Soc. N.S. W. Sydney*. **53** : 303.
- Malloch, J.R. 1928b. The Chloropid genus *Epimadiza* Becker *Ann. Mag.. nat. Hist. London* **1** (2) : 292-293.
- Malloch, J.R. 1929. Exotic Muscaridae (Diptera) xxiv-xxviii. *Ann. Mag. nat. Hist. London*. **10** (3) : 546. **10** (4) : 249-250.
- Malloch, J.R. 1931a. Exotic Muscaridae (Diptera). xxxi-xxxv. *Ann. Mag. nat. Hist. London*, (10) **7** : 473-492, **8** : 49-70.

- Malloch, J.R. 1931b. An African Chloropid predacious upon spiders eggs. *Ann. Mag. nat. Hist. London*. **8** : 422-424, 1 fig.
- Malloch, J.R. 1931c. New Zealand Muscidae Acalyptrate, part 9. Chloropidae. *Rec. Cant. Mus.* **3** : 405-422.
- Malloch, J.R. 1931d. Notes on Australian Diptera. xxvii-xxix. *Proc. Linn. Soc. N.S.W.* Sydney, **56** : 60-78.
- Malloch, J.R. 1935. Some Acalyptrate Diptera from Marquesas Islands. *Bull. Bishop Mus. Honolulu*, **114** : 27-31.
- Malloch, J.R. 1938. Notes on Australian Diptera. xxxvii. *Proc. Linn. Soc. N.S.W. Sydney* **63** : 334-356. 16 figs.
- Malloch, J.R. 1940. Notes on Australian Diptera. xxxviii. Family Chloropidae. I. *Linn. Soc. N.S.W. Sydney*. **65** : 261-288, 26 figs.
- Malloch, J.R. 1941. Notes on Australian Diptera. xxxix. *Proc. Linn. Soc. N.S.W. Sydney*. **66** : 41-64.
- Mani, M.S. 1974. Biogeographical evolution in India. In : Ecology and biogeography of India. Ed. M.S. Mani. Dr W. Junk publishers, Hague pp. 698-707.
- Matsuda, R. 1960. Morphology of the pleurosternal region of the pterothorax in insects. *Ann. ent. Soc. Amer.*, **53** (6) : 712-731.
- Matsuda, R. 1970. Morphology and evolution of insect thorax. *Mem. ent. soc. Canada*. **76** : 1-431.
- Mayr, E. 1965. Numerical phenetics and taxonomic theory. *Syst. Zool.*, **14** (2) : 73-97.
- Mayr, E., E.G. Linsley & R.S. Usinger, 1953. Methods and Principles of Systematic Zoology, New york, 328 pp.
- Meigen, J.W. 1803. Versuch einer neuer Gattungseintheilung der europäischen Zweiflügeligen insekten. *Mag. Insektenkunde*, Braunschweig. **2** : 259-281.
- Meigen, J.W. 1826. *Systematische Beschreibung der bekannten europaischen Zweiflügeligen Insekten*, **5** : 399.
- Meigen, J.W. 1830. *Systematische Beschreibung der bekannten europaischen Zweiflügeligen Insekten*, **6** : 138-166.
- Meigen, J.W. 1838. *Systematische Beschreibung der bekannten europaischen Zweiflügeligen Insekten*, **7** : 138-166.

- Meijere, J.C.H. de 1904. Neue and bekannte sudostasiatische Dipteren *Bijdr. tot de Dierkunde*, **17** : 85-115.
- Meijere, J.C.H. de 1905. Note xi. *Siphonella funicola* n. sp., eine Javanische Dipteren Art. *Notes from the Leyden Museum*, **25** : 160-162.
- Meijere, J.C. H. de 1906. Über enige indo-australische Dipteren des Ung. Nat. Museums bez. Naturhist. Museum zu Genua. *Ann. Mus. nat. Hung.* **4** : 165-196.
- Meijere, J.C.H. de 1908. Stüdien über südostasiatische Dipteran ii. *Tijdschr. Ent.* **51** : 105-180.
- Meijere, J.C.H. de 1910. Stüdien über südostasiatische Dipteran. iv. Die neue Dipteran fauna von krakatau. *Tijdschr. Ent.*, **53** : 147-159.
- Meijere, J.C.H. de 1914. Stüdien über südostasiatische Dipteran ix. *Tijdschr. Ent.*, **57** : 137-275.
- Meijere, J.C.H. de 1915. Stüdien über südostasiatische Dipteran. x. *Tijdschr. Ent.*, **58** : 64-97.
- Meijere, J.C.H de 1915. Fauna Simaluresis, Diptera. *Tijdschr. Ent.*, **58** : 1-63.
- Meijere, J.C.H. de 1915. Diptera aus Nord Neu-Guinea. *Tijdschr. Ent.*, **58** : 98-139.
- Meijere, J.C.H. de 1916. Studien über südostasiatische Dipteran. xi. *Tijdschr. Ent.*, **59** : 184-213.
- Meijere, J.C.H. de 1917. Studien über sudostasiatsche Dipteran. xiv. *Tijdschr. Ent.*, **60** : 336-341.
- Meijere, J.C.H. de 1924. Studien über südostasiatische Dipteran. xvi. Dritter Beitrag zur kanntnis der Sumatranischen Dipteran. *Tijdschr. Ent.*, **67** : 197-224.
- Miles, H.W. 1921. Observations on the insects of grasses and their relation to cultivated crops. *Ann. appl. Biol.*, **8** (3/4) : 170-181.
- Moissev, A.E. 1950. Novie vrediteli semya Zhitnyaka Mukhi roda *Dicraeus* Loew (Chloropidae : Diptera). *Ent. Oboz.* Moscow, **31** (1/2) : 77-79.
- Mulla, M.S. 1962. Mass rearing of three species of *Hippelates* eye gnats (Chloropidae : Diptera). *Ann. ent. Soc. Amer.*, **55** : 253.
- Mulla, M.S. 1964. Seasonal population trends of *Hippelates* eye gnats (Chloropidae : Diptera). *Ann. ent. Soc. Amer.*, **57** : 12.

- Nartshuk, E.P. 1956a. *Oscinella* Arten (Chloropidae : Diptera) des Europäischen Teils der UdssR und ihre Nahrpflanzen (In Russian, with German key). *Ent. Oboz.* Moscow, **35** : 856-882, 30 figs.
- Nartshuk, E.P. 1956b. Methods of distinguishing the larvae and puparia of *Oscinella frit* (L.) and *Oscinella pusilla* Meig. (Chloropidae : Diptera) (In Russian, with English summary). *Zool. Zhurn.* Moscow, **35** : 868-873, 9 figs.
- Narthhuk, E.P. 1958. Two new Palaearctic species of Chloropidae (Diptera) (In Russian). *Trudy Zool. Inst.* Leningrad, **24** : 99-102, 4 figs.
- Nartshuk, E.P. 1959. Novie rod i vid Chloropidae is Palaearktiki. *Ent. Oboz.* Moscow, **38** (2) : 472-474.
- Nartshuk, E.P. 1960. K biologii mukh Semeedov roda *Dicraeus* Loew (Chloropidae : Diptera). *Ent. Oboz.* Moscow, **39** (3) : 585-593.
- Nartshuk, E.P. 1962a. On the fauna and ecology of Chloropidae (Diptera) of the Leningrad region (In Russian). *Trudy Zool. Inst.*, Leningrad, **31** : 250-275, 29 figs.
- Nartshuk, E.P. 1962b. A review of the Palaearctic species of the genus *Calamoncosis* End. (Chloropidae : Diptera) (In Russian). *Ent. Oboz.* Moscow, **41** (2) : 457-469, 38 figs.
- Nartshuk, E.P. 1962c. Chloropidae of Yunnan and Kwandun provinces, China, Results of the Chinese-Soviet Zoological- Botanical expeditions to South-Western China (In Russian). *Ent. Oboz.*, Moscow, **41** (3) : 672-684, 10 figs.
- Nartshuk, E.P. 1963a. A report on Chloropidae (Diptera) from Kanchatka. *Trudy Kanchtkoi Komplexkoi Exped. Pub. Akad. Sci. USSR. Sibir. Odt.*, pp. 106-112.
- Nartshuk, E.P. 1963b. New Palaearctic genera and species of Chloropidae (Diptera). *Ent. Oboz.* Moscow, **42** : 669-677.
- Nartshuk, E.P. 1964a. Novie rod i novie Ziakovikh Mukh (Chloropidae : Diptera) iz Kazakstana. *Trudy Zool. Inst.* Leningrad, **34** : 302-324.
- Nartshuk, E.P. 1964b. Taxonomic status of the genus *Anatricus* Lw. (Chloropidae : Diptera) *Zool. Zhurn.* Moscow, **43** : 872.
- Nartshuk, E.P. 1965a. Chloropidae (Diptera) from Siberia and the Soviet Far-East. i. New genus and species *Gallomyia miscanthi*, gen. et. sp. n. *Ent. Oboz.* Moscow, **44** (1) : 199-202.

- Nartshuk, E.P. 1965b. Zlakoziya Mukh (Chloropidae : Diptera) Sibiri i Dalnavo Vo stoka iii Vidi roda *Centorisoma* Becker. *Ent Oboz.* Moscow, **44** (4) : 934-945.
- Nartshuk, E.P. 1966. A new genus and new species of Chloropidae (Diptera) from Middle Asia. *Trudy Zool. Inst. Leningrad* **37** : 258-271.
- Nartshuk, E.P. 1967. Chloropid flies of the genus *Dicraeus* Loew (Chloropidae : Diptera). *Ent. Oboz.* Moscow, **46** (2) : 415-438.
- Nartshuk, E.P. 1968a. Two new species of Chloropidae (Diptera) from Mongolia. *Ent. Oboz.* Moscow, **47** (4) : 937-941.
- Nartshuk, E.P. 1968b. The characteristics of the complex of grass flies (Chloropidae ; Diptera) causing harm to farming (In Russian). *Zool. J.*, **47**(9) : 1343-1352.
- Nartshuk, E.P. 1983. A system of the Superfamily Chloropidea (Diptera : Cyclorrhapha). *Ent. Oboz.* Moscow, **62** (3) : 638-648.
- Nartshuk, E.P. 1987. Zlakovie Mukhi (Diptera : Chloropidae) Ik Systema, Evolusia i Suvazi s rastennymi, *Trud. Zool. Inst. Acad. Nauk USSR*, **136** : 1-280.
- Nishijima, Y. 1954. Descriptions of a new genus and a new species of Chloropidae from Japan. *Insecta Matsum.* Sapporo, **18** : 84-86, 1 fig.
- Nishijima, Y. 1955. Notes on Chloropidae of Japan, with descriptions of a new species (Diptera). *Insecta Matsum.* Sapporo, **19** : 1-2, 51-53.
- Nishijima, Y. 1956a. On two species of the genus *Gampsocera* Schiner from Japan (Chloropidae : Diptera). *Insecta Matsum.* Sapporo, **20** : 50-53, 2 figs.
- Nishijima, Y. 1956b. Notes on Chloropidae of Japan with special reference to the species of the genus *Elachiptera* Macquart (Chloropidae : Diptera). *Insecta Matsum.* Sapporo, **20** (1-2) : 39-44, 4 figs.
- Nishijima, Y. 1960. Studies on the barley stem maggot *Meromyza saltatrix* Linn., with special reference to the ecological aspects. *J. Fac. Agric. Hokkaido. Univ.*, **51** : 381-448.
- Nishijima, Y. 1965. Injurious Chloropids of Graminous plants in Japan. *Plant Protect.*, **18** : 165-168.
- Nye, I.W.B. 1958. The external morphology of some Dipterous larvae living in the Graminae of Britain. *Trans. R. ent. Soc. London*, **110** : 411-487.
- Nye, I.W.B. 1959. The distribution of shoot-fly larvae (Acalypterae : Diptera) within the pasture grasses and cereals in England. *Bull. ent. Res.*, **50** (1) : 53-62.

- Ouellett, J. 1934. Descriptions d'un nouveau Dipterii du gene *Chloropisca* Loew. *Nat. Canad. Quebec*, **61** : 320-323.
- Paramonov, S.J. 1961. Notes on Australian Diptera, xxxi-xxxvi. *Ann. Mag. nat. Hist. London* (13), **4** : 97-111, pls. v-vi.
- Parker, J.R. 1918. The life history and habits of *Chloropisca glabra* Meig., a predaceous Oscinid. *J. econ. Ent. Concord*, **11** : 368-380.
- Peterbridge, F.R. 1917. Fritfly (*Oscinis frit* L.) attacking winter wheat. *Ann. appl. Biol.*, **4** : 1-3.
- Peterfi, F. 1961. Neue *Meromyza* -Arten in der Fauna der Rumanischen Volksrepublik (Hungarian summary). *Folia Ent. Hung.* Budapest, **14** : 163-174, pls. ii.
- Redlinger, L. & H.E. Jacques, 1945. A list of the Chloropidae (Diptera) known to occur in Iowa. *Proc. Iowa Acad. Sci. Des Moines*, **51** : 427-472, 1 fig.
- Reuter, E. 1902. *Meromyza cerealium*, sp. n. ein neuer Getreide Schädiger. *Medd. Soc. Faun. Fenn.*, **28** : 84-91.
- Richards, O.W. 1955. Species of *Alombus* Becker (Chloropidae : Diptera) from the Belgian Congo and adjacent regions. *Rev. Zool. Bot. afr. Russels*, **52** : 36-47, 10 figs.
- Riggert, E. 1935. Zur Kenntnis der Lebensgewohnheiten von *Oscinella frit* (L.) und ihrer Jugendstadien. *Arb. Physiol. angew. Ent. Berlin*, **2** : 101-130, 145-156, 8 figs.
- Rockwood, L.F., S.K. Zimmermann & T.R. Chamberlin, 1947. The wheat stem maggots of the genus *Meromyza* Meigen in the Pacific North-West. *U.S.A. Dept. Agri. Techn. Bull.*, **928** : 1-18.
- Rondani, C. 1856. *Diptera Italicae Prodrum*, **1** : 125-128.
- Rostrup, S. 1905. Fritfluen (*Oscinis frit* L.) (its course of life and its harmfulness in relation to agriculture in Denmark) (Danish). *Aarhus Meddelelser Vedrorende Insektangrab paa Markafgroden Jylland*, **1** : 75-83.
- Rosypal, J. 1930. Ein Beitrag zu der Vergesellschaftung und Ueberwinterungsmöglichkeit der Imagines bei den Chloropidaeen (Chloropidae : Diptera). *Z. Wiss. Insekt Biol. Berlin*, **25** : 1-13, 3 figs.
- Sabrosky, C.W. 1935a. The Chloropidae of Kansas (Diptera). *Trans. Amer. ent. Soc. Philadelphia*, **61** : 207-268.
- Sabrosky, C.W. 1935b. The vittate species of the genus *Madiza* (Chloropidae : Diptera). *J. Kansas ent. Soc. Mepherson*, **8** : 105, 116, pl. i.

- Sabrosky, C.W. 1935c. Notes on the taxonomic status of some species of the genus *Chlorops* Meigen (Chloropidae : Diptera). *Ent. News* Philad., **46** : 77-84.
- Sabrosky, C.W. 1936a Some synonymy in the Chloropid genera *Hippelates* and *Diplotoxa* (Diptera). *Ent. News*. Philad., **47** : 245-248.
- Sabrosky, C.W. 1936b. A review of the Nearctic species of *Chloropisca* (Chloropidae : Diptera). *Canad. Ent. Orillia*, **68** : 170-177.
- Sabrosky, C.W. 1936c. A synopsis of the Nearctic species of *Oscinella* and *Madiza* based on a study of the types (Chloropidae : Diptera). *Ann. ent. Soc. Amer.*, **29** : 707-728.
- Sabrosky, C.W. 1938. Taxonomic notes on the Dipterous family Chloropidae. *I.J.N. York ent. Soc.*, **46** : 417-434, 4 figs.
- Sabrosky, C.W. 1940a. Twelve new North American species of *Oscinella* (Chloropidae : Diptera). *Canad. Ent. Guelph*, **72** : 214-230, pls. ii.
- Sabrosky, C.W. 1940b. Chloropide (Diptera) of the Oriental Region : Notes and synonymy. *Ann. Mag. nat. Hist. London*, (11) **6** : 418-427.
- Sabrosky, C.W. 1941a. The genus *Ectecephala* in North America (Chloropidae : Diptera). *Proc. ent. Soc. Washington*, **43** : 75-80.
- Sabrosky, C.W. 1941b. An annotated list of genotypes of the Chloropidae of the world (Diptera). *Ann. ent. Soc. Amer.*, **34** : 735-765.
- Sabrosky, C.W. 1943. A revised synopsis of Nearctic *Thaumatomyia* (*Chloropisca*) (Chloropidae : Diptera). *Canad. Ent. Guelph*, **75** : 109-117.
- Sabrosky, C.W. 1945. Three new African Chloropidae, with a discussion of the status of *Pseudogaurax* (Diptera). *Proc. Zool. Soc. London*, **114** : 456-461, 3 figs.
- Sabrosky, C.W. 1946a. A new African species of *Pseudogaurax* (Chloropidae : Diptera). *Proc. Zool. Soc. London*, **116** : 47-48, 2 figs.
- Sabrosky, C.W. 1946b. A new species of *Rhodesiella* from Guam. (Chloropidae : Diptera). *Pan. Pacif. Ent. San Francisco*, **22** : 133-134.
- Sabrosky, C.W. 1946 (1947). A revision of the African genus *Epimadiza* Becker (Chloropidae : Diptera). *Ann. Mag. nat. Hist. London* (11), **13** : 821-851, 18 figs.
- Sabrosky, C.W. 1947. *Rhodesiella* Adams, a genus new to the western Hemisphere (Chloropidae : Diptera). *Ent. News Lancaster pa.* **58** : 174-177.

- Sabrosky, C.W. 1948. A synopsis of the Nearctic species of *Elachiptera* and related genera (Chloropidae : Diptera). *J. Washington Acad. Sci. Menasha*, **38** : 365-382, 4 figs.
- Sabrosky, C.W. 1949a. A new species of *Pseudogaurax* from Brazil (Chloropidae : Diptera). *Rev. brasil. Biol.* Rio de Janeiro, **9** : 33-34.
- Sabrosky, C.W. 1949b. On the distribution and correct name of *Oscinis pallipes*, the swarming gnat of Sudan. *Bull. ent. Res.* London, **40** : 61-62.
- Sabrosky, C.W. 1950a. A new species of *Eribolus* from California (Chloropidae : Diptera). *Pan Pacif. Ent.* San Francisco, **26** : 91-92.
- Sabrosky, C.W. 1950b. A synopsis of the Chloropid genera *Chaetochlorops* and *Eugaurax* (Diptera). *J. Washington Acad. Sci.*, **40** : 184-188.
- Sabrosky, C.W. 1950c. A new species of *Pseudogaurax* from Florida (Chloropidae : Diptera). *Bull. Brooklyn ent. Soc. Lancaster pa.*, **45** : 33-34.
- Sabrosky, C. W. 1951a. Chloropidae. Ruwenzori Expedition 1934-1935. *Brit. Mus. nat. Hist.* London, **2** (10) : 711-828, 21 figs.
- Sabrosky, C. W. 1951b. A revision of the Nearctic species of the genus *Gaurax* (Chloropidae : Diptera). *Amer. Midl. Nat.* Notre-Dame, **45** : 407-431, 8 figs.
- Sabrosky, C. W. 1951c. A review of the Nearctic species of *Lasiopleura* (Chloropidae : Diptera). *Canad. Ent.* Ottawa, **83** : 336-343, 4 figs.
- Sabrosky, C.W. 1951d. Transfer of the genus *Otitidae* to Chloropidae (Diptera). *Proc. ent. Soc. Washington*, **53** : 49.
- Sabrosky, C.W. 1951e. Nomenclature of the eye-gnats (*Hippelates* spp.) *Amer. J trop. Med.* Baltimore, **31** : 257-258.
- Sabrosky, C.W. 1952. Chloropidae (Diptera) from the island of Sumba. *Verh. naturf. Ges. Basel*, **63** : 215-217.
- Sabrosky, C.W. 1954a. Notes and descriptions of Australian Chloropidae (Diptera). *Proc. Linn. Soc. N.S.W.* Sydney, **79** : 182-192, 5 figs.
- Sabrosky, C.W. 1954b. Some East African species of the families Acroceridae, Asteiidae and Chloropidae. *Bull. Brooklyn ent. Soc Lancaster Pa.*, **48** : 36-46.
- Sabrosky, C.W. 1955a. Los insectos de las islas Juan Fernandez 19. Chloropidae (Diptera). *Rev. Chil. Ent.* Santiago, **4** : 45-49.

- Sabrosky, C.W. 1955b. Contributions á l'étude de la fauna entomologique du Ruanda Urundi (Mission P. Basilewsky 1953) xxxv. Diptera, Chloropidae. *Ann. Mus Congobelge Tervuren (Sér 8) Sci. Zool.*, **36** : 308-316.
- Sabrosky, C.W. 1956. Lectotypes of African Chloropidae (Diptera) described by C.F. Adams. *J. Kansas ent. Soc.*, Manhattan, **29** : 19-21.
- Sabrosky, C.W. 1961a. The present status of the systematics of Diptera. xi. Internationaler Kongress für Entomologie Wien 1960. *Verhandlungen* Bd. i. 1961. pp. 159-166.
- Sabrosky, C.W. 1961b. A new Nearctic species of *Stenoscinis*, with key to the species of the Western Hemisphere (Chloropidae : Diptera). *Ent. News Lancaster Pa.*, **72** : 19-23, 1 fig.
- Sabrosky, C.W. 1961c. A report on Chloropidae and Milichiidae from Afghanistan. *Opusc. Ent. Lund.*, **26** : 61-66, 4 figs.
- Sabrosky, C.W. 1961d. The "new family" Echiniidae and the Chloropid genus *Anatrichus* (Diptera). *Ann. Mag. nat. Hist.*, London, (13) **4** : 559-560.
- Sabrosky, C.W. 1963. New synonymy, generic transfers and a new genus in old world Chloropidae (Diptera). *Ann. Mag. nat. Hist.*, London, **6** : 749-752.
- Sabrosky, C.W. 1964a. Additions and corrections to the world list of Chloropidae (Diptera). *Entomological News*, **75** (7) : 177-185.
- Sabrosky, C.W. 1964b. Milichiidae and Chloropidae (Diptera) from the Batu caves, Malaya. *Pacific Insects*, **6** (2) : 308-311.
- Sabrosky, C.W. 1972. A synopsis of the genus *Eutropa* Loew, with a new African species (Diptera : Chloropidae). *Stutt. Beitr. Naturkd.*, **251** : 1-7, 1 fig.
- Sabrosky, C.W. 1976. A new genus and two new species of Chloropidae from Hawaii (Diptera). *Pac. Insects*, **17** : 91-97, 4 figs.
- Sabrosky, C.W. 1977a. Fam. Chloropidae. In : La faune terrestre de l'île de Sainte-Helene. Musée Royal de l'Afrique Centrale (8) **215** : 110-118.
- Sabrosky, C.W. 1977b. Family Chloropidae. In : A catalog of Diptera of the Oriental Region. Suborder Cyclorrhapha- (excluding Division Aschiza). **3** : 277-319.
- Sabrosky, C.W. 1980a. New genera and new combinations in Nearctic Chloropidae (Diptera). *Proc. ent. Soc. Washington*, **82** : 412-429, 12 figs.

- Sabrosky, C.W. 1980b. Family Chloropidae. In : A Catalog of the Diptera of the Afrotropical Region. *Brit. Mus. (Nat. Hist.)* London, pp. 695-712. Crosskey, R.W., ed.
- Sabrosky, C.W. 1980c. Unexpected synonymy in Chloropidae, From the family Ephydriidae (Diptera). *Aust. ent. Mag.*, **6** : 101-102.
- Sabrosky, C.W. 1982. The Afrotropical species of *Apotropina* Hendel (Diptera Chloropidae). *Ann. Natal. Mus.*, **25** (1) : 267-279.
- Sack, P. 1935. *Chloropisca* Loew und *Thaumatomyia* Zenker. *Ent. Rdsch.* Stuttgart, **52** 195-197.
- Salmon. J.T. 1939. A remarkable fly from an ants' nest in New Zealand (Diptera Chloropidae). *Proc. R. ent. Soc.*, London (B), **8** : 113-114, 1 fig.
- Sarno, P. 1958. Sobre "*Hippelates convexus*" Loew, 1865. (Diptera : Chloropidae). *Rev. bras. Biol.* Rio de Janeiro, **18** : 237-273, 25 figs.
- Schander, R. & R. Meyer, 1925. Untersuchungen uber die Fritfliege. *Arch. Natg.* Berlin, **90** (1924) 1925 Abt. A Heft. 12. pp. 12-87, 12 figs.
- Schesterikow, M.K. 1910. Zur Biologie der *Oscinis frit* L. *Moskva Ann. Inst. agron.*, **16** : 207-228.
- Scott, H. 1916. Note on the swarming of Chloropid flies Psocidae, etc. in house. *Ent. mon. Mag.* London, **52** : 18-21 & 43.
- Seamons, H.L. 1917. Wheat-sheath miner. *Jour. Agr. Res.*, **9** (1) : 17-25.
- Séguy, E. 1938. Mission Scientifique de l'omo. Diptera i. Nematocera et Brachycera. *Mém. Mus. Hist. nat. Paris* (N.S.), **8** : 359-365.
- Séguy, E. 1940. Étude sur les Diptérés Hippelatoides (mouches desyeux) de la region neotropicale (Diptera : Chloropidae). *Mém. Mus. Hist. nat. Paris* (N.S.), **13** : 331-357, 14 figs.
- Séguy, E. 1941. Insectes Dipteres du genre *Hippelates* Loew recueillis en Columbie et au Venezuela. Listi et caratérés des espèces. *Ann. Parasit. hum. Comp.* Paris, **18** : 233-244, 2 figs.
- Séguy, E. 1946. Mission de M. Risbec en Afrique occidentale., Insects Diptérés. *Encycl. ent.* Paris (B), ii. Dipt., **10** : 9-14.
- Séguy, E. 1950. Contribution a l'etude de l'Air Dipteres. *Mém. Inst. franc. Afr. noire* Paris, no. **10** : 272-282.

- Séguy, E. 1957. Chloropids africains du Museum (Dipt.) *Rev. franc. Ent.* Paris, **24** : 264-277.
- Shapiro, I.D. 1961. Osobennosti vzai mootnoshenii Shvedskoi Mukh (*Oscinella frit*) C Vaprezheaemumi k elomu Vreditelyu. *Ent. Oboz.* Moscow, **40** (4) : 794-806.
- Shapiro, I.D. & N.A. Vilkova, 1983. Places of egg laying in *Oscinella frit* (L.) (Diptera : Chloropidae) *Ent. Oboz.* Moscow, **42** (1) : 138-150.
- Shapiro, I.D., N.A. Vilkova & A.P. Sazanov, 1967. Ob Adaptivnikh Chertakh stroeniya pischevaritelnykh traktov liichinok Nakolorih vidov krugloshovnykh mukh (Diptera : Chloropidae). *Zool. J.*, **46** (4) : 540-550.
- Simmonds, F.G. 1952. Parasites of the fritfly *Oscinella frit* (L.) in Eastern North America. *Bull. ent. Res.*, **43** (3) : 503-542.
- Simmonds, F. G. 1953. Inter-relationship of the parasites of the fritfly *Oscinella frit* (L.) in Eastern North America. *Bull. ent. Res.*, **44** (2) : 387-393.
- Skuse, F.A.A. 1889. Descriptions of a new genus (*Batrachomyia*, W.S. Macleay, Ms) and two species of Dipterous Insects parasitic upon Australian Frogs. *Proc. Linn. Soc. N.S.W.*, Sydney, (2), **4** : 171-177, pl. x.
- Smirnov, E.S. 1958. Übersicht der *Chlorops*-Arten (Diptera : Chloropidae) aus der Umgegend von Moskau (In Russian, with German summary). *Zool. Zhurn.* Moscow, **37** : 1157-1174, 14 figs.
- Smirnov, E.S. 1964. New Palaearctic species of the genus *Chlorops* Mg. (Diptera : Chloropidae). *Ent. Oboz.* Moscow, **43** (2) : 478-481.
- Smirnov, E.S. & L.I. Fedoseeva, 1976a. New Asian species of the genus *Chlorops* Meigen (Diptera : Chloropidae). *Zool. Zhurn.* Moscow, **55** : 1489-1494, 3 figs. (In Russian with English Summary).
- Smirnov, E.S. & L.I. Fedosseva, 1976b. Grass flies of the genus *Chlorpos* (Diptera Chloropidae) in the fauna of the USSR. A key. *Zool. Zhurn.* Moscow, **55** : 1659-1676, 5 figs. (In Russian with English Summary).
- Snodgrass, R.E. 1953. The metamorphosis of a fly's head. *Smithson. misc. Coll.*, **122** : 1-25.
- Spencer, K.A. 1977. A revision of the New Zealand Chloropidae. *J. Roy Soc., N.Z.*, **7** : 433-472, 69 figs.

- Spencer, K.A. 1978. Notes on the Australian Chloropidae (Diptera). 1. *Stutt. Beitr. Naturked. A.* **309** : 1-14, 21 figs.
- Stackelberg, A. A. 1955. New species of flies of the group Acalyptrata (Diptera) from the Leningrad Province. *Trud. Zool. Inst. Akad. Nauk SSSR.* **18** : 328-333, 8 figs (In Russian).
- Stackelberg, A.A. 1958. List of Diptera of the Leningrad regiôn. III. Acalyptrata, Part 1. *Trud. Zool. Inst. Akad. Nauk SSR,* **24** : 103-191 (In Russian).
- Steyskal, G.C. 1957. The postabdomen of male Acalyptrate Diptera. *Ann. ent. Soc. Amer.* **50** (1) : 66-73.
- Steyskal, G.C. 1974. Recent advances in the primary classification of the Diptera. *Ann. ent. Soc. Amer.,* **50** (1) :66-73.
- Steyskal, G.C. 1976. The terminology of bristles on the upper back of the head in the higher Diptera. *Jour. Kansas. ent. Soc.,* **49** (2) : 155-159.
- Syddiq, M.M. 1938. *Siphunculina funicola* (eye fly). *Indian Med. Gazette,* **73** : 17-19.
- Thomson, C.G. 1868. Diptera, *Rugen Resa,* ii Zool. i. *Insecta,* pp. 443-614.
- Travassos, F.L. & M. Carrera, 1949. Contribuição para o conhecimento de *Pseudogaurax longilneatus* Sabrosky Parasita de ooteca de Montodea (Diptera : Chloropidae). *Rev. brasil. Biol.* Rio de Janeiro, **9** : 97-101, 8 figs.
- Tzuigankov, S.K. 1930. On the biology of *Chlorops taeniopus* Meig., *Meromyza saltatrix* L. and *Lasiosina cinctipes* Meig. (In Russian). *Trud. Poltava Agri. Expt. Sta.,* **90** : 53 pp., 21 figs.
- Valley, K., T. Wearsch & B.A. Foot, 1969. Larval feeding habits of certain Chloropidae (Diptera). *Proc. ent. Soc. Washington,* **71** (1) : 29-34.
- Walker, F. 1858. Catalogue of the Dipterous insects collectd in the Aru islands by Mr. A.R. Wallace, With descriptions of new species (part). *J. Proc. Linn. Soc. (London) Zool.,* **3** : 77-110.
- Walker, F. 1860. Catalogue of the Dipterous insects collectd at Makassar in Celebes by Mr. A.R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc. (London.) Zool.,* **4** : 145-172.
- Wallace, A.R. 1876. Geographical Distribution of Animals. 2 Vols.

- Westwood, J.R. 1840. An introduction to the modern classification of insects. Synopsis of the genera of British insects. *Diptera* London, **2** : 125-158.
- Wiedmann, C.R.W. 1830. Aussereuropäische Zweiflügelige Insekten, II. *Hamm.*, p. 594-598.
- Wilbur, D & C.W. Sabrosky, 1936. Chloropid populations on pasture grasses in Kansas. *J. Econ. Ent.*, **29** : 384-389.
- Young, B.P. 1921. Attachment of the Abdomen to the thorax in Diptera. *Cornell Univ. Memoir*, **44** : 255-282.
- Zhabinskaja, M.I. 1963. Larvae of certain species of the genus *Chlorops* Mg. (Diptera : Chloropidae) of the European part of the U.S.S. R. *Ent. Oboz.* Moscow, **42** : 924.
- Zuska, J. 1960. Bemerkungen über einige palaearktische Arten der Gattung *Chlorops* Meigen and Beschreibung (Diptera : Chloropidae). *Acta Soc. Ent. Csl. Prague* **57** : 387-396, 12 figs.

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