

Fauna of India

DERMAPTERA

PART—I SUPER FAMILY : PYGIDICRANOIDEA



G. K. SRIVASTAVA

The present volume forms part one of the *Fauna of India, Dermaptera*. It deals with the family Pygidicranoidea including four subfamilies, seven genera and seventysix species from the Indian Region. The volume includes morphology of a typical form; review of classification and zoogeography of this group of insects besides detailed descriptions of all the species with adequate drawings and keys for identification. A critical evaluation of intraspecific variations has also been made on the basis of large collections of different species obtained by the author from his faunistic surveys conducted in different parts of the country and from several other museums in the World. It is hoped that the present work will serve as an authoritative guide for future workers on these little known but fascinating insects.

THE FAUNA OF INDIA

AND

THE ADJACENT COUNTRIES

By
G. K. SRIVASTAVA
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FOREWORD

The present volume fulfils a long felt need of a comprehensive work on Dermaptera from India and adjacent countries since the earlier monograph from the area by Dr. M. Burr, published in the year 1910 under the *Fauna of British India* series has become out of date. It aims at putting together much scattered information published subsequently and it is envisaged to deal with the whole Order in three parts.

This part deals with altogether 76 species under seven genera and four subfamilies of the family Pygidicranidae under the superfamily Pygidicranoidea from India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka. The interpretations presented here are largely based upon fresh material present in the Zoological Survey of India and that procured from various sources in India and abroad. Special emphasis is laid upon intraspecific variations, which are of common occurrence in the group, for the better understanding of various taxa, especially at species level.

It is hoped that this work will serve as an authoritative guide for the future workers on these little known but fascinating insects.

Dr. Srivastava is well known for his contributions on the World Dermaptera. He deserves my compliments for his endeavour to bring out this valuable volume.

Zoological Survey of India
Calcutta

Dr. Asket Singh
Joint Director-in-Charge

PREFACE

Since the publication of Burr's (1910) volume on Dermaptera under the *Fauna of British India* series, a lot of information is added on the group which unfortunately is scattered in astray papers. Although this being a valuable contribution it has now become out-of-date with the passage of time. Besides, it may be observed that species treated in this volume are mostly based on records either from Burma or Sri Lanka and the locality records from India are very few and refer to certain selected areas only. In order to fill this lacunae the present revision is undertaken.

For the purpose of present study the area includes India including Andaman and Nicobar group of Islands, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka.

It is proposed to divide the volume into three parts and the present one i. e., part 1 deals with superfamily Pygidicranoidea. Altogether 76 species under seven genera and four subfamilies and one family are dealt with.

During the course of present study an attempt is made to check various previous records of the species by procuring material, if available, through various sources. Besides, the taxonomic identity of those species which are known by meagre description is varified by examining their types. Most of the species are described on the basis of fresh material, incorporating and checking published information as well.

An important feature of the present work is a careful evaluation of various intraspecific variations occurring in Dermaptera. For undertaking such a study it is always necessary to have a large sample of population. This was fortunately accomplished by the careful collections made by me and other colleagues in the Zoological Survey of India. However, generous help in this direction by various World Museums was also available.

G. K. SRIVASTAVA

ACKNOWLEDGEMENTS

The present study is primarily based on the collections present in the Zoological Survey of India, Calcutta for which I am thankful to Dr. B. K. Tikader, Director who generously provided necessary facilities for the expeditious completion of this work.

In addition the help of following World Museums and individuals is also gratefully acknowledged who readily came forward by providing valuable material in their possession or supplying information for the improvement of the Ms. in various ways :

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Most of the dotted illustrations were prepared by Shri Kshudi Ram Patra and other line drawings by me.

In the last but not the least I wish to record my sincere thanks to Smt. Kiran Srivastava, my wife, who has helped in various ways during the course of preparation of this work.

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INTRODUCTION

The Dermaptera, commonly known as Earwigs, are soft bodied, elongated insects and mainly characterised by the presence of three jointed tarsi and unsegmented, chitinous forceps at the hind end of body.

They occur in a variety of habitats. Some of the species are capable of adapting themselves above the timber line in Himalayas and elsewhere and crawl freely even on snow. A few species with depressed body, generally live under the bark of dead and decaying logs whereas others are found under stones on the edge of streams, rivers and moist places. During monsoon they may be collected from foliage and occasionally visit flowers as well. Generally they avoid day light and due to their secretive habit, collection is often difficult. However, some species can be collected in large numbers under boulders and stones at high altitudes whereas some others could be easily collected in nature in reasonable numbers only because of their social and sub-social nature.

It is easy to collect Dermaptera by sweeping over vegetation of various types with the help of any convenient type of insect net. However, picking by means of forceps is quite rewarding. Besides, some species are attracted to light that can be easily collected. Generally it is useful to have a representative collection of each species which provides an opportunity to recognise intraspecific variations, a common feature in the group.

It is desirable to preserve them temporarily in spirit which keeps the body wet and makes the extraction of genitalia easy. However, for permanent storage they should be dried and pinned because prolonged preservation in spirit results in decolourisation and distending of abdominal tergites. A small card should be passed on pin below the specimen to provide an additional support to abdomen which otherwise tends to break off.

ABBREVIATIONS USED

- ANSP* — Academy of Natural Sciences of Philadelphia, U. S. A.
AZL — Academy of Zoology, Leningrad, USSR.
BMNH — British Museum (Natural History), London, England.
BMNS — Bombay Natural History Society, Bombay, India.
CAS — California Academy of Sciences, San Francisco, U. S. A.

- CASP* — Institute of Entomology, Chinese Academy of Sciences, Peking, China.
- FNH* — Field Museum of Natural History, Chicago, Illinois, U. S. A.
- FRI* — Forest Research Institute, Dehra Dun, India.
- HNAB* — Zoology Department, Hungarian Natural History Museum, Budapest Baross U, Hungary.
- IARI* — Indian Agricultural Research Institute, New Delhi, India.
- IPEG* — Institut für Pflanzenschutzforschung, Abteilung Taxonomie der Insekten, Eberswalde—Finow, DDR.
- IRSNB* — Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium.
- ITZA* — Institut voor Taxonomische Zoologie, Zoölogisch Museum Universiteit van Amsterdam, Afdeling Entomologie, Amsterdam, Netherland.
- IZAP* — Institut Zoologique, Académie Polonaise des Sciences, Warszawa, Poland.
- MCZH* — Museum of Comparative Zoology, Harvard University, Cambridge, Mass, U. S. A.
- MIZT* — Museo ed Istituto di Zoologia Sistemica della Università di Torino, Torino, Italy.
- MHNG* — Muséum d'Histoire Naturelle, Geneva, Switzerland.
- MM* — Manchester Museum, Manchester, England.
- MNHP* — Museum National d'Histoire Naturelle, Paris, France.
- MSNG* — Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy.
- MZL* — Musée Zoologique, Lausanne (Switzerland).
- MZM* — Museum of Zoology, The University of Michigan, Ann Arbor, U. S. A.
- MZSC* — Museum of Zoology, National Central University, China.
- NMB* — Naturhistorisches Museum Basel, Basel, Switzerland.
- NMWA* — Naturhistorisches Museum Wien, Wien, Austria.
- NRSS* — Naturhistoriska Riksmuseet, Stockholm, Sweden.
- RNHL* — Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.
- USNM* — The United States National Museum, Washington, D. C., U. S. A.
- UZMC* — Universitetes Zoologiske Museum, Copenhagen, Denmark.

- ZILS** — Zoological Institute, Lund, Sweden.
ZMHB — Zoologisches Museum für Naturkunde der Humboldt-
 Univ., Berlin, DDR.
ZMS — Zoology Department, Museum, J & K University,
 Srinagar, Kashmir, India.
ZSI — Zoological Survey of India, Calcutta, India.
ZSZM — Zoologisches Staatsinstitut und Zoologisches Museum,
 Hamburg, FRG.
ZUSL — Zoology Department, University of Sri Lanka, Colombo,
 Sri Lanka.

SYSTEMATIC LIST

- Superfamily : PYGIDICRANOIDEA
 Family : PYGIDICRANIDAE
 Subfamily : PYGIDICRANINAE

Genus *Cranopygia* Burr*Cumingi*—Group

1. *C. cumingi* (Dohrn)
2. *C. nietneri* (Dohrn)
3. *C. bhallaie* Kapoor
4. *C. kallipygos* (Dohrn)
5. *C. burri* Hincks
6. *C. raja* (Burr)
7. *C. parva* Brindle
8. *C. manipurensis* Srivastava

Brindlei—Group

9. *C. brindlei* sp. n.

Siamensis—Group

10. *C. assamensis* Hincks

Picta—Group

11. *C. picta* (Guérin-Méneville)
 (= *C. triangulata* Ramamurthi)
 (= *C. livingstoni* Kapoor)
12. *C. steinmanni* sp. n.

13. *C. constricta* Hincks
14. *C. fletcheri* Bharadwaj and Kapoor
15. *C. vittipennis* Hincks
16. *C. eximia* (Dohrn)
 (= *C. meghalayana* Biswas and Ghosh)
 (= *C. angulata* Srivastava)
17. *C. bifurcata* Srivastava
18. *C. dravidia* (Burr)

Doubtful species

19. *C. angustata* (Dohrn)
20. *C. tumida* Borelli

Subfamily : DIPLATYINAE

Genus **Schizodiplatys** Steinmann

21. *S. angustatus* (Burr)

Genus **Paradiplatys** Zacher

22. *P. gladiator* (Burr)

Genus **Diplatys** Serville

23. *D. brindleyi* Steinmann
24. *D. chopardi* Hincks
25. *D. devlensis* Srivastava
26. *D. papovi* Bey-Bienko
27. *D. excidens* Hincks
28. *D. gerstaeckeri* (Dohrn)
29. *D. confusus* Hincks
30. *D. coelebs* Hincks
 (= *D. jogiensis* Kapoor)
31. *D. jawalagiriensis* Kapoor, Bharadwaj and Banerjee
32. *D. nathani* Hincks
33. *D. dolens* Hincks
 (= *D. poonaensis* Kapoor)
34. *D. tikaderi* sp. n.
35. *D. lefroyi* Burr
36. *D. menoni* Kapoor & Bharadwaj
37. *D. ernesti* Burr
38. *D. fletcheri* Burr

- 39. *D. anamaliensis* Srivastava
- 40. *D. greeni* Burr
- 41. *D. carli* sp. n.
- 42. *D. adjacens* Hincks
- 43. *D. sinuatus* Hincks
- 44. *D. propinquus* Hincks
- 45. *D. santoshi* Srivastava
(= *D. incisus* Brindle)
- 46. *D. nilgiriensis* Hincks
- 47. *D. carinatus* sp. n.

Genus **Haplodiplatys** Hincks

- 48. *H. niger* Hincks
- 49. *H. siva* (Burr)
- 50. *H. kurseongensis* sp. n.
- 51. *H. glenis* (Kapoor)
- 52. *H. bhowmiki* (Srivastava and Saha)
- 53. *H. bidentatus* (Hincks)
- 54. *H. malaisei* (Hincks)
- 55. *H. trisinuatus* sp. n.
- 56. *H. chinensis* (Hincks)
- 57. *H. shillongensis* sp. n.
- 58. *H. brancuccii* Srivastava
- 59. *H. stemmleri* (Brindle)
- 60. *H. rileyi* (Hincks)
- 61. *H. urbanii* (Brindle)
- 62. *H. srivastavai* (Kapoor)
- 63. *H. rufescens* (Kirby)
- 64. *H. simlaensis* (Kapoor)
- 65. *H. lobatus* sp. n.

Doubtful species

- 66. *Diplatys flavobrunneus* Chopard
- 67. *D. baijali* Duda and Malhotra
- 68. *D. himalayanus* Baijal and Singh

Subfamily : ECHINOSOMATINAE

Genus **Echinosoma** Serville

Yorkense—Group

- 69. *E. trilineatum* Borelli

Parvulum—Group

- 70. *E. parvulum* Dohrn
- 71. *E. andamanensis* sp. n.

Sumatranum—Group

- 72. *E. convolutum* Hincks
- 73. *E. dentiferum* Borelli
(= *E. garoensis* Lahiri and Ghosh)
- 74. *E. nandii* sp. n.

Doubtful species

- 75. *E. rufomarginatum* Borelli

Subfamily : PROLABISCINAE

Genus **Parapsalis** Borelli(= *Prolabisca* Bey-Bienko)

- 76. *Parapsalis infernalis* (Burr)
(= *P. laevis* Borelli)

GENERAL EXTERNAL MORPHOLOGY

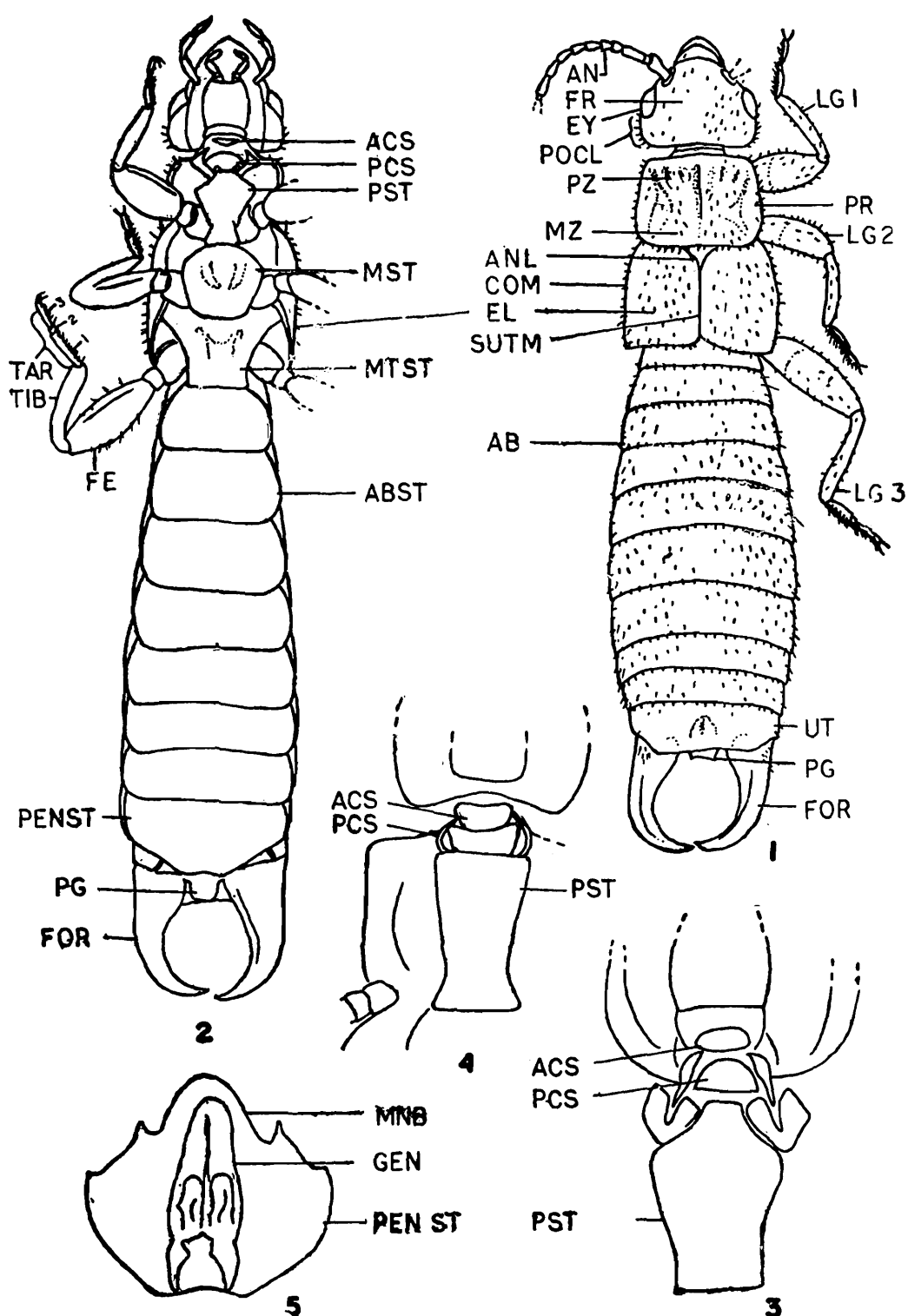
(Figs. 1—15)

Colouration : The body colour is generally uniform with varying intensity on various body parts. Earwigs may be brightly or dull coloured, occasionally with a metallic sheen. In some species elytra and wings are provided with spots and streaks. Intraspecific variations in colour are not uncommon but generally within narrow limits.

Vestiture : This is generally stable and affords valuable characters for the separation of genera and species. The members of the subfamily Echinomatinae have thick chitinous bristles, commonly known as 'setae'. The term 'pubescence' is applied to fine hairs present on certain body parts. It is characteristic of members of the genus *Chaetospania* Karsch (Labiidae) and *Hamaxas* Burr (Chelisochidae), etc.

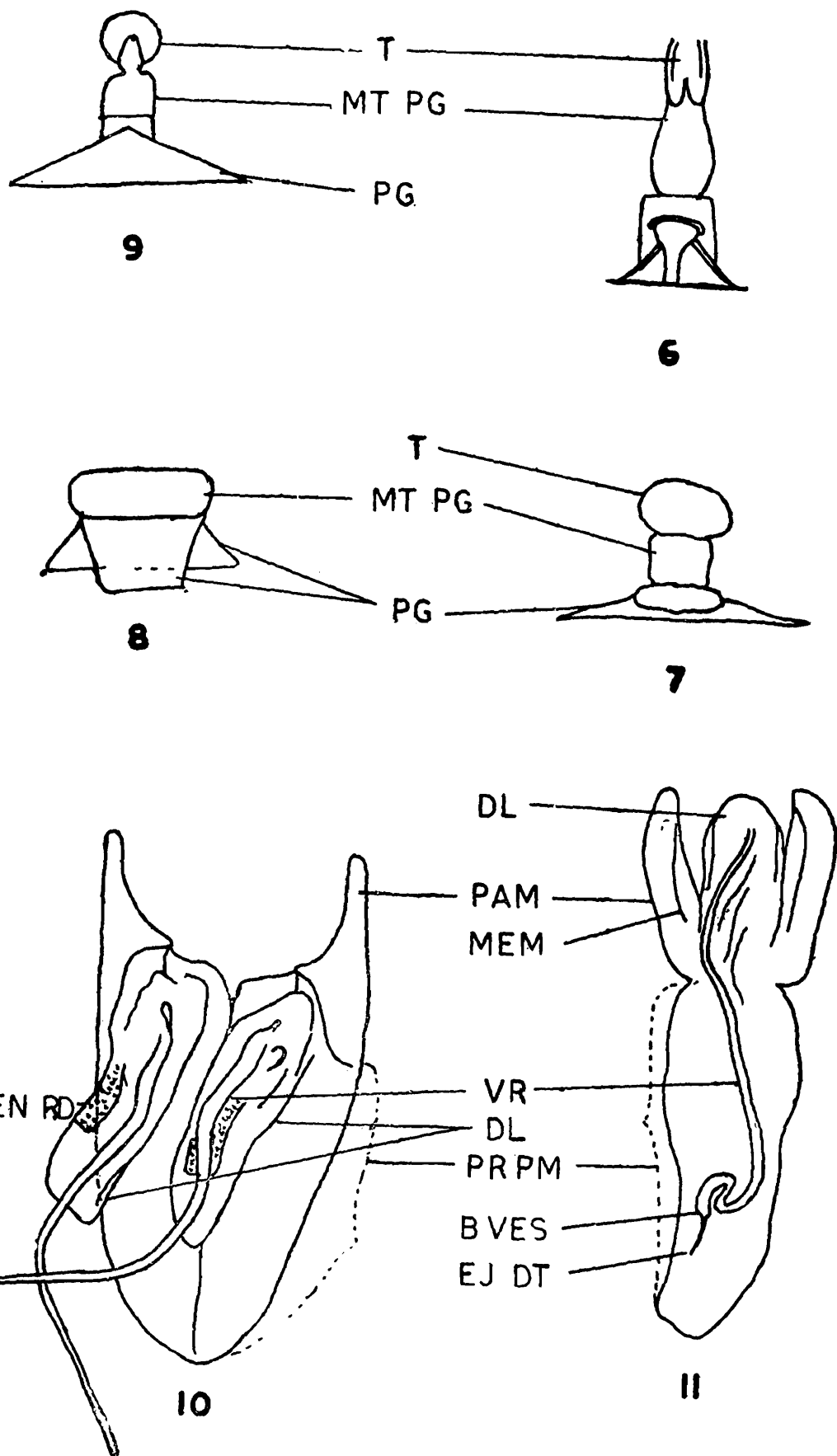
Punctuation : It varies on various body part within certain limits and affords useful taxonomic characters.

Head : It is prognathus, triangular or heart shaped ; about as long as broad or slightly longer, sometimes transverse also. Sutures may be distinct or faint ; frons may be either depressed or convex ; occiput is generally tumid. In the subfamily Diplatyinae often a carina of varying length behind eyes is present. Hind margin is generally straight but often emarginate also. All these characters are of much use in the separation of species.



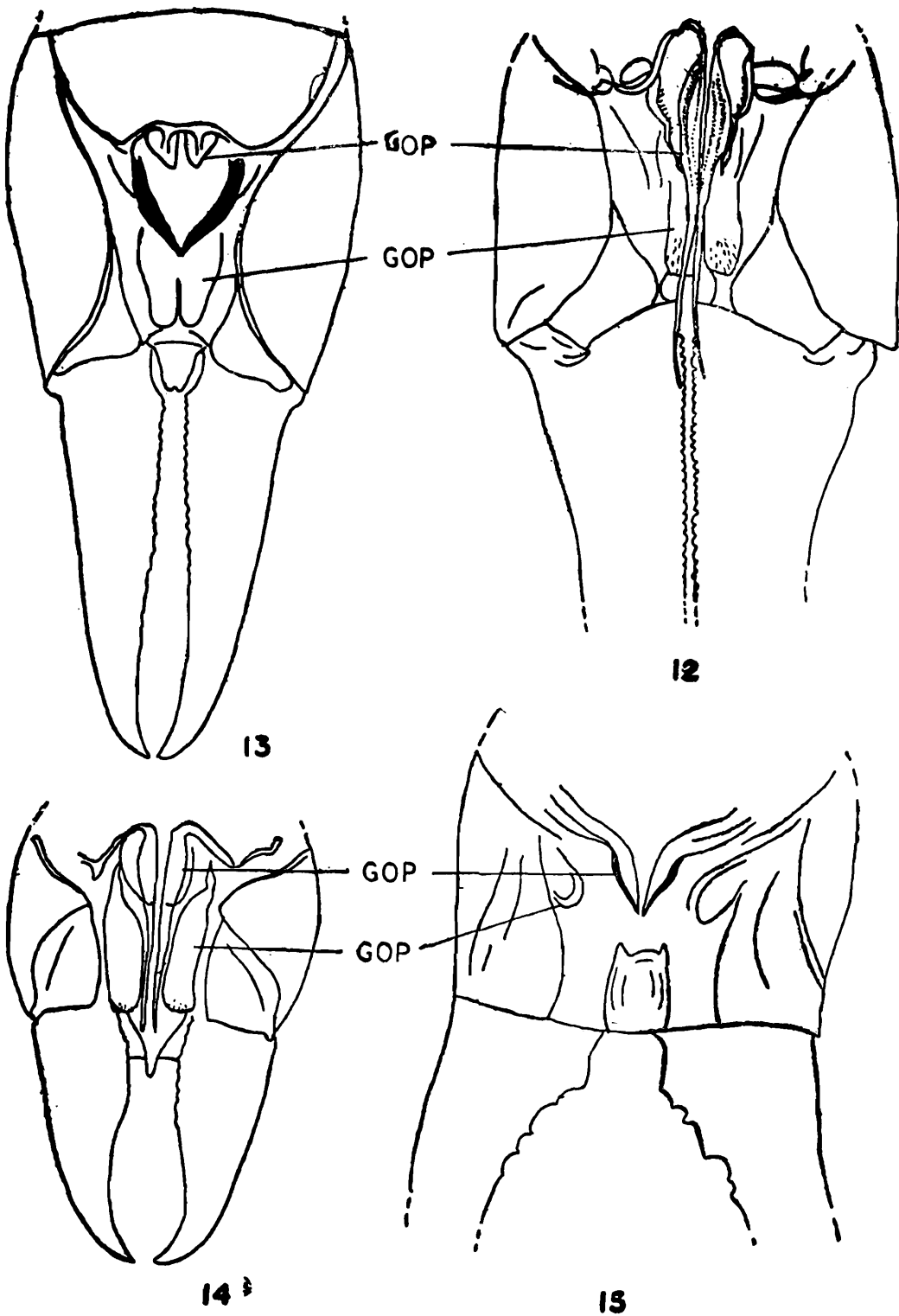
Figs. 1-5: General External characters, ♂ : 1 and 2. Dorsal and ventral view of *Echinorama* sp., 3 and 4. Cervical sclerites and prosternum of *Euborellia* and *Parapsalis* spp., respectively; 5. Penultimate sternite with genitalia as seen from inner side of *Echinorama* sp.

Abbreviations : AB—Abdomen; ABST—Abdominal sternites; ACS—Anterior cervical sclerite; AN—Antennae; ANL—Anal angle; COM—Costal margin; EL—Elytra; EY—Eye; FE—Femur; FOR—Forceps; FR—Frons; GEN—Genitalia; LG₁—Fore leg; LG₂—Middle leg; LG₃—Hind leg; MNB—Manubrium; MST—Mesosternum; MTST—Metasternum; MZ—Metazona; PCS—Posterior cervical sclerite; PEN ST—Penultimate sternite; PG—Pygidium; POCL—Post ocular length or genae; PR—Pronotum; PZ—Prozona; SUT M—Sutural margin; TIB—Tibia; TAR—Tarsus (1, 2, 3—Tarsal segments); UT—Ultimate tergite.



Figs. 6-11. General external characters, ♂; 6-9. Opisthomeres of *Cranopygia*, *Diplatys*, *Echinotoma* and *Parapsalis* spp., respectively; 10 and 11. Genitalia of *Echinotoma* and *Forficula* spp., respectively.

Abbreviations: BVES—Basal vesicle; DEN PD—Denticulated pads; DL—Distal lobes; EJ DT—Ejaculatory duct; Mem—Membrane; MT PG—Metapygidium; PAM—Paramere; PG—Pygidium; PRPM—Proparamere; T—Telson; VR—Virga.



Figs. 12-15. General External characters, ♂. Gonapophyses of VIII and IX sternites with other associated structures in *Cranopygia*, *Diplatys*, *Echinosoma* and *Parapsalis* spp., respectively.

Abbreviations : GOP—Gonapophyses of VIII and IX abdominal segments.

Antennae : These are long and multisegmented ; number of segments varying from twelve to fifty or more. Basal segment is generally large and stout, narrowed basally and normally longer than the 2nd to 4th together. Basal segment in the genus *Eudohrnia* Burr

is characteristic in having sharp ridges laterally and flat above. The 2nd segment is small, about as long as broad whereas 3rd is long and cylindrical, generally longer than 4th and slightly shorter than 5th; remaining segments are gradually increasing in length, long, cylindrical or cylindrico-conical or rarely thin and rod shaped. In the subfamily Pygidicraninae segments 4-6 are transverse. Taxonomically the shape and the relative length of first five segments is very important since it provides valuable generic and specific characters.

Eyes: Always placed laterally and vary greatly in length, in being either longer or shorter than genae (the region behind eyes). The size of eye is normally constant within the species but varies intraspecifically in *Marava arachidis* (Yersin); *Labia lutea* (Bormans) and a few other species.

Thorax: Pronotum is a flat plate of varying shape (rectangular, oval or semicircular), thus providing very reliable and stable taxonomic characters at generic as well as specific level. It varies rarely intraspecifically, i. e., in *Proreus simulans abdominalis* Ramamurthi. Anterior margin may be truncate or gently convex, laterally generally straight, sometimes very slightly convex or emarginate in middle also. Hind margin varies greatly, in being either rounded, straight or obtuse. A median sulcus is generally present. The prozona, the anterior half of the pronotum, is generally tumid and the posterior half, the metazona, is less so; often both these areas are little differentiated. The meso—and metanotum are transverse, the former is sometimes provided with a fold or ridge laterally and truncate posteriorly and the latter concave posteriorly. Both these plates are concealed below the elytra and wings when present.

The prosternum is an elongated plate, often narrowed posteriorly. The mesonotum is of various shapes and is generally about as long as broad. The metasternum is the largest of the preceding two plates with hind margin variable in shape.

Only the shape of the hind margin of meso—and metasternum has been used for the discrimination of some subfamilies and genera. It is hoped these parts may prove to be of much more taxonomic use when investigated in detail.

Elytra and Wings: Elytra may be well developed, abbreviated or totally absent. In the former case, these vary greatly in length, extending from base to the apex of abdomen. In abbreviated form elytra are

present as narrow lateral ovate flaps on mesonotum or cemented to it. Costal margin is smooth in majority of species but in some a distinct, raised ridge is present. Hind margin may be straight or obliquely truncate. Anal or basal axillary angles are often rounded off showing a small or large triangular scutellum. Wings in the present work refer to the portion projecting beyond elytra and are often concealed or absent.

Legs : Legs may be long or short, adapted for running. The femora is generally smooth but in the superfamily Pygidicranoidea it may have one or two longitudinal ridges. Tibia is normally elongated, often furrowed above from middle to extreme apex. Tarsi is always three segmented, provided with thick pubescence on underside. The second segment may be small, heart shaped or produced below the third segment in the form of a long and narrow lobe. Hind 1st tarsal segment may be longer or equal to remaining two segments together. It is found during the present study that the characters based on relative length of tibia and tarsus and between the three segments of the latter provide stable generic as well as specific characters.

Abdomen : It forms the bulk of the body and there are 10 visible tergites and the 11th is represented by the pygidium. In females there are only seven visible segments because 8th and 9th segments are generally very much reduced and concealed. Besides 1st sternum being absent, only sternites 2 to 9 and 2 to 7 are seen in males and females, respectively. It may be generally convex, often weakly so or depressed with sides of certain segments sometimes recurved, posteriorly convex, obtuse or acute, occasionally with a median ridge. Penultimate sternite is represented by 9th and 7th sternites in males and females, respectively. In males it is generally transverse and the shape of free margin is variable which affords valuable taxonomic characters at specific level. In females it is obtusely triangular posteriorly.

Ultimate tergite in males, is rectangular, transverse or quadrate, often narrowed posteriorly ; depressed in middle, occasionally provided with compressed tubercles in the area corresponding with base of forceps. It may be smooth, punctate or with longitudinal smooth and punctate stripes alternating. The hind margin is also sometimes provided with tubercles. In females it is comparatively narrowed posteriorly.

Forceps : These are unsegmented chitinous structures, situated at the hind end of abdomen, varying greatly in size, shape and internal armature in males. In females these are simple and straight. Moreover, in males, these exhibit allometric growth and polymorphism. The members of families Chelisochidae and Forficulidae may possess intraspecifically shorter (forma cyclolabia) or longer (forma macrolabia) forceps in relation to other body parts. In the subfamily Diplatyinae another form of modifications are encountered which relate to slender and straight (forma microlabia) or robust and heavily curved (forma macrolabia). The modification in forceps sometimes lead to some variations in ultimate tergite and pygidium. This important aspect should be always kept in mind while examining Dermaptera. Very often due to injury during early stages of development one branch may be either deformed or shortened.

Pygidium (Opisthomeres)—It is a chitinous plate situated between the bases of forceps with its free posterior margin variously shaped. It varies greatly in both sexes and is usually less conspicuous in females. But in certain genera of Chelisochidae, the females possess equally prominent pygidium. In some species viz. *Labia lutea* (Bormans) and *Irdex nitidipennis* (Bormans) males show great intraspecific variation whereas in the species of genus *Chaetospania* it is constant. For this reason it is being used for the discrimination of various species.

As already stated pygidium represents 11th segment of the abdomen. Besides, if penultimate sternite is removed, two more segments, i. e., meta-pygidium and telson representing 12th and 13th segments, respectively are visible. Last one is sometimes absent. All these three segments together are called Opisthomeres and differ in both sexes. The taxonomic value of these appendages does not seem to have been adequately investigated. In the subfamilies Pygidicraninae, Diplatyinae and Prolabiscinae there are three distinct plates whereas in Echinomatinae only pygidium and metapygidium are visible.

Gonapophyses—These the paired appendages of eighth and ninth sternites in females and vary in different subfamilies. In Pygidicraninae and Echinomatinae gonapophyses of eighth sternite are thread like and in the former projecting well beyond penultimate sternite whereas those of ninth sternite are dilated and flat lobed. These appendages are developed but short and hidden in Diplatyinae and Prolabiscinae.

The detailed study on female genitalia is not done. Perhaps it may be most useful in identifying isolated females which could not be

determined at present since the taxonomy of the whole Order is based on male genitalia only.

Male genitalia—The male genitalia can be divided into two parts, the basal portion is known as penis (proparamere) which may be paired, fused only at extreme base as is found in lower families viz., Pygidicranidae, Carcinophoridae, Labiduridae and Apachyidae or fused into a single mass in higher families viz, Labiidae, Chelisochidae and Forficulidae. The apical portion of the genitalia is termed as parameres and is always paired. It varies greatly in shape, especially in lower families and affords very valuable generic and specific characters. From the distal end of penis arise one or two lobes termed as penis lobes or distal lobes ; when paired, often right one may be reduced and directed forward or any one of them, usually the left one may be flexed backwards. The distal lobes are apically hollowed to form preputial sacs which accommodate a chitinous duct and accessory plates of varying length. The virga is the chitinous portion of ejaculatory duct, generally distinct but sometimes faint also. It may be paired in subfamily Diplatyinae and associated with denticulated pads, plates or rods. In the family Forficulidae the basal portion of virga is dilated to form a vesicle.

The characters offered by genitalia appear to be most sound and stable and have been used for the discrimination of families, genera and species. The shape of parameres generally, as a rule, is constant within the species. Only rarely it shows polymorphism as has been observed by Borelli (1931) in the case of *Epilabis penicillata* (Borelli).

In the above account the terminology used, is after Hincks and Pophan (1970).

The male genitalia is situated on the inner surface of penultimate sternite and can be easily taken out with the help of a fine forceps by lifting the latter. In case of dry specimens, the last one or two abdominal segments alongwith forceps should be detached and soaked properly in water to make the extraction of genitalia easy. The hind portion of body is again glued to the specimen after drying and the genitalia is placed in 5% solution of KOH for 24 hours or for quick results a little heating is necessary. Afterwards, it is transferred to glacial acetic acid and finally to clove oil for a few minutes for clearing. The mounting may be done in neutral Canada Balsam between two cover slips or celluloid slips and attached to the pin of the specimen.

MEASUREMENTS

The length of body is measured from tip of mouth to hind margin of ultimate tergite and those of forceps from its base to apex. Since various body parts are either oblong, trapezoidal or variously shaped their length and width refers to greatest length and width.

CLASSIFICATION

Burr (1911a) proposed for the first time the detailed classification of the Order but it was based mainly on external morphological features. Zacher in the same year made certain improvements in the classification especially at generic level in the light of investigations made on male genitalia. Subsequently, Burr (1915-1916) made hurried genitalic studies utilising Zacher's observations in support of his earlier (l.c.) arrangement. This study could not be continued further due to Burr's involvement in the 1st World War, yet it was of much use to taxonomists for a little over three and half decades. Recently, Popham (1965) made a comprehensive survey of male genitalia and presented a much improved system. In the present work Steinmann's (1975) arrangement is followed where external as well as genitalic characters are correlated. He has given equal weightage to various morphological characters in various taxa of the same category.

Following is the summary of Steinmann's (l.c.) classification with certain additions and modifications. The most important one relates to resurrection of subfamily Prolabiscinae Bey-Bienko (1959) which was synonymised under Echinomatinae (Steinmann, 1973).

I. Superfamily *PYGIDICRANOIDEA*
(= *PROTODERMAPTERA* Zacher)

1. Family PYGIDICRANIDAE Verhoeff

ANATAELINAE Burr

CHALLINAE Steinmann

ESPHALMENINAE Burr

BLANDICINAE Burr

PYRAGRINAE Burr

KARSCHIELLINAE Burr

PYGIDICRANINAE Verhoeff

CYLINDROGASTRINAE Maccagno

DIPLATYMORPHINAE Boeseman
DIPLATYINAE Verhoeff
ECHINOSOMATINAE Burr
PROLABISCINAE Bey-Bienko

II. Superfamily *CARCINOPHOROIDEA*

2. Family *CARCINOPHORIDAE* Popham

PLATYLABIINAE Burr
GONOLABIINAE Popham and Brindle
TITANOLABIINAE Srivastava
ANOPHTHALMOLABIINAE Steinmann
CARCINOPHORINAE Hincks
BRACHYLABIINAE Burr
ISOLABIINAE Steinmann
ANTISOLABIINAE Brindle
PARISOLABIINAE Verhoeff
IDOLOPSALINAE Steinmann
ISOLABOIDINAE Brindle

3. Family *LABIDURIDAE* Verhoeff

ALLOSTETHINAE Burr
NALINAE Steinmann
LABIDURINAE Burr

III. Superfamily *APACHYOIDEA*
(= *PARADERMAPTERA* Verhoeff)

4. Family *APACHYIDAE* Verhoeff

APACHYINAE Burr

IV. Superfamily *FORFICULOIDEA*
(= *EUDERMAPTERA* Verhoeff)

5. Family *LABIIDAE* Burr

PERICOMINAE Burr
NESOGASTRINAE Verhoeff
RAMAMURTHIINAE Steinmann

VANDICINAE Burr
 STRONGYLOPSALINAE Burr
 SPARATTINAE Burr
 GERACINAE Brindle
 ISOPYGINAE Borelli
 SPONGIPHORINAE Burr
 LABIINAE Burr

6. Family CHELISOCHIDAE Burr

CHELISOCELLINAE Steinmann
 CHELISOCHINAE Burr

7. Family FORFICULIDAE Stephens

ANCISTROGASTRINAE Burr
 SARCINATRINAE Steinmann
 COSMIELLINAE Steinmann
 OPISTHOCOSMIINAE Verhoeff
 DIAPERASTICINAE Burr
 ALLODAHLINAE Verhoeff
 ANECHURINAE Burr
 EUDOHRNIINAE Burr
 RHYACOLABINAE Steinmann
 NEOLOBOPHORINAE Burr
 FORFICULINAE Burr

Key to the Super-generic Taxa Represented From Indian Subcontinent

(modified after Steinmann, 1975)

- | | |
|--|---|
| 1 (8). Neck blattoid type, i.e., anterior and posterior cervical sclerites anterior to prosternum separated from each other but hind margin of posterior sclerite may be separate or fused with apical margin of prosternum ; male genitalia with two functional distal lobes, sometimes one of them reduced ... | <i>PYGIDICRANOIDEA</i>
(<i>Pygidicranidae</i>) |
| 2 (3). Antennal segments 4-5 transverse, 25 segmented or more ... | <i>Pygidicraninae</i> Verhoeff |
| 3 (2). Antennal segments 4-6 longer than broad, 20 segmented or less | |
| 4 (5). Femora compressed with sharp longitudinal ridges ; male genitalia with parameres armed internally in various ways ... | <i>Diplatyinae</i> Verhoeff |

- 5 (4). Femora not compressed, usually smooth, occasionally with a faint ridge ; male genitalia with parameres simple (unarmed)
- 6 (7). Body convex, covered with thick characteristic setae and long pubescence ; femora occasionally with a faint ridge ; pygidium with hind margin projecting ; forceps cylindrical ... *Echinosomatinae* Burr
- 7 (6). Body depressed, glabrous and smooth ; femora devoid of any ridge ; pygidium vertical with hind margin not projecting ; forceps trigonal in basal one third, afterwards depressed ... *Prolabiscinae* Bey-Bienko
- 8 (1). Neck forficuloid type, i.e., anterior and posterior cervical sclerites fused and the hind margin of latter joined with anterior margin of prosternum ; male genitalia with one or two functional lobes. sometimes one of them reduced
- 9(30). Male genitalia with two functional distal lobes, often one of them reduced or atrophied
- 10(29). Pygidium in both sexes vertical with its hind margin not free ; forceps partially trigonal near base and moderately depressed afterwards or cylindrical ... *CARCINOPHOROIDEA*
- 11(24). Male genitalia, if virga present, usually not wider at base and without a sinuous inner tube ; otherwise denticulate pads present ... *CARCINOPHORIDAE* Popham
- 12(13). Body strongly depressed ; male forceps strongly curved, female ones elongated ... *Platylabiinae* Burr
- 13(12). Body not so strongly depressed, weakly or strongly convex ; forceps various
- 14(15). Meso-and Metasternum oblong and both with posterior margin convex or tongue shaped ... *Titanolabiinae* Srivastava
- 15(14). Meso-and metasternum quadrate, former briefly convex or truncate posteriorly and latter narrowed posteriorly with hind margin truncate
- 16(17). Mesosternum briefly convex posteriorly ... *Carcinophorinae* Hincks
- 17(16). Mesosternum truncate posteriorly
- 18(21). 1st antennal segment longer than the distance between antennal bases
- 19(20). Mesonotum laterally with a well defined ridge ... *Brachylabiinae* Burr

- 20(19). Mesonotum without any ridge laterally (occasionally a blunt fold may be present) ... *Isolabiinae* Steinmann
- 21(18). 1st antennal segment shorter than the distance between antennal bases
- 22(23). Male genitalia with one of the distal lobes atrophied and virga much reduced ... *Isolaboidinae* Brindle
- 23(22). Male genitalia with both distal lobes and virga well developed ... *Parisolabiinae* Verhoeff
- 24(11). Male genitalia with virga distinct, dilated at base with a distinct inner sinuous tube ... LABIDURIDAE Verhoeff
- 25(26). Mesosternum strongly narrowed posteriorly with tip extending up to middle of metasternum ... *Allostethinae* Burr
- 26(25). Mesosternum posteriorly wider, not strongly narrowed posteriorly
- 27(28). Elytra with a sharp ridge along the costal margin ; legs relatively short, posterior femora not longer than pronotum ... *Nalinae* Steinmann
- 28(27). Elytra without any sharp ridge along the costal margin ; legs longer, posterior femora longer than pronotum ... *Labidurinae* Burr
- 29(10). Pygidium in both sexes forming a flat process with hind margin free ; forceps with branches broad and flat ... *APACHYOIDEA*
(= *APACHYIDAE* Verhoeff)
- 30 (9). Male genitalia with one functional, median distal lobe ... *FORFICULOIDEA*
- 31(36). Second tarsal segment simple ... LABIIDAE Burr
- 32(33). Body strongly depressed ; pronotum anteriorly narrowed forming a sort of neck ... *Sparattinae* Burr
- 33(32). Body may be weakly depressed or convex
- 34(35). Third antennal segment longer than the fifth ; eyes usually large and elytra glabrous and smooth or occasionally finely pubescent *Spongiphorinae* Burr
- 35(34). Third antennal segment almost equal or shorter than the fifth ; eyes usually smaller (excepting *Irdex*) ; elytra generally punctured and pubescent ... *Labiinae* Burr
- 36(31). Second tarsal segment dilated or produced in the form of a narrow lobe below the third segment
- 37(40). Antennae 17-22 segmented ; second tarsal segment spiniform, extending below up to the middle of third, visible from sides only ... CHELISOCHIDAE Burr

- 38(39). Elytra along the costal margin with a sharp ridge, often not complete ... *Chelisochellinae* Steinmann
- 39(38). Elytra along the costal margin without any ridge ... *Chelisochinae* Burr
- 40(37). Antennae 12-16 segmented; second tarsal segment lobed, visible from above on either side of third segment ... *FORFICULIDAE* Stephens
- 41(44). Antennal joints long and slender, 4th longer than the 3rd or almost equal, both of similar build, i.e., slender
- 42(43). Elytra with a sharp ridge along the costal margin ... *Cosmiellinae* Steinmann
- 43(42). Elytra without any ridge along the costal margin ... *Opisthocosmiinae* Verhoeff
- 44(41). Antennal joints shorter and wider, occasionally apical ones long and slender, 4th shorter or almost equal to 3rd but former always wider
- 45(48). Mesosternum broader than long
- 46(47). Elytra with a sharp ridge along the costal margin ... *Allodahlinae* Verhoeff
- 47(46). Elytra without any ridge along the costal margin ... *Anechurinae* Burr
- 48(45). Mesosternum about as broad as long
- 49(50). Forceps generally curved or elongated, cylindrical, not deplanate at base ... *Eudohrniinae* Burr
- 50(49). Forceps in most of the species deplanate in basal half or less, afterwards cylindrical or depressed ... *Forficulinae* Burr

ZOOGEOGRAPHY

(Fig. 16)

Dermaptera or earwigs constitute a well defined group of insects which are mainly distributed in tropical and subtropical parts of the world. They are moisture loving montane insects. Many species are apterous but those which possess well developed organs of flight do not take to wings readily or are not capable of undertaking long flights. Moreover, their secretive habits have also acted to some extent, as limiting factor in the distribution of various species in different zoogeographical regions. Perhaps this may be one of the reasons that a good number of species are confined to a particular area or region.

For the purpose of present study the fauna of India including Andaman and Nicobar Islands, Pakistan, Bangladesh, Nepal, Bhutan and Sri Lanka are treated. It is generally desirable to have, in brief, some idea about the topography of the area for the better understanding of the zoogeography of the group.

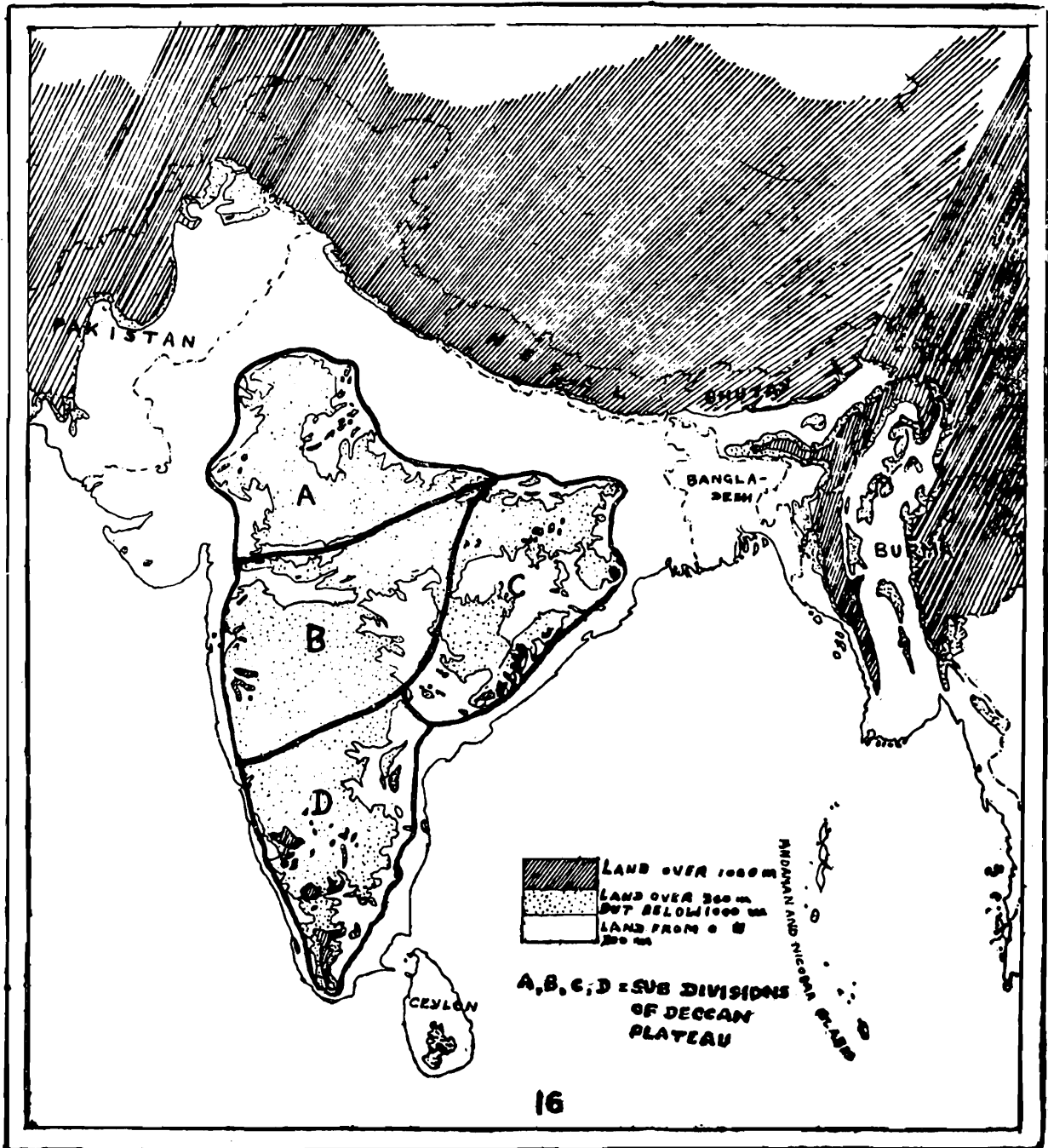


Fig. 16. Map of Indian subcontinent showing important physical features which influence distribution of earwigs and subdivisions of Peninsular or Deccan Plateau viz. A. The Aravallis and the North Western Plateau ; B. Deccan lavas ; C. North Eastern Plateau and D. Southern Uplands.

The "Indian subcontinent" comprises India, Pakistan, Bangladesh, Nepal and Bhutan. It can be divided into following four natural regions, (i) The Northern mountain Ranges which run in the form of

an arc with its convex side on its southern face and extends from Kashmir in the west to the Arunachal Pradesh in the east. The Hindukush, the Karakorum and the Himalayas form parts of it. Besides Sinchula, Patkoi, Lushai, the Arakan Yoma, Garo, Khasi, Jantia and Naga Hills are also included ; (ii) The Northern plain—It extends from Arabian Sea to the Bay of Bengal and was formed by the rivers Ganga, Indus and Brahmaputra and their tributaries. It is situated between Northern mountain ranges and Deccan plateau ; (iii) Peninsular Plateau—it is separated from Indo—Gangetic plain by a raised mass of land comprising several hill ranges and plateaus. It slopes on the east and is surrounded by various hills, the Vindhya and Satpura Ranges in the North ; the Western and Eastern Ghats on either side. It also covers plateaus of Malwa, Chhota Nagpur, Maharashtra and Karnataka and (iv) The narrow Coastal Plains—These lie between Arabian Sea and Western Ghats and Bay of Bengal and Eastern Ghats and both differ from each other topographically. Besides Gujarat plains are also included.

The four sub-divisions of peninsular plateau are : (a) The Aravalli and the North Western Plateau—As the name implies it embraces the Aravalli Ranges, Malwa Plateau, Vindhya Ranges and the area between them and Satpura Ranges ; (b) Deccan Lavas—It extends in North up to Satpura Ranges and South up to northern boundary of Dharwar Dist., Karnataka. Besides, western half of Madhya Pradesh and Maharashtra Plateau including northern portion of Western Ghats also form part of this sub-division ; (c) North Eastern Plateau—It covers eastern half of Madhya Pradesh, Chhota-Nagpur Plateau, Northern part of Eastern Ghats, Chattisgarh Plains and Godavari Valley ; and (d) Southern Uplands—The Karnataka Plateau including Dharwar Dist., southern portion of Western Ghats including Cardamom Hills and southern portion of Eastern Ghats are included.

The Sri Lanka is pear shaped island, close to southern tip of Indian peninsula. It has a central mass of mountains surrounded by a broad stripe of coastal plains. The composition and age of mountain rocks is almost similar to that of great massif of Peninsular India since they originally formed part of the latter.

The accompanying table provides an overall idea regarding the faunal composition of Dermaptera fauna of Indian subcontinent including Sri Lanka. Since so little is known from Andaman and Nicobar Islands it is advisable to point out with asterisks the number of species known for various subfamilies rather than assigning a separate

column in the table. It is evident that a large number of species (59.9%) are spread over North India followed by 40.6% and 18.8% from Peninsular India and Sri Lanka, respectively. Out of 298 species so far known, on the basis of available records, only 18.7 are widely distributed in the Oriental Region, 0.6% in Ethiopian Region which does not take into account those species that are world wide in distribution and amount only 3.4%.

The zoogeography of various subfamilies with remarks on genera and species composition from the area under study is discussed below which clearly indicates distinct pattern of distribution.

Pygidicraninae—It is said to be a primitive subfamily occurring in Oriental, Ethiopian, Australian and Neotropical Regions. Altogether 20 species under 1 genera are represented of which the maximum number i.e., 10 occur in Peninsular India and 6 others are known from North India including Himalayan Ranges. Four species are endemic to Sri Lanka. Strictly speaking only *Cranopygia picta* (Guérin-Méneville) is the only widely distributed species in the Oriental Region besides *C. manipurensis* Srivastava described from Manipur (India) is also found in Thailand. Amongst the North Indian species which are found in Himalayas, only *C. constricta* Hincks, could reach up to an altitude of 3100 m. but is more common at lower elevations like other species. Of the Indian peninsular species only *C. bhallaie* Kapoor occurs in Deccan Lavas and the rest are distributed south of this area. The genus *Cranopygia* Burr, is represented in the Andaman group of Islands as well (Srivastava, 1975).

Diplatyinae—It has less extensive distribution than *Pygidicraninae*, occurring only in Neotropical, Ethiopian and Oriental Regions. The largest concentration appears to be in the Oriental region extending in east up to wallac's line only.

It is represented by 4 genera and 45 species. Judging on the basis of number of species this subfamily appears to be most dominant in Indian subcontinent and is almost evenly distributed in North and Peninsular India. The genus *Schizodiplatys* Steinmann, is recorded from North East India by a single species but its nearest relatives are found in Indo-Chinese and Malayan Subregions extending as far east as in Philippine Islands. Similarly *Paradiplatys* Zacher, is also known by a single species *P. gladiator* (Burr), which has a wider distribution within India, occurring in eastern part of Indo-Gangetic plains (West Bengal), Deccan Lavas and Southern Uplands in Peninsular India. A single ♂ from Udaipur in Z.S.I. collections extends its distribution in West as

Table showing Zoogeographical composition of Dermaptera from the Indian region including Andaman and Nicobar Islands

Families & subfamilies	Genera	Species	O R I E N T A L P E A S W W											
			Indian peninsular	North India including Hima- layas & N. E. mountains	Sri Lanka	Rest of areas								
PYGIDICRANIDAE														
Pygidicraninae	1	20	10	6	4	2	—	—	—	—				
Diplatyinae	4	45	23	21	6	5	—	—	—	—				
Echinosomatinae	1	7**	3	3	1	1	—	—	—	—				
Prolabiscinae	1	1	—	1	—	1	—	—	—	—				
CARCINOPHORIDAE														
Platylabiinae	1	2	1	1	—	—	—	—	—	—				
Brachylabiinae	3	3	1	1	2	—	—	—	—	—				
Isolabiinae	1	5	2	—	3	—	—	—	—	—				
Parisolabiinae	1	2	—	2	—	—	—	—	—	—				
Isolaboidinae	1	2	—	2	—	—	—	—	—	—				
Titanolabinae	1	1	1	—	1	—	—	—	—	—				
Carcinophorinae	9	41	21	18	11	4	2	3	2	2				
LABIDURIDAE														
Allostethinae	2	4	4	—	—	—	—	—	—	—				
Labidurinae	2	14***	4	13	2	4	1	1	1	1				
Nalinae	1	3	1	3	1	1	1	1	1	1				
APACHYIDAE														
Apachyinae	2	2	—	1	1	1	—	—	—	—				
LABIIDAE														
Sparattinae	1	2	2	—	—	—	—	—	—	—				
Labiinae	3	32	12	20	11	13	3	3	3	3				
Spongiphorinae	3	7	6	6	3	4	1	1	1	1				
CHELISOCHIDAE														
Chelisochellinae	1	1	—	1	—	1	—	—	—	—				
Chelisochinae	6	25*	12	14	3	10	1	1	1	1				
FORFICULIDAE														
Allodahlinae	2	9	—	9	—	4	—	—	—	—				
Anechurinae	3	8	1	7	—	—	7	—	—	—				
Forficulinae	4	29	9	23	3	7	3	2	2	1				
Eudohrniinae	3	9	1	9	—	1	—	—	—	—				
Cosmiellinae	1	6	—	6	—	—	—	—	—	—				
Opisthocosmiinae	9	18	7	11	4	6	—	—	—	—				
	67	298	121	178	56	66	39	12	11	10				

* Including one from Andama Isls.

** Including two from Andaman Isls.

*** Including three from Andaman Isls.

P=Palaeartic

E=Ethiopian

AS=Australian

WW=World wide.

well. This genus has greater concentration in Tropical Africa. The genus *Diplatys* Serville, appears to be most dominant in being represented by 21 species, of which *D. brindleyi* Steinmann, is endemic to N. E. Himalayas and *E. papovi* Bey-Bienko, is recorded for the first time from Garo Hills (Meghalaya) which was originally described from South China (Yunnan). Rest of the species are confined to Peninsular India except *D. sinuatus* Hincks, which also occurs in the foot hills of Punjab Himalayas. Amongst the Peninsular species, only six species are restricted to Deccan Lavas only.

Sri Lanka has six species ; all of them are endemic, save *D. fletcheri* Burr which extends in Peninsular India as far north as Satpura Ranges,

It is interesting that *Haplodiplatys* Hincks, is mainly distributed in Himalayas. There are altogether 18 species, of which 12 occur exclusively in N. E. Region including two extending in Malayan Subregion. Majority of them are more common in forested slopes of Himalayas but *D. stemmleri* Brindle, is sometimes found at higher elevation up to 3100 m. Amongst the North Indian (Himalayan) species only *H. rufescens* (Kirby), is able to reach up to Chhota-Nagpur Plateau.

So far, no records are available for this subfamily from Andaman and Nicobar Islands which is perhaps mainly due to lack of exhaustive faunistic survey in the area.

Echinosomatinae—Members of this subfamily are distributed in tropical parts of Africa, Asia and Papua (New Guinea).

The genus *Echinosoma* Serville, is represented by 7 species which include two undescribed species from Andaman Islands. Of the remaining 5 mainland species, 2 are confined to Peninsular India, mainly in Southern uplands whereas *E. parvulum* Dohrn, is found in Sri Lanka, Peninsular and North India, especially along the forested slopes of Himalayas. *E. dentiferum* Borelli and *E. convolutum* are more common in lower altitudes in Himalayas especially in tropical monsoon forest belt. The former is confined to N. E. India but the latter appears to have more extensive distribution in Indo-Chinese and Malayan Subregions.

Prolabiscinae—This subfamily is reinstated in the present study and perhaps represents transitional stage between Pygidicraniodea and Carcinophoroidea and shares the characters of both. It is mainly endemic to Oriental Region and is represented by one species viz., *Parapsalis infernalis* (Burr) which is generally found under the bark of dead and

decaying trees at lower altitudes in Himalayas but surprisingly it has not been able to establish itself in Peninsular India. It also occurs in large numbers in montane regions of Taiwan, China (Yunnan), Java and Philippine Islands.

Platylabiinae—The members of this subfamily have strongly depressed body adapted to living under bark of trees and resemble closely in external appearance with members of Oriental genera *Auchenomus* Karsch (Labiidae : Sparrattinae). This subfamily is endemic to Oriental Region and is represented by one genus and three species.

Platylabia major Dohrn is recorded from Burma, China (Yunnan), Thailand, Sumatra, Java and Philippine and Hainan Islands. Although, it has not been recorded from India there is every possibility of its occurrence in N. E. India. The two other species viz., *P. nathani* Srivastava and *P. brindlei* Srivastava are known by their types from Peninsular India (Anamalai Hills) and N. E. India (Cherrapungi), respectively.

Brachylabiinae—It occurs in most of the regions except Palaearctic. From the area under study, three genera containing one species each is represented. *Geracodes brincksi* Brindle is endemic to Sri Lanka but members of others species of the genus are known to occur in Ethiopian and Neotropical Regions. *Ctenisolabis fletcheri* Burr, occurs both in Southern Highlands of Peninsular India and Sri Lanka. In N. E. Hills and Himalayas, *Metisolabis caudelli* (Burr) is found. The presence of three distinct species with limited distribution in separate distant areas is of interest.

Isolabiinae : Distribution coincides with that of preceding subfamily. Altogether 2 genera and 5 species are recorded. The genus *Nannisolabis* Burr, is represented in Sri Lanka by three species which are endemic to the area whereas *Isolabis* Verhoeff, is known to occur in Southern Uplands of Peninsular India.

Parisolabiinae : The distribution is almost same as for the preceding two subfamilies. Only two species are known from Himalayas.

Isolaboidinae : This subfamily is endemic to Himalayas in which one distal lobe is completely atrophied and the vestige of virga is the only indication of its presence. Two species viz., *Isolaboides burri* (Borelli) and *I. tenera* (Burr) are known. Besides *I. jonathani* (Kapoor & Katiyar) and *I. santokhi* (Kapoor & Katiyar) are described from Himalayas and perhaps represent mere varieties of either of the above two species.

I. burri commonly occurs in large numbers between 2000 and 2500 m but it occasionally occurs even at higher altitudes as well i. e., from 3000 to 3500 m.

Titanolabiinae : This subfamily is erected by Srivastava (1982a) for those carcinophorid species which possess meso-and metasternum oval, more or less tongue shaped with posterior margin convex.

It includes only two genera and three species viz., *Titanolabis colossea* (Dohrn) from New Guinea and *T. maindroni* (Borelli) from Peninsular India and Sri Lanka. Besides, *Paratitanolabis bormansi* Srivastava, is endemic to Burma. Distribution of this subfamily presents a curious picture, at present, in being represented in New Guinea on one hand and Peninsular India, Sri Lanka and Burma on the other.

The absence of sexual dimorphism through morphological characters, sturdy build and external similarity in most of the species lends support that this subfamily represents a primitive group among Carcinophoroidea.

Carcinophorinae : This subfamily is almost world wide in distribution.

In the present work the generic arrangement proposed by Burr (1915) is followed. Altogether 9 genera comprising 39 species are known.

Gonolabis Burr, is recorded by two species endemic to Sri Lanka whereas *Aborolabis* Srivastava, is mainly distributed in Himalayas by five species, one of which is undescribed. The latter, according to Steinmann (1979) has two epicentres ; one in Himalayas and the other in the Iberian Peninsula and Palaeartic North Africa.

Out of the four species of *Apolabis* Burr, only one is known from N. E. India and the remaining are confined to Peninsular India.

Most widely distributed genus *Anisolabis* Fieber, is poorly represented since only four species are known. *A. gaudens* Burr, is based on females and nymphs with uncertain taxonomic position and *A. deplanata* Srivastava, are recorded from outer Himalayas and the other two *A. kudagae* Burr and *A. rubella* Brindle are endemic to Sri Lanka.

Members of the genus *Gelotolabis* Zacher and *Epilabis* Burr, are distributed only in Peninsular India. Former has concentration in South China besides being distributed in East Africa and the latter is found to occur only in South India.

Genus *Paralabis* Burr, is distributed in Liberia, Okinawa and India and adjacent countries. It is represented by five species which include one undescribed species endemic to N. E. Himalayas. Besides, *P. montshadskii* Bey-Bienko, although found in N. E. Himalayas, is also distributed in China (Yunnan). *P. greeni* (Burr) is endemic to Sri Lanka and *P. lefroyi* (Burr) to Southern Uplands of Peninsular India. *P. dohrni* (Kirby) appears to be most widely distributed in being recorded from Sri Lanka and India (Peninsular Plateau and a single record from Sadiya, Assam).

The genus *Euborellia* Burr, is one of the most widely distributed genera. Eleven species, of which two are of doubtful taxonomic position, are known. *E. annulipes* (Lucas), *E. stali* (Dohrn) and *E. femoralis* (Dohrn), are widely distributed in the Oriental Region but the first one occurs all over the world.

E. compressa (Borelli), originally described from Uganda, Mozambique and Congo (Africa) is known to occur in Chitral (Hindukush Ranges, Pakistan) and in Peninsular India. Two species are described from Rajasthan whereas other three are restricted to N. E. Himalayas in the forested belt.

Epilandex Hebard, is confined to the Oriental Region and extends further east via Sunda Islands to Papuan Sub Region in Bismarck Archipelago and Solomon Isls.

Only two species are recorded from Sri Lanka of which *E. bazyluki* Steinmann, endemic to the area and *E. burri* (Borelli), although widely distributed in the Oriental Region has not been recorded so far from North India.

Allostethinae : It is confined to Oriental Region and is characterised by the mesonotum being strongly narrowed posteriorly. In India it is represented by two genera and four species, all of them are confined to Southern Uplands of Peninsular India.

On the basis of present distribution of various genera and species it may be presumed that this subfamily has a strong hold somewhere in Sunda Islands. And the Indian species represent the derivatives of Malayan element in Peninsular India.

Labidurinae : It is almost world wide in distribution, Two genera and 14 species are represented from the area under study.

Labidura Leach, is recorded by two species viz., *L. riparia* (Pallas), world wide in distribution and *L. dharchulensis* Gangola, known by Types only from Garhwal Himalayas (India).

The genus *Forcipula* Bolivar, is well established in the Oriental Region and is known to occur in Africa, South America and Australia. From the available literature 11 species are recorded. Besides, one undescribed species is also represented in Indian fauna from outer Himalayas.

F. leonardi Steinmann, is described on a ♀ from Andaman Isls (Port Blair). Besides, *F. trispinosa* (Dohrn) is also reported from said Isls but this record is based on females only.

Most of the species are distributed in North, commonly found all along the Himalayas. *F. lurida* Bolivar, is endemic to Peninsular India. Most extensive distribution appears to be of *F. quadrispinosa* (Dohrn), since it is found in India (North as well as peninsular), Sri Lanka, Nepal, Sikkim, Burma, Thailand, Vietnam, Kampuchea, Java, Philippine Islands, Reunion, Mauritius and Afghanistan. In this respect, next is *F. trispinosa* (Dohrn) which occurs all along the Himalayas from East to West, Hindukush Ranges and Afghanistan. In Himalayas this species is reported even at higher elevations between 1000 and 2500 m. The members of genus *Forcipula* are commonly found under stones on the edge of rivers and streams. Perhaps, occurring along the course of rivers through deep gorges, they are occasionally able to establish themselves at higher elevations in Himalayas. N. E. India has two endemic species viz., *F. aborensis* Brindle and *F. borellii* Chopard. Besides, the presence of *F. clavata* Liu in N. E. India indicates the impact of Indo-chinese element in the area.

Nalinae : Distributed in Ethiopian, Oriental and Southern fringes of Palaearctic Region.

Only three species are recorded. *N. lividipes* (Dufour) is distributed world wide whereas *N. nepalensis* (Burr) is quite common in the forested belt of Himalayas and mountains of Indo-Chinese Sub-region. The third species viz., *N. basalis* Bey-Bienko, is at present known from types and is recorded from N. W. Himalayas in Pakistan. Perhaps it may have much more extensive distribution in Himalayas.

Apachyinae : This is a small distinctive group in having strongly depressed body which is well suited for living under the bark of trees. It is well established in the Oriental Region and is able to reach via Sunda Islands to Papua and Australia in the far east. It also occurs in Ethiopian Region.

Two genera and two species are recorded from the area under study. The genus *Dendroketes* Burr, is represented by *D. corticinus* Burr,

endemic to Sri Lanka whereas *Apachyus* Serville, is represented by *A. feae* Bormans which is found in N. E. India and extends further eastwards in the mountains of Burma and Vietnam. The latter indicates the presence of Indo-Chinese forms in N. E. India.

Sparattinae : Members of this subfamily are strongly depressed and are mainly distributed in Central and South America. In the Oriental Region a single genus *Auchenomus* Karsch, is represented, which is well distributed in Sunda Islands, Philippine Isls and Papua (New Guinea) Subregion of Australian Region. Besides, a single species is recorded from Malagasay (Madagascar).

Strangely enough two species viz., *A. hincksi* Ramamurthi and *A. nathani* Ramamurthi, are endemic to Southern Uplands of Peninsular India which indicates the presence of Malayan element in the area.

Labiinae : This subfamily is distributed in all parts of the World with strong hold in the Oriental Region. Judging on the basis of number of species it appears to be most dominant, next to Diplayinae, in the Indian fauna.

It is represented by 3 genera and 33 species. The genus *Labia* Leach, includes 7 spp., of which three are cosmopolitan in distribution. *L. fulleri* Ramamurthi is endemic to N.E. Himalayas whereas *L. legoci* (Fernando) and *L. rotundiformes* Hincks, are confined to Sri Lanka. Besides *L. bormansi* Srivastava, is found in Burma but extends Westwards in N.E. Himalayas (Manipur).

The most variable species *L. lutea* (Bormans), appears to be widely distributed in the Oriental Region. At present several variants of this species are considered as valid species which perhaps may prove to be synonym when detailed investigations are taken up during the course of preparation of subsequent parts of this volume.

The genus *Irdex* Burr, is mainly Oriental but extends eastwards via Sunda Islands up to Papuan Subregion. It is represented by 7 species of which 1 is confined to Sri Lanka ; 2 to Peninsular India and 3 to mountain region of N.E. India. *I. pilosus* (Bey-Bienko), originally described from S. China (Yunnan) is recorded from Bhutan, which may be taken as derivative of Indo-Chinese element in the fauna of N.E. India or vice versa.

The genus *Chaetospania* Karsch, is another widely distributed genus in the Oriental and Ethiopian Regions which includes 11 species known from the area under study. Of these 2 species are endemic to Sri Lanka and 3 others to Peninsular India. *C. nigriceps* (Kirby) and *C.*

thoracica (Dohrn), although occur in Indo-Chinese and Malayan Subregions, appear not to have been recorded from N.E. and N.W. India (Himalayas) but are common in Peninsular India, especially in Southern Uplands. Unlike above two species *C. feae* (Bormans) is quite common in Indo-Chinese and Malayan Subregions and is confined to N.E. Himalayas in Indian subcontinent. *C. malaisei* Hincks, described from N. Burma is recorded from Arunachal Pradesh in N.E. Himalayas, on a single female. *C. kurseongae* Hebard, is described from N.E. India and occurs in Philippine Isls as well. However, *C. shillongensis* Srivastava, is known by its types from Khasi Hills (India).

Spongiphorinae : It is one of the most widely distributed subfamilies but more common in tropical part of the globe. However, it is more dominant in the Neotropical Region. It is represented in Ethiopian and Australian Regions by the genera *Marava* Burr and *Spongovostox* Burr, on basis of a few species only. And the genus *Homotages* Burr, is restricted to Himalayas and mountains of Burma.

Marava Burr, is represented by a single cosmopolitan species, *M. arachidis* (Yersin). Only four species of *Spongovostox* Burr, are recorded, of them two are endemic to Peninsular India and the other two are widely distributed in the Oriental Region including Sri Lanka.

Chelisochellinae : This subfamily is endemic to Oriental Region. In India, *Chelisochella superba* (Dohrn), was reported from Sikkim (Burr, 1910) which is otherwise widely distributed in Oriental Region. The members of this subfamily can be easily separated by the presence of a ridge along the costal margin of the elytra.

Chelisochinae : It is mainly distributed in the Oriental Region although a few species are recorded from Africa in the West and Papua and Australia in the South East. Besides, *Chelisoches morio* (Fabricius) appears to be world wide in distribution, probably due to human activities.

Six genera and 25 species are recorded from the area under study.

Solenosoma Burr, which is known by a single species, is endemic to N. E. India, Burma and S. China.

Proreus Burr, has 5 species and 1 subspecies, of which one is endemic to Sri Lanka ; two known from Peninsular and N. India and one each endemic to Peninsular India and N. E. India, respectively.

P. weisi (Burr), is reported from N. E. India (Srivastava, 1985) which was hitherto known from Thailand.

All the three species belonging to *Chelisoches* Burr, are distributed in other parts of the Oriental Region. Although *C. morio* (F.) is world wide in distribution, its occurrence in N. India is not yet confirmed. The previous records of this species from N. E. India are referable to *C. brevipennis* Borelli, which was originally described from Philippine Isls. Besides *C. ritsemae* Bormans, is another Oriental species which has been recorded from Andaman Isls.

Adiathetus Burr, is endemic to Oriental Region but it is not reported from Sri Lanka. Amongst the Indian species there appear to be two groups, one which are confined to Peninsular India and the other known to occur in N. E. Himalayas. But interestingly enough most of them are distributed in Indo-Chinese and Malayan Subregions. Moreover, the absence of this genus in Sri Lanka seem to suggest that members have their epicentre in Indo-Chinese and Malayan Subregions and are now well established in Peninsular and N. E. India, especially in the mountain regions.

Laprophorella Mjöberg, is an Oriental genus with a single species *L. kervillei* (Burr), which was originally described from Java, is known to occur in large numbers in bamboo stem sheath and bark of trees in N. E. India (in hills as well plains). Its presence is indicative of Malayan element in the faunal composition of N. E. India.

The distribution pattern of various species (six in total) of *Hamaxas*, Burr, is almost similar to that of *Adiathetus* Burr, except that this genus occurs in Sri Lanka also.

H. delicatulus (Burr) is endemic to Sri Lanka whereas *H. kempi* Burr and *H. tigris* (Burr) are restricted to N. E. Himalayas. *H. melanocephalus* (Dohrn) together with *H. bidentatus* Ramamurthi occur in Peninsular India but the former is widely distributed in the Oriental Region. *H. feae* (Bormans), although known from N. E. India, Indo-Chinese and Malayan Subregions is not reported from Peninsular India.

Allodahlinae : It can be separated from *Anechurinae* by the presence of a raised ridge along the costal margin of elytra. Members of this family are mainly distributed in the Himalayan mountains or in the northern limits of Oriental Region adjacent to Palearctic Region.

Two genera and 9 species are represented. The genus *Brindleiana* Steinmann, besides type should also contain *Anechura martensi* Brindle, since the elytra are obliquely truncate in this species. It is found at higher altitudes in Himalayas. The other genus *Allodahlia* Verhoeff,

contains 8 species, all of them are more common in Himalayas between 1200 and 2500 m, some of them are occasionally found even at higher elevations up to 3400 m. Barring *A. gutae* Kapoor, *A. ahrimanes* (Burr) and *A. julkai* Srivastava, which are restricted to mountains of N. E. India, rest are more widely distributed in the mountains of Indo-Chinese and Malayan Sub-regions also. The preponderance of these species shows that middle and inner Himalayas possess in their fauna derivatives of Palaearctic element.

Anechurinae : This is mainly Palaearctic in distribution and in the Oriental Region it occurs at elevations ranging between 1600 and 4200m.

Three genera and 8 species are recorded from the area under study. The genus *Anechura* Scudder and *Lipodes* Burr are represented by 6 and 1 species, respectively. All are found throughout the Himalayas except *Lipodes vivax* Burr, which is endemic to N.E. Himalayas.

The third genus *Neopterygida* Srivastava (= *Pterygida* Verhoeff) is known by a single species *N. circulata* (Dohrn) which has curious distribution in Peninsular India. The holotype ♂ of this species is recorded from Madras without any further data. Besides, type it is further recorded on 1 ♂ from N. India stated to be present in Oxford University Museum. This species is quite characteristic in having the body strongly depressed which makes it quite distinct from other anechurid species.

Forficulinae : It is considered as one of the highly evolved sub-families of the Order and is distributed all over the world.

It is represented by 4 genera and 29 species. *Elaunon* Burr, contains two species viz., *E. bipartitus* (Kirby)—almost distributed world wide and the other *E. gangoli* Gangola, known only by types from Kumaon Hills.

The genus *Guanchia* Burr, is Palaearctic or occurring on the northern fringes of Oriental Region in Himalayas. But strangely enough *G. medica* Burr, is confined to Southern Uplands of peninsular India. The other two are endemic to Himalayas.

The most widely distributed genus *Forficula* L. occurs mainly in Palaearctic Region and the area adjoining to it from Ethiopian and Oriental Regions. Altogether 22 species are recorded from India, Pakistan, Bangladesh, Bhutan, Nepal and Sri Lanka. Of these, *F. greeni* Burr, is distributed in Sri Lanka and Peninsular India ; *F. genitalia* Kapoor in Southern Uplands of Peninsular India and *F. baijali* Kapoor

and *F. gravelyi* Burr from Deccan Lavas. Remaining all are distributed in Himalayas between 1500 and 3600 m. There is a large concentration of species in N.E. Himalayas some of which extend into Indo-Chinese Subregion but in the Northern limits, adjoining Palaearctic Region.

The genus *Hypurgus* Burr, is distributed in Ethiopian and Oriental Regions. Only two species are recorded viz., *H. humeralis* (Kirby) occurring in Sri Lanka and rest of Indian Subregion and other parts of Oriental Region and *H. grata* (Hebard) is endemic to mountains of N.E. India.

Eudohrniinae : This Subfamily is mainly Oriental and occurs in Taiwan also.

Three genera and 9 species are recorded from India and adjacent countries. *Endohrnia* Burr, has only one species, *E. metallica* (Dohrn) which is quite common in Indo-Chinese Subregion. In India it is recorded from the southern forested slopes of Himalayas. It is also reported from Satpura Ranges but does not occur further down South. It represents Indo-Chinese element in the fauna of N.E. India which could transgress only up to Deccan Lavas.

Paradohrnia Shiraki was originally described from Taiwan but now it is represented by 4 species from the area under study, of which three are confined to N.E. Himalayas and the fourth viz., *P. mundgodae* (Kapoor, Bharadwaj and Banerjee) is found only in Deccan Lavas.

The genus *Pterygida* Verhoeff, 1902. (= *Kosmetor* Burr, 1904) has been redefined by Srivastava (1984). It is mainly Oriental and is represented in Indian Subcontinent by 4 species, all of which are restricted to N.E. India.

Cosmiellinae : This is predominantly Oriental but occurs in Ethiopian Region as well. In India a single genus *Liparura* Burr, is recorded by 6 species, all of which are confined to N.E. India (Himalayas).

Opisthocosmiinae : A predominantly Oriental in distribution but it has been able to extend in Neotropics as well as Papuan (New Guinea) Subregion also.

From the area under study 9 genera and 18 species are recorded. Of these, genus *Obelura* Burr (= *Syntonus* Burr) is confined to Peninsular India and Sri Lanka. The 3 species recorded for the genus are, *O. neolobophoroides* (Burr)—endemic to Sri Lanka ; *O. asiatica* (Bormans) and *O. tamul* Burr—restricted to S. India.

The genus *Sondax* Burr, has *S. repens* Burr, endemic to Peninsular India.

Parasondax Srivastava. is endemic to S. India and is based on a single species.

Paratimomenus Steinmann and *Pareparchus* Burr, although Oriental in distribution are represented in Indian Subcontinent by one species each confined to Peninsular India.

North Eastern India has also one endemic genus i. e., *Prosadiya* Hebard with *P. tricota* Hebard, found in Assam plains.

A purely Oriental genus, *Timmomenus* Burr, is represented by 6 species, all of which are found in N.E. India. Of these *T. lugens* (Bormans) is widely distributed in Indo-Chinese Subregion also.

Eparchus Burr, includes two species viz., *E. insignis* (Haan) and *E. simplex* (Bormans). Former is quite common throughout the Oriental Region whereas the latter is recorded from Himalayas and extends in Indo-Chinese Subregion but it is strangely absent in Peninsular India and Sri Lanka.

Cordax Burr, is distributed in the Oriental and Ethiopian Regions only. It is known by its type species *C. armatus* (Haan) which occurs in N. E. India (Himalayas) and various countries falling under Indo-Chinese Subregion. Besides two more species are provisionally included under this genus one of them, *C. ceylonicus* (Motschulsky) is endemic to Sri Lanka and the other (*C. politus* Burr) is recorded from N. E. Himalayas and Burma.

Thus from the foregoing account it becomes evident that Indian subcontinent can be divided into two zoogeographical zones viz., Indian Peninsular and North Indian. Besides Sri Lanka which although shows closeness with the fauna of Southern portion of Peninsular India may also be treated as a separate zone. Perhaps in future, when the Andaman and Nicobar groups of Islands are adequately explored they may merit the recognition of a separate zone. From the available records of Dermaptera it would be seen that fauna of Andamans is essentially derived from the Oriental Region. This fact is further borne out since the Islands represent the exposed tops of Arakan Yoma ranges of Burma. As far as the knowledge of Dermaptera of Nicobar is concerned practically nothing is known at present. However, the proximity of Nicobar group of Islands especially Great Nicobar to Sumatra suggests the possible influence of Malayan element in the fauna

of these islands. The rainfall pattern, location, orography and the forest cover is indicative of rich Dermaptera fauna in the area.

The Indian Peninsular zoogeographical zone has a more or less continuous mountain ranges on western flank known as Western Ghats which enjoy over 200 cm of average annual rainfall on their western windward side. As a result there is a belt of tropical rain forest merging with tropical monsoon deciduous forests towards eastern sides. These mountain forests not only provide refugial but favourable breeding spots for Dermaptera. In the east, Eastern Ghats have the broken chain of hills which receive less rainfall resulting into sparse forest covers. The Dermaptera are concentrated on these hills tops but are less pronounced in numbers.

The peninsular mountains are residual mountains and represent a stable block together with rest of plateau. Save for human interference the ecosystem appears to be more or less stable and harbours the relicts of older fauna which have reached to a stage of evolutionary stegnation (Mani, 1968).

The interesting genera *Parasondax* Srivastava, is endemic to Peninsular India and is based on a single species. Besides, there are about 35% species endemic to the area, of which a large number are confined to Southern Uplands, followed by a small number restricted to Deccan Lavas.

It is observed that Deccan Lavas with Vindhya and Satpura ranges running from North East to South West act as area of meeting point for the North Indian and Peninsular Indian forms. Besides, it serves as southern limit for the former and Northern one for the latter. The traces of Ethiopian and Malayan element are also found.

The North Indian biozoogeographical zone has main concentration of fauna on the forested slopes of Himalayas and other mountains and hills. Besides, there are certain High altitude forms which occur above 3000 m in the Himalayas and represent the dominance of Palaearctic element. There appears to a great variation in the rainfall, forest cover and the density of species from North East to North West.

The North Eastern part is more humid and has a pronounced effect of Indo-Chinese and Malayan elements. About 130 species are recorded which represent a little less than half of the fauna of the Indian subcontinent.

The North Western part is comparatively drier and those faunal elements which are dominant in N. E. become gradually weaker or

insignificant toward this end. According to Srivastava (1982) extreme N. W. part of Himalayas comprising Hindukush ranges, especially Chitral area serves as zone of transgression and intermingling for North Asiatic forms via Afghanistan on one hand and Western Himalayan on the other.

The plains of North India are inhabited mostly by common species which are of world wide distribution. The paucity of fauna is mainly due to shrinkage of natural habitats of these insects. This is the result of human activity on the environment.

In view of the climatic condition and the faunal composition, Sri Lanka is treated here as a separate zoogeographical zone. Altogether 46 species, excluding 9 cosmopolitan ones, are recorded. Of these a little over 52% are endemic and nearly 1.3% species are common to Sri Lanka and Peninsular India. The poor representation of Indian peninsular element in the island suggests that Dermaptera fauna of the latter diversified at a considerable earlier times. Besides, in the light of impoverished fauna in Northern part of Island, there appears to be no influx of fauna from Indian peninsula in recent times which is separated by a narrow strait of 29 kms only.

SYSTEMATIC ACCOUNT

Order DERMAPTERA

Dermaptera De Geer 1773, *Mem. Hist. Ins.*, 3 : 399 (in part) ; Kirby, 1815, *Trans. Linn. Soc. Lond.*, 11 : 87 (As a separate Order) ; Dohrn, 1862, *Stettin ent. Ztg.*, 23 : 225 ; Verhoeff, 1902, *Zool. Anz.*, 25 : (665) : 201 ; Burr, 1904, *Trans. R. ent. Soc. Lond.* : 277 ; Burr, 1909, *Dt. ent. Z.* : 320 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 30 ; Burr, 1911, *Genera Insect.*, 122 : 6 ; Zacher, 1911, *Zool. Jb.*, 30 : 303 ; Bruce, Melander and Carpenter, 1954, *Bull. Mus. comp. Zool. Harv.*, 108 : 112 ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 5 ; Popham, 1965, *J. Zool.*, 146 : 1-43 ; Popham, 1965 ; *Entomologist*, 98 : 126 ; Steinmann, 1975, *Acta zool. Acad. Sci. Hung.*, 21 : 195 ; Sakai, 1976, *Dermapterorum Cat. Prael*, 8 : 4.

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Forficulodea Bolivar, 1893, *Rev. biol. Nord. France*, 5 : 447.

Dermatteri, Macagno, 1933, *Boll. Musei. Zool. Anat. comp. R. Univ. Torino*, 43 : 241.

Linnaeus (1758) included these homogenous group of insects under Coleoptera owing to their external resemblance with Staphylinidae. Subsequently, Olivier (1772) transferred them under Orthoptera. The name Dermaptera was first coined by Dee Geer (1773) and Kirby (1815) was first to use it in modern sense. However, opinion regarding the status of these insects was divided—some treated them as a distinct Order whereas others considered them as a family or superfamily of Orthoptera. Even the name Dermaptera was not fully accepted and several new names were proposed by earlier workers on the group from time to time which is evident from above synonymy.

Superfamily PYGIDICRANOIDEA

=*Protodermaptera* Zacher, 1911, *Zool. Jb.*, 30 : 306.

=*Diandra* Verhoeff, 1902, *Zool. Anz.*, 26 : 201.

Pygidicranoidea Bruce, Melander & Carpenter, 1954. *Bull. Mus. comp. Zool. Harv.*, 108 : 13 ; Steinmann, 1975, *Acta Zool. Acad. Sci. Hung.*, 21 : 199, 200 ; Richards, O. W. and Davis, R. G., 1977, *Imms General Textb. Ent.* : 578.

Body generally covered with short and long pubescence. Legs with femora mostly carinate. Anterior and posterior cervical ventral sclerite separated from each other, occasionally posterior one meeting with apical margin of prosternum. Genitalia with two functional distal lobes often one of them may be reduced.

Family PYGIDICRANIDAE

Pygidicranidae Verhoeff, 1902, *Zool. Anz.*, 25 : 188, 202.

Pygidicraniales Zacher, 1910, *Ent. Rdsch.*, 27 : 105.

Pygidicranales Zacher, 1915, *Zool. Anz.*, 45 : 528.

The characters given under the superfamily hold good for the family also.

Subfamily PYGIDICRANINAE

Pygidicraninae Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 383.

♂ : Size median to large (20-50 mm), rarely smaller (20 mm or so). Build stout, body covered with fine pubescence, forming a matt, occasionally provided with long pubescence of shaggy hairs. Uniformly coloured or variegated or with varying shades on certain body parts. Elytra and wings often with characteristic stripes. Head triangular, sutures distinct, eyes usually prominent. Antennae usually over 35 segmented, 1st segment stout ; 2nd about as long as broad ; 3rd longer than broad, almost equal to 4th and 5th together ; 4th and 5th broader than long, 7th onwards segments gradually increasing in length and thinning, apical ones thin and slender, gently expanded apically. Pronotum about as long as broad or longer. Elytra and wings well developed, often former abbreviated and latter abbreviated or obsolete. Legs stout, strongly pubescent, femora compressed and longitudinally with sharp ridges, tarsi with 1st segment normal or swollen ; 2nd segment small, rarely enlarged, claw with arolium. Abdomen convex, parallel sided or spindle shaped. Penultimate sternite ample, broadly rounded posteriorly with slight emargination in middle or occasionally incrassate. Ultimate tergite transverse, disc convex, laterally with a rugose fold or carina, often absent. Pygidium vertical, metapygidium and telson distinct but visible only on removal of penultimate sternite. Forceps straight in most part, apically incurved to varying degrees, contiguous, subcontiguous or strongly curved from base itself.

♀ : Agrees with males in most characters except that penultimate sternite obtusely triangular posteriorly ; ultimate tergite comparatively narrowed posteriorly and forceps generally simple, straight, contiguous or subcontiguous. Gonapophyses of 8th sternite at base dilated but apically thin and long, projecting beyond the posterior margin of penultimate sternite and those of 9th shorter and broader.

Type genus : *Pygidicrana* Serville, 1831.

Distribution : Oriental, Ethiopian and Neotropical Regions.

Genus *Cranopygia* Burr

Cranopygia Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 384, 389 (Type—*Pygidicrana cumingi* Dohrn).

Pygidicrana (pars) Serville, 1839, *Hist. Nat. Inst. Orth.* : 30.

Pyge Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 384, 390 (Type—*Pygidicrana modesta* Bormans).

Dicrana (pars) Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 384, 387.

Picrana (pars) Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 390.

Kalocrania Zacher, 1910, *Ent. Rdsch.*, 27 : 106 (Type—*Pygidicrana marmoricrura* Serville).

Acarina Burr, 1915, *J. R. micr. Soc.*, 1915 : 432, 436 (Type—*Pygidicrana picta* Guérin-Méneville).

Sakai (1882) in his newly proposed classification of the Order, quoting steinmann's work (in press) records several genera erected by him as a result of splitting the compact genus *Cranopygia* Burr. Since the details of those are not available, the interpretation of this genus in the present work is that of Hincks (1959). The general character given for the subfamily are applicable to the genus also.

Key to the species
(based on males only)

- | | |
|---|--------------------------------|
| 1(2). Virga stout with well marked lateral flanges
(=Brindlei Group) ... | <i>C. brindlei</i> sp. n. |
| 2(1). Virga stout or slender without any lateral flanges | |
| 3(24). Distal lobe shorter than whole armature excluding parameres | |
| 4(5). Virga apically bifurcate ... | <i>C. bifurcata</i> Srivastava |
| 5(4). Virga simple, apically not bifurcate | |
| 6(7). Virga at rest characteristically bent or placed, with a well marked sclerotised process near base (=Siamensis Group) ... | <i>C. assamensis</i> Hincks |
| 7(6). Virga at rest simple, short, stout and straight or long, slender and feebly undulate, without well marked sclerotised process near base | |
| 8(9). Forces straight or curved, virga with a specialised, somewhat thickened area near apex ... | <i>C. dravidia</i> (Burr) |
| 9(8). Forceps straight, contiguous throughout or in basal half or subcontiguous ; virga normal, tubular without any specialised area near apex, longer than distal lobes and undulate or shorter and stout (=Cumingi Group) | |
| 10(11). Elytra abbreviated in the form of broad ovate lobes, not meeting along the sutural margin ; parameres with inner process pointed ... | <i>C. parva</i> Brindle |
| 11(10). Elytra if abbreviated, not as above, or generally well developed ; inner process of paramere bifid apically | |

- 12(13). Penultimate sternite with a small deep emargination in middle posteriorly ; virga internally with a small tubercle, a little before middle ... *C. manipurensis* Srivastava
- 13(12). Penultimate with a shallow emargination in middle posteriorly ; virga internally without any tubercle
- 14(19). Virga longer than distal lobes
- 15(16). Elytra abbreviated with anal margin oblique, exposing a large scutellum, ultimate tergite laterally smooth (not cristate) ; virga stouter apically forming a coiled loop ... *C. bhallaie* Kapoor
- 16(15). Elytra normal, anal margin oblique but scutellum small ; ultimate tergite cristate laterally ; virga slender, weakly undulate but not forming loop apically
- 17(18). Pronotum blackish brown with sides feebly yellow ; ultimate tergite striate, more so in posterior half only ; forceps near base with a small vertical tooth on external margin ; parameres comparatively broader with external angle distinctly projecting ... *C. nietneri* (Dohrn)
- 18(17). Pronotum yellow with a broad blackish brown stripe on either side of middle line ; ultimate tergite obscurely punctulate ; forceps near base with a small convexity on external margin ; parameres comparatively narrower with external angle short and weak ... *C. cumingi* (Dohrn)
- 19(14). Virga about as long as or shorter than distal lobes
- 20(21). Size small (16-22 mm, including forceps) ; ultimate tergite not cristate laterally ; parameres with external angle short and weakly projecting ... *C. burri* Hincks
- 21(20). Size larger (23-31.5 mm, including forceps) ; ultimate tergite cristate in posterior half laterally ; parameres with external angle more prominent
- 22(23). Pronotum and elytra blackish, former pale along the middle line and lateral margin ; forceps near base on external margin with a vertical triangular tooth ; parameres with external angle rounded apically and inner process shorter in relation to it ... *C. kallipygos* (Dohrn)

- 23(22). Pronotum yellow with two broad brownish black stripes on either side of middle line ; forceps near base on external margin with a feeble triangular prominence ; parameres with external angle apically pointed and inner process larger in relation to it ... *C. raja* (Burr)
- 24(3). Distal lob about as long or longer than the whole armature, excluding parameres
- 25(28). Parameres with an external apical angle prominent
- 26(27). Parameres narrower, about twice as long as broad, external angle pointed apically and inner process with tip pointed (not bifid) ... *C. eximia* (Dohrn)
- 27(26). Parameres broader, only slightly longer than broad, external angle less prominent ; inner process at tip with two minute points ... *C. vittipennis* Hincks
- 28(25). Parameres with external margin convex
- 29(30). Penultimate sternite with caudal margin thickened ; ultimate tergite strongly rugose *C. picta* (Guérin-Méneville)
- 30(29). Penultimate not thickened posteriorly ; ultimate tergite less strongly rugose
- 31(32). Size large (34-37 mm, including forceps) ; ultimate tergite ecarinate ... *C. steinmanni* sp. n.
- 32(31). Size smaller (22.6-34 mm, including forceps) ; ultimate tergite carinate
- 33(34). Distal lobes and virga longer in comparison to whole armature ... *C. fletcheri*
Kapoor and Bharadwaj
- 34(33). Parameres and virga shorter in comparison to whole of armature ... *C. constricta* Hincks

Cumingi—Group

1. *Cranopygia cumingi* (Dohrn)

(Figs. 17-21)

Pygidicrana cumingi Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 54 (♂ ; Ceylon) ; Scudder, 1986, *Proc. Boston Soc. nat. Hist.*, 18 : 328 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 21 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 71 ; Kirby, 1904, *Syn. Cat. Orth.*, 1 : 5.

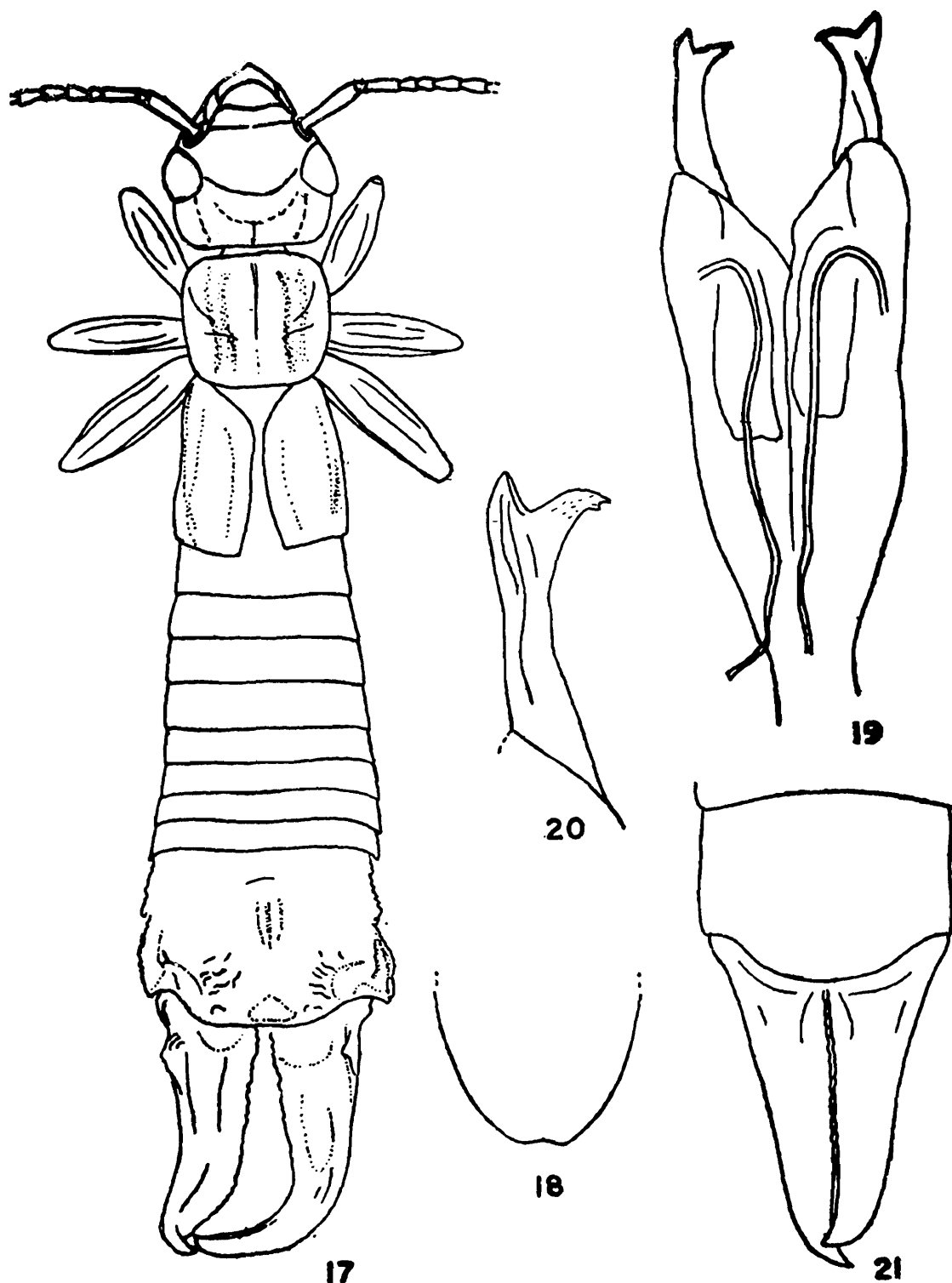
Cranopygia cumingi ; Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 389 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 62 ; Burr, 1911, *Genera Insect.*, 122 : 19 ; Burr, 1913, *J. Asiat. Soc. Beng. (N. S.)*, 9 : 183 ; Burr, 1915, *J. R. Micr. Soc.*, 1915 : 435, pl. 7, fig. 2 (♂ genitalia) ; Borelli, 1931, *Revue. suisse Zool.*, 38 : 298 (♀ ; South India) ; Hincks, 1955, *Syst. mono. Dermaptera*, 2 : 55 (excl. India and fig. 43) ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 133 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. Pap.*, 2 : 1 ; Steinmann, 1979, *Folia Ent. Hung.*, 32(1) : 151, figs. 1, 2.

Cranopygia cumingi v. *greeni* Burr, 1910, *Fauna Brit. India Dermaptera* : 62 (Ceylon).

♂ : General colour blackish brown. Antennae yellowish brown with basal two segments darker. Head with a broad yellow spot in middle. Pronotum yellowish brown with a broad stripe of blackish brown on either side of the middle line. Elytra and wings yellowish brown, former with margins blackish brown. Some of the basal abdominal tergites yellowish brown in middle. Build stout, finely pubescent on abdomen ; pronotum and elytra with short stiff hairs, a few long hairs also present on certain body parts.

Head about as long as broad, smooth, frons and occiput weakly depressed in centre, sutures fine but median one more distinct, hind margin feebly emarginate in middle. Eyes moderately prominent, about as long as post-ocular length. Antennae 25-segmented or more, 1st stout, expanded apically, about as long as the distance between antennal bases ; 2nd short transverse ; 3rd long and slender, about as long as the combined length of 4th and 5th ; 4th longer than broad, gently expanded apically, remaining gradually increasing in length. Pronotum slightly longer than broad, sides scarcely convex in middle, hind margin subtruncate, median sulcus complete and fairly distinct, prozona convex, distinctly differentiated from flat metazona. Legs normal. Elytra meeting along the median suture, hind margin truncate, axillary angle round off, showing a large triangular scutellum. Abdomen smooth, covered with thick fine yellow pubescence, convex, gradually enlarging posteriorly. Penultimate sternite finely pubescent, narrowed posteriorly with a slight emargination in middle. Ultimate tergite obscurely striate posteriorly, transverse, disc moderately depressed, sloping and expanded backwards, area corresponding the base of forceps with a feeble elevation and in the middle a triangular weakly raised area present, hind margin straight in middle, laterally oblique and postero-lateral angles projecting, on sides with an undulate, serrated ridge. Forceps contiguous, depressed, asymmetrical, tapering apically, gently bowed in apical half, right branch more strongly curved with tip pointed and gently hooked, near base armed

with a stout, vertical, triangular tooth on external margin, inner, margin finely crenulate. Genitalia with parameres 4 to 5 times longer than broad, external apical angle projecting and inner tooth curved



Figs. 17-21 : *Cranopygia cumingi* (Dohrn), Holotype ♂, 17. Dorsal view ; 18. Posterior margin of penultimate sternite ; 19. Genitalia ; 20. Paramere enlarged ; ♀, 21. Ultimate tergite and forceps.

with apex bifid ; distal lobes about $\frac{1}{4}$ as long as the proparameres and virga long, tubular, a little more than double the length of distal lobes.

♀ : Agrees with ♂ in most characters except abdomen less strongly expanded apically ; penultimate sternite obtusely rounded posteriorly ; ultimate tergite lacking lateral carina and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	18-20	20.5
Length of forceps	4-5	5.5

Distribution : Endemic to Sri Lanka. Probably all other records from India refer to other species.

Type : Holotype ♂ (♂ genitalia on a slide) in IZAP.

Remarks : Through the courtesy of Doc. dr. hab. A Liana of Academie Polonaise des Sciences it was possible to examine the holotype of this species. Besides 1 ♀ (Sri Lanka) and 1 ♂ (India : Wallardi, Travancore) referred to this species by Hincks (1959) were examined through the kindness of Dr. D. R. Ragge and Mr. P. Ward of British Museum (Natural History), London. Of these 1 ♂ from India is referable to *Cranopygin raja* Burr. Perhaps other material from India referred to by Hincks (l. c.) belongs to *C. raja* since he states under variations that the Indian specimens possess shorter virga.

In Z.S.I. collection there is a ♂ from Sri Lanka which exactly agrees with the Holotype of the species in most of the details except that 4th antennal segment is about as long as broad and 5th onwards gradually increasing in length and stouter. Perhaps it may be the case of individual variation.

Hincks' (l. c.) figures 42 and 43 most likely are from separate specimens since former agrees with *C. cumingi* and latter with that of *C. nietneri*, as understood here in following pages.

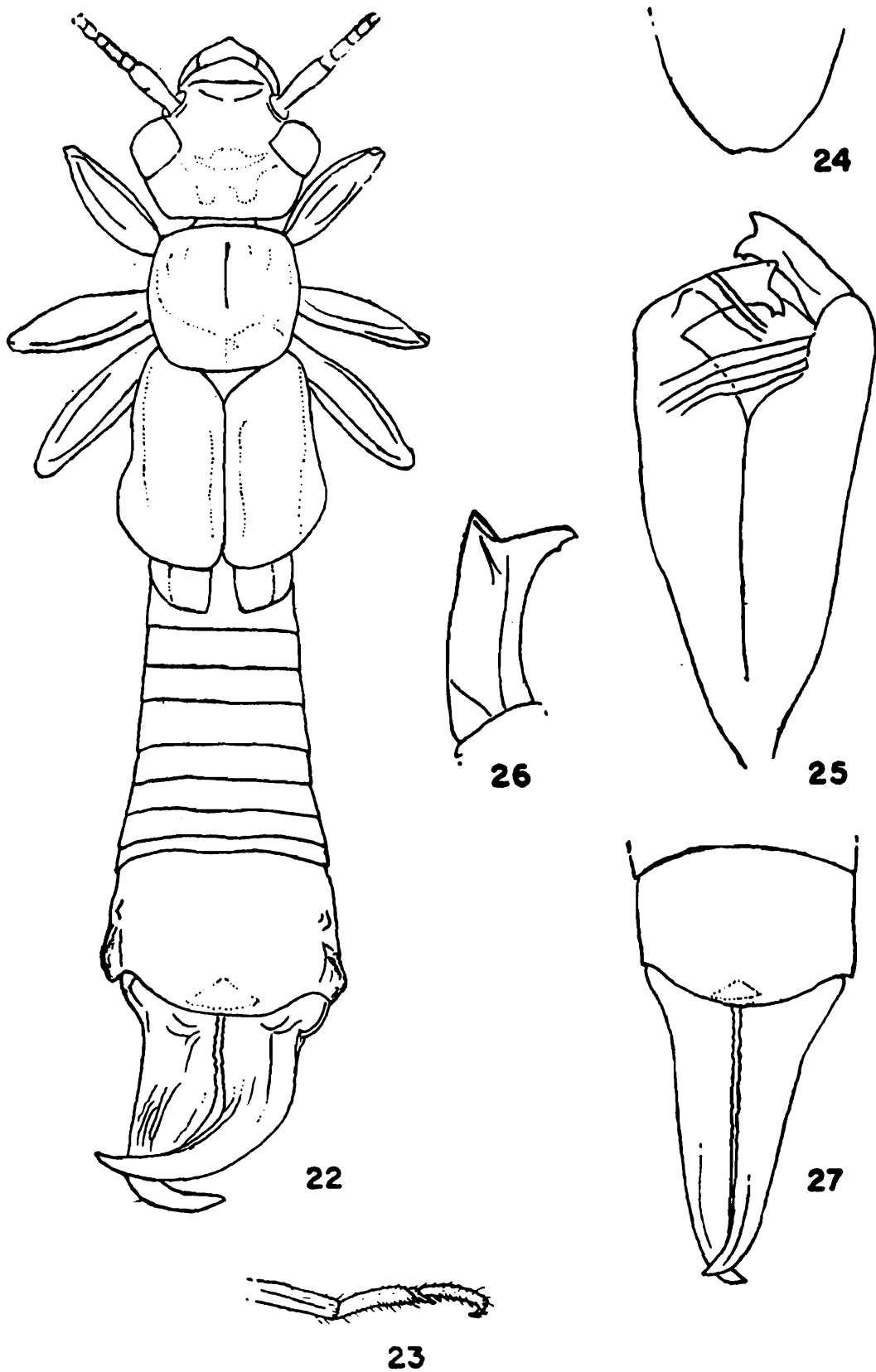
2. *Cranopygia nietneri* (Dohrn) (Figs. 22-32)

Pygidicrana nietneri Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 53 (♀ ; Ceylon) ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 328 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 21 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 70 ; Kirby, 1908, *Syn. Cat. Orth.*, 1 : 5.

Cranopygia nietneri ; Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 389 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 62, 63 (Partim) ; Burr, 1911, *Genera Insect.*, 122 : 19, pl. 1, fig. 6 ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 57 ; Brindle, 1971, *Ent. scand. Suppl.*, 1 : 213 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 13, Srivastava, 1976, *Rec. zool. Surv. India. Occ. Pap.*, 2 : 2.

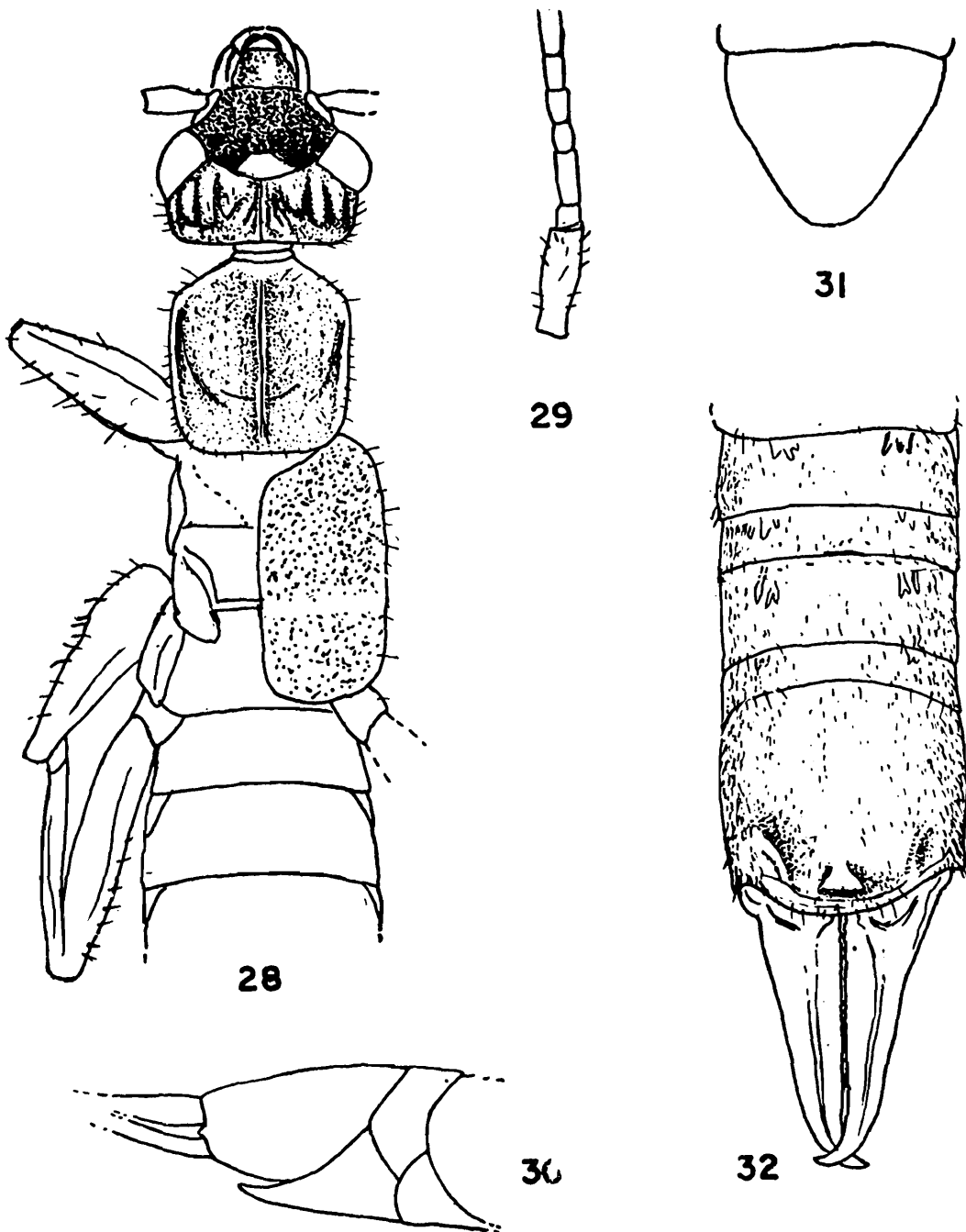
Cranopygia cumingi (nec Dohrn) ; Hinck, 1959, *Syst. mono. Dermaptera*, 2 : 53 (Ceylon, Partim and fig. 43, ♂ genitalia ; excl. India).

♂ : General colour blackish brown. Head with an irregular yellow spot on a portion of frons and occiput. Pronotum along the



Figs. 22-27 : *Cranopygia nietneri* (Dohrn), ♂, 22. Dorsal view ; 23. Hind tarsi ; 24. Posterior margin of penultimate sternite ; 25. Genitalia ; 26. Paramere enlarged ; ♀, 27. Ultimate tergite and forceps.

lateral margin and median line yellow. Antennae somewhat lighter in colour. Legs clear yellow above. Wings blackish brown, yellow along the internal half. Posterior margin of ultimate tergite and apical portion of forceps dark black. Pubescent.



Figs. 28-32 : *Cranopygia nietneri* (Dohrn), Holotype ♀ ; 28. Anterior portion of body ; 29. A few basal antennal segments ; 30. Ultimate tergite and penultimate sternite in profile ; 31. Penultimate sternite ; 32. Posterior half of body.

Head about as long as broad, frons moderately depressed, sutures fine, faintly marked, hind margin almost straight. Antennae multisegmented, basal stout, gently expanded apically, about as long as the

distance between antennal bases and combined length of 3rd to 5th ; 2nd short, transverse ; 3rd long and cylindrical ; 4th almost equal to 2nd ; 5th a trifle longer, apical segments gradually lengthening and thinning. Eyes prominent, distinctly longer than the post-ocular length. Pronotum somewhat roughened, short thick hairs present, gently contracted posteriorly, anteriorly convex, sides lightly convex, hind margin subtruncate, median sulcus fairly distinct, prozona raised and well differentiated from flat metazona. Elytra somewhat roughened with short stiff hairs, $1\frac{1}{2}$ times longer than the pronotum, shoulder weak, meeting along the sutural margin, except at base axillary angles rounded off, exposing a narrow triangular scutellum. Wings short, slightly projecting beyond elytra, not roughened. Legs normal. Abdomen obscurely punctulate, finely pubescent, longer pubescence present on hind margin of each tergite, gradually enlarging posteriorly, convex. Penultimate sternite narrowed posteriorly with a slight emargination in the middle. Ultimate tergite obscurely punctulate, covered with fine yellow pubescence, disc moderately depressed, posteriorly in middle a slightly raised triangular area present, sublaterally in middle with a small tubercle, postero-lateral angles projecting with a short, oblique fold. Forceps contiguous, asymmetrical, strongly depressed above in basal half and with a short convex fold in middle, tapering apically, strongly incurved in apical half, branches crossing in apical $\frac{1}{3}$, tip hooked and pointed, near base external margin slightly raised (reminiscent of a blunt tooth as found in *C. cumingi*) ; internal margin finely crenulate. Genitalia with parameres of uniform width, external apical angle short and pointed, internal tooth slightly curved with apex bifid, distal lobes slightly longer than parameres, virga stout, tubular (apical portion appear to be broken off).

♀ (holotype) : General colour blackish brown. Forceps somewhat reddish and ultimate tergite slightly darker than other abdominal tergites. Head yellowish behind sutural margin, occiput with four fine stripes of blackish brown and pronotum along the median sulcus yellow, laterally with a faint yellow patch. Legs uniform light brown.

Head slightly longer than broad, sutures distinct, sides with long hairs and above with short thick hairs. Antennae partly broken, 1st segment stout, narrowed basally ; 2nd transverse ; 3rd long and slender, about two and half times longer than broad ; 4th slightly longer than broad and shorter than preceding, rest gradually increasing in length distally and thinning. Eyes prominent, slightly longer than the

postocular length. Pronotum and elytra with short, thick hairs above and longer ones on sides. Elytra with axillary angle rounded off, exposing a large triangular scutellum. Wings concealed below elytra. Abdomen smooth with fine yellow pubescence, long hairs on hind margin of each tergite, on some of the tergites above sub-laterally a designe present representing somewhat convoluted loops formed by smooth, shining thin lines. Penultimate sternite triangularly obtuse posteriorly. Ultimate tergite smooth, finely pubescent, lacking lateral fold. Forceps simple, straight, internally finely crenulate.

Measurements (in mm.) :

	Holotype		
	♂	♀	♀
Length of body	17.5	16.5	18.0
Length of forceps	3.5	5.5	4.1

Distribution : SRI LANKA.

Type : Holotype ♀ in ZMHB.

Remarks : Dr. D. R. Ragge and Mr. P. Ward of BMNH was kind enough to send me 1 ♂ (Ceylon : Watawala, 2.1900,0. Collett, Det. by Burr as *Cranopygia nietneri*) and 1 ♀ (Ceylon : Namunakule, 7.2.1910 ; in coll. Burr sub. nom. *C. cumingi* ; Det. by Hincks as *Cranopygia nietneri* Dohrn, ♀). The ♂ genitalia figured here is almost identical with that of Hinck's (1959) figure of ♂ genitalia for *C. cumingi* except that apical portion of virga are perhaps broken off in the former.

This species as understood here, on a ♂ from Sri Lanka, differs from *C. cumingi* in having pronotum blackish brown with sides feebly yellow (vs pronotum yellow with a broad blackish brown stripe on either side of middle line in *C. cumingi*) ; ultimate tergite striate, more so in posterior half (vs obscurely punctulate) ; forceps near base with a feeble convexity on external margin (vs with a vertical, triangular tooth) and parameres with external angle distinctly projecting (vs short and weak).

The Holotype ♀ was examined through the courtesy of Dr. Kürt K. Günther of ZMHB. Most likely the ♂ referred to above has been correctly assigned. Various distinguishing characters separating this species and *C. angustata* Dohrn, known only by female from Sri Lanka are discussed under the latter.

3. *Cranopygia bhallaie* Kapoor (Fig. 33-38)

Cranopygia bhallaie Kapoor, 1966, *Ann. Mag. nat. Hist.*, (13)9 : 481 (♂ ; India : Poona) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)* 16(1) : 1 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 32 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 1.

♂ : General colour blackish brown. Pronotum and legs yellowish brown.

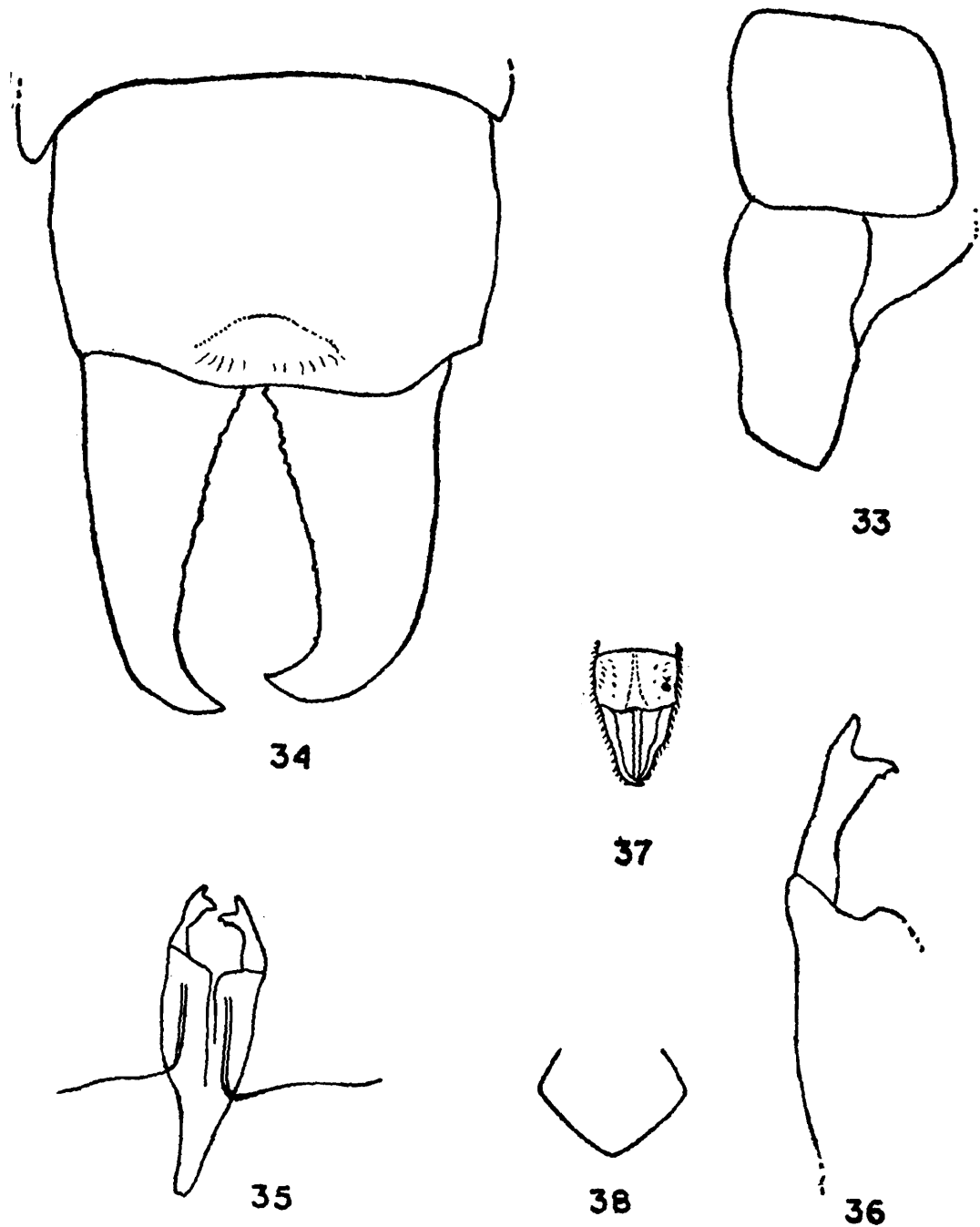
Head covered with short thick hairs, slightly longer than broad, frons moderately raised, occiput comparatively depressed, hind margin feebly emarginate in middle, sutures distinct. Eyes black, prominent, longer than the area behind eyes. Antennae multisegmented (maximum 23-segments present in Holotype ♂), 1st stout, expanded apically ; 2nd short, transverse : 3rd long and slender, almost equal to the combined length of succeeding two segments, 4th transverse ; 5th quadrate, remaining gradually increasing in length and thinning. Pronotum slightly longer than broad, anterior and lateral margins feebly convex, hind margin straight, median sulcus distinct ; prozona tumid and well differentiated from flat metazona by a transverse depression. Elytra abbreviated, covered with short thick hairs, each arising from a small tubercle, slightly longer than the pronotum, meeting along the sutural margin, axillary angle rounded off, exposing a broad triangular scutellum, costal fold prominent, hind margin oblique. Wings abortive. Legs normal, femora compressed, carinate ; tarsi with 1st segment equal to the combined length of 2nd and 3rd. Abdomen covered with fine yellow hairs, moderately depressed above, gradually enlarging posteriorly. Penultimate sternite (according to original description) rhomboidal with apex rounded. Ultimate tergite covered with fine pubescence, rugose, transverse, posteriorly in middle with a slightly raised, polished, triangular area, hind margin almost straight in middle, laterally feebly emarginate and oblique. Forceps covered with fine yellow pubescence, asymmetrical, depressed, tapering apically with tip gently hooked and pointed, right branch in apical 1/4th slightly more curved, inner margin finely crenulate. Genitalia with parameres about four times longer than broad, slightly constricted at basal 1/4th, external apical angle projecting into a pointed lobe and almost equal to inner process, latter with apex distinctly bifid ; virga thin, tubular, projecting well beyond distal lobes, almost straight in basal half, afterwards turned externally.

♀ : Unknown.

Measurements (in mm) :	Holotype
	♂
Length of body	20.0
Length of forceps	4.0

Distribution : INDIA : Maharashtra, Poona.

Type : Holotype ♂ alongwith slide of genitalia at IARI.



Figs. 33-38 : *Cranopygia bhallaie* Kapoor, Holotype ♂, 33. Pronotum and left elytra ; 34. Ultimate tergite and forceps ; 35. Genitalia ; 36. A portion of genitalia enlarged ; 37. Ultimate tergite and forceps ; 38. Penultimate sternite (Figs. 36 and 37 redrawn from Kapoor, 1966).

Remarks : The Holotype ♂ was examined which is badly damaged and mounted on a card. It is carded in such a manner that examination of penultimate sternite is not possible. The details of this structure are taken from the original description which is rather unusual. The accompanying figure of ultimate tergite and forceps do not tally with the diagram given with original description. The reason for this discrepancy is rather difficult to explain since the specimen labelled as 'Type' is genuine as it bears det. label by the author of the species.

On the basis of shape of parameres it comes close to *C. cumingi* (Dohrn), known only from Sri Lanka but differs by distinctive colouration ; ultimate tergite lacking lateral ridge, somewhat different forceps and virga straight in basal half and apically turned externally.

4. *Cranopygia kallipygos* (Dohrn)

(Figs. 39-44)

Pygidicrana kallipygos Dohrn, 1863, *Stettin ent. Ztg.*, 24 : 53 (♂, ♀ ; India Orientali (Hügel) ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 328 ; Bolivar, 1897, *Annls. Soc. ent. Fr.*, 66 : 283.

Pygidicrana callipyga ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 16, 21 ; Kirby, 1904, *Syn. Cat. Orth.*, 1 : 5.

Pygidicrana kallipyga ; Burr, 1907, *Bull. Mus. Hist. nat. Paris*, 13 : 509.

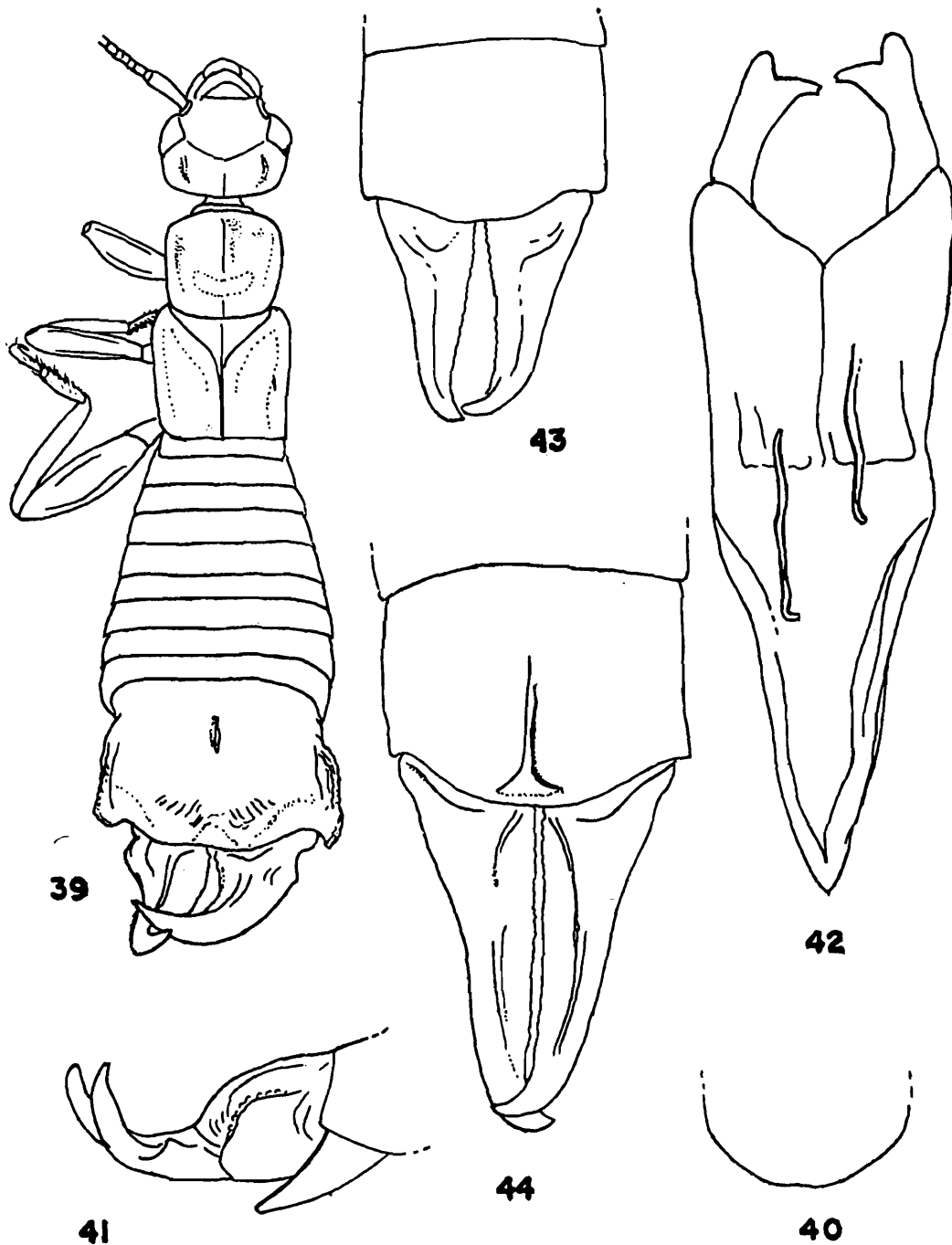
Dicrana kallipyga ; Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 387 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 60 ; Burr, 1911, *Genera Insect.*, 122 : 19 ; Burr, 1912, *Annln. naturh. Mus. Wien.*, 26 : 68.

Cranopygia kallipygos ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 435, pl. 6, fig. 13 (♂ genitalia) ; Hebard, 1923, *Mem. Dep. Agric. India ent. Ser.*, 7(11) : 201 ; Borelli, 1931, *Revue. suisse Zool.*, 38 : 290 ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 58 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 1 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 14 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. Pap.*, 2 : 2.

♂ : General colour reddish brown, shaded with black on certain body parts, head brick red, pronotum, elytra and sides of abdominal segments, especially basal ones shaded with black. Antennae, legs and median stripe on scutellum yellow.

Head slightly longer than broad, moderately convex, smooth, occiput feebly more raised than frons, sutures obsolete, in its place a faint depression present, hind margin almost straight. Eyes not prominent, about as long as post-ocular area. Antennae (in type ♂ right basal and on the left 15-segments present) multisegmented, 1st stout, expanded apically, shorter than the distance between antennal bases ;

2nd short, strongly transverse ; 3rd long and cylindrical, almost equal in length to 4th and 5th together ; segment 4th and 5th transverse, but latter slightly longer, remaining gradually increasing in length,



Figs. 39-44 : *Cranopygia kallipygos* (Dohrn), Holotype ♂, 39. Dorsal view ; 40. Posterior margin of penultimate sternite ; 41. Hind end of body, in profile ; 42. Genitalia ; Allotype ♀ ; 43. Ultimate tergite and forceps ; other ♀ ; 44. Ultimate tergite and forceps.

apical ones thinner. Pronotum a trifle longer than broad, apically lightly convex, sides straight, faintly yellowish, hind margin truncate, median sulcus distinct, prozona feebly convex and fairly differentiated

from flat metazona. Elytra abbreviated, covered with short thin hairs or setae giving granulose appearance, slightly longer than pronotum, axillary angles at base broadly rounded showing a broad triangular scutellum. Wings concealed. Legs normal, hind tarsi with 1st segment slightly longer than 3rd, claw with a triangular arolium. Abdomen finely pubescent, surface micro-reticulated, gradually enlarging from base to apex, sides of segments broadly convex posteriorly, underside covered with a few long, golden yellow hairs. Penultimate sternite obscurely punctulate, in posterior 1/3 with a faint median impressed line, hind margin broadly rounded with a faint concavity in middle. Ultimate tergite transverse, gently expanded posteriorly, surface striate, striations more pronounced posteriorly, laterally with a rugose fold, curved posteriorly and merging with posteriorly projecting angle, hind margin in middle straight and laterally oblique, median sulcus represented by faint broken impressed line. Forceps at base contiguous, asymmetrical, tapering apically, feebly trigonal in basal 1/3, afterwards depressed, almost straight in basal 1/3 and then curved in varying degrees in different individuals, externally near base constricted, followed by a vertical blunt tooth, internal margin finely crenulate. Genitalia with apical process of parameres prominently projecting and rounded, inner preapical process narrower than apical process and bifid apically, distal lobes about 1/2 as long as proparamere; virga short, about as long as distal lobes and feebly undulate apically.

♀ : Agrees with male in most characters except penultimate sternite obtusely triangular posteriorly; ultimate tergite with lateral fold wanting and postero-lateral prominence weak and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	20.0-20.8	18.0-20.0
Length of forceps	3.6-5.0	4.0-4.1

Distribution : INDIA : Tamil Nadu; Nilgiri Hills, Ootacamund, Coonoor, Elk Hill, Doda-Hokal, Kodai Kanal.

Types : Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen) and Allotype ♀ in NMWA.

Remarks : This species has extremely close resemblance with *Crano-pygia raja* (Burr) known only from South India. It can be differentiated by the shape of forceps having near base on external margin a short vertical triangular tooth and branches rather more strongly turned

upwards in apical 1/3. Besides the ♂ genitalia possesses rather narrower inner process in comprision to apical process which is more prominent and more or less obtuse or rounded.

The value of various characters of forceps is doubtful since these have been found to vary in related species where a large series was available for study.

5. *Cranopygia burri* Hincks

(Figs. 45-50)

Cranopygia burri Hincks, 1955, *Ann. Mug. nat. Hist.*, (12)8 : 812, 813 (♂, ♀ : South India : Shembaganur) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 60 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 1 ; Ramamurthi, 1968, *Zool. Anz.*, 181(1-2) : 129 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 15 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. Pap.*, 2 : 1.

Pyge ophthalmica ; (nec Dohrn) Burr (partim), 1910, *Fauna Brit. India Dermaptera* : 66 (excl. descr., Burma and Tenasserim), pl. 2, fig. 16 (♂) ; Burr, 1911, *Genera Insect.*, 122 : 20 (partim), pl. 1, fig. 5.

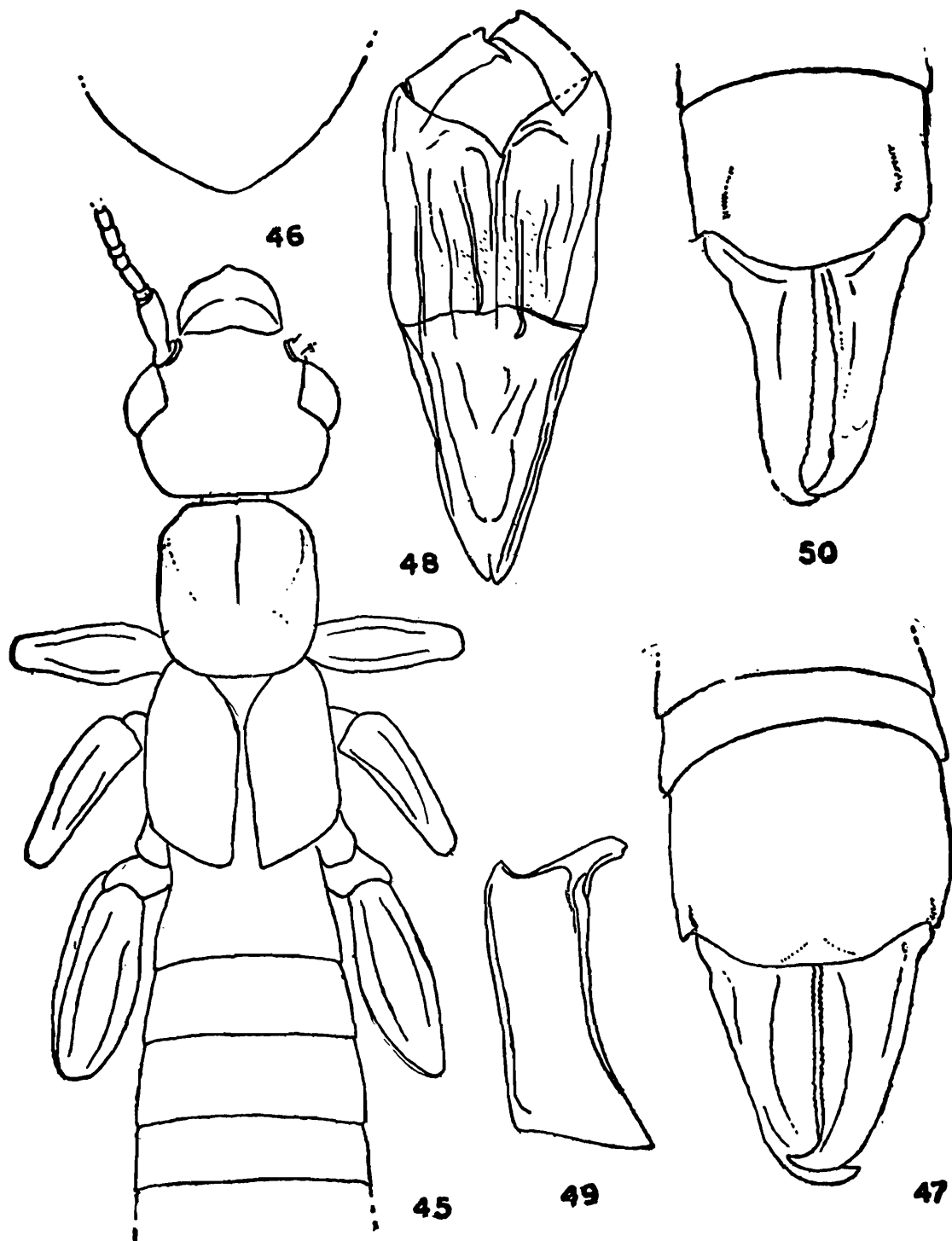
Cranopygia ophthalmica ; (nec Dohrn) Borelli, 1931, *Revue. suisse Zool.*, 38 : 291.

Cranopygia modesta ; (nec Bormans) Burr, *J. R. micr. Soc.*, 1915 : 435, pl. 7, fig. 3 (♂ genitalia) ; Borelli, 1931, *Revue. suisse Zool.*, 38 : 290 (♂, ♀ ; South India).

♂ : Head, elytra and posterior abdominal segments smoky brown ; antennae yellowish brown, 2nd segment blackish, apically segments shaded with black ; pronotum and legs yellowish brown, basal abdominal segments smoky brown with a shade of yellowish brown.

Head about as long as broad, in middle area at the junction of median and transverse sutures faintly depressed, frons and occiput moderately convex, sutures fine but fairly marked, hind margin emarginate. Eyes prominent distinctly longer than post-ocular area. Antennae multi-segmented (25-segmented or more), basal segment stout, expanded apically shorter than the distance between antennal bases ; 2nd transverse, short ; 3rd long and cylindrical equal to the combined length of 4th and 5th ; 4th and 5th almost equal, about as long as broad ; 6th slightly longer than broad ; remaining gradually increasing in length distally and thinning. Pronotum about as long as broad or a trifle longer, sides lightly convex in middle, hind margin straight with a faint emargination in middle, median sulcus faint, prozona convex and well differentiated from flat metazona by an ill-defined transverse suture. Elytra slightly longer than pronotum,

abbreviated, covered with short stiff hairs, axillary angle rounded off, exposing a narrow triangular scutellum. Wings aborted. Legs stout, femora compressed but distinctly enlarged in middle. Abdomen



Figs. 45-50 : *Cranopygia burri* Hincks, ♂, 45. Anterior portion of body ; 46. Posterior margin of penultimate sternite ; 47. Ultimate tergite and forceps ; 48. Genitalia ; 49. Paramere enlarged ; ♀, 50. Ultimate tergite and forceps.

covered with fine golden yellow pubescence, a few long hairs present laterally and along the posterior margin, gradually enlarging backwards. Ultimate tergite obscurely punctulate, covered with

fine pubescence, disc flat with a short median sulcus in middle, posteriorly with a broad triangular, slightly raised and polished area, hind margin straight in middle, laterally oblique with postero-lateral angle a little projecting, sides with an inconspicuous fold, ecarinate. Penultimate sternite finely punctulate, narrowed posteriorly with margin convex and a slight emargination in middle. Forceps contiguous, depressed, almost straight, tapering apically with tip gently hooked and pointed, external margin at base feebly emarginate, internal margin finely but distinctly crenulate. Genitalia with parameres four times longer than broad, internal margin curved, apical angle feebly projecting and internal process apically projecting with tip bifid; distal lobes slightly less than half the length of proparamere, virga tubular, as long as the distal lobes, tapering apically.

♀ : Agrees with male in most characters except the penultimate sternite obtusely rounded posteriorly and forceps comparatively more slender.

Measurements (in mm) :

	♂	♀
Length of body	16-22	19-22
(including forceps)		

Distribution : INDIA : Tamil Nadu, Madurai Dist., Shembaganur ; Karnataka.

Types : Holotype ♂, allotype ♀ and paratypes 1 ♂, 4 ♀ ♀ in BMNH and Paratype 1 ♂ in M.M.

Remarks : In the Z.S.I collections this species is represented by 2 ♂ ♂ from Karnataka.

This species comes close to *C. raja* Burr from S. India in having somewhat similar parameres but the former can be easily separated by the smaller size ; different colouration and the ♂ genitalia with external apical angle of parameres less prominent and inner process comparatively longer.

The material comprising 1 ♂, 2 ♀ ♀ from South India referred to by Borelli (1931) under *Cranopygia modesta* (Bormans) was examined through the courtesy of Dr. B. Hauser, Museum d' Histoire Naturelle, Geneva, Switzerland. Although the genitalia appears to have been taken out earlier from the male specimen, it together with other two females agrees so well with other material of the species I am inclined refer this material under this species.

6. *Cranopygia raja* (Burr)

(Figs. 51-53)

Kalocrania raja Burr, 1911, *J. Asiat. Soc. Beng.* (N. S.); 7(11) : 773 (♂ ; Nilgiri Hills).

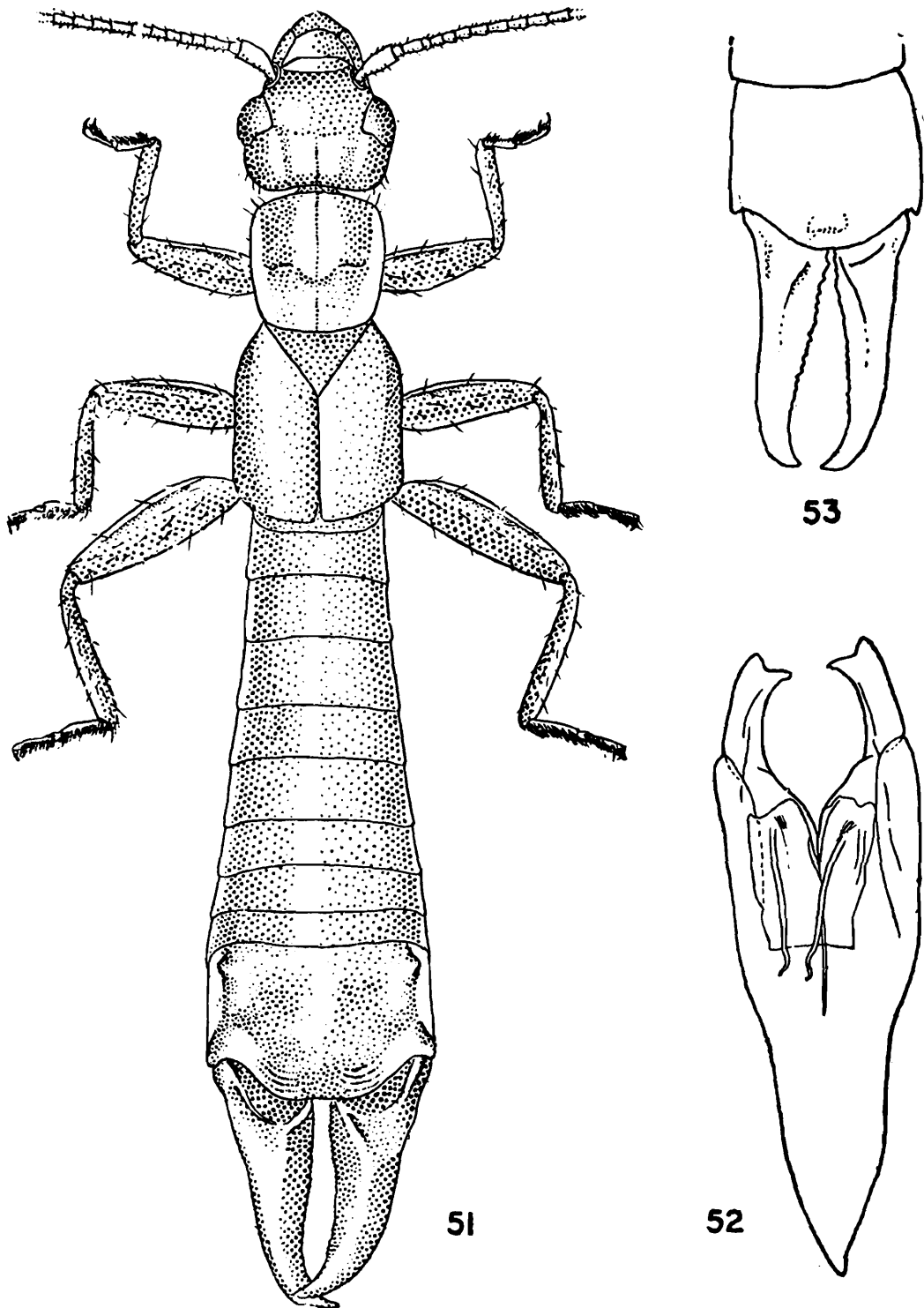
Cranopygia raja ; Hebard, 1923, *Mem. Dep. Agric India ent. Ser.*, 7(11) : 199 ; Hincks, 1955, *Syst. Mono. Dermaptera*, 2 : 63 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 2 ; Srivastava, 1970, *Eos. Madr.*, 45 : 320 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 16 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 2.

Cranopygia cumingi ; (nec Dohrn) Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 53 (1♂ from South India : Wallardi and most likely other South Indian material also may belong to this species).

♂ : General colour blackish brown. Head with a quadrate yellow patch on occiput. Antennae and legs yellowish brown. Pronotum yellow with two broad brownish black stripes, meeting posteriorly. Elytra yellowish brown, laterally as well as along the sutural margin blackish brown. Abdomen and forceps blackish brown, covered with short, fine, yellow pubescence. A few long hairs present on legs and head. Pronotum and elytra covered with short, thick hairs giving them rough appearance.

Head slightly longer than broad, frons moderately raised, occiput occasionally depressed in middle, sutures faint, area behind eyes laterally not narrowed, hind margin feebly emarginate in middle. Eyes not very prominent, about as long as the post-ocular area. Antennae 34-segmented or more (since apical ones broken in the present material), 1st stout, faintly depressed dorsally, expanded apically, slightly shorter than the distance between antennal bases ; 2nd short, transverse ; 3rd long and slender ; 4th transverse ; 5th quadrate ; remaining gradually increasing in length and thinning. Pronotum slightly longer than broad, contracted posteriorly, lateral and hind margin straight, median sulcus distinct, prozona convex and differentiated from flat metazona by a curved transverse depression. Elytra abbreviated, slightly longer than pronotum, meeting along the suture, axillary angles rounded off, exposing a broad triangular scutellum. Wings aborted. Legs normal. Abdomen convex, gradually enlarging posteriorly, smooth or micro-reticulated. Penultimate sternite finely punctulate and pubescent, broadly rounded posteriorly, scarcely emarginate in middle posteriorly. Ultimate tergite transverse, disc moderately deplanate, finely rugulose in anterior half, posteriorly striations more pronounced, in middle posteriorly close to hind margin with a smooth triangular area, laterally with a serrated fold, hind margin in middle straight, laterally

oblique, gently emarginate, postero-lateral angles a little projecting. Forceps asymmetrical, subcontiguous, depressed, tapering apically, in posterior 1/3 turned upward, incurved with apices pointed and gently



Figs. 51-53 : *Cranopygia raja* (Burr), ♂, 51. Dorsal view ; 52. Genitalia ; ♀, 53. Ultimate tergite and forceps.

hooked, at base above with a curved transverse depression, internal margin finely serrated, external margin at base sinuate, followed by a feeble triangular prominence laterally. Genitalia with parameres three

times longer than broad, external apical angles obtusely pointed, inner process distinctly bifid; virga tubular, about as long as the distal lobes, apical portion twisted and provided with minute tubercles.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	21.1 — 27.5
Length of forceps	3.5 — 4.0

Distribution : INDIA : Nilgiri and Anamalai Hills; Salem Dist. (Tamil Nadu).

Type : Holotype ♂ in BMNH.

Remarks : This species comes very close to *Cranopygia kallipygos* (Dohrn), also restricted to South India, but latter differs in having the pronotum and elytra blackish, former pale along the middle line and laterally; forceps subcontiguous, externally near base with a vertical triangular tooth and parameres with external apical angles lobate and inner process narrower, curved with tip feebly bifid,

7. *Cranopygia parva* Brindle

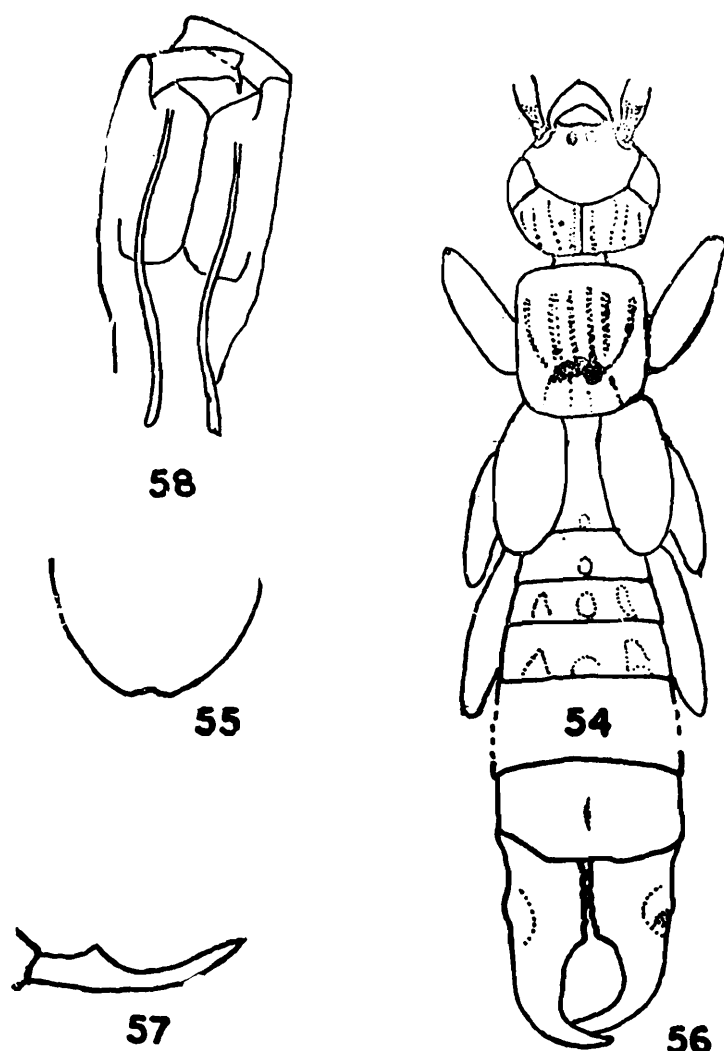
(Figs. 54-58)

Cranopygia parva Brindle, 1975, *Ent. mon. Mag.*, 110 : 147 (♂ and nymphs; Ceylon : N. E. Dist., Mt. Pidurutalagala; 1 ml. N. Nuwara Eilya, 7500-8200 ft.).

♂ : General colour dark brown, in parts shaded with black. Head with two yellow stripes on occiput. Pronotum yellow with a pair of dark brown stripes on either side of middle line on prozona but fused posteriorly into a broader stripe, apical angles dark brown, followed by an incurved dark brown stripe extending in apical half only. Antennae dark brown, basal segment and 4th to 8th yellow in apical half, in remaining segments yellow portion gradually reduced and in some of the apical ones restricted to apical region only. Legs yellow with femora near extreme base blackish and obscurely darkened in apical half. Abdomen with yellow spots on certain basal tergites. Pubescent, longer pubescence also present on head and pronotum.

Head about as long as broad, widest in the region of eyes, slightly narrowed posteriorly, frons convex, sutures fairly marked. Antennae multi-segmented, 1st segment stout, shorter than the distance between antennal bases, expanded apically; 2nd short, transverse; 5th about as long as broad, sixth onwards segments gradually increasing in length

and thinning. Eyes not very prominent, about as long as the post-ocular area. Pronotum slightly longer than broad, contracted posteriorly, sides straight, hind margin truncate, median sulcus obscure, prozona raised and well differentiated from flat metazona by a trans-



Figs. 54-58 : *Cranopygia parva* Brindle, ♂, 54. Anterior portion of body ; 55. Posterior margin of penultimate sternite ; 56. Ultimate tergite and forceps ; 57. Forceps in profile ; 58. Genitalia (All redrawn from Brindle, 1975).

verse depression. Elytra abbreviated as broad, ovate lobes laterally on mesonotum, about as long as pronotum, covered with scattered small tubercles, from each of which arises a long blackish hair. Legs normal. Abdomen gradually enlarging posteriorly, finely punctured and pubescence with short and yellow hairs, somewhat depressed, lateral folds obsolete. Penultimate sternite with posterior margin rounded, a small median emargination present. Ultimate tergite transverse, laterally margin blackish and forming a low ridge, posterior margin straight in middle, laterally oblique, faintly emarginate, median sulcus faint,

short. Forceps with branches asymmetrical, in basal half internally deplanate with margin crenulate, afterwards cylindrical, tapering, right branch incurved in apical 1/3, left one almost straight, apices hooked and pointed, external margin at base emarginate followed by a vertical triangular tooth. Genitalia with parameres more or less parallel sided, external apical angle feebly projecting and triangular, inner process with apex actually pointed, not bifid; lobes about half as long as the proparamere, virga tubular, stout, longer than distal lobes.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	9.0
Length of forceps	1.5

Distribution : Known from the type locality only.

Types : Holotype ♂ in USNM.

Remarks : The above account is based upon the original description of the species since it is known by types only.

This species can be easily separated from all the known species from Sri Lanka by its smaller size (10.5 mm) and abbreviated elytra represented by ovate lobes on mesonotum, not meeting along the median line.

The shape of parameres is almost identical with that of *C. niei* Dohrn, but in the latter inner process is bifid apically.

8. *Cranopygia manipurensis* Srivastava

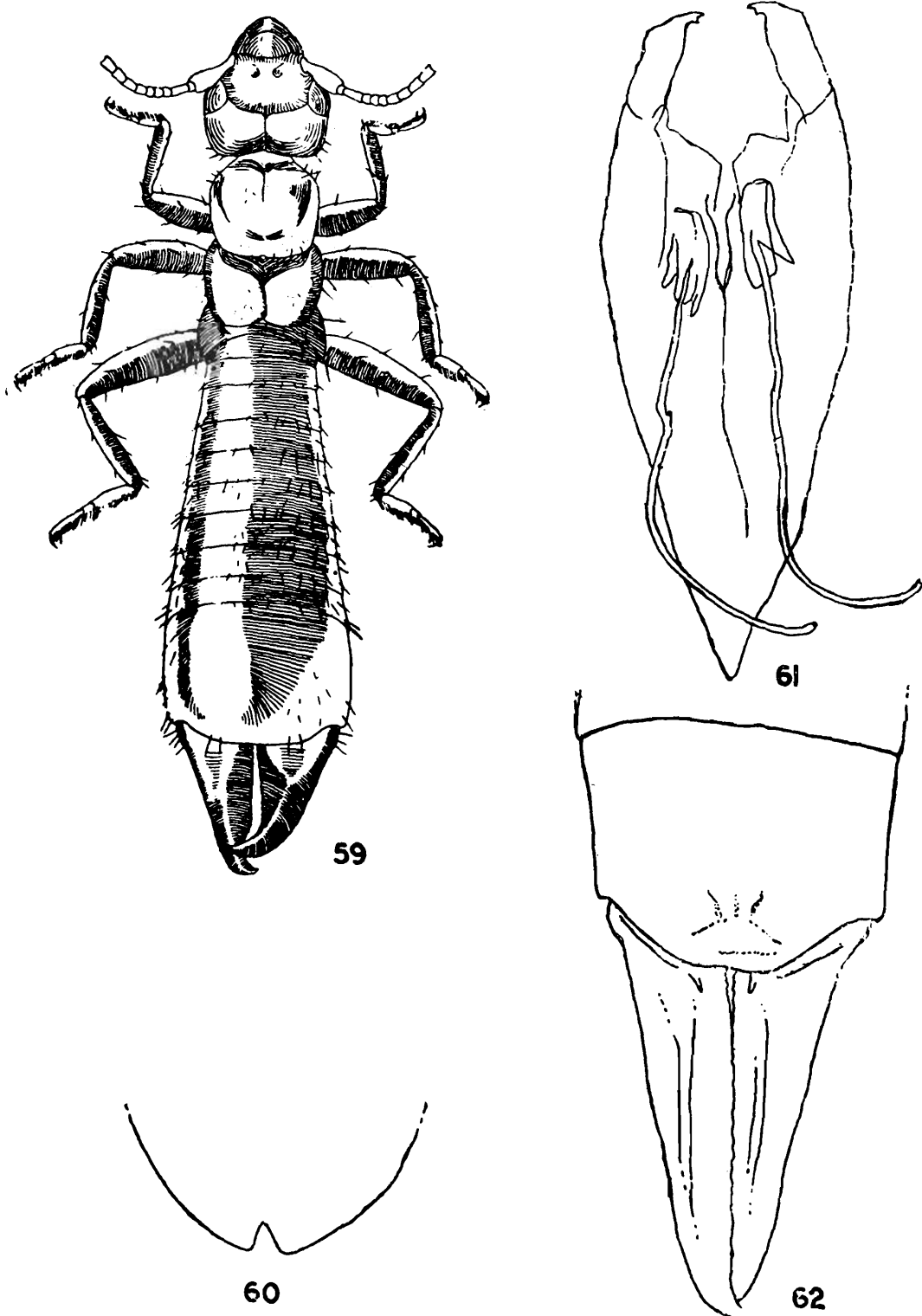
(Figs. 59-62)

Cranopygia manipurensis Srivastava, 1975. *J. zool. Soc. India*, 27 (1 & 2) : 101 (♂ ; India : Manipur, Central Dist., Keibul Sanctuary).

♂ : General colour blackish brown. Pronotum, legs, elytra and metanotum yellowish brown; elytra and metanotum laterally blackish brown. Pronotum and legs occasionally infuscated. Ultimate tergite and forceps somewhat reddish, former with hind margin and latter with external and internal margins black. Finely pubescent, interspersed with a few long hairs. Thorax covered with short thick reddish brown hairs.

Head about as long as broad, moderately depressed in occipital region, sutures distinct, behind eye a faint convexity present, hind

margin emarginate in middle. Eyes about as long as the post-ocular length. Antennae typical for the genus, basal segment stout, expanded apically, slightly shorter than the distance between antennal bases. Pronotum about as long as broad, anterior and lateral margins convex, gently narrowed posteriorly, hind margin truncate, median sulcus distinct ; prozona weakly convex and a little differentiated from flat



Figs. 59-62 : *Cranopygia manipurensis* Srivastava, Holotype ♂, 59. Dorsal view ; 60. Posterior margin of penultimate sternite ; 61. Genitalia ; ♀, 62. Ultimate tergite and forceps.

metazona by a faint transverse depression. Elytra abbreviated, slightly shorter than pronotum, narrowed at base, exposing a broad transverse area of mesonotum, then gradually enlarging and meeting along the median line. Wings obsolete. Abdomen convex, smooth, gradually enlarging posteriorly. Penultimate sternite transverse, narrowed posteriorly with a deep emargination in middle. Ultimate tergite transverse, weakly deplanate above, gently expanded posteriorly, lateral carina absent, postero-lateral angle a little projecting, hind margin in middle straight, laterally oblique. Forceps subcontiguous, depressed, weakly asymmetrical with right branch slightly more incurved in apical one third, apices gently hooked and pointed, inner margin finely serrated. Genitalia with parameres short, almost of uniform width except apically projecting into a narrow lobe with its tip bifid, distal lobes about half as long as proparameres and virga long, tubular and undulate, internally at about middle with a minute tubercle.

♀ : (nova) Agrees with ♂ in most characters except that penultimate sternite posteriorly subtriangular ; ultimate tergite slightly contracted posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	17.3	19.0
Length of forceps	3.3	4.4

Distribution : Besides type locality it is recorded from Damba in Manipur on a ♂ and ♀ in the Z.S.I. collection.

Type : Holotype ♂ in Z.S.I.

Remarks : This species can be easily differentiated from other members of Cumingi-group (Hincks, 1959) by the shape of elytra, penultimate sternite and characteristic ♂ genitalia especially virga in having a minute tubercle internally at about middle.

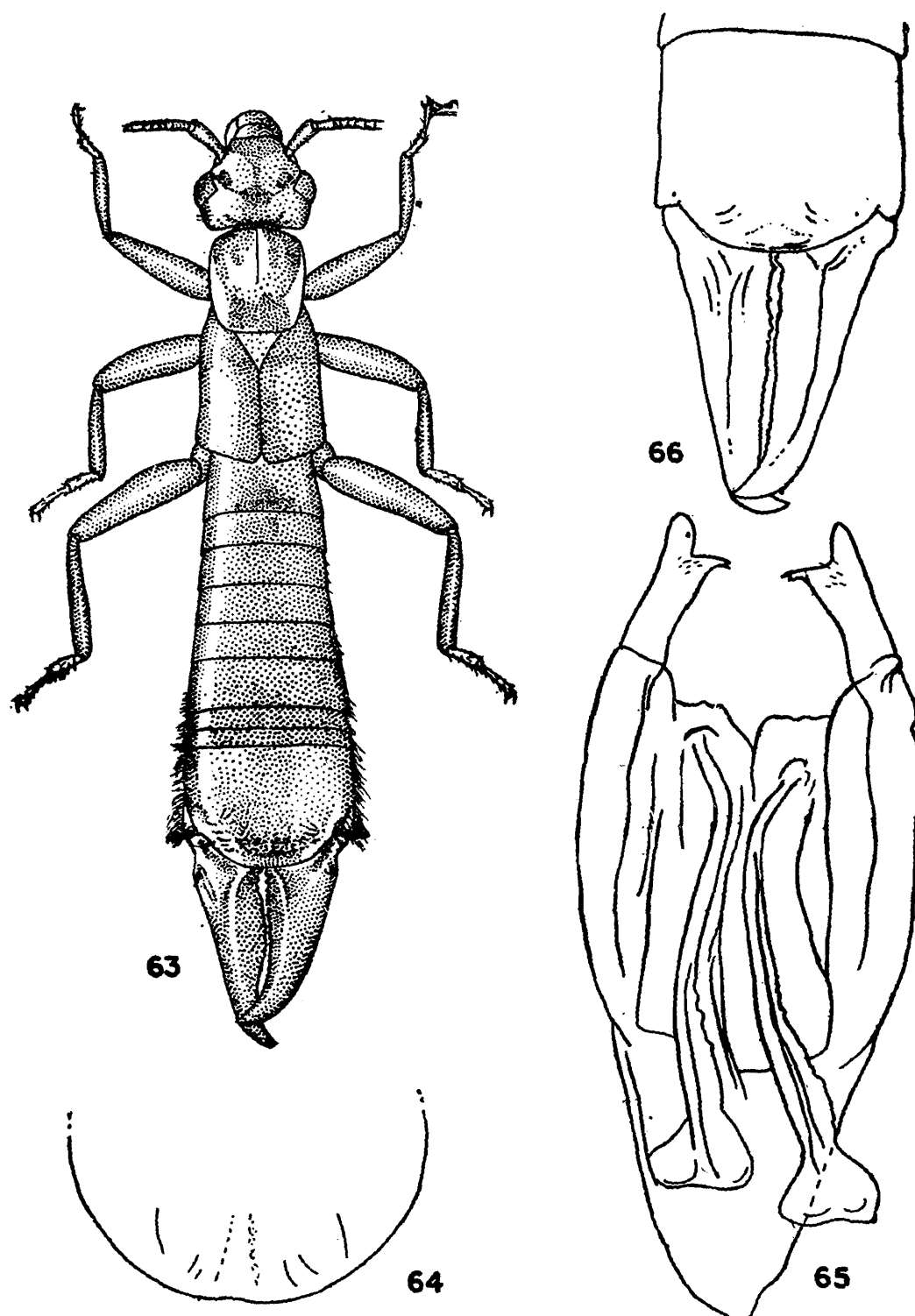
Brindlei-Group

9. *Cranopygia brindlei* sp. n.

(Figs. 63-66)

♂ : General colour blackish brown. Head yellow with blackish brown patches on occiput and apical part of frons, joined medially by

a narrow stripe, mouth parts blackish brown. Pronotum blackish brown with sides and along the median line yellow. Antennae light blackish brown, often 1st segment yellowish brown. Abdomen sometimes yellowish brown in middle on 2nd and 3rd tergites. Finely



Figs. 63-66 : *Cranopygia brindlei* sp. n., Holotype ♂, 63. Dorsal view ; 64. Posterior margin of penultimate sternite ; 65. Genitalia ; Paratype ♀, 66. Ultimate tergite and forceps.

pubescent but sides of posterior abdominal and ultimate tergites and underside of forceps covered with long shaggy hairs.

Head slightly longer than broad, frons weakly raised, occiput feebly depressed in middle, covered sparsely with short thick hairs, hind margin scarcely emarginate in middle, sutures distinct. Eyes not prominent, about as long as the post-ocular area. Antennae multi-segmented (maximum segments 39 present in the Holotype ♂), 1st stout, expanded apically, surface above somewhat flat, about as long as the distance between antennal bases; 2nd transverse, short; 3rd long and slender, equal to two succeeding segments; 4th and 5th transverse but latter slightly longer; 6th about as long as broad; 7th onwards gradually increasing in length and thinning. Pronotum slightly longer than broad, anterior margin convex, sides almost straight, gently convex, sides almost straight, gently converging posteriorly, hind margin truncate, median sulcus faintly marked, prozona weakly raised and poorly differentiated from depressed metazona by a weak transverse depression, sides and above covered with thick, short hairs, each arising out of short tubercle. Elytra abbreviated, slightly longer than pronotum, covered with distantly placed minute tubercles, meeting along the sutural margin, hind margin obliquely truncate, axillary angle rounded off, exposing a broad, yellow triangular scutellum, costal fold prominent. Wings scarcely projecting beyond elytra. Legs covered with golden yellow pubescence, more prominent on apical portion of tibiae and tarsi. Abdomen almost smooth, moderately convex, gradually expanding posteriorly. Penultimate sternite feebly rugose, covered with fine yellow pubescence, narrowed posteriorly with lateral margin oblique, hind margin in middle faintly emarginate. Ultimate tergite transverse, finely to strongly rugose, disc flat, sloping backwards with a slightly raised triangular area, laterally in posterior half with a serrated ridge, hind margin feebly emarginate in middle, oblique laterally with posterolateral angle a little projecting. Forceps contiguous, faintly trigonal in basal $1/4$, afterwards depressed, almost straight in basal $2/3$, thence gently curved, right branch more strongly curved, apices gently hooked and pointed, external margin at base emarginate, followed by a triangular prominence; inner margin undulate, serrated, serrations finer apically. Genitalia with parameres three times longer than broad, lateral margin gently undulate, external apical angle projecting with tip obtuse, inner process short, curved with tip bifid, virga tubular, stout, laterally supported by membranous flange, apically membranous fold triangular, virga longer than the distal lobes.

♀ : Agrees with males in most characters except penultimate sternite smooth, obtusely triangular posteriorly and forceps symmetrical, simple and straight.

Measurements (in mm) :

	Holotype	Paratypes		Others	
	♀	1 ♂	1 ♀	1 ♂	1 ♀
Length of body	12.5	34.0	28.0	22.0	28.0
Length of forceps	5.0	6.0	7.5	7.0	7.0

Material examined : INDIA : Tamil Nadu, Madura Dist., Kodai-kanal, nr. Kukkal Shola Vill., Holotype ♂ (genitalia mounted between two coverslips and penultimate sternite mounted on a card, both pinned with the specimen), 10.xii. 1975 (S. K. Mitra Coll.); Shembaganur (nr. Kodaikanal), Paratypes 1 ♂ (genitalia mounted between two coverslips and pinned with the specimen), 1 ♀ (Astruc Coll. and Det. by John Huxley as *Cranopygia valida* (Dohrn) ex coll. BMNH)—all in ZSI ; Nilgiri Hills, Kukkal, Reisekiste, 1 ♂ (genitalia taken out earlier, presumably by Borelli and lost) ; 1.vi..... ; Maryland, Tigershola, 1 ♀, 20.iv. ; det. by Borelli as *Cranopygia valida* (Dohrn) ex coll.—in MHNG.

Material designated as Paratypes 1 ♂, 1 ♀ were received through Shri B. N. Ramamurthi.

Remarks : This species was earlier confused with *Cranopygia valida* (Dohrn) known from Burma. Steinmann (1979 a) has figured the genitalia from the Holotype ♂ of the latter which is very different.

Siamensis-Group

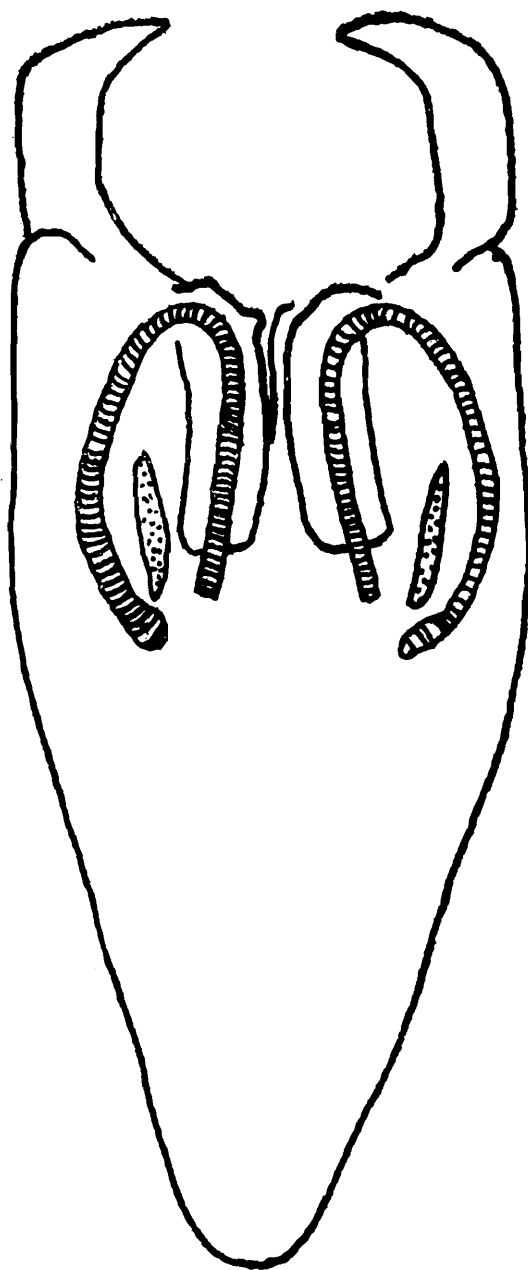
10. *Cranopygia assamensis* Hincks

(Figs. 67)

Cranopygia assamensis Hincks, 1955, *Ann. Mag. nat. Hist.*, (12) 8 : 819 (♂ ; India : Khasi Hills, Nangstoin State) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 81 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 3 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 23 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 3.

♂ : Anterior part of body including head, pronotum, elytra and wings yellow but marked with brownish black on margins of head and a portion of frons ; pronotum with an irregular stripe on either side of median line ; elytra along the humeral fold and extreme internal margin and wing roughly along the external half. Antennae

and legs also yellowish, former shaded with brownish black on distal segments and the latter with two brownish black streaks on external face of femora. Abdomen and forceps dark brownish black.



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Fig. 67 : *Cranopygia assamensis* Hincks, ♂, 67. Genitalia
(redrawn from Hincks, 1959).

Head with frons moderately raised but weakly depressed in middle. sutures fairly marked. Eyes moderately prominent, about as long as the post-ocular area. Antennae multi-segmented (maximum 29-segments recorded), normal. Elytra and wings well developed. Legs

typical for the genus. Abdomen finely pubescent and punctate, moderately convex, gradually expanding posteriorly. Penultimate sternite rounded posteriorly, a faint median depression present. Ultimate tergite transverse, somewhat rugose, laterally without any fold or carina, hind margin in middle straight, laterally feebly emarginate and oblique. Forceps contiguous at base, afterwards incurved enclosing an oval space and terminating into a tooth, beyond which margin contiguous and straight, internal margin crenulate. Genitalia with parameres apically incurved with apices pointed (not bifid), apical external angle hardly projecting, distal lobes short, about as long as the parameres, virga tubular, stout, characteristically bent, at base with an accessory chitinous rod.

♀ : Unknown.

Measurements (in mm) :

	Holotype
	♂
Length of body (including forceps)	33.0

Distribution : INDIA : Khasi Hills, Nongstoin State, 3000 ft.

Type : Holotype ♂ in BMNH.

Remarks : This species is known by Holotype ♂ only and the above description is adopted from that of Hincks (1959).

The genitalia is quite distinctive and on the shape of parameres it can be easily discriminated from other known Oriental species.

Picta-Group

11. *Cranopygia picta* (Guérin-Ménéville)

(Figs. 68-74)

Pygidicrana picta Guérin-Ménéville, 1839, *Magasin Zool.*, 8 : 70, pl. 236, fig. 1 (♀ ; India : Madras) ; Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 50 ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 329 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 16, 18 ; Burr, 1900, *Ann. Soc. ent. Belg.*, 44 : 47 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 69 ; Burr, 1906, *J. Asiat. Soc. Beng. (N. S.)*, 2 : 387 ; Burr, 1908, *Ann. Mag. nat. Hist.*, (8) 2 : 284 ; Burr, 1910, *Fauna Brit. India, Dermaptera* : 54, 55 ; Burr, 1911, *Stettin. ent. Ztg.*, 1911 : 330 ; Kirby, 1904, *Syn. cat. Orth.*, 1 : 5.

Kalocrania picta ; Burr, 1911, *Genera Insect.*, 122 : 18 ; Burr, 1912, *Annln. naturh. Mus. Wien*, 26 : 68 ; Burr, 1913, *Rec. India Mus.*, 8 (2) : 136.

Acrania picta ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 436, pl. 7, fig. 6 ; Hebard, 1923, *Mem. Dept. Agric. India ent. Ser.*, 7(11) : 199.

Cranopygia picta ; Hincks, 1959 ; *Syst. mono. Dermaptera*, 2 : 98 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 3 ; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 214 ; Sakai, 1971, *Dermapterorum Cal. Prael.*, 3 : 28 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 6.

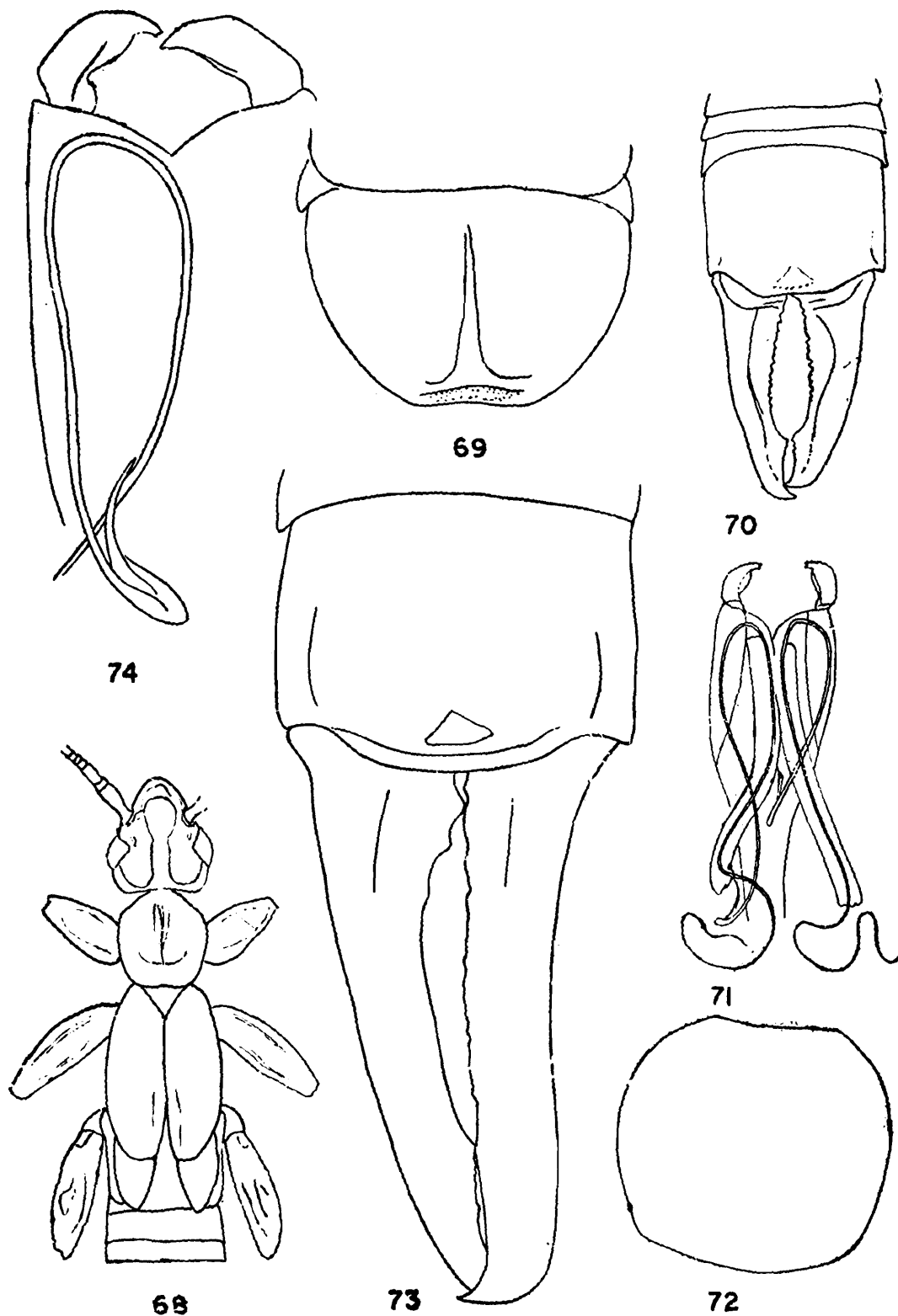
Cranopygia triangulata Ramamurthi, 1965, *Ann. Mag. nat. Hist.*, (13) 8 : 59, figs. 1-5 (♂, ♀ ; India : Tamil Nadu, Madras)-Syn. nov.

Cranopygia livingstoni Kapoor, 1966, *Agra Univ. J. Res. (Sci.)*, 15 (1) : 47, figs. 1-4(♂ ; India : Kerala : Thekkady)-Syn. nov.

♂ : General colour blackish brown with varying shades on various parts. Head yellow, dark blackish brown along the margin and median line. Pronotum yellow with two blackish brown stripes meeting at about middle only. Antennae with basal segment yellowish and rest dark brown. Legs and scutellum yellow, former with streaks and spots of smoky brown on femora and tibiae. Elytra light blackish brown, along the lateral margin with a narrow yellow stripe and in middle with a broader one. Wings yellow, light smoky brown, laterally. Abdomen and forceps dark blackish brown.

Head triangular, slightly longer than broad, frons moderately deplinate, sutures distinct, hind margin scarcely emarginate in middle, on margin a few long and short hairs present. Eyes not prominent, about as long as the post-ocular area. Antennae 35-segmented or more, basal stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd transverse ; 3rd about thrice as long as broad ; 4th transverse, globular ; 4th quadrate ; 6th onwards segments longer than broad, distal ones gradually increasing in length and thinning. Pronotum almost quadrate, slightly longer than broad, anteriorly and sides lightly convex, hind margin subtruncate, median sulcus distinct, prozona moderately raised and differentiated from flat metazona by a transverse depression, covered with short thick, reddish black hairs, margins with longer hairs. Elytra well developed, feebly granular, covered with short, thick, reddish black hairs, humeral angle weak, axillary angle rounded off, exposing a triangular scutellum. Wings about $1/4$ as long as the elytra, covered with short thick hairs. Legs normal. Abdomen covered with fine yellow pubescence, laterally and on hind margin of each tergite with long, thick hairs, convex, gradually enlarging backwards. Penultimate sternite narrowed posteriorly, sides oblique, hind margin with slight emargination in middle, the area a little before hind margin thickened, medially in posterior $1/3$ a feeble depression and long and short pubescence present. Ultimate tergite weakly transverse, covered with fine pubescence, coarsely rugose, disc convex, posteriorly in middle with a slightly raised polished, triangular area,

hind margin in middle convex, laterally oblique and faintly emarginate, postero-lateral angle slightly projecting. Forceps covered with fine



Figs. 68-74 : *Cranopygia picta* (Guérin-Ménéville), ♂, 68. Anterior half of body ; 69. Penultimate sternite ; 70. Ultimate tergite and forceps ; 71. Genitalia ; 72. Pronotum ; 73. Ultimate tergite and forceps ; 74. A portion of genitalia (Figs. 72-74 are drawn from the Holotype ♂ of *Cranopygia livingstoni* Kapoor, considered here as synonym).

yellow pubescence, tapering apically with apices gently hooked, at base with a transverse, curved depresssien, trigonal above in basal 2/3, afterwards depressed, internal margin arcuate enclosing an elongated, oval space, crenulate, meeting at apical 1/3 and terminated with a blunt, comparatively large tooth, afterwards margin straight, contiguous and and finely crenulate. Genitalia with parameres externally convex, internally double margined, straight, apically narrowed, projecting as a process, distinctly bifid apically ; distal lobes about as long as the proparameres, virga thin, tubular projeceting well beyond the distal lobes, at base with a short chitinization.

♀ : Agrees with males in most characters except that penultimate sternite obtusely pointed posteriorly, forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	22.5-28.0	18.0-27.5
Length of forceps	6.25-6.5	4.0-7.01

Distribution : INDIA : Various States of South and Eastern parts.

Also recorded from SRI LANKA and SUMATRA.

Type : Holotype ♀ ; presumably lost ; repository not known.

Holotype ♂ and allotype ♀ of *Cranopygia triangulata* Ramamurthi with Shri B.N. Ramamurthi, 66, Muthu Mudali St., Madras.

Holotype ♂ of *Cranopygia livingstoni* Kapoor at Entomology Division, IARI.

Remarks : On comparing with Guérin-Ménéville's (1839) figure of Holotype ♀ with the material referred to this species it appears that they are correctly assigned.

Some slight colour variations especially in the black stripes on head and narrow yellow stripes on elytra and wings are noted.

The types of *C. triangulata* Ramamurthi and *C. livingstoni* Kapoor were examined and found identical in most of the details. These are treated as synonyms.

It is rather strange that Holotype ♂ of *C. livingstoni* and the original description and diagrams by Kapoor (1966) differ in certain details. In fact the right branch of forceps is deformed and does not show normal form.

It is generally found that when distal lobes are exerted out they appear longer and virga is pushed outwards. The figure of male genitalia of *C. triangulata* by Ramamurthi (1965, fig. 5) shows that basal

part of virga with chitinization has come to apical portion of distal lobes during the process of eversion and has not attained the normal position. Some slight variations are noted in the shape of parameres in various diagrams by Hincks (1959) and Ramamurthi (l.c.).

This is perhaps due to differences in the angle of mounting because parameres are roughly triangular (not flat) with internal margin differentiated into dorsal and ventral borders.

The record of this species from Sumatra is based on a ♂ from MZL.

12. *Cranopygia steinmanni* sp. n.

(Figs. 75-78)

Kalocrania eximia (part) ; Burr, 1911, *Genera Insect*, 122 : 19 (excl. Darjeeling).

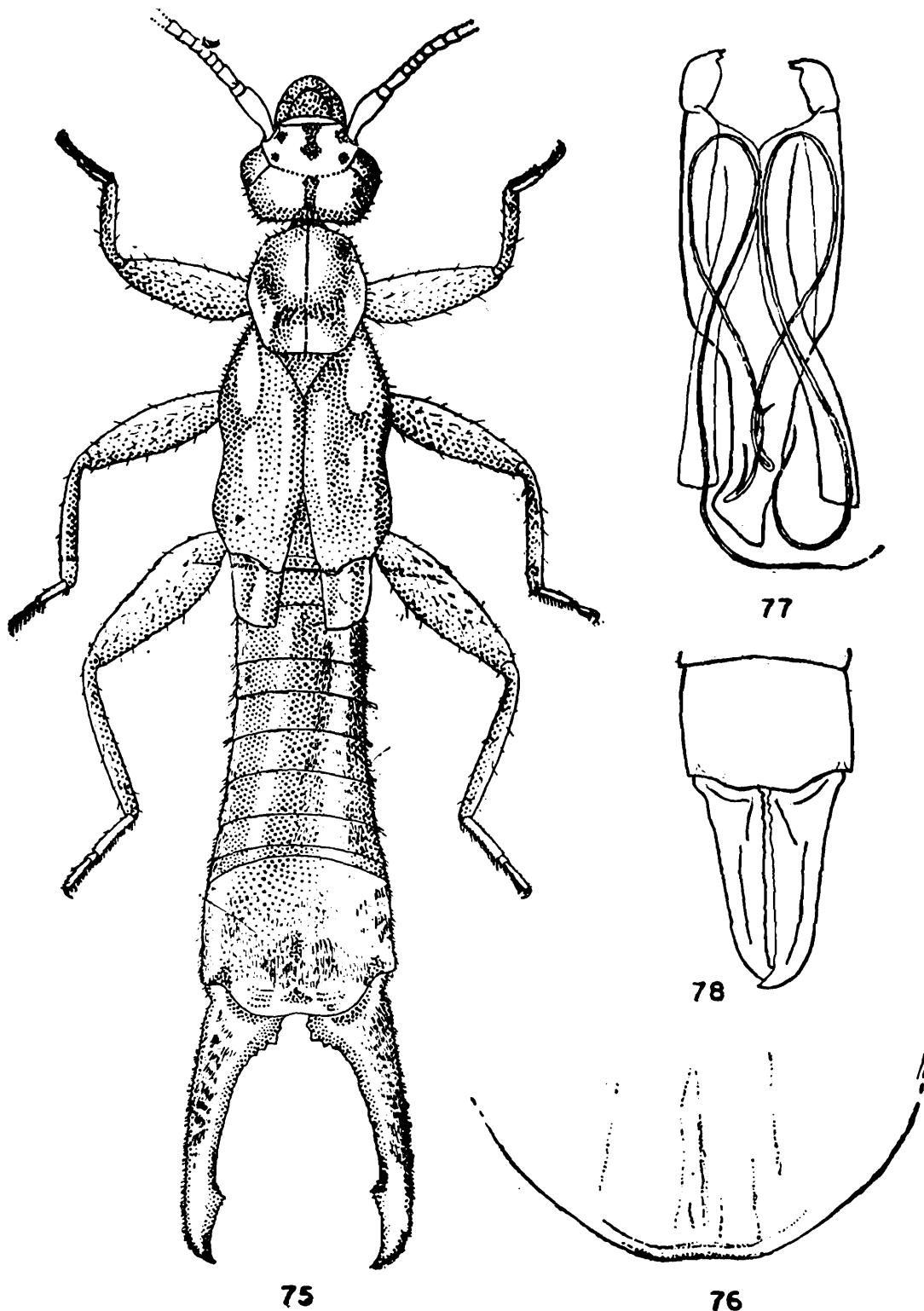
Acrania eximia ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 436, pl. 7, fig. 5.

Cranopygia eximia (part) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 100 (description, figures and material from South India only) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 3 (excl. Darjeeling) ; Srivastava, 1970, *Eos, Madr.*, 45 : 320 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 5 (excl. Darjeeling).

♂ : General colour blackish brown. Head yellow with margins black and a median stripe, broken in middle, with four small spots on frons. Antennae with basal two segments yellowish, rest blackish. Eyes black. Pronotum with a broad blackish brown stripe narrowed posteriorly, on either side of yellow median stripe, lateral borders yellow. Elytra light blackish brown, internally close to margin with a narrow yellow stripe, above with two elongated spots extending from shoulder to apical two thirds, often spots reduced, externally near margin with broad yellow stripe. Wings yellow, externally with broader and internally with narrower blackish brown stripe. Legs yellow, sometimes shaded with black on certain parts only. Abdomen, ultimate tergite and forceps covered with fine yellow pubescence, dark blackish brown, sometimes hind margin of ultimate tergite and internal margin of forceps black. Pronotum, elytra and wings covered with short thick hairs, each arising from a minute tubercle.

Head slightly longer than broad, gently contracted behind eyes, frons and occiput weakly raised, latter faintly depressed in middle, sutures faintly distinct, hind margin almost straight. Eyes moderately prominent, about as long as post-ocular area. Antennae multisegmented (maximum 25 segments observed in the material present), 1st about as long as the distance between antennal bases ; 2nd, 4th to 6th transverse ; 3rd twice as long as broad, a few pre-apical ones

thin and rod shaped. Pronotum slightly longer than broad, gently contracted posteriorly, lateral margin gently convex in middle, hind margin almost truncate, median sulcus distinct, prozona convex and well differentiated from flat metazona by a transverse depression. Legs



Figs. 75-78 : *Cranopygia steinmanni* sp. n., Holotype ♂, 75. Dorsal view ;
76. Posterior margin of penultimate sternite ; 77. Genitalia ;
Paratype ♀, 78. Ultimate tergite and forceps.

normal. Elytra and wings well developed, former with axillary angle rounded, thus exposing a small triangular scutellum. Abdomen

moderately convex, obscurely punctulate, expanding backwards up to last tergite. Penultimate sternite narrowed posteriorly with hind margin convex, medially raised but furrowed along the median line, obscurely punctulate and pubescent. Ultimate tergite transverse, rugose, moderately convex, sloping and expanded backwards, a slightly raised polished, triangular area present in middle, close to hind margin thickened, posterior margin straight in middle, laterally concave and oblique, postero-lateral angle a little projecting. Forceps depressed, gently curved, tapering apically with tip pointed and hooked, internally margin differentiated into dorsal and ventral borders, curved enclosing an elongated elliptical space up to apical $1/5$ and terminating into a serrated projection, afterwards margin contiguous, straight, ventral border at base with several larger teeth, afterwards finely crenulate, in apical $1/5$ serrations more prominent. Genitalia with parameres broad, externally convex, internally emarginate, apically produced into a hooked process with tip bifid; distal lobes slightly shorter than the proparameres, virga thin, tubular, projecting slightly beyond the distal lobes.

♀ : Agrees with male in most characters except that ultimate tergite less expanded posteriorly; penultimate sternite posteriorly in middle obtuse and forceps simple, contiguous and straight.

Measurements (in mm) :

	Holotype	Paratypes	
	♂	3 ♀	1 ♀
Length of body	29.0	29.5-33.0	28.0
Length of forceps	8.0	7.5-8.0	6.0

Material examined : INDIA : Tamil Nadu, Anamalai Hills, Top slip, Holotype ♂ (genitalia mounted between two cover slips and pinned with the specimen), 31.I.1971, K. S. Pradhan; Cinchona, 3500 ft., Paratypes 1 ♂ (genitalia mounted between two cover slips and pinned with the specimen), 1 ♀, May, 1968, P. S. Nathan; Kerala, Silent Vally, N. Amarambolam, Sayivala, Paratype 1 ♂ (genitalia mounted between two cover slips and pinned with the specimen), 17.III.1979, K. R. Rao; Tamil Nadu, Anakayam, Paratype 1 ♀, 22.XII.1980, R. S. Pillai; all in ZSI.

Remarks : Some minor colour variations regarding the extent and intensity of fuscous stripes on head, pronotum and legs were noted.

This species was earlier confused with *C. eximia* (Dohrn), from NE part of India but the latter though externally somewhat similar it possesses distinctive genitalia.

The described species can be easily separated from *C. pita* (Guérin-Me'neville) in having the penultimate sternite convex posteriorly (not thickened or emarginate); somewhat different forceps with internal margin in middle obscurely crenulate and genitalia with distal lobes in relation to proparameres comparatively shorter.

13. *Cranopygia constricta* Hincks

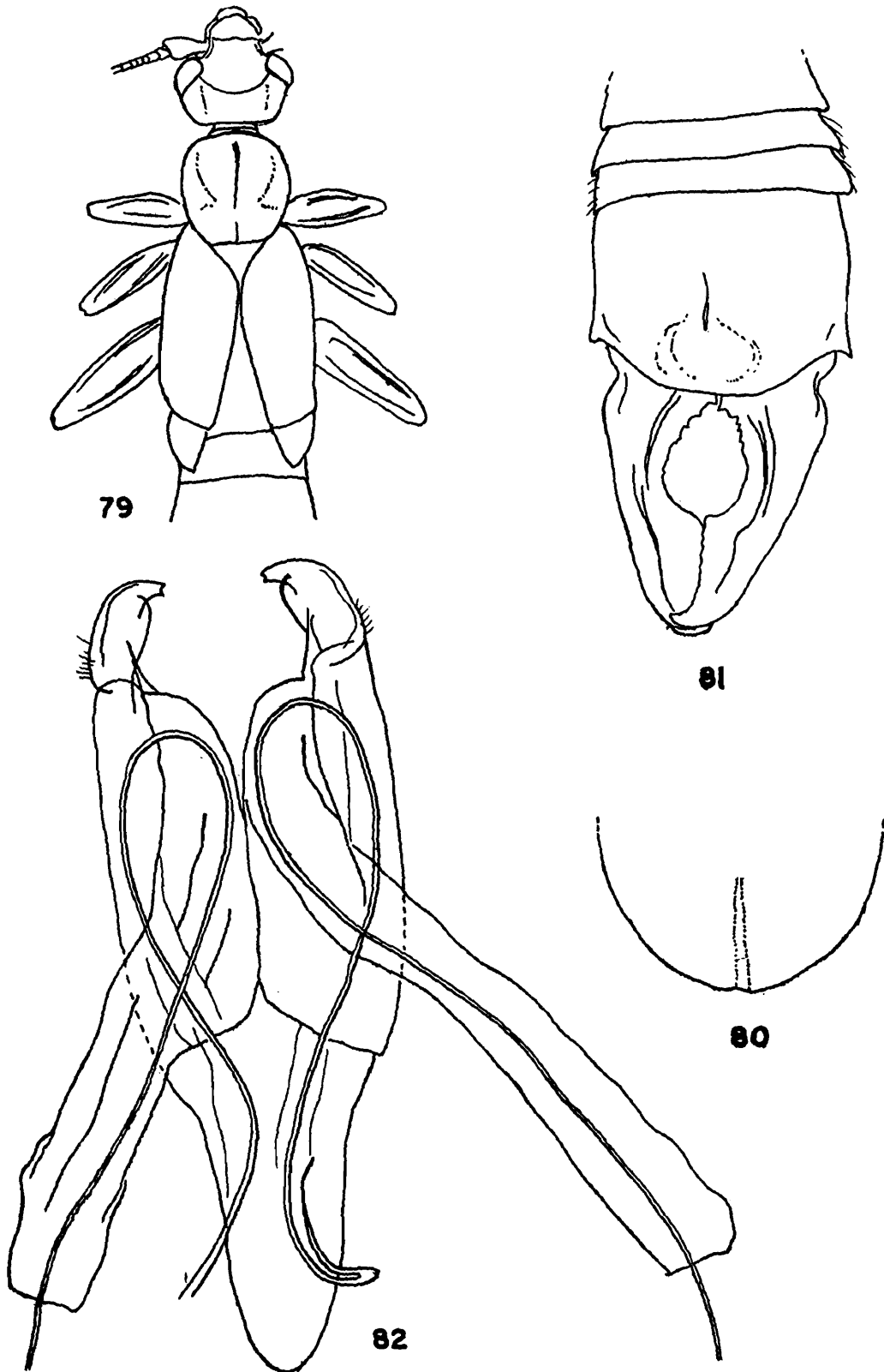
(Figs. 79-82)

Cranopygia constricta Hincks, 1955, *Ann. Mag. nat. Hist.*, (12) 8 : 822 (♂ ; Bhutan : Maria Basti); Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 101; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 29; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 5.

♂ : General colour brownish black. Head smoky brown or with yellowish brown patch on hind portion of frons and a pair of stripes on either side of median line on occiput. Eyes black. Antennae yellowish brown, sometimes basal segment lighter in colour. Pronotum blackish brown, apical angles yellow extending into a lateral stripe, along the median line with a faint yellow stripes, often obsolete or represented in apical 1/3 only. Elytra light blackish brown, yellowish in middle close to internal margin. Wings yellow with blackish brown leniar stripe in external half or slightly less. Legs yellow, sparkled with blackish brown spots or broad broken or uniform continuous stripes. Abdomen blackish brown with shade of red on certain tergites, often ultimate tergite dark brownish black. Head, abdomen and forceps covered with fine pubescence, interspersed with long hairs. Pronotum and elytra covered with short, thick, blackish brown hairs, each arising from a minute tubercle.

Head slightly longer than broad, frons moderately convex, occiput in middle weakly depressed, hind margin lightly emarginate in middle, sutures fine but distinct, behind eyes slightly narrowed. Eyes moderately prominent, distinctly longer than the post-ocular area. Antennae multi-segmented (over 30 segmented), typical for the genus, a few pre-apical ones thin and rod shaped. Pronotum slightly longer than broad and laterally convex in middle, hind margin truncate, sometimes with slight emargination in middle. Scutellum triangular, dark blackish brown to smoky brown with median sulcus distinct. Elytra and wings

well developed, former with axillary angle rounded off. Legs normal, hind 1st tarsal segment compressed, almost equal to third. Abdomen



Figs. 79-82 : *Cranopygia constricta* Hincks, ♂, 79. Anterior portion of body ; 80. Posterior margin of penultimate sternite ; 81. Hind portion of body ; 82. Genitalia.

smooth, convex, greatly enlarging from 7th to 9th tergites. Penultimate sternite pubescent, obscurely punctulate, hind margin broadly

rounded with a faint emargination in middle, along the median line faint groove present. Ultimate tergite transverse, expanded posteriorly, rugose, rugosity more prominent posteriorly with a slightly raised, polished, triangular area, median sulcus feebly marked, laterally with a weak crested ridge, hind margin straight in middle, oblique laterally with angle projecting. Forceps stout, depressed, punctate, internally margin differentiated into ventral dentate and dorsal smooth borders, curved, enclosing a rhomboidal area, afterwards contiguous, dentate and straight, tip gently hooked and pointed, above at base with a transverse, semi-circular depression, external margin near the base with a strong emargination. Genitalia with parameres curved, apically narrowed into a sort of lobe with tip bifid; distal lobes only slightly longer than the proparameres and virga thin, tubular, only slightly projecting beyond the distal lobes.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	24.0-25.0
Length of forceps	4.5-5.0

Distribution : BHUTAN : Maria Basti. INDIA : Sikkim and West Bengal (Darjeeling Dist., Chunabathi nr. Bagrakot and Jamduar).

The two ♂ ♂ from India, W.B. are present in ZSI.

Types : Holotype ♂, Paratypes 2 ♂ ♂ in BMNH.

Remarks : The colour variations on head, pronotum and legs are quite obvious in this species. Normally the sides of pronotum are slightly convex but in 1 ♂ from Darjeeling Dist., convexity is more prominent thus pronotum appears narrowed posteriorly.

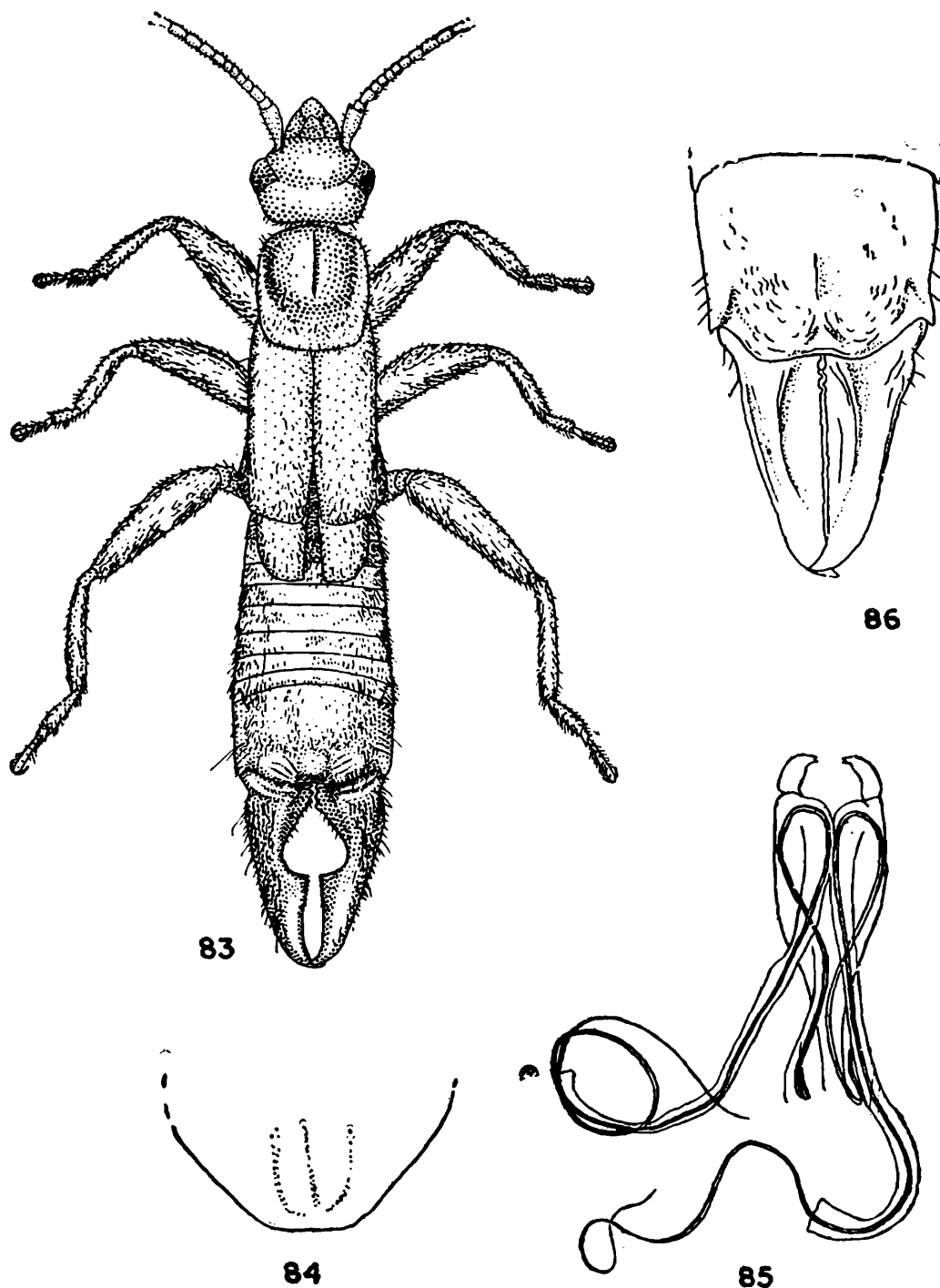
This species has a remarkably close resemblance to *Cranopygia fletcheri* Bharadwaj and Kapoor, from India (Khasi Hills, Shillong) but differs in having comparatively shorter distal lobes and virga in relation to genital armature.

14. *Cranopygia fletcheri* Bharadwaj and Kapoor

(Figs. 83-86)

Cranopygia fletcheri Bharadwaj and Kapoor, 1967, *Bull. Ent.*, 8 (2) : 1 (♂ ; India. Meghalaya, Shillong, 5000 ft.) ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 32 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 5.
Kalocrania picta (nec Guérin-Méneville) ; Burr, 1914, *Rec. Indian Mus.*, 8(2) : 136 (only 1 ♂, 1 ♀, Kobo).

♂ : General colour blackish brown or smoky black, head with yellow streaks on occiput, pronotum yellow laterally. Elytra sometimes with a yellow spot in middle and wings externally with a yellow stripe.



Figs. 83-86 : *Cranopygia fletcheri* Bharadwaj and Kapoor, ♂, 83. Dorsal view ; 84. Posterior margin of penultimate sternite ; 85. Genitalia ; ♀, 86. Ultimate tergite and forceps.

Legs blackish, tibiae and tarsus on margins yellowish brown. Ultimate tergite and forceps deep black. Pronotum, elytra and wings with short thick hairs, each arising from a minute tubercle. Abdomen and forceps with fine pubescence, on sides pubescence longer.

Head slightly longer than broad ; frons weakly raised, occiput feebly depressed in middle, laterally slightly raised, sutures distinct, hind margin lightly emarginate in middle. Eyes moderately prominent, slightly longer than the post-ocular length. Antennae (apical segments generally broken) 23-25 segmented. Pronotum longer than broad, anteriorly convex, sides straight, hind margin subtruncate, hardly emarginate in middle, median sulcus distinct, prozona tumid, metazona strongly depressed. Elytra twice as long as the pronotum, costal fold prominent, hind margin feebly oblique, truncate. Wings one third as long as the elytra. Legs thickly pubescent, femora carinate, typical for the genus. Abdomen long and cylindrical, very slightly expanded posteriorly. Penultimate sternite triangular with posterior margin slightly emarginate in middle. Ultimate tergite slightly broader than long, hind margin truncate in middle, laterally weakly emarginate and oblique, postero-lateral angle slightly projecting and with a weak fold laterally. Forceps stout, depressed, tapering posteriorly, internally at base contiguous with one or two strong teeth, branches incurved up to a little beyond basal half and enclosing an elliptical area with inner margin finely crenulate, afterwards almost straight with apices gently hooked, externally at base slightly emarginate, above with a shallow transverse depression. Genitalia with parameres three times longer than broad, inner margin feebly concave and external margin convex, apically narrowed with tip obscurely bifid, distal lobes membranous, about one and half times longer than the proparameres, virga long, thin and tubular, about twice as long as the distal lobes.

♀ : Agrees with male in most characters except that the penultimate sternite triangular with hind margin in middle obtuse, ultimate tergite comparatively narrowed and forceps simple, straight, contiguous, inner margin distinctly crenulate near base only.

Measurements (in mm) :

	♂	♀
Length of body	17.5-27.5	21.0
Length of forceps	5.23-6.5	4.5

Distribution : INDIA : Meghalaya, Shillong. Besides, type some additional material from type locality is present in ZSI.

Types : Holotype ♂ and paratype 1 ♂ at Entomology Division, IARI.

Remarks : This species has a remarkably close external resemblance with *C. constricta* Hincks, known from India (Sikkim and North Bengal) and Bhutan but differs in having much longer virga in being about twice as long as the genital armature.

15. *Cranopygia vittipennis* Hincks

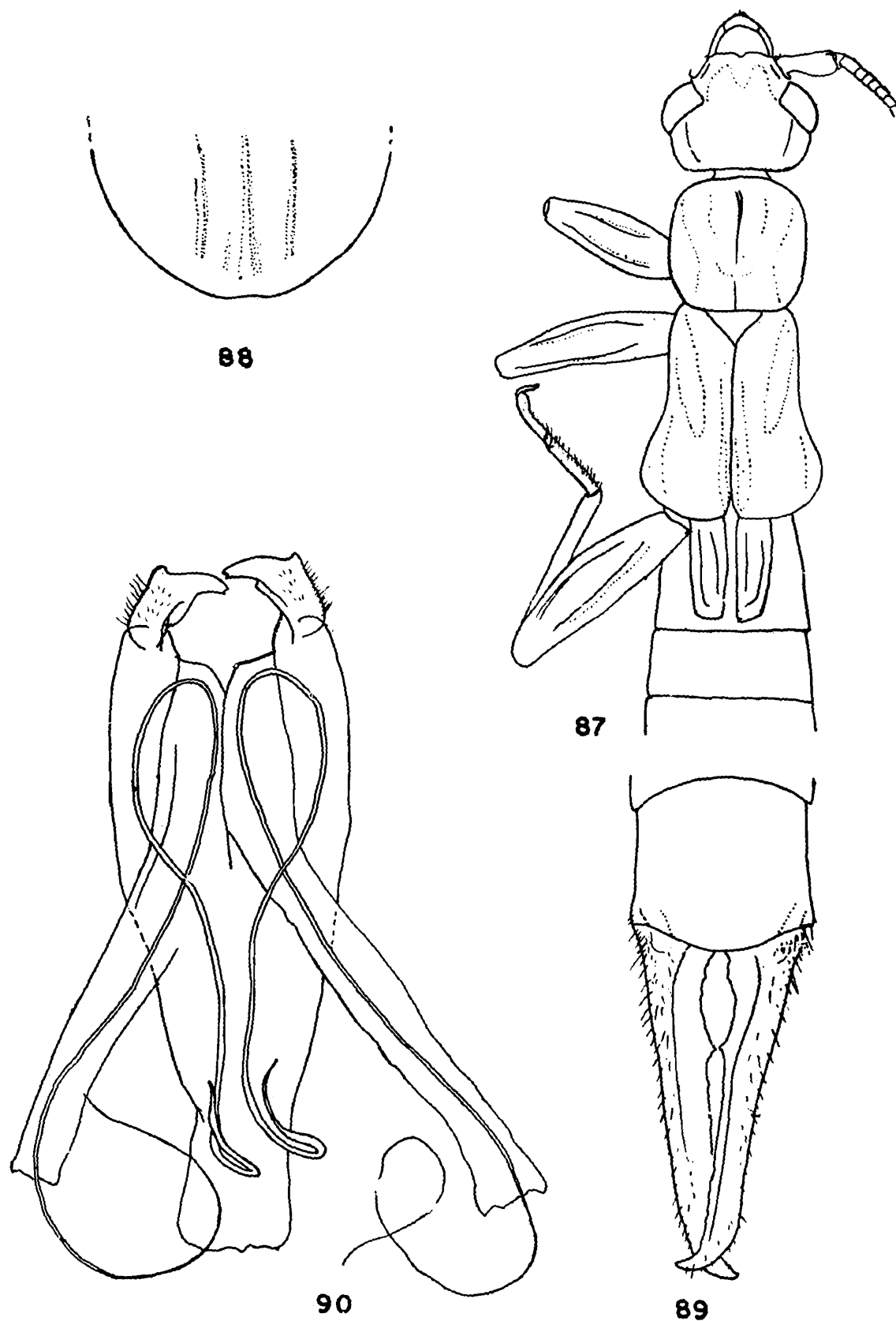
(Figs. 87-90)

Cranopygia vittipennis Hincks, 1955, *Ann. Mag. nat. Hist.*, 12 (8) : 820, 821 (♂ ; South India : South Coorg) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 105 ; Kapoor, 1966, *Ann. Mag. nat. Hist.*, (13) 9 : 481 ; Kapoor, 1968, *Agra Univ. Res. (Sci.)*, 16 (1) : 4 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 30 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 6.

♂ : General colour blackish brown. Basal two antennal segments, sides of pronotum yellow. Head with a broad irregular yellow patch in the centre. Legs yellow, femora faintly shaded with blackish brown, on or near borders. Elytra with three yellow stripes, external one running along the entire length, middle one extending from shoulder to middle, slightly broader posteriorly and inner one narrow, running along the whole of sutural margin. Wings yellow with narrow blackish brown stripes internally and externally. Pubescence fine on abdomen but longer on forceps. Elytra and wings covered with short, thick hairs, these imparting, a rough appearance,

Head slightly longer than broad, widest in the region of eyes, post-ocular area narrowed posteriorly, frons feebly raised, occiput feebly depressed anteriorly, sutures weakly marked, hind margin almost straight. Eyes moderately prominent, slightly longer than the post-ocular length. Antennae multi-segmented (over 25-segmented in the material examined), 1st stout, expanded apically, about as long as the distance between antennal bases ; 2nd short, about as long as broad, 3rd long and cylindrical, almost equal to succeeding two segments combinedly ; 4th and 5th transverse, equal ; 6th onwards segments gradually increasing in length with apical one thin and elongated. Pronotum slightly longer than broad, slightly contracted posteriorly, anterior margin convex, sides depressed and weakly convex, hind margin truncate ; prozona raised and metazona depressed and both separated by a faint transverse depression. Elytra and wings well developed, former about twice as long as the pronotum and latter slightly more than half the length of the pronotum. Legs typical for the genus ; posterior tarsi with 1st segment almost equal to 3rd, former compressed and the latter depressed, claw with an arolium. Abdomen

micro sculptured, gently expanded posteriorly, sides of segments convex. Penultimate sternite posteriorly rounded. Ultimate tergite weakly transverse, rugose, gently expanded posteriorly, convex above, sloping



Figs. 87-90 : *Cranopygia vittipennis* Hincks, ♂, 87. Anterior half of body ; 88. Posterior margin of penultimate sternite ; 89. Ultimate tergite and forceps ; 90. Genitalia.

backwards and laterally, lateral carina very feeble, median sulcus weakly marked, terminating posteriorly near hind margin into a smooth triangular area, hind margin almost straight in middle, laterally faintly emarginate and oblique, postero-lateral angle a little projecting. Forceps straight, depressed, tapering apically with tip gently hooked and pointed, at base above with a faint depression, internal margin finely crenulate, at base subcontiguous, feebly curved enclosing an elongated, elliptical space, the length of this space variable, terminated by a strong tooth, afterwards subcontiguous, more or less straight. Genitalia with parameres broader in basal two thirds, apically narrowed into a hooked lobe with its tip bifid, external apical angle produced into a minute point ; distal lobes slightly longer than the proparameres ; virga thin, tubular and projecting well beyond distal lobes.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	22.5
Length of forceps	6.0

Distribution : INDIA : Karnataka, S. Coorg, Ammatti, 3100 ft. ; Shimoga Dist., Jog falls, 258 m.

Hitherto this species was known by its types but it is now represented in ZSI collection by a ♂ from Jogfalls (Karnataka).

Types : Holotype ♂ and Paratype 1 ♂ in BMNH.

Remarks : This species can be easily separated from other species in the details of genital armature especially parameres with hairs on external border and external angle projecting ; very long distal lobes and slender virga.

The extent of basal curvature of forceps appears to be variable.

16. *Cranopygia eximia* (Dohrn)

(Figs. 91-94)

Pygidicrana eximia Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 49 (♂ ; Darjeeling) ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 13 : 328 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 16, 18, fig. 11 (♂, ♀) ; Kirby, 1904, *Syn. Cat. Orth.*, 1 : 5 ; Burr, 1905, *J. Asiat. Soc. Beng. (N.S.)*, 1 : 27 ; Burr, 1908 *Ann. Mag. nat. Hist.*, (8) 2 : 385 ; (part) Burr, 1910, *Fauna Brit. India Dermaptera* : 54, 57 (excluding Madras).

Kalocrania eximia ; Burr, 1911, *Genera Insect.*, 122 : 19.

Cranopygia eximia (Part) : Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 100 (excluding South India) ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 28 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 3 (excl. S. India) ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 5 (excl. South India) ; Steinmann, 1979, *Fol. Ent. Hung.*, 32 (1) : 152, figs. 5, 6.

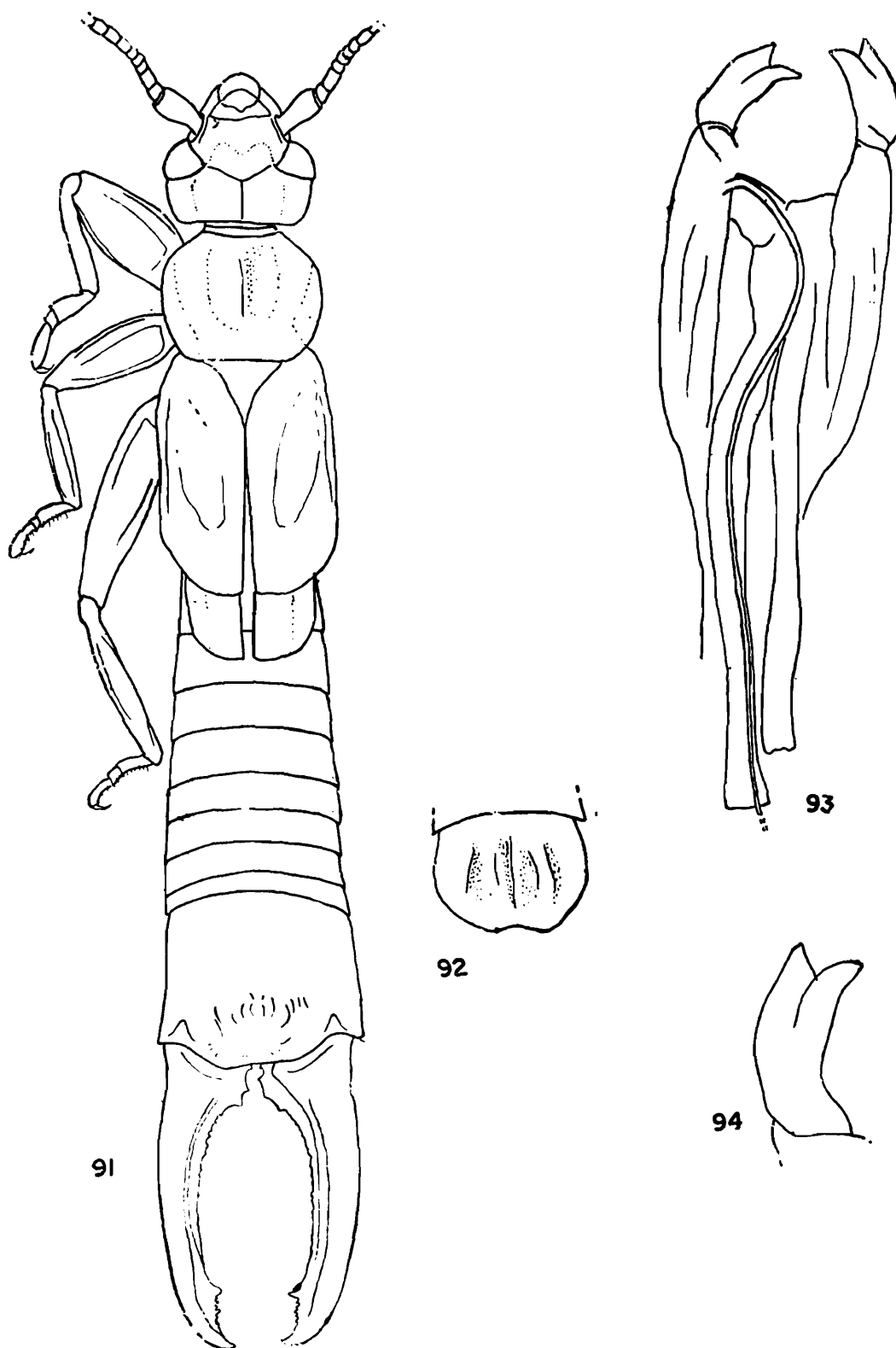
Cranopygia angulata Srivastava, 1975, *Entomologists Rec. J. Var.*, 87 : 121, figs. A, B (♂, ♀ ; India : Naga Hills). Syn. nov.

Cranopygia meghalayana Biswas and Ghosh in Biswas, Lahiri, and Ghosh, 1974, *Orient. Insects*, 8 (4) : 420, figs 1, 2 (♂ ; India : Meghalaya, Garo Hills and Khasi Hills). Syn. nov.

♂ : General colour blackish brown. Head dark brownish black with a large yellow spot in the middle ; pronotum yellow with a broad fuscous stripe on either side of middle line and meeting posteriorly ; elytra blackish brown with a broad yellow stripe extending up to apical $1/3$; wings yellow, externally blackish and legs yellow but femora shaded with black.

Head smooth, trinagular, longer than broad, frons moderately convex, sutures fine, distinct, posterior margin slightly emarginate. Eyes prominent, distinctly longer than the post-ocular area. Antennae multi-segmented (in Holotype ♂ on the right 16 and on the left 25 segments remaining), yellowish, 1st expanded apically, about as long as the distance between antennal bases ; 2nd small, about as long as broad ; 3rd long and cylindrical, about as long as the combined length of 4th and 5th ; segments 4th to 6th transverse ; 7th about as long as broad, remaining gradually increasing in length, a few apical ones thin and cylindrical. Pronotum about as long as broad, anteriorly lightly and on sides distinctly convex, narrowed posteriorly, hind margin truncate, median sulcus distinct, prozona moderately raised and poorly differentiated from flat metazona. Elytra well developed, posteriorly convex, axillary angle rounded off, exposing a small triangular scutellum. Wings projecting well beyond the elytra, shorter than the pronotum in length. Legs stout, normal, claw with a distinct arolium. Abdomen smooth, covered with fine pubescence, convex, gradually enlarging from base to 9th tergite. Penultimate sternite transverse, rugose in posterior $2/3$, sides and hind margin convex, latter with slight emargination in middle, a faint median impressed line present. Ultimate tergite transverse, sides lightly convex and expanded posteriorly, hind margin in middle straight, laterally oblique and gently emarginate, median sulcus pronounced in basal half, less marked in apical half. Forceps somewhat depressed, almost straight, tapering apically with tip pointed and gently hooked, inner margin differentiated into ventral and

dorsal borders, former at base contiguous with two or three strong teeth, afterwards provided with minute teeth, at apical one third a large



Figs. 91-94 : *Cranopygia eximia* (Dohrn), Holotype ♂, 91. Dorsal view ; 92. Penultimate sternite ; 93. Genitalia ; 94. Paramere enlarged.

tooth present. Genitalia with parameres three times longer than broad, external apical angle acute and internal tooth curved, acute, tip not

bifid ; distal lobes about as long as the proparamere, virga tubular, stout, about twice as long as the distal lobes.

♀ : Agrees with male in most characters except that sutures of head faint ; penultimate sternite obtusely pointed posteriorly, ultimate tergite parallel sided and forceps contiguous, simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	30.0-36.0	25.0-30.7
Length of forceps	6.0-9.5	5.8-8.0

Distribution : INDIA : Nagaland (Naga Hills) and Meghalaya (Garo Hills).

Types : Holotype ♂ (genitalia on slide separately) in IZAP.

Holotype ♂ (genitalia between two coverslips and attached with the specimen), Allotype ♀ and Paratype 1 ♂ (abdomen missing) of *Cranopygia augulata* Srivastava in ZSI.

Holotype ♂ (genitalia on a slide separately), Allotype ♀ and Paratypes 1 ♂, 1 ♂ (last instar) of *Cranopygia meghalayana* Biswas and Ghosh in ZSI (Eastern Regional Station, Shillong).

Remarks : Holotype ♂ alongwith genitalia of this species and the type series of other two species placed as synonym were examined. The virga are normaly twice as long as the distal lobes but the apical portion tend to break off. The slide containing genitalia of Holotype ♂ (*C. eximia*) lacks the apical portion of virga.

Prior to Steinmann (1979a) this species was not properly understood and Hincks (1959) described this species on the material from South India which represents an undescribed species.

C. meghalayana Biswas and Ghosh in Biswas et. al. (1974) and *C. angulata* Srivastava (1975a) which were published almost simultaneously are synonymised here since both agree with this species.

There appears to be some minor variation in the location of internal tooth of forceps which is located either at apical 1/3 (in Holotype ♂) or middle (in other two species synonymised here).

This species comes close to *C. burmensis* Hincks (Siamensis-Group) in having more or less indentical parameres but differs by the larger size and comparatively longer distal lobes and virga.

17. *Cranopygia bifurcata* Srivastava

(Figs. 95-98)

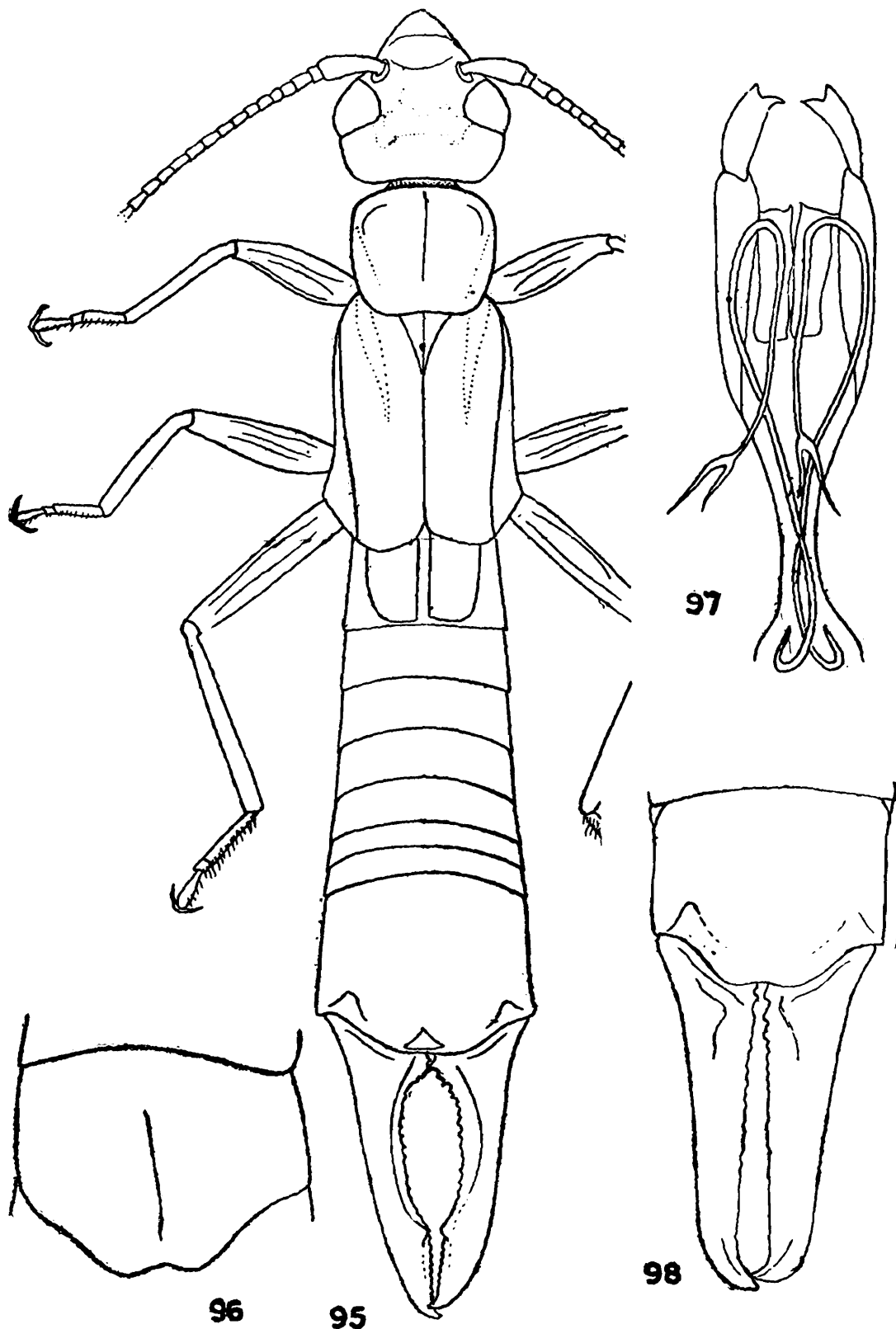
Cranopygia bifurcata Srivastava, 1980, *Ent. mon. mag.*, 115: 73 (♂, ♀; India, Arunachal Pradesh, Sunbansiri Dist., Chukru).

♂ : Build stout, finely pubescent. General colour dark brownish black; head with a large yellow spot in the centre; pronotum yellowish laterally; elytra with two yellow stripes, one extending laterally along the entire length and another above, extending from humeri to middle; wings and legs yellow but femora shaded with black.

Head about as long as broad, frons slightly depressed in middle, sutures distinct, posterior margin truncate. Antennae 40-45 segmented, 1st segment long, stout and club shaped; 2nd small; 3rd long but shorter than the 1st and cylindrical; 4th and 5th transverse, afterwards gradually increasing in length and narrowed. Eyes large and prominent, slightly longer than the post-ocular length. Pronotum about as long as broad, apically and laterally rounded, posteriorly subtruncate with slight emargination in middle and very slightly contracted, median sulcus fairly distinct. Elytra twice as long as the pronotum, hind margin convex. Wings extending well beyond the elytra but shorter than the pronotum. Legs with femora stout and carinate; tibiae long and compressed, clad with short and long pubescence; tarsi with 1st and 3rd segments equal in length, thickly pubescent on underside. Abdomen long and cylindrical, finely pubescent with dark, oval patches on each segment sublaterally, but very faint on segments 7th to 9th, very slightly enlarged posteriorly. Penultimate sternite punctate, roughly triangular, lateral and posterior margin feebly emarginate.

Ultimate tergite weakly transverse, slightly expanded posteriorly with angles projecting and margin rounded, disc convex, a slightly raised, smooth, and triangular area close to hind margin present, median sulcus fairly distinct. Forceps with branches stout and depressed with a transverse depression basally, long, tapering apically, internal margin with one or two strong teeth basally, afterwards arched enclosing an elongated, oval space terminating into a strong tooth at apical one fourth, thereafter margin very finely crenulate, straight and contiguous, apices gently hooked and crossing, branches flat below and punctate. Genitalia with paramers about three times longer than broad, inner margin concave and external margin convex, apically bifid; distal lobes only slightly longer than parameres and

about one fourth as long as the proparameres ; virga, stout, tubular, tapering apically and bifurcated, arms of bifurcated portion short, about as long as the parameres.



Figs. 95-98 : *Cranopygia bifurcata* Srivastava, Holotype, ♂, 95. Dorsal view ; 96. Penultimate sternite ; 97. Genitalia ; ♀, 98. Ultimate tergite and forceps.

♀ : Agrees with males in most characters except penultimate sternite triangular with sides oblique and straight and posteriorly

obtuse ; forceps simple and straight, internally finely crenulate and subcontiguous.

Measurements (in mm) :

	♂	♀
Length of body	22.0-27.5	21.8-25.8
Length of forceps	5.4-6.1	5.3-5.9

Distribution : INDIA : Arunachal Pradesh.

Types : Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen), Allotype ♀ and Paratype 2 ♂ ♂ (genitalia mounted between two coverslips and pinned with the respective specimens) at ZSI.

Remarks : In having the bifurcate apex of virga, the genitalia is very characteristic and its nearest ally appears to be *C. appendiculata* Hincks, from French Indo-China. The described species, however, can be easily separated from the latter by the shape of parameres which are quite different and virga is comparatively longer.

18. *Cranopygia dravidia* (Burr)

(Figs. 99-100)

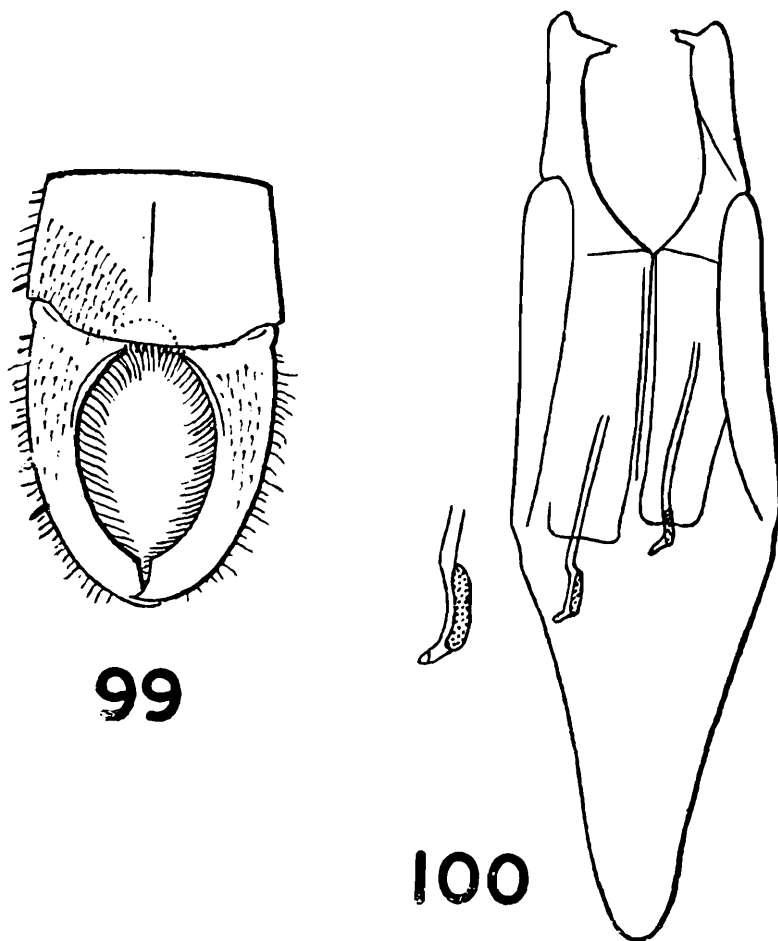
Dicrana dravidia Burr, 1914, *Rec. Indian Mus.*, 10 : 284 (♂ ; Madura Dist., Shembaganur).

Cranopygia dravidia ; Burr, 1914, *Ann. Mag. nat. Hist.*, (8) 14 : 423 (S. India, Shembaganur) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 72 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 2 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 20 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 1.

♂ : General colour smoky black. Head yellow with dark markings on frons and occiput ; antennae yellowish, shaded with smoky black. Pronotum along the anterior two third of median line, sides and a portion of hind margin yellow. Elytra with an oblique yellow stripe medially extending from shoulder to hind margin ; wing yellow. Legs yellow shaded with smoky black in parts. Abdomen covered with golden yellow pubescence and long thick hairs on hind margin ; ultimate tergite and forceps with dense long hairs.

Head slightly longer than broad, weakly convex, sutures distinct. Eyes slightly longer than the post-ocular length. Antennae (partly broken) 25-segmented or more, typical for the genus. Pronotum distinctly longer than broad, broadest behind, gently narrowed posteriorly with hind margin truncate and postero-lateral angles rounded. Elytra about half as long as the pronotum, basal axillary

angle rounded off to show a triangular scutellum. Wings projecting beyond the elytra for a short distance. Abdomen finely and closely punctate, gradually expanding posteriorly. Penultimate sternite broadly rounded, posteriorly more or less truncate with a faint emargination in middle, median sulcus with lateral depression on each side present. Ultimate tergite rugosely punctate, transverse, gently expanded posteriorly, laterally with a weak carina, hind margin straight, feebly emarginate and oblique at postero-lateral angles, median sulcus moderately distinct, terminating into a smooth, triangular, slightly raised



Figs. 99-100 : *Cranopygia dravidia* (Burr), ♂, 99. Ultimate tergite and forceps ; 100. Genitalia (redrawn from Hincks, 1959).

area close to the hind margin. Forceps depressed, tapering apically. at extreme base contiguous with strong teeth, strongly curved enclosing an elongated oval space, a little before apex internally with faint tubercles, afterward contiguous, crenulate, apices hooked and pointed. Genitalia with parameres $1/5$ as broad as long, external apical angle triangular, projecting above the inner projection ; distal lobes short, only slightly longer than the parameres ; virga shorter than distal lobes, a little before apex with a small specialised area,

♀ ; Unknown.

Measurements (in mm) :

	♂
Length of body	19.0
Length of forceps	3.5

Distribution : INDIA : Madura Dist.. Shembaganur (Palni Hills, 5.6 km E of Kodaikanal).

Types : Holotype ♂ in BMNH.

Remarks : This species was hitherto known by the Holotype ♂ and the above description is based upon the information furnished by Burr (1914) and Hincks (1959).

It can be very easily separated from the other known species by the details of male genitalia together with other morphological characters.

DOUBTFUL SPECIES

19. *Cranopygia angustata* (Dohrn)

(Figs. 101-107)

Pygidicrana angustata Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 56 (♀ ; Ceylon) ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 327 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 16, 23 (♀) ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 71 ; Kirby, 1904, *Syn. Cat. Orth.*, 1 : 5.

Pygidicrana angustata ; Burr, 1908, *Ann. Mag. nat. Hist.*, (8)2 : 390 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 64 (partim, ♂, ♀ ; Ceylon) ; Burr, 1911, *Genera Insect.*, 122 : 20, pl. 2, fig. 1, 1a (head, thorax, penultimate sternite of ♂ ?).

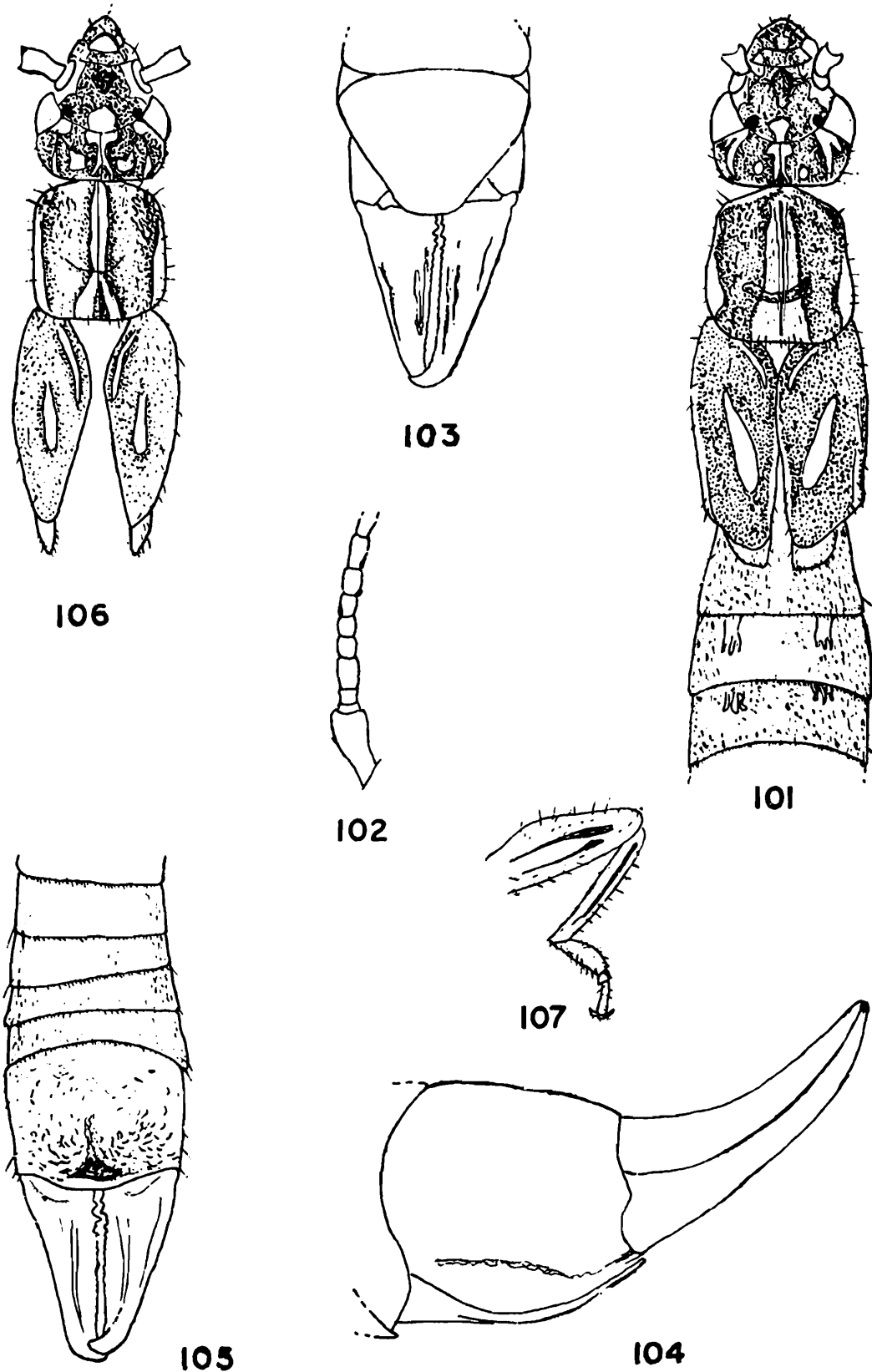
Kalocrania (vel *Cranopygia*) *angustata* ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 433.

Cranopygia angustata ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 89 (part) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 3 ; Kapoor, 1966, *Ann. Mag. nat. Hist.*, (13)9 : 481 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 24 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 3.

♂ : Not known.

♀ : General colour blackish brown, except ultimate tergite and forceps dark brownish black. Head with mouth parts yellow, around margin of basal follicle of antennae yellow, in posterior half of head with three of yellow stripes, external ones extending from inner angle of eye to hind margin and the other along the median line, somewhat broader apically and extending beyond transverse suture and forked posteriorly ; between lateral and median stripes a rounded patch of yellow close to hind margin present. Pronotum yellow along the lateral margin and median axis. Elytra with a broad elongated stripe

in middle, anal and costal margins with a narrow yellow stripe. Legs yellow, femora with a pair of narrow blackish brown bands and tibiae blackish brown at base only. Abdominal segments with obscure yellow



Figs. 101-107 : *Cranopygia angustata* (Dohrn), Syntypes 2 ♀ ♀, specimen 1, 101. Anterior portion of body ; 102. A few basal antennal segments ; 103. Penultimate sternite and forceps ; 104. Ultimate tergite and forceps, in profile ; 105. Posterior half of body ; specimen 2, 106. Anterior half of body ; 107. Hind leg.

patches. Whole body except ultimate tergite and forceps covered with fine yellow pubescence but on certain tergites an obscure, smooth, design sort of thing having three lobes present on either side, formed by smooth and shining thin lines.

Head slightly longer than broad, moderately convex, widest at the region of eyes and narrowed posteriorly, hind margin almost straight with slight emargination in middle, suture fairly distinct. Eyes moderately prominent, slightly shorter than the post-ocular length. Antennae (with maximum segments present 32 only, remaining broken off) with 1st segment stout, narrowed basally, about as long as the distance between antennal bases ; 2nd transverse ; 3rd twice as long as broad: 4th about as long as broad, remaining gradually increasing in length and thinning. Pronotum longer than broad, sides depressed, parallel with postero-lateral angles brief or prominent and hind margin subtruncate, median sulcus distinct ; prozona weakly convex and metazona flat. Elytra brief, axillary angles rounded off, exposing a triangular scutellum, meeting along the sutural margin, hind margin oblique. Wings yellow, scarcely projecting beyond the elytra. Legs normal. Abdomen convex, gradually expanding posteriorly. Penultimate sternite obtusely triangular posteriorly. Ultimate tergite strongly rugose with a raised triangular area in the middle posteriorly, median sulcus faint, laterally with a feeble, oblique, rugose fold. Forceps straight, tapering apically with tips gently hooked, internal margin below crenulate

Measurements (in mm) :

	Syntypes	
	♀	♀ (with big yellow label)
Length of body	15.5	15.8
Length of forceps	2.7	2.8

Distribution : SRI LANKA.

Types : Following two ♀ ♀ are present in ZMHB :—

1. ♀ , Labelled as : (i) 11-a small printed label ; (ii) angustata Dohrn-Ceylon Nietner-a big yellow label with black border-hand written probably by Dohrn ; (iii) Types-pink label printed in black and (iv) Zool. Mus. Berlin-printed white label.

2. ♀, Labelled as (i) Kat No. 11, Ceylon Nietner-a small yellow label, hand written but writing different from that of above one; (ii) *Cranopygia angustata* Dohrn*; (iii) Type-pink label printed in black; and (iv) Zool. Mus. Berlin-printed on white paper.

Remarks: The above two females labelled as 'Type' were made available to me for my study through the courtsey of Dr. Kürt K. Günther of ZMHB. In the absence of any other indication through Dohrn's (1863) publication or any other source it is advisable to treat both the specimens as 'Syntypes'. However, it may be pointed out that one of the females listed under 'Types' with big yellow label bordered with black bears the same handwriting as has been found on the labels of other Dohrn's types of Dermaptera examined by me earlier. The handwriting on the labels of the other ♀ specimen is different.

This species on comparison with the Holotype ♀ of *Cranopygia nietneri* (Dohrn), appears to differ in having distinctive yellow streaks on head, pronotum and elytra (vs somewhat different colour pattern on head (fig. 28), pronotum almost uniformly coloured except for a faint dull yellow streak along the median suture and faint patch in middle laterally and elytra uniform dull blackish brownish in *C. nietneri*); elytra scarcely projecting beyond elytra (vs abbreviated); legs variegated (vs uniform yellowish brown); ultimate tergite glabrous, rugose, laterally with an oblique, somewhat raised fold (vs pubescent, smooth, laterally without any raised fold) and forceps internally at base more strongly dentate (vs finely crenulate throughout); size smaller i.e. 18.2 to 18.6 mm (vs slightly larger i.e. 22.1 mm).

20. *Cranopygia tumida* Borelli

Cranopygia tumida Borelli, 1931, *Revue suisse Zool.*, 38 : 291 (♂, ♀; S. India : Nilgiris, Bangitappali); Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 107; Kapoor, 1968, *Agra Univ. J. Res. (Sci)*, 16(1) : 5; Sakai, 1971, *Dermapterorum Cat. Prael*, 3 : 31; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 7.

♂ : Head shining black with anterior part of clypeus yellowish brown, generally convex, post-frontal suture distinct, occipital suture less prominent, slightly longer than broad. Antennae typical, yellowish brown. Pronotum a little longer than broad, a little narrower than the head, convexly rounded anteriorly, angles rounded; opaque, black, lateral and posterior margin with a narrow yellowish brown stripe, prozona weakly convex, granular, traversed by a median sulcus; metazona depressed with granulations more prominent.

Scutellum short, triangular, black, opaque. Elytra about as long as the pronotum, humeral angles weak, posterior angles and margin rounded, black, granular. Wings absent. Legs coraceous, yellow, typical. Abdomen shining black, faintly yellowish, wrinkled, gradually increasing in length from base to last segment, laterally along the posterior margin of segments 3rd to 6th a cushion present, but highly prominent on 5th. Penultimate sternite large, broadly rounded in posterior half. Last dorsal segment large, trapezoidal, widening posteriorly, convex, rugose and with a faint median sulcus in anterior one fourth, strongly grooved above the base of forceps, limited externally by a convex, rugose crest, posteriorly in middle with a triangular depression, hind margin between bases of forceps truncate. Pygidium invisible from above. Forceps with branches yellowish brown, robust, asymmetrical, widened and depressed, along the external margin with a strong, obtuse tooth near base, internal margin, narrowing, becoming cylindrical up to curved points, raised upwards, right branch shorter than the left; denticulate along the internal margin almost throughout their length.

♀ : Abdominal segments widening from 1st to last segments less strongly than ♂; segments 3rd to 6th with natural lateral cushions. Last dorsal segment almost rectangular, posterior depression and lateral crest less marked. Penultimate sternite obtusely triangular posteriorly. The forceps simple, contiguous and straight.

Measurements (in mm) :

	♂	♀
Length of body	19.0	19.0
Length of forceps		
Left arm	4.6	4.0
Right arm	4.0	—

Distribution : INDIA : Tamil Nadu, Nilgiris, Bangitappali.

Types : According to the original description this species is known from ♂ ♀, which should be considered as 'syntypes' and are deposited at MHNG.

Remarks : The above description is base upon the original description. Since the ♂ genitalia of the syntype ♂ is not known the identity of the species is difficult to establish. It appears to be closely related to *C. raja* (Burr).

Borelli (1931) differentiated it from *C. kallipygos* (Dohrn) by the colour of head and branches of forceps and by the presence of well

marked lateral cushions on abdominal segments 3rd to 6th, close to hind margin.

It has been found during the course of present study that body colour varies within the narrow limits amongst the members of the genus *Cranopygia* Burr. In some species smooth, lateral, ovate and weakly raised patches close to hind margin of abdominal tergites are observed. Perhaps Borelli's "bourrelets" refer to these structures.

Subfamily DIPLATYINAE

Diplatyidae Verhoeff, 1902, *Zool. Anz.*, 25 (nr. 665) : 187 ; Zacher, 1910, *Ent. Rdsch.*, 27 : 105 ; Zacher, 1911, *Zool. Jb.*, 30 : 350.

Diplatyinae Burr, 1909, *Dt. ent. Z.*, 1909 : 321, 322 ; Burr, 1910, *Fauna Brit. India, Dermaptera* : 38 ; Burr, 1911, *Genera Insect.*, 122 : 10, 12 ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 424, 425 ; Burr, 1915, *Trans. R. ent. Soc. Lond.*, 1915 : 257, 267, 270 ; Maccagno, 1929, *Boll. Musei. Zool. Anat. comp. R. Univ. Torino*, 41(12) : 7 ; Hincks, 1955, *Ann. Mus. Congo. Belge. Zool.*, 8 : 13 ; Hincks, 1955, *Syst. Mono. Dermaptera*, 1 : 17 ; Steinman, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 188.

Build slender. Body covered with long and short pubescence thus giving dull appearance. Head with eyes prominent, usually longer than the post-ocular length, frons and occiput well differentiated in males but less so in females. Antennal segments long and slender excepting 2nd about as long as broad. Pronotum variable. Elytra and wings well developed, often latter wanting and former abbreviated. Neck blattoid type i. e. anterior margin of prosternum and hind margin of posterior ventral sclerite not touching. Anterior and posterior ventral sclerites not meeting. Abdomen long and cylindrical, often expanded apically in males but not differentiated in females. Male genitalia with parameres variously shaped and occasionally provided with apical epimerite, armed with teeth or divided medially into two halves ; distal lobes directed backwards ; virga double, often provided with chitinous accessory plates and rods.

Type genus : *Diplatys* Serville, 1831.

Distribution : Neotropical, Ethiopian and Oriental Regions.

Remarks : Hincks (1955) included only two genera viz., *Cylindrogaster* Stål and *Diplatys* Serville, under this subfamily and based his diagnosis of various genera and species on male genitalia together with morphological characteristics. In the present work the arrangement proposed by Steinmann (1974) for various genera is followed which is mainly based on genitalic characters.

Key to the genera (on males only)

- 1(2). Parameres with a deep cleft along the axis
dividing it into two lobes ... *Schizodiplatys* Steinmann
- 2(1). Parameres not divided along the axis
- 3(4). Parameres with a moveable epimerite
apically which is usually smaller than the
paramere ... *Paradiplatys* Zacher
- 4(3). Paramere without any moveable eipmerite
or projection.
- 5(6). Paramere internally armed with one or
more teeth, often separated by deep cavity
or emarginations ... *Diplatys* Serville
- 6(5). Paramere usually simple, internally without
any prominent teeth, occasionally margin
undulate, feebly emarginate or provided
with fine serrations ... *Haplodiplatys* Hincks

Genus *Schizodiplatys* Steinmann

Schizodiplatys Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1 & 2) : 189
(Type—*Cylindrogaster nigriceps* Kirby, 1891).

Diagnostic characters : Parameres divided into two equal or unequal lobes by a deep cleft, generally extending in apical half, along the axis or sometimes oblique. Lobes of parameres varied in shape, affording useful characters. Virga with a short or long unpaired basal portion, apically bifurcated.

Distribution : Ethiopian and Oriental Regions.

Remarks : This genus is represented in the Oriental Region by 12 species of which a single species is known to occur in India.

21. *Schizodiplatys angustatus* (Burr)

(Figs. 108-111)

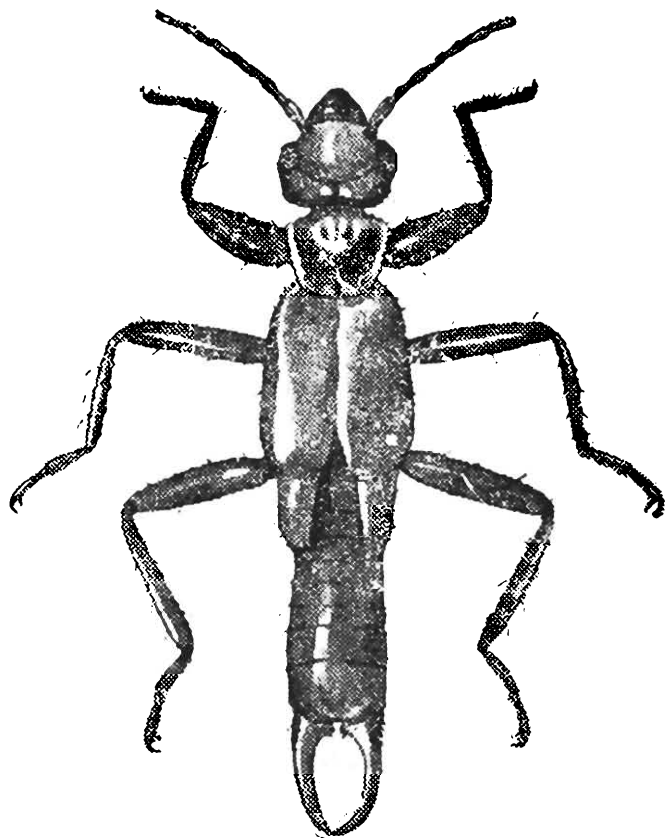
Diplatys angustatus Burr, 1910, *Fauna Brit. India Dermaptera* : 40, 43 (♂ ; North Bengal : Purneah Dist., Bhogaon) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 25, 30 ; Burr, 1911, *Genera Insect.*, 122 : 13 ; Kapoor, 1968, *Agra Univ. Res. (Sci.)*, 16(1) : 5 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 93 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 12.

Schizodiplatys angustatus ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 189.

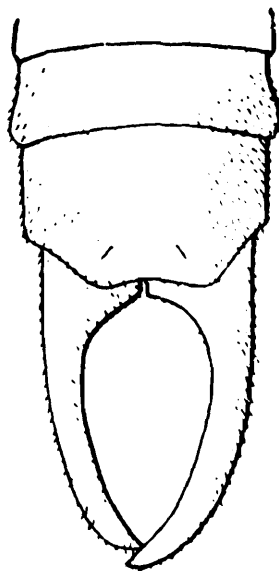
♂ : General colour dull dark brownish black. Antennae somewhat lighter, apical half of basal, 2nd and basal one third of 3rd segment ; mouth parts ; pronotum laterally ; basal one third and apex of femora and base of tibiae and wings at base and along the

internal margin yellow. Ultimate tergite in basal half and forceps reddish-brown but shaded with black. Body covered with long and sparse pubescence.

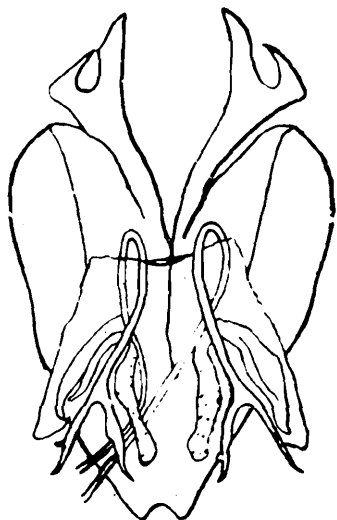
Head about as long as broad, surface covered with fine granulations



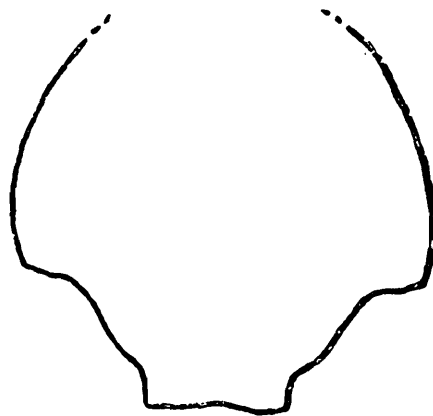
108



110



111



109

Figs. 108-111 : *Schizodiplatys angustatus* (Burr), ♂, 108. Dorsal view ;
109. Penultimate sternite ; 110. Ultimate tergite and forceps ;
111. Genitalia.

bearing very short fine golden yellow pubescence, frons weakly raised and passing into moderately depressed occiput, surface uneven. With longitudinal depression, transverse suture marked by a fine polished line and median suture by a distinct groove, post-ocular carina sharp, slightly curved, extending up to hind margin, hind margin raised posteriorly as well as laterally up to two third of post-ocular area. Eyes moderately prominent, only slightly longer than post ocular area. Antennae 11-segmented or more, covered with fine, short, yellow pubescence, 1st segment stout, greatly expanded apically, shorter than the distance between antennal bases ; 2nd about as long as broad, short ; 3rd long and cylindrical ; 4th slightly shorter than preceding ; 5th almost equal to 3rd but shorter and gently expanded apically, remaining gradually increasing in length and thinning except 18th, slightly shorter than the preceding. Pronotum slightly broader than long, anteriorly convex, as wide as head, contracted posteriorly, surface granulations and pubescence finer than on the head, sides straight, hind margin almost truncate, prozona convex and metazona well differentiated, strongly depressed, median sulcus fine but distinct and running along the entire length. Elytra and wings well developed, former finely granulated and axillary angles rounded off, exposing a large triangular scutellum. Legs very long and slender, finely granulated, hind femora twice as long as wings. Prosternum brownish black, shining, about twice as long as broad, anteriorly convex, posteriorly truncate, laterally contracted between fore coxae ; mesosternum brownish black in anterior half and yellowish brown posteriorly, quadrate, all sides straight, hardly sinuate between middle coxae ; metasternum brownish black, yellowish posteriorly, broad in posterior half with a shallow, broadly triangular depression, narrowed between hind coxae and slightly extending beyond it, hind margin lightly concave with postero-lateral lobes a little projecting. Abdomen smooth, long and cylindrical, slightly enlarging posteriorly, finely granulated, tergites posteriorly with a transverse depression and hind margin beset with a row of fine yellow hairs, lateral tubercles of 3rd weakly and 4th tergite moderately developed. Penultimate sternite laterally and posteriorly produced into narrow lobe, characteristic (Fig. 109), finely pubescent. Ultimate tergite transverse, finely granulated and pubescent, moderately convex above, sloping backwards, hind margin trisinuate, laterally oblique. Forceps at base expanded with it inner margin dentate, afterwards depressed, tapering apically and regularly curved, apices gently hooked and meeting, inner margin unarmed demarkated into dorsal and ventral borders. Genitalia with parameres broadly

triangular, in apical half divided into two narrow lobes by a median rounded incision, inner lobe longer and external one apically acuminate ; distal lobe slightly longer than the parameres, provided with elongated, denticulate accessory plates ; virga with unpaired portion twice as long as the distal lobes, apically bifurcated, arms short, strongly narrowed apically, provided with an external lobe, internal arm slightly swollen preapically.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	9.0
Length of forceps	1.8

Distribution : INDIA : Meghalaya, Garo Hills, Songsek, (ZSI) ; Bihar, Purnea Dist., Bhogaon.

Type : Holotype ♂ in BMNH.

Remarks : Hitherto this species was known by Holotype ♂ which was collected in 1908 and the second male in ZSI, after a lapse 67 years, was collected in the year 1975 in Meghalaya, shows the rarity of the species. The second specimen is identical to Holotype ♂ except for some minor variations in general colour and pubescence. It may be mentioned that colour varies slightly with age and the pubescence is sometimes brushed off.

This species comes close to *Schizodiplatys palawanensis* (Srivastava) from Palawan, Philippine Islands in having the inner lobe of parameres longer than the outer one but differs by the remarkable shape of penultimate sternite and the details of genitalia in males.

Genus *Paradiplatys* Zacher

Paradiplatys Zacher, 1910, *Ent. Rdsch.*, 27 : 105 (subgenus) (monobasic—*Diplatys conardti* Burr, 1904) ; Sakai, 1982, *Bull. Daito Bunka Univ.*, 20 : 19.

Lobodiplatys Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 198.
(Type—*Forficula coriaceus* Kirby, 1891).

Diagnostic characters : Paramere entire but provided with a narrow or lobed epimerite externally, situated a little before apex. Epimerite generally smaller than the paramere and variously shaped.

Distribution : Ethiopian and Oriental Regions.

Remarks : Sakai (1982) has rightly resurrected subgenus *Paradiplatys*

Zacher (1910a) to generic rank synonymising *Lobodiplatys* Steinmann (1974) since the types of both the genera appear to be congeneric.

According to Steinmann (l. c.) the presence of an epimerite shows close relationship with *Schizodiplatys* Steinmann, since it appears to be a derivative of outer lobe of parameres.

22. *Paradiplatys gladiator* (Burr)

(Figs. 112-116)

Diplatys gladiator Burr, 1905, *J. Asiat. Soc. Beng. (N. S.)*, 1 : 27, 29 (♂, Calcutta) ; Burr, 1906, *J. Asiat. Soc. Beng. (N. S.)*, 2 : 387 ; Burr, 1907, *Rec. Indian Mus.*, 1 : 207 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 40, 41 ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 24, 29 ; Burr, 1911, *Genera Insect.*, 122 : 13 ; Burr, 1914, *Rec. Indian Mus.*, 10 : 282 ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 427, 428 ; Hincks, 1955, *Syst. mono. Denmaptera*, 1 : 92 ; Ramamurthi, 1968, *Zool. Anz.*, 181(1 & 2) : 128 ; Kapoor, 1968, *Agra. Univ. J. Res. (Sci.)*, 16(1) : 5 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 97 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 12.

Lobodiplatys gladiator ; Steinmann, 1974, *Acta. zool. Acad. Soc. Hung.*, 20(1-2) : 200.

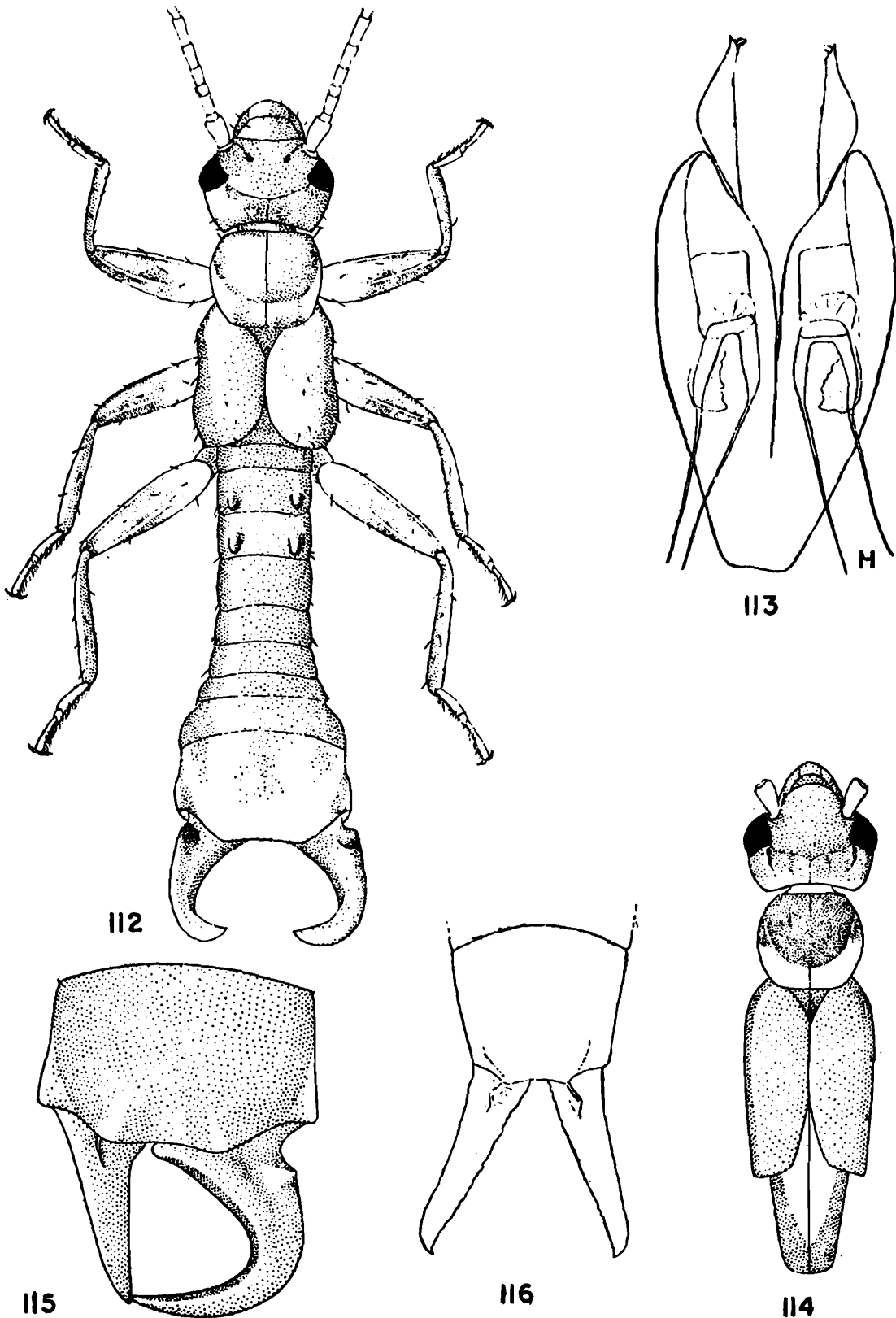
Pardiplatys gladiator ; Sakai, 1982, *Bull. Daito Bunka Univ.*, 20 : 20.

Diplatys bicoloripes Hebard, 1923, *Mem. Dep. Agric. India ent. Ser.*, 7 : 196 (♂ ; Nagpur, Central Province [now in Maharashtra], India).

♂ : General colour light to dark brown or brownish black. Antennae generally yellowish brown with second and remaining segments apically yellow, sometimes uniformly coloured with dark brown. Pronotum uniform dark brown or occasionally yellow laterally in middle. Legs uniform brown or dark blackish brown with femora basally and apically ; tibia in apical one third and whole of tarsi yellow. Abdomen light to dark brown or blackish with varying intermediate shades.

Head slightly longer than broad, frons weakly raised and passing into feebly depressed occiput, sutures fairly distinct but fine, post-ocular carina represented by a weak curved fold, dying out a little before hind margin, hind margin distinctly and broadly emarginate. Eyes not very prominent, slightly shorter than the post-ocular length. Antennae 20-segmented or more, 1st stout, greatly expanded apically, shorter than the distance between antennal bases ; 2nd about as long as broad ; 3rd long, slender ; 4th subclavate, distinctly shorter than the preceding ; 5th almost equal to 3rd in length, gently expanded apically, remaining gradually increasing in length, and thinning. Pronotum about as long as broad, sides lightly convex in middle, gently contracted posteriorly, hind margin truncate, prozona weakly raised and metazona

lightly depressed, median sulcus running the entire length, distinct but fine. Elytra generally abbreviated, axillary angles rounded off, exposing a large triangular scutellum, surface microsculptured, covered with short,



Figs. 112-116 : *Paradiplatys gladiator* (Burr), brachypterous ♂; 112. Dorsal view; 113. Genitalia; macropterous ♂, 114. Anterior half of body; 115. Ultimate tergite and forceps with left arm showing stunted growth; brachypterous ♀, 116. Ultimate tergite and forceps.

sparse pubescence. Wings abortive. Rarely elytra and wings well developed. Prosternum twice as long as broad, anteriorly convex, posteriorly subsinuate, almost parallel sided, with a slight constriction between fore-coxae ; mesosternum transverse, all margins almost straight ; metasternum transverse, narrowed slightly between hind-coxae and extending beyond it with hind margin subsinuate. Legs long and slender. Abdomen smooth, long and cylindrical, apically greatly expanded. Penultimate sternite more or less round, posterior angles rounded and margin feebly concave in middle. Ultimate tergite strongly transverse, expanded posteriorly in forma macrolabia, less so in f. mesolabia, disc almost flat, very slightly sloping backwards hind margin trisinate, laterally oblique, postero-lateral angles distinctly projecting in f. macrolabia and comparatively less so in f. mesolabia. Forceps at base internally flattened with margin crenulate, afterwards, in f. macrolabia strongly incurved, internal margin smooth, sometimes at base externally with a vertical triangular tooth ; in f. mesolabia less strongly curved, tapering apically with tip pointed and gently hooked. Genitalia with parameres expanded in middle, inner margin almost straight, anteriorly narrowed, tip acute ; provided with a short hooked lobe ; distal lobes short with denticulated accessory plates, virga at base supported by chitinous flange, apically long, tubular and thus, projecting well beyond distal lobes.

♀ : Agrees with males in most characters except that post-ocular carina less distinct or almost obsolete, eyes clearly shorter than the post-ocular length, abdomen flattened, strongly narrowed posteriorly including ultimate tergite ; penultimate sternite strongly narrowed posteriorly with margin rounded, finely pubescent and forceps contiguous, simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	8.5-9.2	8.3-10.4
Length of forceps	1.2-1.5	1.2-1.6

Distribution : INDIA : Tamil Nadu : Coimbatore ; Madras : Poondi Reservoir ; Maharashtra : Nagpur ; Naotha ; 901 ft., Burhanpur Range, Nemar Div. (1 ♂ macropterous) (FRI) ; Madhya Pradesh : Shivpuri ; Orissa : Ganjam Dist., Tatapani (micropterous) ; Cuttack ; West Bengal : Purulia, Calcutta ; Bihar : Chottanagpur, Chaibasa, Manbhum ; pass between Chaibasa and Chakradharpur.

Type : Holotype ♂ of *Diplatys gladiator* in ZSI ; Holotype ♂ of *Diplatys bicoloripes* in ANSP and Paratype 1 ♂ in IARI.

Remarks : This species shows great variation in general body colour especially antennae, pronotum, elytra and legs. It is seen occasionally that the antennae of two sides show variation in the relative length of various segments. They may be either stout which is generally the normal condition or somewhat elongated. Normally elytra are abbreviated and wing are wanting. But in 1 ♂ from Orissa, Tatapani (ZSI) wings are scarcely projecting beyond the abbreviated elytra as narrow lateral lobes whereas in another ♂ from Maharashtra (FRI) elytra and wings are quite well developed. Macrolabic and mesolabic forms with various intermediate stages of male forces are occasionally met with in a large series.

During the rainy season in Calcutta this species is quite common in old houses and very often can be collected at light. Presence of a large number of nymphs during this period possibly indicates its breeding season.

Amongst the known Oriental species of the genus it can be easily separated on the shape of genital armature in conjunction with other morphological peculiarities.

Genus *Diplatys* Serville

Diplatys (pars) Serville, 1831, *Ann. Sci. Nat.*, 22 : 33 (monobasic, *Forficula macrocephala* Palisot de Beauvois, 1805) ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 293 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 5, 8-10 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 73 ; Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 277-285 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 35-53 ; Burr, 1911, *Genera Insect.*, 122 : 12-14 ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 425-429 ; Zacher, 1910, *Ent. Rdsch.*, 27 : 105 ; Zacher, 1911, *Zool. Jb.*, 30 : 350-355 ; Rehn, 1924, *Bull. Am. Mus. nat. Hist.*, 49 : 353-354 (excl. Syn. *Cylindrogaster*) ; Maccagno, 1929, *Boll. Musei. Zool. Anat. comp. R. Univ. Torino*, (3)41(12) : 1-6 ; Hincks, 1947, *Ark. Zool.*, 39A(1) : 6-15 ; Hincks, 1951, *Ann. Mus. Congo. Belge. Zool.*, 8 : 14-25 ; Hincks, 1953, *Trans. IXth Int. Congr. Ent.*, 2 : 3-6 ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 26-127 ; (not pars ; in revised sense), Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20(1-2) : 191 ; (pars), Srivastava, 1976, *Rec. zool. Surv. India Occ. Pap.*, 2 : 10.

Nannopygia Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 60 (monobasic, *N. gerstaeckeri* Dohrn, 1863) ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 5, 10-11 ; Zacher, 1910, *Ent. Rdsch.*, 27 : 105 (Subgenus) ; Zacher, 1911, *Zool. Jb.*, 30 : 354, 355 ; Burr, 1911, *Genera Insect.*, 122 : 14 (subgenus) ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 428.

Dyscritina Westwood, 1881, *Trans. R. ent. Soc. Lond.*, 1881 : 601 (nymph) (monobasic, *D. longisetosa* Westwood, 1881) ; Green, 1898, *Trans. R. ent. Soc. Lond.*, 1898 : 381 ; Burr, 1898, *Trans. R. ent. Soc. Lond.*, 1898 : 387 ; Burr, 1910, *Fauna Brit. India Dermoptera* : 40.

Verhoeffiella Zacher, 1910, *Ent. Rdsch.*, 27 : 105 (subgenus) (monobasic, *Diplatys aethiops* Burr, 1904) ; Zacher, 1911, *Zool. Jb.*, 30 : 351, 355 (subgenus) ; Burr, 1911, *Genera Insect.*, 122 : 14 (subgenus) ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 416.

Diagnostic characters : Parameres usually elongated, external margin usually unarmed, internally armed with one or two teeth, sometimes separated by a concavity, occasionally concavity preceding or succeeding pre-apical tooth ; virga may be long and tubular or short and thick.

Distribution : Oriental and Ethiopian Regions.

Key to the species (based on males only)

- 1(10). Virga at base with a rounded vesicle or small protuberance
- 2(3). Basal vesicle of virga large, rounded ; parameres internally at about middle with a sharp tooth, apical half narrow, turned externally ... *D. brindlei* Steinmann
- 3(2). Basal vesicle of virga comparatively smaller ; parameres internally provided with one or two teeth in the middle of apical half
- 4(5). Penultimate sternite bisinuate posteriorly ; parameres slender, virga about as long as proparameres ... *A. chopardi* Hincks
- 5(4). Penultimate sternite not bisinuate posteriorly ; parameres comparatively broader, virga shorter than proparameres
- 6(7). Penultimate sternite with hind margin feebly undulate ; branches of virga near apex with a minute protuberance ... *D. devlensis* Srivastava
- 7(6). Penultimate sternite emarginate posteriorly ; branches of virga tubular, tapering apically
- 8(9). Penultimate sternite posteriorly in middle with a small concavity, on either side of it with a minute tooth directed externally ; parameres internally with an oblique and deep concavity ... *D. papovi* Bey-Bienko

- 9(8). Penultimate sternite with a broader and deeper concavity posteriorly ; parameres internally with preapical concavity, hardly distinct ... *D. excidens* Hincks
- 10(1). Virga at base without a rounded vesicle, occasionally thickened at base or represented by an unpaired portion
- 11(26). Virga paired throughout its entire length
- 12(15). Virga shorter than distal lobes
- 13(14). Penultimate sternite concave posteriorly ; apical portion of paramere very slender, internally with a single strongly curved tooth ... *D. confusus* Hincks
- 14(13). Penultimate sternite truncate posteriorly ; apical portion of paramere broader, tapering apically, internally with a pair of teeth, smaller in size ... *D. coelebs* Hincks
(=*D. jogiensis* Kapoor syn. n.)
- 15(12). Virga about as long or distinctly longer than the distal lobes
- 16(17). Penultimate sternite with postero-lateral angles produced into lobes and margin scarcely sinuate or almost straight ; virga flanked by fimbriated membranous flange ... *D. jawalagiriensis* Kapoor, Bharadwaj and Banerjee
- 17(16). Penultimate sternite various, but not as above ; virga simple, tubular, without membranous flange
- 18(21). Penultimate sternite truncate posteriorly
- 19(20). Parameres with 3 small teeth internally ; virga at base tubular, feebly thickened ... *D. nathanii* Hincks
- 20(19). Parameres with a large hooked tooth internally ; virga at base strongly thickened ... *D. dolens* Hincks
(=*D. poonaensis* Kapoor syn. n.)
- 21(18). Penultimate sternite concave or rounded posteriorly
- 22(23). Penultimate sternite broadly rounded posteriorly ; virga at base tubular, with a minute tubercle or swelling internally at the base of inner arm ... *D. tikaderi* sp. n.
- 23(22). Penultimate sternite shallowly concave posteriorly ; virga at base distinctly thickened

- 24(25). Penultimate sternite sublaterally with a short linear carina in middle ; parameres with internal teeth more prominent and concavity narrow ... *D. lefroyi* Burr
- 25(24). Penultimate sternite sublaterally smooth ; parameres with internal teeth feeble and broader ... *D. menoni* Kapoor and Bharadwaj
- 26(11). Virga unpaired at base, in relation to paired portion its length variable
- 27(34). Unpaired basal portion of virga very short to at least less than $1/3$ of the paired portion
- 28(31). Parameres internally with a single pre-apical tooth, occasionally with a concavity before it
- 29(30). Pronotum elongated, sides straight, parallel or gently converging posteriorly, hind margin rounded ; distal lobe longer than half the length of proparameres, basal median portion of virga tubular, arms of paired portion equal to distal lobes in length ... *D. fletcheri* Burr
- 30(29). Pronotum rounded laterally and forming an arch with hind margin, entire border provided with small tubercles ; distal lobes shorter than half the length of proparameres ; basal median portion of virga thickened laterally, arms of paired portion about half as long as the distal lobes ... *D. anamaliensis* Srivastava
- 31(28). Parameres internally with a pair of teeth, separated by a concavity
- 32(33). Parameres with preapical concavity narrow and the portion anterior to it shorter and acute ; branches of virga thin and tubular ... *D. greeni* Burr
- 33(32). Parameres with preapical concavity broader and the portion anterior to it longer, acuminate ; branches of virga stout and swollen ... *D. carli* sp. n.
- 34(27). Unpaired portion of virga about as long or longer than the paired portion
- 35(42). Unpaired portion of virga twice as long as the paired portion
- 36(39). Parameres internally with a large tooth and the portion beyond it narrow

- 37(38). Parameres internally armed with a hooked tooth at a little before middle and the portion beyond it longer and narrower, armed internally with a minute tooth at about middle ... *D. propinquus* Hincks
- 38(37). Parameres internally armed at apical one fourth with a tooth and its free margin straight and the portion of paramere beyond it narrower and shorter ... *D. ernesti* Burr
- 39(36). Parameres internally armed with three teeth situated in apical half, the middle one situated in a concavity separating anterior and posterior tooth, apical portion beyond teeth shorter and comparatively broader at base
- 40(41). Penultimate sternite truncate posteriorly; branches of paired portion of virga shorter and stout ... *D. adjacens* Hincks
- 41(40). Penultimate sternite posteriorly faintly bisinuate with slight convexity in middle; branches of paired portion of virga longer and slender ... *D. sinuatus* Hincks
- 42(35). Unpaired portion of virga about as long as the paired portion
- 43(46). Penultimate sternite bisinuate posteriorly
- 44(45). Penultimate sternite with median lobe of posterior margin pointed; parameres $\frac{1}{3}$ as long as proparameres, apically with a broad internal lobe ... *D. gerstaeckeri* (Dohrn)
- 45(44). Penultimate sternite with median lobe of posterior margin obtuse; parameres only slightly shorter than proparameres, long and narrow, internally armed with a small tooth at apical $\frac{1}{3}$... *D. santoshi* Srivastava
- 46(43). Penultimate sternite not bisinuate posteriorly
- 47(48). Penultimate sternite slightly concave posteriorly; apical portion of parameres beyond internal teeth shorter; branches of paired portion of virga stouter, a little before apex so called ... *D. nilgiriensis* Hincks
- 48(47). Penultimate sternite truncate posteriorly; apical portion of parameres beyond internal teeth longer; branches of paired portion of virga thinner, apically not so called ... *D. carinatus* sp. n.

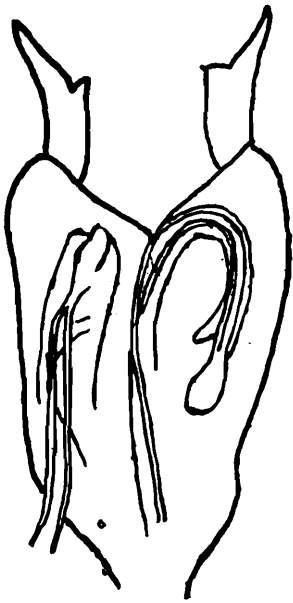
23. *Diplatys brindlei* Steinmann

(Figs. 117-119)

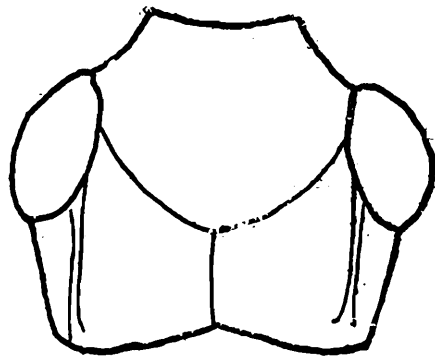
Diplatys brindlei Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 197 (♂, ♀ ; India : West Bengal, Darjeeling Dist., below North Point).

♂ : General colour yellowish brown. Head dark brown with mouth parts yellow. Antennae with basal segment ; pronotum laterally and posteriorly, sternal plates and elytra yellow. Finely pubescent.

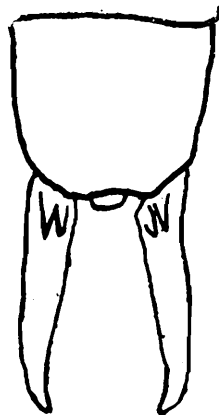
Head slightly longer than broad, frons weakly raised or flat, occiput weakly depressed, not much differentiated from frons, post-



119



117



118

Figs. 117-119 : *Diplatys brindlei* Steinmann, ♂, 117. A portion of head showing eyes, frons and occiput ; 118. Ultimate tergite and forceps ; 119. Genitalia (redrawn after Steinmann, 1974).

ocular carina sharp, straight, extending up to hind margin, sutures distinct, hind margin emarginate and feebly thickened. Eyes prominent, distinctly longer than the post-ocular area. Antennae 17-segmented, typical for the genus. Pronotum slightly longer than broad, gently contracted posteriorly, prozona convex and metazona depressed. Elytra well developed, about two and half times longer than the pronotum. Wings well developed, extending up to 4th abdominal tergite. Prosternum narrow, twice as long as broad, anterior margin convex; mesosternum one and half times as broad as metasternum, latter twice as broad as prosternum. Legs normal, at rest apex of hind femora slightly projecting beyond apex of wings. Abdomen long and slender, almost of uniform width. Ultimate tergite about as long as broad, gently contracted posteriorly, hind margin trisinuate, laterally oblique. Forceps depressed, straight, tapering apically with tip gently hooked and pointed, at base above with a small triangular crest in the middle of a shallow depression. Genitalia with paramere $1/3$ as long as the proparamere, broader and almost parallel sided up to a little beyond middle, at this point internally armed with a sharp pointed tooth, afterwards narrowed, turned externally with apex acute; distal lobes with accessory plate, virga at base with a large rounded vesicle, branches of virga long, thin and tubular, projecting beyond the distal lobes.

♀ : Agrees with males in most characters except in secondary sexual characters.

Measurements (in mm) :

	♂	♀
Length of body	9.9	11.2
Length of forceps	1.1	1.0

Distribution : INDIA : West Bengal, Darjeeling Dist., below North Point.

Types : Holotype ♂ and Paratype 1 ♀ in HNAB.

Remarks : This species is known by its type and the shape of penultimate sternite is not described.

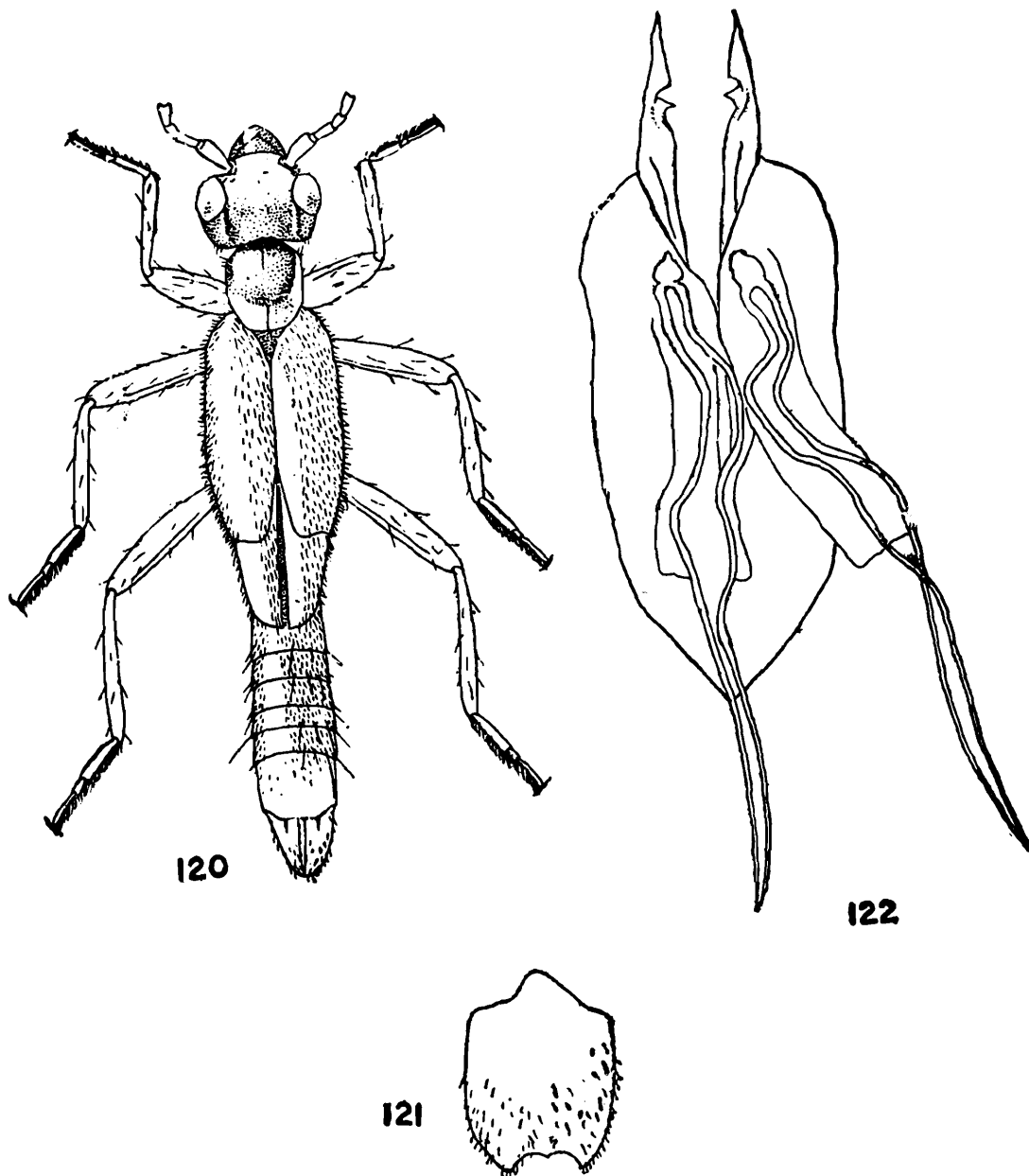
In having very characteristic ♂ genitalia this species can be very easily distinguished from other known species under the genus from the Oriental Region.

24. **Diplatys chopardi** Hincks
(Figs. 120-122)

Diplatys chopardi Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 119 (♂ ; India (South), Chambaganur) ; Kapoor, 1968, *Agra. Univ. J. Res. (Sci.)*, 16 (1) : 7 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 129 ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 193 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 13.

♂ : General colour yellowish brown. Head generally shaded with blackish brown ; pronotum darker in anterior half ; legs yellow ; elytra with an elongated pale spot in posterior half internally ; abdomen, ultimate tergite and forceps reddish brown. Strongly pubescent, short and long pubescence present.

Head slightly longer than broad, smooth, frons weakly convex,



Figs. 120-122 : *Diplatys chopardi* Hincks, ♂, 120. Dorsal view ;
121. Penultimate sternite ; 122. Genitalia.

gradually passing into weakly depressed occiput, transverse suture obsolete and median suture represented by a fine groove, post-ocular carina moderately developed, slightly curved, almost reaching up to hind margin, occiput converging posteriorly, hind margin triangularly emarginate, Eyes complete black, whitish or yellowish brown, prominent, slightly longer than the post-ocular length. Antennae 10-segmented or more, basal segment stout, expanded apically, about as long as the distance between antennal bases ; 2nd short, about as long as broad ; 3rd long and cylindrical, slightly longer than 4th ; 4th stouter, gently expanded apically ; 5th longer than 3rd, slender, gently expanded apically, remaining gradually increasing in length and thinning. Pronotum clearly longer than broad, smooth, gently contracted posteriorly, sides straight and parallel, hind angles and margin conjointly rounded, prozona moderately convex, metazona depressed, median sulcus distinct in basal two thirds only. Elytra and wings well developed, micro-reticulated, former with axillary angles rounded off, exposing a small triangular scutellum. Legs normal, hind femora at rest extending beyond apices of wings. Abdomen long and cylindrical, smooth, parallel sided, a trifle expanded apically, long pubescence present on sides and posterior margin of tergites. Penultimate sternite with sides gently convex, posteriorly with a short median oval depression, hind margin bisinuate, postero-lateral angles and in the middle of hind margin with a minute tooth. Ultimate tergite about as long as broad, convex laterally in middle and above, smooth, gently sloping backwards, hind margin subsinuate in middle, laterally oblique and subsinuate. Forceps shorter than the length of ultimate tergite, contiguous, straight, tapering apically, apices pointed, gently incurved, inner margin finely crenulate, at base with a short, vertical crest in the middle of a shallow depression. Genitalia with parameres about half as long as the proparameres and shorter than the distal lobes, tapering apically to acuminate apex, internally at apical one third armed with two teeth, anterior one small and posterior one larger, hooked, both separated by a concavity ; virga at base with a moderate sized, rounded vesicle, arms of bifurcated portion two times longer than the distal lobe, strongly undulate.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	7.7-8.2
Length of forceps	0.55-0.6

Distribution : INDIA : Karnataka : Chembaganur, Coorg, Fraserpet. Tamil Nadu : Vellore, Kottur ; 3700 ft. (FRI).

Type : Holotype ♂ in MNHP.

Remarks : This species exhibits slight variation in the colour of head, eyes and elytra.

In having rounded vesicle at the base of virga it comes close to *D. brindlei* Steinmann, from India, Darjeeling but the shape of penultimate sternite and paramere is characteristic and virga is distinctive.

25. *Diplatys devlensis* Srivastava

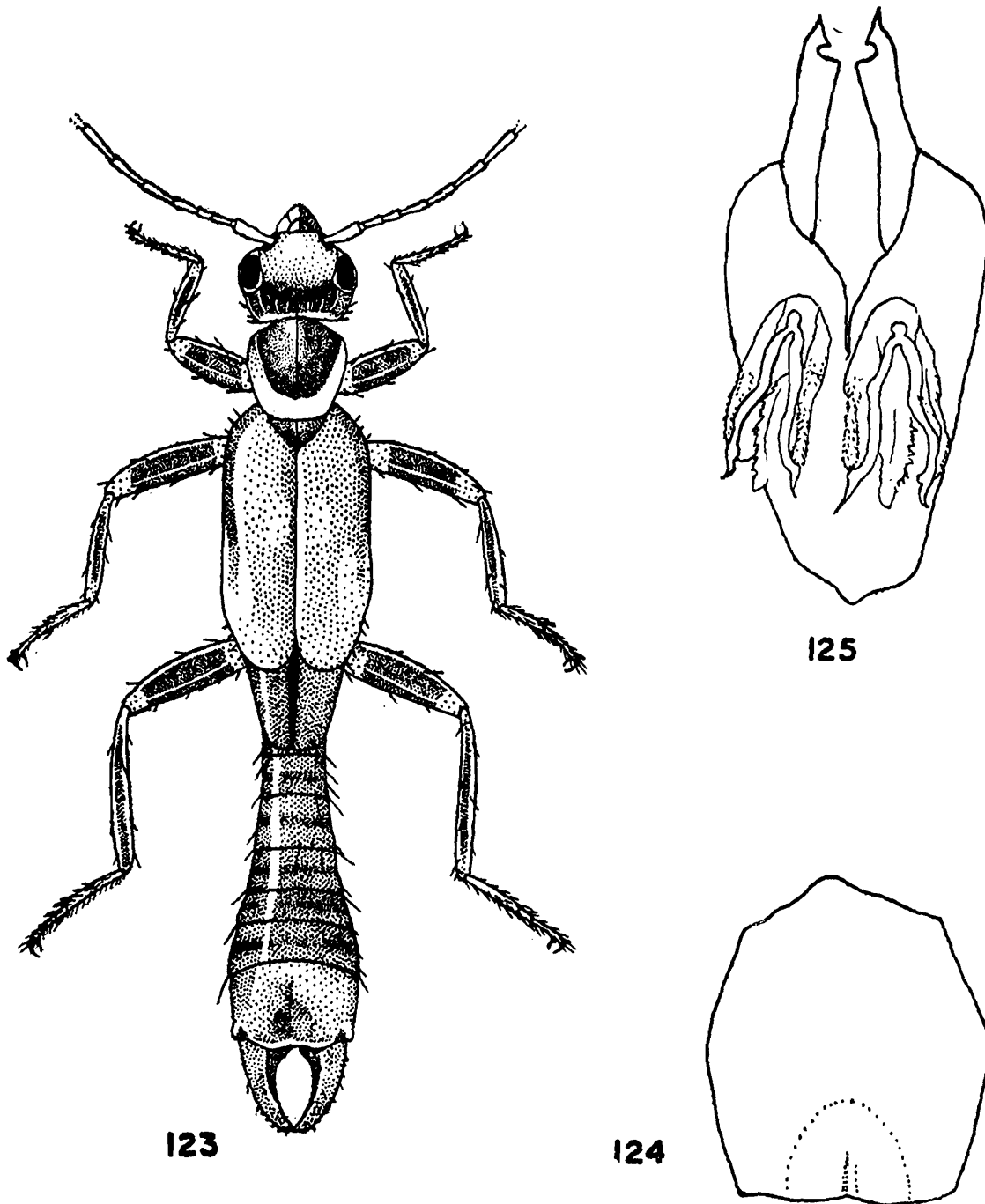
(Fig. 123-125)

Diplatys devlensis Srivastava, 1974, *Ceylon J. Sci. (Bio. Sci.)*, 11 (1) : 10 (♂, India : Tamil Nadu, Nilgiri Hills, Devla, 3200 ft.).

♂ : General colour brownish black. Antennae with basal segment brownish black ; 2nd to 5th yellow and rest yellowish brown. Pronotum laterally and posteriorly ; legs with femora and tibiae in apical half and whole of tarsi yellow.

Head a trifle broader than long, triangular, sutures obsolete, frons convex and occiput depressed with one or two impressed areas, post-ocular carina distinct but dying out posteriorly, hind margin feebly emarginate. Eyes prominent, distinctly longer than the post-ocular length and basal antennal segment. Antennae 16-segmented, 1st expanded apically, slightly shorter than the combined length of 2nd to 4th ; 3rd long and slender ; 4th slightly shorter than the preceding ; 5th onwards segments gradually increasing in length and thinning up to 13th and 14th ; 15th slightly shorter than 13th and ultimate one slightly shorter than the preceding. Pronotum about as long as broad, contracted posteriorly, anteriorly convex, sides almost straight, hind margin sub-rotundate, median sulcus distinct, prozona tumid and well differentiated from flat metazona. Elytra well developed, humeral angles weak, costal margin straight, hind margin obliquely convex, axillary angle weak, showing a broad triangular scutellum. Wings well developed but about 1/3 as long as the elytra. Legs long and slender, typical for the genus. Abdomen long, cylindrical, greatly enlarging from 7th tergite onwards. Penultimate sternite with a faint median depression in posterior half only, hind margin feebly undulate with angles prominent. Ultimate tergite transverse, disc convex, median sulcus short but distinct, faintly depressed in

middle posteriorly, hind margin trisinate, laterally oblique with angles a little projecting. Forceps about as long as the ultimate tergite, trigonal with ridge present in basal two thirds only, branches tapering and gently curving apically with tip pointed, internally at base with a sharp tooth, afterwards margin faintly crenulate. Genitalia with



Figs. 123-125 : *Diplatys devlensis* Srivastava, Holotype ♂, 123. Dorsal view ; 124. Penultimate sternite ; 125. Genitalia.

parameres about $1/2$ as long as proparamere, almost of uniform width, except tapering apically, internally with a small, deep concavity at apical $1/4$ and the narrowed apical portion only slightly longer than the parameral incision, distal lobes slightly shorter than the parameres, provided with fine dentations and broad elliptical median accessory plate ; virga at base with a small rounded vesicle, arms of paired portion

long tubular, about as long as the distal lobes, a little before apex with a small swelling, tip pointed.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	9.0
Length of forceps	0.9

Distribution : INDIA : Tamil Nadu, Nilgiri Hills, Devla.

Type : Holotype ♂ in ZSI.

Remarks : This species comes very close to *D. menoni* Kapoor & Bharadwaj and *D. lefroyi* Hincks from India (Poona and Belgaum, respectively) in having somewhat similar parameres but differs by the shape of penultimate sternite, especially hind margin and in the details of distal lobes, especially virga.

26. *Diplatys papovi* Bey-Bienko

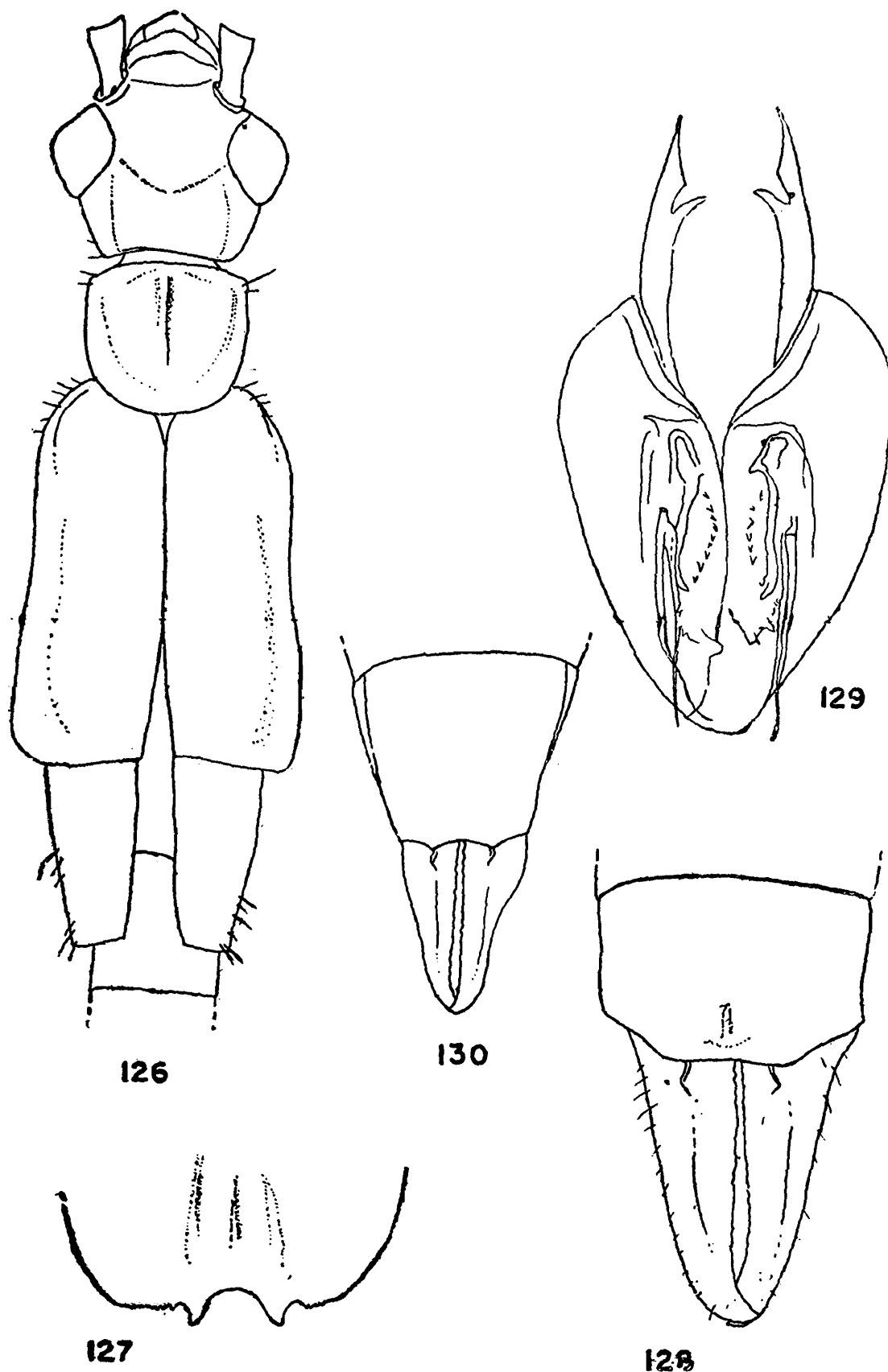
(Figs. 126-130)

Diplatys papovi Bey-Bienko, 1959, *Ent. Obzor*, 38 (3) : 593 (♂, ♀ ; China : Yunnan, Mangshih) ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 146 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 193 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour dark brownish black. Pronotum with a yellow stripe laterally and posteriorly. Legs with base of femora slightly lighter in colour. Wings at base and internally yellow. Body covered with short and long, yellow pubescence.

Head about as long as broad, frons convex, smooth, occiput in middle depressed, surface uneven, laterally comparatively raised, post-ocular carina sharp, distinct, complete, transverse suture obsolete, median suture distinct, hind margin emarginate and thickened. Eyes prominent, one and half times longer than the post-ocular length. Antennae with 1st segment stout, expanded apically, shorter than the length of eye and distance between antennal bases, remaining segments normal. Pronotum slightly longer than broad, sides straight, gently contracted posteriorly, hind angles and margin forming an arc jointly, prozona convex, metazona depressed, median sulcus distinct on prozona only. Elytra and wings smooth, well developed ; scutellum not visible. Legs long and slender, normal. Abdomen smooth, covered with fine yellow pubescence, laterally pubescence

longer, gradually expanding posteriorly. Penultimate sternite weakly transverse, smooth, covered with fine pubescence, postero-lateral angles rounded, hind margin subtruncate with a concavity in middle,



Figs. 126-130 : *Diplatys papovi* Bey-Bienko, ♂, 126. Anterior half of body ; 127. Posterior margin of penultimate sternite ; 128. Ultimate tergite and forceps ; 129. Genitalia ; ♀, 130. Ultimate tergite and forceps.

on either side of which with an externally directed, hooked tooth, margin with fine serrations. Ultimate tergite convex, weakly transverse, smooth, disc moderately convex, gently sloping backwards, parallel sided, hind margin trisinate, laterally oblique. Forceps contiguous, depressed, straight, tapering apically with tip gently hooked and pointed, internally finely crenulate, at base above with an oblique triangular crest in the middle of a shallow depression. Genitalia with parameres long, flat, broadly incurved, almost of uniform width except in apical $1/3$, narrowed to acuminate point, internally armed with a minute tooth, followed by another longer one in apical $1/3$, both separated by a triangular, oblique incision; distal lobes with chitinous, dentate plates; virga at base with a small protuberance, arms of bifurcated portion long, slender, strongly tapering apically.

♀ : Similar to male in most characters except that the pronotum in middle apically yellow; head more elongated, frons and occiput weakly raised, not well differentiated, post-ocular carina complete, weakly raised, slightly curved near eyes; antennal segments more elongated; abdomen including ultimate tergite more strongly contracted posteriorly; penultimate sternite narrowed posteriorly with margin rounded and forceps simple, strongly tapering apically.

Measurements (in mm) :

	♂	♀
Length of body	8.7-11.0	9.1-10.5
Length of forceps	1.0-1.5	1.0-1.5

Distribution : CHINA : Yunnan, Mangshih : INDIA : Meghalaya, Garo Hills, Anogiri (ZSI).

Type : Type 1 ♂ and 1 ♀ in AZL.

Remarks : In India this species is recorded for the first time on 1 ♂, 2 ♀ from Meghalaya.

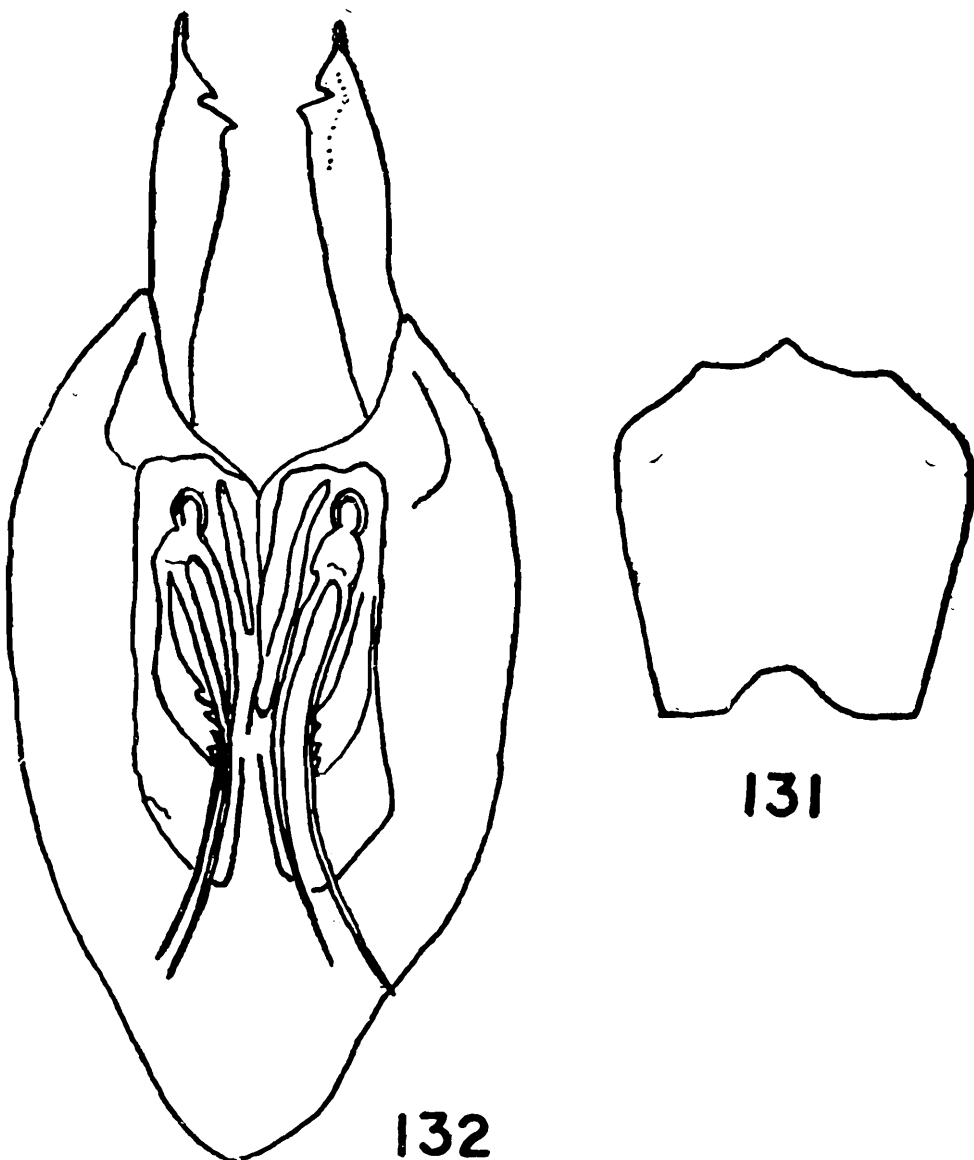
This species shows remarkable external resembles with *D. denticulatus* Hincks, from Burma but differs in having the tooth slightly larger and turned externally on the either side of median situation on the hind margin of penultimate sternite and the parameres broadly incurved with internal incision triangular and oblique.

27. *Diplatys excidens* Hincks (Figs. 131-132)

Diplatys excidens Hincks, 1954, *Proc. R. ent. Soc. Lond.*, (B) 23 : 161 (♂ ; South India : Mysore); Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 7; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 156; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 194, Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 14.

♂ : General colour blackish brown ; mouth parts, lateral and posterior margin of pronotum, apical antennal segments excepting basal one, base and apex of femora and 1st tarsal segment brownish yellow.

Head with frons weakly raised, transverse suture obsolete, median suture faint, occiput in middle depressed, laterally weakly raised, post-ocular carina weakly marked, curved, dying out near hind margin. Eyes prominent, distinctly longer than the post-ocular area. Antennae 13-segmented or more, normal. Pronotum longer than broad, sides straight, converging posteriorly with hind margin rounded. Elytra and wings well developed. Legs typical for the genus. Abdomen long, cylindrical, 8th tergite onwards gently expanded, strongly punctate with pubescence sparse. Penultimate sternite slightly depressed posteriorly, hind margin in middle deeply emarginate, postero-lateral lobes with hind margin truncate. Ultimate tergite sub-quadrangle, sloping



Figs. 131-132 : *Diplatys excidens* Hincks, ♂, 131. Penultimate sternite ; 132. Genitalia (redrawn after Hincks, 1954).

backwards, hind margin trisinate, laterally oblique. Forceps contiguous, straight, tapering apically with tip gently hooked, at base with an oblique crest in the middle of a shallow depression, internal margin crenulate. Genitalia with parameres about half as long as proparameres, gently expanded apically with extreme tip produced into a narrow point, internally armed near apex with two teeth separated by a narrow gap; virga long, slender, projecting beyond distal lobes, at base with a small rounded lobe, accessory rods curved, expanded apically with rows of large teeth.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	11.0
(including forceps)	

Distribution : INDIA : Karnataka, Mysore.

Type : Holotype ♂ in BMNH.

Remarks : On the basis of deep sinuation on the hind margin of penultimate sternite this species comes close to *D. denticulatus* Hincks and *D. papovi* Bey-Bienko, which differ by having a small or prominent tooth on either side of median sinuation of penultimate sternite and characteristic genitalia.

It shows external resemblance with *D. nilgiriensis* Hincks, but differs by the penultimate sternite being deeply emarginate and genitalia with distinctive parameres and virga at base projecting into a small rounded vesicle and provided with long and slender arms.

28. *Diplatys gerstaeckeri* (Dohrn)

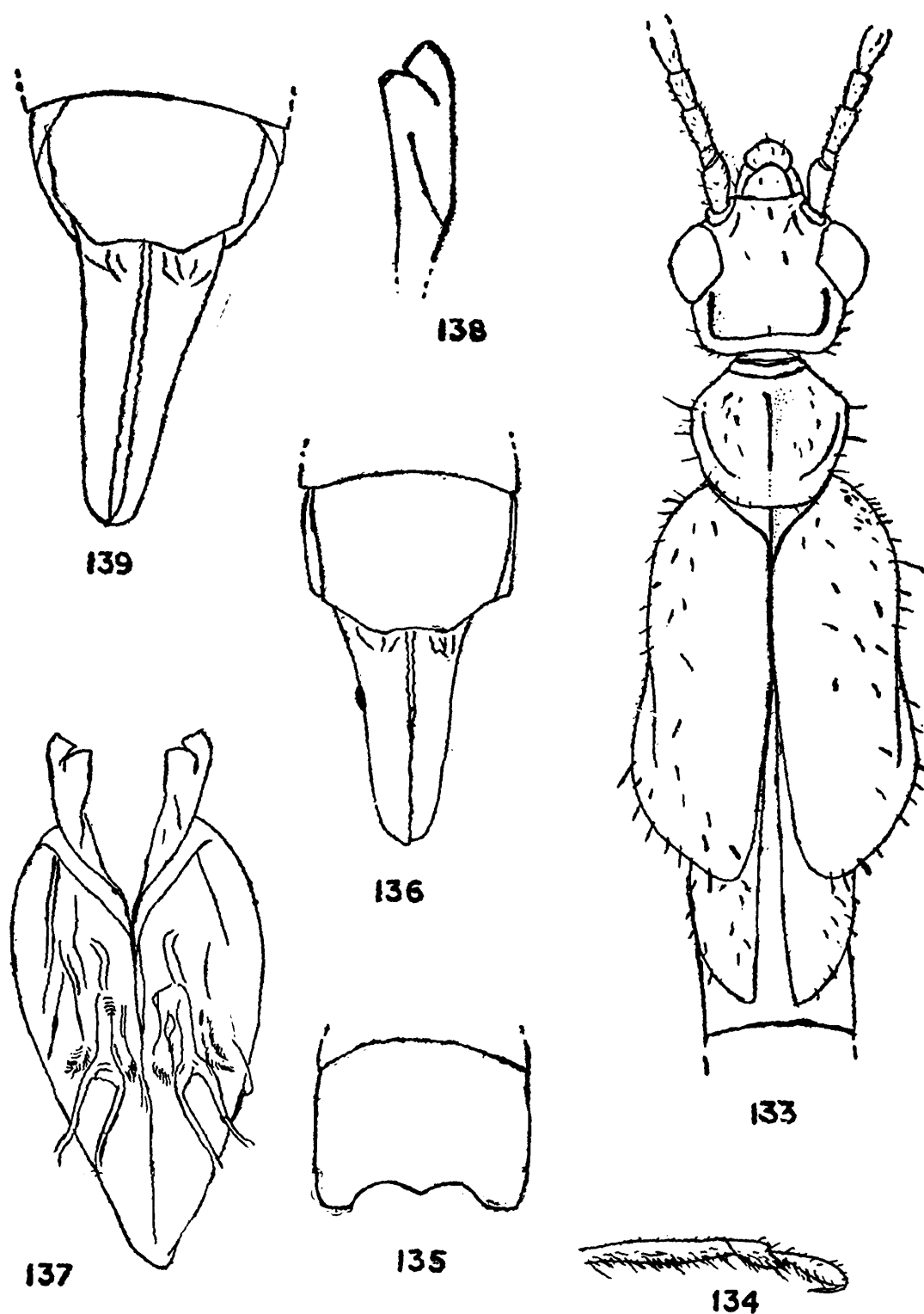
(Figs. 133-139)

Nannopygia gerstaeckeri Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 60 (♂, ♀ ; Ceylon) ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 326 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 11 (pars ; excl. Burma=*liberatus* Burr) ; Zacher, 1911, *Zool. Jb.*, 30 : 354.

Diplatys gerstaeckeri ; Burr, 1910, *Fauna Brit. India Dermaptera* : 40, 43 (pars ; excl. Burma=*liberatus* Burr) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 35 ; Burr, 1911, *Genera Insect.*, 122 : 14 ; Hincks, 1947, *Ark. Zool.*, 39A (1) : 4, 7 (excl. Burma=*liberatus* Burr) ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 79 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 85 ; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 211 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 197 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 11.

♂ : General colour unifrom yellowish brown. Antennae, legs somewhat yellowish. Abdomen slightly darker. Finely pubescent.

Head about as long as broad, smooth, area behind eyes contracted posteriorly, frons moderately convex, gradually merging with weakly depressed and moderately rugose occiput, transverse suture obsolete



Figs. 133-139 : *Diplatys gerstaeckeri* (Dohrn), Holotype ♂, 133. Anterior half of body ; 134. Hind tarsi ; 135. Penultimate sternite ; 136. Ultimate tergite and forceps ; 137. Genitalia ; 138. Paramere enlarged ; Allotype ♀, 139. Ultimate tergite and forceps.

and median one distinct, post-ocular carina sharp, gently curved, almost reaching the hind margin, posterior margin thickened and emarginate in middle. Eyes prominent, distinctly longer than the post-ocular area. Antennae (partly broken) 12-segmented or more, 1st stout, expanded apically, shorter than the eye in length and distance between antennal bases ; 2nd short, broader than long ; 3rd long and slender, slightly longer than the 4th ; 5th onwards segments gradually increasing in length and slender. Pronotum about as long as broad or a trifle longer, almost rounded, narrowed posteriorly, anteriorly convex, margin bordered with stiff hairs, hind margin weakly convex, median sulcus distinct, prozona raised and well differentiated from depressed metazona. Legs long and slender. Elytra ample, smooth, shoulders weak, axillary angle rounded off, showing a broad, triangular scutellum. Wings normal, $1/3$ as long as the elytra. Abdomen convex, smooth, almost parallel sided. Penultimate sternite bisinuate posteriorly, median lobe narrow, pointed, postero-lateral angles broad, in dorsal view laterally projecting beyond the margin of ultimate tergite. Ultimate tergite longer than broad, smooth, narrowed posteriorly, disc convex above, sloping posteriorly, hind margin trisinuate, laterally oblique. Forceps thickly pubescent, contiguous, depressed, tapering apically, almost straight with apices gently hooked and pointed, internal margin finely crenulate, at base above with an oblique triangular crest. Genitalia with parameres $1/3$ as long as the proparameres, narrowed apically, preapical incision narrow and strongly oblique, followed by a broad rounded lobe with its tip pointed and the portion beyond incision triangular with minute point, distal lobes with dentate, chitinous accessory rods or plates ; virga projecting beyond distal lobes, unpaired portion almost equal to the arms of paired portion.

♀ : Agrees with males in most of the details except that the head with frons and occiput less differentiated, moderately raised, sutures feebly marked, post-ocular carina distinct but less prominent ; eyes about as long as the post-ocular area and penultimate sternite narrowed posteriorly with hind margin in middle obtusely pointed.

Measurements (in mm) :

	♂	♀
Length of body	8.0-8.1	7.7
Length of forceps	0.8-1.1	1.1

Distribution : SRI LANKA : Maskeliya.

Type : Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen) and Allotype ♀ in ZMHB.

Remarks : Dohrn's types containing 1 ♂ and 1 ♀ which may be considered as Holotype ♂ and Allotype ♀, are in fair condition and without any precise locality data, were examined. The male possesses only 7 antennal segments on the right and 12 on the left and lacks elytra and wing of the left side. The allotype lacks antennae, except the right basal segment.

The above description is based upon the types giving details of male genitalia for the first time.

Hincks (1955) who was not having type at this disposal, however, could correctly place 2 ♂♂, 1 ♀ from Sri Lanka, Maskeliya by the simple process of elimination. Of these, 1 ♂ has been examined. This clearly demonstrates the seriousness and the care taken by Hincks (1. c.) in revising the subfamily Diplatyinae.

The shape of parameral incision and lobes represent a transitional stage between *Schizodiplatys* Steinmann and *Diplatys* Serville.

This species can be easily separated from other members of the genus by the shape of median lobe of posterior margin of penultimate sternite in being narrow and triangular and characteristic genitalia.

29. *Diplatys confusus* Hincks

(Figs. 140-143)

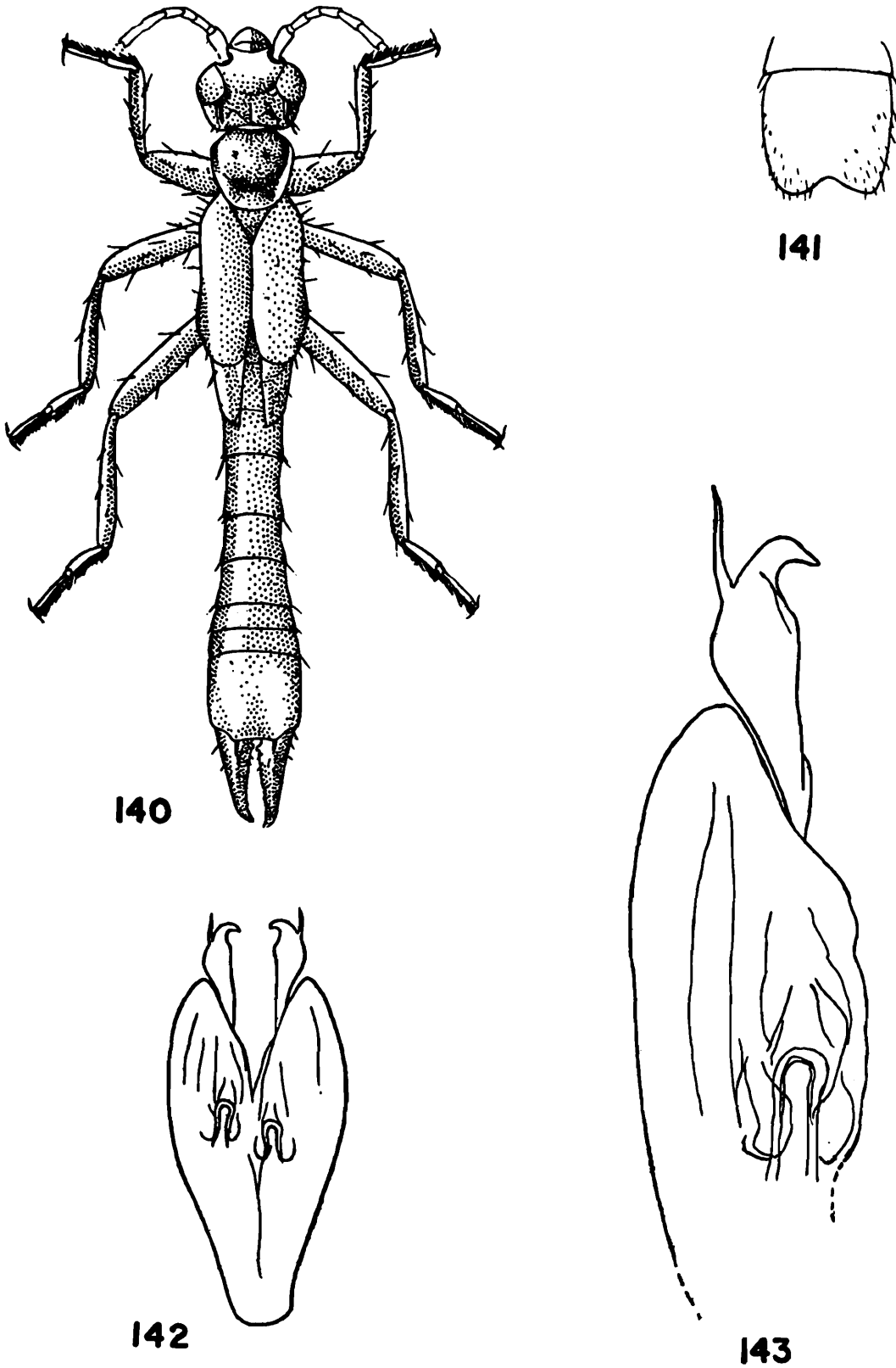
Diplatys bormansi (nec Burr, 1910), Burr, 1915, *J. R. micr. Soc.*, 1915 : 427, pl. 5, fig. 3 (genitalia); Hincks, 1947, *Ark. Zool.*, 39A (1) : 11, 12 (Nos. 5, 8); Borelli, 1931, *Revue. suisse Zool.*, 38 : 289.

Diplatys confusus Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 103 (♂, ♀; India : Tamil Nadu, Coimbatore, Madura Dist., Shembaganur; Coramandel, Genji; Nilgiri Hills, Mayor camp); Kapoor, 1968, *Agra. Univ. J. Res. (Sci.)*, 16 (1) : 6; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 112; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 195; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 13.

♂ : General colour dark brownish black to dark brown. Antennae except basal segment yellowish brown; pronotum on sides and posteriorly; legs with femora in basal one third; knee joint and tibia near apex and whole of tarsi and wings at base internally yellow. Sparsely pubescent, sides of head, pronotum, elytra on shoulder with a few thick dirty yellow hairs.

Head slightly longer than broad, smooth, frons moderately convex,

occiput depressed, surface uneven with a few irregular striations, transverse suture obsolete, post-ocular carina distinct, slightly curved, reaching up to hind margin, hind margin emarginate. Eyes prominent, reaching up to hind margin, hind margin emarginate. Eyes prominent,



Figs. 140-143 : *Diplatys confusus* Hincks, ♂, 140. Dorsal view ; 141. Penultimate sternite ; 142. Genitalia ; 143. Left half of genitalia enlarged.

distinctly longer than the post-ocular area. Antennae 19-segmented or more, basal segment stout, slightly expanded apically and shorter than the distance between antennal bases; 2nd short, about as long as broad; 3rd long, cylindrical; 4th stouter, slightly expanded apically, shorter than the preceding; 5th about as long as the 3rd, gently expanded apically, remaining gradually increasing in length and thinning. Pronotum about as long as broad, sides feebly convex, contracted posteriorly, postero-lateral angles well rounded and hind margin briefly rounded. Elytra and wings well developed, former micro-reticulated, axillary angles briefly rounded, exposing a small triangular scutellum. Prosternum twice as long as broad, constricted laterally between fore-coxae, anterior margin convex, posterior margin truncate, light blackish brown in apical two thirds, remaining portion yellow; mesosternum quadrate, hind margin truncate, sides straight, feebly emarginate between middle coxae, anteriorly with semicircular brownish black spot, otherwise yellow; metasternum ample, transverse in basal two thirds, between hind coxae forming a narrow lobe and extending beyond it posteriorly with hind margin slightly concave in middle, light blackish brown, yellow at posterior margin. Legs long, slender, hind femora at rest extending well beyond the apex of wings. Abdomen long, cylindrical, slightly expanded apically, each tergite in posterior half with an ill defined transverse depression, lateral tubercles on 3rd and 4th tergites moderately developed. Penultimate sternite narrower in microlabic from (figured) than the macrolabic form, hind margin emarginate in middle. Ultimate tergite about as long as broad, smooth, disc, convex above, gently sloping backwards, hind margin subsinuate in middle and laterally, latter oblique. Forceps (microlabic) depressed, straight, tapering apically, tip gently hooked and pointed, internally crenulate, at base with larger tooth, at base above with a short, vertical crest in the middle of a shallow depression; (macrolabic from) curved in posterior half enclosing an oval space, at base subcontiguous and crenulate. Genitalia with parameres broad, apically produced into a narrow, slender lobe, internally armed near apex with a large hooked tooth; virga with branches short and slender, about half as long as the distal lobes.

♀ : Similar to male but general body colour lighter, pronotum, base of antennae and legs more or less yellowish brown; head with frons and occiput weakly raised, less differentiated; eyes slightly shorter than the post-ocular length; penultimate sternite rounded posteriorly and forceps almost similar to microlabic males.

Measurements (in mm) :

	♂	♀
Length of body (including forceps)	11.0-12.2	13.0

Distribution : INDIA : Tamil Nadu : Coimbatore (ZSI Col.) ; Madura Dist., Shembaganur, Coromandal, Genji, Nilgiri Hills, Mayor Camp.

Types : Holotype ♂ (microlabic), Allotype ♀ , Paratypes 1 ♂ , ♀ in BMNH ; Paratype 1 ♂ (mesolabic) in MNHP and Paratype 1 ♂ in MM.

Remarks : This species comes close to *Diplatys coelebs* Hincks, from South India in having virga shorter than the distal lobes but the latter is quite distinct by the moderately developed post-ocular carina ; pronotum about as long as broad, not strongly contracted posteriorly ; penultimate sternite posteriorly truncate and internal teeth of parameres smaller.

The ♂ from S. India referred to by Boreili (1931) under *D. bormansi* Burr, was examined through the courtesy of Dr. B. Hauser, Muse'um d' Histoire Naturelle, Geneva, Switzerland. It undoubtedly belongs to this species, although genitalia was not available for study which perhaps might have been taken out earlier by Borelli.

30. *Diplatys coelebs* Hincks

(Figs. 144-148)

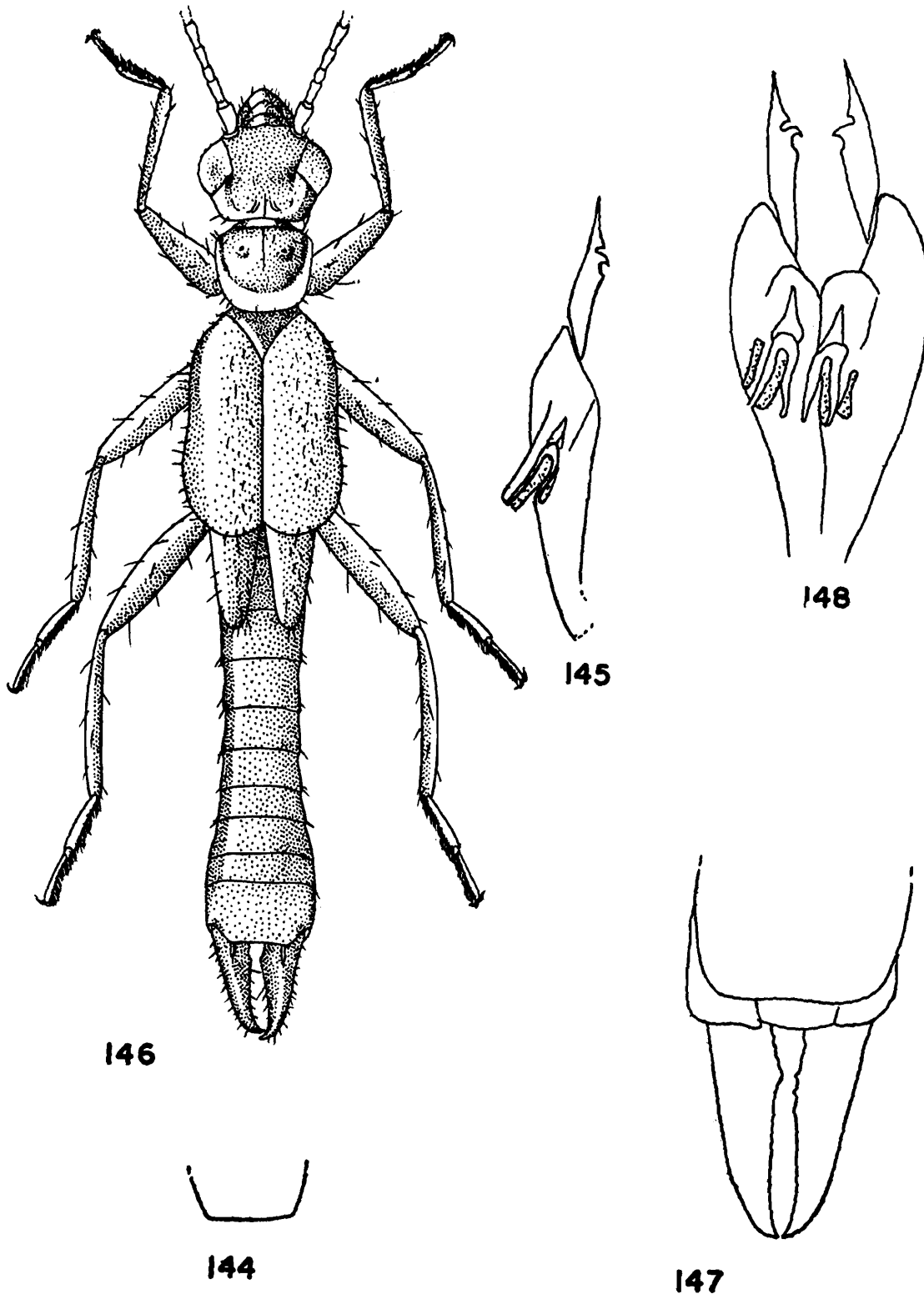
Diplatys liberatus (nec Burr, 1910), Burr, 1912, *Annln. naturh. Mus. Wien.*, 26 : 66 (♂ ; Malabar : Mahé) ; Burr, 1914, *Rec. Indian Mus.*, 10 : 283 (♂ , S. India : Puthir) ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 427, 428, pl. 5, fig. 5.

Diplatys coelebs Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 110 (♂ , ♀ ; South India : Nilgiri Hills ; Mahé, Malabar ; Bombay) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 6 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 118 ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 197 ; Srivastava, 1976, *Rec. zool. Surv. India Occ. Pap.*, 2 : 13.

Diplatys jogiensis Kapoor, 1968, *Zool. Anz.*, 181 (1/2) : 124 (♂ ; India : Karnataka : Jog Falls) ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20(1-2) : 196 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 13. Syn. nov.

♂ : General colour black or yellowish brown, pronotum posteriorly and on sides, base and apex of femora and 1st segment of hind tarsi yellow. Antennae generally uniformly coloured, occasionally segments 2nd to 4th yellow. Body covered with long and short pubescence.

Head slightly broader than long, frons convex; occiput depressed in middle posteriorly, surface uneven, post-ocular carina sharp, extending up to hind margin where slightly curved, transverse suture obsolete and median suture represented by a fine sharp groove, hind margin feebly emarginate in middle. Eyes prominent, $1\frac{1}{2}$ times longer



Figs. 144-148. *Diplatys coelebs* Hincks, ♂, 144. Penultimate sternite; 145. Left half of genitalia (drawn from the Holotype ♂ of *Diplatys jogiensis* Kapoor); 146. Dorsal view; 147. Penultimate sternite and forceps; 148. Genitalia.

than the post-ocular area. Antennae 17-segmented or more, 1st stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd short, about as long as broad ; 3rd long and slender ; 4th slightly shorter than the preceding ; 5th about as long as 3rd ; remaining gradually increasing in length and thinning. Pronotum about as long as broad or a trifle longer, smooth, anteriorly lightly convex and as wide as head, contracted posteriorly, sides straight, hind angles and margin rounded, median sulcus distinct, obsolete in posterior 1/3, prozona convex with a faint depression on either side of middle line, metazona depressed. Elytra and wings well developed, former with axillary angles rounded off exposing a large triangular scutellum or normal, meeting along the sutural margin. Legs normal, hind femora extending at rest beyond the apex of wings. Abdomen long, cylindrical, gently expanded apically. Penultimate sternite quadrate, hind margin truncate. Ultimate tergite weakly transverse, disc convex with a short median depression in middle, sloping backwards, hind margin in middle subsinuate, laterally oblique, posterolateral angles a little prominent. Forceps with branches subcontiguous, depressed, straight, tapering apically, apices gently hooked and pointed, at base faintly trigonal, internally at base with a small tooth, followed by fine crenulations. Genitalia with parameres a little over half the length of proparameres, internally armed in apical 1/3 with a hooked tooth, preceded and followed by sinuations, portion beyond this acuminate pointed ; distal lobes about half as long as the proparameres, accessory chitinous plates with fine denticles virga short, at base somewhat thickened.

♀ (nov.) : Similar to males in most characters except head with frons and occiput less differentiated, post-ocular carina faint ; penultimate sternite obtusely rounded posteriorly ; abdomen including ultimate tergite narrowed posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	10.3-10.5	8.1
Length of forceps	1.0-1.2	1.5

Distribution : INDIA : Kerala : S. Malabar, Walayar Forests, 1000 ft. (MZM) ; Mahe ; Karnataka : Jog falls ; Tamil Nadu : Nilgiri Hills, 3500 ft. and Maharashtra : Bombay.

Types : *D. coelebs* Hincks : Holotype ♂ and Paratype 1 ♀ in BMNH and Paratype 1 ♂ in NMWA.

D. jogiensis Kapoor : Holotype ♂ in IARI (♂ genitalia mounted on a slide).

Remarks: The holotype ♂ of *Diplatys jogiensis* Kapoor was examined and a portion of its genitalia is figured here (fig. 145). Besides ♂ genitalia from another specimen from Kerala (MZM) is also given (fig. 148). A careful comparison of these two diagrams with that of Hincks (1955) figure of ♂ genitalia of *D. coelebs* show that all are identical as far as the shape of parameres and other details are concerned. There may appear some minor variations in the relative length and width of parameres and the proparameres which perhaps may be due to difference in the angle of mounting and the preparation of drawing. In view of this it is proposed to sink *D. jogiensis* Kapoor under *D. coelebs* Hincks.

31. *Diplatys jawalagiriensis*

Kapoor, Bharadwaj & Banerjee

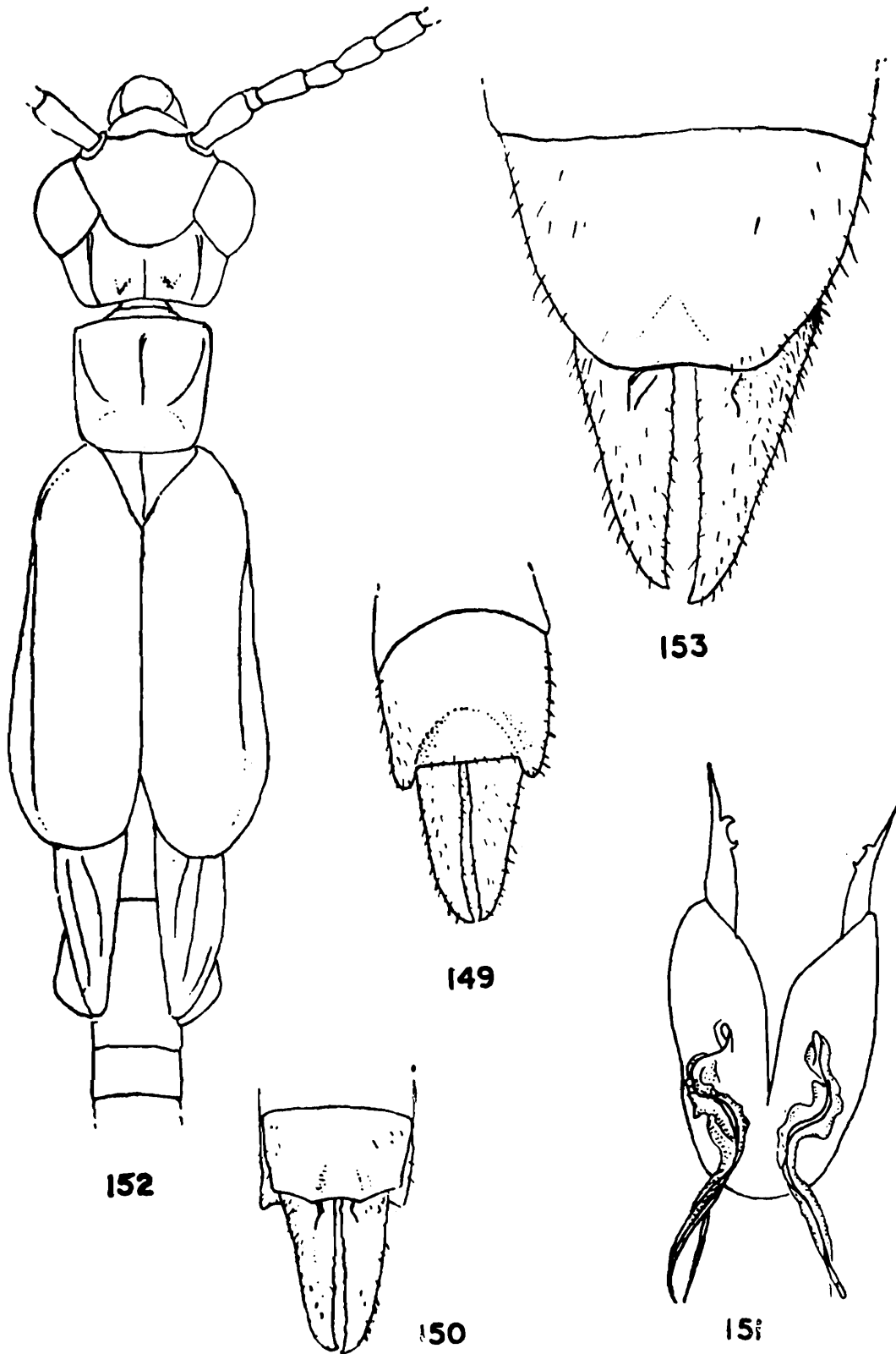
(Figs. 149-153)

Diplatys jawalagiriensis Kapoor, Bharadwaj and Banerjee, 1971, *Bull. Ent.*, 12(1) : 29 (♂ ; Jawalagiri, North Salem) ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour yellowish brown, head blackish brown to black, antennae yellowish brown or blackish brown, elytra and wings blackish brown, former with an ill defined yellow spot in a little less than basal half, abdominal segments, ultimate tergite and forceps shaded with black in parts or wholly. Moderately pubescent.

Head about as long as broad, smooth, frons convex, occiput strongly depressed in middle, laterally feebly raised, micro-reticulated, post-ocular carina faint but complete and straight, transverse suture obsolete and median one marked by a faint depression, posterior margin emarginate in middle. Eyes very prominent, about twice as long as the post-ocular length. Antennae 9-segmented or more (apical portion generally broken), 1st stout, expanded apically, shorter than the distance between antennal bases ; 2th small, about as long as broad ; 3rd gently expanded apically ; 4th cylindrical, slightly shorter than the preceding ; 5th equal to 3rd, remaining gradually increasing in length and thinning. Pronotum longer than broad, gently narrowed posteriorly, sides almost straight, hind angles and margin rounded, prozona moderately raised, metazona depressed, median sulcus obsolete. Elytra and wings well developed, former with axillary angles greatly rounded

off to show a large, triangular scutellum. Legs normal. Abdomen smooth with postero-lateral angles projecting in the form of a lobe and margin subtruncate, postero-lateral angles visible in dorsal view i.e.,



Figs. 149-153 : *Diplatys jawalagiriensis* Kapoor, Bharadwaj & Banerjee ♂, 149. Penultimate sternite and forceps; 150. Ultimate tergite and forceps; 151. Genitalia (all drawn from the Holotype); 152. Anterior half of body; ♀, 153. Ultimate tergite and forceps.

projecting beyond lateral and posterior margin of ultimate tergite. Ultimate tergite transverse, convex. smooth, hind margin trisinate, thickened, laterally oblique. Forceps with branches contiguous or sub-contiguous, depressed, straight, tapering posteriorly with tip gently hooked, at base above with an oblique and triangular crest, internal margin finely crenulate. Genitalia with parameres long, gradually attenuate apically with tip acuminate, internally with two small hooked teeth situated a little beyond middle ; distal lobes membranous, strongly twisted ; virga projecting well beyond the distal lobes, long, slender, strongly undulate and laterally provided with chitinous flange.

♀ : Agrees with males in most characters except that the body more strongly pubescent and uniform yellowish brown including head and antennae ; head with frons and occiput moderately convex, not well differentiated, post-ocular carina weakly marked, dying out posteriorly ; antennal segments less stout and elongated ; eyes about as long as the post-ocular length ; penultimate sternite narrowed posteriorly with margin in middle obtusely pointed ; ultimate tergite more narrowed posteriorly and forceps stouter, more strongly depressed, simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	8.2-9.7	8.2-8.9
Length of forceps	0.8-1.0	0.9

Distribution : INDIA : Tamil Nadu : North Salem Dist., Jawalagiri and Ayur and Kottur, 3700 ft. ; Karnataka : Coorg, Fraserpet.

In FRI Collection there are several specimens as listed below : 1 ♂, Karnataka, Coorg, Fraserpet ; 4 ♂ ♂, 2 ♀ ♀ and 2 exs (hind portion missing) ; Tamil Nadu, Salem Dist., and 1 ♂, Kottur, 3700 ft.

Types : Holotype ♂, Paratype 1 ♂ at FRI and Paratype 1 ♂ at IARI.

Remarks : This species is quite unique in having the penultimate sternite broader, especially in posterior half and can be seen even in dorsal view projecting laterally beyond the margins of ultimate tergite, giving sometimes false impression as if ultimate tergite has lateral expansion. Besides, the frilled distal lobes and fine tubular virga supported by chitinous flange which is also undulate, are quite distinctive in establishing the identity of this species. On account of above peculiarities this species stands apart from most of the known species of the genus.

32. **Diplatys nathani** Hincks

(Fig. 154)

Diplatys nathani Hincks, 1960, *Bull. Ent.*, 1 : 15 (♂ ; India : Jabalpur) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 7 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 147 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour smoky black, head black, base of elytra, most part of legs and forceps yellowish brown, tibiae at base and antennae smoky brown. Strongly pubescent, more so on elytra, wings and abdomen. Head smooth, frons convex, occiput strongly depressed in middle, laterally raised, post-ocular carina distinct but not sharp, straight. Eyes prominent, distinctly longer than the post-ocular length. Antennae typical for the genus. Pronotum longer than broad, gently contracted posteriorly, sides straight, hind margin almost truncate. Elytra and wings well developed. Legs normal for the genus. Abdomen long and slender, 9th tergite slightly expanded. Penultimate sternite with a median, oval depression in apical one third, hind margin truncate. Ultimate tergite slightly more expanded than the other abdominal tergites, slightly sloping backwards, hind margin trisinate, laterally oblique. Forceps contiguous, depressed, straight, tapering backwards with apices gently hooked and pointed. Genitalia with parameres about as long as the distal lobes, apex acuminate, internal margin with three teeth near apex, of which middle one largest ; distal lobes $\frac{2}{3}$ as long as the proparameres, a short curved accessory rod present ; virge long, slender tapering apically, extending well beyond the distal lobes and longer than the proparameres.

♀ : Agrees with male in most characters excepts that body less pubescent, elytra uniform yellowish brown and tibiae smoky at base ; head with occiput less depressed and smooth, post-ocular carina obsolete ; antennae with segments more elongated ; pronotum comparatively broader with sides rounded ; penultimate sternite obtusely triangular posteriorly ; ultimate tergite narrowed, median sulcus in posterior half distinct, hind margin in middle raised and forceps comparatively narrower and simple.

Measurements (in mm) :

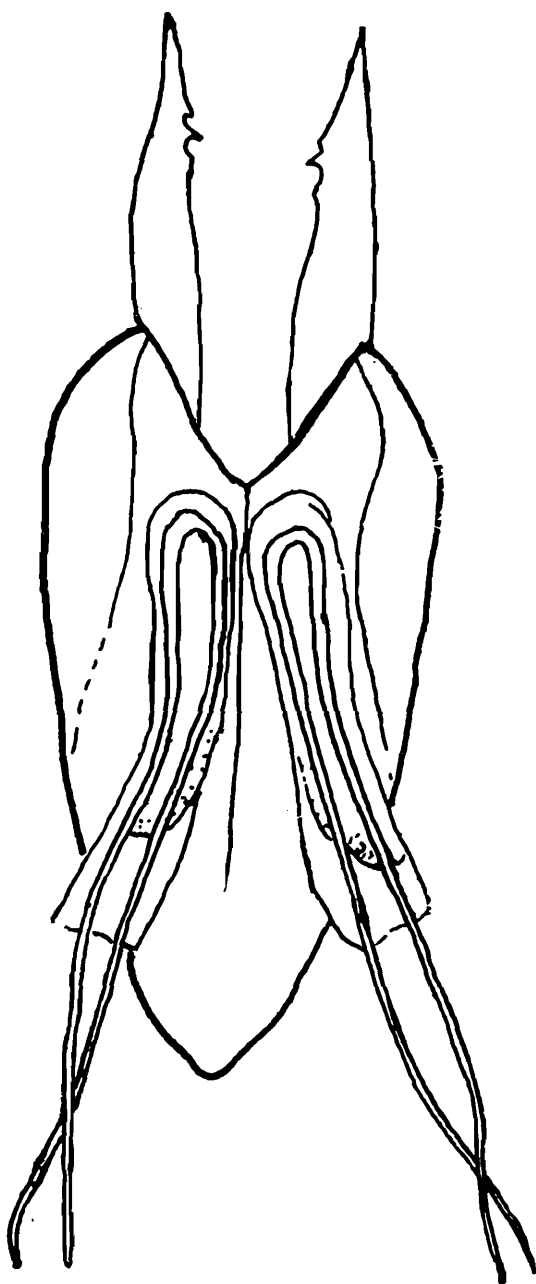
	♂	♀
Length of body	9.0	10.0
(including forceps)		

Distribution : INDIA : Madhya Pradesh, Jabalpur.

Types : Holotype ♂ and Allotype ♀ in BMNH.

Remarks : In having long and slender virga it comes close to *D. menoni* Kapoor and Bharadwaj, from India, Poona and *D. lefroyi* Burr, from Karnataka, Belgaum but differs by the prominent eyes which are distinctly longer than the post-ocular length ; penultimate sternite truncate posteriorly ; forceps contiguous and parameres internally armed near apex with three teeth.

This species appears to be closely related to *D. chopardi* Hincks, on the basis of indentical forceps and long and slender virga, but



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Fig. 154. *Diplatys nathani* Hincks, ♂, 154. Genitalia (redrawn after Hincks, 1960).

posterior margin of penultimate and shape of parameres are quite distinctive.

Moreover, *D. chopardi* possesses a small vesicle at the base of virga which is lacking in *D. nathani*.

33. *Diplatys dolens* Hincks

(Figs. 155-162)

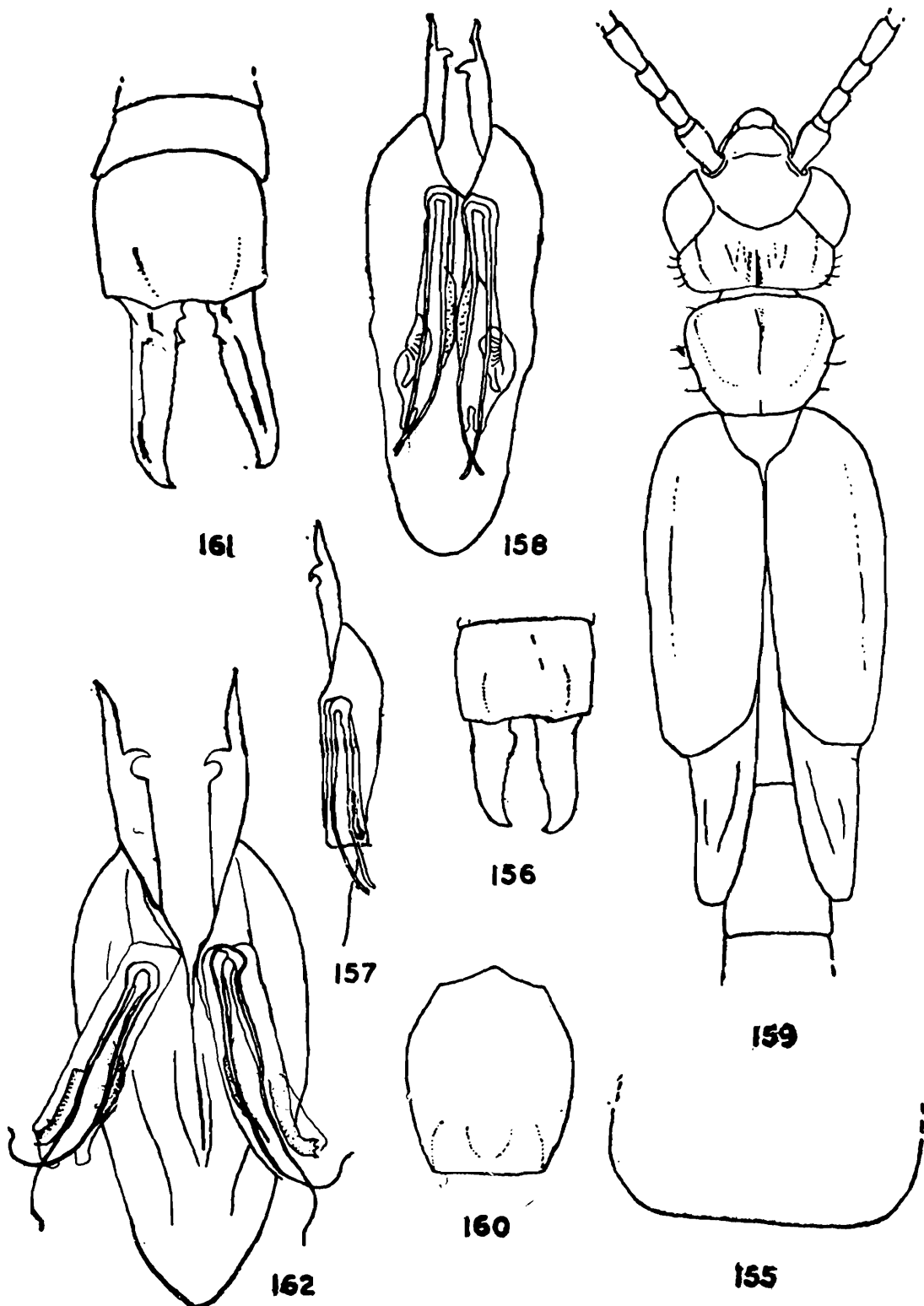
Diplatys dolens Hincks, 1957, *Proc. R. ent. Soc. Lond.*, (B)26 : 153 (♂ ; India—no further data) ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 144 ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 195 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 13.

Diplatys poonaensis Kapoor, 1968, *Zool. Anz.*, 181(1/2) : 122 (♂ ; India : Maharashtra, Poona) ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 160 ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 195 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15. Syn. nov.

♂ : General colour brownish black. Eyes shining, silvery white. Pronotum laterally and posteriorly, wings at base internally, legs with femora at base and apex, tibia near apex and tarsi yellow. Sparsely pubescent with a few long stiff hairs on the sides of head, border of pronotum, legs and sides of abdominal tergites.

Head slightly longer than broad or about as long as broad, surface micro-reticulated, frons convex, occiput feebly depressed and comparatively raised laterally with faint longitudinal grooves and somewhat obscurely rugose, post-ocular carina sharp, straight reaching up to the hind margin, transverse suture obsolete, median suture distinct, hind margin feebly emarginate in middle. Eyes prominent, distinctly longer than the post-ocular length. Antennae 17-segmented or more, elongated, 1st stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd short, about as long as broad ; 3rd long and slender ; 4th slightly shorter, cylindrico-conical ; 5th almost equal to 3rd, remaining gradually increasing in length and thinning. Pronotum slightly longer than broad, anteriorly convex, gently contracted posteriorly, sides straight, parallel, hind angles and margin rounded conjointly, median sulcus faintly marked, prozona convex and metazona depressed. Elytra and wings well developed, former with axillary angles rounded off, exposing a large triangular scutellum. Legs normal, long and slender. Abdomen long and cylindrical, gradually expanding from 7th to 9th tergites, smooth, covered with fine yellow pubescence. Penultimate sternite with disc convex, smooth, covered with fine yellow pubescence, sloping posteriorly with

hind margin truncate. Ultimate tergite weakly transverse, gently expanded posteriorly, micro-reticulated, disc moderately raised, gently sloping backwards, hind margin feebly trisinuate, laterally oblique.



Figs. 155-162 : *Diplatys dolens* Hincks, ♂, 155. Posterior margin of penultimate sternite ; 156. Ultimate tergite and forceps ; 157. Right half of genitalia (Figs. 155-157 drawn from the Holotype of *Diplatys poonaensis* Kapoor) ; 158. Genitalia (redrawn from Hincks, 1957) ; 159. Anterior half of body ; 160. Penultimate sternite ; 161. Ultimate tergite and forceps ; 162. Genitalia.

Forceps slightly separated, straight, tapering posteriorly with apices gently hooked and pointed, at base with a short, oblique triangular crest followed by a sharp ridge in basal one third, afterwards branches depressed, internally at base with a short triangular tooth, afterwards margin finely crenulate. Genitalia with parameres narrowed and acuminate in apical one third, internally armed with a hooked tooth followed by a concavity; distal lobes long with chitinous accessory plates bearing numerous small denticles; virga at base moderately thickened, arms of bifurcated portion long, projecting beyond the distal lobes, tapering apically.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	8.8-13.0
Length of forceps	1.4-2.0

Distribution : INDIA : Maharashtra, Poona.

Types : Holotype ♂ of *D. dolens* Hinck in BMNH and Holotype ♂ of *D. poonaensis* Kapoor in IARI.

Remarks : The Holotype ♂ of *D. poonaensis* Kapoor, was examined and figures 155-157 showing posterior margin of penultimate sternite, ultimate tergites and forceps and genitalia are drawn from it. It will be seen that posterior margin is subtruncate and not round with slight emargination as figured and described in the original description of the species.

Besides, in Z.S.I. collections there is a ♂ from Poona which agrees with *D. dolens* in most characters except the pronotum being slightly longer than broad and genitalia with parameres comparatively broader and internal hooked tooth more prominent.

The figure of ♂ genitalia given by Hincks (1957, fig. 6) shows proparameres very much elongated in being very slightly expanded apically. Generally in *Diplatys* species ♂ genitalia is greatly expanded apically and narrowed at base. Perhaps due to lateral shrinkage of genitalia during mounting, the proparameres are looking more elongated. Since all the three diagrams (figs. 157, 158 and 162) are identical in shape, the variation in length of paramere in relation to that of proparamere may perhaps be due to the degree of shrinkage in the mounts, which is not unusual.

There appears to some variation in the shape of pronotum. Hincks (l.c.) mentions that pronotum is clearly longer than broad whereas in

the ♂ from Poona (ZSI) it is only slightly longer than broad, although shape is identical.

In view of the above explanations, it is proposed to sink *D. poonaensis* Kapoor under *D. dolens* Hinck.

This species comes very close *D. nathani* Hincks, in having the penultimate sternite truncate posteriorly and long and slender virga but differs by the shape of parameres in being armed internally with a large hooked tooth and virga at base strongly thickened.

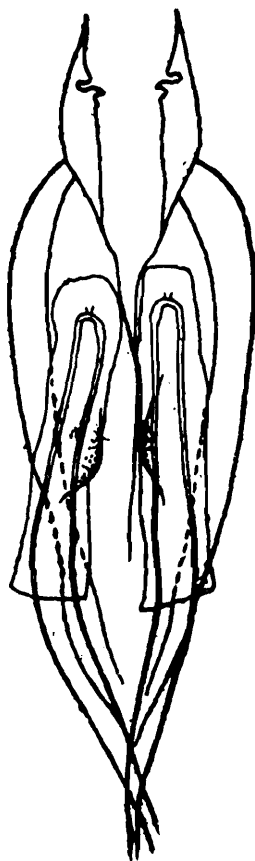
34. *Diplatys tikaderi* sp. n.

(Figs. 163-165a)

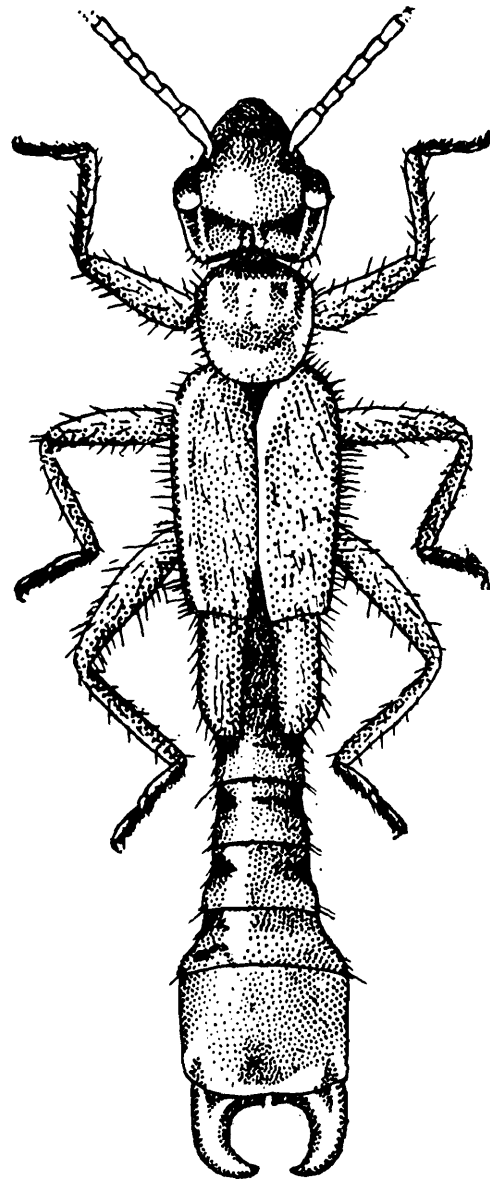
♂ : General colour yellowish dark brown, head and pronotum somewhat lighter ; antennae with basal two segments yellow ; legs with base and apex of femora, apical half of tibiae and whole of tarsi yellow. Strongly pubescent, abdomen and forceps covered with short pubescence.

Head about as long as broad, smooth, frons moderately convex, occiput in middle weakly depressed, laterally moderately micro-reticulated, post-ocular carina sharp and complete, feebly curved in middle, transverse suture obsolete, median suture distinct, hind margin emarginate. Eyes about as long as the post-ocular area. Antennae partly broken (11 segments on the left and 10 on the right remaining), basal segment stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd small, about as long as broad ; 3rd long and slender ; 4th slightly shorter than the preceding, stouter, gently expanded apically ; 5th slightly longer than the 3rd, stouter, remaining gradually increasing in length, a few apical ones slightly thinning. Pronotum about as long as broad, contracted posteriorly, sides moderately convex and hind margin well rounded, median sulcus almost obsolete, prozona convex and metazona flat. Elytra and wings well developed, former with axillary angles feebly rounded showing a small, triangular scutellum. Legs normal. Abdomen long, slender, smooth, tergites 8th and 9th greatly expanded, each tergite with weak transverse depression near base. Penultimate sternite smooth, covered with short pubescence, narrowed posteriorly with hind margin subrotundate. Ultimate tergite quadrate, weakly transverse, smooth, covered with short pubescence, sloping in posterior half and depressed in middle, hind margin trisinuate, laterally oblique. Forceps short, stout,

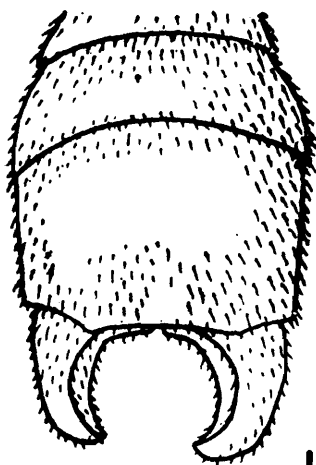
incurved, shallowly grooved above at base, expanded internally at base with its margin crenulate, this part mostly covered by hind portion of



165a



163



165



164

Figs. 163-165a : *Diplatys tikaderi* sp. n., Holotype ♂, 163. Dorsal view ; 164. Posterior margin of penultimate sternite ; 165. Ultimate tergite and forceps enlarged ; 165a. Genitalia.

ultimate tergite. Genitalia with parameres about $1/3$ as long as the propodeum, apically acuminate, internally armed with a small

triangular and a larger hooked tooth, both separated by moderately narrow sinuation, virga long, slender, tapering apically, distinctly longer than the distal lobes.

♀ : Unknown.

Measurements (in mm) :

	Holotype
	♂
Length of body	12.4
Length of forceps	0.7

Material examined : INDIA : Orissa ; Mayurbhanj Dist., Lulang, Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen), 14.11.1975, R. L. Choudhury (ZSI).

Remarks : The long and slender virga brings this species close to *D. nathani* Hincks, but the former is easily distinguished by the pronotum being rounded posteriorly ; last tergites including ultimate tergite greatly expanded ; forceps with a short dilation at base and strongly curved and genitalia with parameres, especially inner tooth and sinuation very different.

This species is named after Dr. B. K. Tikader, Ex-Director, Zoological Survey of India who has greatly enriched the knowledge about spider fauna of India.

35. *Diplatys lefroyi* Burr

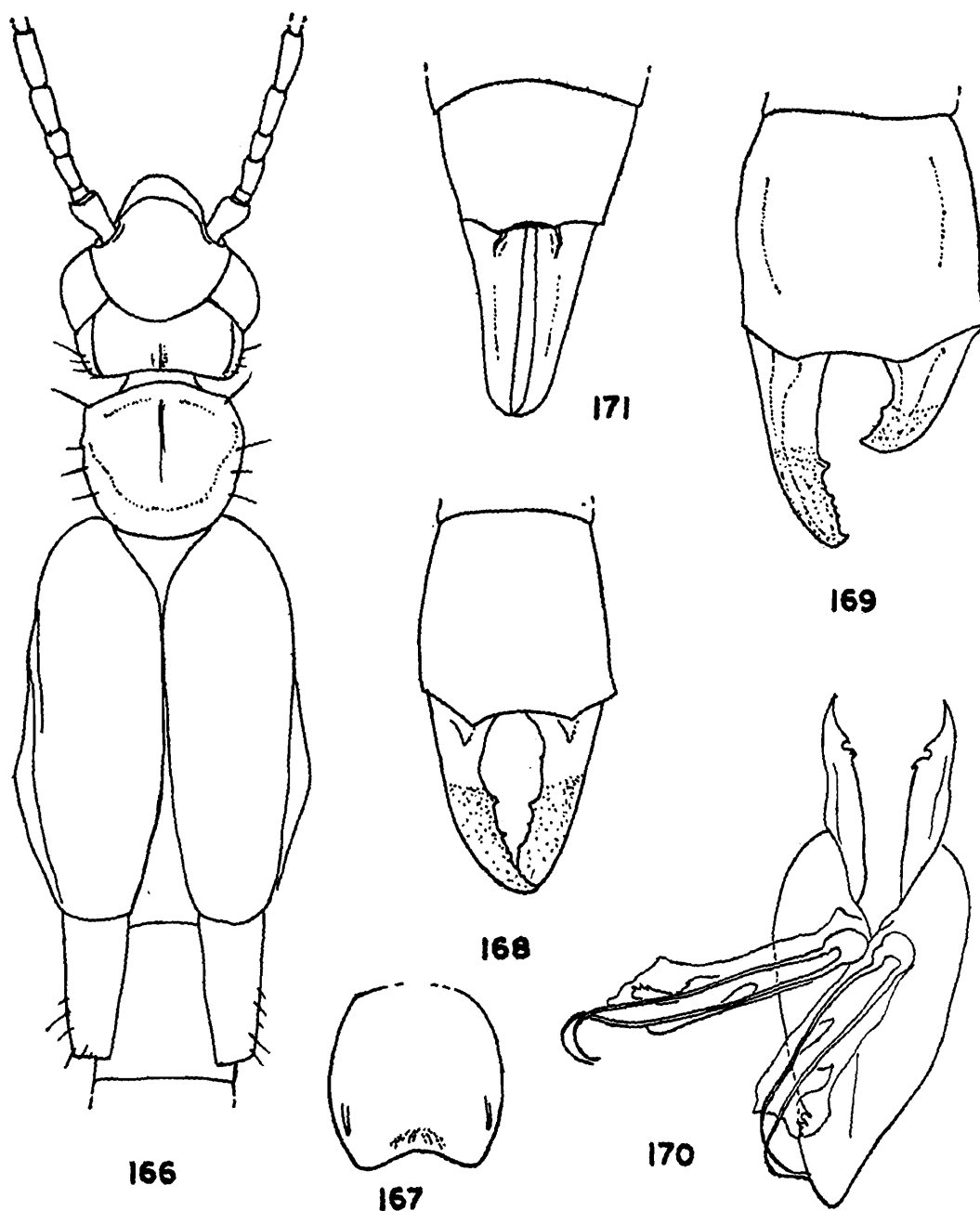
(Figs. 166-171)

Diplatys lefroyi Burr, 1910, *Fauna Brit. India Dermaptera* : 40, 44 (♂, S. Bombay, Belgaum, 2000 ft., (now in Karnataka) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 25, 30 ; Burr, 1911, *Genera Insect.*, 122 : 13 ; Burr, 1915, *J. R. mlcr. Soc.*, 1915 : 427, pl. 5, fig. 1 (? this species) ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 117 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 7 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 126 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20(1-2) : 194 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour brownish black. antennae with a few basal segments, pronotum on sides and posteriorly, wings along the internal margin and legs with femora in basal half and near apex, tibia in apical half and whole of tarsi and forceps in basal one third yellow ; abdomen reddish brown. Sparsely pubescent.

Head about as long as broad, smooth, frons raised and occiput depressed in middle, laterally feebly raised, post-ocular carina gently

curved in middle, sharp, dying out posteriorly, transverse suture obsolete and median one faint; hind margin emarginate in middle. Eyes slightly longer than the post-ocular length. Antennae 17-segmented or more, stout, basal segment gently expanded apically,



Figs. 166-171 : *Diplatys lefroyi* Burr, ♂, 166. Anterior portion of body; 167. Penultimate sternite; 168. Ultimate tergite and forceps (f. microlabia); 169. Ultimate tergite and forceps with right branch stunted (f. macrolabic); 170. Genitalia; ♀, 171. Ultimate tergite and forceps.

shorter than the distance between antennal bases; 2nd about as long as broad; 3rd cylindrical or gently expanded apically; 4th subclavate, shorter than the preceding; 5th as long as the 3rd; remaining gradually increasing in length, a few preapical ones appreciably thinning. Pronotum about as broad as long, gently contracted posteriorly,

anteriorly convex, sides gently convex and hind margin subtruncate, prozona raised, metazona depressed, median sulcus faint. Elytra and wings well developed, former with axillary angles rounded off to expose a small triangular scutellum. Legs normal. Abdomen long and cylindrical, shining, tergites 8th and 9th gently expanded and depressed. Penultimate sternite covered with short yellow pubescence, microreticulated, feebly depressed in middle posteriorly, hind margin shallowly emarginate, laterally in middle with a short compressed, linear ridge, often feebly marked. Ultimate tergite dull dark black with microreticulations, weakly transverse, gently expanded posteriorly, disc strongly raised with feeble depression in middle, strongly sloping backwards, hind margin in middle subsinuate and laterally oblique and gently sinuate, postero-lateral angles a little projecting. Forceps with branches remote, somewhat cylindrical, at base with a small triangular depression, gently incurved in middle, tapering posteriorly, apices gently hooked and pointed, internal margin below finely crenulate with a slightly larger tooth in middle. Genitalia with parameres flat, elongated, external margin subsinuate, apices acuminate, gently incurved, internally armed in apical one third with one smaller anterior and a posterior larger hooked tooth, both separated by a deep and narrow emargination; distal lobes about as long as the parameres, provided with chitinous accessory plates, apically serrated; virga at base greatly thickened, arms of bifurcated portion tubular, tapering apically, projecting beyond the distal lobes.

♀ : Similar to male in most characters except that the pronotum yellow with a few black patches in middle and anteriorly; head with frons and occiput not well demarkated, post-ocular carina moderately distinct; antennal segments comparatively more slender; eyes about as long as the post-ocular length; abdomen dark brownish black, narrowed posteriorly; penultimate sternite strongly narrowed posteriorly with hind margin rounded; ultimate tergite strongly narrowed posteriorly, disc moderately raised, hind margin trisinuate, laterally oblique and in middle feebly raised and forceps simple and straight, strongly tapering posteriorly, internally finely crenulate and at base above with a short, oblique, triangular crest.

Nymph (2 exs. at advance stage): Agrees with adult in general colouration and other body parts except head moderately convex, not well differentiated, sutures distinct; eyes distinctly shorter than the post-ocular area; antennae partly broken but maximum segments present 18, all segments comparatively longer and slender except 4th

and 5th which are almost globular ; legs with a brownish band, on femora, patchy not continuous ; mesonotum almost pentagonal, posteriorly emarginate, median sulcus distinct, sublaterally feebly raised ; metanotum represented by wing pads with obscure venation ; basal abdominal tergites or some of the tergites in basal half yellow, narrowed posteriorly ; penultimate sternite transverse with hind margin broadly rounded ; ultimate tergite strongly narrowed posteriorly and cerci segmented, about as long as the body or longer (since apically broken), basal segment longest, cylindrical, almost equal to combined length of 2nd to 6th, apically, tapering, covered with a few long blackish brown hairs.

Measurements (in mm) :

	♂	♀
Length of body	10.2-11.2	7.5-8.5
Length of forceps	1.2- 1.5	1.3-1.4

Distribution : INDIA : Karnataka ; Dist. Belgaum, Belgaum and Londa.

Types : Holotype ♂ in BMNH.

Remarks : In ZSI collections there are 2 ♂♂, 2 ♀♀ and 2 nymphs from Karnataka : Dist. Belgaum, Londa, 634.64 m collected by me under the bark of a standing tree. The Holotype ♂ is from from Belgaum proper which is quite near the above locality. Therefore, above material may be considered as 'topotype' for all practical purposes and the males agree with the description of type except in one of the ♂ right branch shows much stunted growth which may be perhaps due to injury in early stage of development, the present figure of ♂ genitalia (Fig. 170) shows apex of parameres strongly drawn out and a little incurved. The extreme apex is transparent and the portion below it is darkened triangular in the genitalic mount before me, thus giving false impression of apex being shorter. Perhaps this might be the reason for Hincks (1955, fig. 154) diagram of ♂ genitalia showing apex slightly shorter.

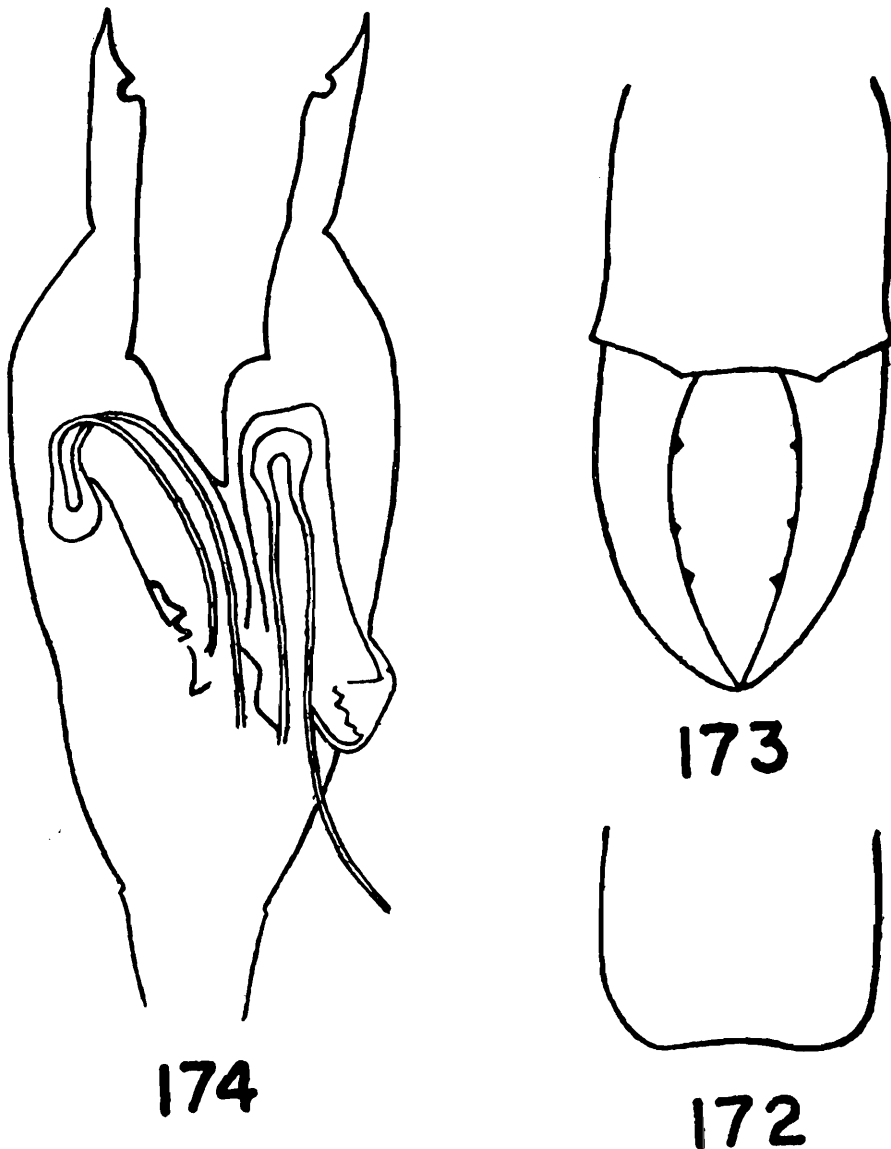
It exhibits close resemblance with *D. menoni* Kapoor and Bharadwaj, and the various characters separating the two species are discussed under the latter species. It can, however, be compared with *D. dolen* Hincks, in having almost identical virga but the latter can be easily separated by the truncate hind margin of penultimate sternite posteriorly and parameres armed internally with a large hooked tooth followed by a large concavity.

36. *Diplatys menoni* Kapoor and Bharadwaj

(Figs. 172-174)

Diplatys menoni Kapoor and Bharadwaj, 1968, *Bull. Ent.*, 9 (1) : 81 (♂ ; India : Maharashtra : Poona); Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 161 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour reddish-brown. Head slightly longer than broad, frons convex, occiput depressed in middle, laterally raised, sutures distinct. Eyes about as long as the post-ocular area. Antennae with 1st segment stout, expanded apically, almost equal to the combined length of 2nd and 3rd ; 2nd small ; 3rd twice as long as preceding. Pronotum shorter and anteriorly narrower than head, sides parallel, hind margin rounded. Elytra and wings well developed. Legs normal



Figs. 172-174 : *Diplatys menoni* Kapoor and Bharadwaj, ♂, 172. Posterior margin of penultimate sternite ; 173. Ultimate tergite and forceps ; 174. Genitalia (redrawn from Kapoor and Bharadwaj, 1968).

for the genus. Abdomen long and cylindrical, parallel sided. Penultimate sternite with a faint depression in middle posteriorly, hind margin slightly concave. Ultimate tergite broader than abdominal tergites, longer than broad, sloping backwards, hind margin faintly emarginate in middle and laterally, postero-lateral angles a little projecting. Pygidium invisible from above. Forceps nearly equal to ultimate tergite in length, remote, cylindrical, gently incurved in middle, tapering apically with tip pointed, internal margin below armed with three small teeth. Genitalia with parameres about half as long as the proparameres, tip acutely pointed, internal margin at apical one third with a deep emargination, armed above and below with a small tooth, distal lobes about as long as the parameres, chitinous accessory plates with apical margin serrated present; virga long, projecting well beyond the distal lobes, arms thin, tubular, tapering apically, at base thickened.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	10.5
Length of forceps	1.5

Distribution ; INDIA : Maharashtra ; Poona.

Types : Holotype ♂ ; location not known.

Remarks : The above description is taken from Kapoor and Bhardwaj (1968) which does not provide in detail colouration of body parts. Moreover, there is no mention of post-ocular carina of head and faint sublateral carina on penultimate sternite.

I could not trace the type of above species in the collections of IARI and FRI where most of the Kapoor's 'types' are deposited.

This species shows remarkable similarity with *D. lefroyi* Burr, in colour, penultimate sternite, ultimate tergite, forceps and details of distal lobes including virga. It, however, can be differentiated by the shape of parameres which are armed internally with two small teeth separated by comparatively broader emargination (vs teeth hooked shape especially posterior one larger and emargination between them narrower in *D. lefroyi*) and penultimate sternite without a small sublaterally compressed raised areas in middle (vs short raised compressed areas in middle sublaterally present).

37. *Diplatys ernesti* Burr

(Figs. 175-179)

Diplatys ernesti Burr (partim), 1910, *Fauna Brit. India, Dermaptera* : 40, 48 (♂, ♀ ; Ceylon-excl. Paratype 1 ♂) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 27, 36 ; Burr, 1911, *Genera Insect.*, 122 : 13 ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 107 ; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 212 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 114 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 195 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 14.

Dyscritina longisetosa Westwood, 1881, *Trans. R. ent. Soc. Lond.*, 1881 : 601 (partim) ; Green, 1898, *Trans. R. ent. Soc. Lond.*, 1898 : 381 (partim) ; Burr, 1898, *Trans. R. ent. Soc. Lond.*, 1898 : 387 (partim).

Diplatys gerstaeckeri (nec Dohrn) ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 74 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 46 (partim) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 35 (partim) ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 428, pl. 5, fig. 6.

♂ : General colour yellowish brown. Finely pubescent, a few long hairs present.

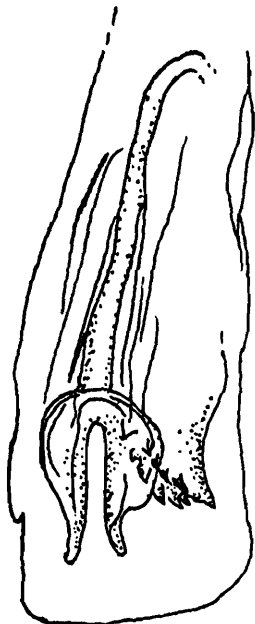
Head with frons moderately raised, gradually passing into occiput, transverse suture obsolete or nearly so, median suture short but distinct, post-ocular carina moderately distinct, straight, dying out posteriorly. Eyes prominent, distinctly longer than the post-ocular area. Pronotum quadrate, sides scarcely convex, narrowed posteriorly, hind margin feebly rounded. Wings well developed, axillary angles rounded off, exposing a large triangular scutellum. Wings and legs normal. Abdomen cylindrical, almost parallel sided. Penultimate sternite posteriorly bisinuate with median lobe rounded and postero-lateral angles moderately pointed. Ultimate tergite subquadrate, posterior margin lightly concave, laterally oblique, area above the bases of forceps and in the middle behind hind margin with a minute and comparatively larger tumidity, respectively. Forceps short, depressed, almost straight, tapering apically with tip gently hooked and pointed. Genitalia with parameres in basal half broader with anterior margin truncate and internally with a minute teeth, followed by a faint concavity, in apical half forming a narrow acute lobe ; distal lobes about as long as the parameres, provided with accessory chitinous, dentate plate, virga short, inverted U-shaped, arms thick, apically pointed.

♀ : Agrees with male in general colour except that on frons, wings along the external margin and some of the abdominal and ultimate tergites slightly darker ; frons and occiput weakly differentiated, post-ocular carina faint and obsolete a little before hind margin ;

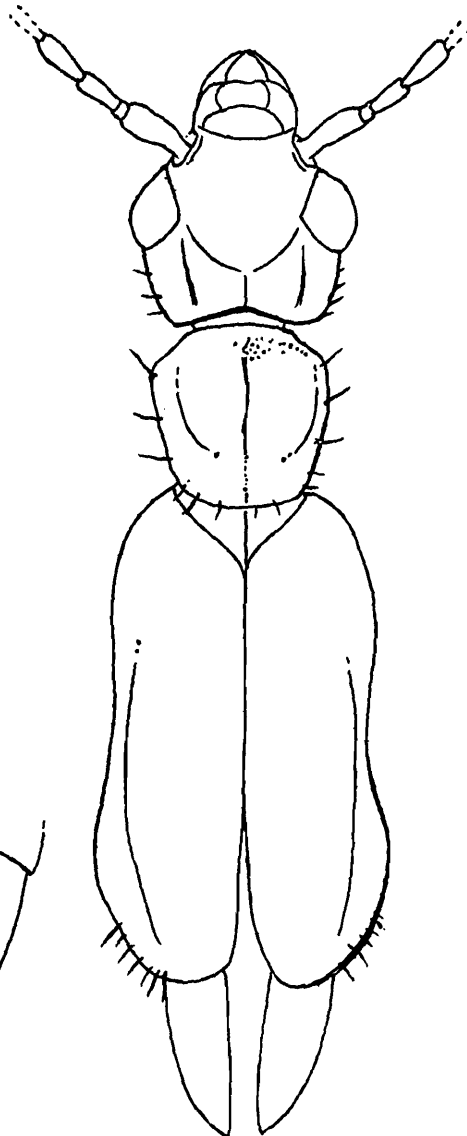
penultimate sternite obtusely triangular posteriorly ; ultimate tergite strongly narrowed and forceps comparatively longer and more attenuate posteriorly.

Measurements (in mm) :

	♂	♀
Length of body (including forceps)	8.0-9.0	10.05



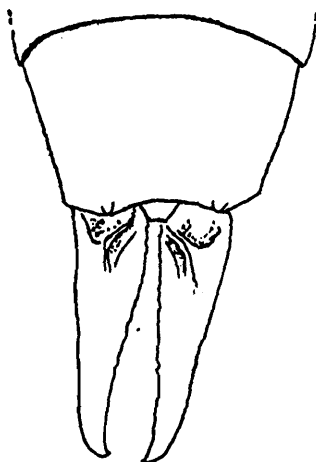
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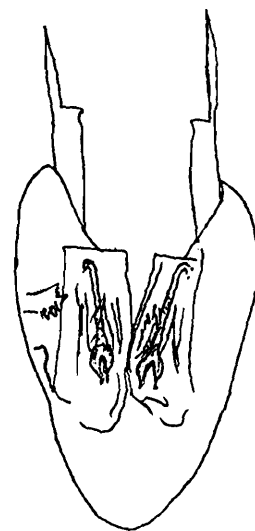
178



176



179



175

Figs. 175-179 : *Diplatys ernest*. Burr, ♂, 175. Genitalia ; 176. Apical portion of paramere enlarged ; 177. Distal lobe enlarged ; ♀, 178. Anterior half of body ; 179. Ultimate tergite and forceps.

Distribution : SRI LANKA : Madulsima, Peradeniya, Punduloya and Maskeliya.

Types : Holotype ♂, Allotype ♀ and Paratype 1 ♂ in BMNH.

Remarks : Through the kindness of Dr. D. R. Ragge and Mr. Peter Ward it was possible to examine 1 ♂ Paratype, 1 slide with ♂ genitalia and 1 ♀ of this species available in BMNH.

This paratype ♂ is not in very good condition and a portion of genitalia especially paramere of one side is projecting beyond the penultimate sternite which agrees with that of *D. propinquus* Hincks, known from Sri Lanka. This specimen is fuscous brown whereas according to Hincks (1955) holotype and allotype of *D. ernesti* are uniform brown.

D. ernesti and *D. propinquus* are almost identical in external features except for minor differences in general body colour and distinctive ♂ genitalia.

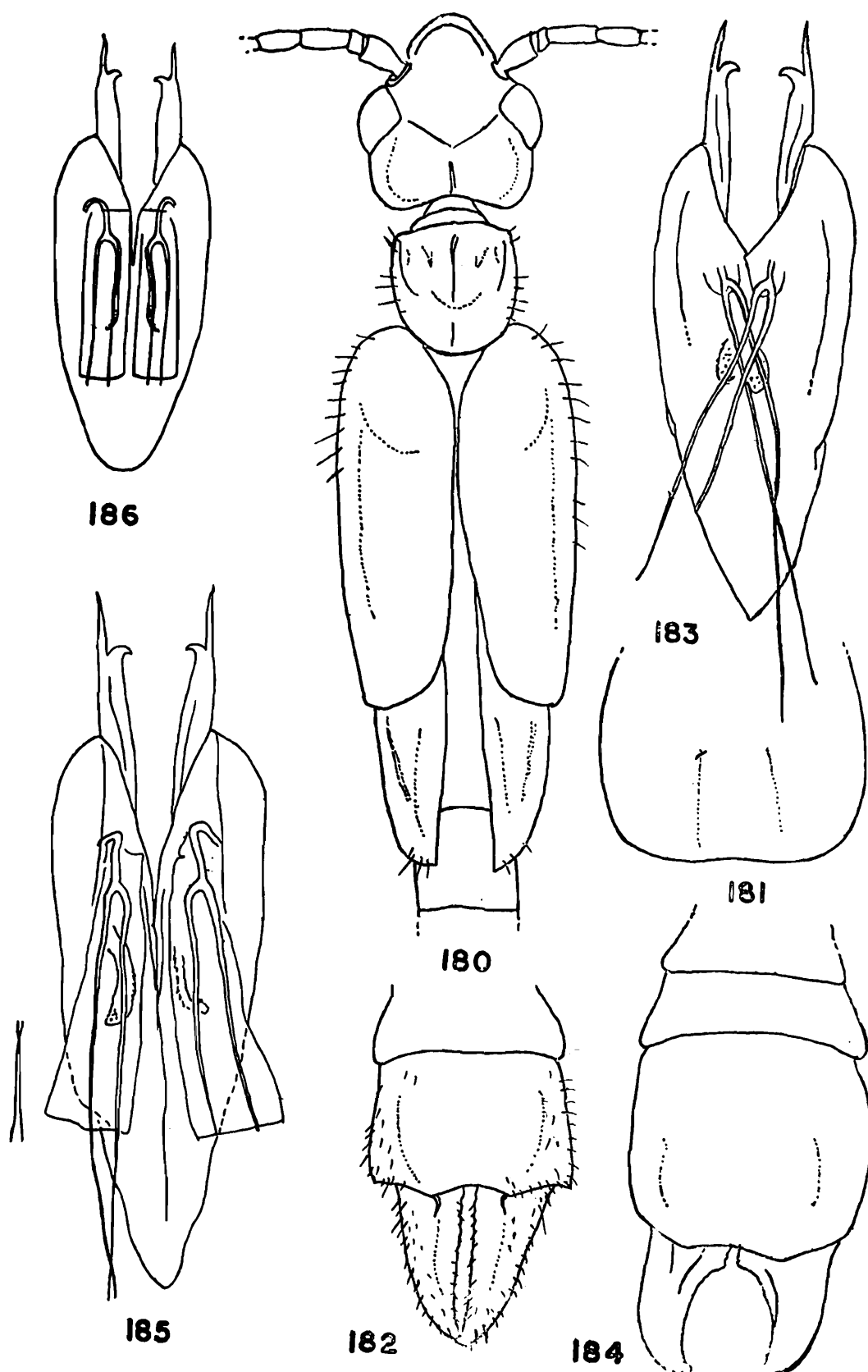
38. *Diplatys fletcheri* Burr

(Figs. 180-186)

Diplatys fletcheri Burr, 1910, *Fauna Brit. India Dermaptera* : 41, 52 (♂, ♀ ; Ceylon) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 28, 39 ; Burr, 1911, *Genera Insect.*, 122 : 14 ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 100 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 106 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 195 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 14.

♂ : General colour, shining reddish brown or often shaded with black. Head darker ; elytra in basal one third yellow ; pronotum light yellow in posterior half, remaining portion light to dark blackish brown ; legs yellow with femora in middle and tibiae at base shaded with light brown ; wings yellow at base and forceps somewhat lighter in colour. Strongly pubescent, short and long pubescence present.

Head longer than broad, smooth, frons moderately convex, gradually passing into weakly depressed occiput, its surface undulate, slightly roughened, transverse suture feebly and median suture distinctly marked, post-ocular carina strong, lightly curved, reaching up to hind margin, posterior margin emarginate in middle. Eyes moderately prominent, only slightly longer than the post-ocular length. Antennae 12-segmented or more, 1st stout (less stout in comparison to other species under the genus), feebly expanded apically, only very slightly shorter than the distance between antennal bases ; 2nd short, about as long as broad ; 3rd long and slender, slightly longer than the



Figs. 180-186: *Diplatys fletcheri* Burr, ♂ (f. *microlabia*), 180. Anterior portion of body; 181. Posterior margin of penultimate sternite; 182. Ultimate tergite and forceps; 183. Genitalia (right apical portion of one branch of virga missing); (f. *macrolabia*), 184. Hind end of body; 185. Genitalia (apical portion of virga of left side given at extreme left and apical portion of right probably broken off); 186. Genitalia (fig. 186 redrawn from Hincks, 1955).

4th and equal to 5th, remaining gradually increasing in length, thinning, each gently narrowed basally and expanded apically. Pronotum clearly longer than broad, smooth, a trifle contracted posteriorly, anteriorly convex, narrower than the head, sides almost straight, hind angles and margin conjointly rounded. Elytra and wings well developed, former with axillary angles normal or weakly rounded off exposing a small triangular scutellum. Sternal plates yellow, in middle shaded with brown, prosternum twice as long as broad, anteriorly expanded with margin convex, slightly constricted between fore-coxae but afterwards gently expanded but narrower in comparison to anterior half, hind margin subtruncate; mesosternum quadrate, slightly longer than broad, all margins straight, feebly emarginate laterally between middle-coxae; metasternum broad, narrowed posteriorly between hind coxae and extending beyond them slightly, hind margin emarginate with postero-lateral angles obtuse. Legs long and slender, apex of femora extending well beyond the tip of wings. Abdomen long and cylindrical, gently (f. microlabia) and greatly (f. macrolabia) enlarged apically, each tergite with a transverse depression in posterior half. Penultimate sternite micro-reticulated (in f. microlabia), comparatively narrowed posteriorly, hind margin more or less truncate with postero-lateral angles well rounded. Ultimate tergite weakly transverse, gently expanded apically, more so in forma macrolabia, disc convex above, slightly sloping backwards, hind margin trisinate, oblique laterally, postero-lateral angles slightly prominent. Forceps in f. microlabia depressed, subcontiguous, tapering apically, straight in basal half, lightly curved in apical half with apices gently hooked and pointed, internal margin finely crenulate, contiguous in basal one third, afterwards enclosing a narrow, oblong space, at base above with a short, triangular crest in the middle of a narrow depression; in f. macrolabia branches shorter, depressed, with an elongated triangular depression at base, strongly incurved, apices gently hooked and pointed, widely separated, internally at base dilated with margin crenulate, afterwards margin smooth but differentiated into ventral and dorsal borders giving false impression of forceps as trigonal. Genitalia with parameres about $\frac{1}{3}$ of proparameres in length, comparatively broader in basal $\frac{2}{3}$, internally armed with a large, hooked tooth at apical $\frac{1}{3}$ and beyond it parameres strongly narrowed to acuminate tip; distal lobes with a small chitinous denticulate plate; virga about twice as long as the distal lobes, at base with a short median extension, often incurved.

♀ : Agrees with males in most characters except that penultimate

sternite and ultimate tergite narrowed posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body (including forceps)	9.9-11.4	11.0

Distribution : SRI LANKA : Madulsima ; INDIA : Tamil Nadu, Coimbatore, 1400 ft. (microlabic forms, ZSI) ; North Salem, Jawalagiri (macrolabic male, FRI) ; Madhya Pradesh : Hoshangabad.

Types : Holotype ♂ and allotype ♀ (both broken, in poor condition) in BMNH.

Remarks : General body colour varies from yellowish brown to blackish brown and elytra often provided with a yellow spot in basal one third or uniform blackish brown. The macrolabic form hitherto unknown in the species is recorded on a ♂ from Tamil Nadu : North Salem Dist., Jawalagiri which possesses antennal segments stouter and other morphological characteristics i.e., enlargement of abdominal tergites posteriorly and shortning of forceps, generally associated with this form.

Hincks (1955, fig. 126) diagram shows that arms of virga are scarcely projecting beyond distal lobes. Two more figures of ♂ genitalia (figs. 183, 185) are given herewith. Figure 185 shows that virga on left side is about twice as long as distal lobes and on the right side it is scarcely projecting beyond the distal lobes whereas in figure 183 virga of both sides are twice as long as the distal lobes. Since all the three figure are identical in all other respects it may be presumed fig. 183 represents the normal condition. It is likely that apical portion of virga in Hincks figure and fig. 185 are broken off because the material from which these mounts have been prepared are either fragmentary or very old in which case this possibility can't be entirely ruled out.

On the basis of combination of characters of pronotum, penultimate sternite and male genitalia it can be easily separated from the other known species from India and Sri Lanka.

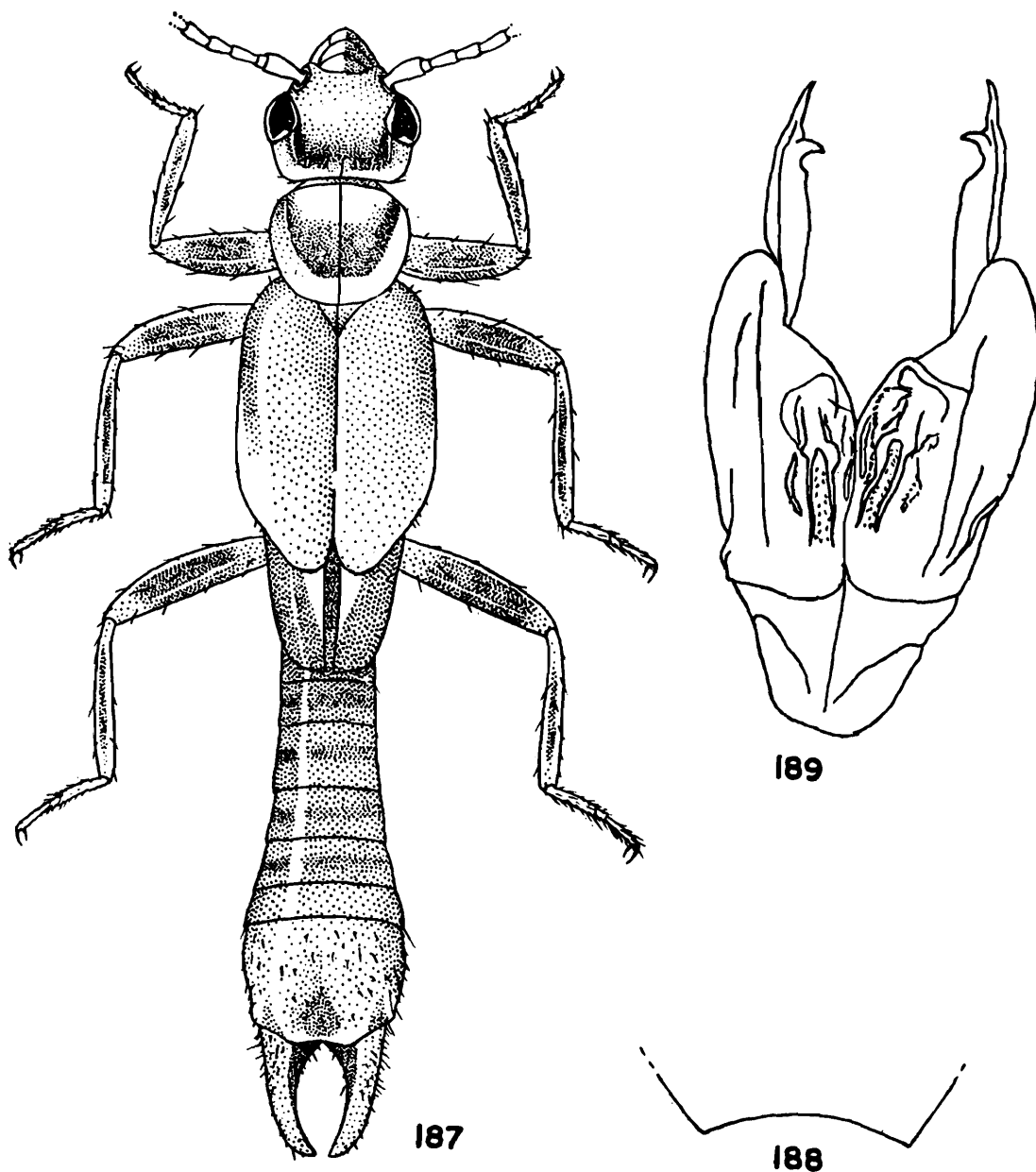
39. *Diplatys anamaliensis* Srivastava

(Fig. 187-189)

Diplatys anamaliensis Srivastava, 1970, *EOS. Madr.*, 45 : 320 (♂ ; India, Tamil Nadu, Anamalai Hills, Cinchona, 3500 ft.) ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 13.

♂ : General colour black. Antennae with basal two segments black and remaining blackish brown. Pronotum laterally yellow. Elytra and wings with a yellow spot, on former close to humeral angle and on latter at base close to sutural margin. Body covered with fine pubescence on certain body parts, especially sides of abdominal segments and forceps.

Head about as long as broad, frons convex and passing gradually in to depressed occiput, post-ocular carina sharp but dying out near



Figs. 187-189 : *Diplatys anamalaiensis* Srivastava, Holotype ♂, 187. Dorsal view ;
188. Posterior margin of penultimate sternite ; 189. Genitalia.

posterior margin, hind margin emarginate. Eyes prominent, about as long as the post-ocular area. Antennae (partly broken), 16-segmented or more, 1st stout, expanded apically ; 2nd about as long as broad, small ; 3rd long and cylindrical ; 4th a trifle shorter than the preceding ; 5th onwards segments gradually increasing in length and thinning. Pronotum more or less rounded, gently contracted posteriorly, prozona

convex and well differentiated from flat metazona, median sulcus faint. Elytra long, humeral angles weak, hind margin obliquely truncate, axillary angle weak, exposing a small triangular scutellum. Wings about one third as long as the elytra. Legs normal. Abdomen smooth, convex, long, expanding from 7th to 9th tergites. Penultimate sternite with a faint depression in posterior half, hind margin shallowly sinuate. Ultimate tergite smooth, weakly transverse, sides feebly convex in middle, disc, above sloping posteriorly, a median raised, elliptical area present posteriorly, hind margin trisinate, laterally oblique. Forceps with branches at base depressed, contiguous and dentate, thence trigonal with ridge present above in basal half only, in apical half branches gradually curving and tapering apically with tip pointed, internal margin smooth. Genitalia with parameres about half as long as the proparameres, internally armed at apical one third with a hooked tooth, apically narrowed with apex acute, distal lobes a little over one third as long as the proparameres, accessory dentate rods present; virga with unpaired portion much shorter than the paired one.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	11.45
Length of forceps	1.25

Distribution : INDIA : Tamil Nadu.

Type : Holotype ♂ in ZSI.

Remarks : This species comes close *D. fallax* Borelli, from Sumatra and Malaya but differs in having the pronotum rounded and in the details of male genitalia, especially inner pre-apical tooth in being hooked and with a concavity below it; distal lobes much shorter than the parameres and with a straight, chitinous and denticulate rod on either side of virga.

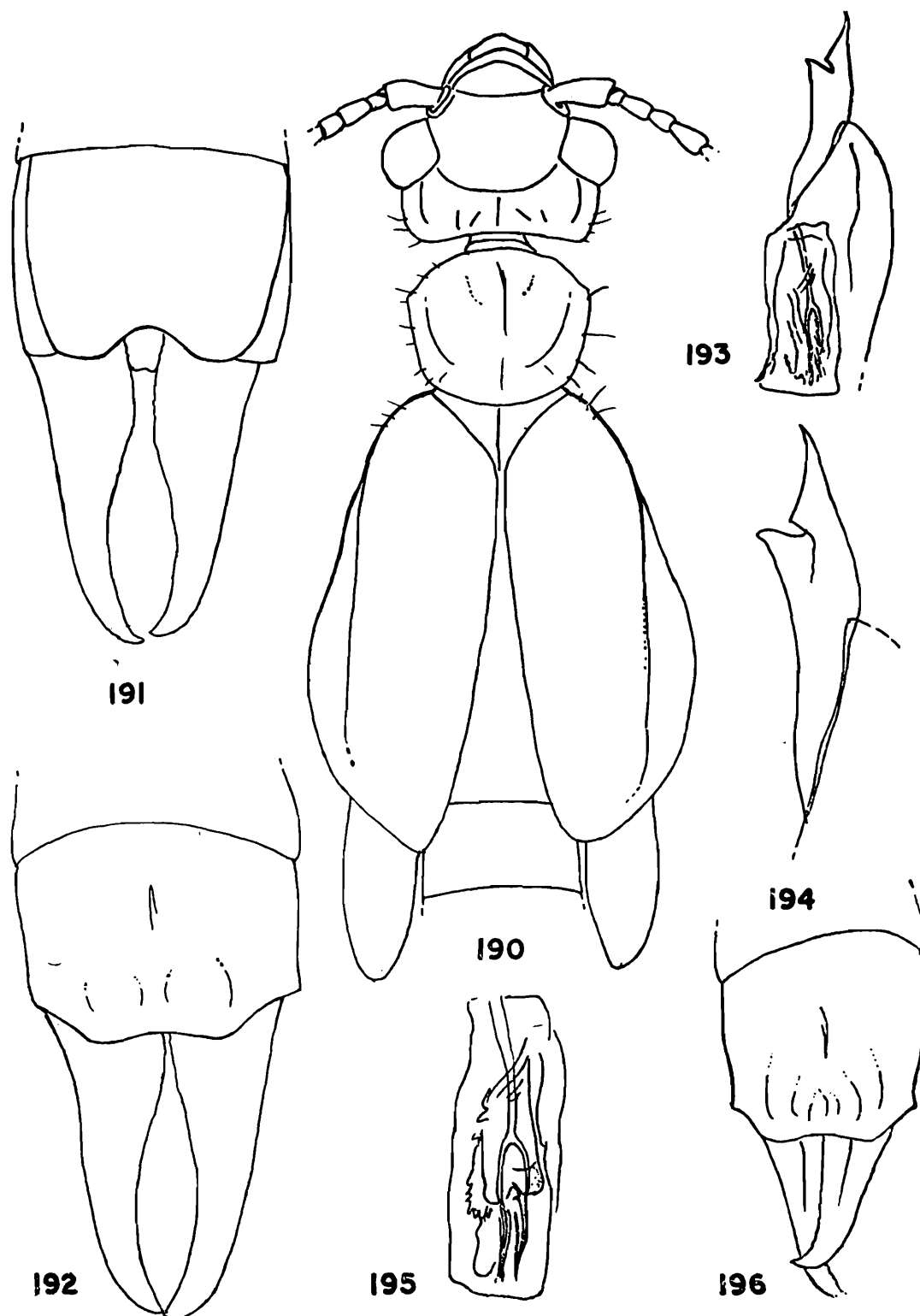
40. *Diplatys greeni* Burr (Figs. 190-196)

Dyscritina longisetosa Westwood, 1881, *Trans. R. ent. Soc. Lond.*, 1881 : 601 (partim); Green, 1898, *Trans. R. ent. Soc. Lond.*, 1898 : 381 (partim); Bormans and Krauss, 1900, *Das Tierreich*, 11 : 8, 10 (partim).

Diplatys gerstaeckeri (nec Dohrn); Burr, *Fauna Brit. India Dermaptera* : 46 (partim); Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 35 (partim).

Diplatys nigriceps (nec Kirby); Burr, 1898, *Trans. R. ent. Soc. Lond.*, 1898 : 389; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 1901 : 75; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 10 (partim).

Diplatys greeni Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 280, 285 (♂, Ceylon) ; Kirby, 1904, *Syn. Cat. Orth.*, 4 : 2 (partim) ; Burr, 1910, *Fauna Brit. India Dermaptera* : 41, 50 ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 27, 38 ; Burr, 1911, *Genera Insect.*, 122 : 14 ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 112 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 120 ; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 212 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20(1-2) : 196 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 14.



Figs. 190-196 : *Diplatys greeni* Burr, ♂, 190. Anterior half of body ; 191. Penultimate sternite and forceps ; 192. Ultimate tergite and forceps ; 193. Right half of genitalia ; 194. Paramere enlarged ; 195. Distal lobe enlarged ; ♀, 196. Ultimate tergite and forceps.

♂ : General colour uniform brownish ; sparsely pubescent.

Head about as long as broad, frons moderately convex, occiput weakly depressed in middle with surface uneven, i. e., provided with blunt folds on either side of middle line, post-ocular carina moderately strong, slightly curved, dying out posteriorly, transverse suture obsolete and median suture distinct, hind margin emarginate. Eyes prominent, distinctly longer than the post-ocular area. Antennae 16-segmented or more. Pronotum slightly longer than broad, contracted posteriorly, sides gently convex, median sulcus distinct, hind margin truncate, prozona convex occupying larger part, metazona depressed, short. Elytra and wings well developed, smooth, former with axillary angles rounded, exposing a small, triangular scutellum, hind margin convex. Legs long and slender. Abdomen long, cylindrical, gradually expanding posteriorly, laterally on each tergite with elongated paired polished spots. Penultimate sternite transverse, posteriorly with a short median depression, hind margin concave, postero-lateral angles obtuse. Ultimate tergite feebly expanded in comparison to abdominal tergites, transverse, convex above, smooth, median sulcus faintly marked, hind margin trisinate, laterally oblique. Forceps with branches sub-contiguous and trigonal at base, tapering and gradually curving from base to apex, enclosing an elliptical space, under surface flat. Genitalia with parameres about half as long as the proparameres, internally armed with two teeth at apical one third and separated by a narrow, oblique concavity, strongly narrowed in apical one third with tip acute and slightly pointed inwards, distal lobes about as long as the parameres, arms of virga thin tubular, about half as long as the distal lobes.

♀ : Doubtfully associated to this species ; very similar to males.

Measurements (in mm) :

	♂
Length of body	8.5
Length of forceps	1.0

Distribution : SRI LANKA : N. W. Prov., Punduloya ; Sab. Prov., Kegalle and Derwood.

Types : Holotype ♂ and Paratype ♂ (without head) in BMNH.

Remarks : This species comes close *D. fletcheri* Burr from Sri Lanka and India, on the basis of concave penultimate sternite posteriorly but differs in having the concavity of penultimate sternite more pronounced ; parameres with a pre-apical emargination, bounded apically with a shorter and basally with an acute, oblique, larger tooth and distal lobes with virga comparatively shorter.

41. *Diplatys carli* sp. n.

(Figs. 197-200)

Diplatys rufescens (nec Kirby) ; Borelli, 1931, *Revue. suisse Zool.*, 38 : 389 (♂ ; Nilgiri, Kateri valley).

Diplatys sp. Hincks, 1955 *Syst. mono. Dermaptera*, 1 : 124 fig. 165 (♂ genitalia-slide with ♂ genitalia in MIZT).

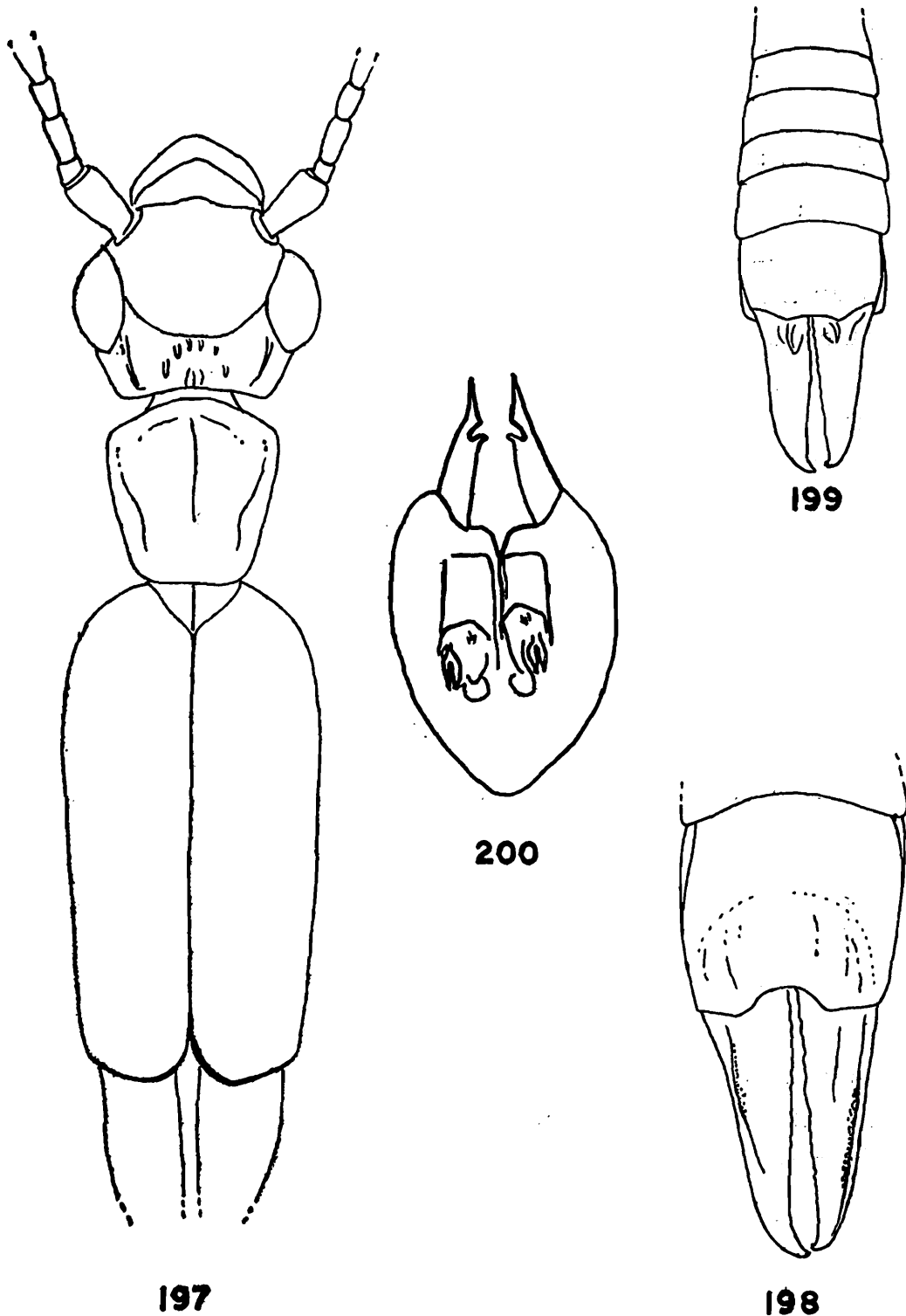
♂ : General colour brownish black. Mouth parts, antennae, pronotum with broad median stripe in basal 2/3 ; femora in basal half obscurely and knee joints, some of abdominal tergites in middle above and forceps at base and apically with varying shades of dull smoky yellow. Body covered with fine and sparse pubescence.

Head about as long as broad, frons greatly raised and well differentiated from strongly depressed occiput, behind eyes narrowed posteriorly, sutures obsolete, median suture represented by a fine, faint depression, hind margin incrassate, emarginate posteriorly, post-ocular ridge sharp, almost straight and complete. Antennae (partly broken) only 5 basal segments remaining on the left side ; 1st stout, narrowed at base, strongly expanded apically ; 2nd transverse ; 3rd long and cylindrical, almost equal to 5th ; 4th slightly shorter than the preceding. Eyes very prominent, $1\frac{1}{2}$ time longer than the post-ocular area. Pronotum longer than broad, anterior margin convex, lateral margin gently reflexed and converging posteriorly, hind margin truncate, median sulcus distinct, faint in apical 1/3, prozona moderately raised and gradually merging into depressed metazona. Sternal plates dull yellowish. Legs long and slender, typical for the genus. Elytra well developed, shoulders weak, meeting along the suture, hind margin obliquely convex, axillary angle weak, exposing a broad, triangular scutellum. Wings a little less than 1/2 the length of elytra, extending up to 4th abdominal tergite. Abdomen long and cylindrical almost parallel sided, smooth, finely pubescent. Penultimate sternite finely punctulate, with a vaguely semicircular depression in posterior half, hind margin with deep concavity in middle. Ultimate tergite transverse, slightly narrowed posteriorly, smooth, convex above in middle, sloping backwards, hind margin trisinate, laterally oblique. Pygidium scarcely visible from above, vertical, narrowed apically. Forceps subcontiguous, straight, depressed, tapering apically with tip gently hooked and pointed, internal margin finely crenulate.

Genitalia with parameres about as long as the distal lobes, broader at base, narrowed apically with tip acute, internally in apical 1/3 with a

deep, oblique concavity, armed basally with a gently hooked tooth ; virga short, median unpaired portion about $\frac{1}{3}$ as long as paired portion and latter with arms thick and swollen, apically acute.

♀ : Unknown.



Figs. 197-200 : *Diplatys carli* sp.n. ; Holotype ♂, 197. Anterior half of body ; 198. Penultimate sternite and forceps ; 199. Posterior half of body ; 200. Genitalia (redrawn from Hincks 1955, p. 24, fig. 165).

Measurements (in mm) :

	Holotype
	♂
Length of body	9.1
Length of forceps	0.9

Material examined : INDIA : Tamil Nadu, Nilgiri, Kateri-Valley, Holotype ♂ (Voy. Carl et Escher) ; deposited in MHNG ; slide with ♂ genitalia of Holotype in MIZT

Distribution : Known only from the type locality.

Remarks : This species comes close to *D. greeni* Burr from Sri Lanka in having concave penultimate sternite posteriorly but differs by the head with complete post-ocular carina ; pronotum laterally straight ; penultimate sternite with a simicircular depression in posterior half and hind margin with a deep emargination in middle and genitalia with internal parameral emargination broader, portion beyond it comparatively longer and virga with arms thick and shorter.

The shape of penultimate sternite is more or less similar to that of *D. excidens* Hincks, but the male genitalia of both are quite different.

42. *Diplatys adjacens* Hincks

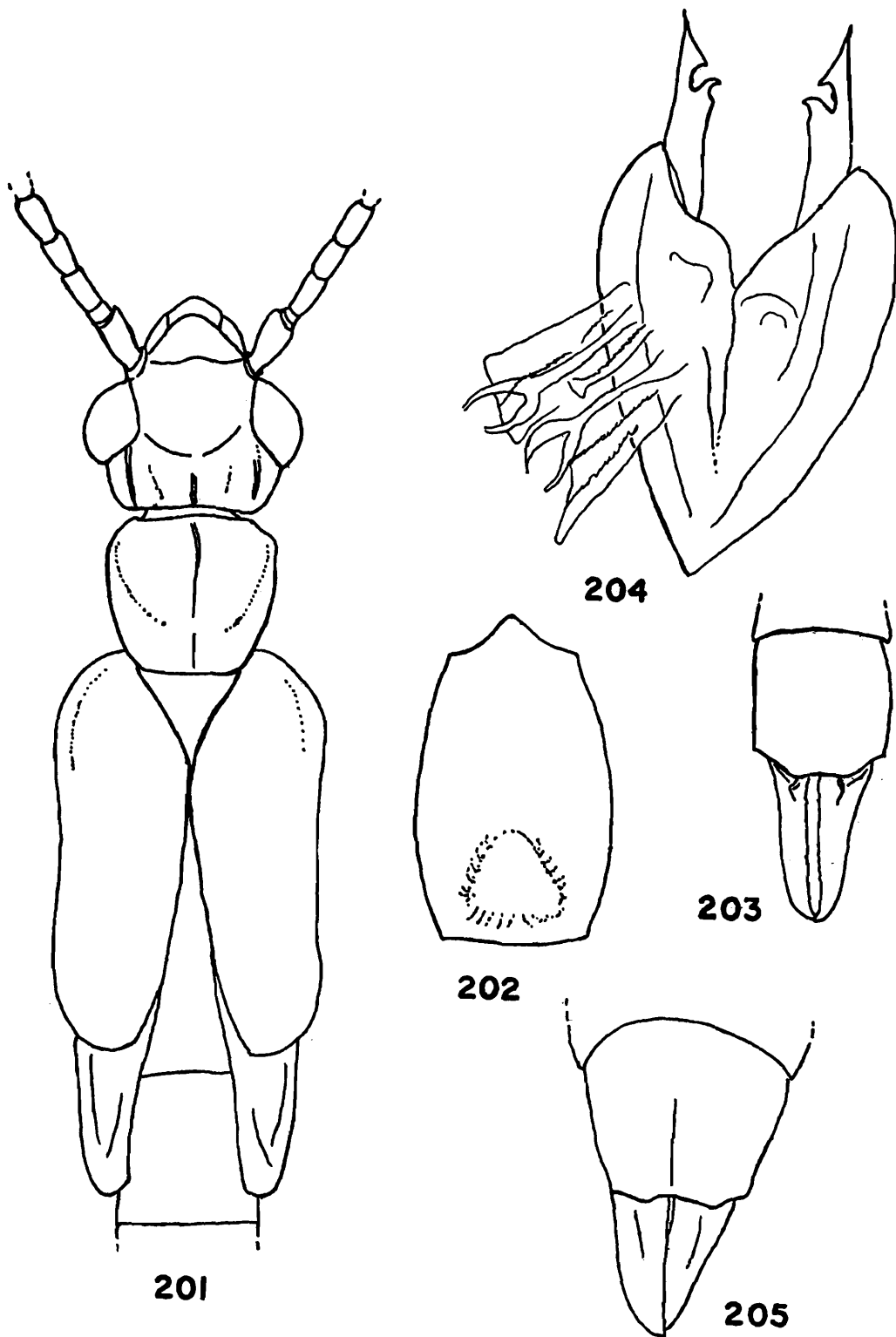
(Figs. 201-205)

Diplatys adjacens Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 110 (♂, ♀ ; India : Madhya Pradesh : Chikalda, Berars ; Uttar Pradesh : West Almora Div. Kumaon) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 6 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 119 ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 196 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 13.

♂ : General colour brown to blackish brown. Legs lighter, often femora in middle and tibiae darker or very slightly shaded with brownish black. Pronotum laterally and posteriorly light brown. Elytra uniform blackish brown, often lighter above. Wings in basal half with an oval spot and internally yellow. Sparsely pubescent.

Head longer than broad, frons moderately convex, occiput strongly depressed in middle, with faint leniar depression on either side of distinct median sulcus, transverse suture obsolete, post-ocular carina strong, straight, reaching up to the posterior margin of head, hind margin emarginate. Eyes prominent, distinctly longer than the post-ocular area. Antennae with 17 segments or more, basal segment stout, expanded apically, shorter than the distance between antennal bases

and length of eye ; 2nd about as long as broad ; 3rd long and slender, equal to 5th in length ; 4th shorter than preceding, stouter ; 5th



Figs. 201-205 : *Diplatys adjacens* Hincks, ♂, 201. Anterior half of body ; 202. Penultimate sternite ; 203. Ultimate tergite and forceps ; 204. Genitalia, ♀, 205. Ultimate tergite and forceps.

stouter, remaining segments gradually increasing in length except a few pre-apical ones, shorter. Pronotum slightly longer than broad, feebly contracted posteriorly, anteriorly convex, sides almost straight,

postero-lateral angles rounded, hind margin truncate, prozona raised, metazona depressed, median sulcus distinct, obsolete in posterior one third. Elytra and wings well developed, former micro-reticulated, axillary angles rounded off, exposing a large triangular scutellum. Legs long and slender, normal. Abdomen long, slender, almost parallel sided, scarcely expanded apically, lateral folds on 3rd and 4th tergites weakly marked. Penultimate sternite feebly depressed posteriorly, hind margin truncate. Ultimate tergite weakly transverse, covered with fine pubescence, disc moderately convex, sloping backwards, hind margin trisinate, laterally oblique. Forceps depressed, contiguous, straight, tapering apically, tip gently hooked and pointed, internally finely crenulate, at base above with an oblique, triangular crest. Genitalia with parameres apically acuminate, internally with a broad, deep emargination near apex, anteriorly and posteriorly armed with a tooth, of which posterior one larger and hooked, a third minute one present in the middle of emargination ; distal lobes longer than the parameres, virga stout, unpaired portion twice as long as the paired portion, arms of bifurcated portion strongly tapering apically.

♀ : Agrees with males in most characters except head longer, frons and occipute not well differentiated, sutures obsolete, hind margin more strongly emarginate ; eyes about as long as the post-ocular area ; pronotum and legs uniform yellowish brown ; abdominal tergites including ultimate tergite strongly narrowed posteriorly ; penultimate sternite elongated, triangularly obtuse in middle posteriorly and forceps simple and straight.

Nymphs (3 exs. at different stages of development) : Head depressed, sutures distinct ; eyes distinctly shorter than the post-ocular area ; antennae with 4th and 5th segments short, almost globular ; pronotum quadrate ; in two examples wing pads present with obscure venation ; abdomen including ultimate tergite strongly narrowed posteriorly and cerci multisegmented with 1st long and cylindrical, almost equal to 2nd to 6th together.

Measurements (in mm) :

	♂	♀
Length of body	8.5-9.4	9.1
Length of forceps	0.8-0.9	1.0

Distribution : INDIA : Madhya Pradesh : Chikalda, Berars ; Barighati and Chhotighati (Sillari) and Jabalpur ; Uttar Pradesh : Almora and Dehra Dun (ZSI).

Types : Holotype ♂ and Allotype ♀ and Paratype ♂ in BMNH.

Remarks : This species is represented in ZSI collections by several examples including nymphs from India : Madhya Pradesh and Uttar Pradesh.

It shows close resemblance with *D. sinuatus* Hincks and various distinguishing characters between the two have been discussed under the latter.

43. *Diplatys sinuatus* Hincks

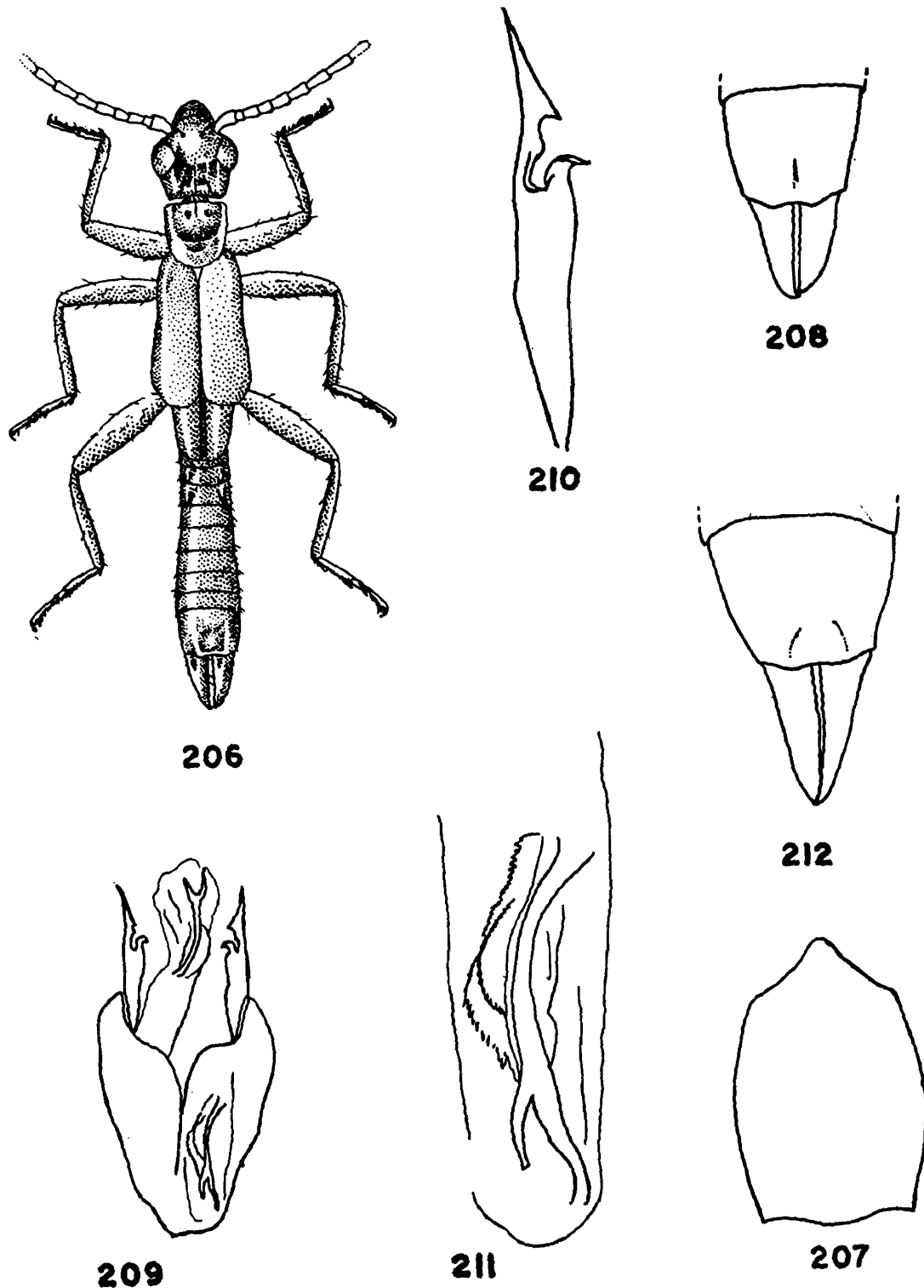
(Figs. 206-212)

Diplatys sinuatus Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 120 (♂, India : Bihar, Ranchi Dist., Nambhum); Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 7; Sakai, 1972, *Dermapterorum Cat. Prael*, 5 : 129; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20(1-2) : 196; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 16.

♂ : General colour dark blackish brown to yellowish brown. Antennae, pronotum laterally and posteriorly and legs yellow. Pronotum often uniform yellowish brown and legs with femora banded with brownish black in middle and tibiae in basal half only.

Head about as long as broad, smooth, frons strongly raised and occiput in middle abruptly depressed, laterally comparatively raised, post-ocular carina sharp, gently curved near eyes, reaching up to hind margin, transverse suture obsolete, median suture distinct, hind margin emarginate in middle. Eyes occasionally silvery white, prominent, distinctly longer than the post-ocular area. Antennae 12-segmented or more, basal segment stout, expanded apically, shorter than the eye and distance between antennal bases : 2nd short, about as long as broad ; 3rd long, slender, equal to 5th in length ; 4th stouter, gently expanded apically and shorter than the preceding, 6th onwards segments gradually increasing in length and thinning. Pronotum longer than broad, smooth, contracted posteriorly, anteriorly gently convex, sides straight, hind angles and margin conjointly rounded, prozona weakly raised and metazona depressed, median sulcus distinct in anterior half only. Elytra and wings well developed, former micro-reticulated, axillary angles scarcely rounded ; scutellum very small, triangular. Legs long and slender, normal. Abdomen long, cylindrical, scarcely dilated posteriorly, lateral tubercles on 3rd and 4th tergites moderately developed, smooth above and covered with fine yellow pubescence. Penultimate sternite smooth, covered with fine yellow pubescence, in posterior half with a faint rounded depression, hind margin undulate,

convex in middle and postero-lateral angles a little projecting. Ultimate tergite smooth, weakly transverse, disc moderately convex, gently sloping backwards, hind margin trisinate, laterally oblique. Forceps



Figs. 206-212 : *Diplatys sinuatus* Hincks, ♂, 206. Dorsal view; 207. Penultimate sternite; 208. Ultimate tergite and forceps; 209. Genitalia; 210. Paramere enlarged; 211. Distal lobe enlarged; ♀, 212. Ultimate tergite and forceps.

depressed, straight, contiguous, tapering apically, tip gently hooked and pointed, internally crenulate, covered with short and long pubescence. Genitalia with parameres strongly acuminate apically,

internally with a narrow, oblique emargination near apex, armed above and below with tooth, lower one strongly hooked and a minute denticle in the middle of emargination present; distal lobes about as long as the parameres, former with slender, curved accessory rods; virga with unpaired portion twice as long as the paired one, arms of paired portion tapering apically, outer branch slightly longer than the inner one.

♀ : Similar to male except elytra almost yellow with slight shade of brownish; head clearly longer than broad, sutures distinct, post-ocular carina weak, dying out posteriorly, frons and occiput less differentiated. Eyes smaller, about as long as the post-ocular area; pronotum quadrate, weakly contracted posteriorly, unicolorous, yellowish brown, sides straight almost parallel; scutellum larger; legs yellowish brown; penultimate sternite obtusely rounded posteriorly; abdomen including ultimate tergite strongly narrowed posteriorly and forceps simple, straight and comparatively narrower.

Measurements (in mm) :

	♂	♀
Length of body	9.4-9.5	11.7
Length of forceps	0.9-1.0	1.0

Distribution : INDIA ; Bihar ; Ranchi, Nambhum ; Orissa, Dist, Sundergarh, Tensa ; Himachal Pradesh, Kota, Kangra Valley (ZSI Coll.).

Type : Holotype ♂ in BMNH.

Remarks : This species shows remarkable similarity in external characters and the ♂ genitalia with *D. adjacens* Hincks, but differs in having somewhat narrower pronotum; penultimate sternite with hind margin undulate and postero-lateral angles a little projecting; internal incision of parameres narrower and oblique, posterior tooth more strongly hooked, and apical portion narrower and strongly scuminate.

44. *Diplatys propinquus* Hincks

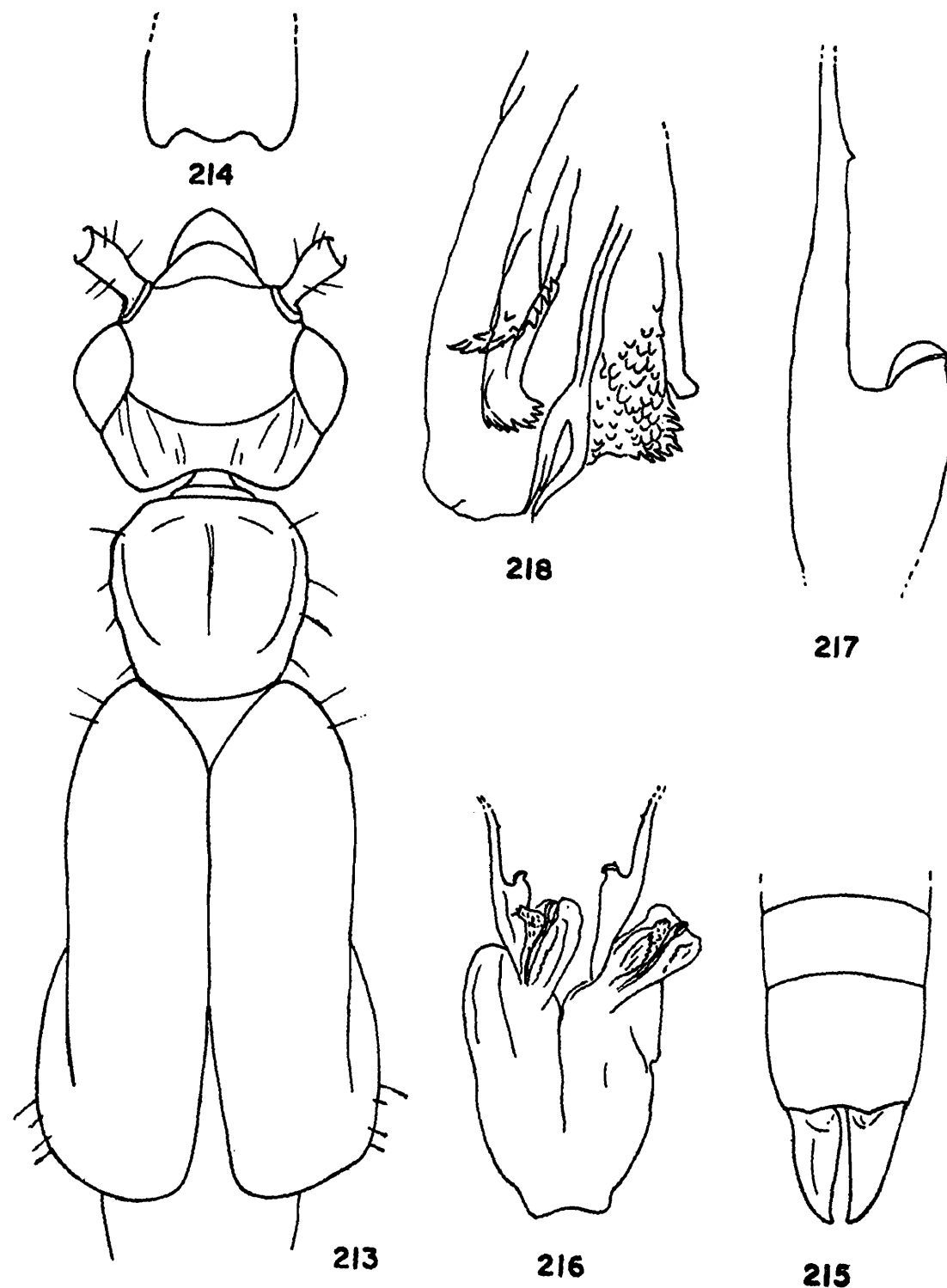
(Figs. 213-218)

Diplatys ernesti (partim); Burr, 1910, *Fauna Brit. India Dermaptera* : 48 (only para-type 1♂, Peradeniya).

Diplatys ernesti (nec Burr, 1910); Burr ; 1912, *Annln. naturh. Mus. Wien*, 26 : 66.

Diplatys propinquus Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 121 (♂ ; Ceylon : Peradeniya); Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 129; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 212; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour yellowish brown and shaded with black on certain body parts. Legs with femora at extreme base, tibia in apical half and whole of tarsi yellow. Body covered with fine golden yellow pubescence, often large stiff hairs on legs, sides of pronotum, elytra and on certain abdominal segments present.



Figs. 213-218 : *Diplatys propinquus* Hincks, Paratype ♂, 213. Anterior half of body ; 214. Posterior margin of penultimate sternite ; 215. Hind end of body showing a few abdominal tergites and forceps ; 216. Genitalia ; 217. Paramere enlarged, apical portion broken off ; 218. Distal lobe enlarged.

Head about as long as broad, micro-reticulated, frons depressed, gradually passing into comparatively more depressed occiput, post-ocular carina feebly marked, gently curved, almost dying out near hind margin, posterior margin emarginate in middle. Eyes prominent, distinctly longer than the post-ocular length. Antennae normal for the genus, basal segment shorter than the distance between antennal bases. Pronotum slightly longer than broad, gently contracted posteriorly, apical margin convex, sides and hind margin straight, median sulcus distinct, prozona convex and well differentiated from flat metazona. Elytra and wings well developed, former with axillary angles rounded off, thus exposing a large triangular scutellum. Legs long and slender, normal. Abdomen long, slender, parallel sided, tergites convex, heavily pubescent. Penultimate sternite transverse, hind margin bisinuate with postero-lateral angles forming a narrow lobe and middle lobe obtusely rounded. Ultimate tergite about as long as broad, smooth, disc convex in middle, median sulcus obsolete, hind margin trisiunuate, laterally feebly oblique. Forceps contiguous, depressed, straight, tapering apically with tip gently hooked and pointed, at base above with a short vertical crest in the centre of a triangular depression, internal margin finely crenulate. Genitalia with parameres only slightly shorter than the proparameres, broader in a little less than basal half with a broad internal tooth, afterwards strongly narrowed, tapering apically, tip turned externally and this portion armed internally at about middle with a minute tooth, distal lobes slightly less than half the length of proparameres, unpaired portion of virga about twice as long as the paired one, branches of paired portion short, stout in middle, various chitinous dentate plates present.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	6.9
Length of forceps	0.3

Distribution : SRI LANKA : Perdeniya.

Types : Holotype ♂ and Paratype ♀ in NMWA.

Remarks : Besides types this species is known by 2 slides with ♂ genitalia present in BMNH and the figure 160 by Hincks, (1955) must have been drawn from one of these slides and not from the Paratype ♂ as given under the legend to figure.

The Paratype ♂ has been examined and the figures of male genitalia

have been drawn from it. On the basis of ♂ genitalia this species can be easily separated from the other known species.

Paratype 1 ♂ of *Diplatys ernesti* Burr from Peradeniya (E. E. Green) present in BMNH was examined. It is mounted on a card and is not in very good condition. The penultimate sternite is slightly raised and paramere of one side is projecting which confirms this specimen is referable under *B. propinquus* Hincks.

45. *Diplatys santoshi* Srivastava

(Figs. 219-221)

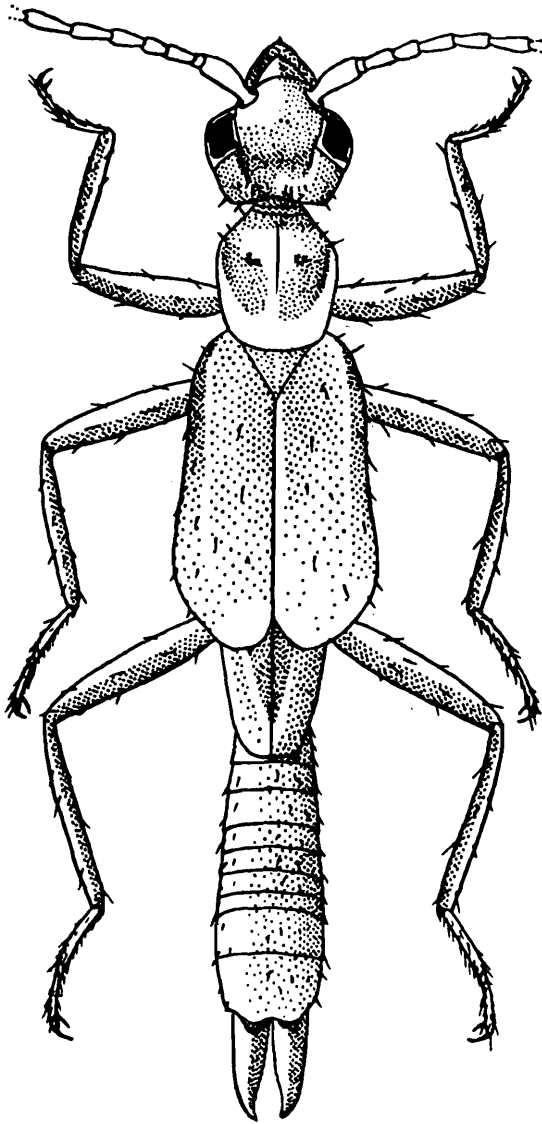
Diplatys santoshi Srivastava, 1975 (enero), *EOS. Madr.*, 49 : 281 (♂ ; Ceylon, Peradeniya).

Diplatys incisus Brindle, 1975 (Aug.), *Ent. mon. Mag.*, 110 (1974) : 147 (♂, Ceylon, Kan Dist., Kandy, 1800 ft.) Syn. nov.

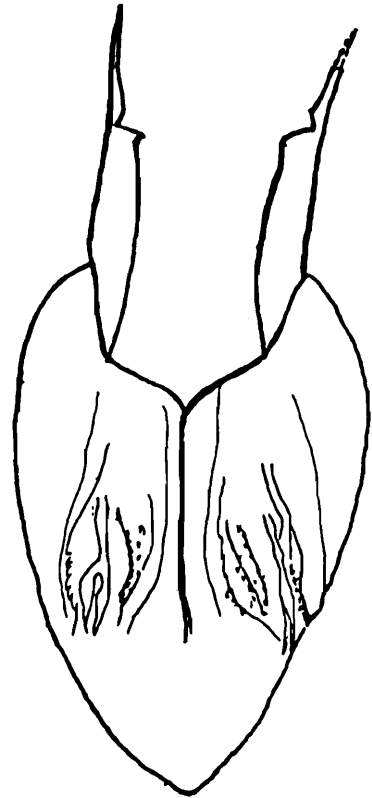
♂ : General colour yellowish brown ; head somewhat darker ; eyes black. Pubescence fine and sparse.

Head triangular, transverse, frons convex, occiput depressed, narrowing behind eyes, hind margin concave, transverse suture obsolete, median suture short, distinct, post-ocular carina fairly distinct but dying out a little before posterior margin. Eyes very prominent, distinctly longer than the area behind eyes. Antennae partly broken (right basal and 9 segments on the left remaining in the Holotype ♂), 1st stout, clavate, slightly shorter than the distance between antennal bases and combined length of segments 2nd to 4th ; 2nd transverse ; 3rd long, cylindrical, slightly longer than the 4th but shorter than the 5th ; 4th subconical, remaining slightly longer than the 5th and each gently contracted basally and expanded apically. Pronotum longer than broad, gently narrowed posteriorly, anteriorly convex, sides straight, hind margin almost straight or subtruncate, median sulcus faint, prozona weakly raised and metazona flat. Elytra well developed, shoulder weak, smooth, hind margin obliquely truncate, axillary angles weak or rounded off, exposing a broad, triangular scutellum. Wings normal. Legs typical for the genus. Abdomen long, cylindrical, finely punctured, almost parallel sided, sides of segments rounded. Penultimate sternite transverse, hind margin bisinuate with median lobe obtuse. Ultimate tergite transverse, gently contracted posteriorly, convex above, sloping backwards, hind margin trisinuate, laterally oblique, postero-lateral angles a little projecting. Forceps with branches simple, almost straight, depressed, at base above with a triangular ridge, tapering apically, apices gently hooked and pointed, internal

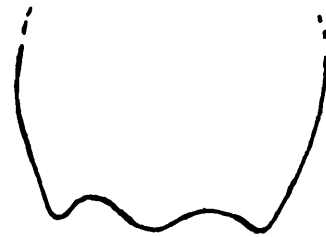
margin finely crenulate. Genitalia with parameres long and narrow, internally, in a little beyond middle a triangular incision present, base of this incision armed with an indistinct tooth; distal lobes not



219



221



220

Figs. 219-221 : *Diplatys santoshi* Srivastava, Holotype, ♂, 219. Dorsal view ; 220. Posterior margin of penultimate sternite ; 221. Genitalia.

quite discernible in the mount, short, provided with a row of fine denticulations ; virga at base unpaired, this portion about as long as the paired portion.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	6.5-6.7
Length of forceps	0.5-0.7

Distribution : SRI LANKA : Central Prov., Paradeniya and Kandy.

Types : Holotype ♂ of *D. santoshi* in ZSI and Holotype ♂ of *D. incisus* in USNM.

Remarks : This species comes close to *D. propinquus* Hincks and *D. ernesti* Burr, both from Sri Lanka in having bisinuate penultimate sternite posteriorly with median lobe obtuse but differs from the former by the short distal process of parameres which lacks internal tooth and from the latter in having the pronotum slightly longer than broad and characteristic parameral incision.

It is proposed here to sink *D. incisus* Brindle under *D. stantoshi* Srivastava on account of priority. The description of both the species are identical except for some minor colour variations which are not uncommon intra-specifically.

46. *Diplatys nilgiriensis* Hincks

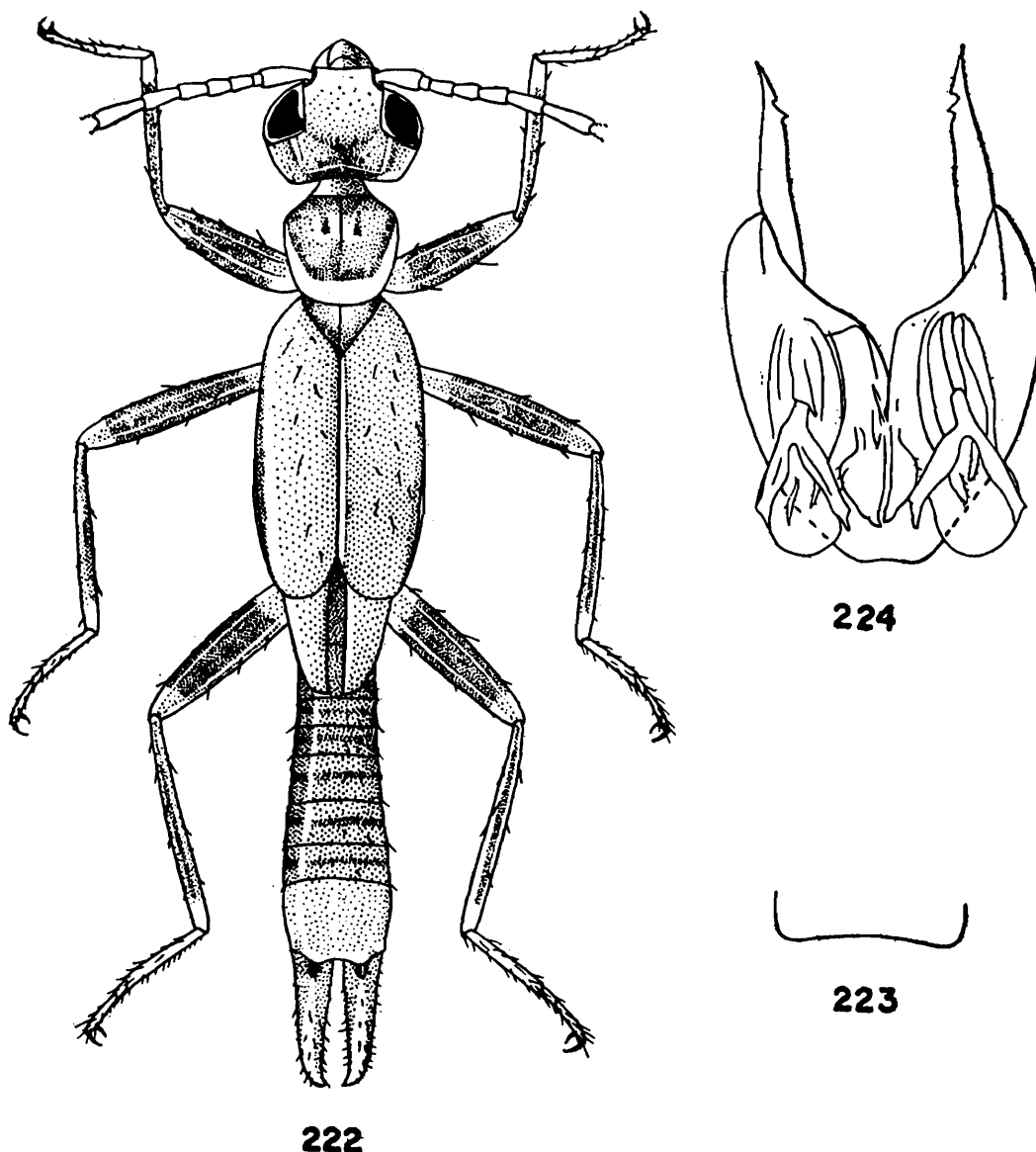
(Figs. 222-224)

Diplatys nilgiriensis Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 11 (♂ ; India : Tamil Nadu, Nilgiri Hills, Cherangode, 3500 ft.) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 6 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 119 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 197 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 15.

♂ : General colour brownish black. Antennae light brownish black. Pronotum laterally and posteriorly ; legs with femora in basal one third and at extreme apex, tibiae in apical one third and whole tarsi yellow, occasionally apex of 3rd tarsal segment shaded with light brown. Sparsely pubescent.

Head about as long as broad, contracted posteriorly, smooth, frons convex, occiput depressed in middle, laterally gently raised, transverse suture obsolete, median suture distinct, post-ocular carina moderately distinct, complete, hind margin emarginate in middle. Eyes enormous, distinctly longer than the post-ocular length. Antennae 17-segmented or more, basal segment, expanded apically, shorter than the distance between antennal bases ; 2nd short, about as long as broad ; 3rd long and slender ; 4th about equal to prededing, stouter ; 5th onwards slightly increasing in length and a few preapical ones thinning. Pronotum about as long as broad, smooth, gently contracted posteriorly, sides almost straight, hind angles and posterior margin making an arc, prozona feebly raised and metazona depressed, median sulcus distinct. Elytra and wings well developed, smooth, former with

axillary angles rounded off, showing a large, triangular scutellum. Legs normal, long and slender. Abdomen long and slender, covered with fine yellow pubescence, almost parallel side, apical segments a trifle expanded. Penultimate sternite covered with fine yellow pubescence,



Figs. 222-224 : *Diplatys nilgiriensis* Hincks, ♂, 222. Dorsal view ; 223. Posterior margin of penultimate sternite ; 224. Genitalia.

elongated, hind margin shallowly emarginate. Ultimate tergite weakly transverse, smooth, gently contracted posteriorly, disc moderately convex, sloping backwards, hind margin trisinate, laterally oblique. Forceps covered with moderately long pubescence, subcontiguous, depressed, straight, tapering apically with tip gently hooked and pointed, internal margin crenulate, at base above with an oblique crest. Genitalia with parameres two third as long as the proparameres, long, narrow, apically acuminate, internally at apical $1/4$ armed with two teeth of which posterior one larger ; distal lobes equal to parameres in length, provided with small chitinous, denticulated accessory plates ;

virga stout, unpaired median portion almost equal in length to paired portion, apices abruptly narrowed.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	9.0
Length of forceps	1.0

Distribution : INDIA : Tamil Nadu, Nilgiri Hills, Cherangode, 3500 ft.

Types : Holotype ♂ and Paratype 1 ♂ (hind portion abdomen missing) in BMNH.

Remarks : This ♂ genitalia on close examination reveals that median unpaired portion of virga is about as long as the arms of paired portion. The accompanying figure 224 is from a ♂ in ZSI collection from India, Nilgiri Hills, Devala, 8200 ft. and it agrees with that of Holotype ♂ given by Hincks (1955, fig. 144) which perhaps has not been properly cleared. In this respect it comes close to *D. carinatus* sp. n. described in following pages but differs by the shape of pronotum and genitalia.

It also shows close resemblance with *D. coelebs* Hincks, but differs by the feebly concave penultimate sternite posteriorly and parameres with posterior tooth slightly shorter. In addition eyes are very prominent and distinctly longer than the post-ocular area and head is clearly narrowed in the region of occiput. Forceps are subcontiguous and finely crenulate internally.

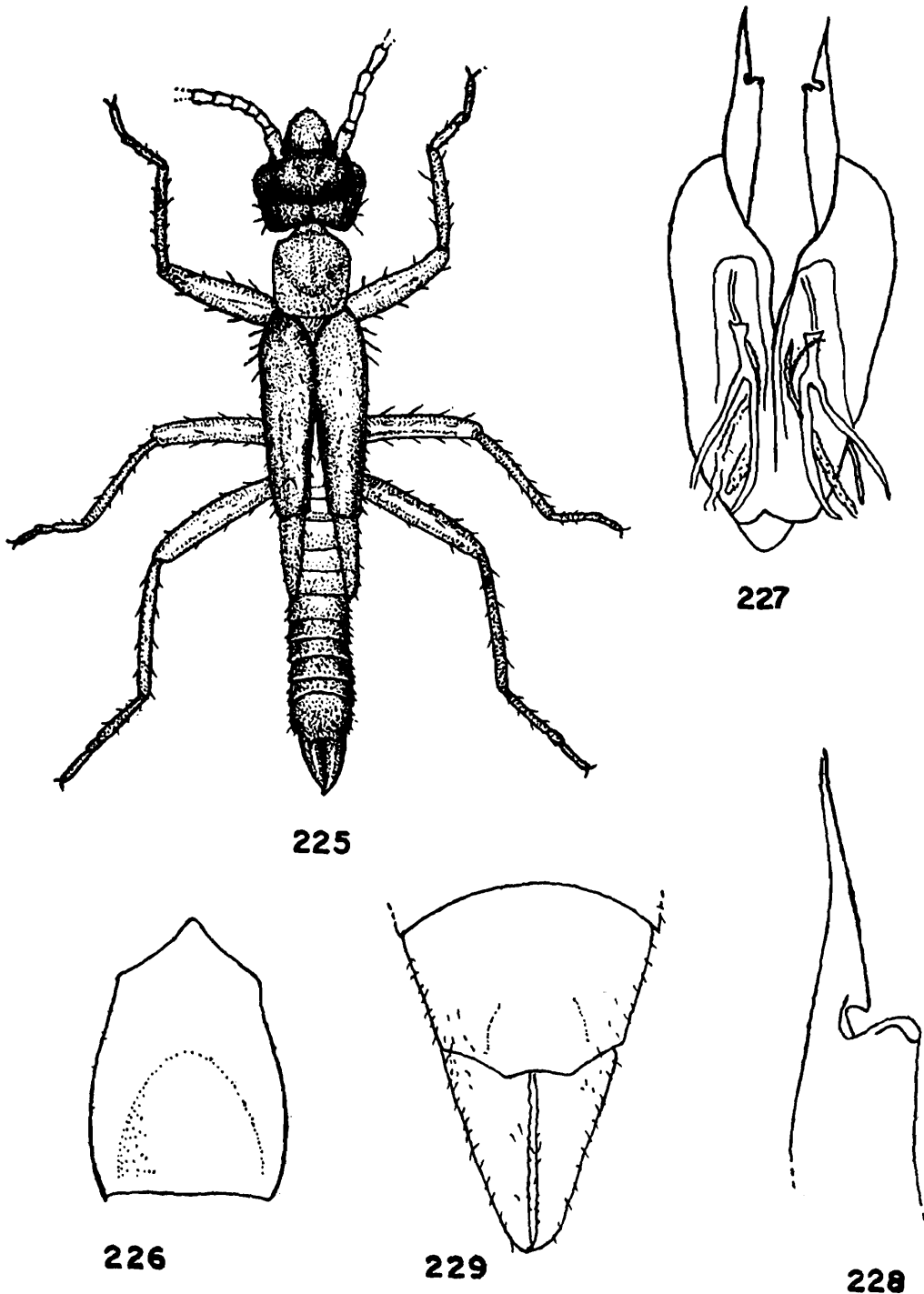
47. ***Diplatys carinatus* sp. n.**

(Figs. 225-229)

♂ : General colour blackish brown, head black, antennae light blackish brown, pronotum yellow, legs yellowish white, elytra, wings and abdomen blackish brown, forceps slightly darker. Sparsely pubescent.

Head weakly transverse, frons distinctly raised, transverse suture wanting, median suture marked by a furrow, occiput depressed in middle, laterally raised and with a distinct post-ocular ridge, hind margin broadly emarginate. Eyes prominent, longer than the area behind eyes. Antennae 17-segmented (or more since apical segment generally broken off), 1st stout expanded apically, slightly shorter than the

distance between antennal bases ; 2nd small ; 3rd long and slender ; 4th subclavate, shorter than the 3rd and 5th ; latter stouter but equal to 3rd ; remaining gradually increasing in length and thinning ; in holo-



Figs. 225-229 : *Diplatys carinatus* sp.n., Holotype ♂, 225. Dorsal view ; 226. Penultimate sternite ; 227. Genitalia ; 228. Apical portion of paramere enlarged ; ♀, 229. Ultimate tergite and forceps.

type ♂ segments 3rd onwards in right antennae comparatively longer and more slender. Pronotum smooth, quadrate, slightly longer than broad, anteriorly convex, sides straight and parallel, hind margin truncate with

postero-lateral angles rounded, median sulcus fairly distinct, prozona raised and metazona depressed. Elytra and wings ample, former with axillary angle rounded off to show a large yellow, triangular scutellum. Abdomen smooth, long and short pubescence present on sides only, tergites 8th and 9th feebly expanded, otherwise remaining segments parallel sided. Penultimate sternite slightly depressed in posterior half, hind margin truncate. Ultimate tergite smooth, weakly transverse, narrowed posteriorly, sloping backwards hind margin slightly thickened, trisinate, oblique laterally. Forceps depressed, contiguous in basal half, almost straight and tapering posteriorly with tip pointed and genrly hooked, at base above with a short triangular ridge in the middle of a shallow depression. Genitalia with parameres a little longer than half the length of proparameres, apically acuminate, internally armed at apical 1/4 with two teeth of which posterior one slightly hooked and separated by a deep sinuation, distal lobes provided with a long, curved, denticulated accessory rod, median unpaired portion of virga about as long as the bifurcated portion, arms of paired portion stout and tapering apically.

♀ : Agrees with male in most characters except that fore legs with apical two thirds of femora and tarsi and middle and hind legs with femora shaded with black ; head less differentiated, post-ocular carina almost obsolete ; abdomen and forceps more strongly narrowed ; penultimate sternite obtusely triangular posteriorly and forceps simple and straight.

Measurements (in mm) :

	Holotype	Paratypes	
	♂	2 ♂ ♂	1 ♀
Length of body	8.4	8.2-8.4	6.8
Length of forceps	0.7	0.6-0.8	0.6

Material examined : INDIA, Karnataka, Londa, 634.64 m, Holotype ♂, Paratype 1 ♂, 1 ♀ and 1 nymph, 29. xii. 1980 (*G. K. Srivastava*) ; Paratype ♂ (hind portion of abdomen missing), same data, 21. vi. 1980 (*M. Prasad*) ; Paratype 1 ♂, same data, Dist. Karwar, Naqzuri river, Kulgi, 7 ii. 1971 (*B. S. Lamba*) ; genitalia of each male mounted between two coverslips and pinned with the respective specimens.

The material at Londa appears to have been attracted at light and was collected while crawling on the ground.

Remarks : This species can be easily separated from other Oriental species by the shape of pronotum and genitalia.

Genus *Haplodiplatys* Hincks

Haplodiplatys Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 17 (Type—*Haplodiplatys niger* Hincks, 1955) ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 201 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 9.

Diagnostic characters : Parameres usually simple, straight, tapering apically, entire, without any cleft. Generally without teeth and internal margin concave or undulate ; rarely finely crenulate.

Distribution : Oriental, Ethiopian and Neotropical Regions.

Remarks : This genus was erected with *H. niger* as the type by Hincks (1955). Steinmann (1974) redefined the genus and included about 30 species. In the present work 18 species are recorded from India and adjacent countries which include four new species besides one new record.

Since many of the species occur in nature as solitary individuals it becomes often difficult to collect them in large numbers. Moreover, their secretive nature is also partly responsible for the paucity of material. It is likely a more exhaustive survey if taken up in various parts of India and other parts of globe may not only yield additional material for scantily known species but some new forms as well.

Key to the species (based on males only)

- | | |
|--|------------------------|
| 1(2). General colour pitch black ; penultimate sternite broadly rounded posteriorly ; forceps slender, cylindrical throughout their entire length ; parameres rod shaped, almost of uniform width with tip rounded ... | <i>H. niger</i> Hincks |
| 2(1). General colour variable ; penultimate sternite not rounded posteriorly ; forceps generally depressed and finely serrated internally ; parameres not as above, generally concave internally with tip pointed | |
| 3(18). Penultimate sternite trisinate posteriorly | |
| 4(7). Virga at base for some distance unpaired, afterwards branches long and one branch characteristically bent | |
| 5(6). Parameres almost straight, gradually narrowing from base to apex with tip pointed, inner margin with a feeble convexity a little before apex ; virga strongly narrowed apically, without chitinous flange ... | <i>H. siva</i> (Burr) |

- 6(5). Parameres bent in middle, basal portion drawn out internally as narrow lobe up to the median axis of proparameres ; inner margin distinctly concave ; virga almost of uniform width, provided with membranous flange near apex, resembling human foot ... *H. kurseongensis* sp.n.
- 7(4). Virga not unpaired at base, often thickened at base
- 8(9). Parameres shorter, narrow, with apex pointed, bent externally ... *H. glenis* (Kapoor)
- 9(8). Parameres comparatively longer and broader, tip pointed, directed inwards or straight
- 10(13). Virga about one third as long as the distal lobes, inverted U-shaped
- 11(12). Penultimate sternite posteriorly with lateral lobes of median sinuation obtusely projecting ; arms of virga with a short diverticula externally, a little before apex *H. bhowmiki* (Srivastava and Saha)
- 12(11). Penultimate sternite posteriorly with lateral lobes of median sinuation strongly projecting, finger like ; arms of without diverticula externally ... *H. bidentatus* (Hincks)
- 13(10). Virga slightly shorter, equal or longer than the distal lobes ; not like inverted U-shaped
- 14(17). Posterior median lobe of penultimate sternite with its margin distinctly concave ; virga shorter or about as long as the distal lobes
- 15(16). Parameres apically hooked ; virga about as long as the distal lobes, apex of both arms provided with flanges ... *H. malaisei* (Hincks)
- 16(15). Parameres straight, gradually narrowing from base to apex with tip pointed ; virga slightly shorter than the distal lobes, at base thickened, arms of virga bare (without membranous flange), characteristically bent like human legs ... *H. trisinuatus* sp. n.
- 17(14). Posterior median lobe of penultimate sternite with its margin scarcely concave ; virga slightly longer than the distal lobes ... *H. chinensis* (Hincks)
- 18(3). Penultimate sternite not trisinuate posteriorly

- 19(20). Penultimate sternite entire posteriorly produced into a convex lobe in middle ; parameres internally serrated in apical third, terminated by a rounded serrated lobe, afterwards margin entire but with emargination ; virga unpaired, tubular at base, afterwards bifurcated and inverted U-shaped with arms short and thin apically *H. shillongensis* sp. n.
- 20(19). Penultimate sternite sinuate or bisinuate ; parameres with internal margin smooth, undulate or emarginate ; virga at base without an unpaired portion, at the most incrassate, arms comparatively longer
- 21(28). Virga short, slightly shorter than the distal lobes
- 22(23). Penultimate sternite bisinuate with shallow emargination postero-laterally, median lobe obtusely convex ; distal lobes with a long characteristic ?—shaped accessory rod ... *H. brancuccii* Srivastava
- 23(22). Penultimate sternite shallowly or deeply emarginate in middle ; distal lobes occasionally with a chitinous, straight accessory rod
- 24(25). Penultimate sternite with postero-lateral angles obtuse, in middle with a small triangular emargination ; parameres simple, external margin entire, feebly convex, inner margin distinctly concave in middle, apex obtuse ... *H. stemmleri* (Brindle)
- 25(24). Penultimate sternite with postero-lateral angles rounded, in middle with deep, broad emargination ; parameres with tip pointed, external margin undulate and internal margin shallowly emarginate ; virga at base thickened into a rounded lobe, arms thin, tapering apically
- 26(27). Base of posterior emargination of penultimate sternite convex ... *H. rileyi* (Hincks)
- 27(26). Base of posterior emargination of penultimate sternite truncate ... *H. urbanii* (Brindle)
- 28(21). Virga long, about as long as the distal lobes
- 29(30). Parameres almost straight, gradually narrowing from base to apex with tip pointed ... *H. srivastavai* (Kapoor)

- 30(29). Parameres undulate with tip pointed and turned slightly inwards
- 31(32). Penultimate sternite deeply or feebly emarginate posteriorly ... *H. rufescens* (Kirby)
- 32(31). Penultimate sternite bisinuate posteriorly
- 33(34). Penultimate sternite with postero-lateral lobes broader, and emarginations shallow, median lobe broad and slightly convex ... *H. simlaensis* (Kapoor)
- 34(33). Penultimate sternite with postero-lateral lobes narrower and emarginations deep, median lobe small, convex with its hind margin almost straight ... *H. lobatus* sp. n.

48. *Haplodiplatys niger* Hincks

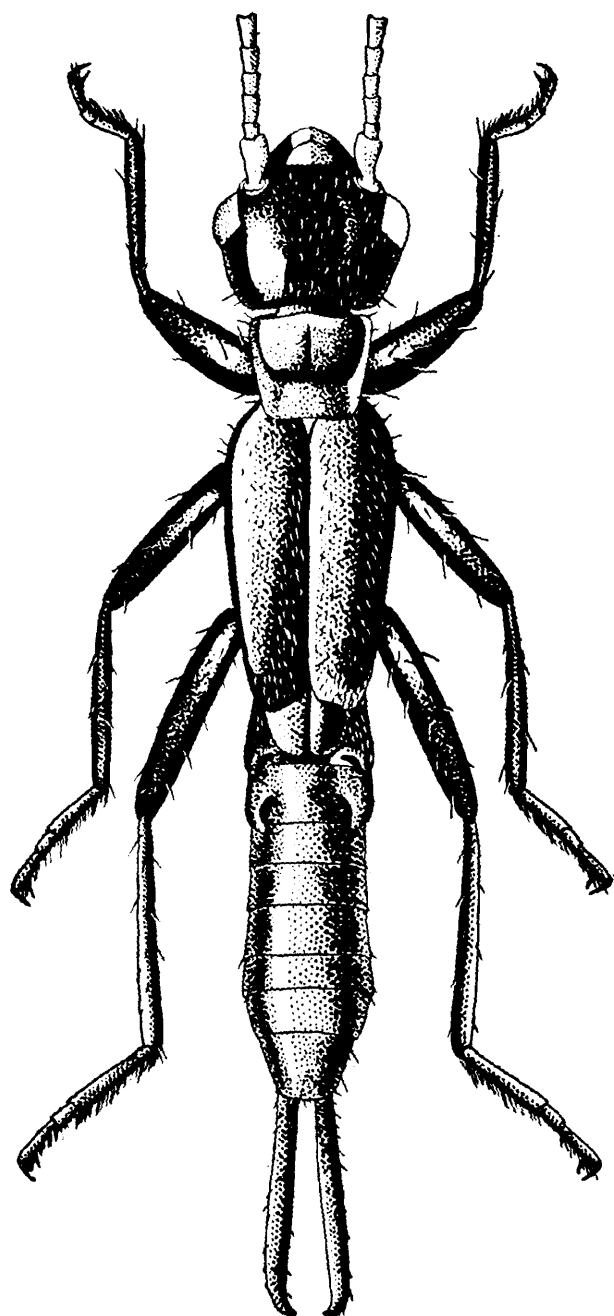
(Figs. 230-233)

Haplodiplatys niger Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 18 (♂ India : U. P., Haldwani) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 4 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 12 ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.* 20(1 & 2) : 204 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 9.

♂ : General colour shining, pitch black ; fine white pubescence present all over the body.

Head slightly longer than broad, finely punctate, convex, sutures obsolete, behind eyes gently contracted, hind margin straight. Eyes slightly longer than the basal antennal segments but shorter than the post-ocular length. Antennae 18-segmented, 1st segment stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd small, about as long as broad ; 3rd longer than 4th and almost equal to 5th, remaining segments up to 9th increasing in length and broadening, thence becoming slender. Pronotum anteriorly narrower than the head, sides gently reflexed and straight, contracted posteriorly with hind margin truncate, median sulcus distinct ; prozona raised and well differentiated from flat metazona. Legs long and slender. Elytra well developed, shoulder rounded, axillary angles weakly rounded off to show a small triangular scutellum, finely punctate, hind margin obliquely truncate. Wings short, half as long as the pronotum, pubescence very scanty. Abdomen cylindrical and parallel sided, punctation distantly placed, lateral tubercles on 3rd and 4th tergites very well marked, sides of segments rounded. Penultimate sternite convex and broadly rounded posteriorly. Ultimate tergite strongly narrowed posteriorly with hind margin

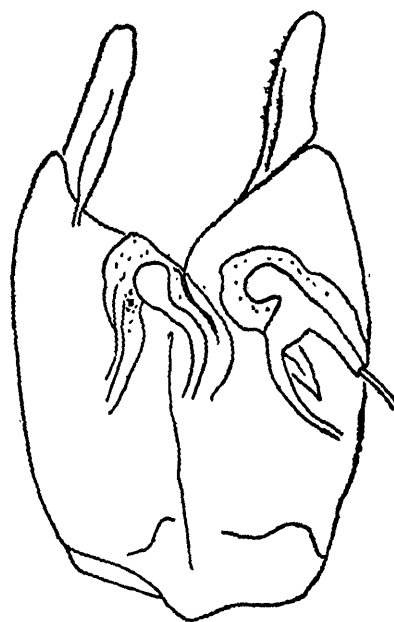
convex, disc convex and punctate. Forceps long, cylindrical, straight throughout except at extreme apices, hooked and pointed. Genitalia



230



231



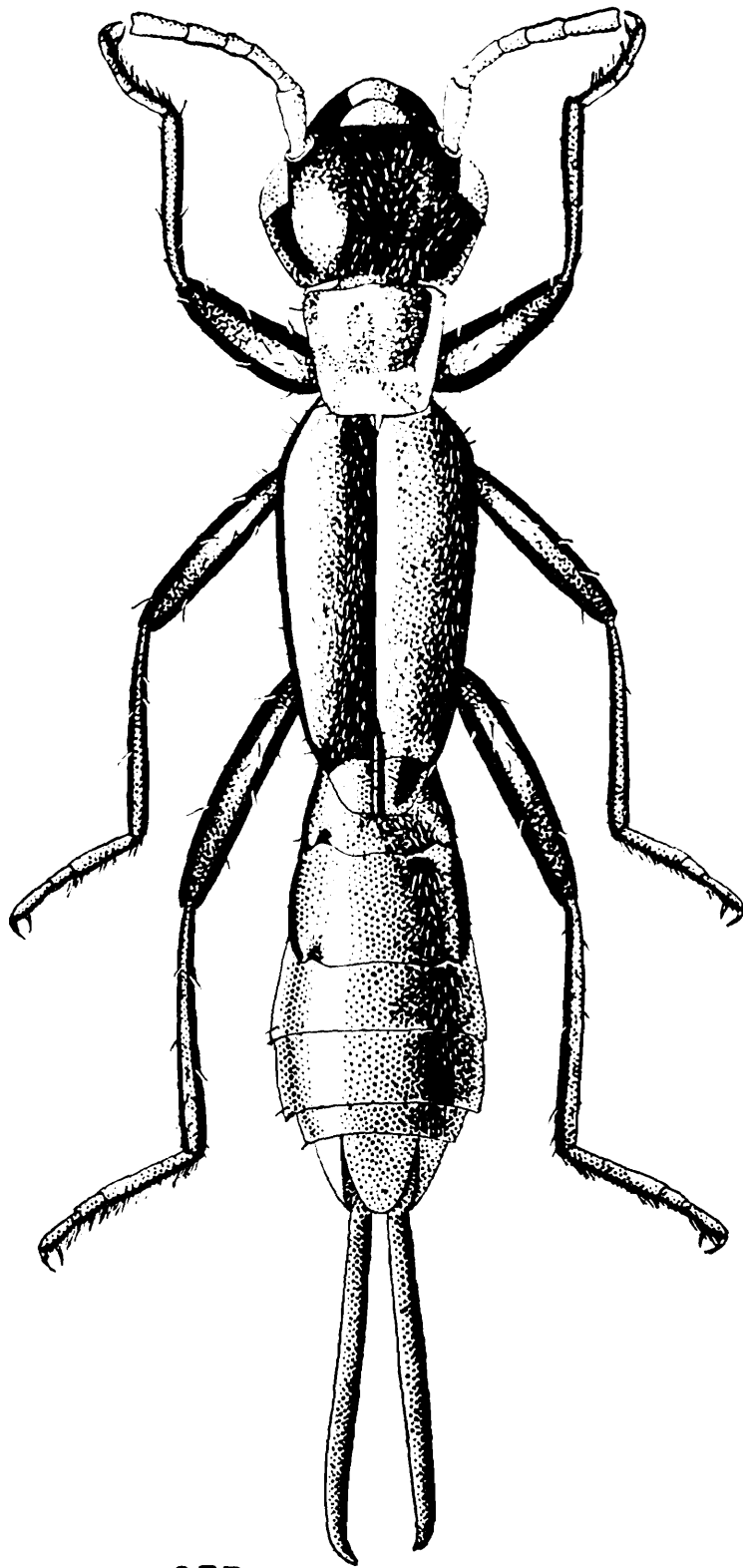
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Figs. 230-232 : *Haplodiplatys niger* Hincks, ♂, 230. Dorsal view ; 231. Penultimate sternite ; 232. Genitalia.

with parameres rod shaped, almost of uniform width, apex rounded ; virga short, not extending beyond the distal lobes, stout, slightly thickened at base.

♀ : Agrees with ♂ in most characters except antennae somewhat brownish black with basal segment more elongated, about as long as

the eye; abdomen dilated posteriorly; penultimate sternite and ultimate tergite strongly narrowed posteriorly.



233

Fig. 233 : *Haplodiplatys niger* Hincks, ♀, 233. Dorsal view.

Measurements (in mm) :

	♂	♀
Length of body	5.5	6.0
Length of forceps	1.2	1.9

Distribution : INDIA : Uttar Pradesh, Kumaon Himalayas.

Type : Holotype ♂ in BMNH.

Remarks : Hitherto this species was known by the Holotype ♂ but now 1 ♂, 1 ♀ from India, U. P.. Nainital are represented in the ZSI collection and the female is described for the first time.

It is a very distinctive species and can be easily separated from other members of the genus by its small size, uniform pitch black body ; head lacking sutures, almost globose above ; lateral tubercles on 3rd and 4th tergites strongly developed ; posteriorly contracted ultimate tergites and identical forceps in both sexes.

Although overall pattern of male genitalia has close resemblance with remaining species but on the basis of morphological peculiarities it appears to be an aberrant member of the genus.

49. *Haplodiplatys siva* (Burr)

(Figs. 234-238)

Diplaty siva Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 278, 283 (♂, ♀ ; India, Darjeeling) ; ? Burr, 1906, *J. Asiat. Soc. Beng.* (N.S.), 2 : 387 ; Burr, 1907, *Bull. Mus. Hist. nat. Paris*, 13 : 508 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 40, 49 ; 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 26, 34, pl. 7, fig. 13, 13a ; Burr, *Genera Insect.*, 122 : 13 ; Hincks, 1947, *Ark. zool.*, 39A : 7, 10, figs. 3, 5 (North East Burma) ; Hincks, 1953, *Trans. IXth Int. Congr. Ent.*, 2 : 4, fig. 3 ; Hincks, 1955, *Syst. mono Dermaptera*, 1 : 68, figs. 67, 68 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)* 16 (1) : 5 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 73, Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 11.

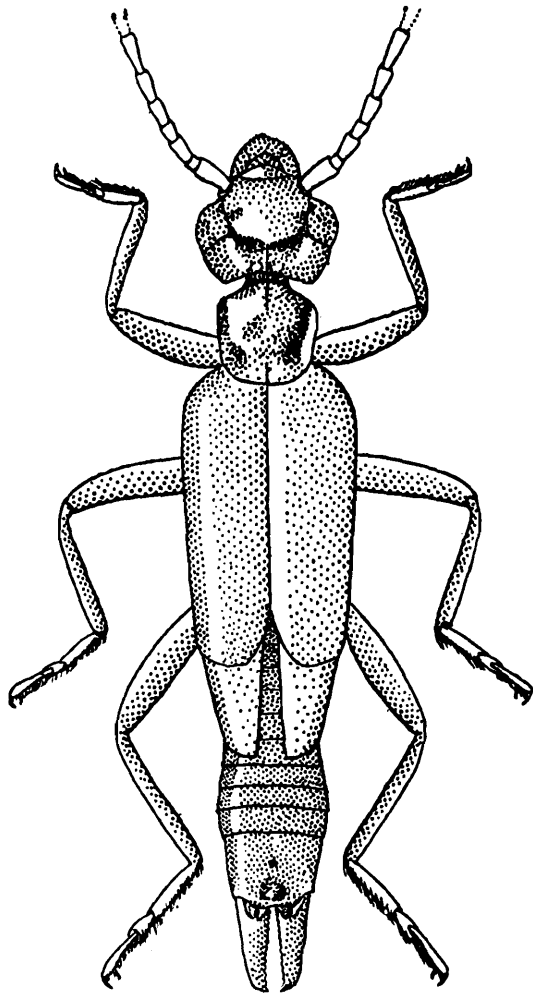
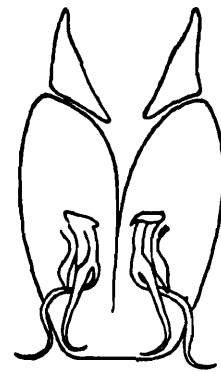
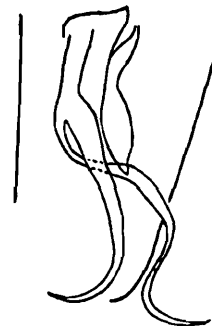
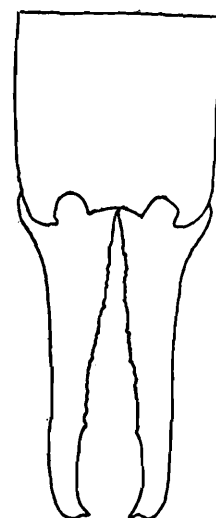
Diplatys gerstaeckeri var. *calidasa* Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 279, 283 (♀ ; India, Darjeeling) ; Burr, 1907, *Bull. Mus. Hist. nat. Paris*, 13 : 508 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 48 (partim) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 35 ; Burr, 1911, *Genera Insect*, 122 : 13 ; Burr, 1912, *Annln naturh. Mus. Wien*, 26 : 66.

Haplodiplatys siva : Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 23 (1-2) : 203.

General colour smoky brown ; head, sides of pronotum and ultimate tergite dark blackish brown. Feebly pubescent.

♂ : Head about as long as broad, area behind eyes moderately convex and narrowed posteriorly, hind margin broadly emarginate ; frons moderately raised, transverse suture obsolete, median suture distinct, post-ocular ridge absent posteriorly. Eyes prominent, about as long as the post-ocular area. Antennae with segments long and slender, basal segment about as long as the eye and gently expanded apically ; 2nd short ; 3rd longer than 4th and 5th, almost equal to 6th ; 4th slightly shorter than 5th, remaining segments

increasing in length distally, each gently expanded apically. Pronotum about as long as broad, anteriorly slightly narrower than head, margin convex in middle, sides straight, weakly converging posteriorly, hind margin subtruncate, prozona weakly raised. Elytra and wings well

**234****236****237****235****238**

Figs. 234-238 : *Haplodiplatys siva* (Burr), ♂, 234. Dorsal view ; 235. Posterior margin of penultimate sternite ; 236. Genitalia ; 237. A portion of distal lobe enlarged to show virga ; Type ♂, 238. Penultimate sternite and forceps.

developed, both covered with fine, dense pubescence. Legs normal. Abdomen long, convex, occasionally weakly dilated in middle. Penultimate sternite posteriorly trisinate, with deep lateral emarginations and median one comparatively shallower. Ultimate tergite about as long as broad, gently contracted posteriorly, convex above in basal half, sloping backwards, hind margin trisinate, laterally oblique. Forceps subcontiguous, depressed, straight, gently tapering apically with apices gently hooked and pointed, at base above with a faint depression and a median raised ridge in the centre, internal margin finely crenulate. Genitalia with parameres triangular, inner margin almost straight or with slight convexity in middle, apically acuminate; virga at base for a short distance unpaired, arms of bifurcated portion strongly tapering apically, inner arm almost straight and external arm characteristically bent forming a broad loop.

♀ : Agrees with male in most characters except that head with occiput not depressed; post-ocular ridge obsolete; pronotum with sides lightly rounded; penultimate sternite obtuse posteriorly; ultimate tergite comparatively more contracted posteriorly and forceps strongly tapering apically.

Measurements (in mm) :

	♂	♀
Length of body	10.1-15.3	10.0-12.1
Length of forceps	1.3-2.0	1.0-1.2

Distribution : INDIA : Darjeeling; and BURMA (NE).

Types : Syntypes present in MNHP and BMNH. Burr (1904) refers to 2 ♂ ♂ and 3 ♀ ♀ without designating Holotype and Allotype. Therefore they may be considered as 'Syntypes' only.

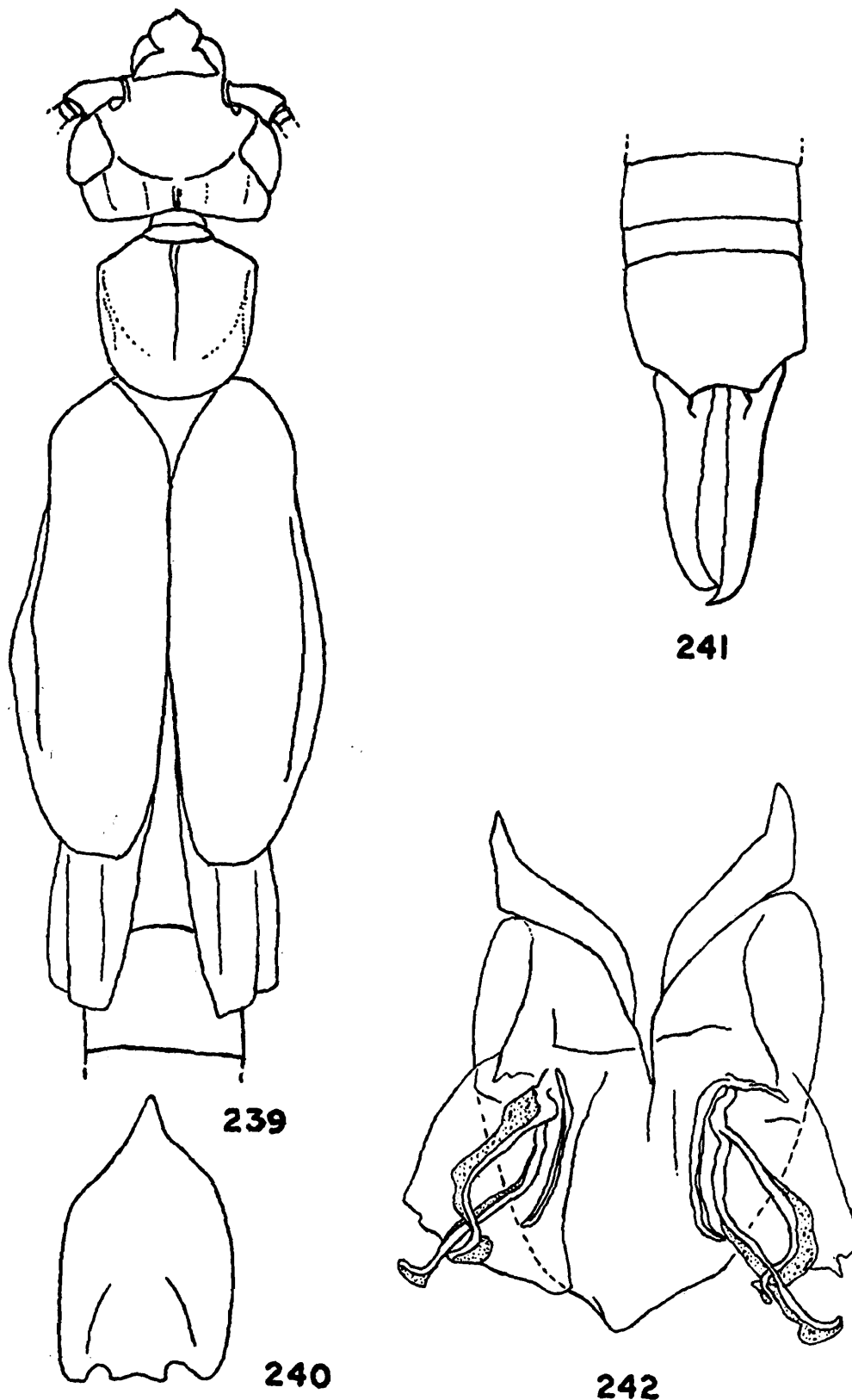
Remarks : Although basic structure of penultimate sternite, especially posterior margin, remains same there appears to be some variation in the degree of emarginations. This is evident from the diagrams furnished by Burr (1911) and Hincks (1947, 1955). The figure 235 given in the text is from a ♂ from N. E. Burma, Kambaiti referred to by Hincks (1947) which shows that median emargination is appreciably deep with its lateral lobes acutely produced. The median posterior emargination in the figure 238 taken from 'Type ♂' in MNHP and sent by Mr. M. Donskoff, is shallowly emarginate with lateral lobes less acutely pointed.

This species can be easily separated from other related species in possessing trisinate penultimate sternite posteriorly and by the shape of parameres and long and thin virga.

50. *Haplodiplatys kurseongensis* sp. n.

(Figs. 239-242)

♂ : General colour dark brownish. Head with frons and sides of occiput black ; legs with knee joint darker, abdominal tergites somewhat blackish ; pronotum, elytra and wings lighter.



Figs. 239-242 : *Haplodiplatys kurseongensis* sp. n., Holotype ♂, 239. Anterior half of body ; 240. Penultimate sternite ; 241. Hind end of body showing a few abdominal tergites and forceps ; 242. Genitalia.

Head smooth, transverse, frons raised, occiput raised laterally but depressed in middle, all sutures represented by impressed lines, hind margin concave. Eyes prominent, longer than the post-ocular area. Antennae broken except basal segment, shorter than the distance between antennal bases. Pronotum smooth, slightly longer than broad, sides straight, gently contracted posteriorly; median sulcus distinct, hind margin subrotundate; prozona convex, well differentiated from depressed metazona. Legs normal. Elytra and wings normal, finely pubescent, scutellum present. Abdomen finely pubescent, long and slender. Penultimate sternite posteriorly trisinuate, lateral sinuations deep; median one somewhat triangularly incised, bordered on sides by feeble obtuse lobes. Ultimate tergite convex above, sloping backwards, hind margin trisinuate, laterally oblique. Forceps contiguous, straight, tapering apically, depressed, gently hooked at apices, internally finely crenulate. Genitalia with parameres broadly S-shaped, inner basal angle very much produced and extending almost up to median line; distal lobes about $1/2$ as long as the proparameres, accessory rod elongated and narrow; virga at base with a short median portion, branches of paired portion tubular, projecting well beyond the distal lobes, in part laterally frilled with membranous flange which is shaped like human foot apically.

♀ : Not known.

Measurements (in mm) :

	Holotype
	♂
Length of body	14.4
Length of forceps	2.2

Material examined : INDIA : W. B., Darjeeling Dist., Kurseong, Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen); 7-20.vi. 1922 (*T. B. Fletcher*); deposited in ZSI.

Distribution : Known from type locality only.

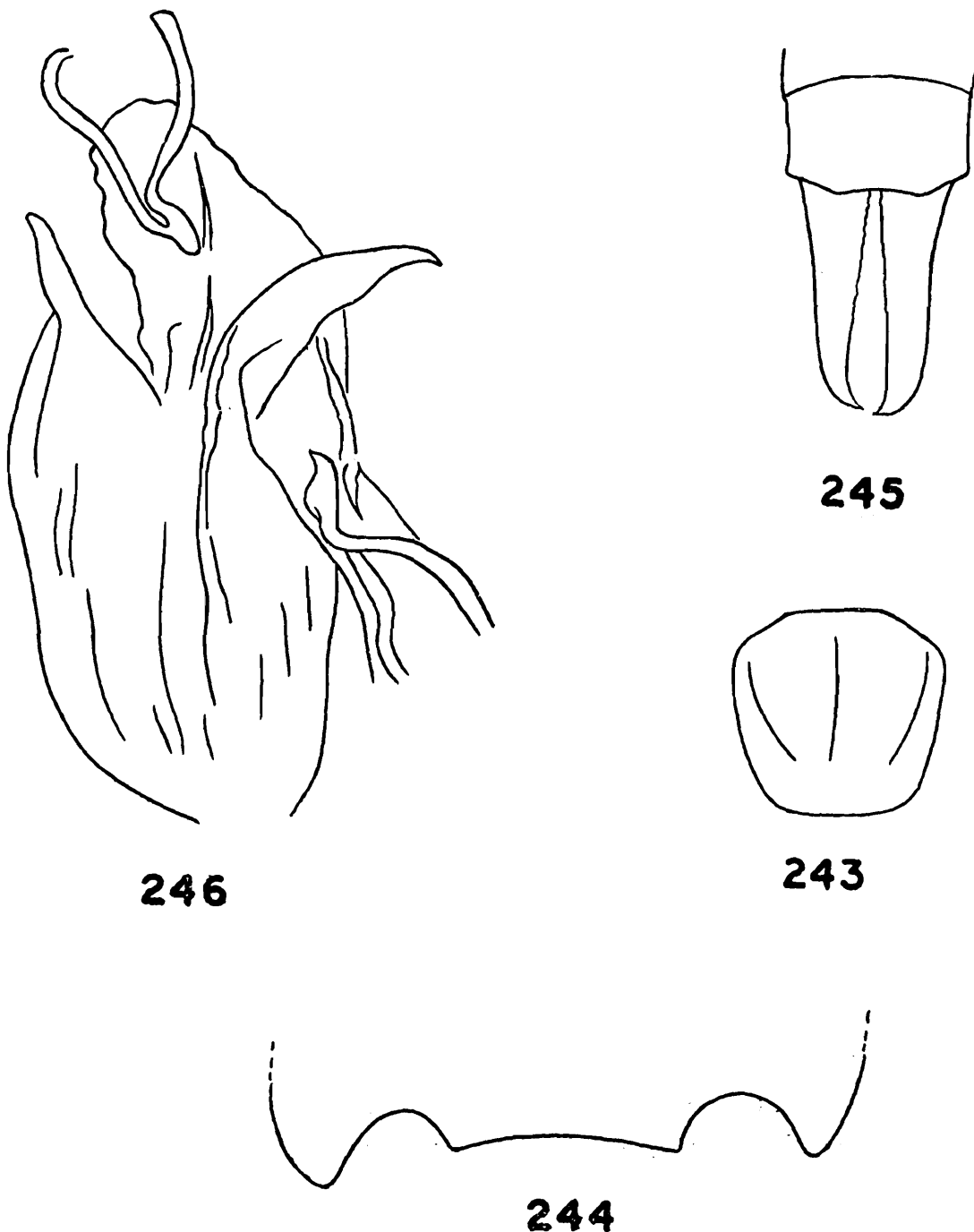
Remarks : This species comes very close to *H. malaisei* (Hincks) from Burma in having the lateral flangs on virga but differs by the shape of posterior margin of penultimate sternite in having the median sinuation less distinct than the lateral ones which are triangularly incised with obtusely projecting lobes and virga comparatively longer, projecting well beyond penis lobes.

51. **Haplodiplatys glenis** (Kapoor)
(Figs. 243-246)

Diplatys glenis Kapoor, 1968. *Zool. Anz.*, **181** (1/2) : 120 (♂, ♀ ; Himachal Pradesh, Simla) ; Sakai, 1972, *Dermapterorum Cat. Prael.*, **5** : 160.

Haplodiplatys glenis : Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, **20**(1-2) : 204.

♂ : General colour blackish brown. Head with frons convex, occiput comparatively depressed, sutures well marked, post-ocular carina obsolete, hind margin emarginate. Eyes black, prominent, almost equal to post-ocular area. Antenna 17-segmented, 1st segment stout, expanded apically ; 2nd about as long as broad ; 3rd long and



Figs. 243-246 : *Haplodiplatys glenis* (Kapoor), Holotype ♂, 243. Pronotum ; 244. Posterior margin of penultimate sternite ; 245. Ultimate tergite and forceps ; 246. Genitalia.

slender almost equal to 5th in length ; 4th shorter than the 3rd, rest gradually increasing in length and cylindrical. Pronotum about as long as broad, anteriorly convex and lateral angles a little prominent, sides straight, gently converging posteriorly, hind margin briefly rounded, median sulcus distinct, prozona raised and well demarcated from flat metazona. Elytra ample, about three times longer than broad, axillary angles weak, exposing a small triangular scutellum. Wings wanting. Legs normal. Abdomen almost parallel sided, slightly expanded beyond 7th tergite. Penultimate sternite with postero-lateral lobes obtusely triangular and emargination deep, median lobe broad, its hind margin with a broad triangular incision in middle. Ultimate tergite rugose, transverse, postero-lateral angles a little projecting, hind margin trisinate, laterally oblique. Forceps depressed, subcontiguous, tapering apically, almost straight except at apices gently hooked with tip pointed, inner margin finely serrulated. Genitalia with parameres short, narrow, sinuate with tip pointed and directed externally, virga tubular, stout, at base forming a short loop, a little projecting beyond distal lobes.

♀ : Agrees with male in most characters except head with sutures relatively more distinct ; penultimate sternite obtusely rounded posteriorly ; ultimate tergite narrowed posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	13.0	17.0
Length of forceps	2.0	2.0

Distribution : INDIA : Himachal Pradesh, Simla,

Types : Holotype ♂ (genitalia mounted on a slide separately) in IARI. Allotype ♀ and Paratypes 1 ♂, 1 ♀ with the author.

Remarks : The Holotype ♂ was examined and the figures in the text are drawn from it.

Amongst the Oriental species possessing trisinate penultimate sternite it comes very close to *H. kurseongensis* sp. n., described in preceding pages, in having the posterior margin of median lobe of penultimate sternite triangularly emarginate in middle but shape of parameres and the virga is quite distinctive.

Hitherto, it was known by types only but some additional material from Himachal Pradesh is represented in the collection of Zoological Survey of India, Calcutta.

52. *Haplodiplatys bhowmiki* (Srivastava and Saha)

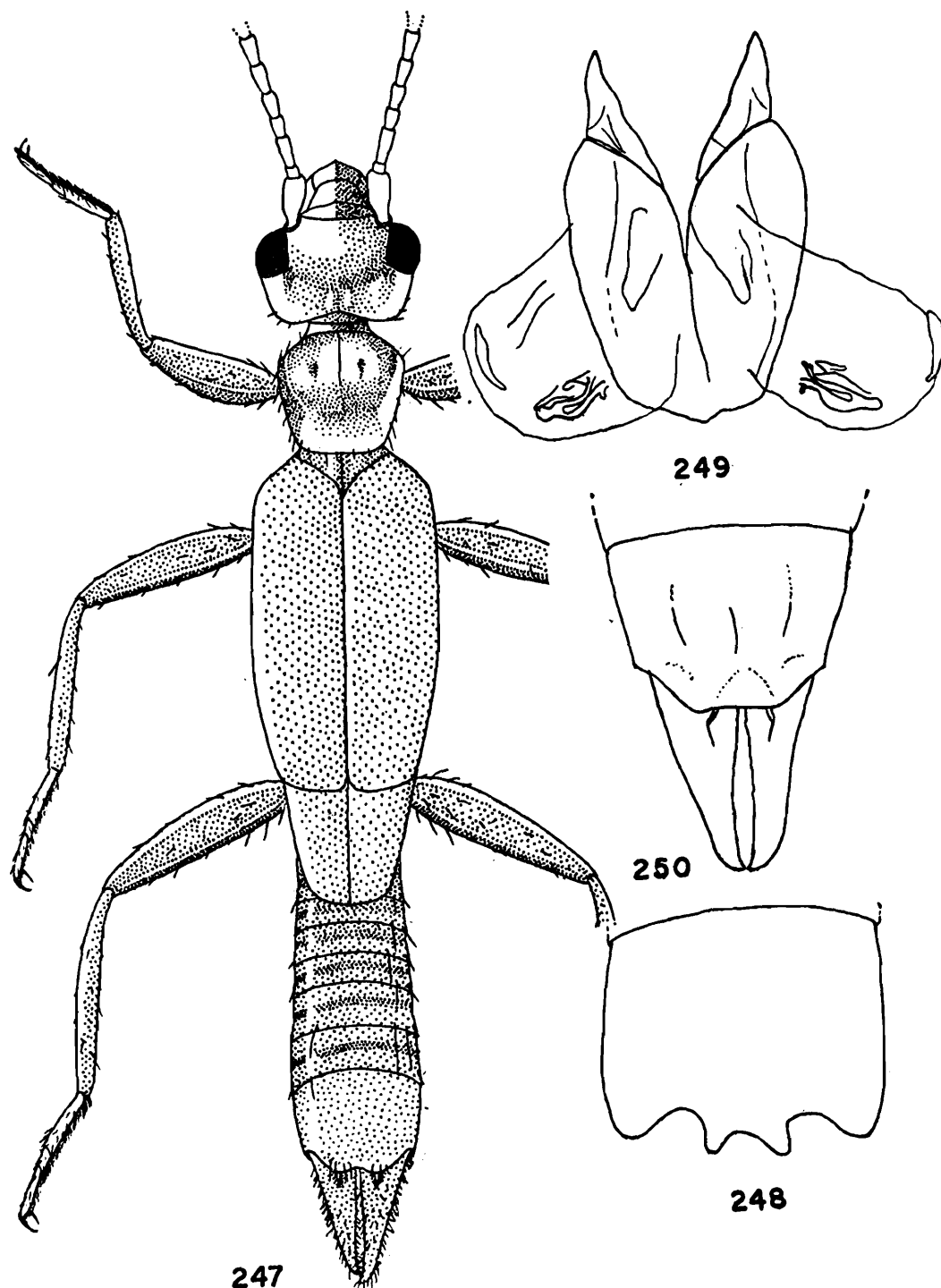
(Figs. 247-250)

Diplatys bhowmiki Srivastava and Saha, 1975 (April), *Ceylon J. Sci. (Bio. Sci.)*, 11(2) :

61 (♂, ♀ and nymphs ; India : West Bengal, Darjeeling Dist, Jorpokri).

Diplatys bhutanensis Brindle, 1975 (Oct.), *Ent. Basiliensia*, 1 : 12 (♂, ♀, nymphs ; Bhutan : Chimakothi). syn. n.

♂ : General colour dark brown, head and pronotum shaded with black and elytra and wings of pale colour. Build slender, pubescent.



Figs. 247-250 : *Haplodiplatys bhowmik* (Srivastava and Saha), Holotype ♂, 247. Dorsal view ; 248. Penultimate sternite ; 249. Genitalia ; Paratype ♀, 250. Ultimate tergite and forceps.

Head transverse, pentagonal, sutures obsolete, frons raised and well differentiated from occiput, post-ocular ridge obsolete, hind margin emarginate. Eyes about equal to post-ocular length. Antennae 18-segmented, typical for the genus. Pronotum slightly longer than broad, slightly contracted posteriorly, anteriorly convex, sides straight, hind margin briefly rounded, median sulcus faint, prozona tumid and metazona flat. Elytra well developed, convex posteriorly, axillary angles rounded, showing a small triangular scutellum. Wings normal. Legs with femora strongly carinate ; tibiae long and slender. Abdomen long, slender, gently expanded posteriorly, convex, sides of segments rounded. Penultimate sternite large, depressed along the median line, posterior margin with three emarginations, postero-lateral angles obtusely produced, lateral lobes of median emargination obtuse. Ultimate tergite transverse, median sulcus faint, sloping backwards, hind margin trisinate, oblique laterally, postero-lateral angles projecting. Forceps stout, almost straight, subcontiguous, depressed, a triangular depression with a median crest at base present, tapering apically with tip pointed and gently hooked, internal margin finely crenulate. Genitalia with parameres broad, narrowed apically ; virga short, stout, U-shaped and arms provided with a small diverticula near apex.

♀ : Agrees with male but slightly larger in size, head more or less square with sides parallel ; hind margin of elytra obliquely truncate ; abdomen parallel sided ; penultimate sternite obtuse posteriorly and ultimate tergite comparatively narrower posteriorly.

Measurements (in mm) :

	♂	♀
Length of body	10.0-18.6	14.0-26.6
Length of forceps	0.8- 2.0	1.0- 2.5

Distribution : INDIA : Darjeeling Dist. and BHUTAN.

Types : The holotype ♂ , paratypes 1 ♀ and 3 nymph of *Diplatys bhowmiki* Srivastava and Saha in the collections of ZSI.

The Holotype ♂ , paratypes (including allotype) 2 ♂ ♂ , 1 ♀ and 1 larva of *Diplatys bhutanensis* Brindle, in NMB besides Paratypes 1 ♂ , 1 ♀ in MM.

Remarks : The descriptions and figures of *H. bhowmiki* (Srivastava and Saha) and *H. bhutanensis* (Brindle) are identical but the former has a priority.

The specimens referred under *H. bhutanensis* are much smaller in

size. But in view of great variations in body size intraspecifically, it may be considered as a case of individual variation.

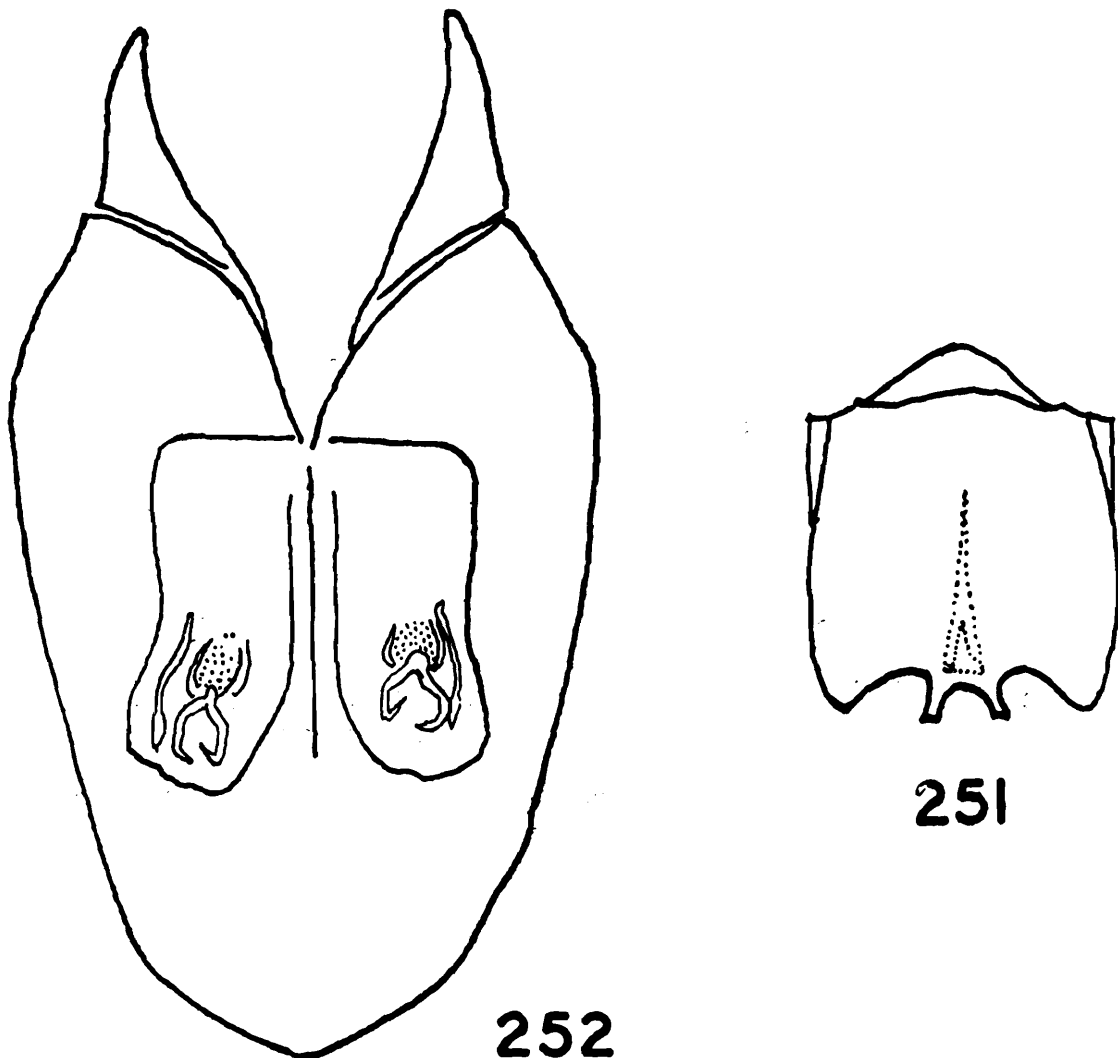
This species comes very close *H. bidentatus* (Hincks) from India (North Bengal) but differs in having the lateral lobes of median sinuation of penultimate sternite obtuse and distinctive virga which is U-shaped and its arms provided with a small diverticula externally near apex.

53. *Haplodiplatys bidentatus* (Hincks)
(Figs. 251-252)

Diplatys bidentatus, Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 75, figs. 79-80 (♂ ; India : W. B., Kurseong) ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 5 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 83 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 10.

Halodiplatys bidentatus ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 204.

♂ : General colour uniform blackish brown. Pubescent. Head with frons raised, occiput depressed, transverse suture obsolete, median



Figs. 251-252 : *Haplodiplatys bidentatus* (Hincks), ♂, 251. Penultimate sternite ; 252. Genitalia (redrawn from Hinks, 1955).

suture fairly distinct, lateral margin behind eyes convex, post-ocular ridge obsolete. Eyes moderately prominent, slightly longer than the post-ocular area. Antennae 13-segmented or more. Pronotum slightly longer than broad and contracted posteriorly, sides straight, hind margin truncate. Elytra and wings well developed. Legs typical for the genus. Abdomen long, slender, convex, scarcely expanded posteriorly. Penultimate sternite trisinate posteriorly, lateral sinuations broad and deep with postero-lateral angles obtuse, median sinuation short and comparatively shallower with its lateral lobes dentiform and projecting strongly. Ultimate tergite with disc convex, hind margin trisinate, laterally oblique. Forceps rather short, contiguous, tapering apically, depressed, almost straight, apices gently hooked and pointed, internal margin finely crenulate. Genitalia with parameres representing a scalene triangle, apically acute, basal margin longer than the external margin and inner basal angle acuminate produced up to basal two thirds of median incision of proparameres, inner margin broadly and shallowly emarginate with a faint convexity in the middle ; virga short, at base with a small lobe and branches thin, tubular ; accessory rod thin and long.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	12.0
(including forceps)	

Distribution : Known from the type locality only.

Types : Holotype ♂ in BMNH.

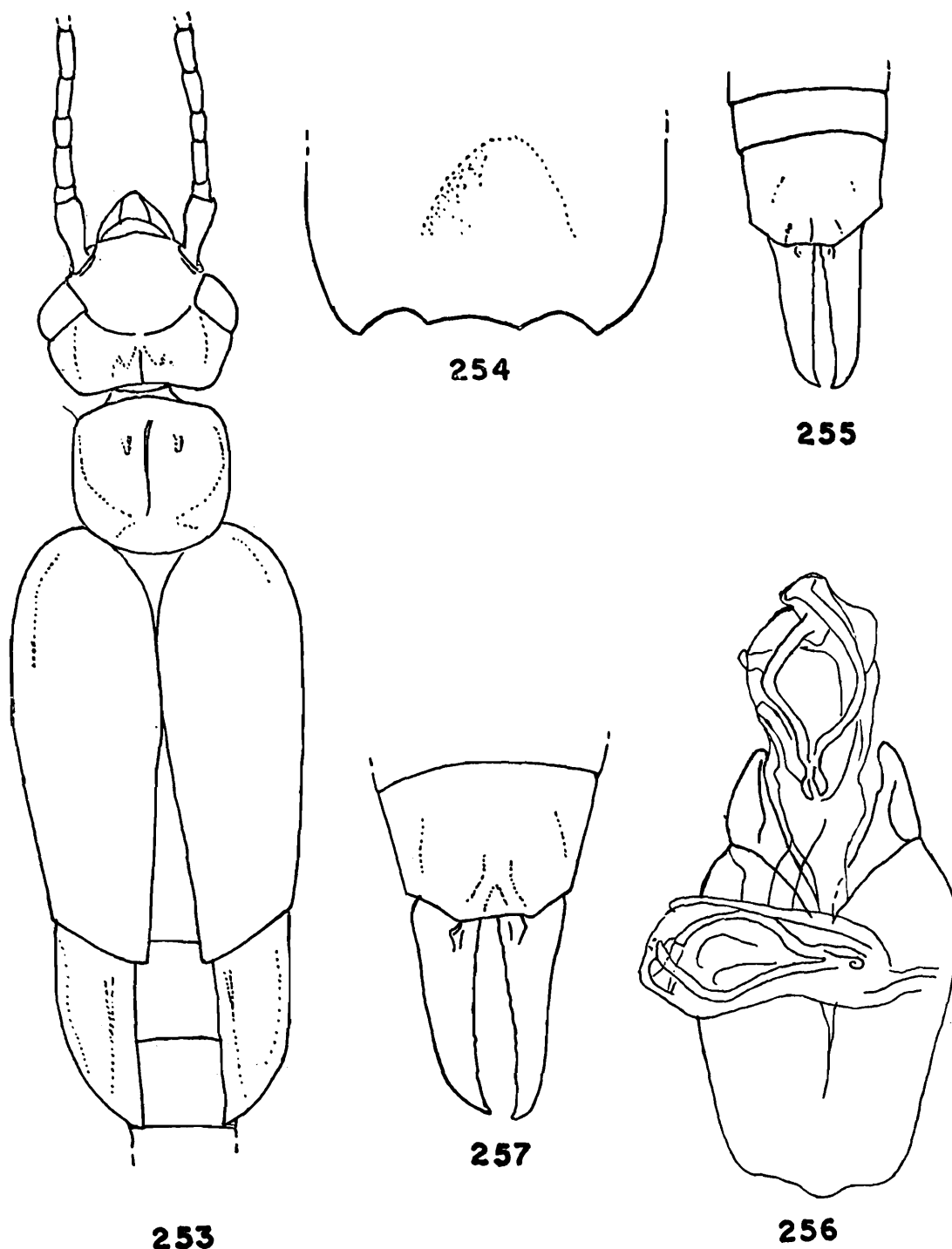
Remarks : From the other Indian species possessing trisinate penultimate sternite, it can be easily separated by the finger like projections of lateral lobe of posterior median sinuation of penultimate sternite. In addition, short tubular, inverted U-shape virga is also quite distinctive besides the prolongation of inner basal angle of parameres up to the basal two thirds of median incision of proparameres.

54. *Haplodiplatys malaisei* (Hincks) (Figs. 253-257)

Diplatys malaisei Hincks, 1947, *Ark. zool.*, 39A (1) : 7, 8 (♂, ♀ ; North-East Burma : Kambaiti, 7000 ft.) ; Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 67 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 72 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 10.

Haplodiplatys malaisei : Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 203.

♂ : General colour reddish-brown with shades of black ; antennae and legs yellowish brown ; head black with frons brick red in



Figs. 253-257 : *Haplodiptotys malaisei* (Hincks), ♂, 253. Anterior half of body ; 254. Posterior margin of penultimate sternite ; 255. Ultimate tergite and forceps ; 256. Genitalia ; ♀, 257. Ultimate tergite and forceps.

middle ; elytra and wings chocolate brown ; abdomen, ultimate tergite and forceps reddish brown, tergites in posterior half, ultimate tergite laterally and posteriorly and forceps internally and near the tip shaded with black. Finely pubescent, a few long hairs also present on the margin of head, pronotum, legs and sides of abdomen.

Head about as long as broad, smooth, frons convex with two faint rounded depressions in middle on the either side of middle line, vertex in middle depressed, laterally behind eyes raised, post-ocular carina obsolete, sutures except median one obsolete, hind margin broadly emarginate. Eyes prominent, slightly longer than the post-ocular area. Antennae 17-segmented or more (apical segments in the material examined broken), basal segment stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd transverse ; 3rd long and slender, equal to 5th and longer than 4th ; 6th onwards gradually thinning and increasing in length. Pronotum about as long as broad, anteriorly convex, sides straight, feebly converging posteriorly with angles rounded and margin almost truncate, prozona distinctly convex and metazona depressed, median sulcus represented by a smooth polished line. Elytra and wings well developed, former with axillary angle rounded off, thus showing a small triangular scutellum. Legs typical. Abdomen long, slender, provided with thick, long and short pubescence, smooth, almost parallel sided. Penultimate sternite posteriorly with three sinuations, median one slightly shallower, postero-lateral angles rounded. Ultimate tergite weakly transverse, disc moderately convex, gently narrowed posteriorly, hind margin trisinate, oblique laterally. Forceps subcontiguous, straight, depressed, tapering apically, tip gently hooked and pointed, at base a shallow depression with a small triangular ridge present, internal margin finely serrated. Genitalia with parameres narrowed abruptly in apical half with tip sharply pointed, undulate, basal margin slightly longer than the external margin and inner angle extending up to the middle line as narrow acute stripe ; virga about as long as the distal lobes with branches stout, supported by chitinous flange laterally, external opening with its rim somewhat projecting.

♀ : Agrees with male in most characters except that occiput less depressed, sutures more prominently marked ; penultimate sternite triangular posteriorly ; ultimate tergite more strongly narrowed posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	14.9-19.5	15.7-22.5
Length of forceps	1.9-2.5	2.2-3.5

Distribution : Hitherto known from type locality : N.E. BURMA ; recorded for the first time from INDIA : Sikkim, Gangtok (ZSI coll.).

Types : Holotype ♂, Allotype ♀ and Paratype 1 ♂ in NRSS and Paratype 1 ♂ in BMNH.

Remarks : In having trisinuate penultimate sternite posteriorly it comes very close to *H. siva* (Burr); *H. chinensis* (Hincks); *H. glenis* (Kapoor); *H. trisinuatus* sp. n. and *H. kurseongensis* sp. n. but all these can be easily distinguished from each other by the shape of various parts of male genitalia.

55. *Haplodiplatys trisinuatus* sp. n.

(Fig. 258-262)

♂ : General colour dark smoky black, elytra and wings above and legs somewhat lighter; thickly pubescent but abdominal tergites sparsely so.

Head transverse, smooth, frons convex, vertex in middle depressed, median suture distinct but transverse suture represented by an impressed line, post-ocular carina absent, hind margin emarginate in middle. Pronotum about as long as broad, contracted posteriorly, sides straight, hind margin subrotundate, median sulcus faint; prozona moderately convex and metazona flat. Legs normal. Elytra and wings well developed, scutellum visible. Abdomen long and slender, smooth, sparsely pubescent on sides. Penultimate sternite posteriorly trisinuate, lateral lobes of median sinuation acute. Ultimate tergite pubescent, declivient posteriorly, hind margin trisinuate, laterally oblique. Forceps with branches depressed, straight, tapering apically with tip gently hooked, inner margin finely crenulate. Genitalia with parameres straight, inner margin faintly undulate; virga short and stout, resembling the lower portion of human body, at base with a moderately large lobe, branches of paired portion tapering apically.

♀ : Unknown.

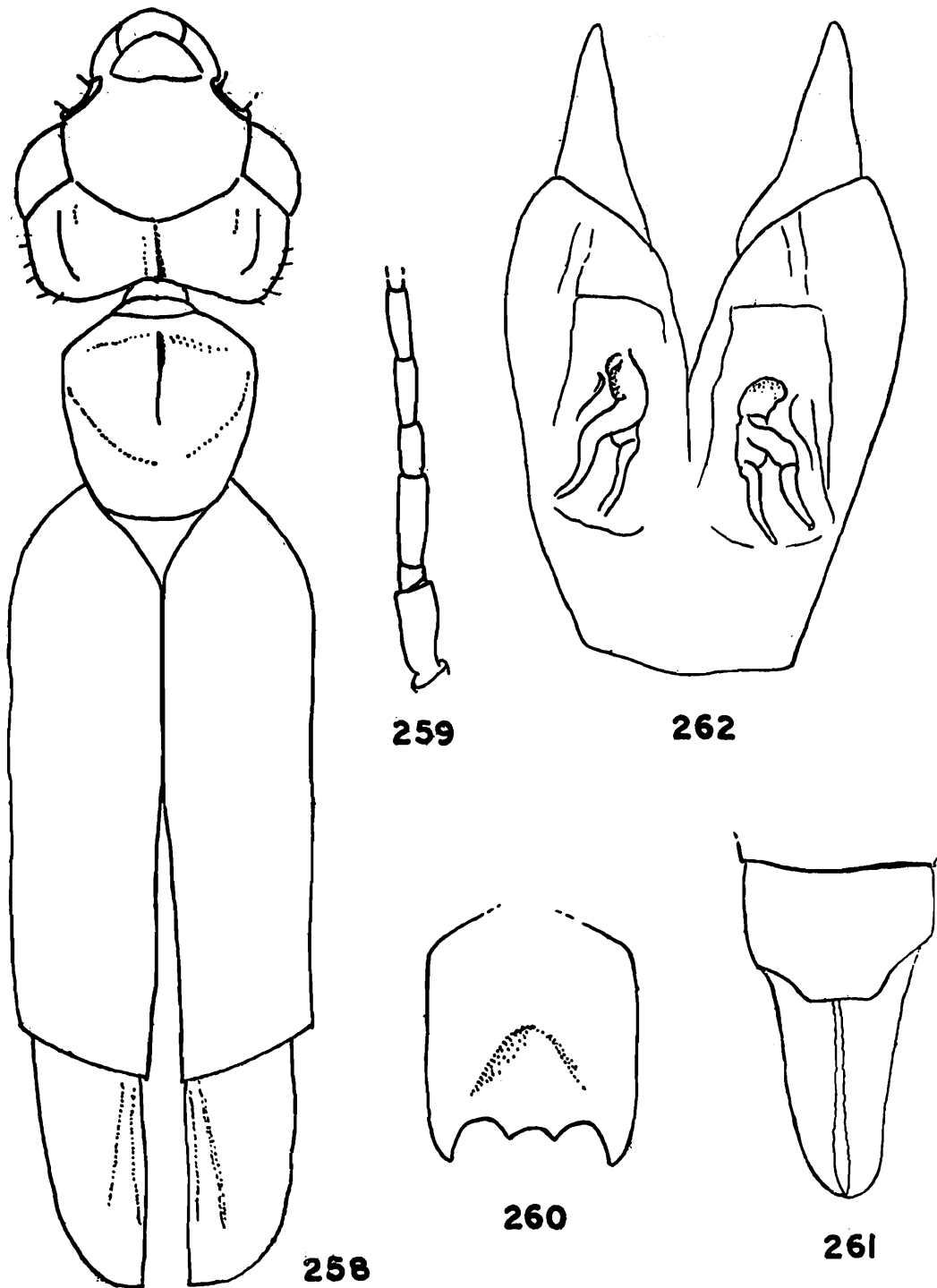
Measurements (in mm) :

	Holotype
	♂
Length of body	10.4
Length of forceps	1.2

Material examined : INDIA : Sikkim : Chungthang, Holotype ♂ (genitalia mounted between two coverslips and attached with the specimen), 11.viii.1979, 1525 m (*S.M. Ali*), deposited in the ZSI.

Distribution : Known from type locality only.

Remarks : In having trisinate posterior margin of penultimate sternite the described species comes close to *H. siva* (Burr) and related species but can be easily separated by the straight paramerse, not deeply



Figs. 258-262 : *Haplodiplatys trisinnatus* sp. n., Holotype ♂, 258. Anterior half of body ; 259. A few basal antennal segments ; 260. Penultimate sternite ; 261. Ultimate tergite and forceps ; 262. Genitalia.

concave internally and characteristic virga, resembling the lower portion of human body.

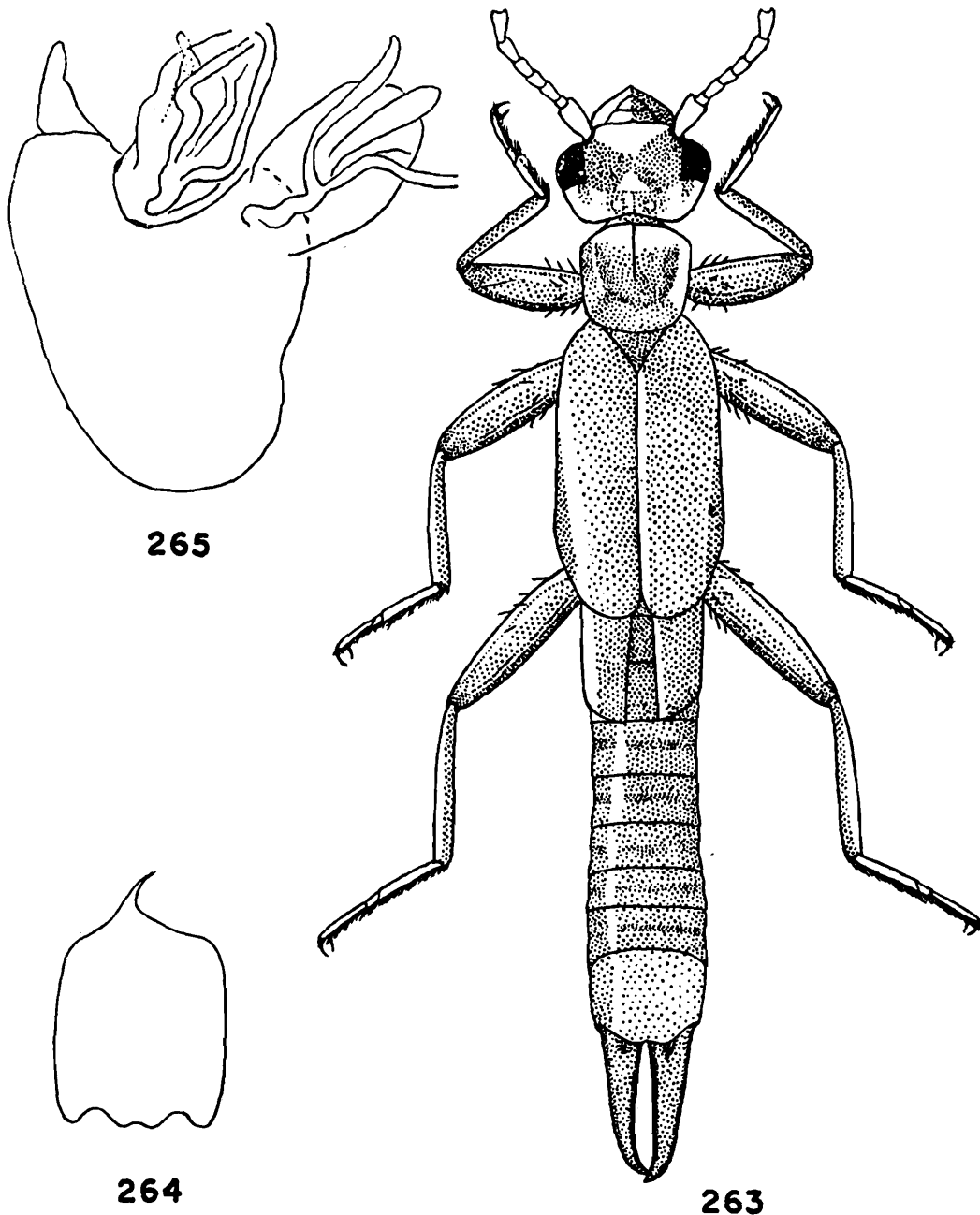
56. *Hiplodiplatys chinensis* (Hincks)

(Figs. 263-265)

Diplatys chinensis Hincks, 1954, *Syst. mono. Dermaptera*, 1 : 69, figs. 68-69 (♂ ; China : Szechwan, Ben Luh Din, 30 m N. Chengtu, 6000 ft.) ; Kapoor, 1974, *Zool. J. Linn. Soc.*, 55 : 244 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 76 ; Srivastava, 1975, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 10.

Haplodiplatys chinensis : Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 204.

♂ : General colour dull brownish to brownish black ; mouth parts, antennae somewhat lighter. Body moderately pubescent.



Figs. 263-265 : *Haplodiplatys chinensis* (Hincks), ♂, 263. Dorsal view ; 264. Penultimate sternite ; 265. Genitalia.

Head transverse, frons weakly raised and occiput depressed, feebly contracted posteriorly, hind margin slightly emarginate in

middle, sutures and post-ocular carina obliterated. Eyes prominent, slightly longer than the post-ocular area and the distance between basal antennal segments. Antennae 12-segmented or more (very often apical segments broken), basal segment stout, expanded apically, shorter than the distance between antennal bases ; 2nd short ; 3rd long and slender ; 4th and 5th subequal, both shorter than the 3rd ; remaining gradually increasing in length and thinning. Pronotum quadrate, about as long as broad, anteriorly gently convex, sides straight, scarcely converging posteriorly, hind margin subtruncate or feebly rounded, median sulcus distinct in anterior half ; prozona raised and well differentiated from depressed metazona. Elytra ample, meeting along the sutural margin, inner basal angle rounded off, showing a small triangular scutellum, hind margin obliquely convex. Wings well developed, one third as long as the elytra. Legs long and slender, typical for the genus. Abdomen convex, almost parallel sided or occasionally slightly contracted in middle. Penultimate sternite depressed in middle in posterior half, posteriorly trisinate with posterolateral angles obtusely produced and emargination very shallow. Ultimate tergite weakly convex, sloping backwards, gently contracted posteriorly, hind margin trisinate, laterally oblique. Forceps with branches depressed, tapering apically, almost straight, apices gently hooked and tip pointed, at base above with a small triangular crest in middle, internal margin finely crenulate. Genitalia with parameres triangular, basal margin feebly oblique, distinctly shorter than the external margin, internal margin oblique from base to apical two thirds, thence abruptly straight, making parameres look narrower, tip pointed, virga with branches stout, at base twisted, afterwards undulate, slightly projecting beyond the distal lobes, more or less straight, elongated accessory rod present.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	13.1 — 15.2
Length of forceps	1.9 — 2.1

Distribution : INDIA : West Bengal, Darjeeling Dist., Ghum Bhanjang, Kurseong (ZSI) ; U. P., Mussorie (FNH) ; H. P., Simla, CHINA : Szechwan.

Type : Holotype ♂ in USNM.

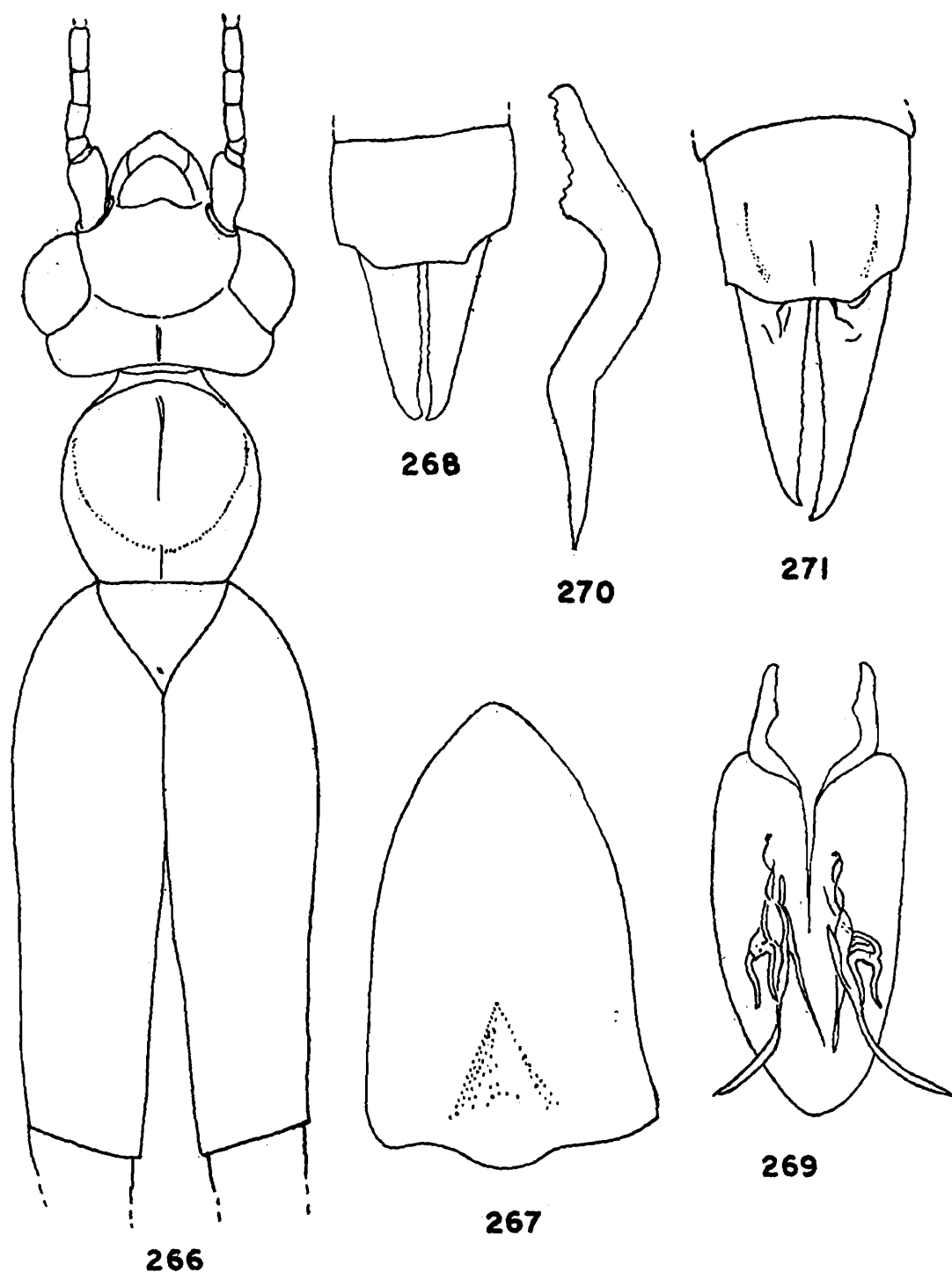
Remarks : Amongst the species having trisinate penultimate

sternite posteriorly it comes very close to *H. malaisei* (Hincks) but differs in having the arms of virga bare and slightly projecting beyond the distal lobes.

57. ***Haplodiplatys shillongensis* sp. n.**

(Figs. 266-271)

♂ ; General colour yellowish brown with shades of black on certain body parts. Head black, antennae yellow ; pronotum yellow,



Figs. 266-271 : *Haplodiplatys shillongensis* sp. n., Holotype ♂, 266. Anterior half of body ; 267. Penultimate sternite ; 268. Ultimate tergite ; 269. Genitalia ; 270. Paramere enlarged ; Paratype ♀, 271. Ultimate tergite and forceps.

laterally and posteriorly smoky black ; legs yellow except distal half of fore femora and tibia smoky black elytra and wings smoky but former in apical half yellowish.

Head transverse, smooth, frons moderately convex, vertex depressed in middle, laterally raised, median sulcus distinct, transverse suture obsolete, hind margin emarginate. Eyes prominent, longer than the post-ocular area. Antennae 20-segmented or more ; basal segment stout, gently expanded apically, shorter than the distance between antennal bases ; 2nd small, transverse ; 3rd long and slender ; 4th slightly shorter than the 3rd ; 5th onwards segments gradually increasing in length and thinning ; prozona weakly raised and metazona depressed. Elytra and wings well developed, clad with short fine pubescence ; scutellum visible. Abdomen pubescent, long and slender. Penultimate sternite posteriorly with a convex lobe in middle and with a somewhat triangular depression in posterior half only. Ultimate tergite pubescent, transverse, sloping backwards, hind margin trisinate, laterally oblique. Forceps depressed, straight, tapering apically with tip gently hooked and pointed, internally crenulate. Genitalia with parameres long and narrow, $\frac{1}{3}$ as long as the proparameres, incurved in a little less than basal half, external margin entire, internally margin wavey, in apical $\frac{1}{3}$ finely crenulate, terminating into an obtuse protuberance, basal angle projecting as narrow lobe up to the median axis ; distal lobes short, not well discernible in mounts, a long spirally coiled and a straight chitinous accessory rod present ; virga with a tubular unpaired portion, about as long as the paired portion, arms of paired portion tapering apically and inverted U-shaped.

♀ : Agrees with males in most characters except that penultimate sternite narrowly rounded posteriorly and ultimate tergite contracted posteriorly.

Measurements (in mm) :

	Holotype	Paratypes	
	♂	♂	♀
Length of body	9.8	10.8	13.1
Length of forceps	1.0	1.1	10.4

Material examined : INDIA : Meghalaya : Shillong, Holotype ♂ (genitalia mounted between two coverslips and pinned with specimen), Paratype ♀ , 20.v.1979, ex rotten wood (*G. K. Srivastava*) ; Risa Colony, Paratype 1 ♂ (broken), 1.v.1975 ; Tripura Cattle Road, Paratype 1 ♂ , 17.vii.1972, all deposited in ZSI.

Distribution : Known from the type locality only.

Remarks : This species is quite distinct in having the parameres finely crenulate internally with margin wavey and a long spirally coiled chitinous accessory rod extending well beyond the distal lobes.

58. **Haplodiplatys brancuccii** Srivastava

(Figs. 272-275)

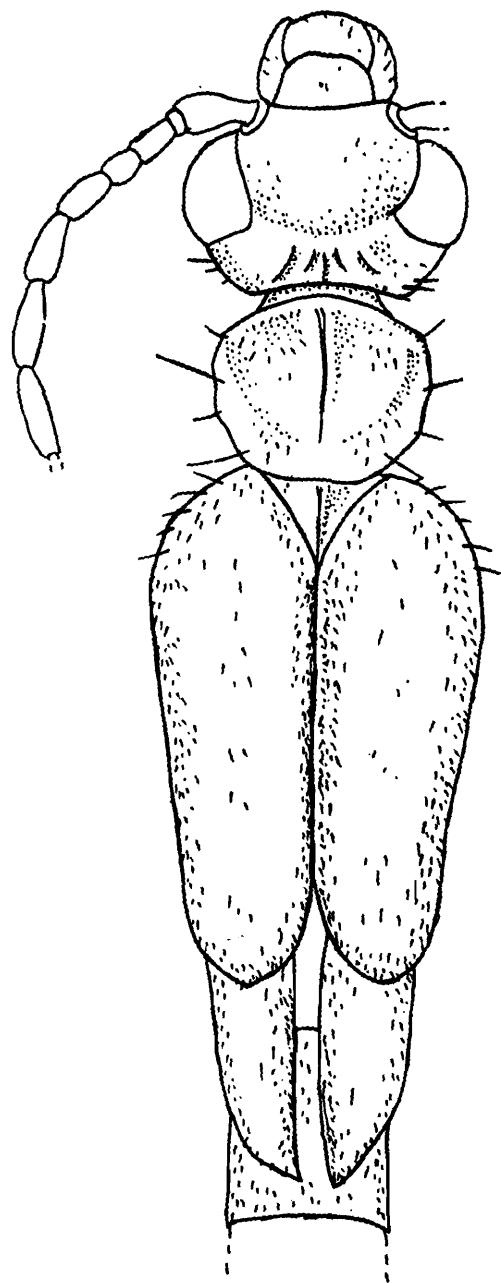
Haplodiplatys brancuccii Srivastava, 1983, *Ent. Basiliensia*, 8 : 39 (♂ ; India, U. P., Gangani).

♂ : General colour smoky grey, head somewhat darker, black, antennae especially basal segment, pronotum and legs lighter in colour. Elytra, wings, abdomen and forceps finely pubescent, head and pronotum on margins and legs with a few long hairs.

Head weakly transverse, smooth, frons convex, occiput in middle depressed, area behind eyes raised, sutures obsolete, post-ocular carina wanting, hind margin broadly concave. Eyes prominent, about twice as long as the post-ocular area. Antennae (partly broken) 17-segmented or more, basal segment shorter than the distance between antennal bases, gently expanded apically ; 2nd transverse ; 3rd long and slender ; 4th slightly shorter than the preceding ; 5th almost equal to 3rd but stouter, remaining gradually increasing in length. Pronotum rounded, contracted posteriorly, pubescence very short, prozona convex and metazona depressed, median sulcus faint but complete. Elytra and wings well developed, former with axillary angle weak, thus showing a large, triangular scutellum. Legs normal, tarsi of left leg with 2nd segment undeveloped and on right side normal. Abdomen long, slender, parallel sided. Penultimate sternite bisinuate posteriorly, median lobe obtusely triangular, lateral sinuations broad and shallow, postero-lateral angles obtusely produced but feebly. Ultimate tergite weakly transverse, convex above, sloping backwards, gently contracted posteriorly, hind margin trisinate, laterally oblique. Forceps with branches contiguous, depressed, straight, tapering apically, tip gently hooked and pointed, at base a triangular depression with an oblique triangular ridge present, internally finely serrated. Genitalia with parameres narrowed and undulate, tip pointed, basal margin slightly shorter than the external margin, inner angle not produced up to middle line, virga shorter than the distal lobes, at base median portion weakly

lobed, arms thin, tubular, undulate and tapering apically, accessory chitinous rod characteristically bent at base, tapering apically.

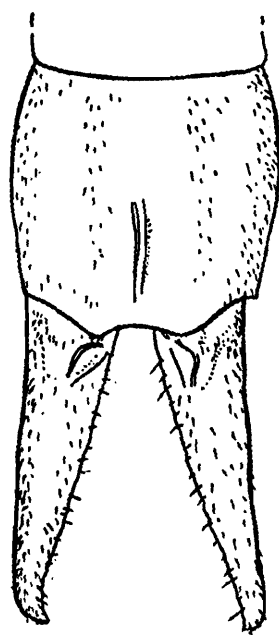
♀ : Unknown.



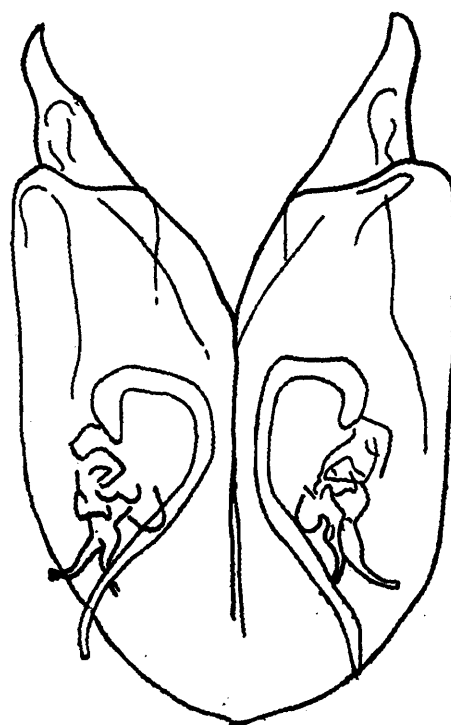
272



273



274



275

Figs. 272-275 : *Haplodiplatys brancuccii* Srivastava, Holotype ♂, 272. Anterior half of body ; 273. Posterior margin of penultimate sternite ; 274. Ultimate tergite and forceps ; 275. Genitalia.

Measurements (in mm) :

	Holotype
	♂
Length of body	11.0
Length of forceps	1.0

Distribution : Known from the type locality only.

Type : Holotype ♂ in NMB.

Remarks : This species comes close to *H. rufescens* (Kirby) but differs by the shape of posterior margin of penultimate sternite and genitalia.

59. *Haplodiplatys stemmleri* (Brindle)

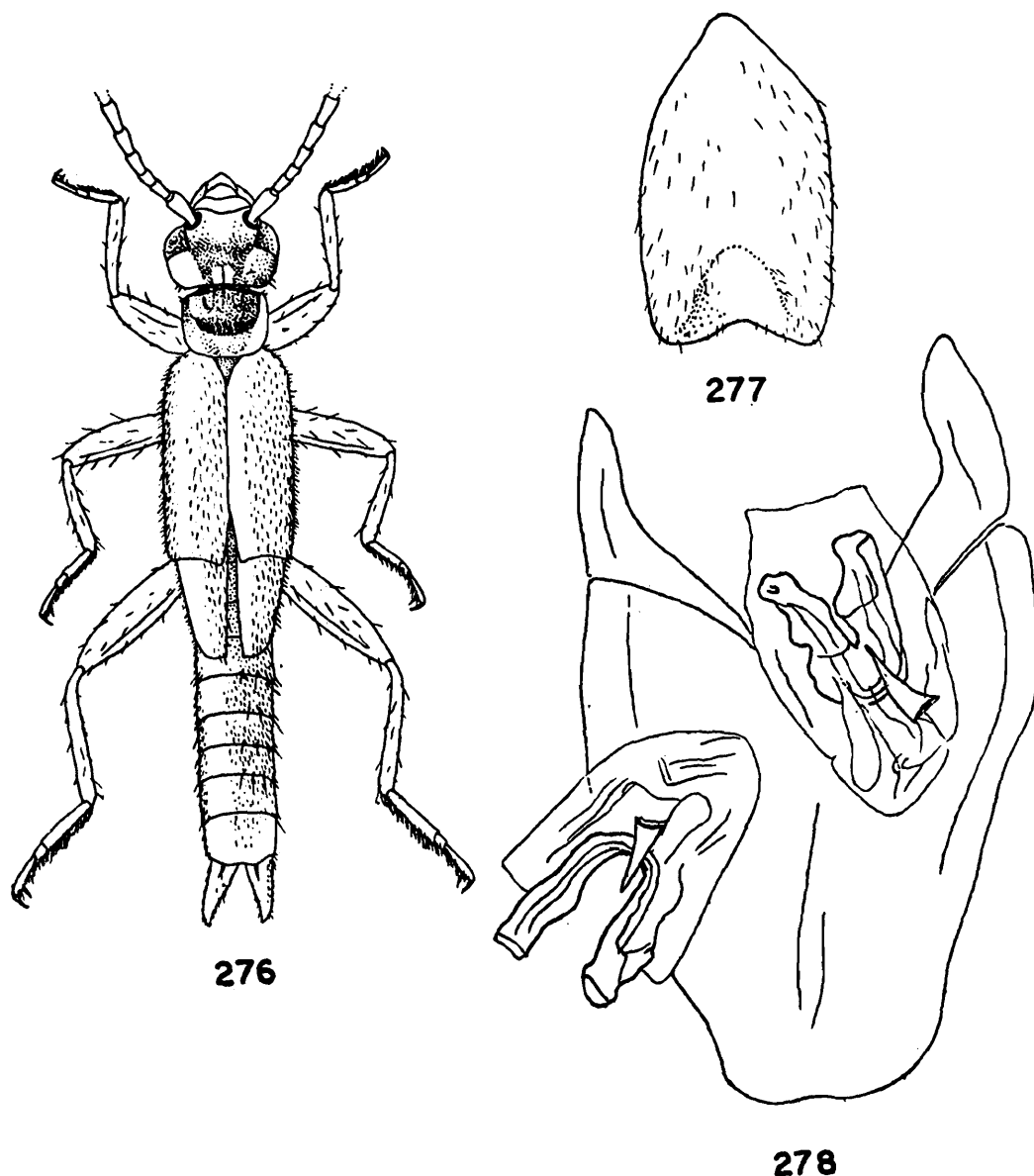
(Figs. 276-278)

Diplatys stemmleri Brindle, 1975, *Eut. Basiliensia*, 1 : 10 (♂ ; Bhutan).

♂ : General colour yellowish brown ; head with frons shaded with black and vertex slightly lighter in colour ; pronotum on sides and legs yellow ; elytra, wings, abdominal tergites in middle, ultimate tergite and forceps shaded with black. Finely pubescent, comparatively longer hairs present on the sides of abdomen.

Head transverse, smooth, frons moderately raised, occiput in middle depressed and laterally raised, post-ocular carina obsolete, sutures except median one wanting, hind margin gently emarginate in middle. Eyes about as long as the post-ocular length. Antennae 15-segmented or more ; 1st stout, slightly shorter than the distance between antennal bases ; 2nd transverse ; 3rd slightly longer than the 4th but shorter than the 5th, remaining gradually increasing in length and thinning especially a few distal ones. Pronotum about as long as broad, anteriorly convex, lateral and posterior margin straight, prozona weakly raised and metazona depressed, median sulcus faintly marked. Elytra and wings well developed former with axillary angle weak, exposing a triangular scutellum. Legs normal. Abdomen long, slender and parallel sided. Penultimate sternite posteriorly in middle depressed, hind margin in middle with a feeble triangular incision. Ultimate tergite with a triangular yellowish brown spot in middle posteriorly, weakly transverse and sloping backwards, hind margin trisinate but sinuations shallow, laterally oblique. Forceps straight, depressed, tapering apically with tip gently hooked and pointed, internally finely crenulate, at base above with a small triangular crest in the middle of a shallow depression. Genitalia with parameres

straight, narrow, apex pointed and turned externally, external margin convex, internal margin concave in middle, basal margin oblique, straight, longer than the external margin, inner basal angel acuminately



Figs. 276-278 : *Haplodiplatys stemmleri* (Brindle), ♂, 276. Dorsal view ; 277. Penultimate sternite ; 278. Genitalia.

produced but terminating a little before middle line ; virga distinctly shorter than the distal lobes, U-shaped, supported by strongly chitinated flange.

♀ : (nov.) Agrees with males in most characters except that occasionally darker in colour ; penultimate sternite posteriorly obtusely triangular ; ultimate tergite strongly narrowed posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	10.0-11.0	11.2
Length of forceps	0.9- 1.2	1.0

Distribution : BHUTAN ; INDIA ; Darjeeling Dist. (ZSI Coll.).

Types : Holotype ♂, Paratype 1 ♀ in NMB and Paratype 1 ♂ in MM.

Remarks : This species comes very close to *H. tibetanus* (Hincks) from Tibet but differs in having the penultimate sternite medially triangularly emarginate and postero-lateral angles obtuse ; parameres gradually narrowing apically with tip sharply pointed and virga short, inverted U-shaped, stout and supported by chitinous flange.

60. *Haplodiplatys rileyi* (Hincks)

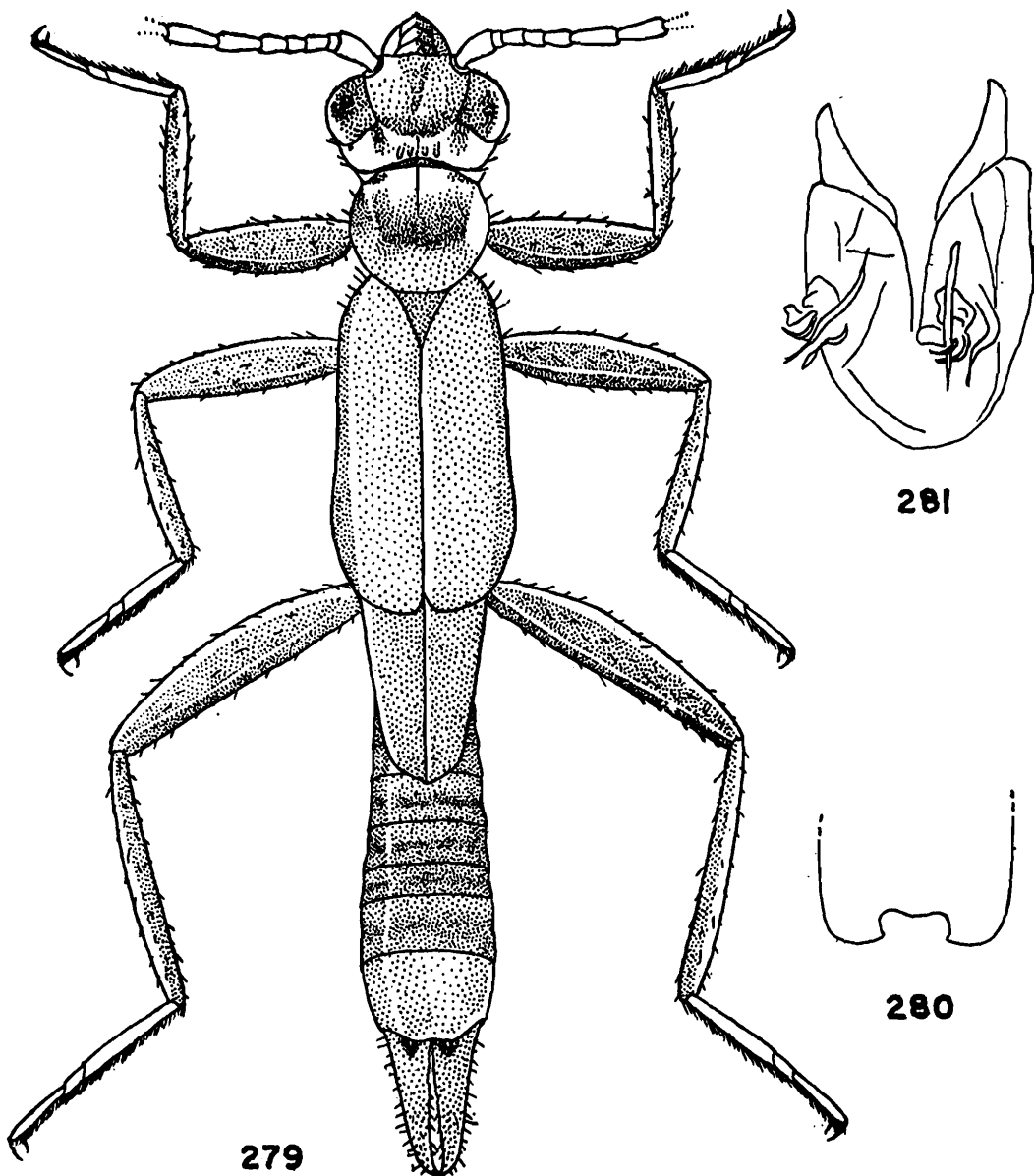
(Figs. 279-281)

Diplatys rileyi Hincks, 1955, *Syst. mono. Dermaptera*, 1 : 74 (♂, ♀ ; Sikkim) ; Ramamurthi, 1963, *Anu. Mag. nat. Hist.*, (13) 6 : 675 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 5 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 82 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 10.

Haplodiplatys rileyi Steinmann, 1974, *Acta. zool. Acad. Sci, Hung.*, 20 (1-2) : 203.

♂ : General colour blackish brown, head black with posterior half of frons and middle of occiput dark reddish brown, abdomen, ultimate tergite darker. Pubescence fine, a few long stiff hairs present on head, margin of pronotum and legs. Head transverse, frons very weakly raised, occiput laterally raised, transverse suture obsolete and median suture faint, post-ocular carina wanting, hind margin emarginate in middle. Eyes prominent, distinctly longer than the post-ocular length. Antennae 18-segmented or more, 1st stout, expanded apically, shorter than the distance between antennal bases and length of eye ; 2nd short, transverse ; 3rd cylindrical ; 4th stout, slightly shorter than the preceding ; 5th slightly longer than 3rd ; 6th onwards gradually increasing in length and thinning. Pronotum about as long as broad, anteriorly convex, sides convex with border faintly wavey, gently contracted posteriorly ; hind margin truncate, prozona moderately raised, metazona depressed, median sulcus represented by a smooth line. Elytra and wings well developed, former with axillary angle weak to show a small triangular scutellum. Legs normal. Abdomen long and slender, parallel sided except last two segments gently expanded. Penultimate sternite pubescent, gently expanded posteriorly, above with a broad semicircular depression, in the middle with a short longitudinal

depression, posterior margin with a deep incision, base of which feebly convex, postero-lateral angle forming a broad lobe with tip turned inwards. Ultimate tergite transverse, gently narrowed backwards, disc convex, hind margin trisinate, laterally oblique. Forceps with long and short pubescence, subcontiguous, tapering posteriorly, straight, apices gently hooked with tip pointed, at base a depression with an



Figs. 279-281 : *Haplodiplalys rileyi* (Hincks), ♂, 279. Dorsal view ; 280. Posterior margin of penultimate sternite ; 281. Genitalia.

oblique, vertical and triangular ridge present, internal margin finely crenulate. Genitalia with parameres narrowed and undulate apically, tip pointed and turned inwards, internal margin broadly concave, basal margin oblique, straight, inner angle not very much produced, barely reaching middle line ; virga at base with a rounded lobe, arms thin, tubular, an accessory chitinous rod present.

♀ : Agrees with male in most characters except that head with frons and occiput less differentiated ; eyes comparatively shorter in relation to post-ocular length ; abdomen broader, less cylindrical ; penultimate sternite narrowed posteriorly with margin rounded and forceps simple and straight, comparatively more slender apically.

Measurements (in mm) :

	♂	♀
Length of body	9.7-11.5	10.0-12.0
Length of forceps	1.2- 1.5	1.5- 1.6

Distribution : INDIA : West Bengal : Kalimpong and Kurseong ; Sikkim : Gangtok, Singhik.

Types : Holotype ♂, allotype ♀ and Paratypes 3 ♀ ♀ in BMNH and paratypes 2 ♂ ♂, 2 ♀ ♀ in MNHP.

Remarks : Amongst the Indian species its nearest relative appears to be *H. urbanii* (Brindle) in having somewhat identical pronotum and parameres but differs by the shape of posterior emargination of penultimate sternite with its base truncate or subtruncate.

61. *Haplodiplatys urbanii* (Brindle)

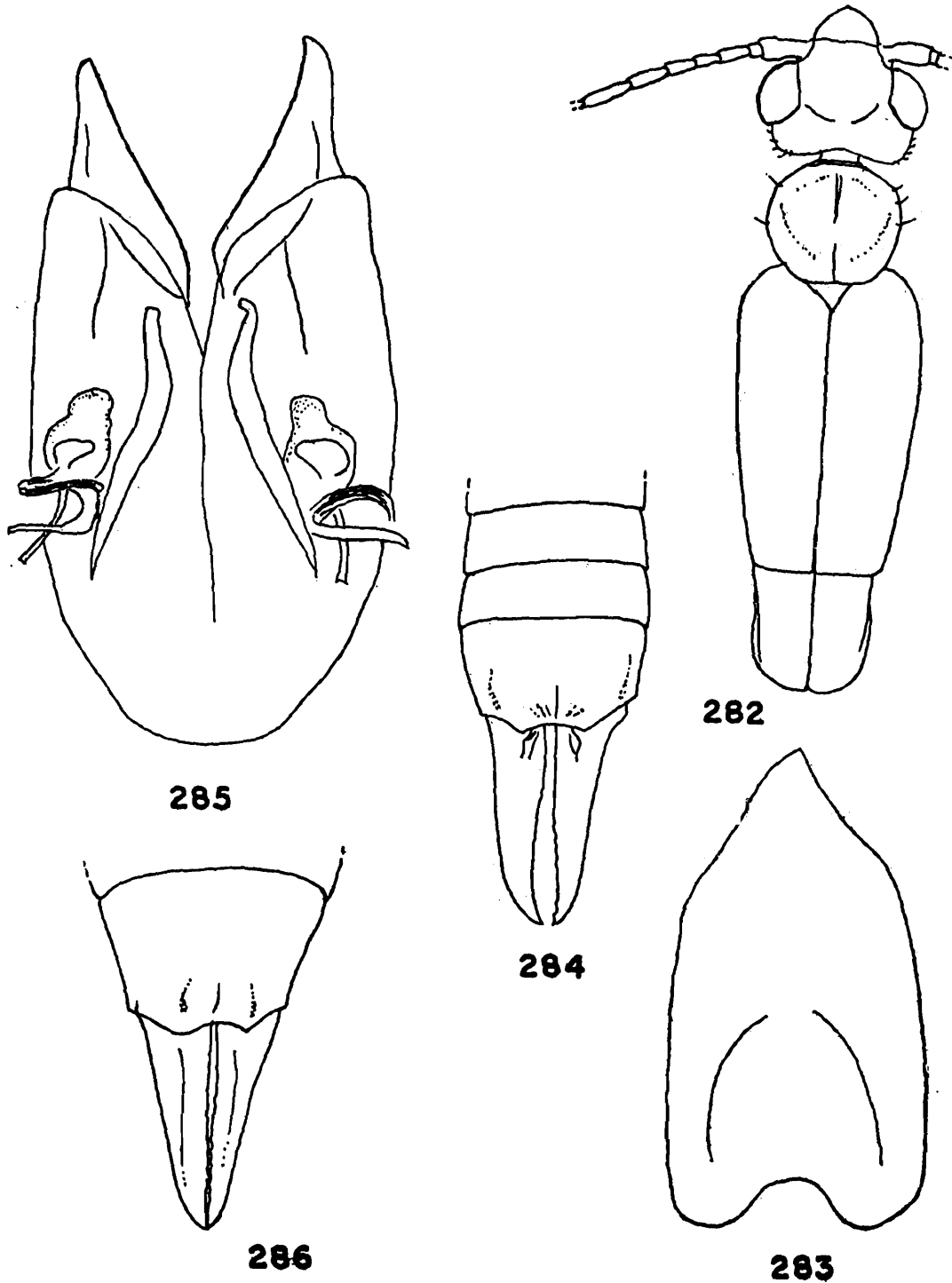
(Figs. 282-286)

Diplatys urbanii Brindle, 1975, *Ent. Basiliensia*, 1 : 9 (♂, Bhutan).

♂ : General colour yellowish brown, antennae and legs yellow but fore-femora shaded with black in apical half ; head black ; pronotum black but yellowish laterally and posteriorly ; elytra and wings yellowish black, former with an elongated yellow spot in apical half, close to sutural margin ; abdominal tergites blackish in basal half and ultimate tergite black ; forceps yellowish brown. Finely pubescent, forceps internally with comparatively longer pubescence.

Head smooth, transverse, frons convex with two small depressions in middle, occiput depressed in middle, laterally raised, post-ocular carina faint, sutures except median one obsolete, hind margin emarginate in middle. Eyes prominent, longer than the post-ocular area. Antennae 17-segmented or more (since often broken), 1st stout, expanded apically, almost equal to the combined length of 2nd and 3rd ; 2nd small ; 3rd long and slender ; 4th stouter, slightly shorter than the preceding ; 5th stouter but equal to 3rd ; remaining gradually increasing in length, a few apical ones thinning. Pronotum more or less rounded, gently narrowed posteriorly with hind margin truncate, prozona weakly raised and metazona depressed, median sulcus distinct.

Elytra and wings normal, former with axillary angle rounded off to show a small triangular scutellum. Legs typical. Abdomen long and slender, parallel sided. Penultimate sternite pubescent, posterior



Figs. 282-286 : *Haplodiplatys urbanii* (Brindle), ♂, 282. Anterior half of body ; 283. Penultimate sternite ; 284. Posterior half of body ; 285. Genitalia ; ♀, 286. Ultimate tergite and forceps.

margin with a broad incision with its base almost truncate. Ultimate tergite transverse, smooth, gently narrowed and sloping backwards, hind margin trisinate, laterally oblique. Forceps subcontiguous,

depressed, straight, tapering apically with tip gently hooked and pointed, at base with an oblique crest in the middle of a shallow depression, internal margin finely crenulate. Genitalia with parameres straight, narrowed apically, tip pointed and turned inwards, inner margin broadly concave or feebly undulate, basal margin longer than the external margin and inner angle produced ; virga short, tubular, at base median portion swollen, accessory chitinous rod straight or slightly bent in middle.

♀ (nov.) : Agrees with male in most characters except that hind abdominal tergites and ultimate tergite narrowed strongly ; penultimate sternite obtusely triangular posteriorly and forceps simple and straight.

Measurements (in mm) :

	♂	♀
Length of body	9.1-10.8	12.1-13.1
Length of forceps	0.35-1.2	1.2-2.3

Distribution : Originally described from BHUTAN on a ♂ it and is represented in NMB. In the collection of ZSI 1 ♂, 1 ♀ from INDIA (Sikkim) are present.

Type : Holotype ♂ in NMB.

Remarks : This species comes very close to *H. rileyi* (Hincks) known from India (Darjeeling Dist., West Bengal and Sikkim) in having deep incision at the posterior margin of penultimate sternite but in the former its shape is quite distinctive in having its base almost slightly concave or straight in middle and lateral lobes with inner angles rounded and parameres comparatively more narrowed apically, especially external apical angles less rounded.

62. *Haplodiplatys srivastavai* (Kapoor)

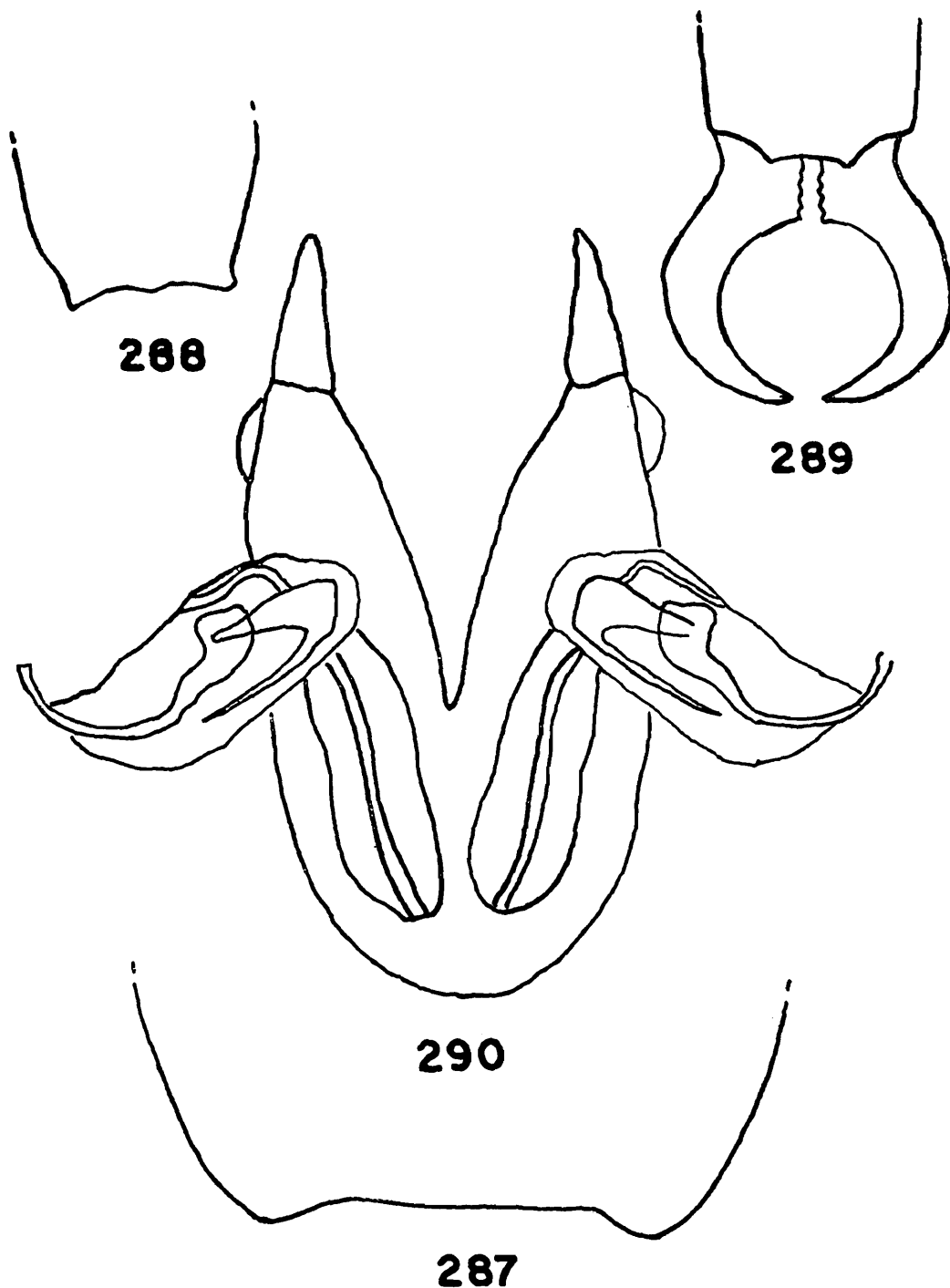
(Figs. 287-290)

Diplatys srivastavai Kapoor, 1974, *Zool. J. Linn. Soc.*, 55 : 241 (♂, ♀ : Himachal Pradesh, Simla).

♂ : General colour brownish-black, head black, pronotum brownish black, in middle light brown, extreme lateral border brownish yellow, elytra brownish black and wings black but whitish near base and legs yellowish brown.

Head about as long as broad, frons raised and occiput depressed, post-ocular carina weak posteriorly. Eyes prominent, longer than the

post-ocular area, hind margin concave in middle. Antennae 12-segmented, 1st enlarged apically, stout, longer than the 2nd and 3rd together ; 4th slightly shorter than the 3rd ; 5th almost equal to 3rd,



Figs. 287-290 : *Haplodiplatys srivastavai* (Kapoor), Holotype ♂, 287. Posterior margin of penultimate sternite ; 288. Penultimate sternite ; 289. Ultimate tergite and forceps ; 290. Genitalia (Figs 288 and 290 redrawn from Kapoor, 1974).

remaining gradually lengthening. Elytra and wings normal, former with inner basal angles rounded off, thus exposing a small, triangular

scutellum in middle. Abdomen long, slender, gently enlarging beyond middle up to penultimate tergite. Penultimate sternite with posterolateral angles obtusely lobed and with shallow emarginations and margins in middle scarcely convex. Ultimate tergite smooth, sloping backwards, hind margin trisinate, oblique laterally. Forceps (Holotype, macrolabic) sub-contiguous and deplanate in basal one fourth with internal margin finely crenulate, afterwards strongly bowed, tapering apically with tip sharply pointed. Genitalia with parameres straight, triangular, gradually narrowing apically with tip pointed, proparameres with median incision deep and extending up to middle; virga at base forming a rounded loop, afterwards long and tubular extending beyond the distal lobes.

♀ : Unknown

Measurements (in mm) :

	♂
Length of body	12.5
Length of forceps	1.0

Distribution : Known from type locality only.

Type : Holotype ♂, Entomology Department, IARI.

Remarks : The original description (Kapoor, 1974) of the species is based on 'Holotype ♂' and Paratypes 4 ♂♂, of which Holotype ♂ and Paratype 1 ♂ are stated to be deposited with the author and remaining in the Zoology Department, Punjab University, Chandigarh. However, Holotype ♂ is at present available in the collection at Entomology Department, Indian Agricultural Research Institute, New Delhi but the slides containing male genitalia is not traceable there. The posterior margin of penultimate sternite is figured here from the Holotype ♂ (fig. 287) which differs slightly from the figure provided alongwith the original description of the species.

This species comes very close *H. rufescens* (Kirby) but differs by the distinctive parameres and hind margin of penultimate sternite.

63. *Haplodiplatys rufescens* (Kirby)

(Figs. 291-296)

Cylindrogaster rufescens Kirby, 1986, *J. Linn. Soc. (Zool.)*, 25 : 524, pl. 20, fig. 2 (♂ not ♀, North India).

Diplatys rufescens ; Kirby, 1904, *Syn. Cat. Orth.*, 1 : 2 ; Burr, 1904, *Trans. R. ent. Soc. Lond.*, 1904 : 279, 283 ; Burr, 1907, *Bull. Mus. Hist. nat. Paris*, 13 : 308 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 41, 51 (excl. Tonkin), pl. 8, fig. 75, 75a ; Burr, 1911, *Genera Insect.*, 122 : 14 ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 28, 38 (excl. pl. 8, fig. 20, 20a, Siam) ; Burr, 1911, *J. Asiat. Soc. Beng. (N. S.)*, 7 : 774 ; Burr, 1914, *Rec. Indian Mus.*, 10 : 282 (partim) ; Hincks, 1955, *Syst. Mono. Dermaptera*, 1 : 72, figs. 71-73 ; Bharadwaj and Bhatnagar, 1961, *Zool. Anz.*, 167 (7-8) : 282 ; Bharadwaj and Kapoor, 1967, *Bull. Ent.*, 8 (2) : 2 ; Kapoor, 1968, *Agra Univ. Univ. J. Res. (Sci.)*, 16 (1) : 5 ; Sakai, 1972, *Dermapterorm Cat. Prael.*, 5 : 78 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 11.

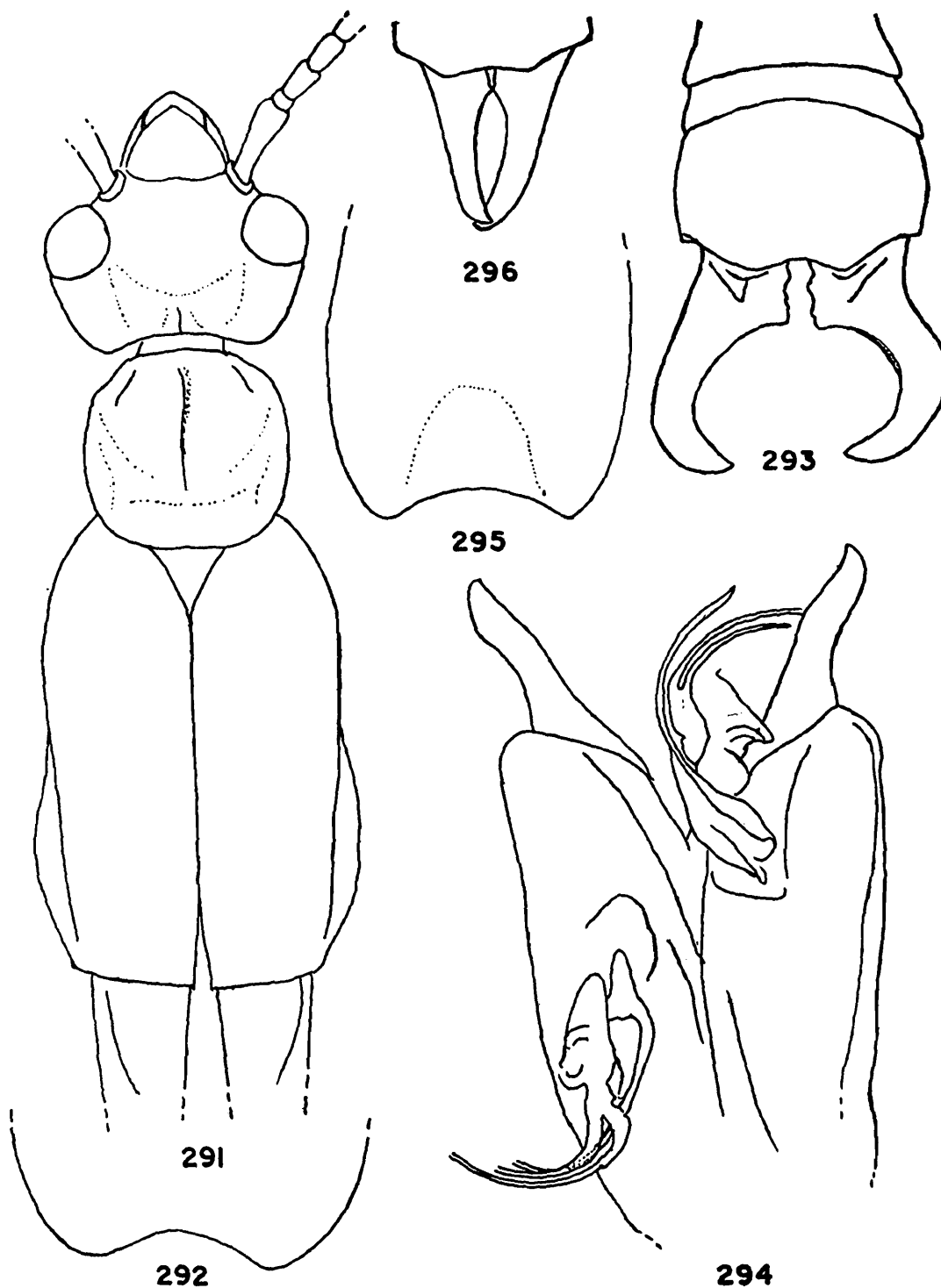
Haplodiplatys rufescens ; Steinmann, 1974, *Acta zool. Acad. Sci. Hung.*, 20 (1-2) : 203, fig. 84.

Diplatys longisetosa (Westwood) ; Bormans and Krauss, 1900, *Das. Tierriech*, 11 : 10 (partim).

Diplatys falcatus Burr, 1910, *Fauna Brit. India Dermaptera* : 40, 42 (partim), fig. 3A, pl. 1, fig. 4 (excl. ♀ ex., Burma) ; Burr, 1911, *Trans. R. ent. Soc. Lond.*, 1911 : 24, 30 (partim), pl. 7, fig. 3 ; Burr, 1911, *Genera Insect.*, 122 : 13 ; Burr, 1913, *J. Asiat. Soc. Beng. (N. S.)*, 9 : 183 ; Burr, 1914, *Rec. Indian Mus.*, 10 : 282.

♂ : General colour varies between dark brownish black and yellowish brown. Head with frons weakly raised, occiput depressed, post-ocular carina distinct. Eyes longer than the post-ocular length. Antennae typical for the genus. Pronotum about as long as broad or a little longer, convex anteriorly, sides moderately rounded, hind margin truncate. Elytra about twice as long as the pronotum, axillary angles rounded off to show a small triangular scutellum. Wings about half as long as the elytra. Legs normal. Abdomen long, slender, finely sculptured, in microlabic form, of uniform width but in macrolabic form dilated posteriorly. Penultimate sternite concave posteriorly, less so in microlabic form. Ultimate tergite is wider than the abdomen, smooth, convex above, postero-lateral angles more prominent in f. macrolabia, median sulcus complete and distinct, hind margin trisinate, laterally oblique or sometimes in middle truncate. Forceps in f. macrolabia contiguous, deplanate in basal $\frac{1}{4}$, crenulate internally, afterwards strongly bowed, in f. microlabia simple and straight, minutely crenulate internally along the entire length. Genitalia with parameres about three times longer than the greatest width, undulate with tip pointed and turned inwards ; virga with branches long and slender ; an accessory chitinous, long and slender rod present in distal lobes.

♀ : Agrees with ♂ in most characters except that occiput comparatively less depressed ; post-ocular carina wanting ; pronotum with sides prominently rounded ; ultimate tergite strongly narrowed posteriorly and forceps simple and straight.



Figs. 291-296 : *Haplodiplatys rufescens* (Kirby) ♂, (f. *macrolabia*), 291. Anterior half of body ; 292. Posterior margin of penultimate sternite ; 293. Ultimate tergite and forceps ; 294. Genitalia ; (f. *micro-labia*), ♂, 295. Posterior margin of penultimate sternite ; 296. Ultimate tergite and forceps.

Measurements (in mm) :

	♂	♀
Length of body	10.0-13.0	11.3
Length of forceps	1.4- 1.6	1.7

Distribution : All along the Himalayas in INDIA, NEPAL and BHUTAN.

Types : Types of *Cylindrogaster rufescens* Kirby and *Diplatys falcatus* Burr in BMNH.

Remarks : It is now resolved that *Diplatys falcatus* Burr is a synonym of this species which is distributed all along the Himalayas and all other records from other areas perhaps refer to some other species.

It shows indeed a remarkable morphological similarity with *H. srivastavai* (Kapoor) but ♂ genitalia is quite distinctive.

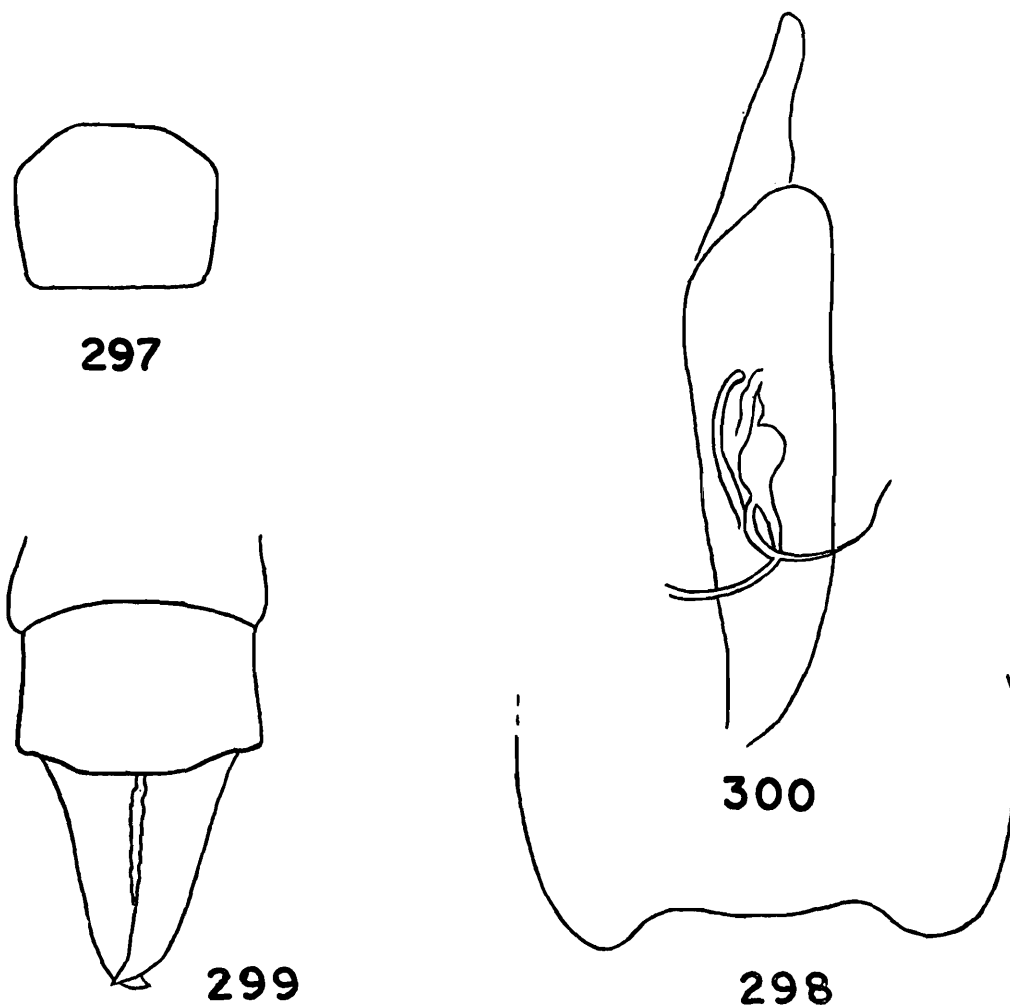
64. *Haplodiplatys simlaensis* (Kapoor)

(Figs. 297-300)

Diplatys simlaensis Kapoor, 1968, *Zool. Anz.*, 181 (1-2) : 117 (♂ ; Himachal Pradesh, Simla) ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 160.

Haplodiplatys simlaensis ; Steinmann, 1974, *Acta. zool. Acad. Sci. Hung.*, 20 (1-2) : 203.

♂ : General colour reddish brown, head black, antennae brownish, pronotum yellow with a broad lateral patch meeting posteriorly



Figs. 297-300 : *Haplodiplatys simlaensis* (Kapoor), Holotype ♂, 297. Pronotum ; 298. Posterior margin of penultimate sternite ; 299. Ultimate tergite and forceps ; 300. Right half of genitalia.

in a semicircle, elytra dark reddish brown and wings light brown, legs yellow but femora at apex with a brown patch.

Head with frons raised, occiput depressed, sutures feebly marked. Eyes about as long as the post-ocular length. Antennae 18-segmented, 1st stout, gently expanded apically ; 2nd small, about as long as broad ; 3rd long and slender ; 4th slightly shorter than 3rd and 5th, remaining gradually increasing in length and thinning. Pronotum transverse, anteriorly convex in middle, lateral margin feebly convex and converging posteriorly, hind margin truncate, median sulcus distinct, prozona weakly raised and not well differentiated from flat metazona. Elytra punctate, about three times longer than broad, inner basal angles rounded off, thus showing a small triangular scutellum, meeting along the inner margin. Wings projecting well beyond the elytra. Legs normal, femora compressed with longitudinal ridges. Abdomen long and cylindrical, pubescent, 8th and 9th tergites feebly enlarged. Penultimate sternite with rounded lobes postero-laterally and hind margin with a shallow emargination sublaterally and feebly convex in middle. Ultimate tergite quadrate, weakly transverse, sides straight, postero-lateral angles prominent, hind margin in middle straight, laterally oblique and gently concave. Forceps with branches subcontiguous, depressed, tapering apically with tip gently hooked and pointed, internal margin finely serrated. Genitalia with parameres simple, sinuate ; virga at base with a rounded lobe, arms thin and tubular, slightly projecting beyond the distal lobes.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	13.0
Length of forceps	2.0

Distribution : INDIA : Himachal Pradesh, Simla.

Type : Holotype ♂ and ♂ genitalia mounted on a slide-only one half is present, at IARI.

Remarks : The Holotype ♂ was examined and the figures given here are drawn from it. The diagrams provided with the original description appear to be unnatural and do not tally with the figures given here.

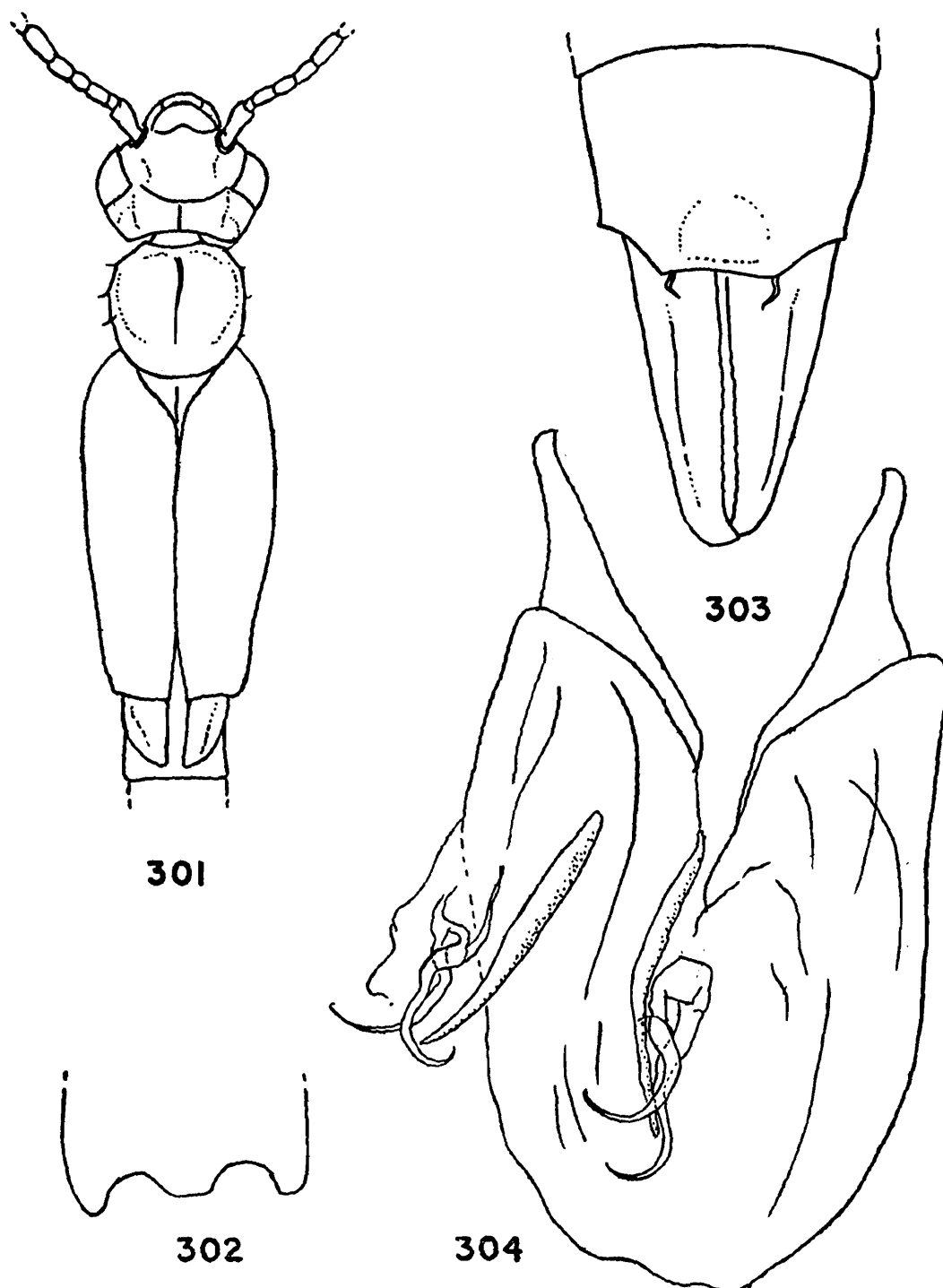
The general morphological features and details of genitalia are identical to *H. rufescens* (Kirby) but the shape of penultimate sternite is slightly different. On account of this it is retained here as valid.

But in future on the availability of more material of the above two species it may be possible to elucidate whether *H. simlaensis* is really distinct from *H. rufescens*.

65. *Haplodiplatys lobatus* sp. n.

(Figs. 301-304)

♂ : General colour brownish yellow ; head brownish black ; antennae yellow ; legs yellow with fore-femora and tibiae shaded with



Figs. 301-304 : *Haplodiplatys lobatus* sp. n., Holotype ♂, 301. Anterior half of body ; 302. Posterior margin of penultimate sternite ; 303. Ultimate tergite and forceps ; 304. Genitalia,

black ; elytra in basal half and laterally blackish brown except for a narrow transverse yellow stripe at base ; wings blackish brown with tip yellow ; ultimate tergite shaded with black in apical two thirds. Finely pubescent with a few stiff hairs on the margin of pronotum and legs.

Head transverse, frons moderately raised, occiput laterally feebly raised, sutures marked by faint depressions, hind margin broadly emarginate, post-ocular carina wanting. Eyes prominent, distinctly longer than the post-ocular length. Antennae 20-segmented, 1st stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd transverse ; on the right side 3rd and 4th subequal and 5th longer than 3rd ; on the left sides 3rd longer than 4th ; 5th almost equal to 3rd, remaining segments stouter and gradually increasing in length except a few apical ones thinner and apical one smaller. Pronotum about as long as broad, oblong, anteriorly straight, sides convex, contracted in posterior half, prozona convex, metazona depressed, median sulcus faint but complete. Elytra and wings well developed, smooth, former with axillary angle rounded off to show a small triangular scutellum. Legs typical for the genus. Abdomen long, slender, smooth, almost parallel sided. Penultimate sternite longer than broad, slightly depressed in middle posteriorly, hind margin bisinuate posteriorly, median lobe with hind margin almost straight, postero-lateral angles produced into obtuse lobe. Ultimate tergite weakly transverse, gently narrowed posteriorly, smooth and sloping backwards with a faint depression in middle, hind margin trisinate, laterally oblique, in middle thickend and slightly raised. Forceps with branches contiguous, straight, depressed, at base above a depression present, with a small triangular ridge in the middle, tapering apically with tip gently hooked and pointed, inner margin finely serrated. Genitalia with parameres narrowed apically, long, undulate, apex rounded with tip pointing inwards, basal margin oblique, straight, only slightly longer than the external margin, inner basal angle extending up to the middle line ; virga with a rounded median area at base, branches tubular, undulate tapering apically, an accessory, chitinous rod, tapering apically present.

♀ : Unknown.

Measurements (in mm) :

	Holotype
	♂
Length of body	9.7
Length of forceps	1.0

Material examined : INDIA : West Bengal, Darjeeling Dist., Rongbong, Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen), 13.iv.1978, ex Soil (A. R. Bhowmik) ; deposited in ZSI.

Remarks : This species comes close to *H. simlaensis* (Kapoor) but differs by the shape of posterior margin of penultimate sternite.

DOUBTFUL SPECIES

66. *Diplatys flavobrunneus* Chopard

(Figs. 305-307)

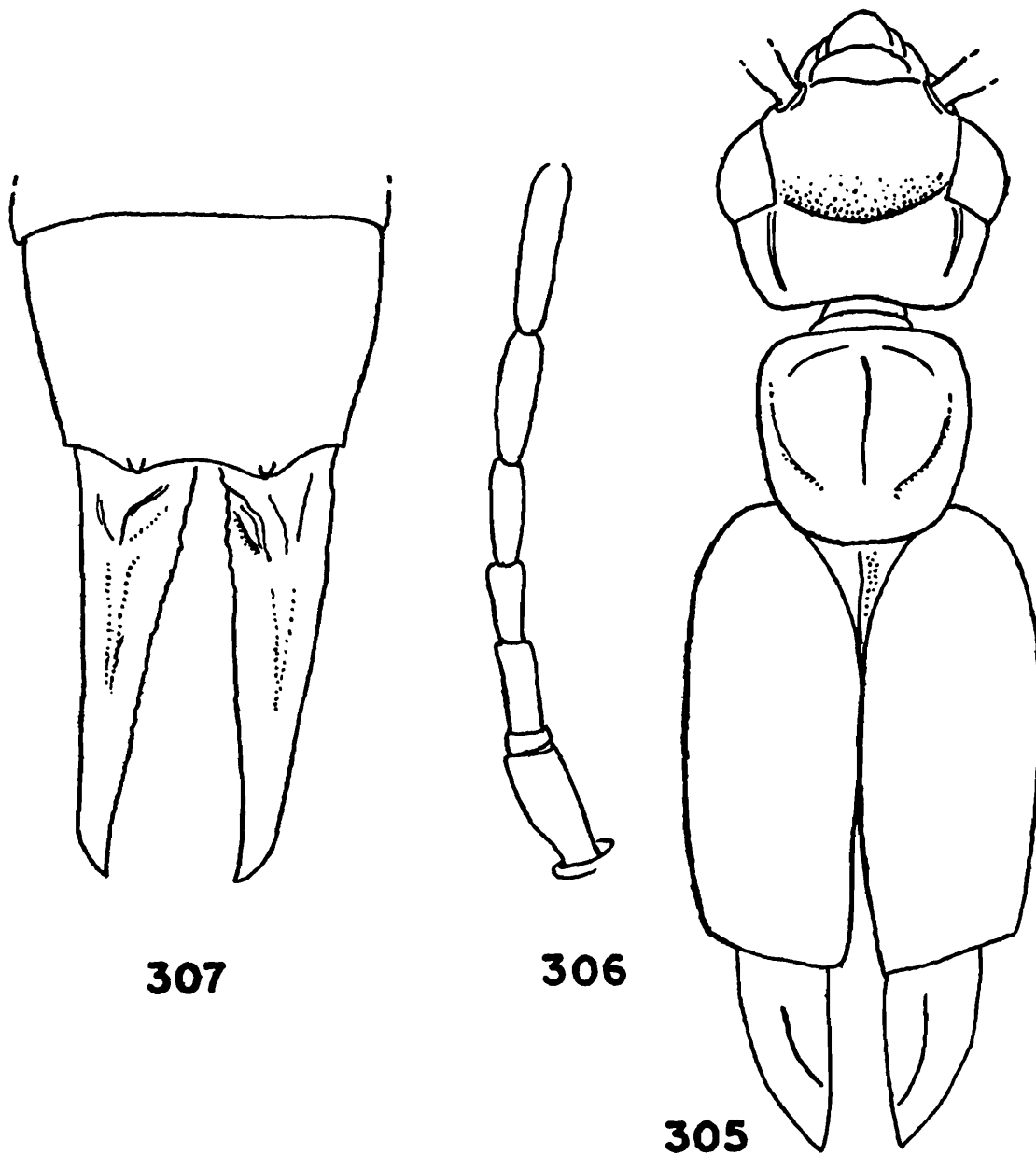
Diplatys flavobrunnea Chopard, 1924, *Rec. Indian Mus.*, 26 : 167 (♀ ; Barkuda Isl.).
Diplatys flavobrunneus (emend.) ; Hincks, 1955, *Syst. mono. Dermaptera*, (probably a ♂ not ♀), 1 : 127 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16(1) : 7 ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 136 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 16.

♂ : Unknown.

♀ : General colour yellowish brown with head, apical half of elytra, posterior half of 9th and whole of ultimate tergite blackish. Build slender, finely pubescent, on legs, sides of pronotum and basal portion of elytra a few long hairs present.

Head about as long as broad, frons moderately convex, not well differentiated from weakly depressed occiput, transverse suture obsolete, median suture fairly distinct, hind margin emarginate, post-ocular carina moderately distinct, slightly curved, extending up to the hind margin. Eyes prominent, longer than the post-ocular length. Antennae yellow, 15-segmented or more, 1st darkened, stout, expanded apically, shorter than the distance between antennal bases ; 2nd short, transverse ; 3rd slender, longer than the 4th ; 4th and 5th stouter and remaining gradually increasing in length distally. Pronotum longer than broad, contracted posteriorly, anteriorly convex, sides lightly convex, hind margin subtruncate, median sulcus distinct, prozona tumid and well differentiated from flat metazona. Elytra and wings well developed, former with axillary angle rounded off, exposing a small, yellow, triangular scutellum. Legs long and slender. Abdomen long and slender. Penultimate sternite sub-triangular posteriorly. Ultimate tergite expanded in the middle, disc convex above, sloping anteriorly and posteriorly, hind margin faintly trisinate, laterally oblique, minute tumidities corresponding the bases of forceps present. Forceps almost straight, tapering

apically with tip gently hooked and pointed, at base above with an oblique, triangular, vertical crest and afterward with a low convexity extending up to middle, inner margin finely crenulate.



Figs. 305-307 : *Diplatys flavobrunneus* Chopard, Holotype ♀, 305. Anterior half of body ; 306. A few basal antennal segments ; 307. Ultimate tergite and forceps.

Measurements (in mm) :

	Holotype
	♀
Length of body	10.0
Length of forceps	1.5

Distribution : INDIA : Orissa, Barkuda Is. (Chilka Lake).

Type : Holotype ♀ in ZSI.

Remarks : The Holotype ♀ which was preserved in spirit is now mounted on a card. Due to long preservation in spirit it is partially discoloured and body segments greatly distended. As a result of drying various abdominal terga have shrunk. For this reason in the above description general body colouration and measurements are copied from the original description.

Hincks (1955) on the basis of diagrams given by Chopard (1924, fig. 1) considered that the Holotype may be a ♂ but it is a '♀'.

On account of its unique body colouration it appears to be distinctive but its true identity will be resolved only on the discovery of a ♂.

67. *Diplatys baijali* Duda and Malhotra
(Figs. 308-309)

Diplatys baijali Duda and Malhotra, 1970, *Beitr. Ent.*, 20 (1-2) : 141 (♂, ♀ ; India : Kashmir, Srinagar).

♂ : General colour dark brown, legs yellowish.

Head about as long as broad, frons raised, sutures faintly marked. Eyes not prominent, about as long as post-ocular length. Antennae 15-segmented, 1st long, expanded apically, almost equal to the combined length of 2nd to 4th. Pronotum broader than long, slightly expanded posteriorly, hind margin straight, median sulcus faintly marked, more pronounced in anterior half. Legs moderately long, 1st and 3rd tarsal segments almost equal in length ; 2nd short. Apterous. Abdomen slightly enlarged in middle, hind margin of each tergite with a row of fine setae. Penultimate sternite with hind margin convex. Ultimate tergite weakly transverse. Forceps contiguous, straight, tapering apically with apices gently hooked and pointed, internal margin finely crenulate. Genitalia not known.

♀ : Agrees with male in most characters.

Measurements (in mm) :

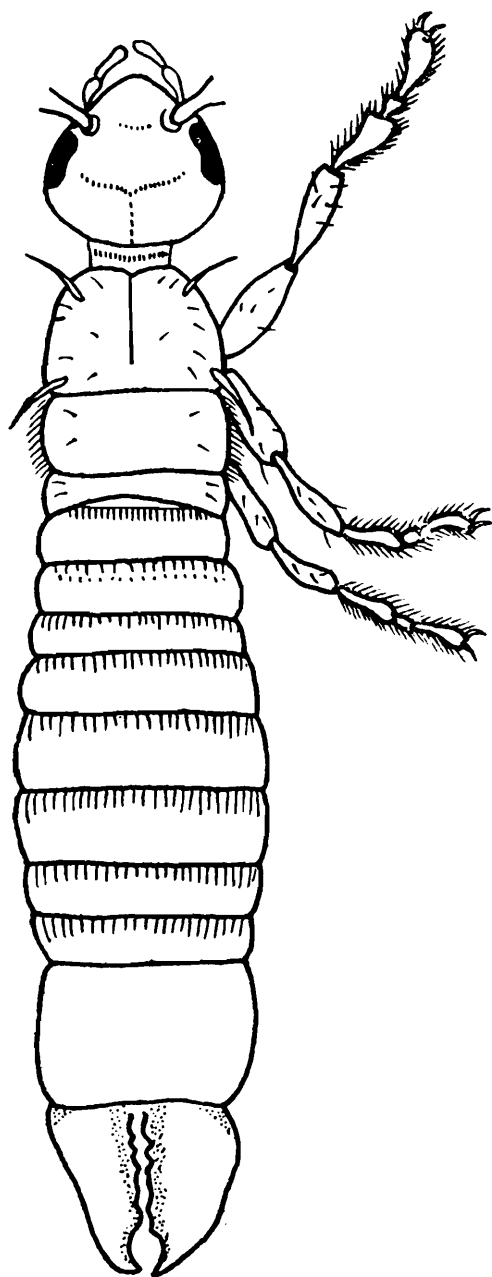
	♂	♀
Length of body	9.0	10.0
Length of forceps	2.0	2.0

Distribution : INDIA : Jammu and Kashmir, Srinagar.

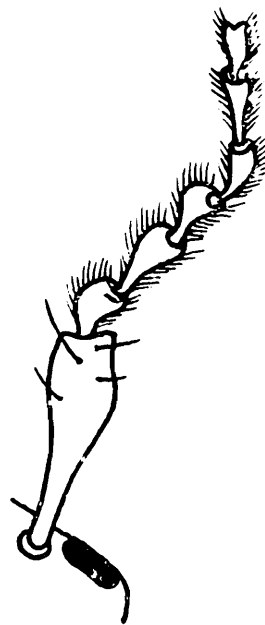
Types : Holotype ♂, Allotype ♀ and Paratypes 4 ♂♂ in ZMS.

Remarks : On the basis of description and diagrams alone, it is not possible to place this species properly. The original illustrations do

not appear to have been drawn properly ; for in no species of Dermaptera the legs and 2nd antennal segments are like that.



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309

Figs. 308-309 : *Diplatys baijali* Duda and Malhotra, ♂, 308. Dorsal view ; 309. A few basal antennal segments (redrawn from Duda and Malhotra, 1970).

In spite of repeated letters to the Head of Zoology Department, J. K. University, Srinagar, Kashmir it was not possible to get types where these are stated to be deposited. According to Dr. P. L. Duda (personal communication), senior author of the species, this species is quite common in J. K. University Campus and in other parts of Srinagar.

68. *Diplatys himalayanus* Baijal and Singh

Diplatys himalayanus Baijal and Singh, 1954, *Agra Univ. J. Res. (Sci.)*, 3(2) : 455 (♂ ; U. P., Nanital Dist., Jeolikote, Naranikarkana, 5,500 ft.) ; Sakai, 1972, *Dermapterorum Cat. Prael.*, 5 : 155.

In the collection of the ZSI there are present 3 nymphs, one of which lacks hind portion, and labelled as : i) Cotypes and ii) *Diplatys himalayana* Baijal and Santokh-in Baijal's handwriting. According to the original description (Baijal and Singh, 1954) this species was described on Holotype ♂ and Paratype 1 ♂. The above material which is preserved in spirit represents Holotype ♂ and paratype 1 ♂ and the third broken one might have been put later. These are nymphs at various stages of development and belong to *Labidura riparia* (Pallas).

Subfamily ECHINOSOMATINAE

Echinosomatinae Burr, 1910, *Fauna Brit. India Dermaptera* : 67, 69 (Labiduridae) ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 161, 163 (Labiduridae) ; Burr, *Genera Insect.*, 122 : 11, 22 ; Burr, 1911, *J. Asiat. Soc. Beng. (N. S.)*, 7 : 774 ; Burr, 1915, *J. R. Micr. Soc.*, 1915 : 425, 436 ; Hincks, 1951, *Ann. Mus. Congo. Belge (Se'r. in 8°) Zool.*, 8 : 13, 40 ; Hincks, 1947, *South African Animal Life*, 4 : 40, 52 ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 117.

Pyragrinae (pars), Verhoeff, 1902, *Zool. Anz.*, 25 : 189 (Pygidicranidae) ; Burr, 1909, *Dt. ent. Z.*, 1909 : 324, 325 (Labiduridae).

Echinosomidae Zacher, 1910, *Beitr. zur. Revision der Dermaptera*, 1 (Inaug. dissat. Namslau) : 36 ; Zacher, 1910, *Ent. Rdsch.*, 27 (4) : 24 ; Zacher, 1911, *Zool. Jb.*, 30 : 342 ; Zacher, 1915, *Zool. Anz.*, 45 : 528.

Build stout ; covered with stiff setae, truncate apically ; fine pubescence also present. Head broad, usually transverse, hind margin almost truncate. Pronotum generally transverse. Anterior and posterior ventral cervical sclerites separated and latter almost touching the anterior margin of prosternum. Prosternum longer than broad narrowed posteriorly, anterior margin convex and hind margin truncate ; mesosternum with all margins straight, transverse ; metasternum broad, laterally oblique, narrowed posteriorly, hind margin lightly sinuate. Legs stout, femora not compressed or carinated ; claws with a small arolium. Abdomen convex, dilated in middle, sclerotized. Opisthomeres with pygidium and metapygidium sclerotized and telson membranous but distinct. Forceps remote at base, stout, short and cylindrical, generally arcuate. Parameres long narrowed apically, at base with a small internal process or tooth.

Female with forceps simple and straight ; gonapophyses well developed.

Nymphs are more or less similar to adults except the size and often general colouration ; cerci unsegmented.

Type : *Echinosoma* Serville, 1839.

Distribution : Ethiopian, Oriental and Australian Region.

Remarks : Burr (1910a) originally placed this subfamily under Labiduridae whereas Zacher (1911) considered it as a family, correctly recognising its affinities with Pygidicranidae. However, subsequently various authors placed Echinosomatinae under Pygidicranidae.

Owing to the presence of thick setae all over the body and distinctive general out look of various members renders the identification of this subfamily easy. Besides ecarinate femora, characteristic male genitalia and membranous telson and well developed gonapophyses in females are distinctive.

Genus *Echinosoma* Serville

Echinosoma Serville, 1839, *Hist. nat. Orth.* : 34 (Type-*Forficula afra* Palisot de Beauvois, 1805) ; Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 63 ; Scudder, 1876, *Proc. Boston Soc. nat. Hist.*, 18 : 293 ; Kirby, 1891, *J. Linn. Soc. Zool.*, 23 : 504, 508 ; 508 ; Kirby, 1904, *Syst. Cat. Orth.*, 1 : 8 ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 6, 26 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 77 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 70 ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 163 ; Burr, 1911, *Genera Insect.*, 122 : 23 ; Burr, 1915, *J. R. micr. Soc.*, 1915, 437 ; Zacher, 1911, *Zool. Jb.*, 30 : 342 ; Rehn, 1924, *Bull. Am. Mus. nat. Hist.*, 49 : 360 ; Townes, 1945, *Ann. ent. Soc. Am.*, 38 : 347 ; Hincks, 1951, *Ann. Mus. Congo. Belge (Se'r in 8°) Zool.*, 8 : 47 ; Hincks, 1957, *South African Animal Life*, 4 : 53.

Body heavily built, covered with long and short pubescence and thick setae, latter often more prominent on the edge of head, pronotum and elytra, occasionally on the hind margin of abdominal tergites. Setae apically appear truncate but its surface under high magnification reveals a few irregular spinules, often abdominal setae reclining. Head transverse, frons convex ; eyes may be longer or shorter than the post-ocular area ; antennae multisegmented with about 30-segments, 3rd long and cylindrical, about as long as the 1st ; 4th to 6th subquadrate, often pyriform, remaining gradually lengthening and slender. Pronotum transverse. Elytra and wings normal or sometimes brachypterous. Abdomen weakly convex, parallel sided or gently dilated in middle, sides of segments often carinate. Penultimate

sternite with manubrium broad and shorter than the length of sternite, emarginate posteriorly in middle. Pygidium transverse or about as long as broad. Forceps simple, remote at base, incurved, cylindrical. Parameres armed at base, internally with a distinct tooth, distal lobes with sclerotised, coiled or straight rods, associated with bunch or row of teeth and virga long and slender, often characteristically twisted.

In females eyes less prominent; penultimate sternite obtuse posteriorly; ultimate tergite and pygidium narrowed posteriorly and forceps simple and straight.

Distribution : AFRICA, MALAGASY, SEYCHELLES AND COMORO ISLANDS ; ASIA AND PAPUA-NEW GUINEA.

Remarks : Hincks (1959) for the first time revised this genus on the basis of male genitalia. The details of distal lobes are quite useful in discriminating closely related species.

In India, this genus is represented by seven species which includes two species new to science from Andaman Islands. Besides, the taxonomic position of *E. rufomarginatum* Borelli, is not certain since male genitalia is not yet described. Members of the genus are normally found under the loose bark of standing trees as well as dead and decaying logs.

Key to the species and species-Groups

- | | | |
|--------|---|---|
| 1 (6). | Size smaller (8.5-10.0 mm); some of the intermediate antennal segments subpyriform | |
| 2 (3). | Abdomen with series of spots giving impression of linear stripes | ... |
| | | <i>E. trilineatum</i> Borelli
(Yorkense-Group) |
| 3 (2). | Abdomen uniformly coloured or occasionally faint spots present on some of the tergites | ... |
| | | (Parvulum-Group) |
| 4 (5). | Male with pygidium about as long as broad, hind margin almost truncate; genitalia with virga shorter than the distal lobe and straight; female pygidium produced apically into a minute spine | |
| | | <i>E. parvulum</i> Dohrn |
| 5 (4). | Male with pygidium longer than broad, hind margin convex; genitalia with virga longer than the distal lobes, undulate; female pygidium acutely pointed posteriorly | ... |
| | | <i>E. andamanensis</i> sp. n. |
| 6 (1). | Size larger (10.0-16.3 mm); intermediate antennal segments not subpyriform, normal | |
| | | (Sumatranum-Group) |

- 7 (10). Legs yellow with femora and tibiae banded with blackish brown in basal half only ; male genitalia with virga undulate or almost straight apically
- 8 (9). Male genitalia with virga S-shaped ; female pygidium truncate apically *E. convolutum* Hincks
- 9 (8). Male genitalia with virga apically almost straight or gently curved ; female pygidium obtuse or convex posteriorly *E. dentiferum* Borelli
- 10(7). Legs yellow except femora banded with blackish brown in basal half only ; male genitalia with apical portion of virga forming a broad sickle shaped loop *E. nandii* sp. n.

69. *Echinosoma trilineatum* Borelli

(Figs. 310-315)

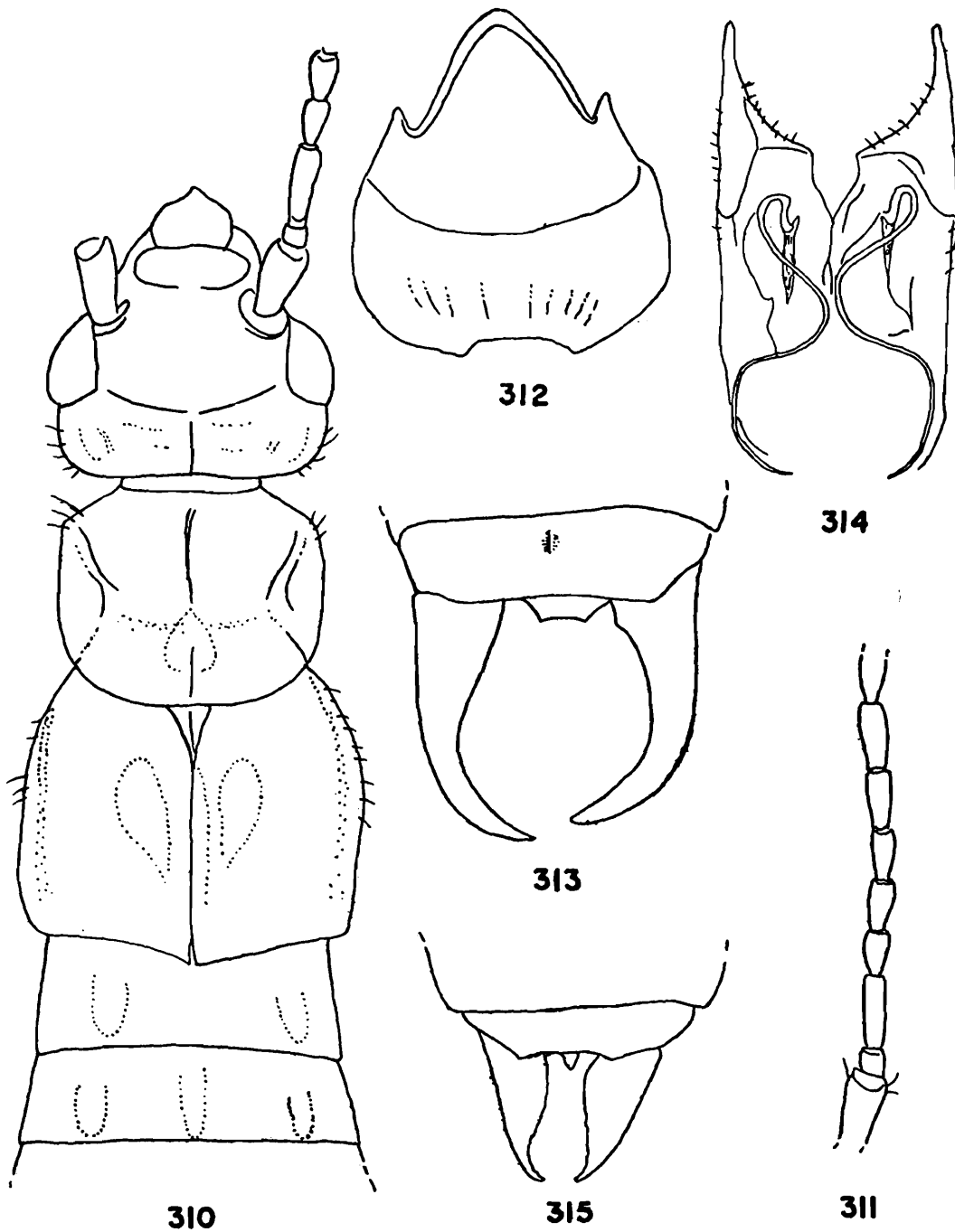
Echinosoma trilineatum Borelli, 1921, *Bull. Mus. Hist. nat. Paris*, 27 : 77 (♂ ; India, Tamil Nadu, Shembaganur) ; Borelli, 1931, *Rev. suisse Zool.*, 38 : 293 (♂, ♀ and nymph ; South India) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 139 (♂ genitalia) ; Kapoor, 1968, *Agra. Univ. J. Res. (Sci.)*, 16(1) : 4 ; Ramamurthi, 1968, *Zool. Anz.*, 181 (1 & 2) : 129 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 47 ; Brindle, 1975, *Ent. Scand. Suppl.*, 1 : 215 ; Steinmann, 1975, *Acta. Mus. Moraviae*, 60 : 157 (1 ex. ; Vietnam).

Echinosoma horridum (nec Dohrn) ; Steinmann, 1981, *Acta. zool. Acad. Sci. Hung.*, 27 (1-2) : 180 (♂ ; India : Tamil Nadu, Coimbatore Dist., Anamalai Hills, Cinchona, 3,500 ft.).

♂ : General colour brownish black. Antennae with 2nd, 15th and 16th segments yellowish brown. Pronotum laterally with a yellowish brown triangular spot and medially in the posterior 1/3 with a narrow yellowish brown oval spot. Elytra with a yellow rounded spot apically close to internal margin and along the costal margin, with a faint yellowish brown stripe near internal margin and apically yellowish brown. Legs yellowish brown, fore-femora in basal 3/4 and middle and hind femora and tarsi banded in basal 1/2 with black. Abdomen with a median and sublateral longitudinal stripes of reddish brown, becoming broader posteriorly, forceps reddish brown with a shade of black at base ; sternal plates yellow. Body covered with short yellow thick setae besides fine, short pubescence, arising from each punctulation.

Head about as long as broad, frons weakly raised and not well differentiated from occiput, sutures obsolete, median suture feebly represented by a fine depression, hind margin slightly emarginate. Eyes not very prominent, about as long as the post-ocular area. Antennae

16-segmented, 1st stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd transverse, short ; 3rd long, cylindrical, slightly longer than the combined length of 4th and 5th ; 4th onwards segments gradually increasing in length and thinning



Figs. 310-315 : *Echinosophia trilineatum* Borelli, ♂, 310. Anterior half of body ; 311. A few basal antennal segments ; 312. Penultimate sternite ; 313. Ultimate tergite and forceps ; 314. Genitalia ; ♀, 315. Ultimate tergite and forceps.

distally. Pronotum weakly transverse, anterior margin straight, sides gently reflexed and lightly convex, hind angles well and margin briefly rounded, latter with a faint depression in middle, median

sulcus fine but distinct ; prozona raised and well differentiated from flat metazona. Elytra and wings abbreviated, former with shoulder weak, gently expanded posteriorly with hind margin truncate ; latter represented by narrow lateral lobes. Legs normal. Abdomen enlarged posteriorly up to 9th tergite, weakly convex, finely punctulate, sides of abdominal segments 7th to 9th obtuse angled and with a lightly curved median carina. Penultimate sternite transverse, finely punctulate, covered with fine, long, yellow pubescence, with an elongated, roughly triangular median depression in apical half, hind margin deeply emarginate with lateral angle produced as an obtuse lobe. Ultimate tergite strongly transverse, sloping backwards, above the bases of forceps feebly raised, hind margin straight, laterally slightly oblique. Pygidium scarcely visible from above, vertical, trapezoidal, narrowed apically, lateral and hind margin straight, postero-laterally with a small tubercle. Forceps smooth, devoid of pubescence except at extreme base, remote, cylindrical, tapering apically, almost straight in basal 1/3, afterwards gradually curving with tip pointed and gently hooked, internal margin smooth. Genitalia with parameres slightly more than 1/2 the length of proparameres, lightly incurved, strongly narrowed apically ; distal lobes about as long as parameres ; virga longer than the distal lobes, at base with a small lobe, tapering apically, undulate, convolutions sigmoid.

♀ : Agrees with males in most characters except that penultimate sternite broadly convex and ultimate tergite narrowed posteriorly ; pygidium produced into a conical point posteriorly ; forceps expanded, almost straight, internal margin crenulate.

Measurements (in mm) :

	♂	♀
Length of body	7.5-8.5	7.6-8.5
Length of forceps	1.0-1.5	1.1-1.5

Distribution : INDIA : Tamil Nadu, Madura Dist., Shembaganur ; Mullaperiyar, Nilgiri Hills, Hill groove, Palni Hills, Maryland, Tiger-shola ; Kerala : Malabar, Nilampatty Hills, Palagapandy, 3500 ft., Silent Valley ; Perriyar Wild Life Sanctuary, Thekkady, 800 m.

Type : Holotype ♂ in MNHP.

Remarks : The material from Mullaperiyar in Tamil Nadu and Silent Valley and Thekkady in Kerala is present in the ZSI collections.

The 2 ♂ ♂ referred to *E. horridum* Dohrn, by Steinmann (1981) were examined through the courtesy of Dr. J. P. Duffels of ITZA. These actually belong to this species.

Hincks (1959) who examined the type of the species states that two proximal antennal segments are yellow whereas in the material examined by me 2nd, 15th and 16th segments are yellowish brown. In all other details it agrees with the description of the species by Borelli (1921a) and Hincks (l.c.).

It can be easily differentiated from other known species by the general body colouration and the shape of ♂ genitalia.

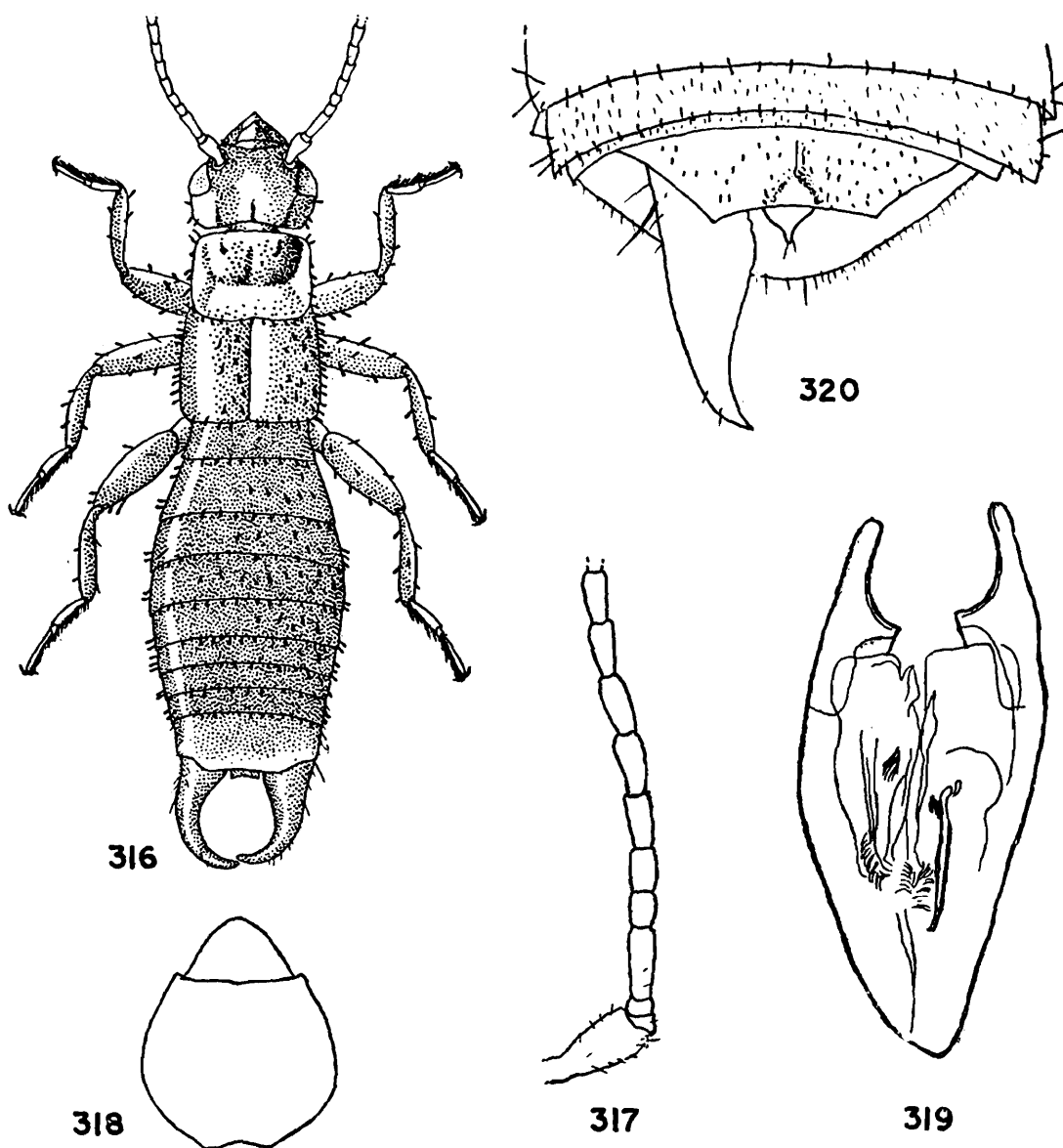
70. *Echinosoma parvulum* Dohrn

(Figs. 316-320)

Echinosoma parvulum Dohrn, 1863, *Stettin. ent. Ztg.*, 24 : 66 (♀ ; Ceylon) ; Bormans and Krauss, 1900, *Das Tierreich*, 11 : 26, 29 ; Burr, 1901, *J. Bombay nat. Hist. Soc.*, 14 : 77 ; Burr, 1910, *Fauna Brit. India Dermaptera* : 72 (♂, ♀ ; Ceylon) ; Burr, 1910, *Trans. R. ent. Soc. Lond.*, 1910 : 164 ; Burr, 1911, *Genera Insect.*, 122 : 23 ; Burr, 1911, *Stettin. ent. Ztg.*, 1911 : 332 ; Burr, 1912, *Annl. naturh. Mus. Wien.*, 26 : 71 ; Burr, 1915, *J. R. micr. Soc.*, 1915 : 438, pl. 8, fig. 3 ; Hincks, 1955, *Syst. mono. Dermaptera*, 2 : 111 ; Brindle, 1967, *Ark. Zool.*, (2) 20 (7) : 154 ; Brindle, 1971, *Ent. Scand. Suppl.*, 1 : 214 ; Kapoor, 1968, *Agra. Univ. J. Res. (Sci.)*, 16 (1) : 4 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 47 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 8 ; Steinmann, 1975, *Acta. Mus. Moraviae*, 60 : 157 (1 ex. ; Vietnam) ; Steinmann, 1979, *Folia. Ent. Hung.*, 32(1) : 152.

♂ : General colour smoky brown. Antennae with base of 1st segment and whole of 2nd yellow ; remaining lighter in colour near base only. Mouth parts, sides of pronotum and wings internally, when present, often yellowish brown. Legs yellowish brown with femora in basal half smoky brown. Abdominal tergites and forceps somewhat brownish, former with hind margin of each tergite darker. Body covered sparsely with short, thick setae and fine yellow pubescence also, not dense. Head about as long as broad, frons moderately convex, gradually passing into sloping occiput, sutures fine, obscurely marked, hind margin emarginate posteriorly. Antennae 17-segmented, basal segment stout, yellow at base, expanded apically, shorter than the distance between antennal bases ; 2nd short, transverse, yellow ; 3rd long and cylindrical, slightly longer than the combined length of 4th and 5th ; 4th onwards gradually increasing in length and pear shaped, apical ones thinning. Eyes moderately prominent, slightly longer than the post-ocular area. Pronotum weakly transverse, anteriorly and laterally straight, latter gently reflexed, hind angles well rounded and margin subtruncate with slight emargination in middle. Elytra abbreviated, humeral angle weak, slightly expanded posteriorly, meeting along

the internal margin, hind margin obliquely truncate, axillary angles rounded off, exposing a narrow, triangular scutellum. Wings normally concealed, when present almost as long as the elytra and covering most part of abdomen. Abdomen long, finely punctulate, narrowed at base, gently enlarging in middle, afterwards almost parallel sided, moderately convex, sides of segments broadly convex posteriorly, punctulate and



Figs. 316-320 : *Echinotoma parvulum* Dohrn, ♂, 316. Dorsal view ; 317. A few basal antennal segments ; 318. Penultimate sternite ; 319. Genitalia ; Holotype ♀, 320. Hind portion of body, right branch of forceps missing.

ecarinate. Penultimate sternite roughly triangular, finely punctulate and covered with short and long, fine pubescence, laterally margin oblique and posteriorly distinctly emarginate. Ultimate tergite transverse, finely punctulate, fine, short hair arising from each puncture, sides straight and parallel, disc weakly raised above, sloping backwards with a vague, triangular depression in middle, hind margin straight,

laterally oblique. Pygidium vertical, about as long as broad, feebly narrowed posteriorly, hind margin almost truncate. Forceps remote at base, smooth, cylindrical, tapering apically, almost straight in basal one thirds, thence incurved, apices gently hooked and pointed, internal margin smooth. Genitalia with parameres about $1/2$ as long as the proparameres, external margin faintly undulate, tip rounded; virga shorter than the distal lobes, at base somewhat lobed and with a small accessory sclerite, tubular, straight, laterally covered with membranous sheath, at base and near apex of virga a bunch of chitinous teeth present; distal lobes longer than the parameres.

♀ : Agrees with male in most characters except penultimate sternite posteriorly broadly convex; ultimate tergite more contracted posteriorly with middle portion of hind margin very short and the area corresponding bases of forcep produced into minute, triangular, pointed lobe; pygidium produced posteriorly into a minute spine and forceps subcontiguous, straight tapering apically, a little before apex gently incurved with tip pointed, internal, margin finely crenulate.

Measurements (in mm) :

	♂	♀
Length of body	5.1-9.1	8.0-9.1
Length of forceps	0.9-1.1	0.9-1.0

Distribution : INDIA : Tamil Nadu : Nilgiri Hills, Cherangode; Madura Dist., Shembaganur; Karnataka : Belgaum Dist., Londa, 634.34 m; Madhya Pradesh : Jabalpur (ZSI); Uttar Pradesh : Dehra Dun Dist., Lachiwala (FRI).

Known from SRI LANKA and VIETNAM also.

Type : Type ♀ in ZMHB.

Remarks : This species generally occurs under the loose bark of dead decaying logs as well as standing trees. However, it is sometimes attracted to light also.

Both brachypterous and macropterous specimens are found but the latter form appears to be less common. Besides, in macropterous form although elytra appears to be abbreviated, wings are quite long in being about as long or longer than the elytra and almost covering the whole abdomen. Some minor colour variations are common, especially the smoky band of femora which may be quite distinct or sometimes vaguely marked on fore femora. In freshly spirit preserved specimens antennal segments are lighter in colour basally and ringed with yellow at apex. But in dried up material this condition is not discernible.

The type ♀ of the species was very kindly sent to me on loan by Dr. Kürt K. Günther of ZMBH. It is a macropterus specimen and the right antennae and forceps are missing. The pronotum is yellowish laterally in middle and the wings are yellow with a brownish black spot in the middle. The material present in the ZSI and FRI is conspecific. Besides, the interpretation of Burr (1910, 1915) and Hincks (1959) about the species appears to be correct.

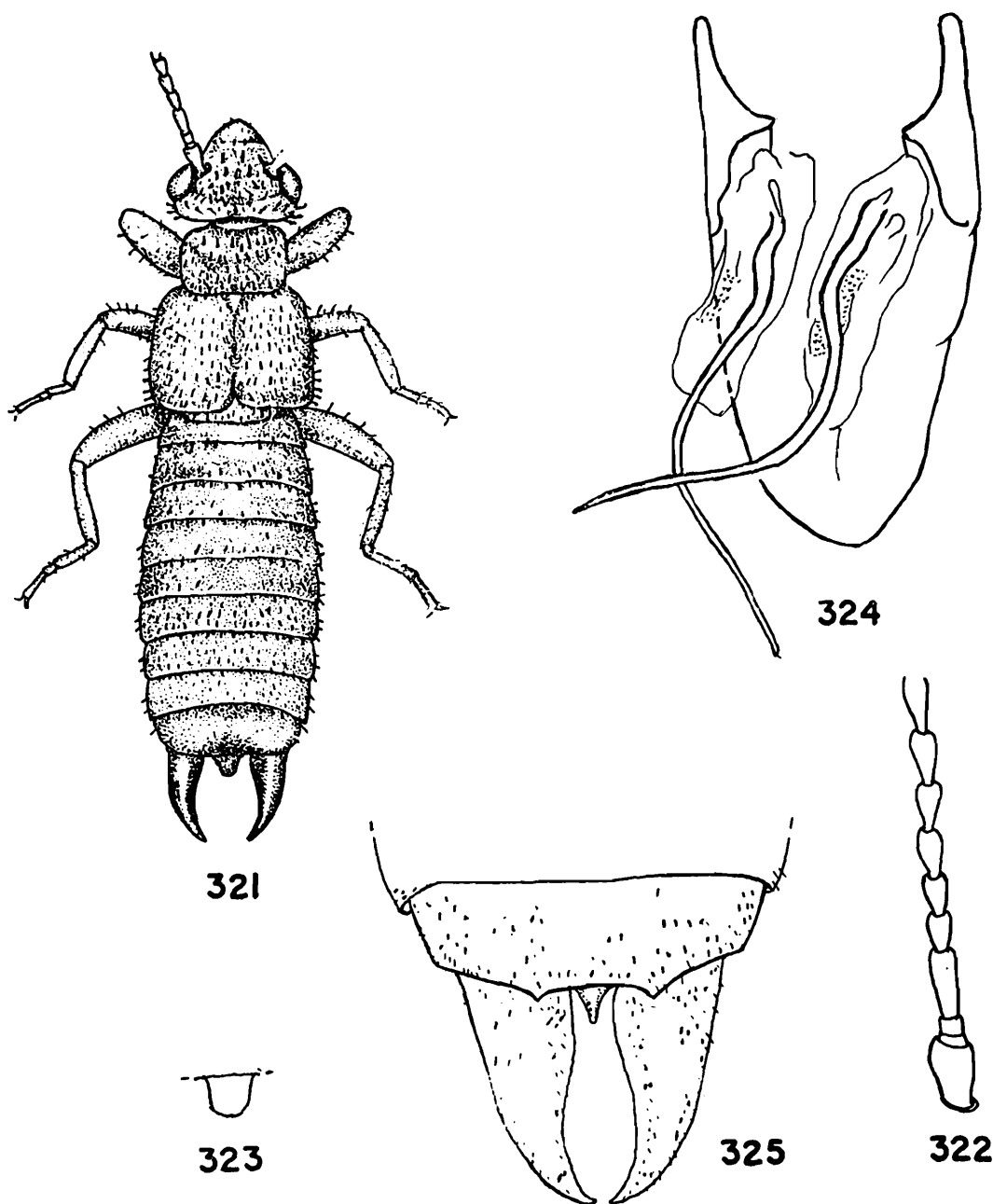
It was originally described from Sri Lanka and subsequently recorded from Peninsular India but the material from Madhya Pradesh and Uttar Pradesh (Kumaon Hills) extends its distribution in Himalayas via Central India.

71. **Echninosoma andamanensis** sp. n.

(Figs. 321-325)

♂ : General colour dull smoky black but abdomen, pygidium and forceps shining. Mouth parts yellowish brown. Antennae smoky brown except basal two smoky dull whitish and both annulated with dull white apically. Pronotum somewhat lighter in colour posteriorly and laterally. Legs smoky dirty white but femora with a broad smoky black band. Covered with thick setae and fine pubescence sparsely. Head a trifle broader than long, frons moderately convex, not well differentiated from occiput, transverse suture obsolete, median suture marked by a fine groove, hind margin feebly emarginate in middle, surface somewhat rough. Eyes moderately prominent, distinctly longer than post-ocular area. Antennae 11-segmented or more, 1st stout, expanded apically, shorter than the distance between antennal bases and the 3rd segment ; 2nd small, about as long as broad ; 3rd long and cylindrical, slightly longer than the combined length of 4th and 5th ; 6th onwards segments gradually increasing in length but all shorter than 3rd ; 4th and 5th pyriform, remaining also narrowed at base and expanded apically. Pronotum quadrate, transverse, sides and hind margin lightly convex, former gently reflexed and latter with a faint emargination in middle, prozona moderately raised but well differentiated from flat metazona ; median sulcus fine but distinct, surface rough. Elytra about two third as long as the pronotum, surface rough, obscurely tuberculated, meeting along the sutural margin except near base where axillary angles briefly rounded off, exposing a narrow, triangular but smooth and shining scutellum, hind margin obliquely truncate. Wings wanting. Legs typical for the genus. Abdomen

elongated, narrowed at base and apex, shining in parts, sparsely punctate, sides of segments rounded, ecarinate. Penultimate sternite with hind margin sinuate in middle. Ultimate tergite transverse, shining, finely punctulate, flat above, in anterior half, median sulcus



Figs. 321-325 : *Echinossoma andamanensis* sp. n., Holotype ♂, 321. Dorsal view ; 322. A few basal antennal segments ; 323. Pygidium ; 324. Genitalia ; Paratype ♀, 325. Ultimate tergite and forceps.

faintly marked, hind margin in middle straight, laterally oblique. Pygidium longer than broad, vertical, narrowed apically with apex rounded, smooth. Forceps remote, cylindrical, tapering apically, gently curved, apices sharply pointed, inner margin unarmed, smooth, shining, short yellow pubescence present at base only. Genitalia with parameres almost straight with tip rounded ; virga long, about twice as long as the distal lobes, tubular, tapering apically.

♀ : Agrees with male in most characters except ultimate tergite slightly narrowed posteriorly ; pygidium acutely pointed posteriorly and forceps simple, straight, obscurely serrated internally.

Measurements (in mm) :

	Holotype	Paratype
	♂	♀
Length of body	6.1	6.7
Length of forceps	0.8	0.75

Material examined : INDIA : Middle Andaman, 8 km W of Rangat, Holotype ♂ (genitalia mounted between two coverslip and pinned with the specimen), Paratype 1 ♀, 7.xii.1979, ex decaying log (*B. Nandi*), deposited in ZSI.

Remarks : In having the abdomen uniformly coloured and some of the intermediate antennal segments subpyriform the described species belongs to *Parvulum* Group.

It can be easily separated from *E. parvulum* Dohrn by the shape of various parts of male genitalia, especially virga and the female pygidium.

72. *Echinosoma convolutum* Hincks

(Figs. 326-331)

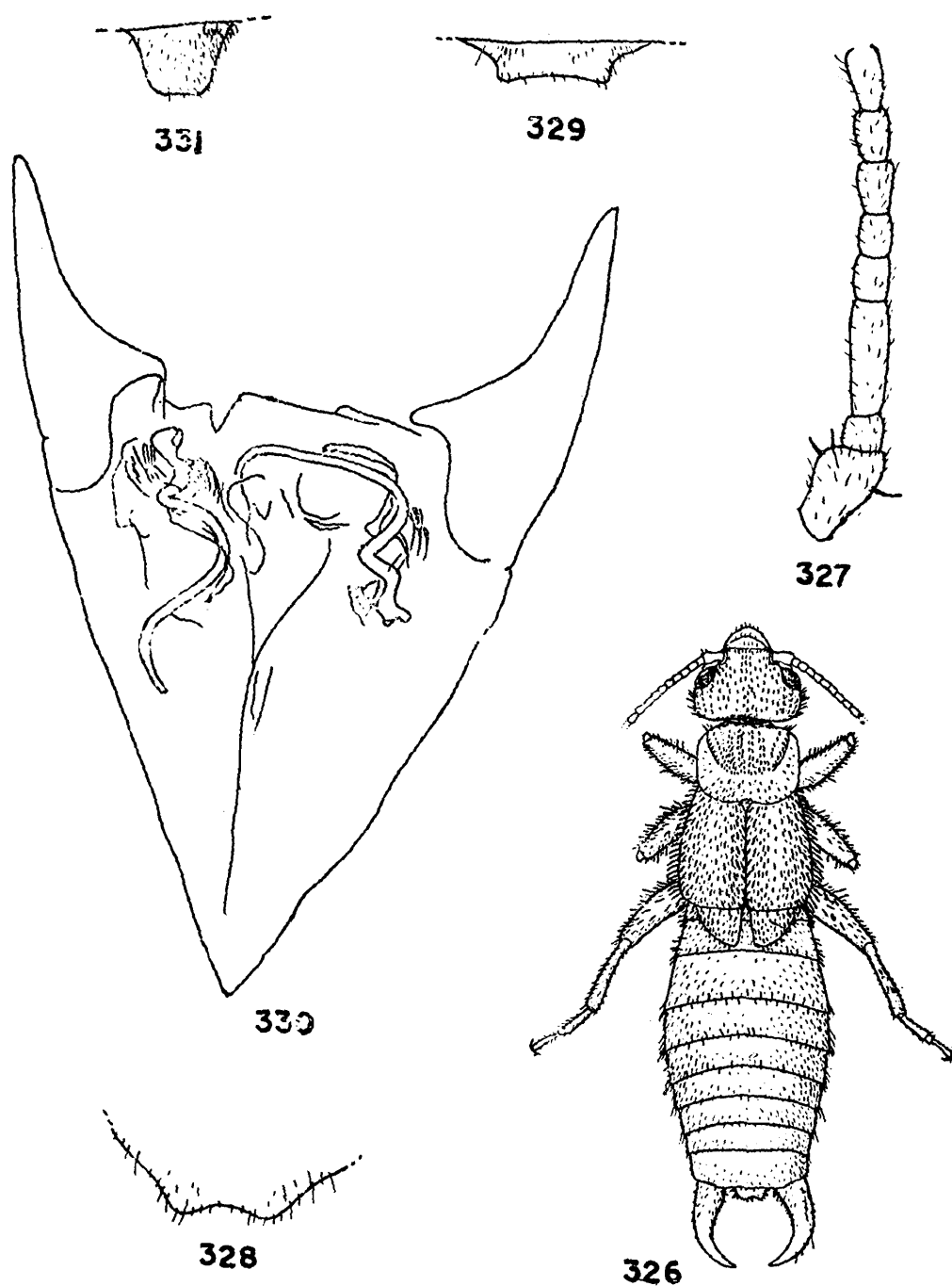
Echinosoma sumatranum (de Haan) (in part), Bormans, 1888, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 6 : 433 (Burma); Bormans and Krauss, 1900, *Das Tierreich*, 11 : 26, 28 (Burma); Burr, 1910, *Fauna Brit. India Dermaptera* : 70 (Burma); ? Burr, 1912, *Annaln naturh. Mus. Wien*, 26 : 70 (Burma).

Echinosoma convolutum Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 152 (♂, ♀; Burma and Tonkin (Vietnam); Brindle, 1967, *Ark. Zool.*, (2) 20 (7) : 155; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 52; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 9; Srivastava, 1983; *Proc. Symp. High Altitude Entomology and Wild life Ecology* : 108.

♂ : General colour smoky brown, often abdominal tergites reddish black or blackish brown. Mouth parts, two basal antennal segments and sides of pronotum yellow. Legs yellow with femora and tibiae blackish brown in basal half only. Elytra often lighter in colour along the sutural margin. Wings yellow with a blackish brown rounded spot apically, intensity of spot variable. Body covered with thick setae as well as fine pubescence.

Head about as long as broad, frons and occiput hardly differentiated, moderately convex, sloping backwards, sutures represented by feeble

depressions, hind margin feebly emarginate in middle. Eyes moderately prominent, equal to the post-ocular area in length. Antennae 25-segmented or more, basal segment greatly expanded apically, shorter than the distance between antennal bases ; 2nd short, about as long as



Figs. 326-331 : *Echinosophora convolutum* Hincks, ♂, 326. Dorsal view ; 327. A few basal antennal segments ; 328. Posterior margin of penultimate sternite ; 329. Pygidium ; 330. Genitalia ; ♀, 331. Pygidium.

broad ; 3rd long and cylindrical, slightly longer than the combined length of 4th and 5th ; segments 4th to 6th stout, gently expanded apically, afterwards segments somewhat less stout, thinning and gradually increasing in length. Pronotum transverse, anterior margin

feebly convex, sides straight, gently reflexed, hind angles and margin rounded, latter with a slight emargination in middle, median sulcus distinct ; prozona convex, with linear smooth stripes and areas with setae alternating, well differentiated from flat metazona. Elytra well developed, rugulose, clad with thick setae, shoulders weak, meeting along the suture, hind margin truncate, axillary angles feebly rounded off, showing a small, triangular scutellum. Wings normal, some variation in length noted. Legs typical for the genus. Abdomen slightly enlarged in middle, punctate above but weaker on posterior tergites, sides of segments 5th to 7th obtuse angled and faintly carinate. Penultimate sternite punctate, emarginate posteriorly. Ultimate tergite transverse, gently contracted posteriorly, sides straight, hind margin in middle straight, laterally oblique and emarginate, disc above moderately convex, sloping backwards with a transverse depression in posterior half. Pygidium vertical, transverse, feebly narrowed apically, hind margin lightly concave, covered with fine yellow pubescence. Forceps with branches remote at base, roundedly trigonal, tapering apically, almost straight in basal half, afterwards gently incurved with tip pointed and gently hooked, internal margin smooth or often provided with one or two fine teeth in apical half only. Genitalia (at rest) with parameres not meeting apically, distal lobes shorter than the parameres and provided with chitinous teeth and bands ; virga convoluted, loop at base shorter and apical one roughly S-shaped.

♀ : Agrees with males in most characters except that penultimate sternite broadly convex posteriorly ; ultimate tergite more contracted posteriorly ; pygidium vertical, about as long as broad or longer, hind margin truncate with a faint emargination in middle and forceps more slender and less arcuate apically.

Measurements (in mm) :

	♂	♀
Length of body	9.5-12.6	8.4-14.5
Length of forceps	1.5-2.2	1.6-2.8

Distribution : INDIA : Arunachal Pradesh ; Assam and West Bengal (Darjeeling Dist. only).

Also know from BURMA and VIETNAM.

Types : Holotype ♂ and Allotype ♀ in BMNH ; Paratype ♂ in BMNH and MNHP.

Remarks : As per available material in ZSI this species occurs in large numbers in the foot hills of Himalayas in a variety of habitats. But occasionally it is reported from higher altitudes as well where, of course, only limited number of individuals are found. Very often large number of nymphs are met with in the field which are more or less replicas of their adults except for size and more notably the presence of spots on abdominal tergites presenting a sort of linear pattern and pygidium pointed apically.

Generally the specimens collected fresh from the field provide dull appearance due to accumulation of dirt on body parts. When cleared with Benzene or any other cleaning agent the abdominal segments and forceps emerge as shining blackish brown. Normally the whole body is covered with short thick, apically truncate setae along with fine long and short pubescence but these are liable to be brushed off during cleaning or sometimes with the age of the preserved material.

This species comes very close to *Echinosoma dentiferum* Borelli, from Bhutan and India but differs by the shape parameres in being comparatively straight externally and the distal loop of virga roughly S-shaped in males and in females pygidium is comparatively broader, narrowed apically with apex truncate.

The Paratype females of *E. garoensis* Lahiri and Ghosh, contain members of two species ; those which possess pygidium truncate posteriorly are referable here and the others with pygidium obtuse apically belong to *E. dentiferum* Borelli with *E. garoensis* as its synonym.

73. *Echinosoma dentiferum* Borelli

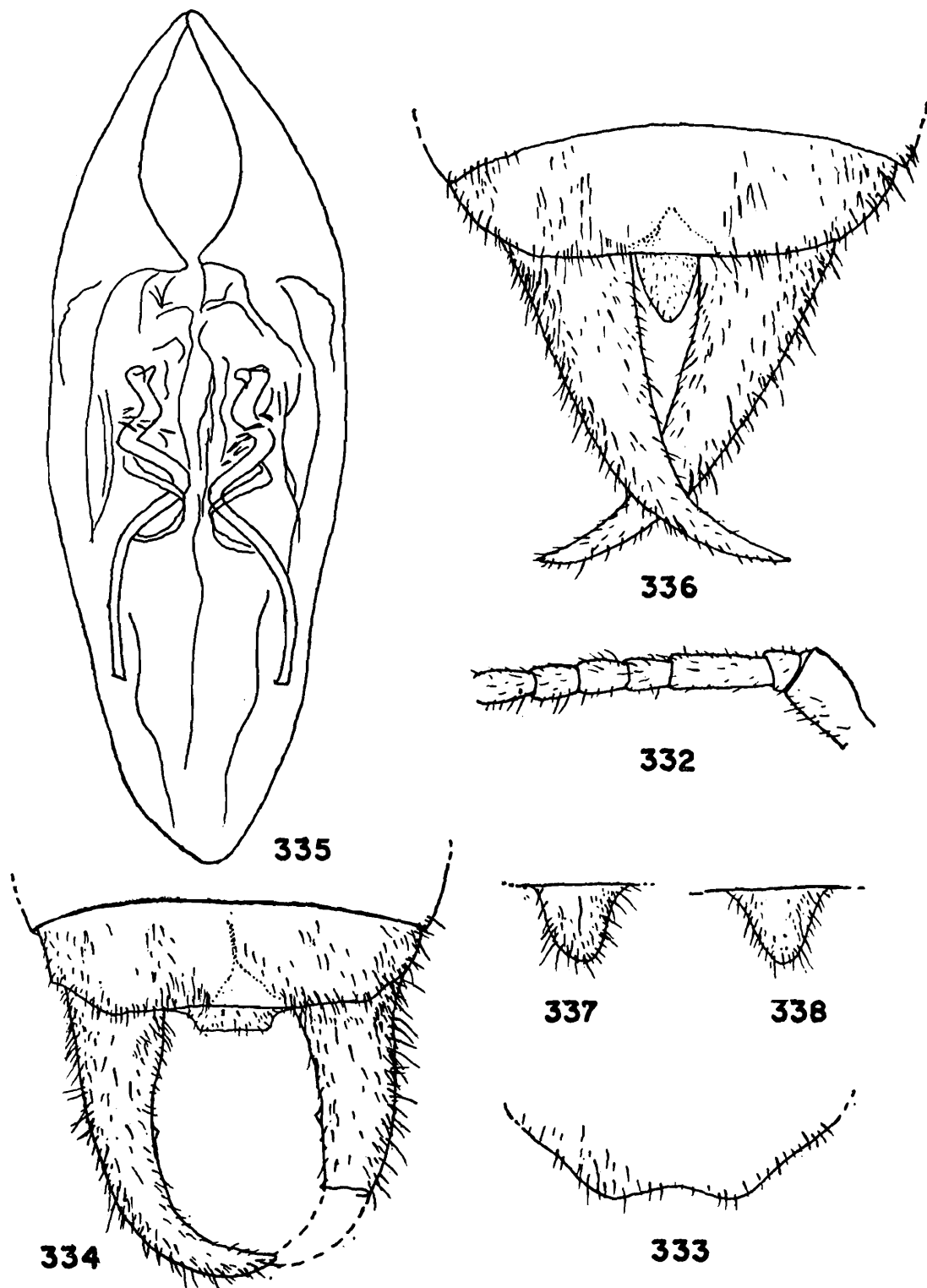
(Figs. 332-338)

Echinosoma dentiferum Borelli, 1912, *Bull. Mus. Hist. nat. Paris*, 18(4) : 223 (♂ ; Bhutan) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 159 ; Sakai, *Dermapterorum Cat. Prael.*, 3 : 54 ; Brindle, 1975, *Ent. Besiliensia*, 1 : 14 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 9.

Echinosoma garoensis Lahiri and Ghosh (pars), in Biswas Lahiri and Ghosh, 1974, *Orient. Insects*, 8(4) : 421 (Holotype ♂, Allotype ♀ and Paratype ♀ with obtuse pygidium ; India : Meghalaya, Garo Hills)—Syn. nov.

♂ : General colour blackish brown. Mouth parts, basal two antennal segments yellowish. Pronotum with a yellow triangular spot laterally. Legs yellow with femora and tibiae shaded with blackish brown in a little more than basal half. Wings yellow with a smoky

spot apically close to internal margin. Thick setae and fine pubescence all over the body. Sides of abdomen with long stiff hairs besides long pubescence.



Figs. 332-338 : *Echinosoma dentiferum* Borelli, ♂, 332. A few basal antennal segments; 333. Posterior margin of penultimate sternite; 334. Ultimate tergite and forceps; 335. Genitalia; ♀, 336. Ultimate tergite and forceps; 337 and 338. Pygidium (Figs. 337 and 338 drawn from Paratype ♀ and Allotype ♀ of *Echinosoma garoensis* Lahiri and Ghosh in Biswas, Lahiri and Ghosh, 1974, respectively).

Head about as long as broad, a trifle broader in the region of eyes, frons moderately convex and occiput also somewhat similar, not much differentiated, former having small patches of smooth areas and latter with broad longitudinal stripes of smooth areas alternating with narrow stripes clad with thick setae, sutures indicated by faint depression, hind margin feebly emarginate in middle. Antennae (generally broken apically) 25-segmented or more, 1st segment stout, expanded apically, shorter than the distance between antennal bases ; 2nd small, transverse ; 3rd long, cylindrical, slightly longer than the combined length of 4th and 5th ; segments 4th to 8th stout, gently expanded apically, all longer than broad ; 9th onwards segments gradually thinning and slightly increasing in length. Pronotum transverse, surface rough and dull coloured due to the deposition of dirt, anterior margin straight, sides gently convex and reflexed, hind angles and margin rounded, latter with faint emargination in middle, median sulcus marked by a polished line ; prozona moderately raised with longitudinal stripes of smooth and areas with thick setae alternating, metazona strongly depressed. Elytra and wings well developed, rough, former with axillary angle weak, exposing a narrow triangular scutellum, hind margin truncate. Legs normal. Abdomen enlarged in middle, narrowed anteriorly and posteriorly, punctation shallow, closely placed, covered with thick, long, yellow pubescence besides thick setae and long thick hairs, more pronounced laterally, sides of abdominal segments broadly convex.

Penultimate sternite transverse, punctation shallow and coalescent, covered with fine, long, yellow pubescence, hind margin emarginate in middle. Ultimate tergite transverse, punctation weak, covered with fine, long, yellow pubescence all over except for a smooth median triangular area posteriorly, disc convex, feebly depressed in middle transversely. Pygidium vertical, covered with fine yellow pubescence, weakly transverse, hind margin feebly concave and laterally with fine a tubercle. Forceps covered with long and short, fine, yellow pubescence in basal half, remote at base, cylindrical, smooth, tapering apically, almost straight in basal half, thence moderately incurved with tip pointed and hooked, internally armed at middle with a small tooth. Genitalia (at rest) with parameres meeting apically, external margin broadly curved ; dital lobes with rows of pointed teeth and spirally coiled, thin, chitinous accessory plates ; virga in basal half with one or two convolutions, apically almost straight, very slightly curved only at the base of apical half.

♀ : Agrees with males in most characters except that the penultimate sternite broadly rounded posteriorly ; ultimate tergite narrower apically ; pygidium triangular, narrowed posteriorly or comparatively broader with hind margin obtuse or convex and branches of forceps slender and less arcuate apically.

Measurements (in mm) :

	♂	♀
Length of body	11.5-13.0	10.0-10.5
Length of forceps	1.7-1.8	1.45-1.5

Distribution : INDIA : Arunachal Pradesh, Kameng Dist. ; Meghalaya : Khasi Hills, around Barapani, on road from Mawsamai to Shella ; West Bengal : Jalpaiguri Dist., Hashimara, Darjeeling Dist., Kalijhora (all ZSI) ; Uttar Pradesh, Dehra Dun Dist. (FRI). Also recorded from BHUTAN.

Types : Holotype ♂ of *E. dentiferum* Borelli in MNHP and Holotype ♂, Allotype ♀, Paratypes 2 ♀ ♀ and 2 nymphs (not ♀) of *E. garoensis* Lahiri and Ghosh in ZSI.

Remarks : Type series of *Echinosoma garoensis* Lahiri and Ghosh consisting of Holotype ♂, Allotype ♀ and Paratypes 2 ♀ ♀ and 2 nymphs instead of 4 ♀ ♀ paratypes as mentioned in original description (Biswas, Lahiri and Ghosh, 1974) were examined. The ♀ pygidium in this species is longer than broad, narrowed posteriorly with hind margin obtuse in Allotype ♀ and somewhat convex in Paratype females.

In another female collected along with a male and nymphs from Meghalaya pygidium is strongly narrowed with apex obtusely pointed. Therefore it may be deduced that some variations exist in the shape of female pygidium but basic structure is same i.e. convex posteriorly.

Since *E. garoensis* and *E. dentiferum* are identical in most of the details it is proposed to sink here the former under the latter.

This species is externally very similar to *E. convolutum* Hincks but differs by the presence of denser, long and short, yellow pubescence all over the body except apical portion of forceps together with long, stiff hairs on sides of abdominal segments ; in ♂ by the ecarinate and broadly convex sides abdominal segments and virga longer with apical portion almost straight or gently curved. Besides, ♀ pygidium is triangular or obtuse posteriorly.

It has been noted that *E. convolutum* and *E. dentiferum* cohabit in nature. Very often females of one or both species are collected in association with males of either species only. Therefore while determining the species more reliance should be placed on the combination of various characters rather than any particular character or sex alone.

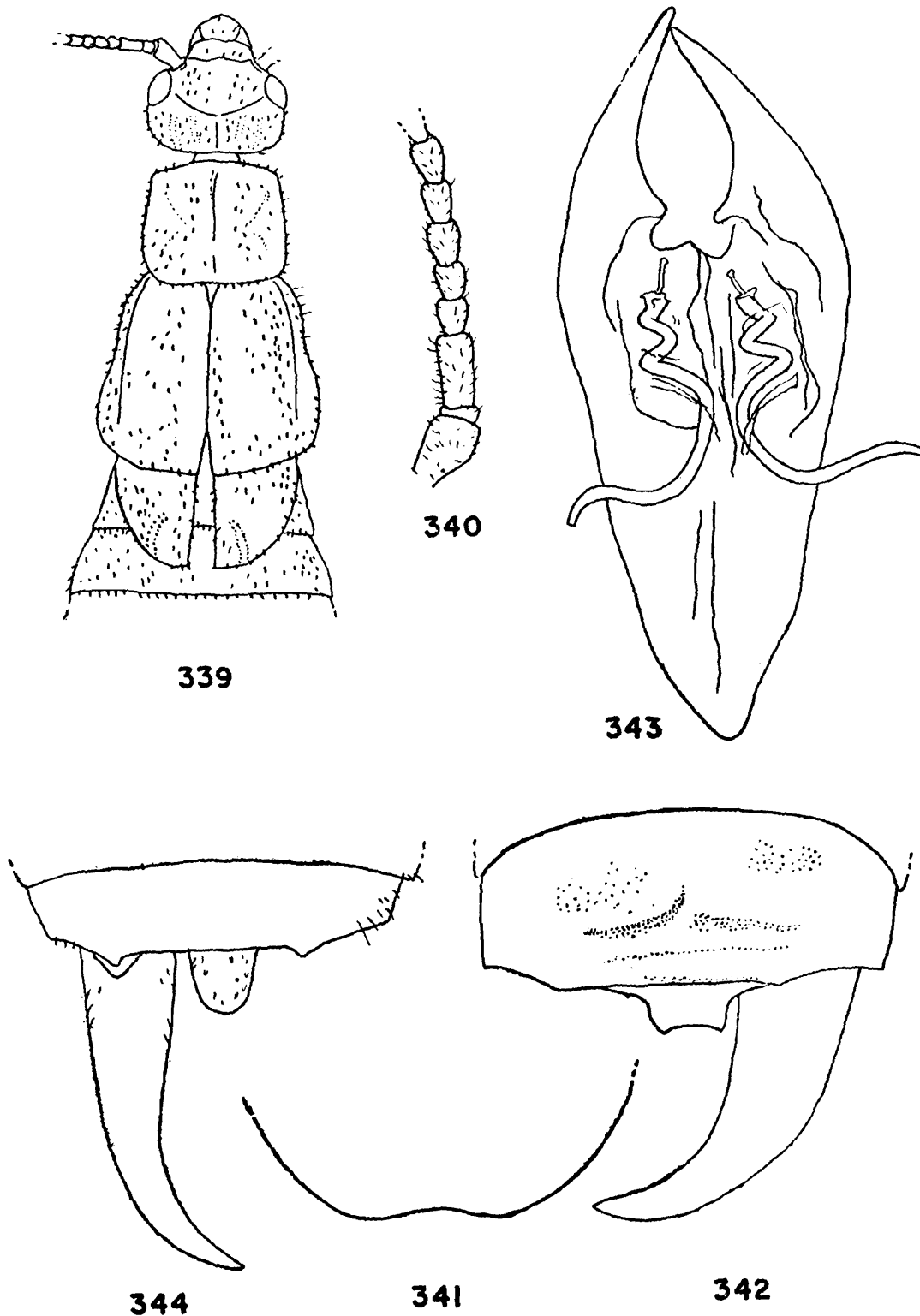
74. *Echinosoma nandii* sp. n.

(Figs. 339-344)

♂ : General colour blackish brown, elytra somewhat lighter in colour in middle ; mouth parts, basal two segments of antennae, pronotum laterally yellow, wings yellow, faintly shaded with brown apically. Legs yellow except fore-femora in a little less than basal half and middle and hind ones in basal half blackish brown. Body covered with fine pubescence and thick setae.

Head about as long as broad, frons convex, sutures obsolete, hind margin emarginate. Eyes not very prominent, a trifle longer than the post-ocular area. Antennae with basal segment expanded apically, shorter than the distance between antennal bases ; 2nd as long as broad ; 3rd long, cylindrical, longer than the combined length of preceding two segments ; 4th slightly longer than broad, remaining gradually increasing in length and thinning, each gently contracted basally. Pronotum quadrate slightly broader posteriorly, anteriorly convex, sides straight, hind angles and margin rounded, latter with a feeble concavity in middle, median sulcus distinct, prozona convex and well differentiated from depressed metazona. Elytra and wings well developed, former with axillary angles rounded off to show a small, triangular scutellum. Legs normal. Abdomen moderately convex, narrowed at base and apically, heavily and densely punctate, punctation finer on apical tergites, covered with setae and fine yellow pubescence ; sides of segments 7th to 9th posteriorly convex and ecarinate. Penultimate sternite transverse, punctulate and covered with fine pubescence, hind margin in middle emarginate. Ultimate tergite transverse, punctulate, moderately convex in posterior half with a broad, more or less triangular depression, hind margin in middle straight, lightly incrassate, laterally oblique and emarginate. Pygidium vertical, covered with fine pubescence, about as broad as long, narrowed posteriorly, postero-lateral angles a little projecting with hind margin lightly concave. Forceps with branches covered with fine pubescence, remote at base, cylindrical, tapering apically, almost straight in basal

half, thence strongly incurved with apices gently hooked and pointed. Genitalia with virga, at rest, convoluted and a little over twice the length of distal lobes, basally with two brief convolutions and the apical one is broad and sickle shaped.



Figs. 339-344: *Echinotoma nandii* sp. n., Holotype ♂, 339. Anterior half of body; 340. A few basal antennal segments; 341. Posterior margin of penultimate sternite; 342. Ultimate tergite and forceps, left branch missing; 343. Genitalia; Paratype ♀, 344. Ultimate tergite and forceps, right branch missing.

♀ : Agrees with male in most characters except penultimate sternite broadly convex posteriorly ; ultimate tergite with a polished triangular area in middle posteriorly ; pygidium slightly longer than broad, subvertical, rounded posteriorly, covered with thick setae at base and forceps more slender and comparatively less arcuate.

Measurements (in mm) :

	Holotype	Paratypes	
	♂	♂	♀
Length of body	10.2	10.5	7.5-9.9
Length of forceps	1.2	1.4	1.4-1.45

Material examined : INDIA : Andaman Islands (North), Lakshmipur 7 km NW of Diglipur, Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen ; left forceps missing), Paratype 1 ♀, 14.xii.1978, ex decaying log, (*B. Nandi*) (ZSI) ; Andaman Islands (no further data), Paratype 1 ♂ (genitalia mounted between two coverslips and pinned with the specimen), RRD. 83, RCR 32, Cage 698, ex unknown wood, 7.v.1930, (*C.F.C. Beeson*) (FRI) ; South Andaman, Ferrargunj, Paratype 1 ♀, 17.iii.1975 (*G. K. Srivastava*) (ZSI).

Remarks : This species is externally very similar to *Echinosoma convolutum* Hincks and *E. dentiferum* Borelli but differs from both of them by the colouration of legs in being yellow except the basal half of femora and the ♂ genitalia with distal loop of virga sickle shaped.

In the described species there appears to be some variation in the colouration of pronotum. Normal condition appears to be with sides yellow but in the Paratype ♂ (FRI coll.) yellow stripe is continuous posteriorly as well. In all the specimens the colouration of legs is constant like that of antennal segments and is of great use in separating it from closely related species. Besides the details of ♂ genitalia are also characteristic.

DOUBTFUL SPECIES

75. *Echinosoma rufomarginatum* Borelli

Echinosoma rufomarginatum Borelli, 1931, *Revue suisse Zool.*, 38 : 293, fig. 1 (♂, ♀ ; South India : Anamalais, Valparai) ; Hincks, 1959, *Syst. mono. Dermaptera*, 2 : 146 ; Kapoor, 1968, *Agra Univ. J. Res. (Sci.)*, 16 (1) : 4 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 49 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 8.

♂ : Head chocolate-brown, covered with yellow and black hairs ; clypeus black, yellow in the anterior half ; upper lip (labrum) testaceous brown, palpi yellowish ; slightly convex, sutures indistinct ; sub-triangular, a little wider than long. Antennal segments brown, the first two yellow-testaceous.

Pronotum chocolate-brown, wrinckled, covered with short yellow hairs, yellowish brown on the sides and along the posterior margin, truncate and slightly grooved in the middle. A little wider than long, being widened slightly in the posterior half ; its anterior half convex, depressed on the sides and along the posterior margin ; posterior angles rounded.

Scutellum triangular, brown.

Sternal segment yellow, strewn with black spots.

Elytra chocolate-brown, covered with yellow hairs, being 1/3rd longer than the pronotum.

Wings absent.

Legs yellow, except the anterior face of femora, which is blackish.

Abdominal segments chocolate-brown, reddish along the length of posterior margin ; wrinckled, covered with shorter yellow hairs, a little longer and more numerous on the sides and along the posterior margin ; widening from the 1st to the 5th then narrowing up to the last, the width of which is equal to that of the 2nd, sides of segments from 5th to 9th produced posteriorly to an obtuse point but devoid of longitudinal carina. Last segment blackish brown, rectangular, thrice as wide as long, punctate, with a large triangular depression in the posterior 2/3rds, in the middle of this depression is a rounded fossette and the base of which is formed by the posterior margin of the segment being truncate.

Ventrally segments of the abdomen reddish, strongly dotted and covered with yellow hairs. Penultimate segment wider than long, sub-triangular, declined and sunk in its middle in the posterior third. The posterior margin strongly grooved in the middle.

Pygidium not prominent, trapezoidal, narrowing from front to behind, convex in its middle, with the posterior margin slightly concave.

Branches of the forceps wide apart at base, straight, robust and rounded in the first half of their length then strongly curved inside (inwardly) and thinning up to the superimposed tips.

♀ : Last dorsal segment of abdomen covered with yellow hairs, narrowing from front to behind, the posterior margin narrower than in the ♂, slightly sinuous between the median carinae of branches of forceps.

Pygidium triangular, prolonged posteriorly to a sharp point. Penultimate segment of abdomen dotted, very much wider than long, rectangular with posterior margin straight cut.

Branches of the forceps separated at the base by the pygidium, straight, robust, triangular and strongly carinated above in the first half of their length ; then rounded upwardly, curved interiorly and gradually thinning up to the meeting points.

Measurements (in mm) :

	♂	♀
Length of body	9.3	9.5
Length of forceps	1.5	1.2

Distribution : INDIA : Tamil Nadu, Coimbatore District, Valparai Region, 1390 m.

Types : Known only from types 1 ♂, 1 ♀ and 1 nymph deposited at MHNG. Since none of them are designated these may be considered as 'syntypes'.

Remarks : The above description is taken from Borelli (1931) who compared this species with *E. horridum* Dohrn, known from Sumatra, Mentawai Islands and Java.

It appears to be closely related to *E. parvulum* Dohrn. But in the absence of ♂ genitalia it is difficult to discriminate from other related Indian species.

Subfamily PROLABISCINAE

Protolabinae Bey-Bienko, 1959, *Ent. Obozr.*, 38 : 597 (Type-*Protolabis* Bey-Bienko, 1959).

Prolabiscinae Bey-Bienko, 1959, *Ent. Obozr.*, 38 : 943 (new name) (Type-*Prolabisca* Bey-Bienko, 1959—new name for *Protolabis* Bey-Bienko, 1959 since latter preoccupied).

Steinmann (1973 and 1975) treated *Protolabinae* (new name *Prolabiscinae*) as synonym of *Echinosomatinae*. However, *Prolabiscinae* appears to be quite distinct in having close affinities with *Pygidicranidae* on one hand by the presence of blattoid neck, two functional penis lobes flexed backwards, at rest, and on the other with *Carcinophoridae*

by the absence of projecting female gonapophyses, ecarinate femora and smooth body. It can, however, be easily separated from Echinomatinae by smooth body, prosternum narrowed posteriorly, not distinctly constricted; posterior ventral cervical sclerite widely separated from prosternum.

Type-genus-Parapsalis Borelli, 1921 (= *Prolabisca* Bey-Bienko, 1959).

Genus *Parapsalis* Borelli

Parapsalis Borelli, 1921, *Boll. Musei. Zool. Anat. comp. R. Univ. Torino*, 35 (736) : 3 (Type : *P. laevis* sp. n.).

Protolabis Bey-Bienko, 1959, (néc Cope, 1876 and Wortman, 1898), *Ent. Obozr.*, 38 : 597 (Type : *Protolabis aroliata* sp. n.).

Prolabisca Bey-Bienko, 1959, *Ent. Obozr.*, 38 : 943 (Type : *Prolabisca aroliata* (Bey-Bienko). Syn. nov.

Body smooth. Femora smooth (ecarinate); claws with arolium. Elytra and wings well developed, latter often concealed. Prosternum triangularly produced apically, narrowed gradually posteriorly but not constricted; mesosternum longer than broad, rounded posteriorly; metasternum forming a rounded lobe posteriorly. Male genitalia with parameres simple, narrowed apically, distal lobes flexed backwards at rest, virga very long, apically spirally coiled. Female gonapophyses not well developed.

Type-species : *Chaetospasia infernalis* Burr, 1913 (= *Parapsalis laevis* Borelli, 1921 and *Prolabisca aroliata* (Bey-Bienko, 1959).

Distribution : Widely distributed in Oriental Region.

76. *Parapsalis infernalis* (Burr)

(Figs. 345-351)

Chaetospasia sp., Burr, 1913, *Rec. Indian Mus.*, 8 : 142 (♀; India : Arunachal Pradesh : Upper Ranging and Kobo; Assam : Sadiya).

Chaetospasia infernalis Burr, 1913, *Ent. Mitt. Berlin*, 2 : 67, fig. 3 (♂, dorsal view); Shiraki, 1928, *Ins. Matsum.*, 3 (1) : 12; Sakai, 1970, *Dermapterorum Cat. Prael.*, 2 : 101; Srivastava, 1976, *Rec. zool. Surv. India Occ. Pap.*, 2 : 37.

Anisolabis infernalis; Popham and Brindle, 1966, *Entomologist*, 99 : 275; Sakai, 1970, *Dermapterorum Cat. Prael.*, 1 : 69.

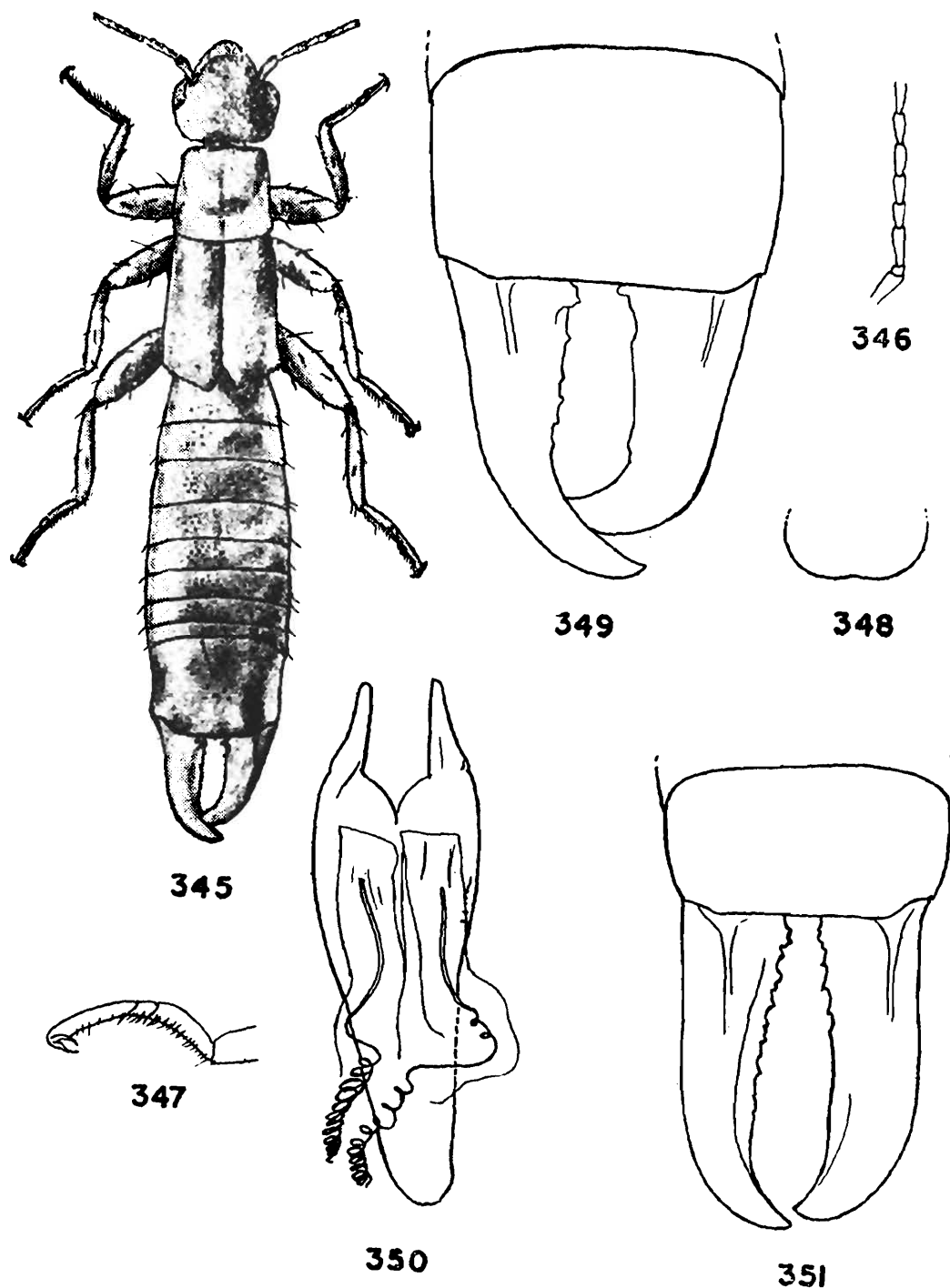
Prolabisca infernalis; Nishikawa, 1978, *Trans. Shikoku ent. Soc.*, 13 (1-2) : 44, figs. 1-9; Srivastava, 1984 *Bull. zool. Surv. India*, 5 (2 & 3) : 105, figs. 5-7 (Lectotype ♂, Paralectotype 1 ♀ and 1 nymph designated).

Parapsalis laevis Borelli, 1921, *Boll. Musie. Zool. Anat. comp. R. Univ. Torino*, 35 (736) : 3, fig. (♂ genitalia) (♂, ♀; Sandakan, Borneo); Borelli, 1926, *Res. Biol.*, 1 (5) : 65. Syn. nov.

Protolabis aroliata Bey-Bienko, 1959, *Ent. Obozr.*, 38 : 598, fig. 10, 14 (♂, ♀ ; China : Yunnan) ; Sakai, 1970, *Dermapterorum Cat. Prael.*, 1 : 22.

Prolabisca aroliata ; Bey-Bienko, 1959, *Ent. Obozr.*, 38 : 943 ; Sakai, 1971, *Dermapterorum Cat. Prael.*, 3 : 67 ; Brindle, 1975, *Ent. Basiliensia*, 1 : 15, figs. 13, 14 & 18 ; Srivastava, 1976, *Rec. zool. Surv. India, Occ. Pap.*, 2 : 20.

♂ : General colour shining dark brown or black ; mouth parts reddish brown ; legs yellowish, hind femora brownish black or black



Figs. 345-351 : *Parapsalis infernalis* (Burr), ♂, 345. Dorsal view ; 346. A few basal antennal segments ; 347. Hind tarsi ; 348. Posterior margin of penultimate sternite ; 349. Ultimate tergite and forceps ; 350. Genitalia ; ♀, 351. Ultimate tergite and forceps.

in basal half. Form depressed, elytra and wings finely pubescent. Forceps in nymphs orange red apically.

Head weakly depressed, smooth, sutures fine, feebly marked, hind margin slightly emarginate in middle. Eyes smaller than the post-ocular area. Pronotum longer than broad, sides gently widened posteriorly, hind margin straight, median sulcus distinct on prozona only. Antennae 20-segmented or more, 1st shorter than the distance between antennal bases ; 2nd small ; 3rd long and slender ; 4th and 5th subequal, both shorter than the 3rd ; 5th onwards gradually increasing in length. Elytra abbreviated, smooth, hind margin convex ; scutellum visible. Wings present or absent. Abdomen parallel sided, depressed. Ultimate tergite transverse, hind margin straight, oblique on sides, median sulcus short and distinct. Penultimate sternite transverse, broadly rounded posteriorly with a faint emargination in middle. Forceps gently arcuate, tapering apically, trigonal in basal one third, internally crenulate. Genitalia as seen in fig. 350, virga long, spirally coiled apically.

♀ : Agrees with male in most characters except that ultimate tergite gently narrowed posteriorly ; penultimate sternite triangularly rounded posteriorly ; forceps simple and almost straight.

Measurements (in mm) :

	♂	♀
Length of body	6.5-8.5	6.1-7.1
Length of forceps	1.2-1.5	1.3-2.0

Distribution : INDIA, BHUTAN, SOUTH CHINA, TAIWAN and BORNEO.

In ZSI collections it is represented from following localities hitherto not reported :

Meghalaya : Khasi Hills, on road to Old Barapani ; Garo Hills, Dianadubi ; Arunachal Pradesh : Tirap Dist., Deopani (Roing) ; Kameng Dist., Tippi ; Siang Dist., Lekhabali ; West Bengal : Darjeeling Dist., Jhalung, 1100-1400 ft., Khumani, Gorubathan ; Jalpaiguri Dist., Hasimara.

Types :

(i) Lectotype ♂, Paralectotypes 1 ♀ and 1 nymph of *Chaetospania infernalis* Burr at IPEG.

(ii) As per original description of *Parapsalis laevis*, only 1 ♂ and 1 ♀ were referred which may be considered as Syntypes. Location unknown ; presumably at MIZT,

(iii) According to Bey-Bienko's (1959) original description of *Protolabis aroliata*, type ♂ and other 5 ♂♂, 3 ♀♀ and 1 larva are listed ; although not designated as Paratypes these may be treated as such. It is also further stated that Type will be handed over to CASP and remaining Paratypes will be equally divided between CASP and AZL.

Steinmann (1975b) records, Paratypes from AZL but he was unable to get authentic information regarding the whereabouts of remaining material.

Remarks : This species is quite unique in having the intermediate position between families Pygidicranidae and Carcinophoridae. It is rather difficult to place it near any of the extant species of either two families therefore the erection of the subfamily Prolabiscinae by Bey-Bienko (1959) appears to be fully justified.

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GLOSSARY

- Abbreviated*—Reduced or not fully developed, in case of wings when reduced, concealed below elytra or projecting as narrow lateral lobes.
- Acute*—Sharply pointed, tapering from base to apex, like that of tip of a needle.
- Allometric growth*—Relatively faster or slower growth of an individual structure than the organism as a whole.
- Anterior*—Forward portion of any part or organ in relation to its centre i. e. in the head mouth parts are located anteriorly ; *con.* Posterior.
- Apical*—Anterior most point of any part ; *con.* Basal.
- Arolium*—Cushion like growth between the claws.
- Axillary angle*—Angle formed by the base of elytra and its inner margin, referred to as anal angle also.
- Basal*—That portion of body or organ which is nearest to its place of origin.
- Basal vesicle*—Thickened basal portion of virga, often 'Bean or Kidney' shaped.
- Carina*—A sharp, raised impressed line, often termed as 'Keel'.
- Conical*—Triangular, pertains to antennal segments, narrowed at base, enlarged and/or thickened at apex.
- Concave*—Refers to incised margin.
- Convex*—Refers to rounded margin or raised area of any part or organ.
- Costal margin*—The external margin of elytra when in repose.
- Crenate*—Provided with a row fine teeth.
- Cyclolabic*—Refers to short and robust form of forceps in Chelisochidae and Forficulidae.
- Cylindrical*—Shaped like a cylinder, having more or less uniform width throughout.
- Dentate*—Having a row of large teeth.
- Distal lobes* (penis lobes)—One or two membranous lobes situated at the distal end of proparameres.
- Emarginate*—Refers to concave or incised margin.
- Fold*—Any raised structure or line or a linear convexity, blunt above.

Gonapophyses—The paired processes of 8th and 9th sternite in ♀, probably connected with oviposition.

Hind—Posterior.

Humeral angle—Pertaining to shoulder, in case of elytra extranal basal angle ; *con.* Axillary angle.

Incrassate—Thickened.

Intraspecific variation—Range of differences in colour, shape and size of any part or organ within the individuals of same or different populations of a species.

Macrolabic—Robust and bowed form of forceps in Diplatyinae and longer from in other families.

Macropterous—Forms with fully developed wings.

Metallic sheen—Refers to colour of elytra giving shine like that of certain metals.

Metazona—Posterior half of pronotum.

Microlabic—Slender and straight form of forceps in Diplatyinae since there is no variation in length in this family.

Micropterous—Weakly or scarcely projecting wings.

Obtuse—Blunt or convex ; *con.* Acute.

Opisthomeres—The rudiments of last three segments in ♂, i. e., 11th to 13th termed as pygidium, metapygidium and telson respectively ; collectively known as Opisthomeres.

Parameres—The paired apical portion of male genitalia and are variously shaped.

Pilose—Hairy.

Polymorphism—Some organs show two or more forms within a species ; in Dermaptera forceps exhibit such forms commonly.

Posterior—Backward portion of a body or organ taken in relation to its centre.

Post-ocular length—Greatest length measured from the posterior margin of eye to posterior margin of head.

Preputial sacs—The hollow apical portion of distal lobe/s which accommodate virga and other accessory organs such as chitinous rods and denticulated pads, etc.

Proparameres—The basal paired or median portion of male genitalia.

Prozona—Anterior half of pronotum.

Pubescence—Hairy covering on the body.

Punctate—Minute depressions on the body, often variable in size, spacing and intensity at species level.

Punctulate—Finer form of above.

Quadrate—Like a square with opposite sides parallel.

Ridge—Same as carina.

Rectilinear—In a straight line or horizontal.

Recurved—Curved inwards.

Refugial spots—Due to shrinkage of habitat only certain areas are left where a species can freely breed without much interference from human being.

Relict forms—Survivors of those species which existed in the same form in geological ages.

Rugose—Covered with irregular lines.

Rugulose—Finer form of above

Scutellum—Exposed portion of metanotum due to the rounding off of axillary angles of elytra.

Serrated—Provided with teeth as arranged on a saw.

Seta—A thick, chitinous hair, with apex truncate as in Echinomatinae.

Smooth—Without any vestiture or markings.

Striate—With a series of fine impressed lines.

Sulcus—A fine groove.

Suture—Same as above.

Transverse—Longer than broad ; at right angle to axis.

Trapezoidal—Any part, quadrilateral in shape with two sides (thought of as base and opposite side) parallel.

Truncate—Abruptly cut off, if referring to margin means 'straight'.

Tubercles—More or less blunt lobes or projections.

Tumid—A swelling or convexity.

Variation—Range of changes generally encountered in respect of colour, shape and size of various organs in the individuals of same species (intraspecific) and different species (interspecific).

Vestiture—Covering such as setae and hairs.

Virga—Chitinous portion of ejaculatory duct.

Wings—Exposed portion of wings, projecting beyond elytra.

ADDENDA

Description of following three species which appeared after the submission of manuscript are included here. Taxonomical notes are also provided for certain species.

Diplatys chowdhuryi Srivastava (Figs. 1-7)

Diplatys chowdhuryi Srivastava, *Rec. zool. Surv. India* (in press).

♂ : Head, posterior half of abdomen, ultimate tergite and forceps brownish black, antennae light blackish brown, pronotum, legs, anterior half of abdomen dull yellowish brown, elytra dull yellowish brown in basal half and brownish black in apical half.

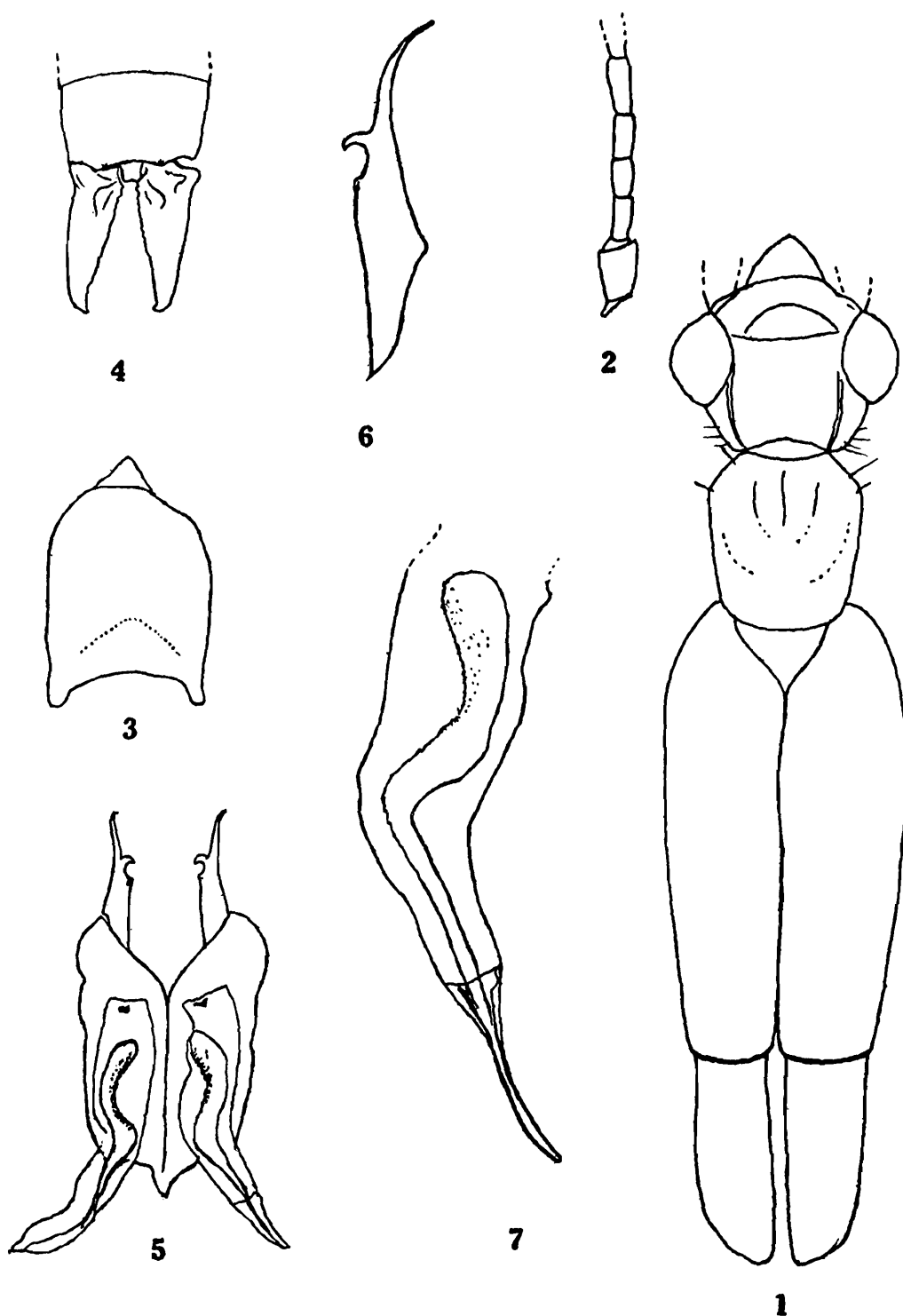
Head with frons raised, occiput depressed, post-ocular carina complete, hind margin sinuate. Eyes prominent, about twice as long as the post-ocular length. Antennae partly broken (right antennae except basal segment missing, left antennae with 17 segments remaining), 1st stout, expanded apically, slightly shorter than the distance between antennal bases ; 2nd short ; 3rd long and slender ; 4th only slightly longer than broad, shorter than the 3rd ; 5th about as long as the 3rd but stouter, remaining gradually increasing in length and thinning, a few apical ones shorter. Pronotum longer than broad, contracted posteriorly, lateral margin straight, hind margin briefly rounded, prozona convex and metazona depressed. Legs long and slender and typical for the genus. Elytra and wings well developed, smooth, former, with inner basal angle rounded off to show a triangular scutellum. Abdomen convex, covered with fine pubescence, smooth, slender, slightly expanded posteriorly. Penultimate sternite depressed in posterior 1/3 with a fine median groove, hind margin concave, postero-lateral angles produced into a lobe. Ultimate tergite weakly transverse, smooth, sloping and narrowed posteriorly, hind margin trisinate, laterally oblique. Forceps with branches depressed, straight, tapering apically with tip gently hooked and pointed, at base above with an oblique crest, internal margin finely crenulate. Genitalia with parameres strongly narrowed in apical 1/3, internally with a pair of hooked teeth of which apical one larger ; distal lobes with virga reduced, represented by a small dot at base, provided with a chitinous denticulate rod, strongly narrowed apically and projecting beyond the distal lobes.

♀ : Unknown.

Measurements (in mm) :

	♂
Length of body	9.8
Length of body	1.0

Distribution : INDIA : Orissa, Mayurbhanj Dist. Lulong, near Simlipal Hills.



Figs. 1-7 : *Diplatys chowdhuryi* Srivastava, Holotype ♂. 1. Anterior portion of body, 2. A few basal antennal segments, 3. Penultimate sternite, 4. Ultimate tergite and forceps, 5. Genitalia, 6. Paramere, enlarged, 7. Distal lobe, enlarged.

Type : Holotype ♂ (genitalia mounted between two coverslips and pinned with the specimen) in ZSI.

Remarks : This species is extremely close externally to *Diplatys jawalagiriensis* Kapoor, Bharadwaj & Banerjee from India (Tamil Nadu and Karnataka) but differs by the shape of penultimate sternite in having the posterior margin concave with postero-lateral angles slightly more strongly lobed (vs hind margin subtruncate or convex with postero-lateral angles less strongly lobed in *D. jawalagiriensis*) and genitalia with parameres in apical 1/3 strongly narrowed, distal lobes with virga very much reduced, represented by a dot at base and provided with a chitinous denticulate rod, narrowed apically (vs virga characteristically convoluted and provided with membranous flange, chitinous denticulate rod narrowed apically but less conspicuous).

Haplodiplaty transversalis (Brindle)
(Figs. 8-9)

Diplatys transversalis Brindle, 1983, *Senckenbergiana biol.*, 63 (1-2) : 96, figs. 1-2 (♂, ♀ ; Nepal).

♂ : Head blackish, strongly transverse, post-ocular carina weak, occiput depressed. Antennae yellow with apical segments darker. Eyes prominent. Pronotum blackish, brownish-yellow laterally, sides rounded. Elytra and wings well developed, former blackish-brown anteriorly and yellowish brown posteriorly. Legs yellowish, femora partially dark and tibiae dark. Abdomen blackish brown. Penultimate sternite trisinate posteriorly with median sinuation deeper and smaller, bordered laterally with a minute teeth. Forceps simple and straight. Genitalia with parameres narrowed apically ; virga short and stout, a chitinous rod, shape like numeral-7, present.

♀ : Agrees with males in most characters except that eyes smaller ; penultimate sternite simple and forceps longer and more slender.

Measurements (in mm) :

	♂	♀
Length of body	10.0	11.0
Length of forceps	0.8	1.0

Distribution : Nepal (♂ Lamjung Dist., Marsyandi and ♀ , Mustang Dist., Dana).

Type : Holotype ♂ and Paratype ♀ deposited at Senckenbergiana Museum, Frankfurt a.M.

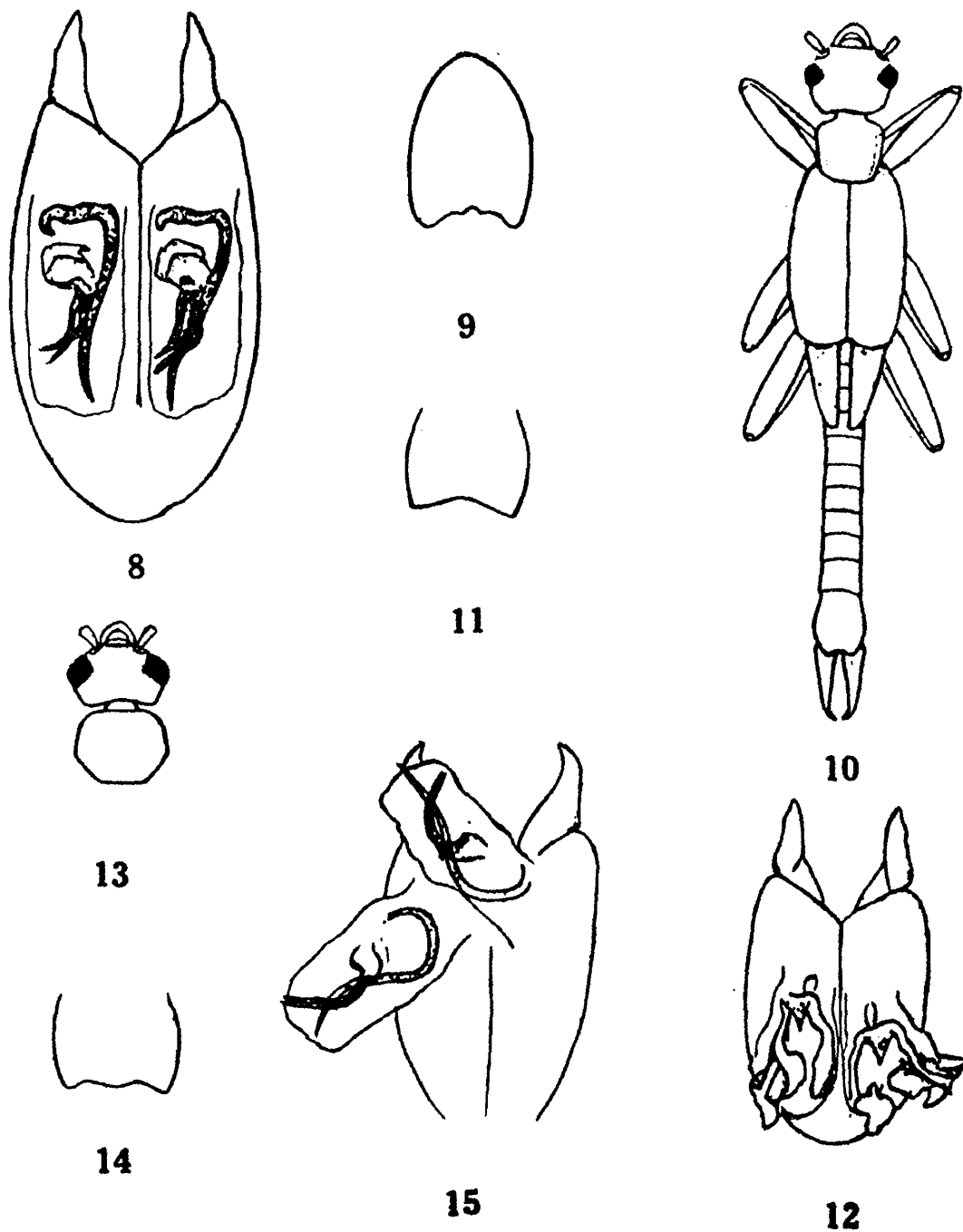
Remarks : This species comes close to *Haplodiplatys brancuccii*

Srivastava, from India (Garhwal Hills) but differs by the shape of posterior margin of ♂ penultimate sternite and the parameres.

Haplodiplatys triangulatus Brindle

(Figs. 10-12)

Haplodiplaty triangulatus Brindle, 1987, *Courier Forsch.—Inst. Senckenberg*, 93 : 335 (♂, ♀ Nepal : Arun Valley, 700 ft.).



Figs. 8-15 : *Haplodiplatys transversalis* Brindle, ♂, 8. Genitalia, 9. Penultimate sternite; *Haplodiplatys triangulatus* Brindle, ♂, 10. Dorsal view, 11. Penultimate sternite, 12. Genitalia; *Haplodiplatys brancuccii* Srivastava (= *Haplodiplatys schawalleri* Brindle), ♂, 13. Head and pronotum, 14. Penultimate sternite, 15. Genitalia, (Figs. 8-9 drawn after Brindle, 1983 and figs. 10-15 after Brindle, 1987).

♂ : General colour reddish brown, mouth parts yellowish ; pronotum darker with lateral margin yellow ; elytra brown and wings darker ; legs, abdomen and forceps yellowish brown, basal half of tergites darker.

Head transverse, sutures obsolete. Eyes prominent, slightly shorter than post-ocular area. Pronotum about as long as broad, sides straight, contracted posteriorly, hind margin subtruncate. Legs normal. Elytra and wings well developed, covered with sparse long and short hairs. Abdomen long and slender. Penultimate sternite broad, hind margin triangularly emarginate in middle. Ultimate tergite longer than broad, slightly enlarged in middle, hind margin trisinate, laterally oblique. Forceps simple and straight. Genitalia with parameres roughly triangular, inner margin concave, external margin with a small convexity a little before apex ; virga short, inverted U-shaped, basal chitinous plate narrow, acuminate posteriorly.

♀ : Agrees with males in most characters except that general colour darker and forceps more slender.

Measurements (in mm) :

	♂
Length of body	10.0-11.0
Length of forceps	8.0

Distribution : NEPAL : Arun valley, 700 ft.

Types : Holotype ♂ and Paratype 1 ♀ in CAS and Paratype 1 ♂ MM.

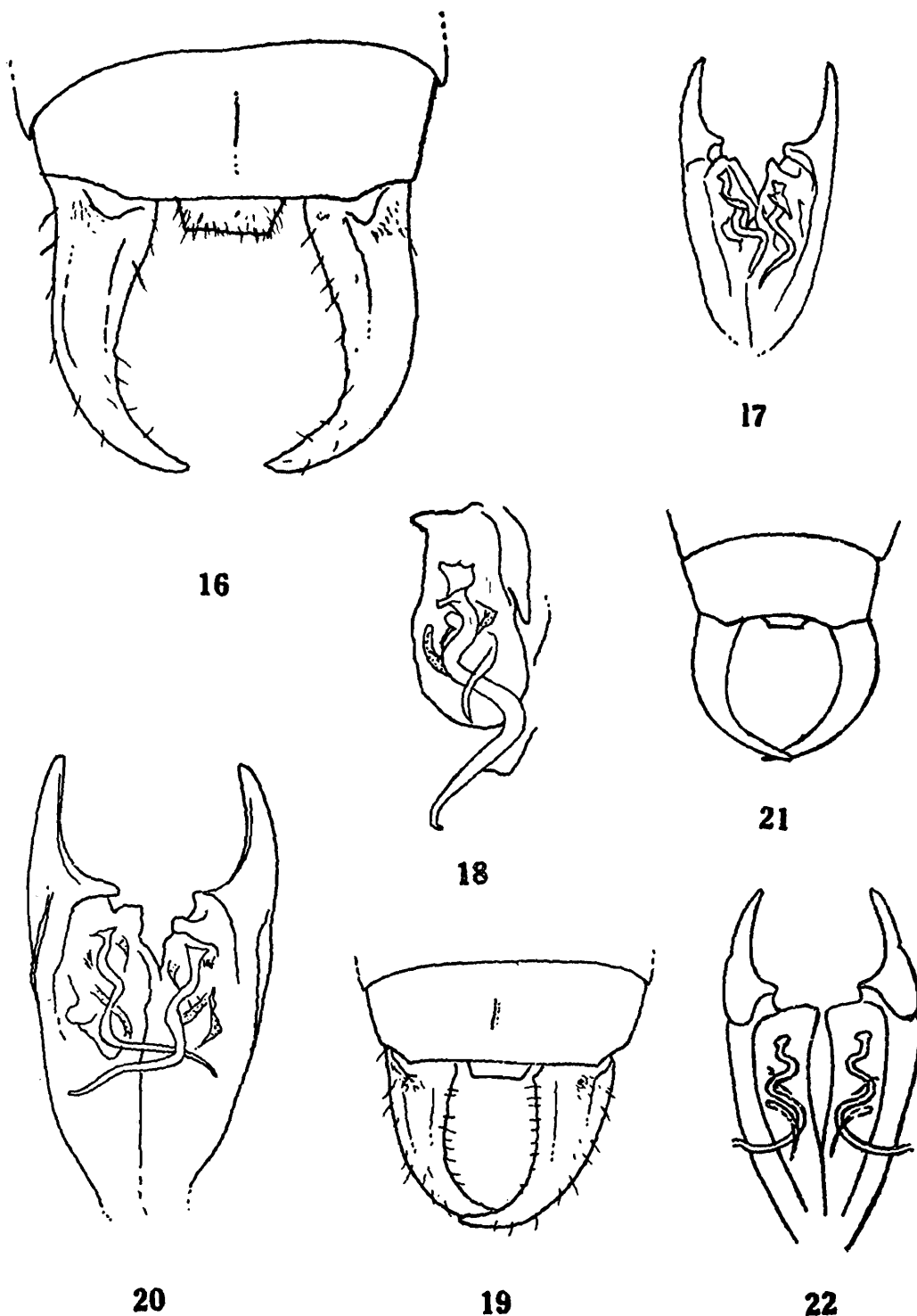
Remarks : This species comes close to *H. stemmleri* (Brindle) but differs in having the eyes about as long as the post-ocular area (vs longer in *H. stemmleri*) ; pronotum slightly longer than broad, narrowed posteriorly (vs transverse, parallel sided) and basal virgal sclerite broader (vs narrower, acuminate apically).

Taxonomic Notes

1. *Haplodiplatys schawalleri* Brindle (1987, *Courier Forsch. Inst.—Senckenberg*, 93 : 335, Holotype ♂, Nepal : Nuwakot Distr., Trisuli, 600-650 m ; deposited in Senckenberg-Museum Frankfurt a.M.)—It is proposed to treat this species as synonym of *Haplodiplatys brancuccii* Srivastava (1983) described from India (Dist. Uttarkashi, U. P.) since both agree in most of the details.

Please refer to figs. 13-15 of *H. schawalleri* reproduced here for comparison.

2. *Echinosoma trileniatum* (néc Borelli) ; Steinmann, 1983, *Rev. suisse Zool.*, 90(3) : 543, ♂ ♀, India : Assam, Meghalaya and Uttar Pradesh



Figs. 16-22 : *Echinosoma convolutum* Hincks (dt. as *Echinosoma trileniatum* Borelli by Steinmann), ♂, 16. Ultimate tergite and forceps, 17. Genitalia, 18. Distal lobe enlarged ; *Echinosoma convolutum* Hincks (= *Echinosoma ater* Steinmann syn. n.) ♂, 19 and 21. Ultimate tergite, 20 and 22. Genitalia (Figs. 21-22 drawn after Steinmann, 1983 are from the Holotype ♂ of *Echinosoma ater*)

(Kumaon)—This species is endemic to South India, especially Western Ghats.

Following two specimens referred to this species and reported in the above publication were examined through the courtesy of Dr. Bernd Hauser, Curator, Département des Arthropodes et d'Entomology II, Muséum d'Histoire Naturelle, Geneve, Switzerland.

i) 1 ♂ labelled as : India, Meghalaya, Khasi Hills, 12 km No. de Dawki, 500-800 m, 29.x.78, Besuchet Löbl.

ii) 1 nymph labelled as : India ; Assam, Manas, 200 m, 22.x.78, Besuchet Löbl. Although this specimen was determined as ♀ it represents nymphal stage.

The accompanying figs. 16-18 of ultimate tergite and genitalia from the above ♂ clearly show that it belongs to *Echinosoma convolutum* Hincks.

3. *Echinosoma ater* Steinmann (1983, *Rev. suisse Zool.*, 90(3) : 544, figs. 1, 2 ; Holotype ♂, India, Assam, Manas, 200 m, 22.x.1978 ; deposited in MHNG).

Although in the original description pygidium is stated to be quadrate, the diagram shows it as transverse. Besides on the basis of other details of body parts and male genitalia this species should be treated as synonym of *Echinosoma convolutum* Hincks

In the collections of ZSI, 1 ♂, from India : Assam, Manas, Dist. Barpeta, Alabari, 4.iv.86 (S. Saha) (♂ genitalia mounted between two coverslips and attached with the specimen) is determined as *E. convolutum* which agrees with the description of this species. The diagrams of ultimate tergite and forceps of this specimen (figs. 19-20) and that of Holotype ♂ of *E. ater* (figs. 21-22) copied from Steinmann (1983) are given here for comparison.

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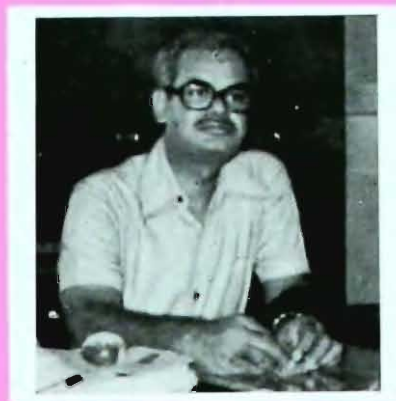
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Dr. Gyanendra Kumar Srivastava obtained his Master's degree from Agra University in the year 1960 and was awarded Ph.D. degree by the same University on his work "Taxonomy and Zoogeography of Oriental Dermaptera with Special Reference to the Fauna of North-east India" in the year 1973.

Dr. Srivastava has more than 70 research publications dealing with taxonomy and zoogeography of Dermaptera from India and also from other parts of the world.

He is a well-known authority on the subject and is also author of 'Catalogue of Oriental Dermaptera'.

Dr. Srivastava is presently Scientist 'SE' (Deputy Director) in the Zoological Survey of India.