

NOTES ON DERMAPTERA (INSECTA) OF NAMDAPHA
(ARUNACHAL PRADESH, INDIA)
A PROPOSED BIOSPHERE RESERVE

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INTRODUCTION

Srivastava (1985) recorded 14 species belonging to 12 genera from the area. In the present study altogether 26 species belonging to 20 genera are dealt with of which 16 are reported for the first time from the area. It also includes a new species viz., *Gonolabidura biswasi*. Besides, *Protolabidura* Steinmann is treated as synonym of *Gonolabidura* Zacher and *Allodahlia ochroptera* Brindle under *Allodahlia coriacea* (Bormans).

A check-list of species is provided which includes altogether 31 species (including 1 species identified up to generic level) belong to 24 genera. Besides a key for their discrimination is also provided.

The material on which the present paper is based was collected by S. Biswas and party.

ZOOGEOGRAPHICAL REMARKS

The area is situated on the western most part of the Indo-Chinese Sub Region of the Oriental Region. An analysis of the Dermaptera fauna reveals that out of 31 species, 17 are derivatives of Indo-Chinese and Indo-Malayan elements and are confined to north eastern portion of India, Bhutan and Nepal. And 7 other species are restricted at present to mountains of north eastern India, may perhaps have a wider distribution in the Oriental Region when further explorations are taken up. In addition 5 species are distributed throughout the Himalays from north west to north east. *Labidura riparia* (Pallas) and *Labia curvicauda* (Motschulsky) are world wide in distribution.

It may be inferred from the above that the Dermaptera fauna of the area has the preponderance of Indo-Chinese and Indo-Malayan elements. Besides, a large number of species are restricted to mountains of north-eastern portion of India and a few are spread all along the Himalayas in India, Bhutan and Nepal.

KEY TO THE SPECIES KNOWN FROM NAMDAPHA

- 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 the apical margin of prosternum ; male genitalia with two functional distal lobes (fig. 1) (PYGIDICRANIDAE)
- 2(3). Antennal segments 4-5 transverse, 25-segmented or more (PYGIDICRANIDAE)
Cranopygia sp.
- 3(2). Antennal segments 4-6 longer than broad, 20 segmented or less
- 4(7). Body convex, covered with thick characteristic setae (fig. 3) ; pygidium with hind margin projecting ; forceps cylindrical (ECHINOSOMATINAE)
- 5(6). Male genitalia with virga S-shaped (fig. 5) ; female pygidium truncate apically (fig. 6) *Echinosoma convolutum* Hincks
- 6(5). Male genitalia with virga apically almost straight or gently curved (fig. 8) ; female pygidium obtuse or convex posteriorly (figs. 9-10) *Echinosoma dentiferum* Borelli
- 7(4). Body weakly depressed, glabrous and smooth ; pygidium vertical with hind margin not projecting ; forceps trigonal in basal one third, afterwards depressed (PROLABISCINAE)
Parapsalis infernalis (Burr)
- 8(1). Neck forficuloid type i.e., (fig. 2) anterior and posterior cervical sclerites fused and the hind margin of the latter joined with anterior margin of prosternum ; male genitalia with one or two functional distal lobes
- 9(28). Male genitalia with paired distal lobes (figs. 14, 16, 26, 29)

- 10(27). Pygidium in both sexes vertical, with its hind margin not free (fig. 19)
- 11(18). Male genitalia, if virga present, at base not wider and without sinous inner tube ; otherwise denticulated pads present on distal lobes (fig. 20)
(ANISOLABIDIDAE)
- 12(17). Male parameres internally without any tooth (fig. 14, 16, 26)
- 13(16). Male parameres three to four times longer than broad, broader at base with outer margin not convex, narrowed apically (figs. 14, 16, 26)
- 14(15). Male parameres with tip obtuse (fig. 14) *Anisolabis deplanata* Srivastava
- 15(14). Male parameres with tip acuminate (fig. 16) *Apolabis aborensis* (Burr)
- 16(13). Male parameres slightly longer than broad, flattened, broad at base somewhat semicircular with external margin convex, tip obtuse (fig. 18)
Paralabis montshadskii Bey-Bienko
- 17(12). Male parameres internally at base armed with a sharp tooth (fig. 20)
Aborolabis pervicina (Burr)
- 18(11). Male genitalia with virga distinct, dilated at base with a distinct inner sinous tube (fig. 29)
(LABIDURIDAE)
- 19(20). Mesosternum strongly narrowed posteriorly (fig. 22) (ALLOSTETHINAE)
Gonolabidura biswasi sp. n.
- 20(19). Mesosternum not narrowed posteriorly
- 21(22). Elytra with a sharp ridge along the costal margin ; legs relatively short
(NALINAE)
Nala nepalensis (Burr)
- 22(21). Elytra without any sharp ridge along the costal margin ; legs longer
(LABIDURINAE)

- 23(24). Sides of abdominal segments in males without spine (fig. 30) and parameres with a short epimerite apically
Labidura riparia (Pallas)
- 24(23). Sides of abdominal segments in normal males with spines (figs. 31, 34); parameres with a long epimerite apically
- 25(26). Sides of abdominal segments 3-5 with a single hooked spine (fig. 31)
Forcipula aborensis Brindle
- 26(25). Sides of abdominal segments 3-5 with a pair of spines, of which dorsal one larger (fig. 34)
Forcipula clavata Liu
- 27(10). Pygidium in both sexes forming a flat process with hind margin free (fig. 36)
(APACHYIDAE)
Apachyus feae Bormans
- 28(9). Male genitalia with a single median distal lobe (figs. 35, 66, 75, 77)
- 29(36). Second tarsal segment simple i.e., compressed (neither lobed or projecting below 3rd tarsal segment) (fig. 37)
(SPONGIPHORIDAE)
- 30(31). Hind tarsi long and slender, 1st segment five times longer than its width (fig. 37)
(IRDEXINAE)
Irdex nitidipenis (Bormann)
- 31(30). Hind tarsi comparatively shorter and thick, 1st segment three to four times longer than its width
(LABIINAE)
- 32(33). Head convex; forceps glabrous or with sparse pubescence (fig. 39)
Labia curvicauda (Mostchulsky)
- 33(32). Head flattened; forceps with thick pubescence (fig. 40)
- 34(35). Pygidium in males short and transverse with hind margin truncate (fig. 40)
Chaetospania kurseongae Hebard
- 35(34). Pygidium in males projecting, slightly longer than broad, on sides straight or convex in middle and converging apically, emarginate posteriorly with

posterolateral angles produced into sharp points, often with a minute point in middle also (fig. 42)

Chaetospania feae Bormans

- 36(29). Second tarsal segment produced below the third (fig. 50) or lobed (figs. 59, 61)
- 37(46). Second tarsal segment produced below the third segment as narrow lobe (fig. 50)
(CHELISOCHIDAE)
- 38(45). Male genitalia with parameres four to five times longer than broad, feebly dilated in middle
- 39(42). Tibiae sulcate above in distal half
- 40(41). Build slender ; colour generally lighter ; antennal segments slender, 3rd almost equal to 4th but slightly shorter than 5th (fig. 44) *Proreus weisi* (Burr)
- 41(40). Build stout ; colour generally dark ; antennal segments thick, 3rd longer than 4th and 5th
Chelisochea brevipennis Borelli
- 42(39). Tibiae smooth above (not sulcate) in distal half (generally with metallic sheen)
- 43(44). General colour uniform dark brown ; in males forceps slender, in females pygidium about twice as long as broad, lanceolats with hind margin truncate or pointed (fig. 49)
Adiathetus glaucopterus (Bormans)
- 44(43). General colour dark brown with head, antennae, tibiae and tarsi of middle and hind legs and ultimate tergite black ; in male forceps stouter (fig. 51) ; in females (fig. 52) pygidium slightly longer than broad, scarcely narrowed posteriorly with sides convex in middle and hind margin concave
Adiathetus metallicus Srivastava
- 45(38). Male genitalia with parameres twice as long as broad, greatly dilated extrnally in middle (fig. 54)
Hamaxas feae (Bormans)
- 46(37). Second tarsal segment dilated, forming a rounded lobe (fig. 59)
(FORFICULIDAE)

- 47(50). Antennal segments long and slender, 4th longer than the 3rd or almost equal, both of similar build i.e., slender (fig. 56) (OPISTHOCOSMIINAE)
- 48(49). Basal segment thick (fig. 56); hind tarsi with 1st segment about as long as third; forceps in males with a compressed vertical tooth in basal one third (fig. 57 & 58) *Timmomenus nevillei* (Burr)
- 49(48). Basal antennal segment slender; hind tarsi (fig. 59) with 1st segment about twice as long as the 3rd; forceps in males with a faint crest above internally near base or branches simply depressed (fig. 60) *Eparchus simplex* (Bormans)
- 50(47). Antennal segments shorter and wider, occasionally apical ones long and slender, 4th shorter or equal to 3rd but former always wider
- 51(56). Mesosternum broader than long (ALLODAHLINAE)
- 52(55). Pronotum quadrate; elytra punctulated or rugose, pygidium in males provided with a small or well developed tooth in middle posteriorly; forceps internally armed with a pair of teeth
- 53(54). General body colour reddish, black on certain body parts; elytra finely punctulate, reddish with internal and posterior margin black; forceps in males, stout, internal teeth well developed; pygidium with a median posterior spine well developed (fig. 62-65) *Allodahlia ahrimanes* (Burr)
- 54(53). General body colour blackish brown; elytra with deep punctures; forceps in males slender with internal teeth not so well marked; pygidium with a small median tooth (fig. 67-69) *Allodahlia coriacea* (Bormans)
- 55(52). Pronotum semicircular; elytra scabrous i.e., covered with dense mass of tubercles; pygidium in males provided with a tooth on posterolateral angles; forceps internally armed with a single tooth in apical one third (fig. 70). *Allodahlia scabriuscula* (Sérville)
- 56(51). Mesosternum about as long as broad
- 57(58). Pronotum about as long as broad (fig. 72); legs yellow, femora with a black

band in apical one third

(EUDHORNIINAE)

Pterygida pulchripes (Bormans)

58(57). Pronotum transverse ; leg uniformly coloured

59(60). Males with pygidium longer than broad with hind margin convex ; forceps dilated in basal one half or little less, afterwards branches almost straight with apices gently curved (fig. 74).

(FORFICULINAE)

Forficula beelzebub (Burr)

60(59). Males with pygidium rounded or obtuse ; forceps dilated near the base, (in f. microlabia) stout and strongly bowed (fig. 76), (in f. macrolabia) slender and straight, slightly curved near apex.

Forficula planicollis Kirby

CHECK-LIST OF SPECIES FROM NAMDAPHA

- * Species represented in the material studied.
- * * Species dealt with in the present paper and reported for the first time from the area.

PYGIDICRANIDAE

PYGIDICRANINAE

Cranopygia sp.

ECHINOSOMATINAE

Echinosoma convolutum Hincks, 1959

* *Echinosoma dentiferum* Borelli, 1912

PROLABISCINAE

* * *Parapsalis infernalis* (Burr, 1913)

ANISOLBIDIDAE

CARCINOPHORINAE

Anisolabis deplanata Srivastava, 1985

Apolabis aborensis (Burr, 1913)

* * *Paralabis montshadskii* Bey-Bienko, 1959

* *Aborolabis pervicina* (Burr, 1913)

LABIDURIDAE

ALLOSTETHINAE

* * *Gonolabidura biswasi* sp. n.

NALINAE

* *Nala nepalensis* (Burr, 1907)

LABIDURINAE

* *Labidura riparia* (Pallas, 1773)

* * *Forcipula aborensis* Brindle, 1966

* * *Forcipula clavata* Liu, 1946

APACHYIDAE

* * *Apachyus feae* Bormans, 1894

SPONGIPHORIDAE

IRDEXINAE

* *Irdex nitidipennis* (Bormans, 1894)

LABIINAE

* *Labia curvicauda* (Motschulsky, 1863)

* * *Chaetospania kurseongae* Hebard, 1923

* * *Chaetospania feae* Bormans, 1894

CHELISOCHIDAE

CHELISOCHINAE

Proreus weisi (Burr, 1904)

- * *Chelisoches brevipennis* Borelli, 1923
- * *Adiathetus glaucopterus* (Bormans, 1894)
- * *Adiathetus metallicus* Srivastava, 1985
- * * *Hamaxas feae* (Bormans, 1894)

FORFICULIDAE

OPISTHOCOSMIINAE

- * * *Timmomenus nevilli* (Burr, 1905)
- * * *Eparchus simplex* (Bormans, 1894)

ALLODAHLINAE

- * * *Allodahlia ahrimanes* (Burr, 1900)
- * * *Allodahlia coriacea* (Bormans, 1894)
- (= *Allodahlia ochroptera* Brindle, 1972—Syn. n.)
- * *Allodahlia scabriuscula* (Serville, 1839)

EUDOHRNIINAE

- * * *Pterygida pulchripes* (Bormans, 1894)

FORFICULINAE

- * * *Forficula beelzebub* (Burr, 1900)
- * * *Forficula planicollis* Kirby, 1891

Superfamily : PYGIDICRANOIDEA

Family : PYGIDICRANIDAE

Subfamily : ECHINOSOMATINAE

***Echinosoma dentiferum* Borelli Figs. 7-10**

1912. *Echinosoma dentiferum* Borelli, *Bull. Mus. Hist. nat. Paris*, 18 : 223 (♂ ; Bhutan).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Miao, 1 ♂, 7. XII. 1982 ; Gandhigram, ca 135 km from Miao, 1 ♀, 30.1.1987.

Distribution : India (North East India), Bhutan, Burma and Vietnam.

Subfamily : PROLABISCINAE

Parapsalis infernalis (Burr) Figs. 11-13

1913. *Chaetospania infernalis* Burr, *Ent. Mitt. Berlin*, 12 : 67, fig. 3 (♂ ; Dorsal view).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Ghandhigram, ca 135 km from Miao, 1 ♀ , 24. XII. 1984.

Distribution : India (North East India), Bhutan, South China, Taiwan and Borneo.

Superfamily : ANISOLABOIDEA

Family : ANISOLABIDIDAE

Subfamily : CARCINOPHORINAE

Paralabis montshadskii Bey-Bienko Figs. 17-18

1959. *Anisolabis (Paralabis) montshadskii* Bey-Bienko, *Ent. Obzor*, 38 : 600, fig. 16 (♂, ♀ ; China : Yunnan).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Miao, 1 ♂ (genitalia mounted between two coverslips and pinned with the specimen), 1.XII.1982.

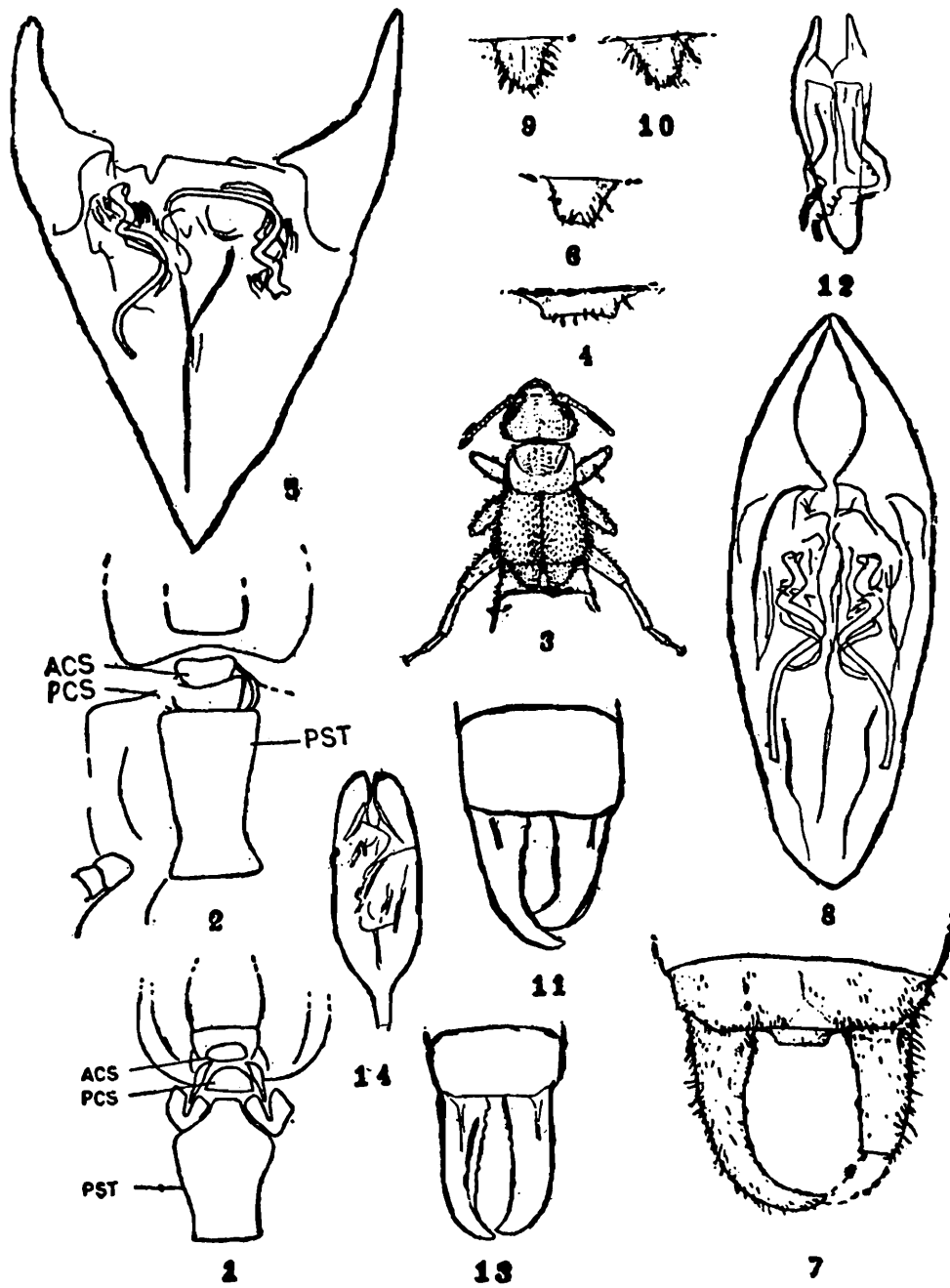
Distribution : India (Arunachal Pradesh) and China (Yunnan).

Aborolabis pervicina (Burr) Figs. 19-20

1913. *Anisolabis pervicina*, *Rec. Indian Mus.*, 8 (2) : 137 (♂, ♀ ; India, Assam).

Material examined : INDIA : Arunachal Pradesh : Tirap Dist., Miao, 1 ♂, 20 ♀, 5.I.1983 ; Gibbons land, 16 km E of Miao, 5 ♂, 5 ♀ and 4 nymphs ; Miao, 4 ♂, 3 ♀ and 3 nymphs, 5.XII.1982, 2 ♀, 21.XII.1982, 1 ♀, 25.XII.1982 ; Gandhigram ca 135 km from Miao, 2 ♀, 30.XI.1982, 1 ♂, 1 ♀, 24.XII.1986 ; 1 ♂, 2 ♀, 26.27.XII.1986, 1 ♂, 20.I.1987, 1 ♂, 1 ♀, 23.I.1987, 1 ♂, 1 ♀, 1 nymph, 25.I.1987, 1 ♂, 1 ♀, 28.I.1987 ; 77 mile camp, Miao-Vijainagar Road, 1 ♀, 4.I.1985, 1 ♀, 1 nymph, 7.I.1985.

Distribution : All along the Himalayas in India, Nepal and Bhutan.



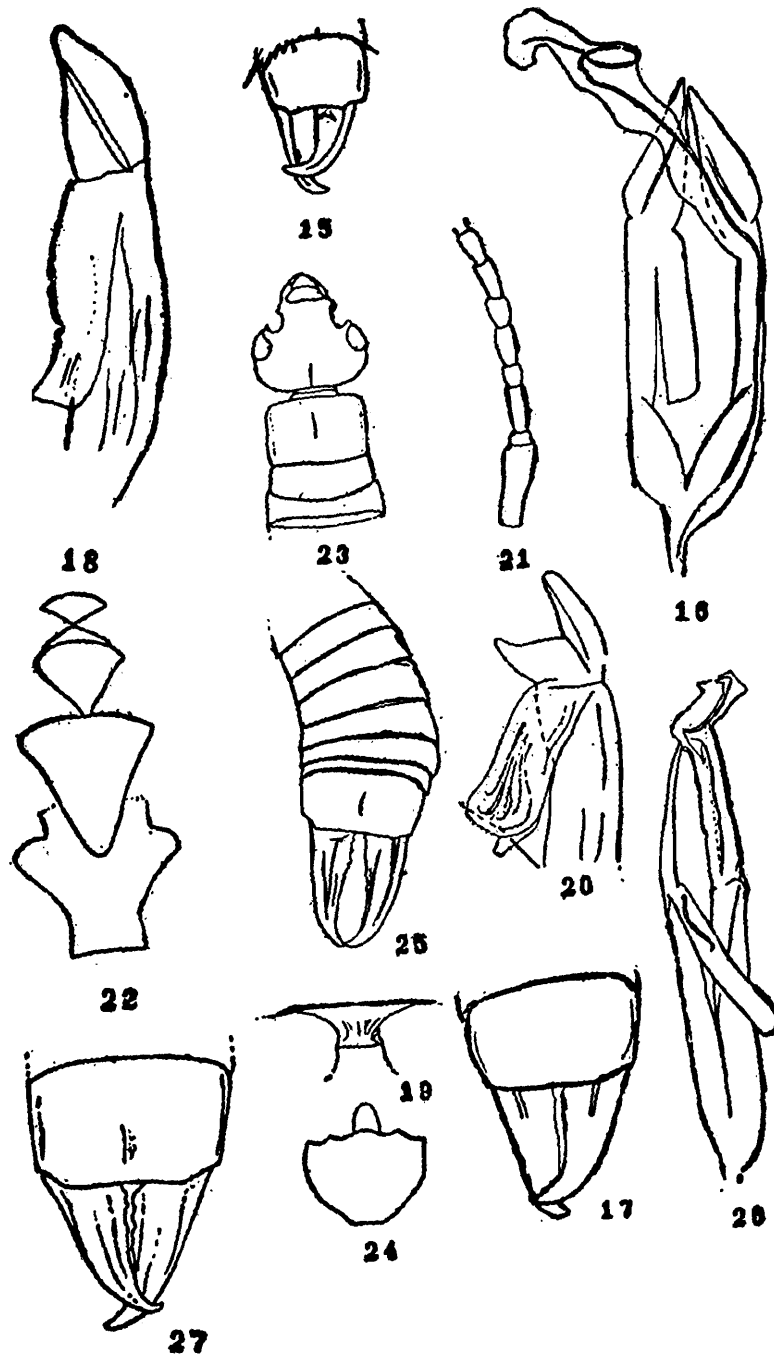
Figs. 1-14: *Parapsalis* sp., 1. Cervical sclerites and prosteron; *Euborellia* sp., 2. Cervical sclerites and prosteron; *Echinosoma convolutum* Hincks, ♂, 3. Anterior portion of body, 4. Pygidium; 5. Genitalia, ♀, 6. Pygidium; *Echinosoma dentiferum* Borelli, ♂, 7. Ultimate tergite, pygidium and forceps; 8. Genitalia, ♀, 9 and 10. Pygidium; *Parapsalis infernalis* (Burr), ♂, 11. Ultimate tergite and forceps, 12. Genitalia, ♀, 13. Ultimate tergite and forceps; *Anisolabis deplanata* Srivastava, ♂, 14. Genitalia.

Abbreviations : ACS—Anterior cervical sclerite ; PCS Posterior cervical sclerite ; PST—Prosteron.

Family : LABIDURIDAE
Subfamily : ALLOSTETHINAE

Genus *Gonolabidura* Zacher

1910. *Gonolabidura* Zacher, *Ent. Rdsch.*, 27 : 28 (Type-species : *Anisolabis piligera* Bormans, 1900).
1985. *Protolabidura* Steinmann, *Int. Qrt. Ent.*, Izmir, 1 : 21 (Type-species : *Gonolabidura boschmai* Boeseman, 1954)—Syn. n.



Figs. 15-27 : *Apolabis aborensis* (Burr), ♂, 15. Ultimate tergite and forceps, 16. Genitalia ; *Paralabis montshadskii* Bey-Bienko, ♂, 17. Ultimate tergite and forceps 18. A portion of genitalia ; *Aborolabis pervicina* (Burr), ♀, 19. Pygidium, 20. A portion of genitalia ; *Gonolabidura biswasi* sp.n., Holotype ♂, 21. A few basal antennal segments, 22. Sternal plates, 23. Anterior portion of body, 24. Penultimate sternite, 25. Hind portion of body, 26. Genitalia ♀, 27. Ultimate tergite and forceps.

Gonolabidura biswasi sp. n. Figs. 21—27

♂ : General colour shining black, mouth parts, knee joints and tarsi brownish. Head slightly longer than broad, smooth, impunctate, frons convex, sutures fine, hind margin emarginate. Eyes small, about half as long as the post-ocular length. Antennae partly damaged, only 9 basal segments on the right side remaining, 1st stout, narrowed basally, slightly shorter than the distance between antennal bases; 2nd short; 3rd segment thrice as long as broad; 4th about as long as broad; 5th longer than broad and slightly shorter than 3rd; 6th onwards segments gradually increasing in length and comparatively less stout. Pronotum transverse, smooth, anterior margin lightly convex, sides and hind margin straight, former gently reflexed, prozona weakly raised and not well differentiated from flat metazona, median sulcus faint. Meso and metanotum transverse, former with hind margin straight and latter with hind margin broadly concave. Sternal plates typical, mesosternum prolonged posteriorly into a narrow process. Legs stout, hind tarsi with 1st and 3rd segments equal and 2nd short. Abdomen narrowed at base, enlarged in middle, long and short pubescence present on sides, tergites weakly convex, obscurely punctulate, sides of segments convex, rugosely striate. Penultimate sternite clad with long pubescence, roughly triangular, hind margin posteriorly in middle truncate, manubrium about 1/3 as long as the sternite. Ultimate tergite transverse, gently narrowed posteriorly, hind margin in middle straight, laterally oblique and concave, disc weakly depressed, median sulcus faint. Forceps subcontiguous and broader at base, tapering apically, almost straight, gently incurved in apical 1/3, tip hooked and pointed, trigonal in basal 1/3, afterwards depressed, internal margin dentate. Genitalia as seen in fig. 26.

♀ : Agrees with male in most characters except that ultimate tergite less transverse, penultimate sternite obtusely rounded posteriorly and forceps simple and straight.

Measurements (in mm) :

	Holotype.	Paratype
	♂	♀
Length of head	3.0	3.8
Width of head	2.8	3.4
Length of pronotum	2.0	2.4
Width of pronotum	2.7	3.5
Length of body (without forceps)	15.4	18.5
Length of forceps	4.0	4.7

Material examined: INDIA : Arunachal Pradesh, Tirap Dist., Gandhigram, ca 135 km from Miao, Holotype ♂ (genitalia mounted between two coverslips and

pinned with the specimen), Paratype 1 ♀, 22.1.1987, S. Biswas coll., deposited in the Zoological Survey of India, Calcutta.

Remarks : With Brindle's (1965) key to species of *Gonolabidura* Zacher, the described species comes close to *G. boschmai* Boeseman 1954 in having body colouration dark black with unicolorous legs but differs by its larger body size, triangular penultimate sternite with posterior margin in middle truncate and branches of forceps internally dentate.

It may be mentioned here that Steinmann (1985) erected genus *Protolabidura* with *Gonolabidura boschmai* Boeseman, as the type-species, after reexamination of its Holotype ♂ and genitalia which represent the immature stage. Besides on comparison with the ♂ genitalia of immature stages of other Anisolabid species it may be inferred that 'Holotype' ♂ of *G. boschmai* is a ♂ nymph. As a result is very difficult to place it accurately up to specific level. As such it is proposed to synonymise *Protolabidura* Steinmann, 1985 under *Gonolabidura* Zacher, 1910.

The genus *Gonolabidura* was hitherto known in India, by the species restricted to South India and the present record of the genus on the basis of an undescribed species from NE India is of interest.

Subfamily : NALINAE

Nala nepalensis (Burr) Figs. 28-29

1907. *Labidura nepalensis* Burr, *Rec. Indian Mus.*, 1 : 208 (♂. ♀ ; Nepal : Soondrijal and Pharping).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., 77 mile camp on Miao-Vijaynagar Road, 2 ♂, 7 ♀, 1 nymph, 12.1.1985.

Distribution : In the mountain and sub-mountain regions of India, Nepal, Malaya, Indo-China and Afghanistan.

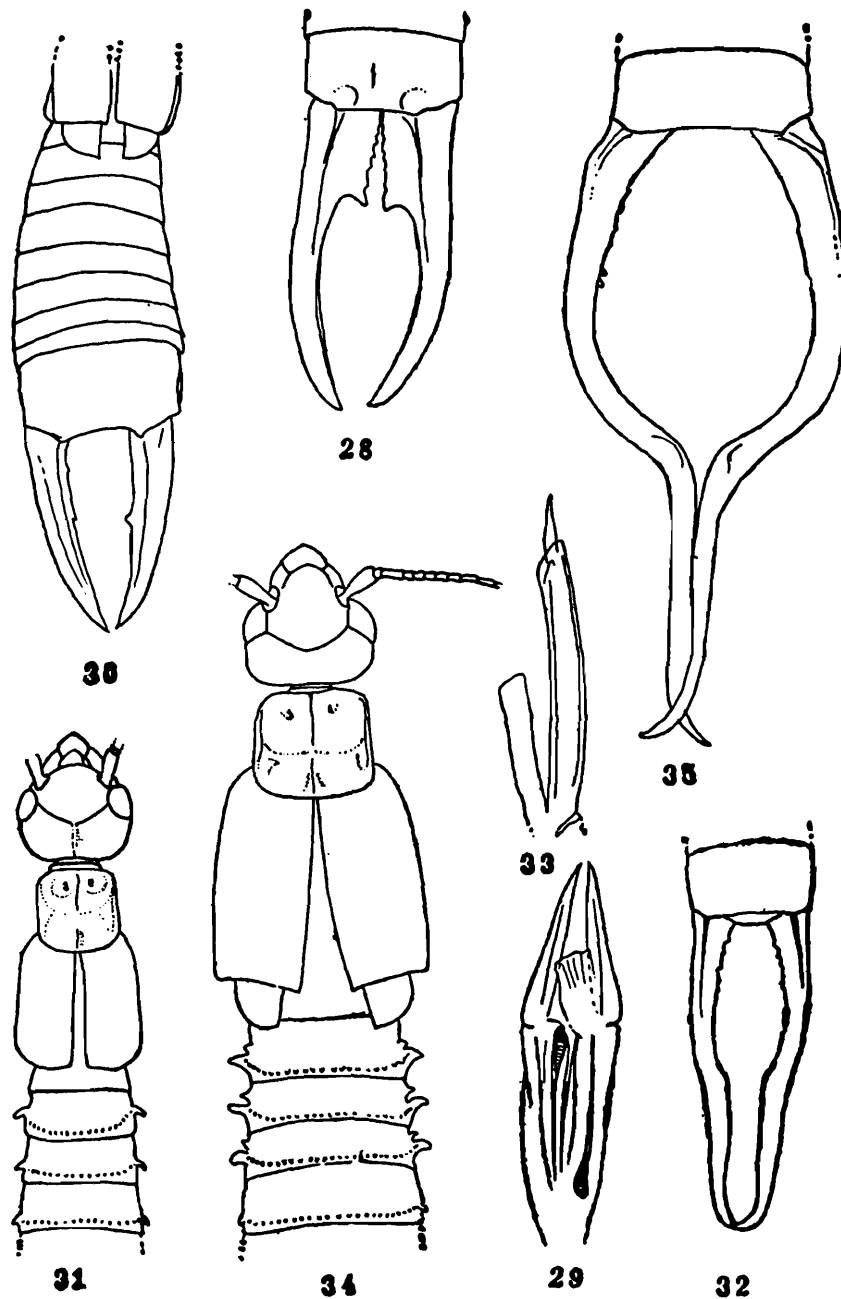
Subfamily : LABIDURINAE

Labidura riparia (Pallas) Fig. 30

1773. *Forficula riparia* Pallas, *Reise Russ. Reichs*, 2 : 727 (Shores of Irtysh River Western Siberi).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Deban, 1 ♀, 14.XII.1982 ; Gandhigram, ca 135 km from Miao, 1 ♂ 20.1.1987.

Distribution : World wide.



Figs. 28-35: *Nala nepalensis* (Burr), ♂, 28. Ultimate tergite and forceps, 29. Genitalia; *Labidura riparia* (Pallas), ♂, 30. A portion of elytra, wings, abdomen, ultimate tergite and forceps; *Forcipula aborensis* Brindle, ♂, 31. Anterior portion of body, 32. Ultimate tergite and forceps, 33. Paramere and distal lobe; *Forcipula clavata* Liu, ♂, 34. Anterior portion of body, 35. Ultimate tergite and forceps.

Forcipula aborensis Brindle Figs. 31-33

1966. *Forcipula aborensis* Brindle, *Ann. Mag. nat. Hist.*, (13) 9: 262 (♂ ; India : Arunachal Pradesh, Near Dosing, 1400 ft., Shimang River).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Gibbons land, 16 km E of Miao, 1 ♂ (genitalia mounted between two coverslips and pinned with the specimens), 1 nymph, 19.XII.1989.

Distribution : N.E. Himalayas in India (Arunachal Pradesh, Siang Dist. and Assam).

Remarks Previous records of the species are based on the material collected during 1911 and 1912 recorded by Burr (1913) as *Forcipula pugnax*, from which the 'Holotype' of the species was designated. Therefore, the present record of the species after a lapse of about eight decades is of interest.

Forcipula clavata Liu Figs. 34-35

1946. *Forcipula clavata* Liu, *J. W. China Border Rec. Soc.*, 16 : 22, pl. 2, fig. 8 (♂, ♀ ; China : Pan-Chi, Pen-Chi in Chunking).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Vijaynagar, 6 ♂, 4 ♀ and 2 nymphs, 14.1.1987 ; 77 mile camp, Miao-Vijainagar Road, 1 ♂, 27.1.1987.

Distribution : India (Arunachal Pradesh) and China (Chunking).

Remarks : Srivastava (1986) has made an attempt to clarify the status of this species on a large series collected from different localities in Arunachal Pradesh, India.

Superfamily : APACHYOIDEA

Family : APACHYIDAE

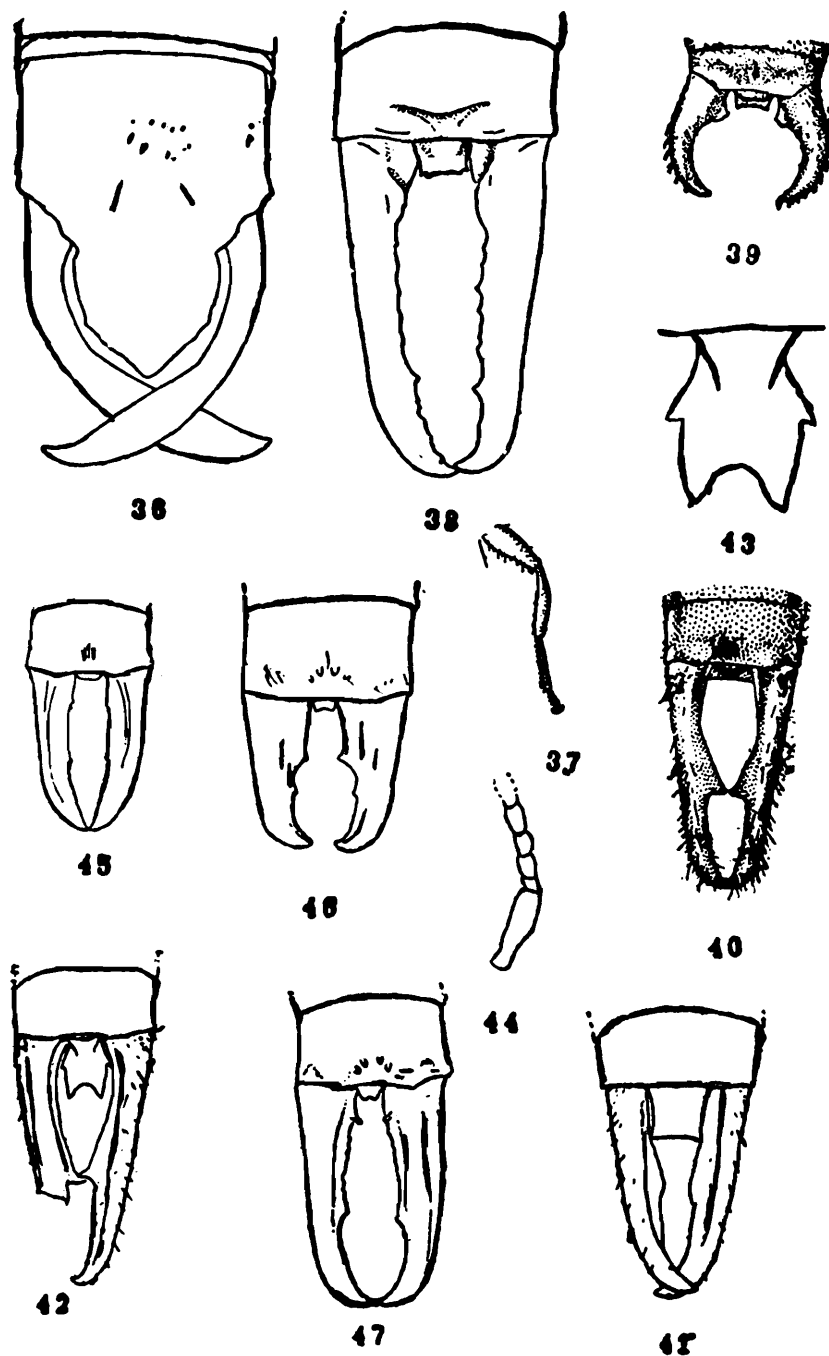
Apachyus feae Bormans Fig. 36

1894. *Apachyus feae* Bormans, *Annali Mus. civ. Stor. nat. Giacoma Doria*, (2) 14 : 372 (1♂, 1♀, 1 nymph ♂, Burma ; Carin Cheba).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Gandhigram, ca 135 km of Miao, 22 nymphs, 30.I.1987.

Distribution : India (NE Region), Bhutan, Burma, Vietman and China (Yunnan).

Remarks : Only nymphs of both sexes at various stages of development are present.



Figs. 36-47: *Apachyus feae* Bormans, ♂, 36. Ultimate tergite, anal process and forceps; *Irdex nitidipennis* (Bormans), ♂, 37. Hind leg, 38. Ultimate tergite, pygidium and forceps; *Labia curvicauda* (Motschulsky), ♂, 39. Ultimate tergite and forceps; *Chaetospania kurseongae* Hebard, ♂, 40. Ultimate tergite and forceps, ♀, 41. Ultimate tergite and forceps; *Chaetospania feae* Bormans, ♂, 42. Ultimate tergite, pygidium and forceps, 43. Pygidium, enlarged; *Proreus weisi* (Burr), ♂, 44. A few basal antennal segments, 45. Ultimate tergite and forceps: *Chelisochis brevipennis* Borelli, ♂, 46 and 47. Ultimate tergite and forceps.

Superfamily : FORFICULOIDEA

Family : SPONGIPHORIDAE

Subfamily : IRDEXINAE

***Irdex nitidipennis* (Bormans) Figs. 37-38**

1894. *Spongophora nitidipennis* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 14 : 382 (1 ♂ ; Burma).

Material examined INDIA : Arunachal Pradesh, Tirap Dist., Gibbon's land, 16 km E of Miao, 1 ♀, 20.XII.1982, 1 ♂, 1 nymph, 22.XII.1981 ; Gandhigram, ca 135 km from Miao, 1 ♀, 23.1.1987, 1 ♀ 23.1.1987 ; 1 ♂, 28.1.1987, 13 ♂, 5 ♀, 2 nymphs, 30.1.1987.

Distribution : India, Bhutan, Burma, China, Sumatra and Hainan Island.

Remarks : The interpretation of the species in this work is after Srivastava (1985a).

Subfamily : LABIINAE

***Labia curvicauda* (Motschulsky) Fig. 39**

1863. *Forgicesila rcurvicauda* Motschulsky, *Bull. Soc. Imp. Nat. Moscou*, 34 (2) : 2, pl. 1, fig. 1 (♂, ♀ ; Nura Illia Mountains, Sri Lanka).

Material examined INDIA : Arunachal Pradesh, Tirap Dist., Gibbons land, 16 km E of Miao, 5 ♂, 1 ♀, 20.XII.1982.

Distribution Almost world wide.

***Chaetospania kurseongae* Hebard Figs. 40-41**

1923. *Chaetospania kurseongae* Habard, *Mem. Dep. Agric. India, ent. Ser.*, 7: 215, figs. 10-11 (♂, ♀ ; India : Kurseong).

Material examined INDIA : Arunachal Pradesh, Tirap Dist., Deban, 27 km E of Miao, 1 ♀, 10.XII.1982.

Distribution : In India this species is reported from West Bengal (Kurseong) and the present record from Arunachal Pradesh, though not unexpected, is new to the area.

Remarks : Generally it is difficult to determine isolated females but on the basis of shape of pygidium and forceps the above specimen may be referred to this species with some certainty.

Chaetospania feae Bormans Figs. 42-43

1894. *Chaetospania feae* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 14 : 390 (♂, ♀ ; Burma).

Material examined : INDIA : Arunachal Pradesh : Tirap Dist., Deban, 27 km E of Miao, 1 ♂, 10.XII.1982.

Distribution : Widely distributed throughout the Oriental Region.

Family : CHELISOCHIDAE
Subfamily : CHELISOCHINAE

Chelisoches brevipennis Borelli Fig. 46-47

1923. *Chelisoches brevipennis* Borelli, *Boll. Musei zool. Anat. Comp. R. Univ. Torino*, 8 (13) : 12 (♂, ♀ ; Philippine Isls, N, Palawan, Binalaun).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., 77 mile camp, Miao-Vijainagar Road, 1 ♂, 4.1.1985, 2 ♂, 2 ♀, 11.1.1985.

Distribution : India (NE Region) and Philippine Isls.

Adiathetus glaucopterus (Bormans) Figs. 48-49

1888. *Chelisoches glaucopterus* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 6 : 441 (1 ♂, and 1 nymph ; Burma).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Gandhigram ca 135 km from Miao, 1 ♀, 23.1.87.

Remarks : India (North Eastern Hills), China (Yunnan), Burma and Vietnam.

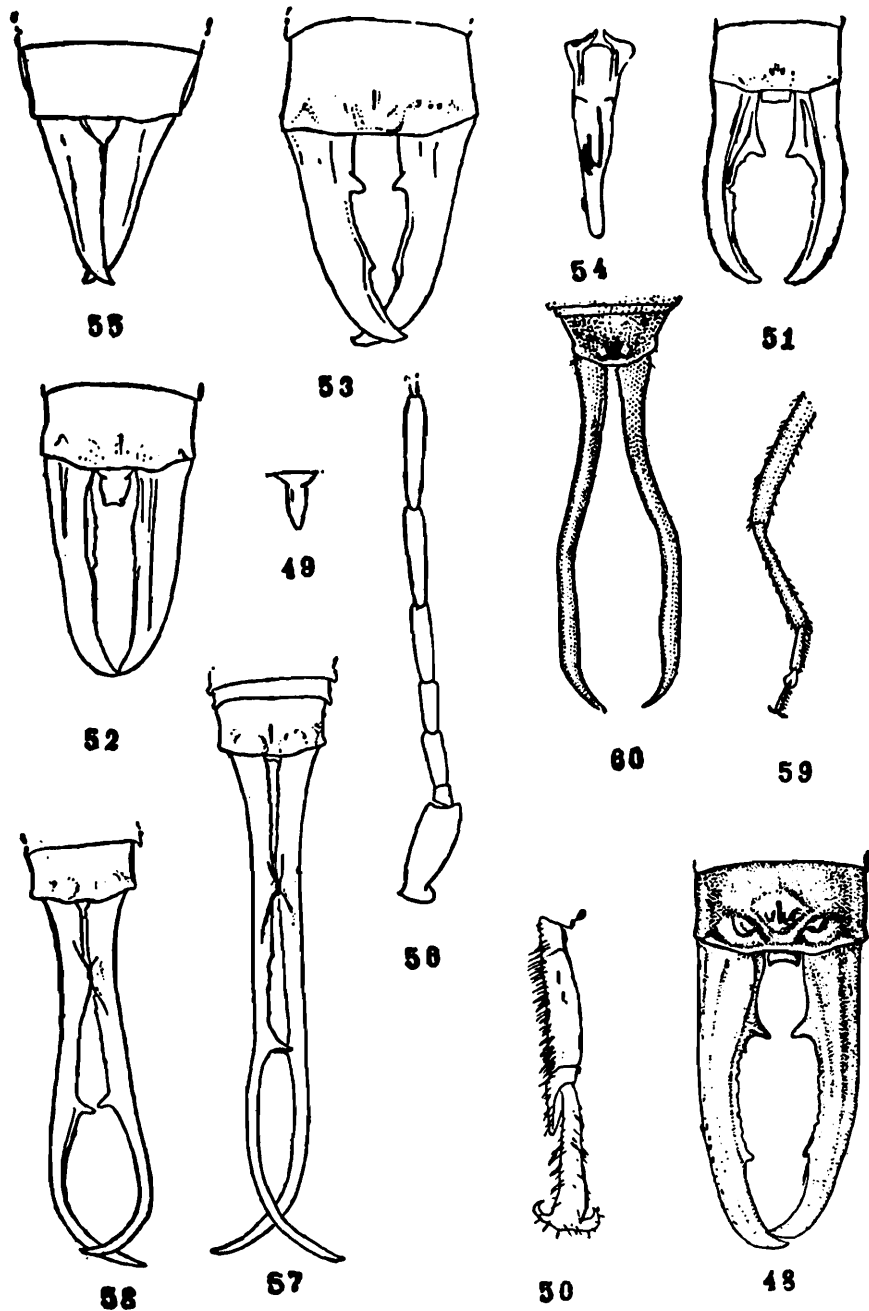
Adiathetus metallicus Srivastava Figs. 50-52

1985. *Adiathetus metallicus* Srivastava, *Rec. Indian Mus.*, 82 (1-4) : 48, figs. 14-19 (♂, ♀ ; India : Arunachal Pradesh, Tirap Dist., Hornbill).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., 77 miles camp on Miao Vijaynagar Road, 1 ♀, 11.1.1985 ; Gandhigram ca 135 km from Miao, 8 ♂, 5 ♀, 30.1.1987 ; Deban, 30 km E of Miao, 1 ♀, 12.XII.1982.

Distribution : So far it is known from India, Arunachal Pradesh, Tirap Dist.

Remarks : The above material agrees with the 'Type' series of the species.



Figs. 48-60: *Adiathetus glaucopterus* (Bormans), ♂, 48. Ultimate tergite and forceps, ♀ 49. Pygidium; *Adiathetus metallicus* Srivastava, ♂, 50. Hind tarsi; 51. Ultimate tergite and forceps, ♀, 52. Ultimate tergite and forceps; *Hamaxas feae* (Bormans), ♂, 53. Ultimate tergite and forceps, 54. Genitalia, ♀, 55. Ultimate tergite and forceps; *Timmomenus nevillei* (Burr), ♂, 56. A few basal antennal segments; 57. and 58. Ultimate tergite and forceps; *Eparchus simplex* (Bormans), ♂, 59. Hind legs; 60. Ultimate tergite and forceps.

Hamaxas feae (Bormans) Figs. 53-55

1894. *Chelisoche feae* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 14 : 393 (♂, ♀ ; Burma).

Material examined INDIA : Arunachal Pradesh, Tirap Dist., Deban, 27 km E of Miao, 1 ♂, 10.12.1982 ; Miao, 1 ♀ ; Gandhigram ca 135 km from Miao, 2 ♀, 30.XII.1984, 1 ♀, 24.1.1987.

Distribution India (North Eastern Himalayas) and other parts of Oriental Region.

Family : FORFICULIDAE

Subfamily : OPISTHOCOSMIINAE

Timmomenus nevillei (Burr) Figs. 56-58

1904. *Opisthocosmia nevillei* Burr, *Trans. R. ent. Soc. Lond*, 1904 : 305, 309 (♂, Bhutan Maria Basti).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Lower Jheel Camp, 4 ♂, 3.II.1987 ; Gandhigram ca 135 km from Miao, 1 ♂, 27.1.1987.

Distribution : India (Sikkim) and Bhutan (Maria Basti),

Remarks The present material agrees with detailed description of Burr (1910) and the following additional information would be useful in the determination of the species.

Head convex, sutures obsolete. Eyes about 1/2 as long as the post-ocular length. Antennae with 14 (in one specimen) segments ; basal segment thick, slightly longer than the distance between antennal bases. Lateral tubercles on 3rd and 4th abdominal tergites well developed, sides of abdominal segments 5th to 6th convex, with an oblique fold or tubercle, well developed or poorly marked. Pygidium obtuse, in middle above with a faint concavity. Forceps may be slender, less curved in apical half or sometimes stouter and more curved in apical half.

T. nevillei comes very close to *Timmomenus lugens* (Bormans) but differs by the presence of greenish sheen on the body, slender build and in ♂, forceps with a vertical, triangular tooth in basal half which is more compressed and hardly incurved or acute at tip.

Eparchus simplex Bormans Figs. 59-60

1894. *Opisthocosmia simplex* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 14 : 396 (♂, ♀ ; Burma).
1981. *Eparchus simplex* ; Srivastava, *Annali, Mus. civ. Stor. nat. Giacomo Doria*, 83 : 302, figs. 42-50.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Gibbons Land, 16 km E of Miao, 1 ♂, 25.XII.1982 ; Lower Jheel camp, 1 ♂, 3.II.1987 ; 77 mile base camp 1 ♀, 31.1.1987.

Distribution : India (NE Himalayas), Bhutan, and South China.

Remarks : Present interpretation of the species is after Srivastava (1981).

Subfamily : ALLODAHLINAE

Allodahlia ahrimanes (Burr) Figs. 61-66

1990. *Anechura ahrimanes* Burr, *Ann. Mag. nat. Hist.*, (7) 6 : 79, pl. Fig. 5 (♂ ; Sikkim).
1910. *Allodahlia ahrimanes* ; Burr, *Fauna British India, Dermaptera* : 154, pl. 10, Fig. 98.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Gandhigram ca 135 km from Miao, 5 ♂, 20.1.1987, 1 ♂, 27.1.1987, 2 ♀, 30.1.1987, 77 mile base camp, 1 ♂, 31.1.1987.

Distribution : India Sikkim ; West Bengal (Darjeeling dist., Kurseong) ; Burma (N.E. Kambaiti).

Remarks : In the above material some variation in the colour of elytra, wings and the shape of pygidium are noted.

The elytra are reddish brown in middle, posterior and lateral margins with a black band and wings with a rounded yellow spot. Forceps in normal ♂ are undulate at base above a vertical pointed tooth and internally at about middle a sharp tooth present, followed by somewhat similar tooth in the middle of posterior half. In some specimens forceps are almost horizontal and internal teeth are not well marked. Besides, other specimens represent the intermediate stages of development of forceps and its inner armatur.

Pygidium, in normal ♂, is about twice as long as the length of ultimate tergite with tip acuminate, at base declivous, afterwards horizontal or a little raised upwards. It is either poorly developed or represents intermediate stages in other specimens.

Allodahlia coriacea (Bormans) Figs. 67-69

1894. *Anechura coriacea* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 14 : 403 (♂; Burma, Carin Cheba).
1959. *Allodahlia coriacea signata* Bey-Bienko, *Ent. Obzor.*, 38 : 620 (♂, ♀; China, Yunnan).
1972. *Allodahlia ochroptera* Brindle, *Entomologist's mon. mag.*, 108 : 27 (Holotype ♂, Teinzo, Burma, Allotype ♀, Bhamo, Burma, Brit. Mus. (Nat. Hist.); Paratype 1♂ with same data as the Allotype, Manchester Museum—All determined by Bormans as *Anechura ancylura* Dohrn; other specimens : 1♂, Sikkim (Manchester Mus.); 1♂, 1♀, Hinterindien (Vienna Mus.); 1♂, Ind. Orientale (Vienna Mus.) and 1♀, (Pedong) W. Bengal (Brit. Mus. Nat. Hist.).—Syn. nov.

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Lower Jheel camp, 2♀, 3.II.1987, 1♂, 5.II.1987; Gandhinagar ca 135 km from Miao, 1♂, 27.I.1987; 77 mile camp, Miao-Vijaynagar Road, 1♂, 31.I.1987.

Distribution : In the mountains of India, Bhutan, Burma, China (Yunnan), Borneo and Sumatra.

Remarks : These specimens are compared with the 'Type' ♂ of the species and agree well with it and differ slightly in ♂ by the degree of development and the position of internal teeth of forceps and the shape of pygidium which may be considered as individual variation.

In the 'Type' ♂, the pygidium is transverse, more or less triangular posteriorly, posterolateral angles and in middle provided with a minute point, at base above convex on either side of a median groove. The above recorded males possess transverse pygidium with three minute points posteriorly but the posterior margin appears wavy due to certain linear grooves. The forceps are internally armed with two sharp teeth beyond middle.

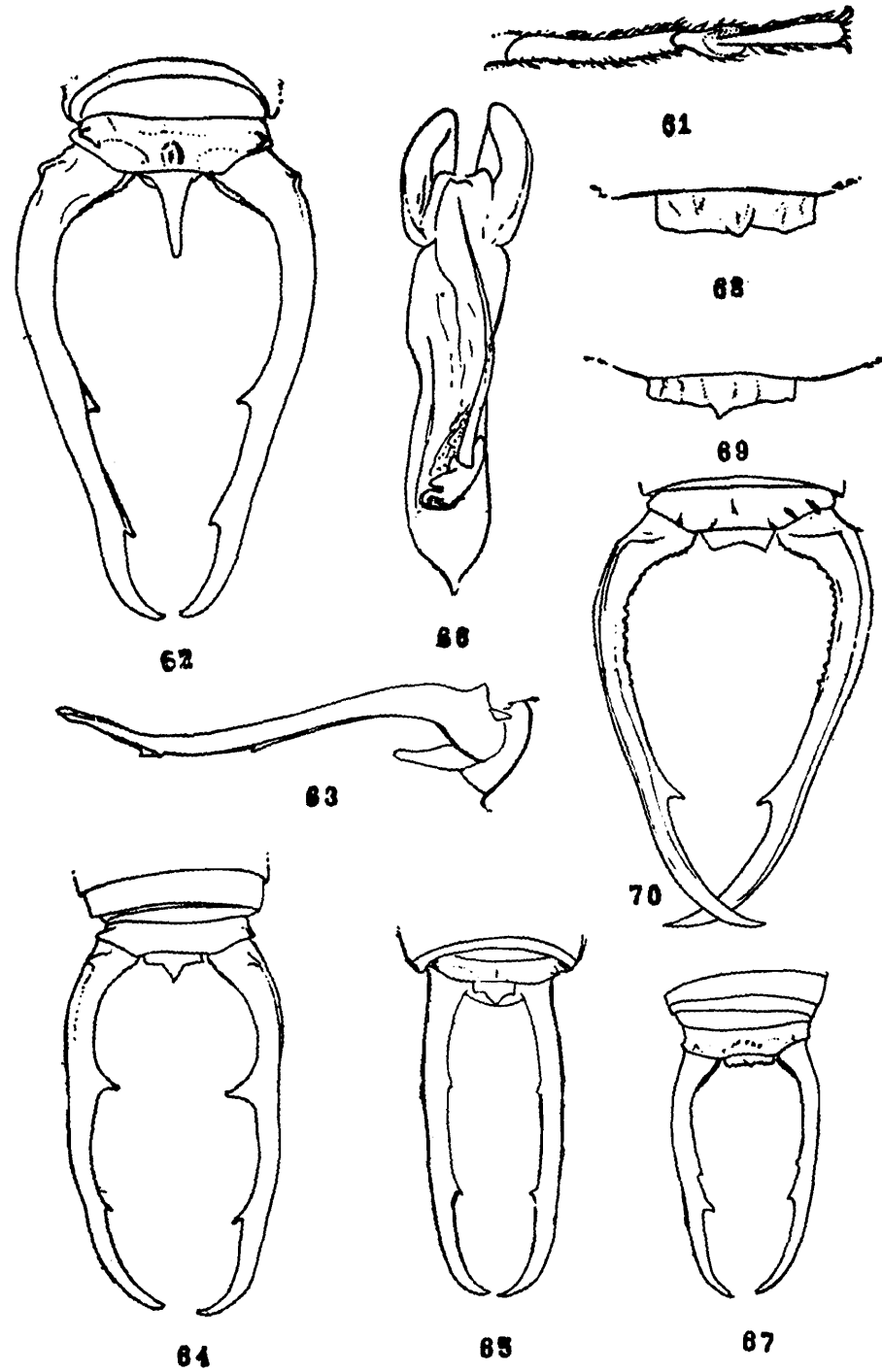
In the light of above variation, the *Allodahlia ochroptera* Brindle (1972) is considered as synonym of this species. Besides, it may be mentioned that the specimens with yellow wings are reported earlier for *A. coriacea* (Bormans).

Allodahlia scabriuscula (Serville) Fig. 70

1839. *Forficula scabriuscula* Serville, *Histoire des Insectes Orthopteres* : 38 (♀, Holotype,) 'Amerique meridionale' (locality erroneus).

Material examined : INDIA : Arunachal Pradesh, Tirap Dist., Lower Jheel camp, 1♀, 30.XI.1987; Gandhigram ca 135 km from Miao, 2♂, 30.I.1987, 1♂, 3.II.1987; 1♂, 5.II.1987; 2♂, 2♀, 8.II.1987.

Distribution India, Bhutan, Burma, Vietnam, Java, Sumatra, Borneo, South China and Philippine Islands.



Figs. 61-70: *Allodahlia ahrimanes* (Burr), ♂, 61. Hind tarsi, 62. Ultimate tergite and forceps, 63. Ultimate tergite and forceps, in profile, 64-65. Ultimate tergite and forceps, 66. Genitalia; *Allodahlia coriacea* (Bormans), Holotype ♂, 67. Hind portion of body, 68. Pygidium, enlarged; 69. Pygidium, enlarged (from other ♂,); *Allodahlia scabriuscula* (Serville), ♂, 70. Ultimate tergite and forceps (Figs. 62 and 63; 67 and 68 from same specimens).

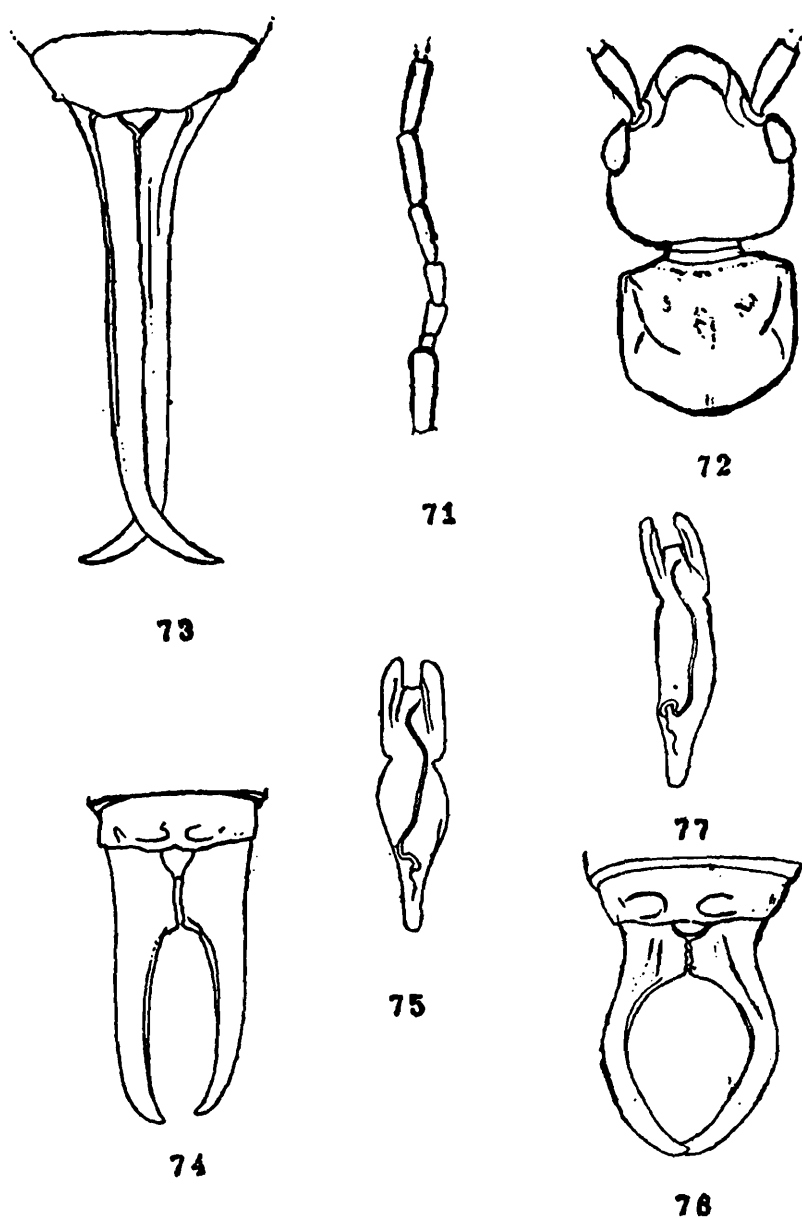
EUDOHRNIINAE

***Pterygida pulchripes* (Bormans) Figs. 71-73**

1894. *Forficula pulchripes* Bormans, *Annali Mus. civ. Stor. nat. Giacomo Dorta*, (2) 14: 408 (♀, Burma).

1982. *Kosmetor pulchripes*; Srivastava, *Annali Mus. civ. Stor. nat. Giacomo Doria*, 85: 103, fig. 12.

Material examined.: INDIA : Arunachal Pradesh, Tirap Dist., Lower Jheel camp, 5 ♀, 3.11.1987.



Figs. 71-77 : *Pterygida pulchripes* (Bormans), ♀, 71. A few basal antennal segments, 72. Head and pronotum, 73. Ultimate tergite and forceps; *Forficula beelzebub* (Burr), ♂, 74. Ultimate tergite and forceps; 75. Genitalia, *Forficula planicollis* Kirby, ♂, 76. Ultimate tergite and forceps. 77. Genitalia

Distribution : Hitherto known by Type ♂ from Burma.

Remarks : The present material agrees well with Type ♀ of the species in morphological details and general body colouration. The only difference noted in the material is that legs are yellow with femora dark brown in apical one third.

FORFICULINAE

Forficula beelzebub (Burr) Fig. 74-75

1900. *Chelisoche beelzebub* Burr, *Ann. Soc. ent. Belge.*, 44 : 51 (1 ♂ ; India, Kurseong).

1904. *Forficula beelzebub* ; Burr, *Trans. R. en Soc. Lond.*, 1904 : 322.

Material examined. INDIA : Arunachal Pradesh, Tirap Dist., Gandhigram, ca 135 km from Miao, 1 ♂ , 27.XII.1987, 1 ♂ , 20.I.1987.

Distribution : India (Himalayan and Sub Himalayam Region), Nepal, Bhutan and also recorded from Africa.

Forficula planicollis Kirby Figs. 76-77

1891. *Forficula planicollis* Kirby, *J. Linn. Soc. (zool)*, 23 : 225 (♀ ; North India).

Material examined. INDIA : Arunachal Pradesh, Tirap dist., Gandhigram, ca 135 km from Miao, 1 ♀ , 2 nymphs, 30.I.1987.

Distribution : Mountain region of India (U.P., W.B and Sikkim), Nepal, Bhutan, Burma and China (South China).

SUMMARY

The paper deals with 26 species belonging to 20 genera, including a new species viz., *Gonolabidura biswasi*, besides proposing the synonymy of the genus *Protolabidura* Steinmann under *Gonolabidura* Zacher and *Allodahlia ochroptera* Brindle under *Allodahlia coriacea* (Bormans). A complete check-list of the species known from Namdapha, Tirap dist., Arunachal Pradesh listing 31 species under 24 genera, besides a key for their identification is provided. Zoogeographical notes are also given.

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