

Records of the Zoological Survey of India

**On a Collection of Hemiptera from Namdapha Biosphere
Reserve in Arunachal Pradesh, India**

by

S. P. Chakrabarty, L. K. Ghosh & R. C. Basu

Zoological Survey of India, Calcutta

**Issued by the Director
Zoological Survey of India, Calcutta**

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INTRODUCTION

The eastern part of the Indian subregion is very rich and diverse faunistically. The study of hemipteran fauna in this region made practically no headway except some stray records of 125 species belonging to 92 genera in 4 families of Hemiptera. (Ghosh and Raychaudhuri 1969; Ghosh 1970; Ghosh *et al.* 1971; Ghosh and Raychaudhuri 1971; Basu *et al.* 1972; Basu and Raychaudhuri 1974; Basu and Mitra 1977a, 1977b; Datta and Chakraborty 1977).

The present paper is based on a small collection of Hemiptera from Namdapha National park in Tirap District. The Biogeography, Geology, Topography, Climate, Rainfall, Vegetational pattern and faunal resources of the area under study are well reflected in a contribution by Ghosh (1985). Study on the hemipteran insects from Namdapha reveals 47 species belonging to 37 genera distributed over 15 families. Of these, five species (marked*) *viz.*, *Erthesina guttata* Fabricius, *Gargara citrea* Distant, *Jucundus burmanus* Distant, *Mezira triangulus* Bergroth, and *Serinetha dallasi* Dohrn are new to India and 23 species (marked **) are being reported for the first time from Arunachal Pradesh. Some of the species are identified upto the generic level only either due to their nymphal stage or damaged condition or paucity of material or non availability of relevant literature. Keys to various taxa are provided for easy identification of various groups. Distributional record of all species has been provided. Present study will add to our knowledge of hemipteran fauna of Arunachal Pradesh.

However, further faunistic explorations in the area may reveal many more species including some undescribed taxa because of unique geographical position and floral diversity.

Classified List of species of Hemiptera from Namdapha

Suborder HOMOPTERA

Family I. APHIDIDAE

1. *Aphis gossypii* Glover
2. *Lipaphis erysimi* Kalténbach
3. *Paczoskia budhium* Banerjee *et al.*
4. *Toxoptera citricidus* (Kirkaldy)

Family II. CERCOPIDAE

5. *Clovia conifera* (Walker)

Family III. MEMBRACIDAE

- *6. *Gargara citrea* Distant
- **7. *G. majuscula* Distant
- **8. *Leptocentrus leucaspis* Walker
- **9. *Telengana capistrata* Distant

Suborder HETEROPTERA

Family IV ARADIDAE

- *10. *Mezira triangulus* Bergr.

Family V CIMICIDAE

- 11. *Cimex lectularius* Linnaeus

Family VI. COREIDAE

- 12. *Cletomorpha raja* Distant
- 13. *Cletus trigonus* Thunberg
- 14. *Homoeocerus striicornis* Scott.
- 15. *Homoeocerus* sp.
- 16. *Leptocorisa acuta* (Thunburg)
- **17. *Notobitus excellens* Distant
- 18. *Notobitus* sp.
- **19. *Riptortus pedestris* Fabricius
- **20. *R. strenuus* Horv.
- 21. *Riptortus* sp.
- *22. *Serinetha dallasi* Dohrn
- 23. *Serinetha* sp.

Family VII. GERRIDAE

- *24. *Jucundus burmanus* Distant
- **25. *Metrocoris nigrofasciatus* Distant

Family VIII. LYGAEIDAE

- **26. *Horridipamera nietneri* (Dohrn)
- **27. *Metochus uniguttatus* (Thunb.)

Family IX. OCHTERIDAE

- **28. *Mononyx spissus* Distant

Family X. DINIDORIDAE

- **29. *Coridius brunneus* (Thunburg)

- **30. *Coridius nepalensis* (Westwood)
 31. *Coridius* sp.

Family XI. PLATASPIDAE

32. *Brachyplatys* sp.

Family XII. PENTATOMIDAE

33. *Antestia* sp.
 34. *Cappaea taprobanensis* (Dallas)
 35. *Carbula crassiventris* Dallas
 **36. *Dalpada affinis* Dallas
 **37. *Dalpada jugatoria* Lethriery
 *38. *Erthesina guttata* Fabricius
 **39. *Eusarcocoris ventralis* Westwood
 **40. *Prionaca burmanica* Distant

Family XIII. SCUTELLERIDAE

- **41. *Chrysocoris grandis* Thunburg.

Family XIV PYRRHOCORIDAE

- **42. *Dysdercus koenigii* (Fabricius)
 **43. *Physopelta gutta* (Burmeister)
 **44. *P. schlanbuschi* (Fabricius)

Family XV. REDUVIIDAE

- **45. *Acanthaspis angularis* Stal
 **46. *Euagoras plagiatus* Burmeister
 **47. *Sminthocoris fuscipennis* Stal

SYSTEMATIC ACCOUNT

Suborder HOMOPTERA

- | | | | | | |
|------|--|-----|-----|-----|-------------|
| 1(2) | Pronotum prolonged backwards into a hood or process of variable form | ... | ... | ... | Membracidae |
| 2(1) | Pronotum not prolonged beyond base of abdomen | ... | ... | ... | 3 |
| 3(4) | Posterior tibiae armed with one or two spines and with a cluster of spinules at apex; scutellum present; tegmina usually coriaceous; siphunculi absent | ... | ... | ... | Cercopidae |

- 4(3) Posterior tibiae not armed with such spines, but usually with normal hairs, without a cluster of spinules at apex; scutellum absent; tegmina usually membranous; siphunculi usually present in between 5th and 6th abdominal segments ... Aphididae

Family I. APHIDIDAE

Associated with woody or herbaceous plants, only sexual females oviparous, otherwise viviparous; siphunculus and cauda usually present; last and penultimate antennal segment each with one primary rhinarium; RS present in fore wing. A certain number of these familiar insects are gall formers.

This group has enormous economic importance, playing a vital role in the transmission of phytopathogenic viruses.

Key to genera

- F.T.C. 5, 5, 5; ultimate rostral segment very long, extending beyond 2nd abdominal segment, about 1.80 - 2.0X
: *Paczoskia*
- F.T.C. 3, 3, 3 or 3, 3, 2; ultimate rostral segment almost upto 1.4 X second joint of hind tarsus
 2
2. Hind tibiae with row of peg-like projections; lateroventral areas of abdominal segments 6 or 7 with inter connecting striae
: *Toxoptera*
- Hind tibia without such structures as above
3. F.T.C. 3, 3, 3; spiracles of abd. segs 1 or 2 usually placed close together; abd. segs 1 or 7 without lateral abd. tubercles; siphunculi clavate in nature
: *Lipaphis*
- F.T.C. 3, 3, 2; spiracles of abdominal segments 1 or 2 placed far apart; abd. seg. 1 or 7 usually with lateral abdominal tubercles. Siphunculi subcylindrical... ..: *Aphis*

Genus *Aphis* Linnaeus

1758. *Aphis* Linnaeus, *Syst. Nat.* (10th ed). 1: 451. Type-species : *Aphis sambuci* Linnaeus, 1758

1. *Aphis gossypii* Glover

1877. *Aphis gossypii* Glover, Rep. Comm. agric. Oper. Dep., (1876) : 36.

1970. *Aphis gossypii* Glover : Ghosh, L.K., *Sci. Cult.*, 36(10) : 562.

Material examined : Apteræ and nymphs, on *Pisidium guajava*, Gibbon's land, Tirap Distt., 22.xii. 1982, Coll. S. Biswas.

Diagnostic features

Apterous viviparous female :

Body pale about 1.2 - 1.6 mm long with 0.8 - 0.9 mm as maximum width near the middle of abdomen. Antennae about 0.6 - 0.7 times as long as body, processus terminalis 2 - 3.5 times as long as the base of antennal segment vi; rostrum reaches beyond mid coxae, ultimate rostral segment a little longer than second joint of hind tarsus. Dorsum of abdomen rather pale to light brownish, without any sclerite; siphunculi cylindrical, 0.14 - 0.19 times as long as body and 1.2 - 1.3 times as long as cauda bearing 5 - 6 hairs.

Alate viviparous female :

Body pale brownish, 1.3 - 1.6 mm long with 0.7 - 0.9 mm as maximum width. Head brown, antenna about 0.7 - 0.8 times as long as body, antennal segment III with 5 - 7 secondary rhinaria, processus terminalis 2.1 - 2.3 times as long as base of antennal segment VI. Dorsum of abdomen with brown sclerotic patches marginally and with distinct post siphuncular sclerites; siphunculi about 1.5 times as long as cauda bearing 4-6 hairs.

Remarks : This is the commonest species of aphid which is highly Polyphagous and widely distributed throughout the world. In India, the species infests about 500 species of plants belonging to 76 families. It exhibits great range of morphological variation even on the same plant. It's colour in life is extremely variable, greyish green to dark green, marbled with paler green and often tinged with yellow. It is found to transmit about 44 viruses of plants (Eastop 1958).

Distribution : India : all over; Elsewhere : Cosmopolitan.

Remarks : It is highly polyphagous species and subject to maximum colour variations even in the same colony. The species is most common and found abundantly in the plains and hills almost throughout the year.

Genus *Lipaphis* Mordvilko

1928. *Lipaphis* Mordvilko, Keys to the Russian Insects : 200 (in Russian).

Type-species : *Aphis erysimi* Kalténbach, 1848.

2. *Lipaphis erysimi* (Kaltenbach)

1843. *Aphis erysimi* Kaltenbach, *Mon. fam.* Pfl. : 99.

1970. *Lipaphis erysimi* Kaltenbach : Ghosh, L.K., *Sci. Cult.*, 36 (10) : 363.

Material examined : 3 apterous viviparous ♀♀, indet. Cruciferae; ++
Miao; Tirap Distt., 5. xii. 1982, Coll. S. Biswas.

Diagnostic features :

Apterous viviparous female :

Body 1.5 - 1.8 mm. long with 0.9 - 1.0 mm as maximum width near the middle of abdomen. Head brownish, with little developed lateral frontal tubercles; antennae about 0.5 - 0.7 times as long as body, with hairs (5 u - 9 u long), processus terminalis 2 - 2.75 times as long as the base of the VI antennal segment; rostrum reaches mid coxae, ultimate rostral segment 0.8 - 0.9 times as long as second joint of hind tarsus. Dorsum of abdomen pale but occasionally with scattered sclerites; siphunculi cylindrical to weakly clavate near apex, nearly equal to or slightly longer than cauda which is elongate and bears 4-6 hairs.

Alate viviparous female :

Body 1.5 - 2 mm long with about 1 mm as maximum width. Head brown, almost flat; antennae about 0.5 times as long as body, antennal segment III with 17-21, IV with 5-7 and V with 0-2 secondary rhinaria, antennal hairs very short and sparse, processus terminalis 2 - 3 times as long as the base of the antennal segment VI; rostrum reaches mid coxae, ultimate rostral segment slightly shorter to nearly as long as second joint of hind tarsus. Dorsum of abdomen with sclerotic segmental patches marginally; siphunculi imbricated weakly clavate distally, about as long as or slightly longer than dark cauda bearing 4-6 hairs. Wing veins dark but not bordered.

Distribution : India : All over; Elsewhere : Cosmopolitan.

Remarks : The species is one of the major pests of Cruciferous crops in India and is a menace particularly to the cultivation of mustard. This is a greyish green to yellow species feeding gregariously on the hostplants. In India, it is known to infest 61 species/subspecies of plants belonging to 16 plant families. The species is also remarkable for its polymorphism and complicated life cycle.

Genus *Paczoskia* Mordvilko

1914. *Paczoskia* Mordvilko, *Foune Rossii*, 1 : 63.

Type-species : *Paczoskia paczoskii* Mordvilko, 1919.

3. *Paczoskia budhium* Banerjee et al.

Paczoskia budhium Banerjee, Ghosh and Raychaudhuri

1969. *Paczoskia budhium* Banerjee, Ghosh, A. K. and Ray Chaudhuri, D.N. *Oriental Ins.*, 3 (3) : 259.

1980. *Paczoskia budhium* Banerjee et al. : Raychaudhuri, D.N. (ed.), *Taxonomy of the aphids of North-east India and Bhutan* : 234.

Material examined : 5 apterous viviparous OO and nymphs, on
++
indet. Compositae, Gibbon's land, Tirap Distt., 20.xii.1982, Coll. S. Biswas.

Diagnostic features :

Apterous viviparous female :

Body elongate, 3 - 4 mm long with 1.3 - 2 mm as maximum width near the middle of abdomen. Head brown, with diverging lateral frontal tubercles; antennae as long as or a little longer than body, antennal segment III with 25 - 55 round secondary rhinaria, processus terminalis 5.2 - 6 times as long as the base of segment VI; rostrum very long reaching 3rd abdominal segment, ultimate rostral segment about 1.8 - 2 times as long as second joint of hind tarsus, abdominal hairs arising from dark scleroites, about 1.5 times as long as the basal diameter of antennal segment III; siphunculi black, slender with distinct polygonal reticulation, cauda pale, elongate with a constriction on basal 0.3 portion, bearing 13 - 16 hairs.

Alate viviparous female :

Body 3.2 - 3.5 mm long with 1.1 - 1.2 mm wide. Head light brown with diverging lateral frontal tubercles; antennae brownish to blackish brown from segment III onwards excepting the very pale base, antennal segment III with 75 - 90 secondary rhinaria, processus terminalis 5 - 6 times as long as the base of segment VI; rostrum almost reaching 3rd abdominal segment, ultimate rostral segment twice as long as second joint of hind tarsus. Abdominal dorsum with distinct paired lateral sclerotic areas, dorsal hairs about 1.2 - 1.4 times as long as the basal diameter of antennal segment; siphunculi dark brown, slender, reticulated on apical 0.2 portion and about 2.5 times as long as elongate cauda bearing 13 - 14 hairs.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Meghalaya, Uttar Pradesh and West Bengal.

Remarks : These brownish to dark greenish brown insects infest

mostly the undersurface of the leaves and also the young shoots of the plant. The species is characterised by its stiletto-shaped rostrum extending beyond hind coxae and more distinct and extensive reticulation (10-14 rows of Cells) on the siphunculi.

Genus *Toxoptera* Koch

1857. *Toxoptera* Koch, *Die Pflanz. Aphiden*, 3 : 253.

Type-species : *Aphis auranti* Bozer de Fonscolombe, 1841.

4. *Toxoptera citricidus* (Kirkaldy)

1907. *Myzus citricidus* Kirkaldy, *Proc. Hawaii ent. Soc.*, 1 : 100.

1980. *Toxoptera citricidus* (Kirkaldy) : Ray Chaudhuri, D.N. (ed.) *Taxonomy of the Aphide of North-east India and Bhutan* : 76.

Material examined : 1 apterous viviparous ♀ and 1 alate viviparous ♀, on *Citrus* sp., Miao, Tirap Distt., 5.xii.1982. coll. S. Biswas.

Diagnostic features :

Apterous viviparous female :

Body 2.1 - 2.5 mm long with 1.2 - 1.5 mm as maximum width. Head brownish; antennae 0.6 - 0.7 times as long as body, longest hair on antennal segment III about 30 μ - long and 1.5 - 2.0 times as long as the basal diameter of the segment, processus terminalis 4.5 - 5 times as long as the base of antennal segment VI; rostrum reaches hind coxae, ultimate rostral segment about 1.1 - 1.3 times as long as second joint of hind tarsus. Abdominal dorsum with polygonal reticulations besides scattered sclerites and with distinct brownish post siphuncular sclerites; siphunculi brown, heavily imbricated, about 1.5 times as long as cauda which is thumb-shaped and bears 20 - 35 hairs.

Alate viviparous female :

Head dark brown; antennae about 0.7 - 0.8 times as long as body antennal segment III black except at very base and bears 8-20 secondary rhinaria, those on IV antennal segment 0-5, longest hair on antennal segment III always longer than the basal diameter of the segment, processus terminalis 4.5 - 5 times as long as the base of the segment VI; rostrum reaches mid coxae, ultimate rostral segment 1.1 - 1.3 times as long as second joint of hind tarsus. Dorsum of abdomen with large brownish post siphuncular sclerite besides scattered small sclerites; siphunculi brown, 1.5 - 1.6 times as long as black cauda bearing 20-35 hairs. Media of forewing twice-branched.

Remarks : This is a shiny dark brown to black aphids attacking a very large number of host plants besides those of Rutaceae. In India, it is widely distributed and virtually cosmopolitan.

Distribution : India : Widely distributed; *Elsewhere* : Cosmopolitan.

Family II. CERCOPIDAE

Head narrower than pronotum, about as wide as anterior margin of Scutellum; crown of head with disk usually convex or tectiform; ocelli on disk of crown, each at posterior end of a sulcus; eyes about as long as wide; pronotum hexagonal, its anterior margin straight or slightly arcuate.

This group is an important pest and certain species are injurious to sugarcane crop.

Genus *Clovia* Stal

1866. *Clovia* Stal *Hemiptera Africana*, t, IV : 75.

5. *Clovia conifer* (Walker)

1851. *Ptyelus conifer* Walker, *Hist. Hom. Brit. Mus.*, iii : 711.

1870. *Clovia conifer* Stal, *tom. cit.* : 726.

1976. *Clovia conifer* Datta and Ghosh, *Eos*, 50 : 42.

Material examined : 12 exs., Gandhigram, 135 km. from Mias, Tirap Distt., 22.1.1987, Coll. S. Biswas and party.

Diagnostic features :

Body above pale yellow, dark brown or brownish yellow, sub sericeous; face chestnut brown with yellowish margins, lateral areas of sternum chestnut brown with longitudinal yellowish fascia; hemelytra with a large median and larger apical, costal glassy spot; head between the eyes subtriangularly rounded its length almost as long as centre of pronotum; hemelytra about two and half times as long as broad. Length 8 mm.

N.B. A variable species in colour and markings.

Distribution : India : Arunachal Pradesh, Assam, West Bengal; *Elsewhere* : Burma.

Family III. MEMBRACIDAE

Head modified, with crown almost vertical and face horizontal; pronotum enlarged and bearing a spine-like or variable process and these

insects may almost always be recognised by this unique type of pronotum.

This group is a minor pest and interesting mutual relationship between ants and membracids is well known.

Key to genera

1(2)	Hind wings with 3 apical cells	...	<i>Gargara</i>
2(1)	Hind wings with 4 apical cells	...	3
3(4)	Posterior process stout, arcuate, base of posterior process very close to scutellum and tegmina	...	<i>Leptocentrus</i>
4(3)	Posterior process slender, tricarinate, base of posterior process apart from Scutellum and Tegmina	...	<i>Telingana</i>

Genus *Gargara* Amyot and Serville

1843. *Gargara* Amyot and Serville, *Hemip.*, : 537.

*6. *Gargara citrea* Distant

1908. *Gargara citrea* Distant, *Fauna Brit. India*, Rhynchota, iv : 63.

Material examined : 1 ex., Mias Reserve Forest, Tirap Distt., 1. xii. 1982, Coll. S. Biswas and party.

Diagnostic features :

Head, pronotum, body beneath and legs pale yellow; tegmina brownish-yellow; apex of posterior pronotal process black; disk of sternum pitchy black; pronotum finely granulose; posterior process short, broad, strongly sinuate at base, its apex subacute and reaching posterior angle of inner margin of tegmina, finely centrally carinate; pronotal lateral angles subprominent.

Length 4.5 mm.

Distribution : India : Arunachal Pradesh, Elsewhere : Burma.

Remarks : The species was hitherto unknown from India.

**7 *Gargara majuscula* Distant

1908. *Gargara majuscula* Distant, *Fauna Brit. India*, Rhynchota, iv : 61.

Material examined : 1 ex., Deban, Tirap Distt., 13.xii. '82, Coll. S. Biswas and party.

Diagnostic features :

Body above and legs black; body beneath greyish pilose; tegmina pale bronzy-yellow, base black; pronotum broad and convex, the lateral angles

slightly prominent; posterior process slightly passing the posterior angle of the inner margin of tegmina, centrally and laterally carinate; base of pronotal front and the face palely pilose. Length 8 mm. Maximum width 4 mm.

Distribution : India : Arunachal Pradesh, Sikkim.

Remarks : The species was originally described from Sikkim. The present record extends its distribution in North-east India.

Genus *Leptocentrus* Stal

1866. *Leptocentrus* Stal, *Hem. Afr.*, 4 : 87 90.

**8. *Leptocentrus leucaspis* Walker

1851. *Centrotus taurus* Walker, *List. Hom.*, ii : 602.

1858. *Leptocentrus leucaspis* Walker, *List. Hom. Suppl.* : 158.

1986. *Leptocentrus leucaspis*, Ghosh, Biswas and Das, *Rec. Zool. Surv. India*, 83 (1 & 2) : 102.

Material examined : 2 exs., Mias, Tirap Distt., 4.xii. 1982, Coll. S. Biswas and party.

Diagnostic features :

Head, pronotum and scutellum black, basal 2/3 rds of scutellum and lateral areas of sternum chalky white sericeous; abdomen beneath and legs black; hemelytra shining yellowish-brown; the lateral transverse process slender, centrally carinate above and somewhat strongly recurved; the posterior process tricarinate above, recurved from near base and touching the apex of the interior margin of tegmina.

Length 7 to 9 mm. Max width 4.5 to 7 mm.

Distribution : India : Widely distributed.

Elsewhere - Philippines and Sri Lanka.

Remarks : The species is characterised by Suprahumeral moderately developed, gently curved, tip of posterior process never impinging on inner margin of tegmina. It is hitherto reported for the first time from Arunachal Pradesh.

Genus *Telingana* Distant

1908. *Telingana* Distant, *Fauna Brit. India, Rhynchota*, iv : 17.

**9. *Telingana capistrata* Distant

1908. *Telingana capistrata* Distant, *Fauna Brit. India, Rhynchota*, iv : 19.

Material examined : 2 exs., Mias Reserve Forest, Tirap Distt., 1.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Pitchy black; lateral margins of the pronotum and central longitudinal discal fascia to same divided by a dark carinate line, scutellum and intermediate and posterior tibiae yellowish-brown; pronotal lateral process strongly recurved and centrally and laterally carinate above; posterior process strongly curved from base to near apex, slender, apically attenuated centrally and laterally carinate above.

Length 8 to 10.5 mm. Maximum breadth 5.5 to 6 mm.

Distribution : India : Arunachal Pradesh, Assam;
Elsewhere - Burma.

Remarks : The species is a new record from Arunachal Pradesh.

Suborder HETEROPTERA*Key to families*

- | | | |
|--------|---|---------------|
| 1(4) | Antennae concealed, situated either underside of head or in fovae under the head | 2 |
| 2(3) | Body short and broad, head very broad with prominent eyes; anterior legs usually raptorial; posterior femora appreciably short | Pelagonidae |
| 3(2) | Body elongate or ovate, head of moderate size; anterior legs normal; posterior femora long and extending far beyond abdominal apex | Gerridae |
| 4(1) | Antennae conspicuous, situated in front of head | 5 |
| 5(6) | Scutellum reaching at least to the base of the membrane or at least half as long as the abdomen | 7 |
| 6(5) | Scutellum not reaching to the base of membrane, nor to the middle of abdomen | 8 |
| 7(8) | Scutellum covers the entire abdomen; hind wing with hamus in basal cell | Scutelleridae |
| 8(7) | Scutellum reaches about half of abdomen | 9 |
| 9(10) | Subtended veins form reticulate network on membrane of hemelytra; apex of scutellum always blunt or rounded | Dinidoridae |
| 10(9) | Subtended veins usually without such network on membrane of hemelytra; apex of scutellum variable | Pentatomidae |
| 11(12) | Mesopleurae and metapleurae made up of several pieces; hemelytron with a cuneus | Cimicidae |
| 12(11) | Mesopleurae and metapleurae composed of one piece only; hemelytron without a cuneus | 13 |

13(20) Tarsi 3 segmented	...	...	14
14(19) Rostrum not bent at base, legs of moderate length, apices of femora not nodulosely clavate	...	...	15
15(16) Antennae inserted on the upper parts of the sides of the head; legs of moderate length; apices of femora not nodulosely clavate	...	Coreidae	
16(15) Antennae inserted below a line drawn from the centre of the eye to the apex of the face	...	...	17
19(18) Ocelli present	...	Lygaeidae	
18(17) Ocelli absent	...	Pyrrhocoridae	
19(14) Rostrum stout and bent at base, hemelytra complete, membrane distinct	...	Reduviidae	
20(13) Tarsi 2-segmented; anterior legs normal, inserted on the disk of the prosternum	...	Aradidae	

Family IV ARADIDAE

Head produced into two antennal tubercles; antennae projecting freely; hemelytra, when present with clavus not meeting that of the opposite side behind the scutellum.

In contrast of other hemipteran groups, these usually occur beneath bark, in cervices of deadtrees and among fungi and are apparently mycetophagous.

Genus Mezira Amyot & serville

1843. *Mezira* Amy & Serv. *Hem* : 305.

*10. *Mezira triangulus* Bergroth

1889. *Mezira triangulus* Bergroth, *Ann. Mus. Civ. Gen.*, 27 : 736.

1902. *Mezira triangulus* Bergroth, Distant, *Fauna Brit. India. Rhyn.* 2 : 161.

Material examined : 8 exs., Gibbon's Land, 20.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Pitchy black or darkbrown; head with the apex of the anterior process moderately emarginate, antennae robust, 1st, 2nd and 3rd segments almost subequal in length, 4th shortest, conical, its apex yellowish-brown; pronotum with four large irregular tubercles on the anterior area, pronotal margin sinuate before base of scutellum which is with a somewhat obscure central longitudinal rugosity; corium longer than scutellum; membrane reaching or just passing the base of the last abdominal segment; abdomen much wider than hemelytra; tarsi and rostrum dark, chestnut brown; lateral margins of the sixth abdominal segment being sinuate somewhat rectangularly excavate.

Length : 10 mm.

Distribution : Burma; Sri Lanka.

Remarks : This species is recorded for the first time from India.

Family V CIMICIDAE

Oval flattened insects with very short hemelytra; rostrum lying in a ventral groove; ocelli absent; tarsi 3-jointed;

Parasites of mammals and birds. A small but well-defined family of blood-sucking ectoparasites.

Genus cimex Linnaeus

1758. *Cimex* Linn. *Syst. Nat.* ed. 10 : 441.

11. *Cimex lectularius* Linnaeus

1758. *Cimex lectularius* Linnaeus, *Syst. Nat.* ed. 10 : 441.

1873. *Cimex lectularius* Linn.; Stal, *En. Hem.*, 3 : 104.

1902. *Cimex lectularius* Linn.; Distant, *Fauna Brit. India, Rhynchota*, 2 : 410.

Material examined : 1 ex., Gibbon's Land, 25.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Reddish-brown or brownish-yellow, strongly and thickly punctate, sparingly finely pilose; head with the eyes prominent; antennae with the 1st and 2nd segments stoutest, 3rd & 4th very slender and finely pilose, 1st segment short, 2nd and 3rd subequal in length; pronotum with the anterior margin deeply sinuate, its lateral margins dilated, rounded and outwardly longly pilose, the disk moderately glabrous and tumid; scutellum very short and broad; elytra transverse, short, strongly punctate, about twice as wide as long; abdomen finely punctate, connexivum a little reflexed; legs yellow with brownish tinge.

Length 5 to 6 mm.

Distribution : Cosmopolitan.

Family VI. COREIDAE

More or less oval rather than elongate inform; head much narrower than pronotum; juga not enclosing tylus anteriorly; scent-gland openings conspicuous; 5th abdominal tergum with margins sinuate but parallel not narrower in mid line. Some genera have unusual foliate expansions of hindtibia restricted to males.

The members are usually a minor pest but species of *Amblypelta* and *Theraptus* are much harmful to coconuts.

Key to genera

- 1(2) Dorsal surface of 4th abdominal segment at base and apex more or less medially sinuate *Serinetha*
- 2(1) Dorsal surface of both 4th and 5th abdominal segments at bases medially sinuate 3
- 3(4) Pronotum posteriorly usually 3 or more than twice the width of head across eyes; dorsal surface of 1st abdominal segment posteriorly truncated; scutellum reaching or passing base of metanotum 5
- 4(3) Pronotum posteriorly not or slightly broader than width of head across eyes, rarely nearly twice; dorsal surface of 1st abdominal segment posteriorly rounded, sometimes strongly produced; scutellum usually not reaching base of metanotum 11
- 5(6) Posterior femora thickened and spinose *Notobitus*
- 6(5) Posterior femora unarmed and normal 7
- 7(8) Abdominal segmental angles exteriorly acutely produced *Cletomorpha*
- 8(7) Abdominal segmental angles normal 9
- 9(10) Anterior lateral margin of corium and lateral margins of abdomen very minutely crenulate or serrulate; lateral angles of pronotum acutely produced *Cletus*
- 10(9) Anterior lateral margin of corium and lateral margins of abdomen normal; lateral angles of pronotum rarely produced or normal *Homoeocerus*
- 11(12) Posterior femora incrassated and spined beneath; mesosternum normal; lateral pronotal spines present *Riptortus*
- 12(11) Posterior femora normal; mesosternum broadly sulcate; lateral pronotal spines absent *Leptocorisa*

Gen. *Cletomorpha* Mayr

1866. *Cletomorpha* Haqr. Reise Nov., Homi : 118.

12. *Cletomorpha raja* Distant

1901. *Cletomorpha raja* Distant, A.M.N.H. 7(7) : 423.

1977. *Cletomorpha raja* Basu and Mitra, *Newsl. zool. Surv. India*, 3(5) : 274.

Material examined : 1 ex., Deban, 8.xii.1982, Coll.S. Biswas and party.

Diagnostic features :

Body above deep yellowish with slight brownish tint; posterior area of pronotum from between the lateral angles, scutellum and corium

thickly fusco-punctate; corium with the lateral margins and a transverse, maculate fascia about 1/3 rd from apex reddish yellow; membrane pale brown with the margins pale; sternum and abdomen beneath with a number of small discal black spots; antennae dark brown with the apical joints yellowish brown, 1st and 2nd antennal segments subequal in length, 4th shortest; pronotal angles acutely produced with their apices recurved; abdomen above yellowish red; connexivum spotted with black, the largest spots near base, followed by a smaller spots and a still smaller ones at apex.

Length : 9 mm. Max. breadth 4 mm.

Distribution : India : Arunachal Pradesh, Assam, Sikkim.

Elsewhere : Burma.

Genus *Cletus* stal

1859. *Cletus* Stal, *Freg. Eug. Resa, Ins. Hem* : 236.

13. *Cletus trigonus* Thunberg

1783. *Cletus trigonus* Thunberg, *Nov. Ins. Sp.*, 2 : 37.

1904. *Cletus trigonus* Distant, *Fauna Brit, India, Rhynchota*, 1 : 394.

Material examined : 1 ex., Deban, 8. xii.1982, Coll. S.Biswas and party.

Diagnostic features :

Body above yellowish-brown; posterior area of the pronotum, scutellum and corium brownish; two small blackish spots on anterior area of pronotum; lateral pronotal angles strongly spinously and straightly produced, their aspices black and posterior margins crenulate; a spot near apical angle of corium light yellowish; body beneath and legs pale yellowish-brown; a small spot on each lateral area of the sternal segments and some scattered discal abdominal spots black.

Length 8; max. breadth 4.5 to 5 mm.

Distribution : India : Arunachal Pradesh, Assam, Sikkim, West Bengal; *Elsewhere* : Burma; Ceylon; North Borneo; Philippines.

Genus *Homoeocerus* Burmeister

1835. *Homoeocerus* Burm, *Handb. ii. i* ; 316.

14. *Homoeocerus striicornis* Scott

1874. *Homoeocerus striicornis* Scott., *A.M.N.H.* (4), xiv : 362.

1904. *Homoeocerus stricornis* Distant, *Faun. Brit. India. Rhynchota*, 1 : 360.

1978. *Homoeocerus stricornis*, Basu and Mitra, *Sci. Cult.*, 44 : 413.

Material examined : 1 ex., 77 mile Base Camp. 7.ii.1987, Coll. S. Biswas and party.

Diagnostic features :

Body above greenish or pale yellowish-brown; antennae pale chestnut brown, the 1st and 2nd segment exteriorly with a longitudinal black line. 1st and 2nd segment subequal in length; 3rd shortest; 4th segment stramineous with its apical half dark brown; pronotum long, the lateral margins with a fine black line, the lateral angles prominently angulate, the disk with a faint central pale yellow line; corium with a distinct subcostal black line; body beneath and legs paler in hue; rostrum with the 3rd joint considerably shorter than 4th.

Length : 17 to 20 mm. Max. width 4.5 to 5.05 mm.

Distribution : India : Arunachal Pradesh, Assam, Maharashtra and Sikkim.

Elsewhere - Japan; Sri Lanka.

15. *Homoeocerus* sp.

Material examined : 10 exs., 77 Mile Base Camp, 7.ii.1987, Coll. S. Biswas and party.

Remarks : Due to nonavailability of comparable material and literature, it could not be identified upto species level.

Genus *Leptocoris* Latr.

1825. *Leptocaris* Latr. *Fam. Nat* : 421.

16 *Leptocoris acuta* (Thunberg)

1783. *Leptocoris acuta* Thunberg, *Nov. Ins. Sp.*, 2 : 34.

1904. *Leptocoris actuta* Distant, *Fauna Brit. India*, *Rhynchota*, 1 : 410.

1965. *Leptocoris acuta*, Ahmad, *Bull. Brit. Mus. (Nat. Hist.) Entom.* 78-80.

1978. *Leptocoris acuta* Basu and Mitra, *Sci. Cult.*, 44 : 413.

Material examined : 1 ex., Deban, 8. xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Body above brownish-olivaceous; beneath pale greenish; abdomen above reddish-brown with the margins pale greenish-yellow; antennae dark brown with bases of 2nd, 3rd and 4th segments deep yellowish with reddish tinge; a small prominent tubercle near each lateral pronotal angle; a distinct central carinate line to pronotum.

Length : 13 to 15 mm.

Distribution : India : Widely distributed; Elsewhere : Burma; China; Ceylon; Malaya Archipelago, Malayan Peninsula.

Remarks : The species is a pest on *Saccharum officinarum*, *Sorghum vulgare* and *Oryza sativa* (Gramineae).

Genus *Notobitus* Stal

1859. *Notobitus* Stal, *Ofv. Vet.* - *AK. Forh.* : 451.

**17. *Notobitus excellens* Distant

1904. *Notobitus excellens* Distant, *Fauna Brit. India, Rhynchota*, 1 : 370.

Material examined : 6 exs., Deban, Tirap Distt., 1.xii.1982, Coll. S. Biswas and Party.

Diagnostic features :

Head and pronotum brassy-black; antennae with the 1st, 2nd and 3rd segments subequal in length, brassy-black; apical segment longest, brownish yellow. Rostrum extending to about base of mesonotum. Lateral pronotal angles slightly prominent and rounded; scutellum finely granulate, brownish towards apex; Corium brown, obscurely and faintly pilose; membrane brassy-brown; abdomen above black; body beneath and legs brassy-black, anterior and intermediate tibiae with their apical halves brownish, all the tarsi dull yellowish brown; posterior femora incrassated, finely granulous, inwardly obscurely tuberculate and with a series of acute tubercles on upper surface, beneath with a strong and curved spine a little beyond middle, preceded and followed by some smaller spines; posterior tibiae moderately curved, their innermargin denticulated.

Differs from the σ in being uniformly pale brown above and also paler in hue beneath; legs also generally paler than in the other sex.

Length 28 to 30 mm. Max. width 8 to 9 mm.

Distribution : India : Arunachal Pradesh, Assam, Nagaland and Sikkim.

Remarks : The species is also a new record from Arunachal Pradesh State.

18. *Notobitus* sp.

Material examined : 7 exs., Gibbon's Land, Tirap Distt., 27.xii.1982, Coll. S. Biswas and party.

Remarks : Due to nonavailability of the comparable material and literature, it was not possible to ascertain the specific identity of the material.

Genus *Riptortus* Stal1859. *Riptortus* Stal, *Vet.-AK. Forh* : 460.Key to species of *Riptortus*

- 1(2) Sternum reddish yellow with prominent pale-yellow spots placed near the coxae; apices of posterior tibiae reddish brown
- *pedestris*
- 2(1) Sternum rather pale yellow, without any such spot; apices of posterior tibiae black *strenuus*

****19. *Riptortus pedestris* Fabricius**1775. *Riptortus pedestris* Fabricius, *Syst. Ent.* : 727.1978. *Riptortus pedestris*, Basu and Mitra, *Sci. Cult.*, 44 : 414.

Material examined : 2 exs., Gibbon's Land, Tirap Distt., 26. xii. 1982, Coll. S. Biswas and party.

***Diagnostic features* :**

Body above brownish-yellow, finely pilose; posterior margin of the pronotum and a lateral fascia on each side of head, not extending beyond base of antennae dark brown; sternum somewhat reddish-yellow with prominent pale yellow spots placed near the coxae; abdomen above olivaceous, largely bimaculated with brownish-yellow; connexivum brownish-yellow with large dark brown spots; posterior femora thickly mottled with reddish-brown; posterior tibiae with bases and apices reddish-brown, lateral pronotum spines black.

Length 15 to 18 mm. Max. breadth 3 to 4 mm.

Distribution : India : Arunachal Pradesh, Assam, Karnataka, Madras, Maharashtra, Sikkim and Uttar Pradesh.

Elsewhere - Burma; Malay Peninsula; Sri Lanka.

Remarks : The species is a new record from Arunachal Pradesh. It is known as pest of orange-growing areas of the country.

**** 20. *Riptortus strenuus* Horvath**1889. *Riptortus strenuus* Horvath, *Term. Fiizetch* : 35.1978. *Riptortus strenuus* Basu and Mitra, *Sci. Cult.*, 44 : 414.

Material examined : 1 ex., Gibbon's Land, Tirap Distt., 25.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Above chestnut brown, greyish-silky; antennae unicolorous. Head with the vertex behind eyes and between ocelli and eyes black; head beneath, a long spine at the lateral pronotal angles, disk of sternum and abdomen black; a lateral fascia to head and sternum pale yellowish-brown, above and beneath margined with black, this fascia is broader on the meso and metasterna than on the head and prosternum; abdomen with the base and lateral areas pale yellowish brown, a median broad black vitta on each side and at apex of 4th and 5th segments angularly produced; posterior femora beneath and apices of posterior tibiae black; rostrum extending to the intermediate coxae.

Length 13.5 mm.

Distribution : India : North-east Himalaya including Manipur and Sikkim. The species is hitherto recorded for the first time from Arunachal Pradesh.

21. *Riptortus* sp.

Material examined : 3 exs., Gibbon's Land, Tirap Distt., 25.xii.1982, Coll. S. Biswas and party.

Remarks : Due to nonavailability of comparable material, it was not possible for identification upto species level.

Genus *Serinetha* Spinola

1837. *Serinetha* Spinola, *Es.* : 247.

***22. *Serinetha dallasi* Dohrn**

1860. *Serinetha dallasi* Dohrn., *Stett. ent. Zeit.*, xxi : 402.

1904. *Serinetha dallasi* Distant, *Faun. Brit. India, Rhychta*, I : 420.

Material examined : 3 exs., Gibbon's Land, Tirap Distt., 27.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Body above reddish-brown, coarsely punctate, head red, the margins dark brownish and pilose; eyes and ocelli sanguineous; pronotum with a distinct anterior collar and with a median carinate line; membrane black; body beneath obsolete reddish-brown; legs, antennae excepting base of 1st segment pitchy black; rostrum black and reaching the middle of the 3rd abdominal segment.

Length 12 to 15 mm.

Distribution : India : Arunachal Pradesh.

Elsewhere : Sri Lanka.

Remarks : The species was hitherto unknown from India.

23. *Serinetha* sp.

Material examined : 1 ex., Deban, Tirap Distt., 8.xii.1982, Coll. S. Biswas and party.

Remarks : The material could not be identified upto species because of paucity of comparable material.

Family VII. GERRIDAE

Moderately large, usually slender insects; rostrum 4-segmented; small medium scent-gland opening on metathorax; hemelytra, when present homogeneous; coxae rotatory; mid and hind legs usually elongate; tarsi 2-segmented with ante-apical claws. Members of this family are semi-aquatic, living on the surface of still or running water where they feed mainly on dead insects.

Key to the genera

Anterior femora about as long as the tibiae; body oblong	...	...	<i>Metrocoris</i>
Anterior femora distinctly longer than the tibiae; body rather elongated and narrow	...	...	<i>Jucundus</i>

Genus *Jucundus* Distant

1910. *Jucundus* Distant, A.M.N.H. (8)v, : 143.

* 24. *Jucundus burmanus* Distant

1910. *Jucundus burmanus* Distant, A.M.N.H. (8) v : 146.

Material examined : 1 ex., Gibbon's Land, 16 km east of Mias, Tirap Distt., 22.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Apterous form :- Body and legs yellowish-brown, the intermediate and posterior tibiae pitchy black; anterior tibiae dentately widened at apex; eyes and a narrow central longitudinal line to pronotum black; abdominal segments pitchy black, legs with narrow black longitudinal lines; antennae black with the basal segment very long and stout; anal abdominal segment yellowish-brown with a transverse black line; rostrum scarcely passing the anterior coxae.

Length : 6.5 mm.

Distribution : India : Arunachal Pradesh.

Elsewhere - Burma.

Remarks : The species is hitherto reported for the first time from India. It is characterised by its robust antennae and anterior tibiae being dentately ampliate apically.

Genus *Metrocoris* Mayr

1865. *Metrocoris* Mayr, *Verh. Z.-b. Ges. Wien*, xv : 445.

** 25. *Metrocoris nigrofasciatus* Distant

1903. *Metrocoris nigrofasciatus* Distant, *Fascic. Malay Zool.*, 1 : 257.

Material examined : 1 ex., Deban, 27 km. east of Mias, Tirap Distt., 10.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Apterous form : - Yellowish-brown; ovate, widest behind the middle; head broadly convex; anterior femora stout, moderately curved with a stout tuberculous tooth near apex; anterior tibiae stout about as long as femora; intermediate femora longer and a little stouter than the posterior femora.

Macropterous form : Hemelytra black; pronotum with lateral fasciae transversely united anteriorly in typical form, not transversely united in varietal form.

Distribution : India : Arunachal Pradesh, Uttar Pradesh.

Elsewhere - Burma, Malaya Peninsula.

Remarks : The species is a new record from Arunachal Pradesh.

Family VIII LYGAEIDAE

Small dark or brightly coloured insects; ocelli almost always present; antennae inserted well down on sides of head; thoracic gland openings present; membrane with 4 or 5 veins; coxae rotatory; tarsi 3-segmented.

A few members of this family are minor pest to fruits and cotton. A few species are predatory in habit.

Key to genera

Head with eyes broader than anterior margin of pronotum;
pronotum strongly constricted near the middle where the lateral
margins are profoundly sinuate; body 10-12 mm. long

... .. *Metochus*

Head with eyes about as long as anterior margin of pronotum;
pronotum rather normal, lateral margin not sinuate as above;
body 6-7 mm. long *Horridipamera*

Genus *Horridipamera* Malipatil,

1978. *Horridipamera* Malipatil, *Aust. J. Zool. Suppl. Ser.* 56 : 89.

**26. *Horridipamera nietneri* (Dohrn)

1860. *Plociomerus nietneri* Dohrn, *Stett. Ent. Zeit.*, 21 : 404-405.

1874. *Pamera nietneri* Stal, *Enum. Hem.*, 4 : 151.

1964. *Pamera nietneri* Slater, *A Catalogue of the Lygaeidae of the world*, 2 : 1241.

1988. *Horridipamera nietneri* Mukhopadhyay, *Rec. Zool. Surv. India, Occ. paper No. 107* : 61.

Material examined : 3 exs., Gandhigram, Tirap Distt., 21.1.1987, Coll. S. Biswas and party.

Diagnostic features :

Head, anterior lobe of pronotum and scutellum black, posterior pronotal lobe and corium dark brown; lateral margin of corium brownish-yellow, impunctate, two small spots a little before apical angle greyish-white; membrane dark fuliginous; body beneath and legs black; apex of scutellum, apices of anterior femora, anterior tibiae (excluding apices), basal halves of intermediate and posterior tibiae (excluding bases and apices) and bases of tarsi yellowish-brown; antennae black, 2nd segments deep brown; rostrum black, 2nd segment yellowish brown.

Length 6.5 to 7 mm.

Distribution : India : West Bengal, Arunachal Pradesh.

Elsewhere - Australia, Boning Is., Burma, Cambodia, Carolines, Celebes, Ceylon, China, Fiji Is., Formosa, Indonesia, Indochina, Japan, Java, Laccadive, Philippines, Sumatra and Thailand.

Remarks : The species is a new record for Arunachal Pradesh.

Genus *Metochus* Scott

1847. *Metochus* Scott, *Ann. Mag. Nat. Hist.*, (4) 14 : 433-434.

** 27. *Metochus uniguttatus* (Thunberg)

1822. *Pendulinus uniguttatus* Thunberg, *Hem. Rest. Cap.*, 4 : 6.

1988. *Metochus uniguttatus*, Mukhopadhyay, *Rec. Zool. Surv. India, Occ. paper No. 107* : 56-57.

Material examined : 1 ex., Gibbon's Land, Tirap Distt., 27.xii.1983, Coll. S. Biswas and party.

Diagnostic features :

Black; antennae, 2nd and 3rd joints of rostrum, tibiae and tarsi brownish-yellow; corium yellowish-red brownly punctate, lateral margins impunctate abroad irregular transverse fascia near inner angle and the apical margin black; a central elongate spot on posterior lobe of pronotum, extreme apex of scutellum, trochanters, bases of femora, post angle of metasternum and a marginal spot on 4th and 5th abdominal segments dull yellowish brown; membrane fuliginous, speckled with brownish yellow beyond base and with a small yellowish-brown spot near the apical angle of corium; body pilose; pronotum strongly constricted near middle where the lateral margins are profoundly sinuate, anterior lobes sub-globose; 2nd, 3rd and 4th antennal segments subequal in length.

Length 10 to 12 mm.

Distribution : India : Andaman Is., Arunachal Pradesh, Assam, Karnataka,

Elsewhere - Burma; Ceylon; China; Malaya Archipelago.

Remarks : The species is hitherto known for the first time from Arunachal Pradesh.

Family IX. OCHTERIDAE

Genus *Mononyx* Laporte

1832. *Mononyx* Laporte, *Ess. Hem.* : 16.

** 28. *Mononyx spissus* Distant

1910. *Mononyx spissus* Distant, *Fauna Brit. India*, 5 : 312.

Material examined : 6 exs., Gibbon's Land, Tirap Distt., 25.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Brownish grey; two small tubercles near the base of head, pronotum with the basal margin distinctly broader than the anterior margin, the lateral pronotal areas flattened and ampliate, their margins almost straight for half the distance from base and then oblique and slightly rounded to eyes; scutellum with three tubercles near each side near base, the other at apex; lateral margins of corium rounded; body beneath dark brown, pubescent; the intermediate and posterior tibiae shortly setose.

Length 10 mm. width 6.5 mm.

Distribution : India : Assam, Arunachal Pradesh.

**** 30. *Coridius nepalensis* (Westwood)**

1837. *Aspongopus nepalensis* Westwood, *Hope Cat.*, 1 : 26.

1904. *Aspongopus nepalensis* Distant, *Fauna Brit. India, Rhynchota*, 1 : 283.

1987. *Coridius nepalensis* (Distant), Durai, *Orient Insect*, 21 : 198.

Material examined : 2 exs., 77 mile Base Camp, Tirap Distt., 7.11.1987, Coll. S. Biswas and party.

***Diagnostic features* :**

Coloration varies between dark brownish yellow to chestnut brown except black extreme lateral margins of the pronotum. Antennae black with luteous apical joint, narrowly black at base. Body beneath and legs copper-colored. Abdomen above red.

Length 20 to 25 mm. Breadth between pronotal angles 11 to 13 mm.

Distribution : India : Assam, Nagaland, Sikkim.

Elsewhere : Burma.

Remarks : This species is also being recorded from Arunachal Pradesh for the first time.

31. *Coridius* sp.

Material examined : 47 exs., Gandhigram, Tirap Distt., 2.11.1987, Coll. S. Biswas and party.

Family XI. PLATASPIDAE

Strongly convex, broadly rounded, usually shiny insects; scutellum covering almost the entire abdomen; hemelytra long and bent beneath scutellum at rest; tarsi 2-segmented.

32. *Brachyplatys* sp.

Material examined : 4 exs., Gandhigram, Tirap Distt., 28.1.1987, Coll. S. Biswas and party.

Family XII. PENTATOMIDAE

Antenna usually 5 segmented; tarsi 2 or 3 segmented; scutellum usually covering only about half the abdomen; hemelytra well developed; membrane with 5-12 veins, spiracles of 2nd abdominal segment completely or almost completely, concealed beneath metaflux.

Remarks : Pentatomids are usually phytophagous and some are minor pest of vegetables cotton and other crops, but members of the sub family asopinae are chiefly predaceous, particularly on lepidopterous larva.

Key to genera of Family Pentatomidae

- 1(2) Anterior and posterior tibiae dilated ... *Erthesina*
- 2(1) Anterior and posterior tibiae usually not dilated 3
- 3(4) Pronotum with lateral angles produced into strong lateral spines; lateral margins of pronotum distinctly serrate; ventral spine just passing posterior coxae ... *Prionaca*
- 4(3) Pronotum with lateral angles subnormal, without lateral spines; lateral margins of pronotum not serrate; ventral spine absent ... 5
- 5(6) Anterior lateral margins of pronotum crenulated *Dalpada*
- 6(5) Anterior lateral margins of pronotum normal 7
- 7(8) Scutellum apically narrowed, shorter than corium *Carbula*
- 8(7) Scutellum a little narrowed at posterior half, almost as long as or a little longer than corium ... 9
- 9(10) Head deflected ... 11
- 10(9) Head normal; abdomen with a short basal furrow *Cappaea*
- 11(12) Anterior lateral margins of pronotum elevated or callous; scutellum almost triangular ... *Antestia*
- 12(11) Anterior lateral margins of pronotum normal; scutellum rather obovate ... *Eusarcocoris*

33. *Antestia* sp.

Material examined : 1 ex., 77 Mile Base Camp. Tirap, 7.11.1987, Coll. S. Biswas and party.

Genus *Cappaea* Ellener

1862. *Cappaea* Ellener, *Nat. Tijdschr. Nederl. Ind.*, xxiv : 146.

34. *Cappaea taprobanensis* (Dallas)

1851. *Pentatoma taprobanensis* Dallas, *Lisi. Hem.*, 1 : 244.

1862. *Cappaea multilinea* Ellener, *Nat. Tijdschr. Nederl. Ind.*, xxiv : 147.

1904. *Cappaea taprobanensis* Distant, *Fauna Brit. India, Rhynchota*, 1 : 149;

1984. *Cappaea taprobanensis* Dist., Datta, Ghosh and Dhar, *Rec. Zool. Surv. India*, Occ. paper No. 80 : 11.

Material examined : 1 ex., Deban, Tirap Distt., 11.xii. '82, Coll. S. Biswas and party.

Diagnostic Characters :

Body above black except lateral margins and three longitudinal lines to head are brownish-yellow. Margins, a central fascia and lineate reticulations on lateral areas of pronotum; a central fasciate line and two united more or less curved lines on basal area of scutellum; margins, a submarginal line and other irregular markings to corium luteous; body beneath and legs pale-yellow with legs finely spotted with black. Antennae dark brown with basal joints yellowish spotted with dark brown; membrane fuliginous with brown spots.

Length : 10 to 11.5 mm.

Distribution : India : Arunachal Pradesh, Assam, Sikkim, Tamil Nadu.

Elsewhere - Java; Malabar; Sri Lanka; Sumatra.

Remark : The species is a pest on *Citrus* spp. (Rutaceae).

Genus *Carbula* Stal

1864. *Carbula* Stal, *Hem. Afr.*, i : 140.

35. *Carbula crassiventris* (Dallas)

1849. *Pentatoma crassiventris* Dallas, *Tr. E. S.*, v : 189.

1904. *Carbula crassiventris* Distant, *Faun. Brit. India, Rhynchota*, I : 170.

1977. *Carbula crassiventris*, Datta and Chakraborty, *Newsl. Zool. Surv. India*, 3 (4) : 212.

Material examined : 1 ex., 77 mile base Camp, Tirap Distt., 7.11.1987, Coll. S. Biswas and party.

Diagnostic characters :

Body above brownish-yellow, thickly and coarsely blackly punctate. Antennae, rostrum, body beneath and legs yellow. Legs blackly punctate. Apex of rostrum, a central spot on each of the two terminal abdominal segments, the stigmata and small marginal spots black. Anterior lateral margins of the pronotum pale yellow, inwardly margined with black punctures; lateral pronotal angles broadly produced, their apices obtuse. Rostrum just passing the posterior coxae.

Distribution : India : Arunachal Pradesh, Nagaland.

Elsewhere - Bhutan, Burma.

Genus *Dalpada* Amyot and Serville1843. *Dalpada* Amyot and Serville, Ess. Hem. : 105.Key to species of *Dalpada*

- 1(2) Body above greyish luteous; rostrum reaches 3rd abdominal segment *Affinis*
- 2(1) Body above yellowish, rostrum reaches a little beyond posterior coxae *Jugatoria*

** 36. *Dalpada affinis* Dallas1851. *Dalpada affinis* Dallas, List. Hem. : 185.1985. *Dalpada affinis* Datta, Ghosh and Dhar, Rec. Zool. Surv. India, Occ. paper No. 80 : 11.

Material examined : 1 ex., Gibbon's Land, Tirap Distt., 27.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Body above brownish yellow, very thickly punctured with brassy black; pronotum sometimes with a slender discal median line in front of which there are four minute yellowish spots in a transverse series; anterior lateral margins of pronotum moderately serrate, lateral angles short, tuberculous and more or less yellowish at their apices and inwardly with two furrows. Scutellum with the basal angular margins yellowish; membrane pale with veins much darker and with a series of irregular subapical dark brown spots. Body beneath dark yellowish; antennae dark brown with base of 4th and 5th segments yellowish; Rostrum reaching the 3rd abdominal segment.

Length 15 to 18 mm. Max. width 8 to 9 mm.

Distribution : India : Arunachal Pradesh, Sikkim. *Elsewhere* - Burma.

Remarks : The species is a new record from Arunachal Pradesh.

** 37. *Dalpada jugatoria* Lethieri1891. *Dalpada jugatoria* Leth., Ann. Soc. Ent. Belg. Bull., p.cxlvi.1904. *Dalpada jugatoria* Distant, Fauna Brit. India., Rhyn., 1 : 112.

Material examined : 1 ex., Gibbon's Land, Tirap Distt., 5.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Body above yellow with reddish tinge, thick darkly punctate; apical fourth of scutellum deep yellow with a tint of red; lateral angles of pronotum olivaceous green with a reddish yellow apical spot; connexivum alternately greenish and brown-yellow; membrane fuliginous with a series of apical spots; abdomen beneath shining metallic green; legs brownish-yellow and spotted. 4th and 5th antennal segment and apex of 3rd segment dark brown. 3rd antennal segment shorter than 2nd, 4th and 5th.

Lateral lobes of head distinctly longer than central lobe; lateral pronotal angle subnodulose, inwardly with two prominent grooves; rostrum slightly passing the posterior coxae.

Length 13 to 17 mm. Max. width 6 to 8 mm.

Distribution : India : Arunachal Pradesh, Assam, Sikkim, West Bengal.

Elsewhere - Burma.

Remark : The species is recorded for the first time from Arunachal Pradesh.

Genus *Erthesina* Spinola

1837. *Erthesina* Spinola, *Ess.* : 291.

*38. *Erthesina guttata* Fabricius

1787. *Erthesina guttata* Fabricius, *Mant. Ins.*, ii : 291.

1904. *Erthesina guttata*, Distant, *Fauna Brit. India*, 1 : 118.

Material examined : 14 exs., Gibbon's Land, Tirap Distt., 27.xii.1982, Coll. S. Biswas and party.

Disgnostic features :

Body above olivaceous green; head with a central line, the lateral margins, the inner margins of eyes and two small spots at base yellowish-brown; pronotum, scutellum and corium speckled with small yellowish-brown callosities; pronotum with anterior and lateral margins and a central line extending about 1/3 rd from apex brownish-yellow; scutellum with three small basal spots and the apex brownish-yellow; connexivum also spotted with same coloration; membrane piceous; body beneath pale yellowish; legs black with bases of femora, centres of tibiae and bases of tarsi yellowish-brown.

Rostrum reaching the 4th abdominal segment.

Length 20 to 25 mm. Max. width 13 mm.

Distribution : India : Arunachal Pradesh.

Elsewhere - Sri Lanka.

Remarks : The species is recorded here for the first time from India.

Genus *Eusarcocoris* Puton

1866. *Eusarcocoris* Puton, *Cat.* : 11.

** 39. *Eusarcocoris ventralis* (Westwood)

1837. *Pentatoma ventralis* Westwood, *Hope Cat.*, 1 : 36.

1904. *Eusarcocoris ventralis* Distant, *Fauna Brit. India. Rhyhchota*, 1 : 167.

Material examined : 1 ex., Gibbon's Land, Tirap Distt., 25.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Browish-yellow, somewhat thick darkly punctate, anterior area of pronotum with two large transverse bassy-black spots; lateral margin of pronotum and a large rounded spot near each basal angle of the scutellum deep yellow with reddish tint; apex of acutellum margined with black punctures; central disk of abdomen beneath brassy-black.

Length 5.5 mm. Max. width 4 to 4.5 mm.

Distribution : India : Arunachal Pradesh, Bihar, Karnataka, Maharashtra, West Bengal.

Elsewhere - Burma, Malaya Peninsula.

Remarks : The species was hitherto unknown from Arunachal Pradesh.

Genus *Prionaca* Dallas

1851. *Prionaca* Dallas, *List. Hem.*, 1 : 291.

** 40. *Prionaca burmanica* Distant

1904. *Prionaca burmanica* Distant, *Fauna Brit. India, Rhynchota*, 1 : 208.

Material examined : 1 ex., 77 mile Base Camp, Tirap Distt., 7.11.1987, Coll. S. Biswas and party.

Diagnostic features : Body above brownish-yellow; apices of the

pronotal angles obtuse. Head beneath, lateral margins of prosternum and under surface of lateral spines with central area of mesonotum black; abdominal margin chestnut brown containing a series of reddish-brown spots; stigmata black.

Length 12 mm. Max. width 9 mm.

Distribution : India : Arunachal Pradesh, Nagaland, Elsewhere - Burma.

Remarks : The species is a new record from Arunachal Pradesh.

Family XIII. SCUTELLERIDAE

Scutellum large, covering the entire abdomen; tarsi- 3-segmented; membrane with veins; abdomen with 6 free sterna hindwing with a hamus (spurvein) in basal cell.

Genus *Chrysocoris* Hahn

1834. *Chrysocoris* Hahn, *Wanz. Ins.*, ii : 38.

** 41. *Chrysocoris grandis* Thunberg

1783. *Cimex grandis* Thunberg. *Nov. Ins. Sp.*, ii : 31.

1904. *Chrysocoris grandis* Distant, *Fauna Brit. India, Rhynchota*, 1 : 54.

Material examined : 4 exs., Gibbon's Land, Tirap Distt., 27.xii. 1982, Coll. S. Biswas and party.

Diagnostic features :

Above reddish-yellow; central lobe and base of head, an anterior subquadrate spot on pronotum and a spot near each posterior angle, base of scutellum narrowly widened at lateral angles, three spots on disk, the central one largest, an irregular transverse fascia beyond these spots and an apical spot black. Abdomen ventrally violaceous with blackish fasciae. Head sternum, antennae, rostrum and legs black. Margins of head beneath reddish-yellow.

N.B. In some specimens body above is pale yellow, pronotum with the basal spots often obsolete. The fascia and apical spot to scutellum wanting. There are two lateral yellow spots to prosternum and one to metasternum.

In some other variety pronotal and central spot to the scutellum is often absent.

Length : 18 to 24 mm. Max. breadth 9 to 13 mm.

Distribution : India : Arunachal Pradesh, Assam, Nagaland. *Elsewhere* - Burma; China; Japan and Java.

Remarks : The species is a new record from Arunachal Pradesh.

Family XIV. PYRRHOCORIDAE

Medium sized often brightly coloured with conspicuous eyes but no ocelli; rostrum slender, 4-segmented, antennae 4-segmented; membrane with almost 5 longitudinal veins which are unbranched. Female with 7th abdominal sternum not divided.

Key to genera

Anterior femora slenderly spined beneath near apex; 1st joint of rostrum longer than head; pronotum with lateral margins amplified and reflexed *Dysdercus*

Anterior femora strongly spined beneath towards apices; 1st joint of rostrum shorter than head; pronotum with lateral margins reflexed *Physopelta*

Genus *Dysdercus* Amyot and Serville

1843. *Dysdercus* Amyot and Serville, *Hem.* : 272.

** 42. *Dysdercus koenigii* (Fabricius)

1775. *Cimex koenigii* Fabricius, *Syst. Ent.* : 720.

1843. *Dysdercus koenigii* Amyot and Serville, *Hemip.* : 272.

Material examined : 1 ex., Gibbon's Land, Tirap Distt., 22.xii.1982, Coll. S. Biswas and party.

Diagnostic features :

Reddish-yellow; head rostrum, anterior transverse callosity and lateral margins to pronotum and body beneath reddish; anterior spot of rostrum, scutellum (sometimes, concolorous), a discal spot to corium membrane and legs black, anterior collar to pronotum, anterior margin to prosternum, posterior margins to sternal and abdominal segments, and spots near Coxae creamy white ; extreme base of 1st segment of antennae reddish.

In a variety pronotal callosity black not reddish. In both forms the colour above also varies from yellowish brown to chestnut brown and

beneath reddish to dark purplish.

Length : 9 to 16 mm.

Distribution : India : Widely distributed.

Elsewhere : Burma; Malayan Archipelago; Malaya Peninsula; Sri Lanka.

Remarks : It is a new record from Arunachal Pradesh. Both adults and nymphs of the species feed on the juices of the tender parts of the cotton plants in India.

Genus *Physopelta* Amyot and Serville

1843. *Physopelta* Amyot and Serville, *Hemip.* : 271.

Key to species of *Physopelta*

1(2) Body dull reddish yellow; antennae reddish yellow with base of apical joint yellowish *gutta*

Body sanguineous; antennae black with apical joint greyish
... .. *schlanbuschi*

** 43. *Physopelta gutta* (Burmeister)

1843. *Lygaeus gutta* Burmeister, *Nova Acta Acad. Leop. Carol.*, xvi Supp. : (300) : 424.

1861. *Physopelta gutta* Stal, *O.V.A.F.* xviii : 195.

1927. *Physopelta gutta* Taeuber, *Konowia*, vi : 174.

Material examined : 1 ex., Deban, Tirap Distt., 10.xii.1982. Coll. S. Biswas and party.

Diagnostic features :

Dull reddish-yellow; antennae, large basal spot to head, pronotum (excluding margins), scutellum and basal area of corium dark brown; a discal rounded spot and apical angles of corium and the membrane black; rostrum, sternum, legs, abdominal incisures and three sublateral spots dark brown; lateral margins of the prosternum, base of 1st segment of antennae, basal angle of membrane, coxae, trochanters and femora beneath dull reddish-yellow; body pilose; base of apical segment of antennae yellowish red.

Length 15 to 17 mm.

Distribution : India : Arunachal Pradesh, Assam, West Bengal.

Elsewhere - Australia; Burma; Indo-China; Philippines; Sri Lanka; Sumatra.

Remark : The species is a new record from Arunachal Pradesh.

**** 44. *Physopelta schlanbuschi* (Fabricius)**

1787. *Cimex schlanbuschi* Fabricius, *Mant. Ins.*, ii : 209.

1861. *Physopelta schlanbuschi* Stal. *O.V.A.F.* xviii : 195.

1909. *Physopelta schlanbuschi* Lefroy, *Rec. Ind. Mus.*, iii : 325.

Material examined : 1 ex., Mias, Tirap Distt., 1.xii.1982, Coll. S. Biswas and party.

***Diagnostic features* :**

Reddish antennae, two large transverse spots near anterior margin of posterior lobe, scutellum, a rounded discal spot to corium, membrane, a lateral series of long transverse linear spots on sternal and abdominal incisures, apex of rostrum, tibiae and tarsi black; base of 1st segment of antennae and apex of scutellum reddish; antennae pilose, 1st and 2nd segments almost subequal in length.

Length 13 to 16 mm.

Distribution : India : Arunachal Pradesh, Assam, West Bengal.

Elsewhere - Burma; China; Japan.

Remark : The species is recorded for the first time from Arunachal Pradesh.

Family XV. REDUVIIDAE

A very large family exclusively predacious or blood-sucking. Antennae often with intercalary segments making up a total of as many as 40 segments; rostrum pointed, 3-segmented, capable of friction against stridulatory groove of prosternum; fore legs not raptorial but their tibiae often provided with a fossula spongiosa for adhesion; tarsi usually 3-segmented. The sub family triatominae, predominantly new world in distribution suck the blood of mammals or birds.

Genus *Acanthaspis* Amyot & serville

1843. *Acanthaspis* Amyot and Serville, *Hem.* : 336.

**** 45. *Acanthaspis angularis* Stal**

1859. *Acanthaspis angularis* Stal, *Ofv. Vet.-AK. Fortz* : 188.

1902. *Acanthaspis angularis* Distant, *Fauna Brit. India, Phynchota*, ii : 262.

Material examined : 1 ex., Gibbon's land, Tirap Distt., 20.xii.1982, Coll. S. Biswas and party.

***Diagnostic features* :**

Pitchy black or brownish black, lateral angular areas of pronotum, a large transverse spot beyond middle of corium, spots to connexivum above and beneath and legs yellowish-brown; 1st and 2nd segments of rostrum sub-equal in length; 1st segment of antennae about as long as head; pronotum with the disk sulcate anterior lobe strongly sculptured, hind lobe posteriorly finely rugulose, lateral angles spinously produced and recurved; scutellar spine obliquely ascendant and recurved.

In some variety there is a yellowish-brown spot at the base of corium.

Length : 15 to 17 mm.

Distribution : India : Arunachal Pradesh, Maharashtra, Tamil Nadu.
Elsewhere - Sri Lanka.

Remarks : The species is a new record from Arunachal Pradesh.

Genus *Euagorus* Burmeister

1835. *Euagorus* Burmeister, *Handb.*, ii : 226.

**** 46. *Euagoras plagiatus* Burmeister**

1834. *Euagoras plagiatus* Burm., *Noo. Act. Ac. Nat. Cur.*, xvi suppl. i : 303.

1902. *Euagoras plagiatus* Distant, *Fauna Brit. Ind. Rhyn.*, ii : 363.

Material examined : 1 ex., Lower Jheel Camp, Tirap Distt., 3.11.1987, Coll. S. Biswas and party.

***Diagnostic features* :**

Head, pronotum and scutellum reddish-yellow; a broad central longitudinal spot to posterior pronotal lobe, the hemelytra and sternum black; lateral margins of hemelytra, lateral margins of sternum, abdomen beneath and legs very pale brownish-yellow; femora linearly streaked with black and with a subapical black annulation; abdomen beneath with broad black fascia on each lateral area; coxae reddish-yellow; antennae

dark brown annulated with yellowish-brown; rostrum reddish-brown, its apex black; posterior spines to pronotum curved and reflexed; 1st segment of antennae as long as anterior femora or as the head, pronotum and scutellum together; body above finely greyish.

Length 13 to 14 mm.

Distribution : India : Andaman Is., Arunachal Pradesh, Assam.

Elsewhere - Burma; Java and Philippines.

Remarks : The species was hitherto unknown from Arunachal Pradesh.

Genus *Sminthocoris* Distant

1902. *Sminthocoris* Distant, *Fauna Brit. India, Rhynchota*, ii : 279.

**47. *Sminthocoris fuscipennis* Stal

1874. *Sminthocoris fuscipennis* Stal, *En.Hem.*, iv : 68

1902. *Smithocoris fuscipennis* Distant., *Fauna Brit. Ind. Rhyn.*, ii : 280.

Material examined : 3 exs., Gibbon's Land, Tirap Distt., 20.xii.1982, Coll. S. Biswas and party.

Distribution : India : Arunachal Pradesh, Assam.

Elsewhere - Burma.

Remarks : The species is being reported from Arunachal Pradesh for the first time.

SUMMARY

The paper deals with 47 species belonging to 37 genera in 15 families of Hemiptera from Namdapha National Park in Tirap district of Arunachal Pradesh. Of these, five species (marked *) viz., *Erthesina guttata* Fabricius, *Gargara citrea* Distant, *Jucandus burmanus* Distant, *Mezira triangulus* Bergroth and *Serinetha dallasi* Dohrn are new to India. Besides, 23 species (marked **) are new records from Arunachal Pradesh. Keys to various taxa, distribution records and relevant reference of each species together with the taxonomic remark, if any, are provided.

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Figs. 1-3 : External morphology of Aphid

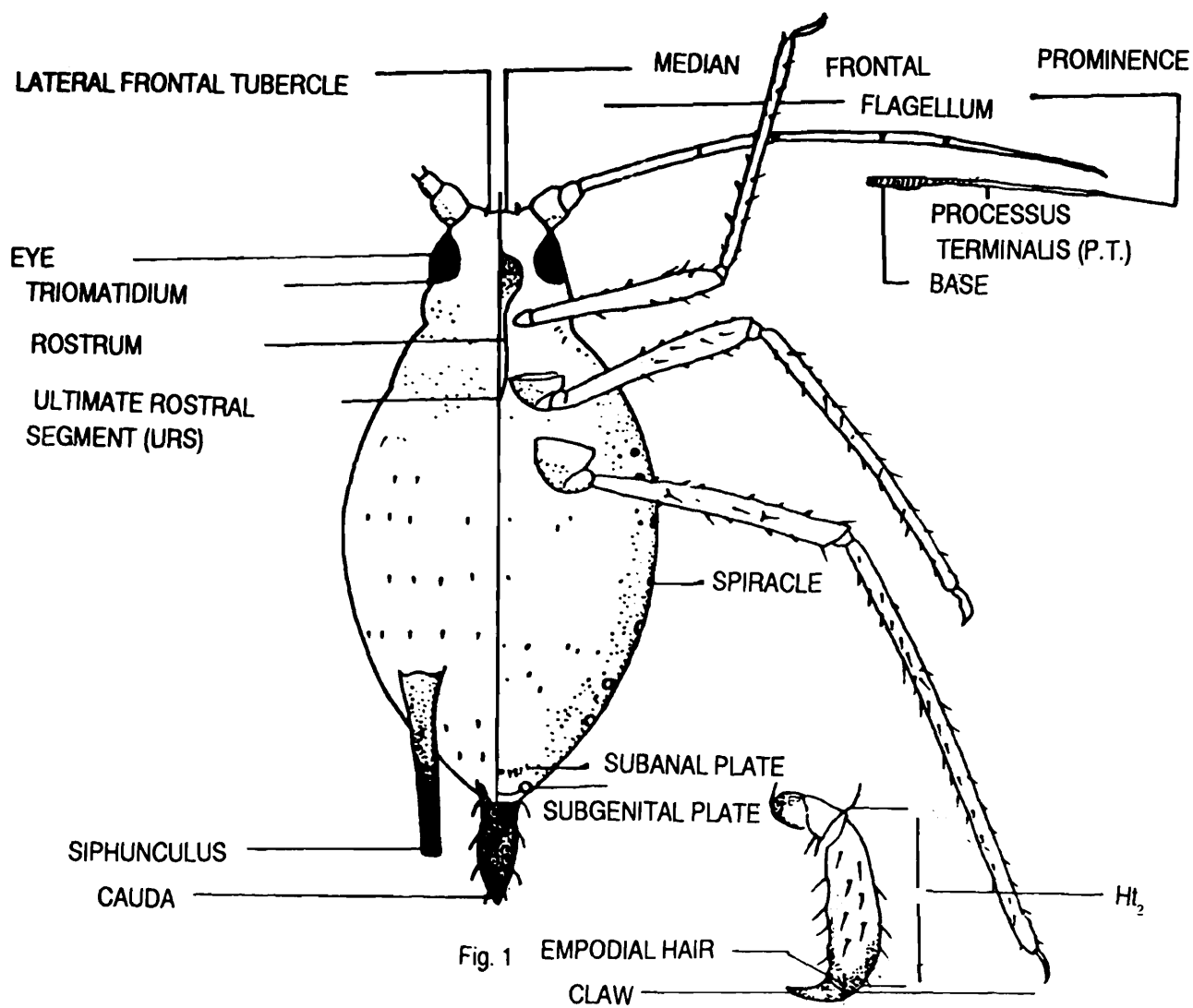


Fig. 1 : Typical Apterous viviparous female

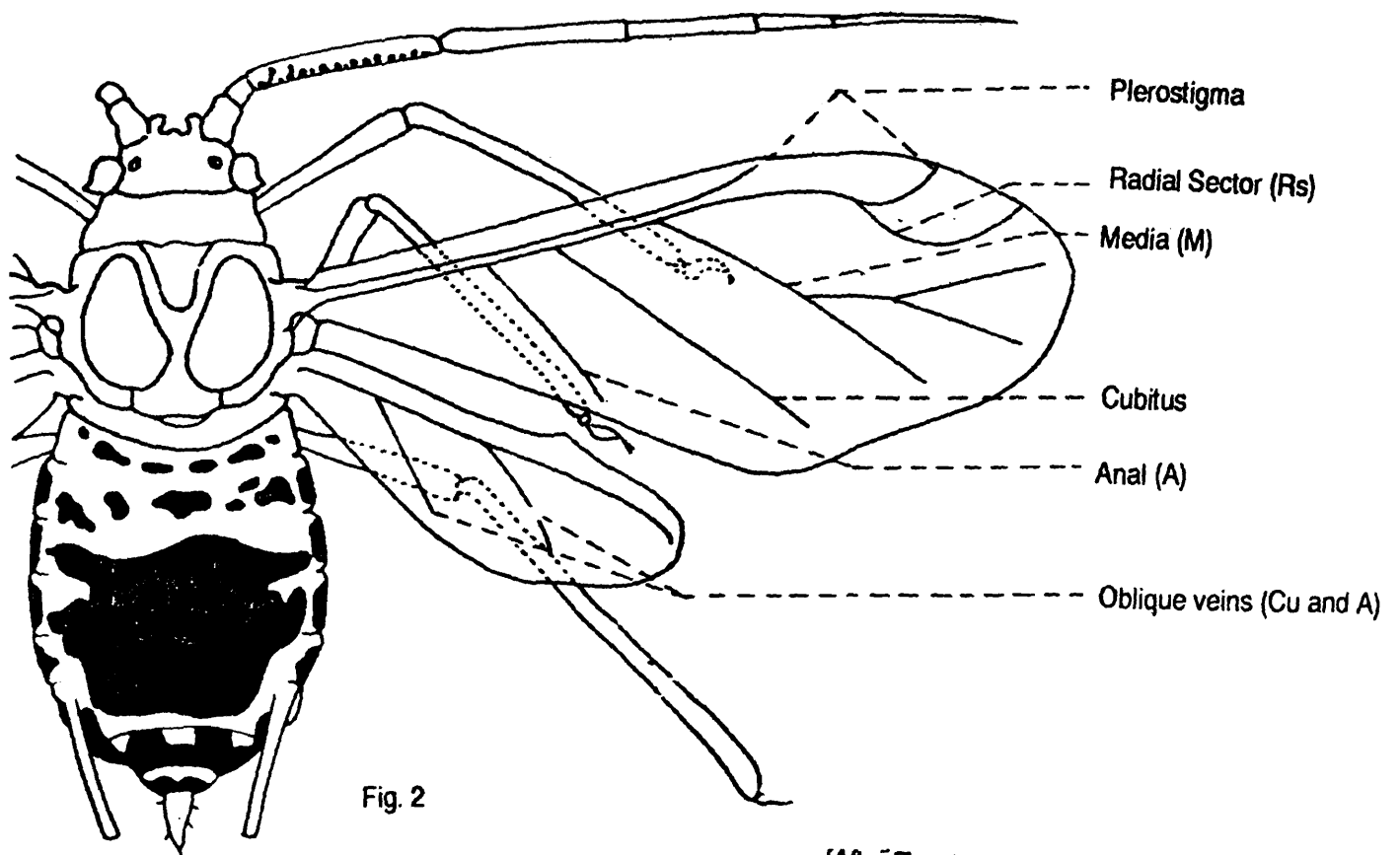


Fig. 2

[After Raychaudhari D.N. (ed) 1980]

Fig. 2 : Typical Alate viviparous female

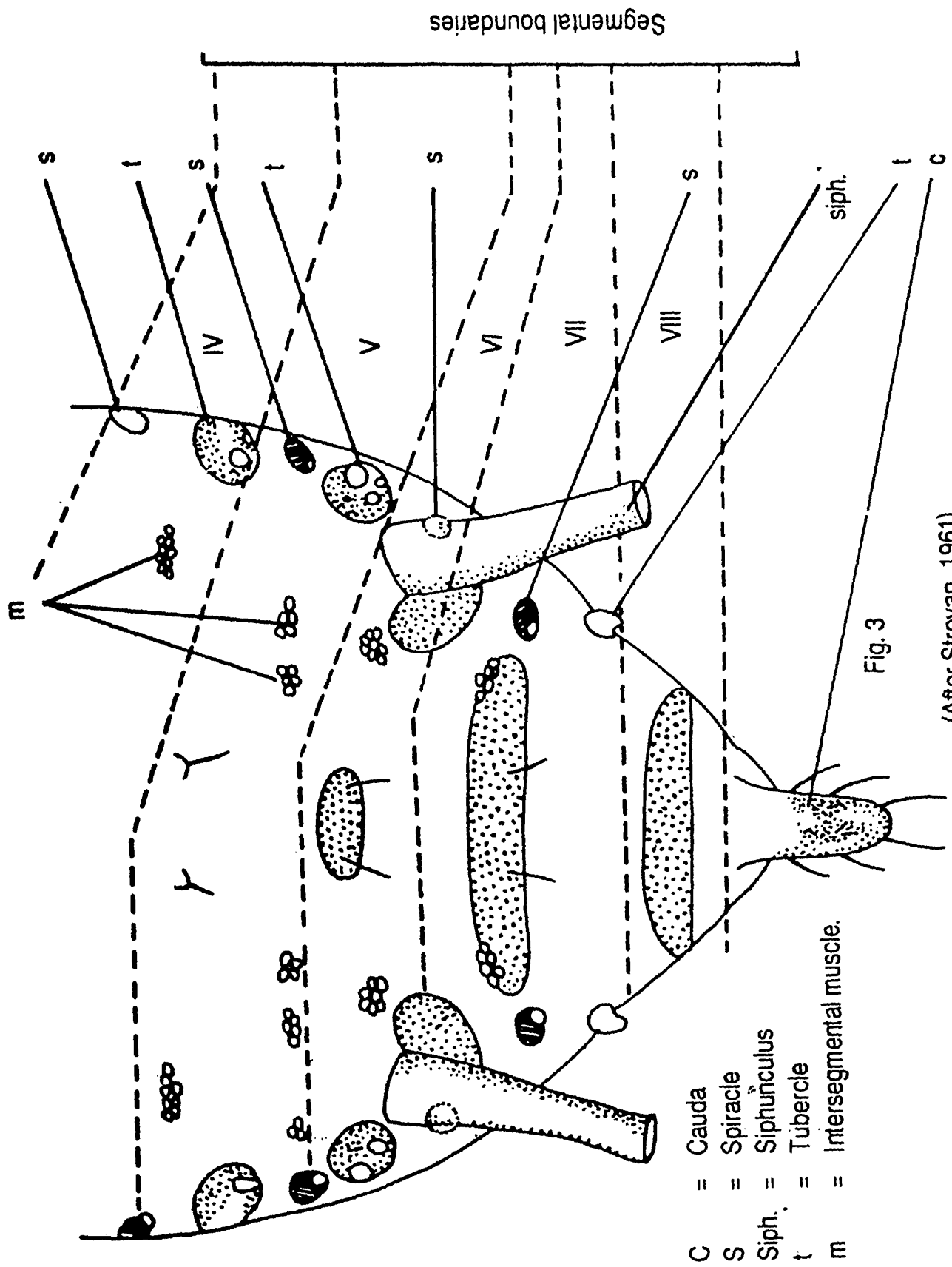
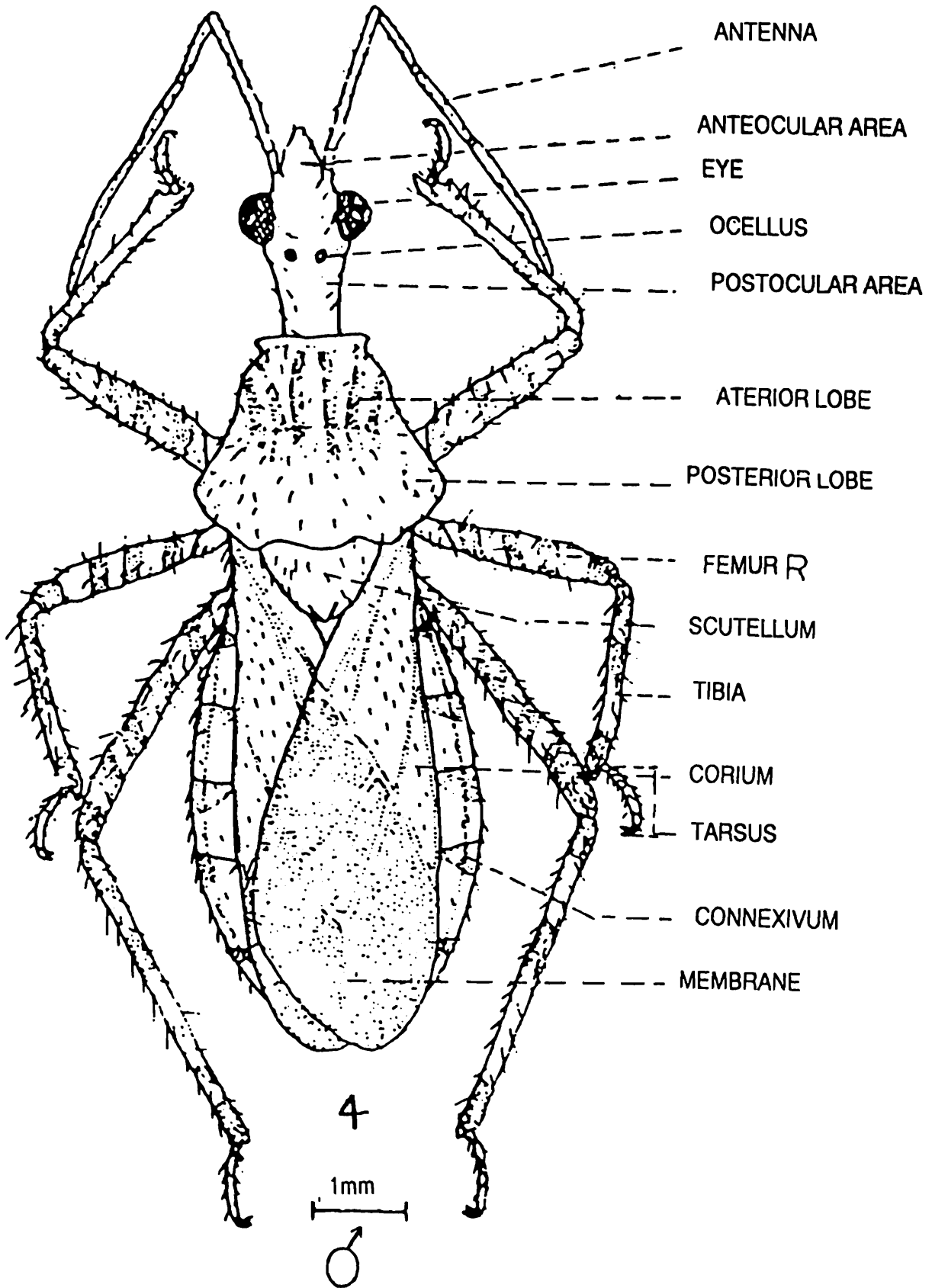


Fig. 3

(After Stroyan, 1961)

Fig. 3 : Posterior segments of abdomen of apterous viviparous female



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SCHEMATIC DIAGRAM OF A REDUVIID BUG SHOWING MORPHOLOGICAL TERMINOLOGY USED IN THE TEXT