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ON ORIENTAL CICADELLIDAE (HOMOPTERA : INSECTA)

by

BIMAL DATTA

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

RECORDS
OF THE
ZOOLOGICAL SURVEY OF INDIA

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BIMAL DATTA
Zoological Survey of India, Calcutta



सत्यमेव जयते

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INTRODUCTION

With the turn of the present century, a number of species of the family cicadellidae, formerly known as Jassidae, are expected to be systematically catalogued on a broad spectrum of global distribution. The increasing facilities of the project-oriented exploration of the fauna, treated as vector of phytopathogenic viruses, invite attention of the virologists to assess the losses to mankind. The correct identification of the specimens is a vital task of the taxonomists, on whom depend the virologists who meticulously deal with the complex methodology associated with the culture and long standing experimentation with viruses and vectors lethal to the floral kingdom. Since 1895, the findings of leafhopper vectors, new viruses, also formulation of theories on virus-vector relationships have refined our knowledge to a specific branch of Entomological science.

HISTORICAL RESUME

The pioneering work on the systematics of jassid fauna dates back to Fieber (1806, 1852-1885) and Latreille (1802) who introduced the name cicadellidae. Subsequent studies were made in chronological order by Stål (1853-1870), Edwards (1877-1928), Distant (1879-1920), Atkinson (1885-1890), Van Duzee (1889-1938), Melichar (1896-1951), Pruthi (1921-1940), Zachvatkin (1924-1948), Oman (1930-1971), Evans (1931-1977), Nielson (1951-1968, 1982), Knight (1968), Vilibaste (1968) and Hamilton (1980-1982) on a number of jassids from the Oriental, Palaearctic and Nearctic regions.

I. Genus *Bhandara* Dist.

1908. *Bhandara* Dist., *Fauna Brit. India*, 4 : 221.

Type, by original designation, *Bhandara semiclara* (Sign.)

1853. *Tettigonia semiclara* Sign., *Ann. Ent. Soc. France*, 1(3) : 666.

Crown rounded anteriorly, lateral margin in line with outer margin of eyes, surface foveate, centrally depressed; face globose, laterally striate; clypeus compressus; pronotum at posterior margin sinuate; tegmina long, margins parallel, four apical cells; posterior tibiae densely spined.

1. *Bhandara sarawakensis* Dist.

1908. *Bhandara sarawakensis* Dist., *Rec. Indian Mus.*, **2** : 143.

Crown with facial structures and thorax dark reddish brown; forewing dark brown, costal and apical areas paler.

Length : 14mm (female).

Morphology : Crown with a transverse ridge at base, median length one and half times longer than interocular width, posterior median half centrally and laterally depressed; ocelli placed at depressed areas; trans-clypeal suture indistinct; clypeus flat-shaped, muscular impression distinct, clypellus ridged; lora with raised-surface; texture of crown glabrous, very finely granulate; pronotal width greater than transocular width, anterior margin with irregular impressions, otherwise smooth, glabrous, shiny, posterolaterally smooth, curvate, posterior margin truncate; scutellum transversely depressed centrally, anterior margin smooth, shiny; tegmina coriaceous, opaque, four apical cells, three ante-apical cells, appendix well-developed, veins elevated, ante-apical cells closed basally, 1st apical cell very large, 2nd and 3rd apical cells almost equal, 4th one smaller, 1st, 2nd, 3rd apical cells parallel sided; hind femoral setal formula : 2:1:1; VIIth sternite (female) deeply emarginate at posterior margin, ovipositor-sheath extending beyond pygofer tip, a circlet of setae at apex of pygofer.

Distribution : Borneo, Sarawak.

Registered number : 1875/H7, Zoological Survey of India, Calcutta.

II. Genus *Bothrogonia* Melichar

1926. *Bothrogonia* Melichar, *Ann. Mus. Nat. Hist. Hung.*, **23** : 341.

Type, by subsequent designation, *Bothrogonia ferruginea* (Fabr.).

1787. *Cicada ferruginea* Fabr., *Mantissa Insectorum*, **2** : 269.

Large, elongate, slender; head wider than pronotum, subtriangularly produced or rounded; face elongate, without either carina or foveola, moderately globosa, lateral areas striate transversely; scutellum with an arcuate, transverse impression before apical area; tegmina longer than abdomen, five apical cells; posterior tibiae spinulose; connective Y-shaped, short arm, aedeagal shaft tubular, slightly attenuate apicad, paraphyses prominent, almost touching at apex, longer than shaft; stylar shaft (apical process) without any preapical lobe, apex minutely pointed, hook-like; male

plate almost of equal length to stylar process, curved along median line, apex may be cup-shaped; pygofer may be serrate along outer margin, usually attenuate distad.

2. *Bothrogonia assamensis* (Dist.)

1880. *Tettigonia assamensis* Dist., *Ent mon. Mag.*, **16** : 203.

Female :

Length . 14 mm

Morphology : Median length of crown half interocular width, median suture distinct at base; ocelli located equidistant from each eye, ocello-ocular area depressed; clypeus strongly developed, muscular impression distinct, transclypeal suture constricted, lateral clypeal suture extending upto each ocellus, texture shiny, pronotal width slightly greater than transocular width, texture shiny, surface sharply pitted, posterolaterally smooth, rounded, posterior margin concave; scutellum depressed in middle, apical part shiny; tegmina longer than abdomen, coriaceous, venational arrangement indistinct, apical veins distinct hind femoral setal formula : 2:1:0; VIIth sternite sinuate at posterior margin, ventromedially projected.

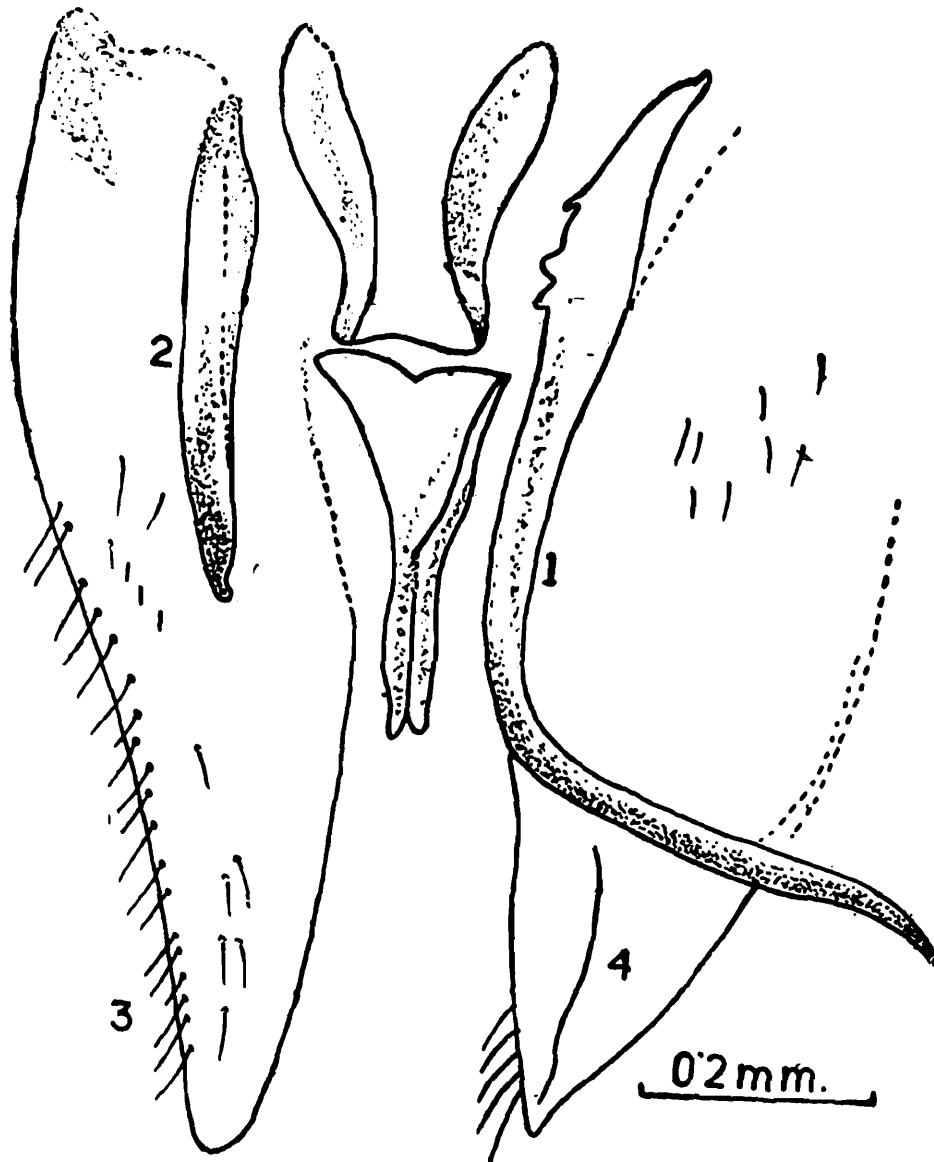
Tip of vertex with a dark reddish spot, at base with a transverse black patch, indented anteriorly, extending between ocelli, clypeus latero-posteriorly with broad bands, dark black; crown, clypeus, clypellus reddish-yellow; pronotum sexnotate, anterior margin with two transverse black patches; posterior margin with four black patches; ground color dark yellow, posterior margin greyish; scutellar angle with a pair of subtriangular patch, apical one dark brown; forewing dark cement-colour, longitudinally large reddish patch on costal margin extending upto middle, three large dark brown patches on claval cells, one at central anteapical cell, apical part pale brown; rostrum dark black; abdominal segments dark black; pygofer and valves dark black; VIIth Segment (♀) dark yellow.

Distribution : Daphabun, NEFA.

Registered number : 9496/H7 (Ind Mus), Calcutta.

3. *Bothrogonia ferruginea* (Fabr.)

(Fig. 1—4)

1794. *Tettigoniella ferruginea* Fabr., *Entomologia Syst.*, 4 : 32.Figs. 1-4. *B. ferruginea* (Fabr.) 1. Aedeagus, 2. Style, 3. Male plate, 4. Pygofer.

Vertex binotate, one near apex, other between ocelli; pronotum with three spots, one at anterior margin, two at base; scutellum with a black spot centrally; tegmina with apical cells blackish, claval suture with black patches; abdomen black.

Length: 14 mm (♂), 15 mm (♀)

Genitalia: Connective subtriangulate, medially depressus, aedeagal shaft (Fig. 1) $\frac{3}{4}$ th apically oar-shaped, deeply cleft lengthwise; style (Fig. 2) with short apical knob, rest cylindrate; male plate (Fig. 3) robust,

obliquely curvate on lateral margin, uniseriate; pygofer hook infolded laterally (Fig. 4), apical third geniculate, apex acuminate; seventh sternite (♀) simple.

Distribution : Ceylon, Sikkim, Cape of Good Hope, Java, Philippine islands, Singapore Island, Burma, Sumatra, Borneo, Nepal, Bengal, Malay Peninsula, Formosa, Japan, Dutch East Indies, Yunnan, Kiangs, Korea, Malacca, U.P.

Economic status : This species is not yet recorded as vector of any viral diseases. It is reported injurious to apple in Hida Province (Nawa 1916 : 325), agricultural crops in Philippine (Woodworth 1921 : 31), silk-worm mulberry (Yokoyama 1925 : 192), citrus plants in Japan (Miyoshi 1926 : 338). It is suspected in spreading spike disease of sandal forest (Dover 1934 : 36), reported on cotton from Formosa (Shiraki 1937 : 43), often it is parasitised by *Halictophagus serratus* Boh. (Strepsiptera) (Bohart 1943 : 352-359).

4. *Bothrogonia indistincta* (Walk.)

(Fig. 5--8)

1851. *Tettigoniella indistincta* Walk., *List. Hom. B. M.*, p. 739.

Vertex binotate, brownish yellow; pronotum with three spots, two at base, one at anterior margin; scutellum subapically with a black spot; tegmina castaneous; abdomen light brown.

Length : 13 mm (♂), 14 mm (♀).

Genitalia : Aedeagus (Fig. 5) massive, structure complex as figured; style (Fig. 6) with rod-shaped preapical lobe, mesal apical extension very short almost hook-shaped; male plate (Fig. 7) convergent gradually; pygofer (Fig. 8) infolded on posterolateral margin, hook massive, long, arising laterobasal margin, 2/3rd geniculate otherwise straight, acuminate, extending posterior margin; seventh sternite (♀) simple.

Distribution : Java, Sumatra, Borneo, Assam, Philippine, Northern and Western China, Szechwan, Tenasserim, Fukien, Burma, U.P.

Comment : This species has covered up the areas of diverse climatic condition but its host specificity and pest status have not been yet investigated, although the allied species, namely *Cicadella* (T.) *spectra* and *Cofana* (Kolla) *mimica* Dist., are recorded to be the pests on paddy and common in occurrence with viruliferous cicadellidae as *Nephotettix* spp., *Inazuama dorsalis* Mots. (Cicadellidae) and *Nilaparvata lugens* Stal under family (Delphacidae).

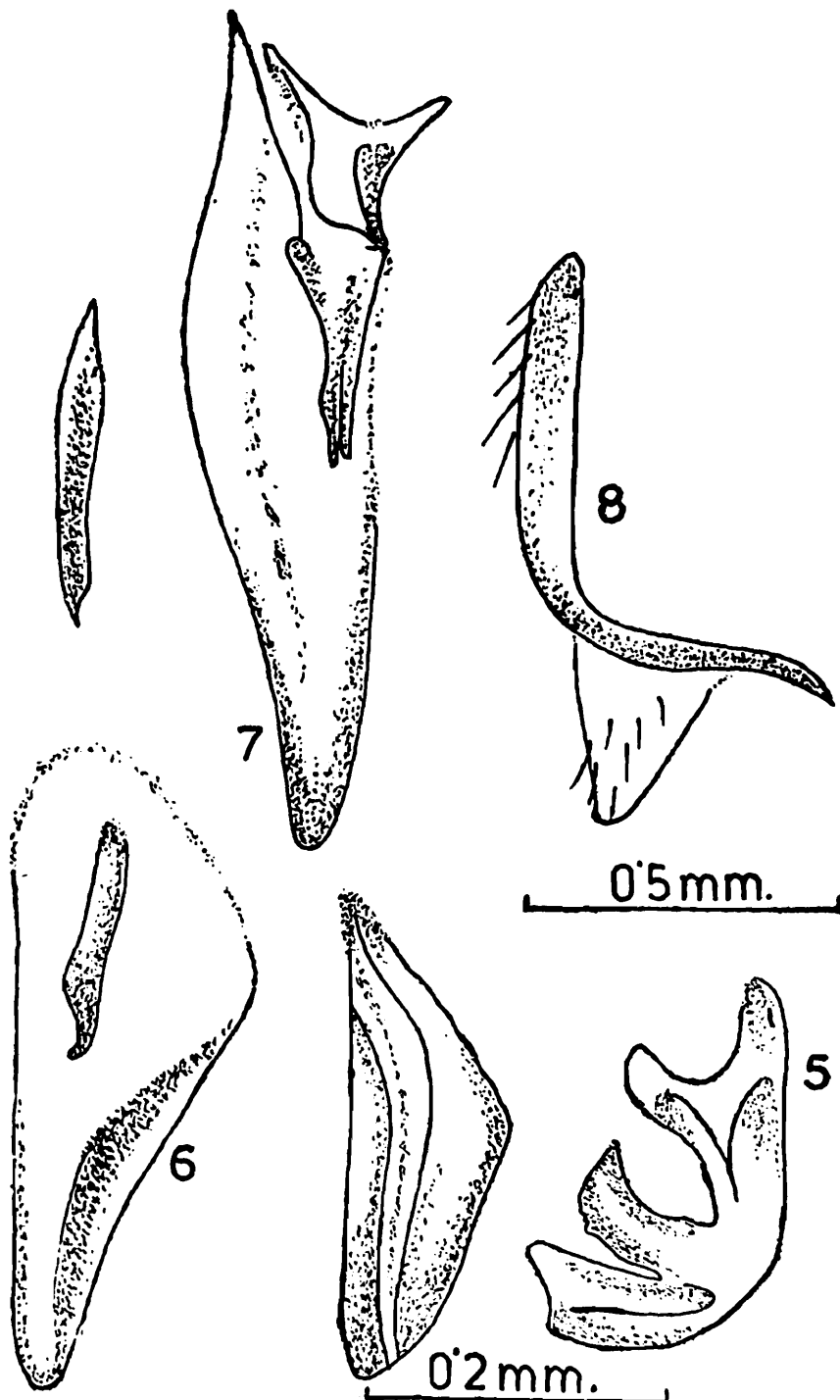


Fig. 5-8. *B. indistincta* (Wlk.) 5. Aedeagus, 6. Style, 7. Male plate, 8. Pygofer.

5. *Bothrogonia leopardina* (Dist.)

(Fig. 9—12)

1908. *Tettigoniella leopardina* Dist., *Fauna Brit. India* 4 : 204.

Vertex yellow with brownish tinge, five spots, sometime a streak before eyes; face trinotate; clypeus centrally black; pronotal surface with five spots; scutellum trinotate; tegmina castaneus, claval suture with a black spot; each ventral segment of abdomen with a dark spot.

Length : 11 mm (male).

Genitalia : Aedeagus as figured (fig. 9), V-shaped connective; style (fig. 10) with mesal apical extension gradually connivent to a point, subapically curvate, directed posterolaterad; male plate (fig. 11) at lateromesal margin concavo-convex, discal surface spined densely, lateral margin setose; pygofer (fig. 12) subrectangulate, hook twisted laterad, geniculate posterolaterad, apex acuminate, directed posteromesal margin.

Registered number : 169/H15, Zoological Survey of India, Calcutta.

Distribution : Assam, Garo Hills, Tenasserim, Java.

Economic status : Annand (1916 : 82) reported its occurrence along with insect pests on tea crop, North East India. Present author (*Tea Board Publication Series No. 5*) during his investigation on mites and insects pests on tea crop during the season, 1960-62, did not observe its incidence as pests on the crop or on the weeds around by. But the possibility of its frequency is always there as the author being concentrated on a specific project work did not have much time to conduct collection of the particular species from the field.

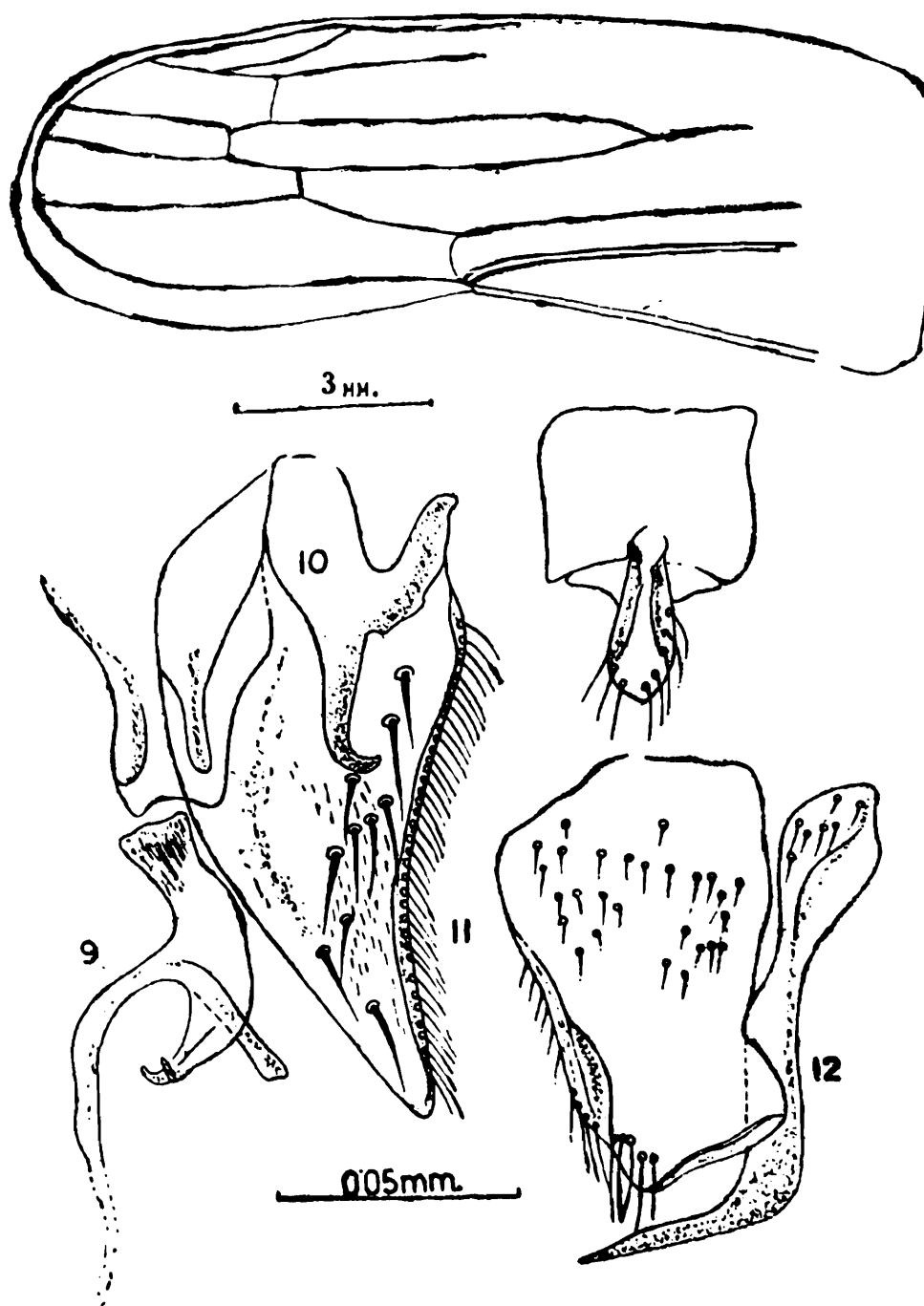
III. Genus *Kolla* Dist.

1908. *Kolla* Dist., *Fauna Brit. India*, 4 : 223.

Type, by original designation, *Kolla insignis* Dist.

1908. *Kolla insignis* Dist., *Fauna Brit. India*, 4 : 223.

Vertex subconical, lateral margin in line with outer margin of each eye which differs from *Tettigella* China & Fennah; vertex depressed near inner margin of each eye; face distinctly striate, medially smooth and flattened; hind wing with submarginal vein continuous from hamulus around apex; connective Y-shaped, aedeagus either simple otherwise with subterminal processes; stylar extension short; pygofer may be present.



Figs. 9-12. *B. leopardina* (Dist.) 9. Aedeagus, 10. Style, 11. Male plate, 12. Pygofer.

6. *Kolla canidia* Dist.

1908. *Kolla canidia* Dist., *Fauna Brit. India*, 4 : 226.

Crown, pronotum, clypeus and elytra sanguineous; legs, clypellus laterally, lora and genae brownish yellow, Y-shaped black band cover-

ing clypeus laterad, extreme margin of vertex with heart-shaped dark red brown pigment, posterior margin of crown being black giving a tetragonal sanguineous area on crown; pronotum both at anterior and posterior margins banded dark black united centrally by linear dark black line; scutellum piceous; tegmina with four broad, black longitudinal bands on costal margin and claval suture, shorter one between costal and clavus, commisural margin dark, black pigmented along with apical cells; abdominal segments dark black. Seventh sternite (female) laterally projecting, posterior margin medially concave, deep dark brown color.

Length : 11.50 mm (female).

Morphology : Crown with indistinct median suture, median length half the length of interocular width; ocelli placed on depressed areas of crown equidistant from each eye, crown clypeus, clypellus, lora, genae finely granulate; transclypeal suture indistinct, clypeus convex, clypellus feebly bulging at base, latero-distally reflexus; pronotal width greater than transocular width, surface granulate; tegminal surface smooth, veins non-elevated, longer than abdominal tip; hind femoral setal formula : 2:1:1.

Distribution : Sikkim.

Registered number : 10131/H7, Zoological Survey of India, Calcutta.

7. *Kolla ganesha* Dist.

(Fig. 13—16)

1908. *Kolla ganesha* Dist., *Fauna Brit. India*, 4 : 8.

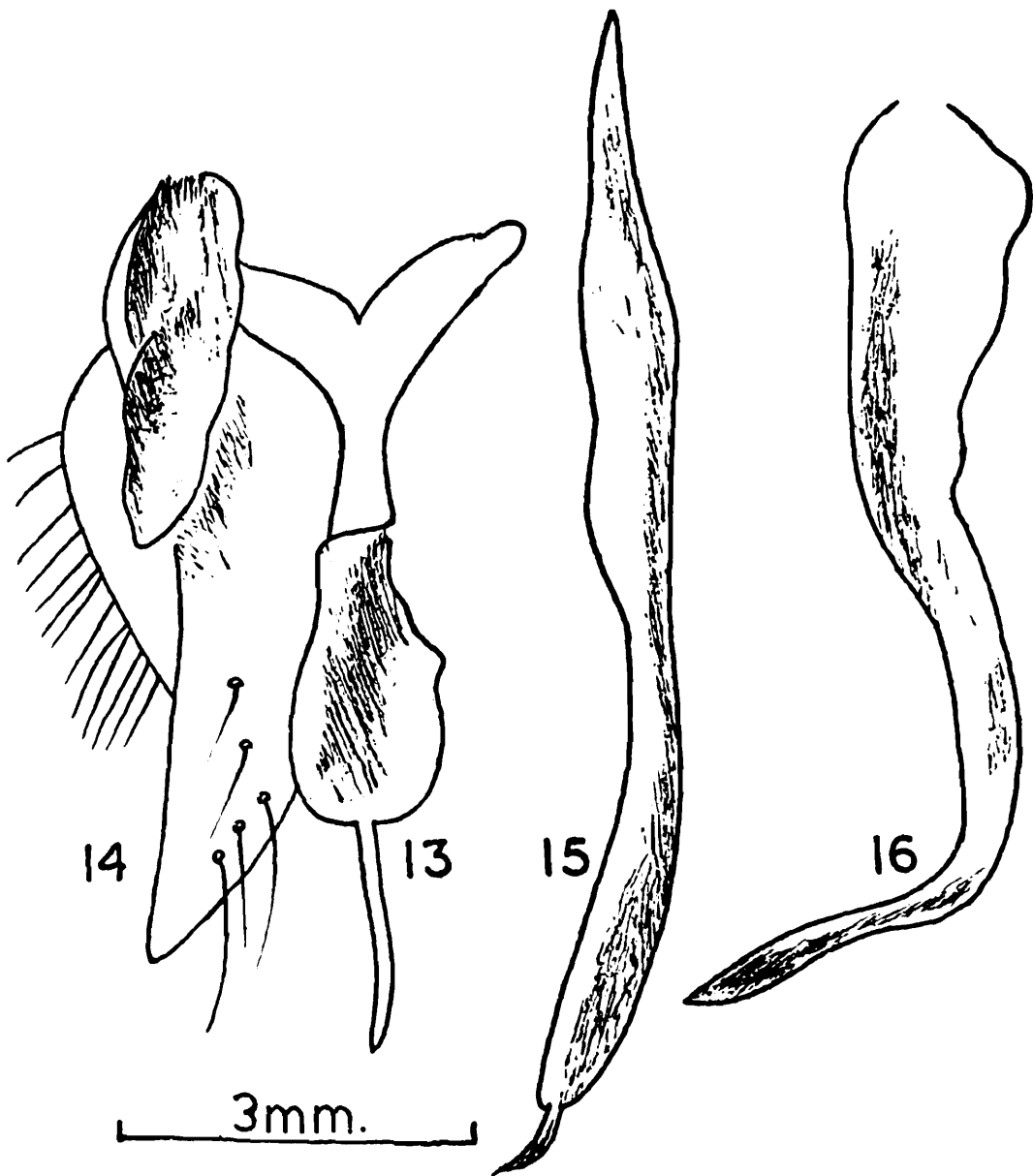
Vertex at tip with a black spot, subanterior margin with a dark band extending to antennal bases, centrally with three linear bands united posteriorly; face reddish brown, anterior margin including clypeus with a black Y-shaped band; pronotum dark brown anteriorly, medially with dark triangulate patch; scutellar angles spotted, centrally depressus, rest part shiny reddish brown; tegmina with costal part black, veins dark grey, claval cells darker; abdominal segments black; legs paler with black spines.

Length : 6.00 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 13, 15) sub-elliptical, a filamentous process arising subapically; style (fig. 14) very short, apex conico-acuminate, preapical lobe well-differentiated, male plate

(fig. 14) converging distad, lateral margin beyond middle appearing twisted, multiseriate; pygofer (fig. 16) simple, densely spinulate, hook long, stout, geniculate basad.

Distribution : Madras, South India.



Figs. 13-16, *Kolla ganisha* Dist. 13, 15. Aedeagus, 14. Style, Male plate, 16. Pygofer.

Morphology : Median length of crown half the length of interocular width, depressed near each eye, texture including clypeus finely granulate; transclypeal suture indistinct, clypellus converging apicad; pronotal width equal to transocular width; scutellar surface rugulose; tegmina longer than abdominal tip, veins thicker; hind femoral setal formula : 2:1:1.

Registered number : 740/H15, Zoological Survey of India, Calcutta.

8. **Kolla insignis** Dist.

1908. *Kolla insignis* Dist., *Fauna Brit. India*, 4 : 223.

Vertex binotate, brownish yellow, centrally with 3 spots, anterior spots united by a short thick line; pronotum shiny black, an wavy fascia close to anterior margin; scutellum at each basal angle with a large black spot, subapically impressus; tegmina bronzy-black, apical cells pigmented; abdomen brownish yellow, VIIth sternite (female) emarginate medially on posterior margin, darkly pigmented.

Length : 5.00 mm (female).

Distribution : Eastern Himalayas.

Economic status : The economic importance is not yet investigated.

Morphology : Median length of crown slightly shorter than interocular width, at base indistinctly depressed, distinctly depressed laterally; ocelli contiguous to eyes, texture glabrous, finely granulate, median suture indistinct; clypeus convex, constricted at transclypeal suture; hind femoral setal formula : 2:1:1, forewing with a narrow strip of appendix, four apical cells and three anteapical cells, 1st apical cell two and half times greater than second and third cells.

Registered number : 3564/16, Zoological Survey of India, Calcutta.

9. **Kolla maculifrons** Schmidt.

1911. *Kolla maculifrons* Schmidt., *Stettin. Ent. Ztg.*, 72 : 295.

Ocello-ocular space, crown centrally and basally sanguineous, surrounded by pitchy black pigments including clypellus; pronotum both at posterior and anterior margins bordered black transversely, centrally connected by a black strip; scutellum over median half with a sanguineous patch surrounded by black bands; tegmina sanguineous excepting 3 longitudinal black bands on commissure, claval suture and 3rd one between darkly pigmented costal margin and claval suture, 3 bands confluent at black apical areas; legs brown; abdominal segments black; VIIth sternite (female) black at posterior margin; pygofer dark color.

Length : 7.00 mm (female).

Morphology : Median length of crown equal to interocular width, ocello-ocular space with reticulate patches; crown at anterior margin rounded,

median suture fine, distinct; ocelli located at depressed area of crown, equidistant from each eye; clypeus feebly convex, transclypeal suture indistinct, texture glabrous, dull; pronotal width similar to trans-ocular width, posterior margin truncate; scutellum transversely depressed medially; seventh sternite (female) concavus at posterior margin, deeply emarginat.

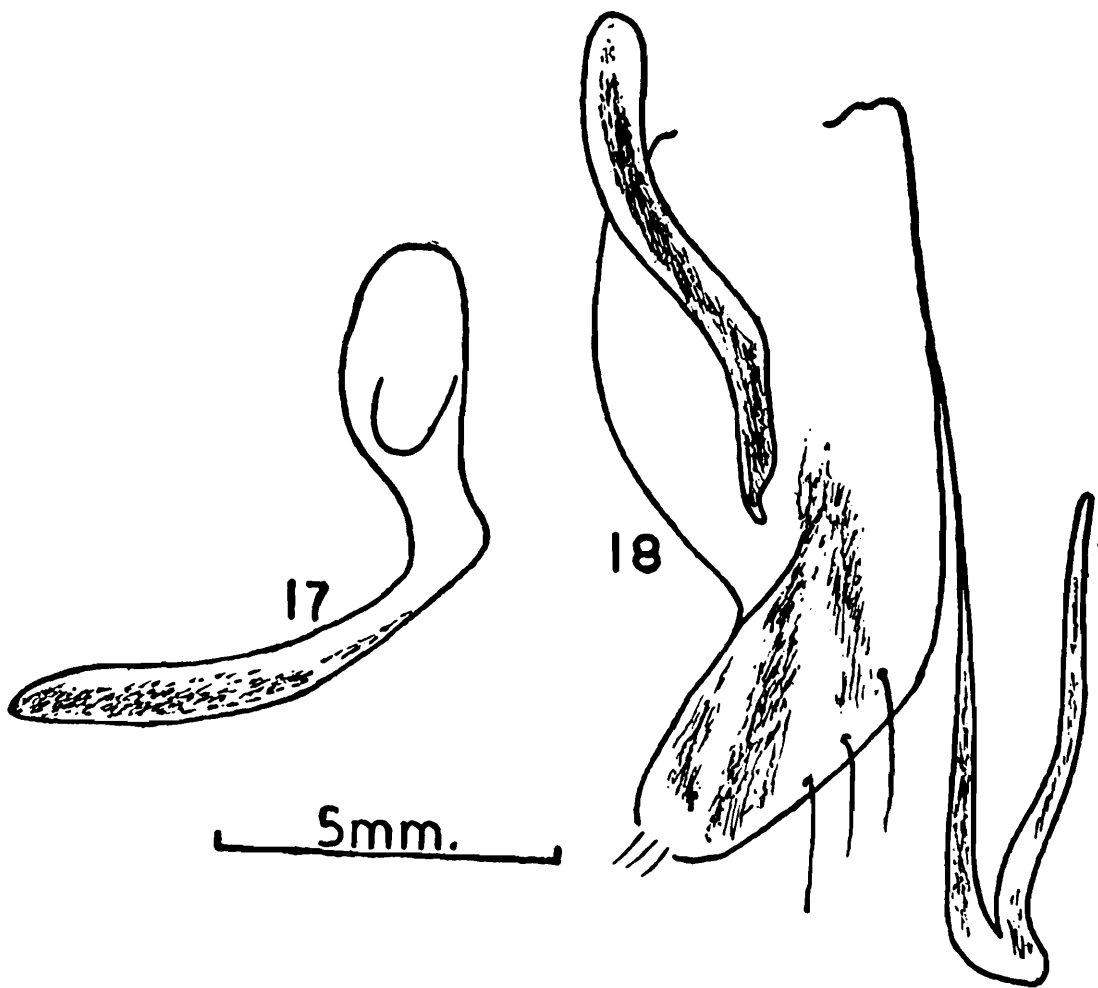
Distribution : Sikkim.

Registered number : 9837/H7, Zoological Survey of India, Calcutta.

10. *Kolla opponens* (Walk.)

(Fig. 17---18)

1851. *Tettigonia opponens* Walg., *List. Hom. B.M.*, 3 : 757.



Figs. 17-18. *K. opponens* (Walk.) 17. Aedeagus, 18. Style, male plate, Pygofer.

Vertex binotate on anterior margin, a black spot at base; pronotum black at anterior margin; scutellum with a pair of black spots at each basal angle;

face and clypeus black; tegmina with longitudinal fasciae on costal, claval and discal areas; sternum spotted; abdomen below fasciate.

Length : 8.00 mm (male), 9.00 (female).

Distribution : North India, Burma, Assam, Bengal, Netherland Indies.

Genitalia : Connective rectangulate, aedeagal shaft (fig. 17) rod-shaped, gradually connivent, apically foot-shaped; style (fig. 18) curved basad. shank infolded marginally, apex beak-shaped; male plate (fig. 18) robust, abruptly narrowed beyond middle, apex rounded; pygofer (fig. 18) quadrate, robust hook, geniculate basad, dagger-shaped, originating basad; abdominal apodeme distinct, extending beyond second abdominal segment; VIIth st. (female) feebly convex at posterior margin.

Morphology : Median length of crown lesser than interocular width, texture granulate; transclypeal suture distinct, clypellus antero-laterally reflexed; pronotal width greater than transocular width; ocelli equidistant from each eye; scutellum with a transverse furrow; tegmina coriaceous, hind femoral setal formula : 2:1:1.

Economic status : Collection was made along with vectors of spike disease of sandal wood (Regd. No. : 9692/H7 (Female), 4108/H2 (male), Z.S.I., Calcutta.

Genus *Cofana* Melichar

1926. *Cofana* Melichar, *Ann. Mus. Nat. Hist.*, **23** : 345.

Type species, by subsequent designation of China, *Tettigonia eburnea* Walk.

1938. *Tettigonia eburnea* Walk., China, *Ann. Mag. Nat. Hist.* 2(11) : 185.

Head not strongly produced, anterior margin narrow to broadly rounded; ocelli each closer to anterior eye angle; lateral clypeal sutures extending onto crown; impression of cibarial muscles distinct; clypellus without pubescence; aedeagus with dorsal apodemes developed, cylindrical shaft, not articulated with connective; style with distinct lateral lobe, apex truncate; pygofer without processes; sternum (VII) of female produced with posterior margin although vary interspecifically.

11. *Cofana mimica* (Dist.)

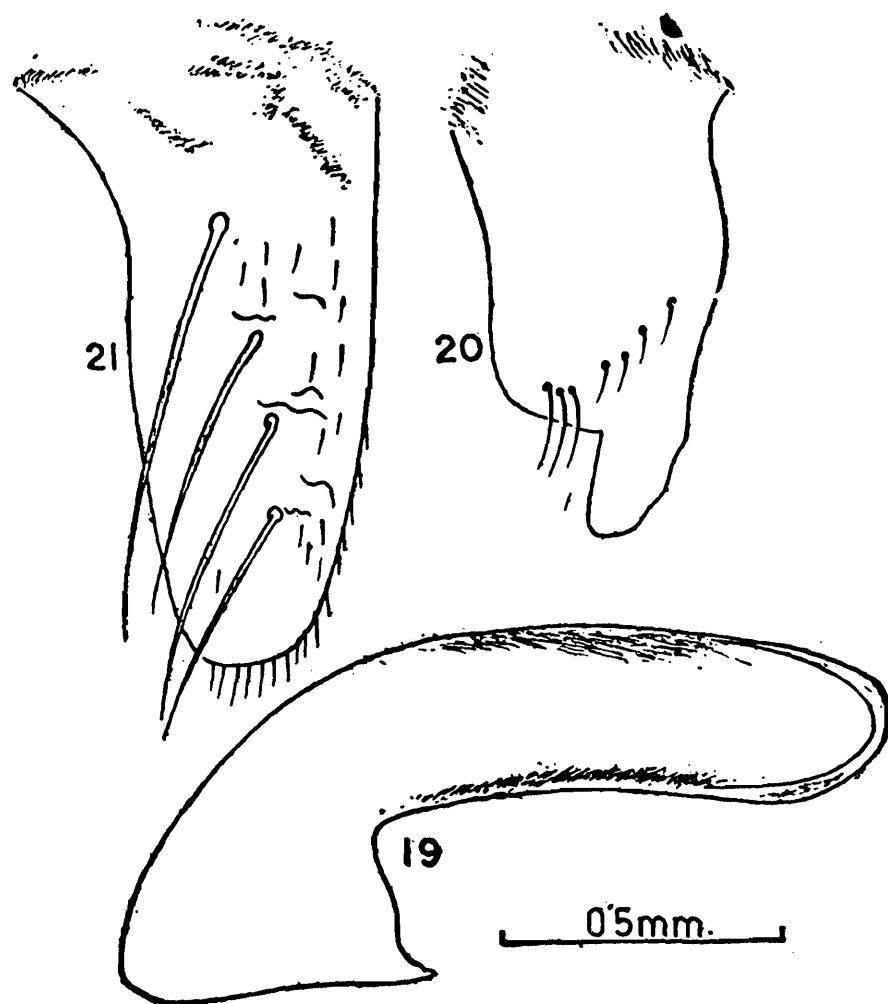
(Fig. 19—21)

1908. *Kolla mimica* Dist., *Fauna Ghit. India*, **4** : 225.

Head triangulate, vertex greenish with three black spots, one at central, rest close to ocelli, extreme lateral margin with a black spot; face centrally with white streak, laterally striate; pronotum greenish with fine transverse impression; tegmina greenish-white; legs yellowish; abdomen dorsally greenish.

Length : 6 mm (male), 7.5 mm (female).

Genitalia : Connective Y-shaped, arm very short; aedeagus (fig. 19) with developed basal strut, strongly geniculate basad, directed caudad, apex in form of membranous process; style (fig. 20) dorsoventrally compressus, 3/4th length, mesal apical extension very short, apex truncate obliquely,



Figs. 19-21. *C. mimica* (Dist.) 19. Aedeagus, 20. Style, 21. Male plate.

directed laterocaudad; male plate (fig. 21) robust, connivent distad, lateral margin uniseriate; pygofer simple, rectangulate, apical margin densely setose.

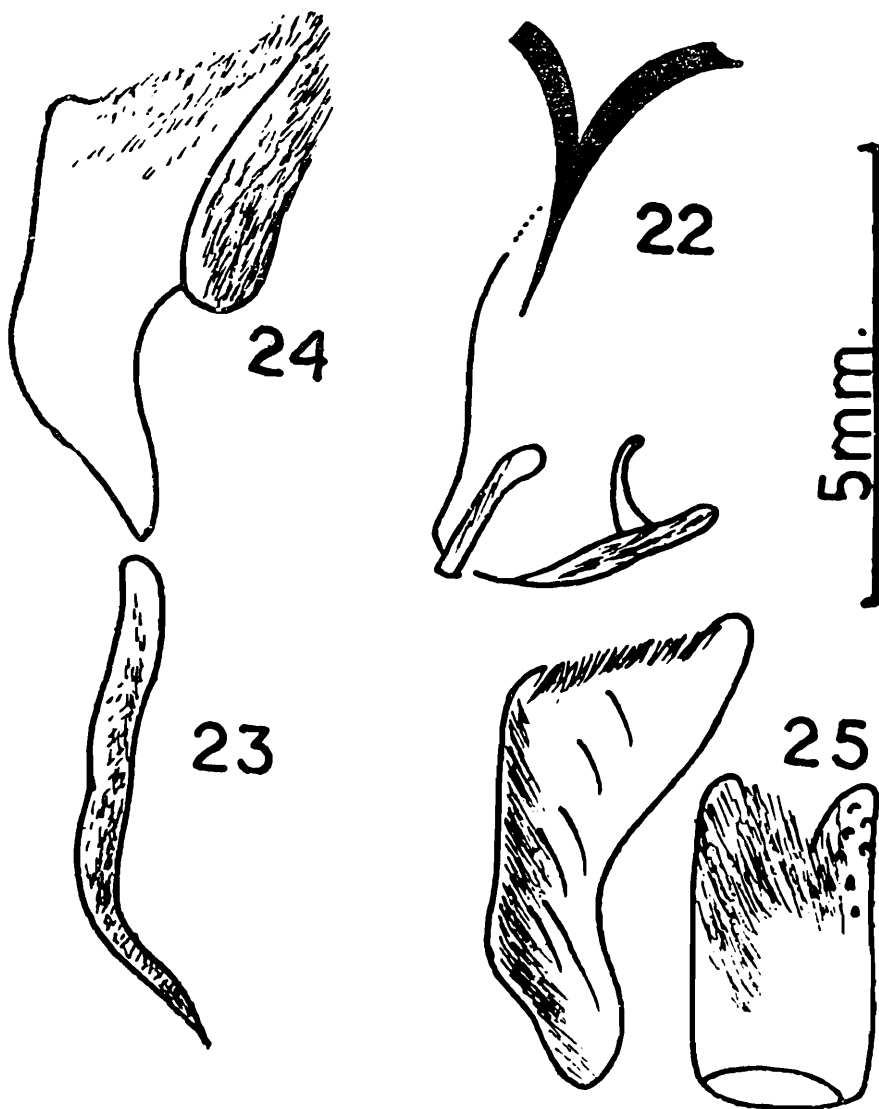
Distribution : Bengal, Assam, U.P., Bihar.

Economic status : The species is abundant with the viruliferous cicadellids, namely, *N. virescens*, *N. nigropicta*, *I. dorsalis*, and fulgorid species as *Nilaparvata lugens*. These species along with *cofana* (K) *mimica* are frequent on paddy crop during winter season. The vectorial trait of this species is not ascertained.

12. Kolla raja Dist.

(Fig. 22—25)

1918. Kolla raja Dist., *Fauna Brit. India.*, 7 : 7.



Figs. 22-25. Kolla raja Dist. 22. Aedeagus, 23. Style, 24. Male plate, 25. Pygofer.

Vertex conically produced, with a spot close to anterior margin, spots near posterior margin bluish, face with an olive green spot covering 2/3 posteriorly; clypeus centrally olive green; pronotum and tegmina olive green, costal margin with a purple blue longitudinal spot; abdomen dark.

Length : 5.00 mm (male).

Genitalia : Aedeagal complex as figured (fig. 22), style (fig. 23) short, dorsoventrally compressus, mesal apical extension short, blunt, directed caudad; male plate (fig. 24) gradually converging, apex rotundate, pygofer (fig. 25).

Distribution : Gangtok (6,000'), Sikkim, Northern Bengal.

Economic status : The economic significance of this species on plantation of hilly tracts of Himalayas is not investigated, mainly because of its sparse incidence compared to its allied species which occur in abundance on paddy crops, even on secondary weeds grown around paddy fields.

Morphology : Median length of crown equal to interocular width, lateromedially depressed at base; clypeus flat-shaped, transclypeal suture marked by constriction; pronotal width slightly greater than transocular width, laterally angulate; scutellum medially with transverse depressions; forewing coriaceous, longer than abdomen, appendix distinct, narrow, four apical and three anteapical cells, inner and central anteapical cells larger than outer anteapical cell, veins at apical areas indistinct; hind femoral setal formula : 2:1:1.

Registered number : 2922/21, Zoological Survey of India, Calcutta.

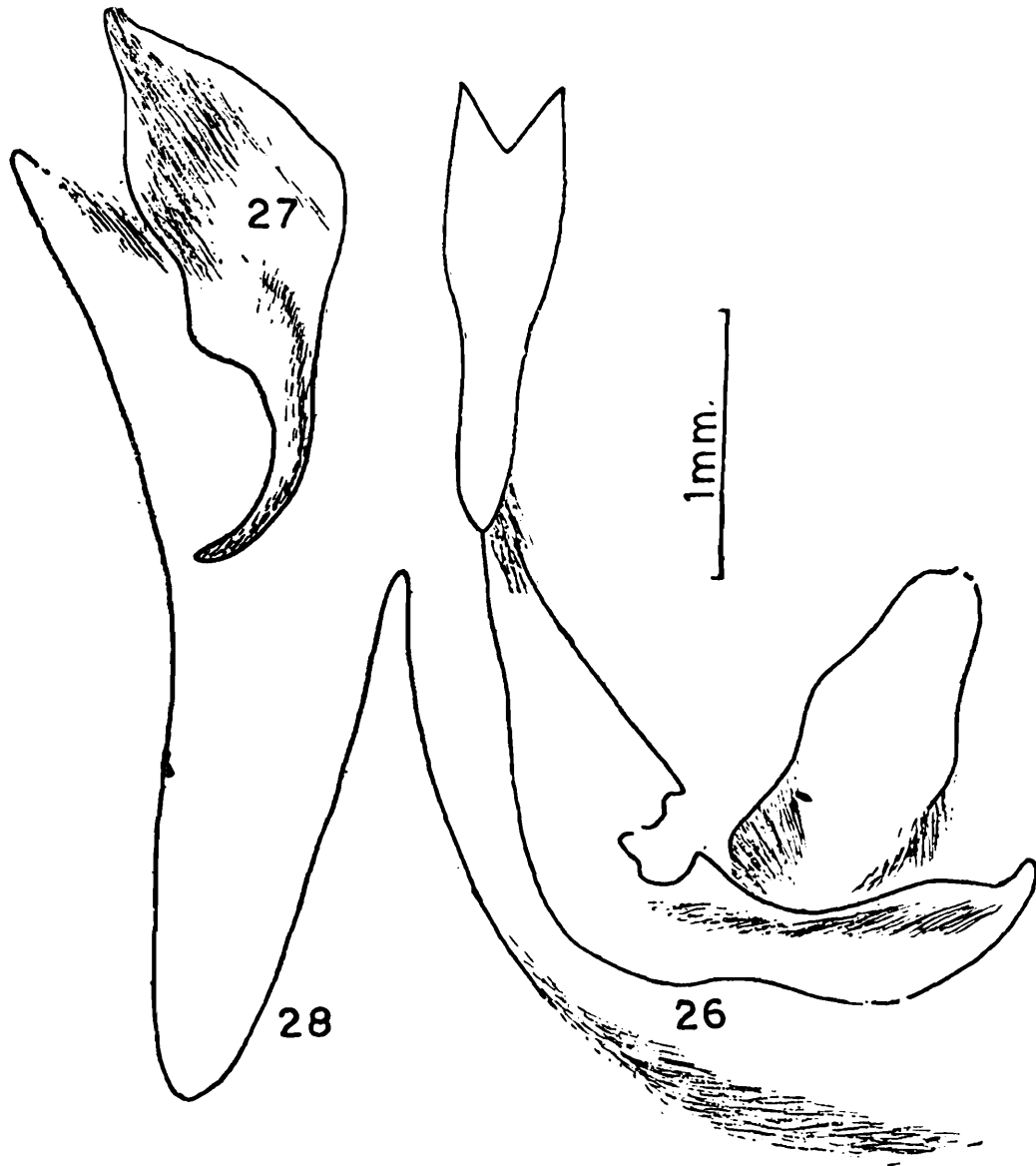
13. *Kolla unimaculata* (Sign.)

(Fig. 26—28)

1854. *Tettigonia unimaculata* Signoret, *Ann. Ent. Soc. France*, 2(3) : 26.

Vertex semicircular, not in line with outer margin of eyes, anterior margin with 3 spots, dark, basal margin binotate, sometimes obsolete in

male; pronotum beyond middle with a transverse band; scutellum at base with a dark spot; tegmina at claval area blackish, a faint, broad, pale brown longitudinal band extending upto apical cells.



Figs. 26-28. *Kolla unimaculata* (Sign.) 26. Aedeagus, 27. Style, 28. Male plate.

Length : 4.50 mm (male), 6.00 mm (female).

Genitalia : Connective Y-shaped, arm elongate, aedeagal shaft (fig. 26) spoon-shaped basad, sharply convergent to a pointed apex; stylar shaft (fig. 27) broader basad, short, stout, apex conico-acuminate, obliquely laterad, preapical lobe well-differentiated, apex flat, crossing inner shaft, wrinkled; male plate (fig. 28) gradually converging; anal hook prominent; VIIth sternite (female) with truncate posterior margin, feebly wavy, pygofer with truncate posterior margin, setose.

Distribution : Bengal, Philippines, Malacca, Java, Burma, Ceylon, Madras, Coorg, Mysore.

Economic status : During investigation of the cause of spike disease of sandal wood, the species was trapped on a sticky paper (Chatterjee 1939:22), (Singh-Pruthi 1934:13), although its specificity is not yet investigated.

Morphology : Median length of crown lesser than interocular width; clypeus convex, muscular impression indistinct, transclypeal suture indistinct; ocelli on surface of crown contiguous to each eye, texture granulate, outer margin not in line with eyes; pronotal width similar to transocular width, finely granulate, surface uneven; hind femoral setal formula : 2:1:1; forewing coriaceous, longer than abdomen; scutellum with faint median impression.

Registered number : 5931/16 (female). 6831/15 (male), Z S.I., Calcutta.

IV. Genus *Mileewa* Dist.

1908. *Milweea* Dist., *Fauna Brit. India*, 4 : 238.

Type, by original designation, *Milweea margheritae* Dist.

1908. *Milweea margheritae* Dist., *Fauna Brit India*, 4 : 238.

Vertex anteriorly conically produced; ocelli on disk, a central oblique carination on each side of disk; face globate, a central carination bifurcate basad, continued over clypeal region; pronotum laterally obliquely straight; tegminal apices truncate, 3 apical cells, tibiae densely spinulate; connective Y-shaped, aedeagus with paired terminal processes; style with mesal apical extension strongly curved; pygofer with hook.

14. *Mileewa margheritae* Dist.

(Fig. 29—32)

1908. *Milweea margheritae* Dist., *Fauna Brit. India*, 4 : 238.

Vertex, pronotum, anterior half of scutellum and tegmina dark brown; facial part and rest of scutellum creamy-white; tegmina centrally with an elliptical-shaped transparent patch, apical cells with more than two patches, apical margin truncate.

Length : 4.50 mm (male).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 29) 3/4th flat, stout, elongate, acuminate, terminal processes parallel, directed laterad;

styler shaft (fig. 30) slender, elongate, marginally infolded, medially notched, deeply curved, apex sharp; male plate (31) tubular, connivent gradually, lateral margin uniseriate; pygofer (fig. 32) sub-quadrate, hook arising postero-lateral margin.

Distribution : Assam, Java, Japan, Hokaido, Honshu, Korea.



Figs. 29-32. *Mileewa margheritae* Dist. Aedeagus (Fig. 29), Style (Fig. 30), Male plate (Fig. 31), Pygofer (Fig. 32).

V. Genus *Soibanga* Dist.

1908. *Soibanga* Dist., *Fauna Brit. India*, 4 : 236.

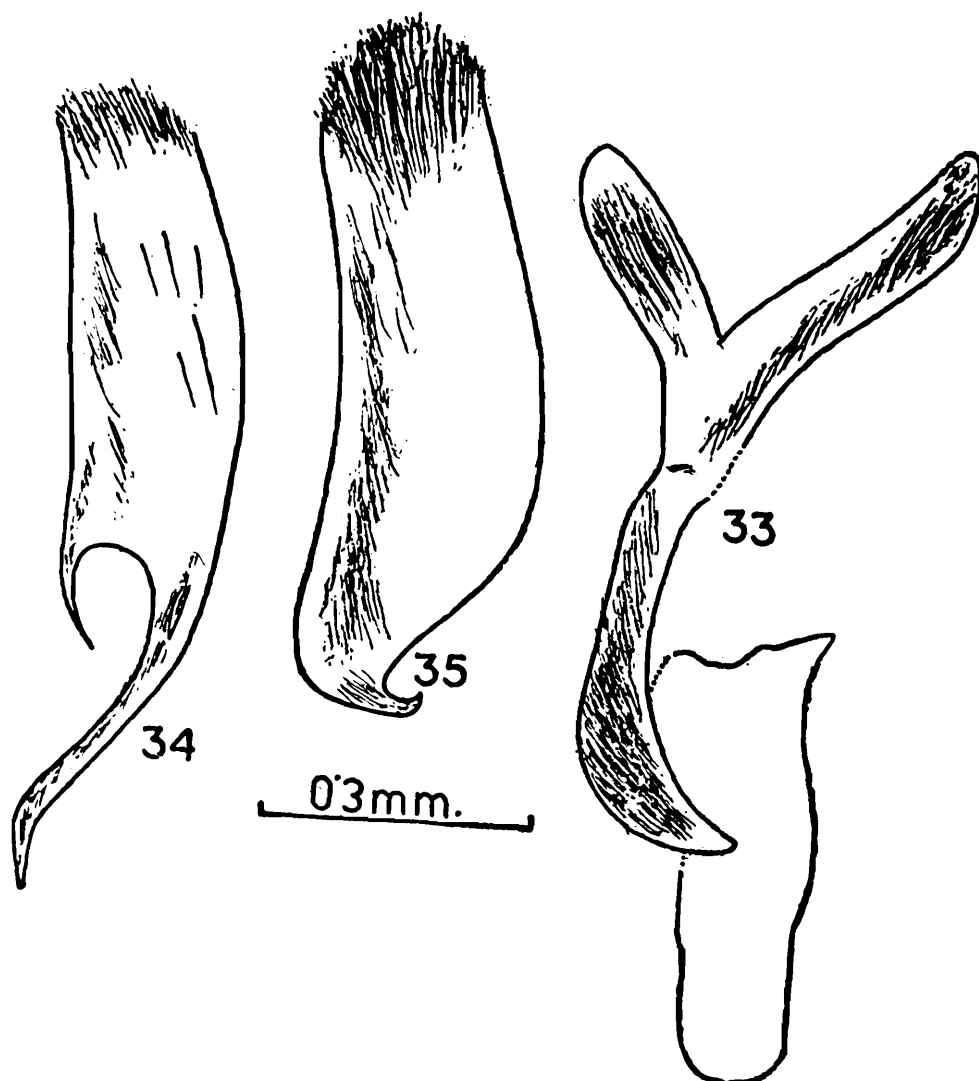
Type, by subsequent designation, *Soibanga bella* (Walk.).

1851. *Tettigonia bella* Walker, *List. Homop. Brit. Mus.* p. 778.

Robust, vertex apically rounded, distinctly rounded above each eye, each foveately depressed laterad, disk transversely depressed; face longitudinally subsulcate; pronotum as long as vertex; scutellum medially narrowed apicad; tegmina with four apical cells, clavus broader, wings broader, apical margin subtruncate, two transverse veins before apical areas; long, slender, connective Y-shaped, aedeagus simple; stylar shaft hook-shaped apicad; male plate connivent distad; pygofer hook geniculate.

15. *Soibanga bella* (Walk.)

(Fig. 33—35)



Figs. 35. *Soibanga bella* (Walk.). Aedeagus (Fig. 33), Style (Fig. 34), Pygofer (Fig. 35).

Body color including facial areas and tegmina dark brown, vertex centrally with a series of ivory spots, face with an ivory spot at posterior margin, laterally with distinct transverse impression; pronotum finely wrinkled, laterally with 2 creamy-white patches; costal and claval areas with creamy-white patches upto middle; abdomen ventrally creamy-white; legs dark brown, posterior tibiae densely spined, creamy.

Length : 5.50 mm (male), incl. tegmn.

Genitalia : Connective Y-shaped, arm curved at point of union with aedeagal base, aedeagal shaft (fig. 33) sinuate postero-laterally; stylar shaft (fig. 34) at apex beak-shaped; male plate connivent gradually; pygofer (fig. 35) hook arising laterobasally, extending along margin, centrally geniculate, apex deeply emarginate, sharply pointed.

Distribution : Assam, Northern India, Simla Hills (6,566').

VI. Genus *Tettigella* China and Fennah

1945. *Tettigella* China & Fennah, *Ann. Mag. Nat. Hist.*, **12**(11) 711.

Type, by original designation, *Cicada viridis* Chino & Fennah.

1945. *Cicada viridis* China & Fennah, *Ann. Mag. Nat. Hist.*, **12**(11) : 711.

Vertex subangularly produced, lateral margins in line with outer margin of eyes; face globular; without ridge or impression, laterally striate; pronotum anteriorly convex; scutellum impressed before apical area; tegmina with 5 apical cells; metatibiae spinulate; aedeagus without any process, paraphyses may be present; style simple; pygofer hook long, prominent.

16. *Tettigella helena* (Dist.)

1908. *Tettigoniella helena* Dist., *Fauna Brit. India*, **4** : 210.

Length : 7.00 mm.

Morphology : Crown with median length half interocular width, anterior margin rounded; clypeus flattened, transclypeal suture distinct; pronotum width as transocular width, posterolaterally smooth, rounded, posterior margin feebly concave; scutellum medially indistinctly depressed; tegmina longer than abdomen, appendix well-developed, hind femoral setal formula : 2:1:1, VIIth sternite posteromedially strongly projected, tongue-shaped, lateral margin slanting; an inverted V-shaped black marking at base of vertex, extreme anterior margin with semicircular black marking on each side, frontoclypeal area reddish yellow; from posterolateral margin of

clypeus a short longitudinal black band extending upto outer angle of eye; pronotal surface with 6 black spots anteriorly; scutellum spotted at each basal angle; tegmina with a black linear patch at costal margin, ground color yellow, discal cells sanguineous; legs reddish yellow; abdominal segments dark brown.

Registered number : 8330/16, Z.S.I., Calcutta.

17. *Tettigella infecta* (Dist.)

1908. *Tettigoniella infectsa* Dist., *Fauna Brit. India*, 4 : 210.

Morphology : Median length of crown half interocular width, basal part slightly elevated forming a concavity on surface, texture smooth, shiny, ocelli placed basad, equidistant from median suture and eyes; ocello-ocular area depressed; clypeus flattened, muscular impression distinct, transclypeal line of demarcation constrictus, clypellus convex at base; pronotal width as transocular width, posterior margin distinctly elevated; scutellum depressed mediad; tegminal texture tough, extending beyond abdominal tip; hind femoral setal formula : 2:1:1; VIIth sternite deeply notched at posteromedian margin; crown at anterior margin with an arrow-shaped dark brown marking continuous along clypeus, binotate at base, close to outer margin of each eye a black spot; cibarial-muscular impression dark brown apparently; pronotal surface at anterior and posterior margin with transverse dark brown patches; scutellum at basal angle spotted, centrally a pair of linear bands; tegmina sanguineous, apical part transparent, abdominal segments dark brown banded; genital segments dark brown, legs yellowish brown.

Distribution : Garohills, 500', Assam.

Registered number : 1779/H2, Z.S.I., Calcutta.

18. *Tettigella sandaracta* (Dist.)

(Fig. 36—40)

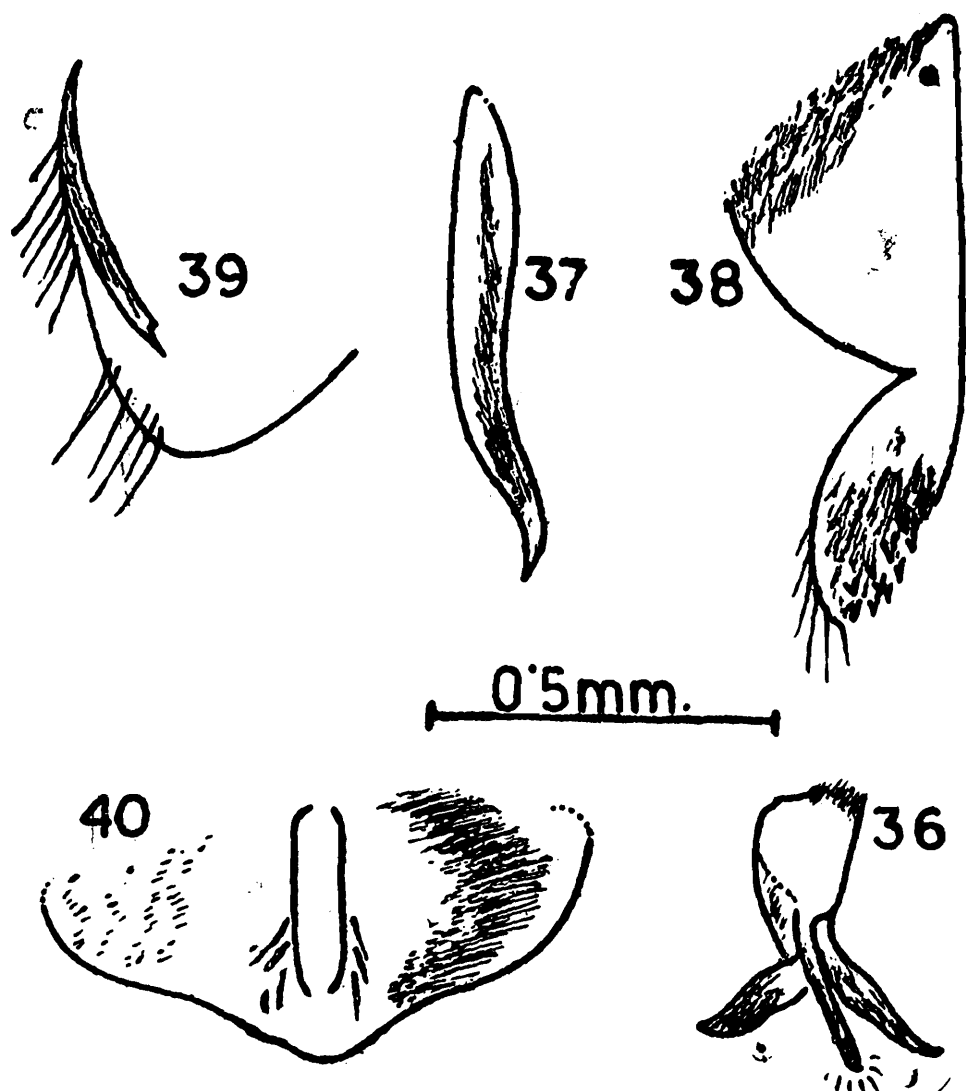
1908. *Tettigoniella sandaracta* Dist., *Fauna Brit. India*, 4 : 217.

Vertex reddish, a triangular spot at base; face anteriorly with median black spot and a linear fascia; pronotum and scutellum each with 4 spots; tegmina with apical cells reddish, costal and claval margins black; wings piceous; abdomen with clay color bands.

Length : 6.00 mm (male), 7.00 mm (female).

Genitalia : Aedeagal shaft (fig. 36) rod-shaped, connivent, paraphyses distinct; style (fig. 37) with mesal apical extension rod-shape, $\frac{3}{4}$ tm sinuate, apex uncinat; male plate robust (38) twisted medially, apically spined; pygofer hook (fig. 39) arising 1 anterobasally, flattened, apex emarginate, extending half the length of pygofer plate; seventh sternite (female) bulged out centrally at posterior margin (fig. 40).

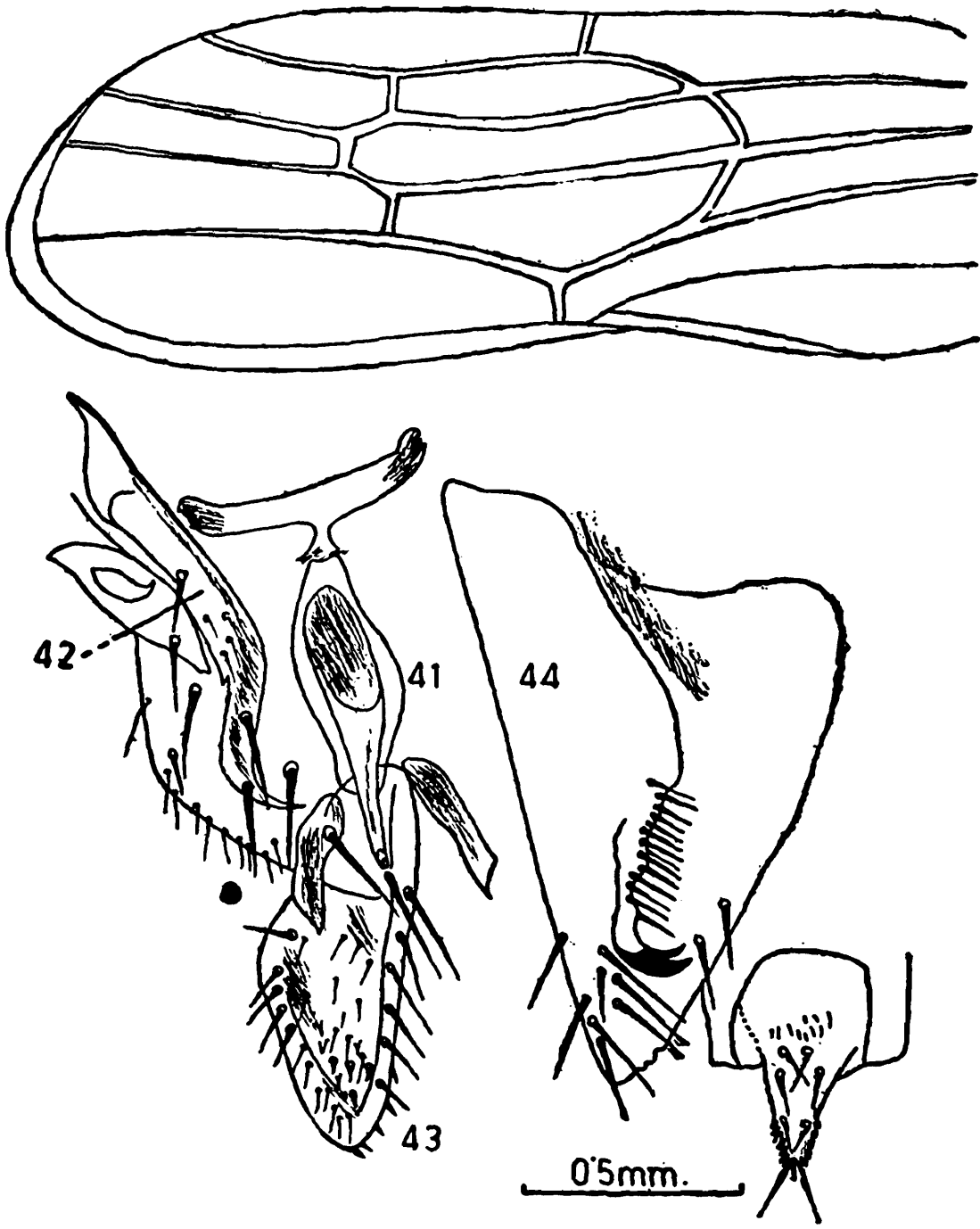
Distribution : Eastern Himalayas, Madras.



Figs. 36-40. *Tettigella sandaracta* (Dist.), Aedeagus (Fig. 36), Style (Fig. 37), Male plate (Fig. 38), Pygofer (Fig. 39), Seventh sternite (Fig. 40).

19. *Tettigella sikhimensis* (Dist.)

(Fig. 41---44)

1908. *Tettigoniella sikhimensis* Dist., *Fauna Brit. India*, 4 : 217.

Figs. 41-44. *Tettigella sikhimensis* (Dist.). Aedeagus (Fig. 41), Style (Fig. 42), Male plate (Fig. 43), Pygofer (Fig. 44).

Vertex black with 3 red spots, central spot bifid; pronotum with 4 spots; scutellum red, binotate basad; tegmina with 3 red fasciae, apical cells cervinus; abdomen brown.

Length : 12 mm (male), 13.50 mm (female) incl. tegmn.

Genitalia : Connective T-shaped, aedeagal shaft (fig. 41) rod-shaped distad, paraphyses well-developed; style (fig. 42) with slender mesal apical extension, curved in form of a hook apically, preapical lobe feebly developed; male plate (fig. 43) broader basad, twisted medially, distal half with rows of microsetae; pygofer (fig. 44) hook curvatus, distinctly bifidus; VIIth sternite (female) simple.

Distribution : Sikkim, Assam.

20. *Tettigella thalia* (Dist.)

1917. *Tettigoniella thalia* Dist., *Fauna Brit. India*, **7** : 3.

Female

Length : 7.00 mm

Median length of crown half length of interocular width, texture shiny, median suture indistinct; ocelli placed equidistant from each eye, ocellular area distinctly depressed; anterior margin of crown rounded, not in line with outer margin of each eye; clypeus convex, muscular impression distinct, transclypeal suture constrictus, lateral clypeal suture extending to antennal bases; pronotal width greater than transocular width, texture shiny, posterolaterally smooth, rounded, posterior margin concavus, scutellum granulated, shiny, without any depression; tegmina longer than abdomen, shiny; hind femoral setal formula : 2:1:1: VIIth sternite (female) truncate at posterior margin, punctate laterobasad; vertex with a black spot at apex. at base with a subtriangulate patch; ground color shiny, dark brown; a pitchy black patch at posterior margin of VIIth sternite (female); pygofer with dark blackish pigmentation.

Distribution : Eastern Himalayas, Bengal.

VII. Genus *Cicadella* Latreille

1817. *Cicadella* Latr., *Contenant crustaces Arachnides insectes*, **3** : 406.

Type, by subsequent designation, *Cicadella viridis* Van Duzee.

1916. *Cicadella viridis* Van Duzee, *Check List of Hemiptera of America North of Mexico*, 1916 : 66.

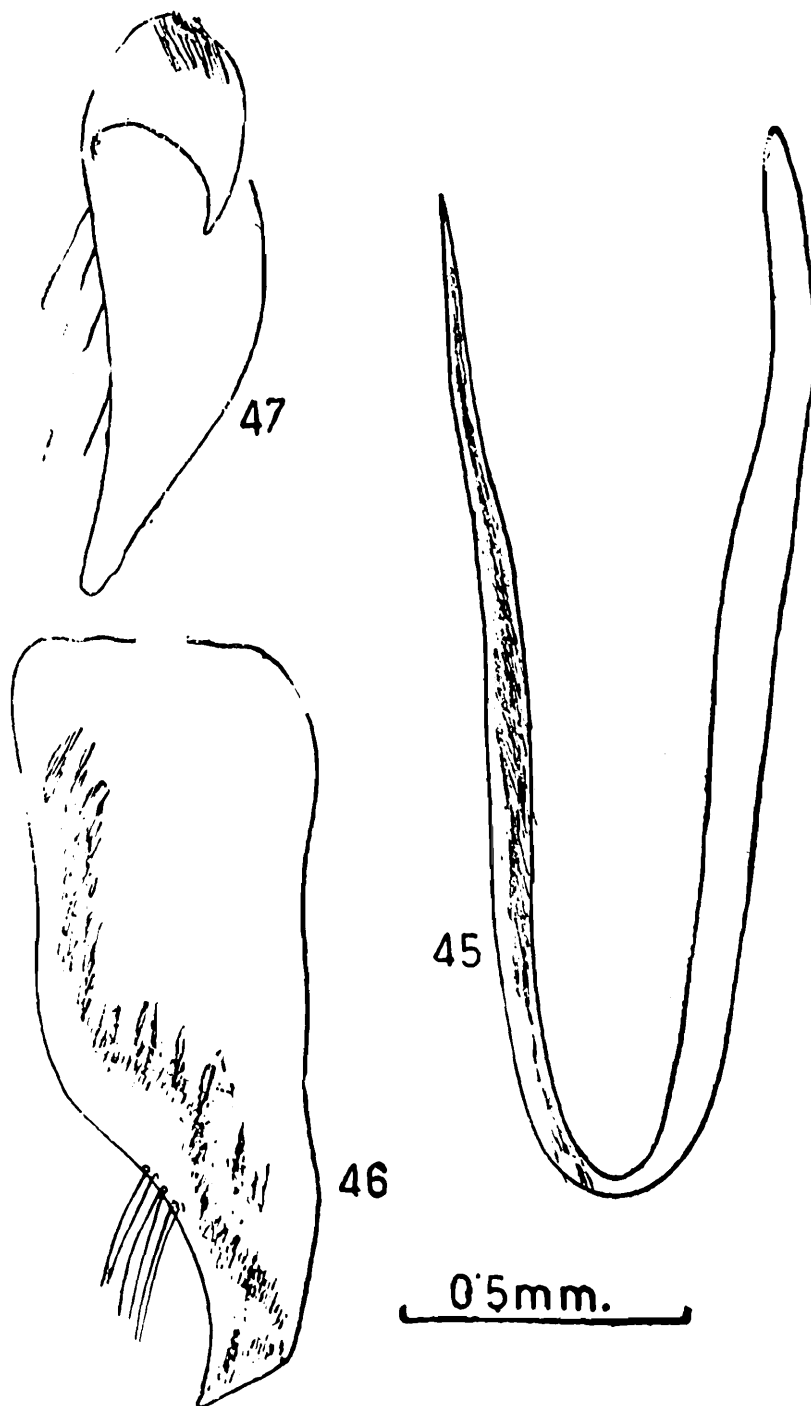
Anterior margin of head rounded, no carina or angle at transition from crown to face, ocelli in line with anterior eye angles, lateral clypeal sutures extending onto crown; clypeus convex, muscle impression distinct, clypellus with short pubescence; thorax with pronotal disk transversely rugulose scutel-

lum without transverse striations behind sulcus; forewing with 3 closed anteapical cells, with 4 apical cells, texture coriaceous, rugulose; hind leg with femoral setal formula 2:1:1, or 2:1:0; connective Y-shaped, aedeagus without process, paraphyses symmetrical; VIIth sternite (female) notched medially, posterior margin produced.

21. *Cicadella spectra* (Dist.)

(Fig. 45—47)

1908. *Tettigoniella spectra* Dist., *Fauna Brit. India*, 4 : 211.



Figs. 45-47. *Cicadella spectra* (Dist.). Aedeagus (Fig. 45), Style (Fig. 46), Male plate (Fig. 47).

Vertex semicircular, extreme anterior margin with 3 black spots, one at centre, rest each one close to each eye, disk with a triangular spot; each ocellus with a black spot; face with a black spot; face with a white streak; pronotum and tegmina greenish, pronotum and scutellum with fine transverse striations; abdomen pale greenish-yellow with legs having similar color.

Length : 8 mm (male), 8.5 mm (female).

Genitalia : Connective Y-shaped, arm short, aedeagal shaft (fig. 45) linear, converging apicad, marginally folded forming a sulcate area beyond middle; stylar shaft foot-shaped (fig. 46), mesal apical extension directed laterad, preapical lobe developed; male plate (fig. 47) gradually connivent, robust; pygofer beyond middle densely spinulate.

Distribution : Cape of Good Hope, Senegambia, Luzan, Tanganyaka, Ceylon, Java, Philippine Islands, Sunda Island, Assam, Coorg, Nepal, Bengal.

Economic status : The species occurs abundantly along with viruliferous paddy pests, namely, *Nephotettix virescens*, *N. nigropicta*, *Recilia dorsalis* during winter period. No report is made on the vectorial status of *Cicadella spectra*.

VIII. Genus **Balala** Dist.

1908. *Balala* Dist., *Fauna Brit. India*, 4 : 250.

Type, by original designation *Balala fulviventr*is Walk.

Vertex short, slanting downward, rounded anteriorly, ocelli close to eyes on disk; face deflected perpendicularly; genae flat; pronotum three times length of vertex, posteriorly subtriangular, extending above scutellum, margins oblique; scutellum centrally strongly ridged, stretching to apex of clavus; tegmina from apex to claval end with numerous short veins, four apical cells; femora compressus; foretibia distinctly dilated, posterior femora and tibiae densely spinulose, connective Y-shaped, aedeagal shaft complex by structure; style robust, apex pointed, preapical lobe developed; male plate triangulate; pygofer hook present.

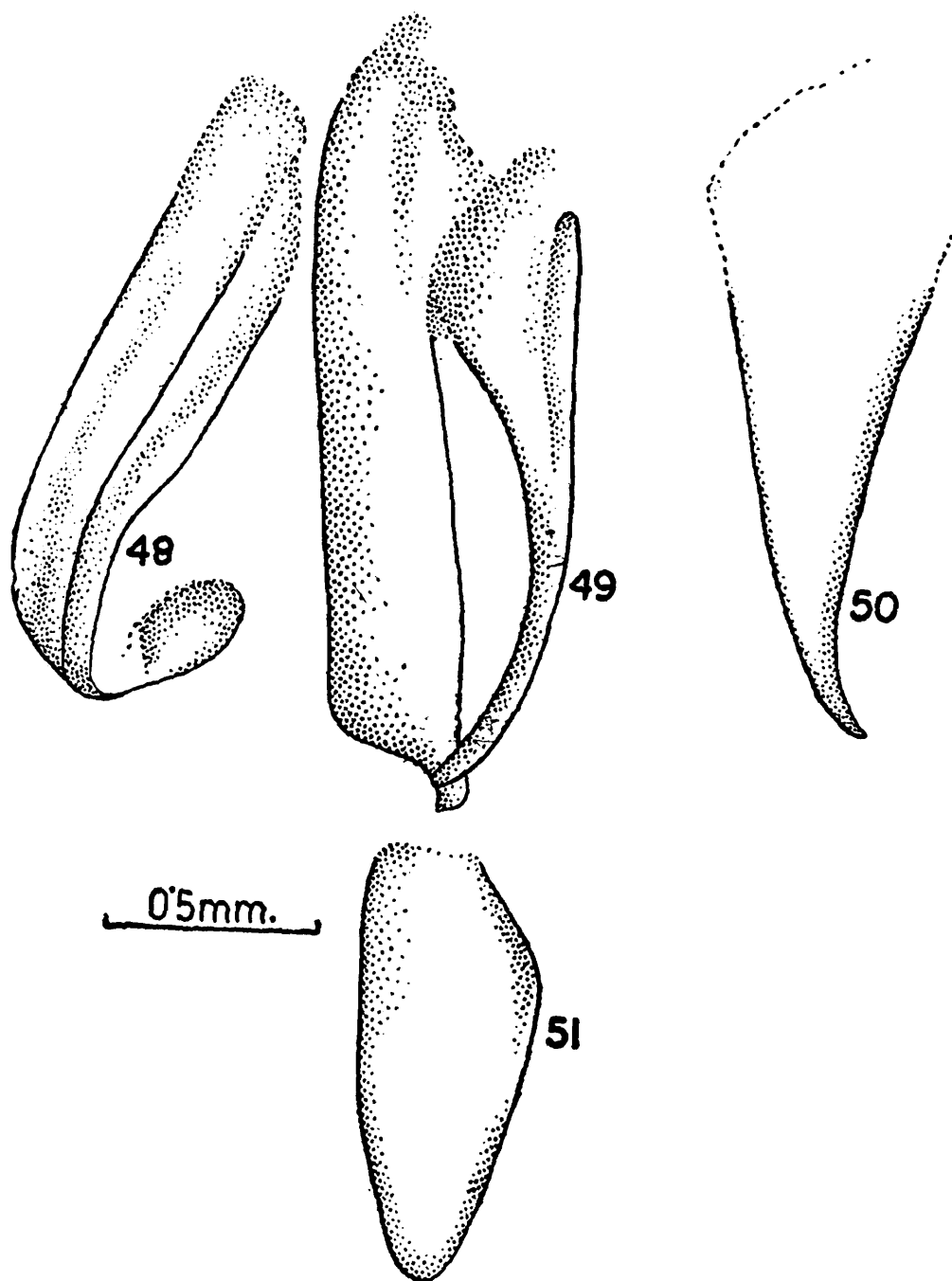
22. **Balala fulviventr**is (Walk.)

(Fig. 48—51)

1851. *Penthimia fulviventr*is Walker, *List. Homop. Brit. Mus.*, p. 841.

Body robust; vertex slanting; pronotum dorsally bulging; tegmina slanting downward, dark grey, clothed with dense silvery pubescence, surface coriaceous; posterior tibiae sulcate with series of black spines.

Length : 12 mm (ale) incl tegmina.



Figs. 48-51. *Balala fulviventrtris* (Walk.). Aedeagus (Fig. 48), Style (Fig. 49), Male plate (Fig. 50), Pygofer (Fig. 51).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 48) complex as figured; style (fig. 49) robust, infolded marginally, shank at apical third

abruptly narrowed, apex sharply pointed, preapical lobe laminate, apically emarginate; male plate (fig. 50) short, triangulate; pygofer (fig. 51) converging, hook arising apex.

Morphology : Median length of crown equal to interocular width; ocelli located at base of crown contiguous to each eye; clypeus convex, trans-clypeal suture indistinct, clypellus gradually attenuate apicad; pronotal width two and half times transocular width, projecting latero-medially, bulging along transverse median line, otherwise slanting, posterior margin concave; scutellum at base deeply sulcus with a longer distinct median carina, laterally carinate; surface of crown glabrous, pronotal surface transversely punctate; surface of forewing rough, veins non-elevated, forewing and hindwing clothed with soft hairs; second row of spines at hind tibia with cucullate base; hind femoral setal formula 2:1:1:1:1:1 (two apical and five subapical setae).

Distribution : Assam, Madras, Burma, Borneo, Formosa, Fukien, Sumatra, Indo-china.

Registered number : 991/9, Zoological Survey of India, Calcutta.

IX. Genus *Haranga* Dist.

1908. *Haranga* Dist., *Fauna Brit. India*, 4 : 248.

Type, by original designation, *Haranga orientalis* (Walk.).

1851. *Penthimia orientalis* Walker, *List. Hom. B.M.*, 3 : 841.

Body oval-shaped in outline, each lateral side deflected; crown broadly transverse, margin prominent; eyes protuberant beyond anterior pronotal margin; ocelli on disk; face obliquely depressus below eyes; pronotum postero-laterally obliquely directed; scutellum conspicuously elongated, reaching claval apex; tegmina velvety close to clavus; a medially sulcate process between meso—and meta-coxae; aedeagus bears a distinct basal apodeme; stylar shaft abruptly connivent; pygofer without hook.

23. *Haranga orientalis* (Walk.)

1851. *Penthimia orientalis* Walker, *List. Hom. B.M.* p. 841.

Crown, pronotal surface, clypeal structures velvety black; eyes dark black, tegminal anterior median half piceous, membranous part dark reddish brown; legs darker; abdomen black, posterior segments dark reddish brown.

Length : 9 mm (female).

Genitalia : VIIth sternum anteriorly strongly convex, postero-medially deeply emarginate in shape of a rectangulate structure with a pair of pointed spurs, posterior margin truncate, central part shiny bluish, lateral part shiny dark brown red.

Morphology : Median length of crown greater than interocular width, anterior margin hanging vertically, surface glabrous excepting a few sparsely distributed white spots, anterior margin rugulose, obliquely wrinkled; ocelli placed close to each eye; clypeus flat, transclypeal suture deeply depressed, clypellus with median ridge, pronotal width twice length of transocular width, lateral margin oblique, posterior margin diverging show concavity; tegmina coriaceous, veins elevated, slightly longer than abdomen; hind femoral setal formula 2:1 1:1.

Registered number : 4604/15 (Z.S.I., Calcutta).

Distribution : Northern India, Nepal.

24. *Haranga scutellaris* Dist.

(Fig. 52—55)

1908. *Haranga scutellaris* Dist., *Fauna Brit. India*, 4 : 249.

Shiny, black; head, sterna, abdomen below piceous brown; vertex and pronotum rugulose; scutellum punctatebasad, disc globose; face compressus; meta-tibiae thickly spined.

Length : 7.50 mm (male).

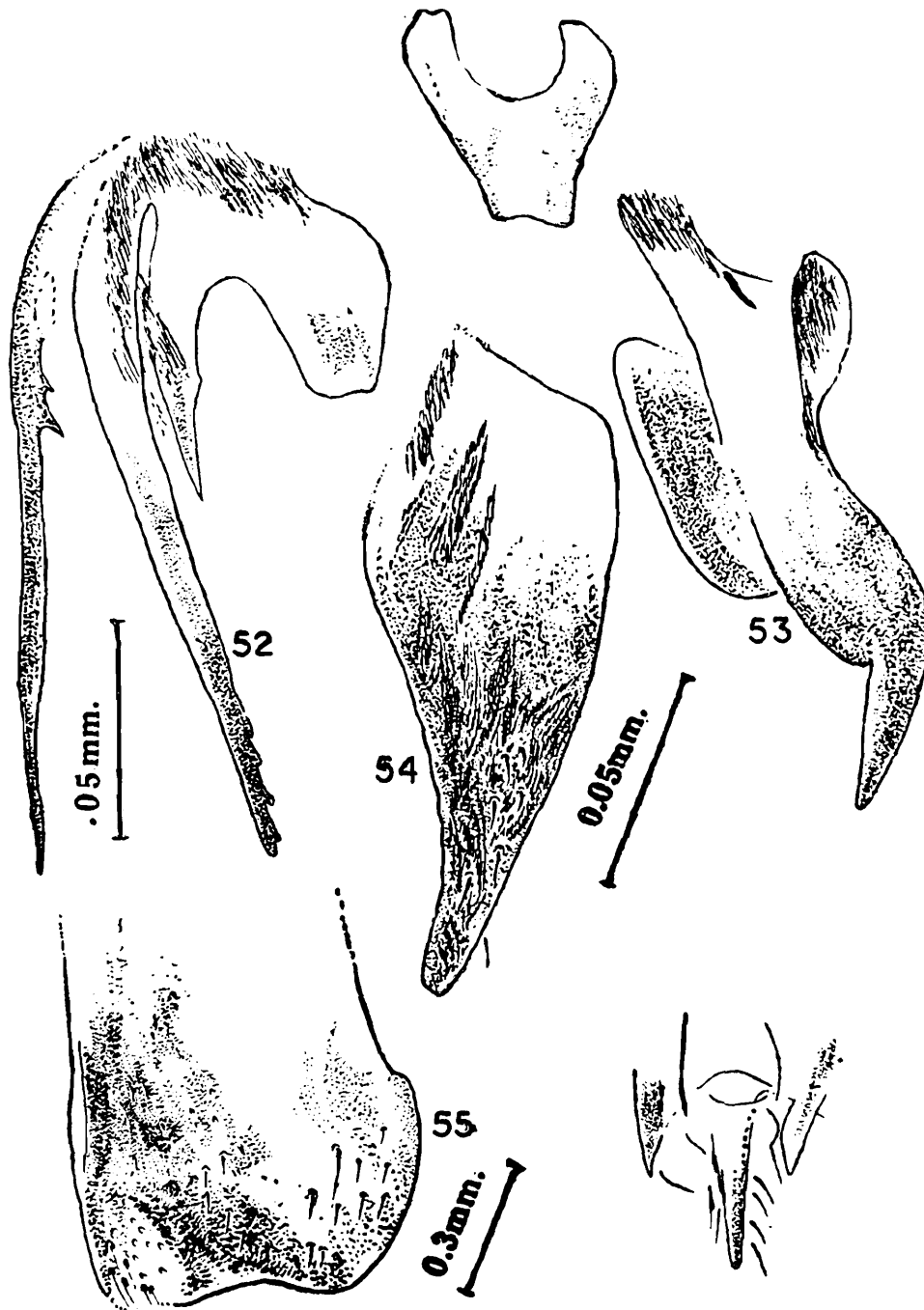
Genitalia : Aedeagal apodeme (fig. 52) developed, shaft lengthwise split into two elongate processes of uniform length; styler shaft (fig. 53) 3/4th abruptly convergent apically; male plate (fig. 54) tapering from proximal part; pygofer (fig. 55).

Distribution : Nilgiri Hills, South India, Ceylon, Assam, New South Wales.

Comment : The distribution displays the occurrence of this species along the Eastern coasts covering Nilgiri Hills, Indian region. The record from New South Wales (Metcalf 1967) is doubtful and needs further confirmation.

Morphology : Median length of crown one and half times lesser than interocular width, texture with fine soft hairs, anterior half transversely

wrinkled, posterior half glabrous ; clypeus concave, transclypeal suture not well-differentiated, surface glabrous ; pronotal width greater than transocular width, texture transversely wrinkled, posterolaterally angulated, posterior margin concavus ; scutellum depressed above median half, transversely depres-



Figs. 52-55. *Haranga scutellaris* Dist. Aedeagus (Fig. 52), Style (Fig. 53), Male plate (Fig. 54), Pygefer (Fig. 55).

sed ; tegmina with elevated veins, appendix well-developed, coriaceous, longer than abdominal tip ; hind femoral setal formula : 2:1:1 ; VIIIth sternite (female) reddish brown, centrally carinate, postero-medially semicircularly notched, posterolaterally feebly concavus.

X. Genus *Neodartus* Melichar

1903. *Neodartus* Melichar, *Hom. Fauna Ceylon*, p. 162.

Type, by monotype, *Neodartus acocephaloides* Melichar.

1903. *Neodartus acocephaloides* Melichar, *Hom. Fauna Ceylon*, p. 163.

Vertex obliquely angulate apicad, latero-apical margin feebly bent up; ocelli present on disc; pronotum postero-laterally transversely oblique; scutellum obliquely depressed; tegmina short, widening distad, clavus broader; meta-tibiae thickly spinulate; aedeagus robust, may be spinulate apicad; stylar shaft simple; male plate triangulate, connivent; pygofer without hook.

25. *Neodartus acocephaloides* Melichar

(Fig. 56—60)

1903. *Neodartus acocephaloides* Melichar, *Hom. Fauna Ceylon*, p. 163.

Vertex black, anterior margin prominently reflexus; pronotum rugulose; scutellum black, finely striate; tegmina with fine hairs, dark brown areolae, sometimes centrally a series of grey white spots; abdomen black, often with sulfur yellow patches; femora black, meta-tibiae thickly spinulate.

Length : 4.00 mm (male).

Genitalia : Aedeagal shaft (fig. 56) robust, broader along semi-circular length, apex slightly sinuate, subapically spinulate; stylar shaft (fig. 57) 3/4th flat-shaped, mesal apical extension stout gradually connivent; male plate (fig. 58) triangulate, pygofer square-shaped, spinulate, setose (fig. 59) VIIth sternite (female) with protuberant posterior lobe (fig. 60).

Distribution : Punjab, Bengal, Luzon, Phillipines, Madras, Coorg. It is recorded on Sandal Wood, *Santalum album* Linn., during the investigation of spike-disease affecting the Sandal trees (Dover 1932 : 36), Singh-Pruthi (1934 : 30-31).

Morphology : Median length of crown one and half times more than inter-ocular width, crown at anterior margin concavus, outer margin semi-circular, surface concavus, rugulose longitudinally; ocelli placed close to each eye on extreme anterior margin of crown; clypeus convex, rugulose, trans-clypeal suture marked by transverse depression, clypellus rectangulate with a median carina; hind femoral setal formula : 2:1:1; pronotal width greater than transocular width of head, posterior margin truncate, rugose; scutellum sulcate centrally, posterior margin beyond middle rugose; tegmina with developed appendix.

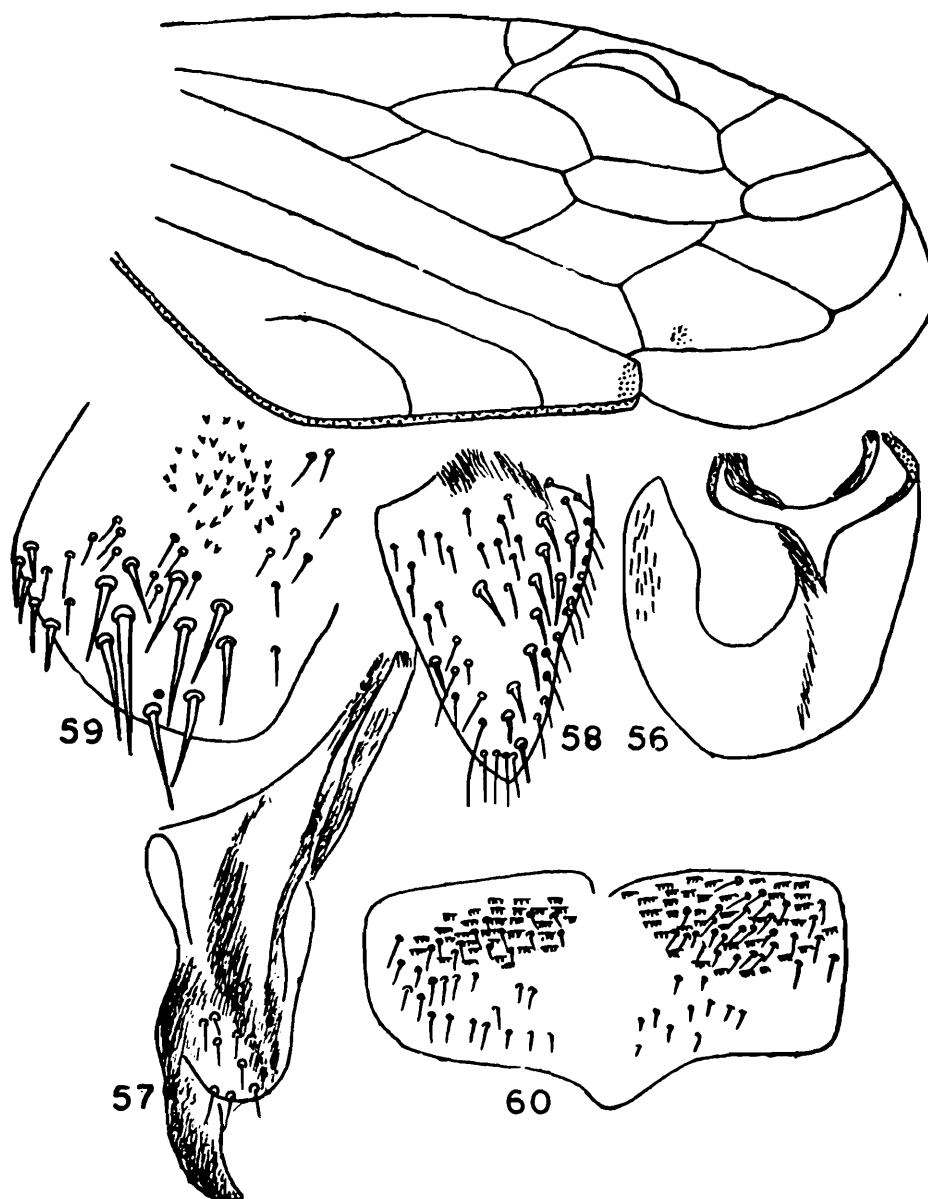
XI. Genus **Penthimia** Germar

1821. *Penthimia* Germar, *Mag. Ent.*, 4 s 46.

Type, by monotypy, *Cercopis atra* Fabr.

1794. *Cercopis atra* Fabr., *Ent. Syst.*, 4 : 50.

Short, broad, depressed leafhoppers; head carinate above antennal pits, vertex transversely striate, rugulosus, sloping anteriorly; pronotal surface striate, laterally carinate, divergent distad; tegmina broad, short, appendix



56-60. *N. acocephaloides* 56. Aedeagus, 57. Style, 58. Male plate, 59. Pygofer, 60. VIIIth sternite (Female).

well-developed, 3 anteapical cells closed, inner one oblique at base, area equal to outer and central anteapical cells combined; 1st apical cell very large, 3rd and 4th smaller than 2nd cell; Connective Y-shaped, aedeagal

shaft recurved, robust, directed laterocaudad, gonopore subterminal; male plate irregularly setose; pygofer simple, seventh sternite (♀) protuberant on posterior margin.

26. *Penthimia castanea* Walk.

(Fig. 61)

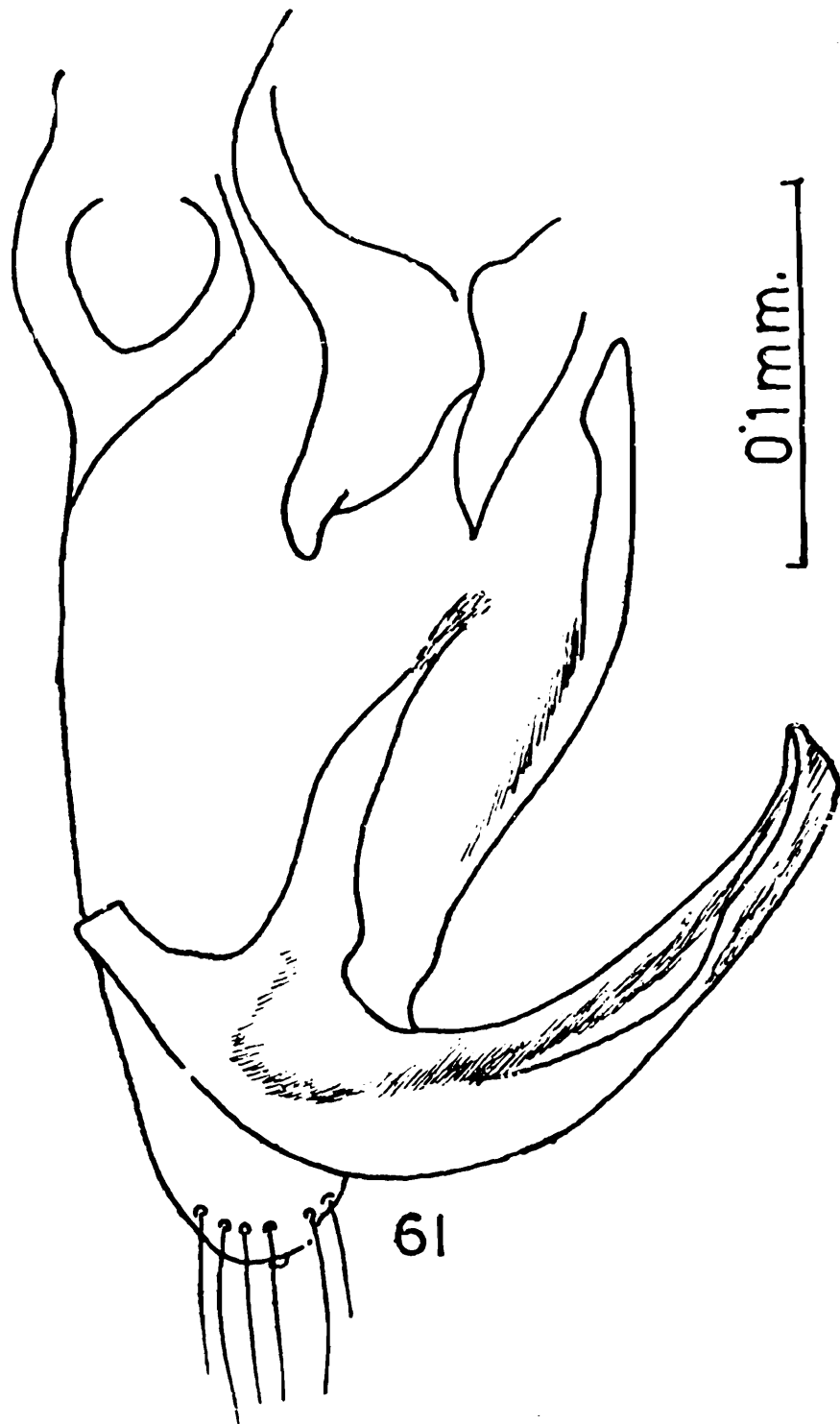


Fig. 61. *P. castanea* 61. Aedeagus, Style, Male plate.

Apical margin of crown, face, meta-tibiae, abdomen black; pronotum deflected anteriorly; scutellum with five spots; meso-notal surface with back markings encircling a castaneous spot; tegmina with anteapical cells spotted oblong, apical cells spotted oblong, black, apical cells spotted, small, claval apex with piceous brown spots; meta-tibiae densely spinulose.

Length : 6.50 mm (male).

Genitalia : Basal plate Y-shaped, stem elongate, aedeagal shaft (fig. 61) terminally bifurcate; stylar mesal apical extension (fig. 61) sub-rectangulate, apex knob-like, feebly dentate at margin; male plate and pygofer of simple structure.

Distribution : Tenasserim, Burma, Malacca Island.

27. *Penthimia compacta* Walk.

(Fig. 62—64)

1851. *Penthimia compacta* Walk., *List. Hom. B.M.*, p. 842.

Vertex piceous pronotum sparsely punctate anteriorly, one fifth piceous, rest including tegmina castaneous; tegmina with reticulate black markings, veins dark brown with sparse spots; scutellum finely punctate, each basal angle with a spot; meta-tibiae strongly spined; abdomen light brown.

Length : 4.00 mm (male); 4.50 mm (female)

Genitalia : Seventh sternite (female) at posterior margin with median lobe. Aedeagus (fig. 62); style (fig. 63); male plate (fig. 64); pygofer (PGP).

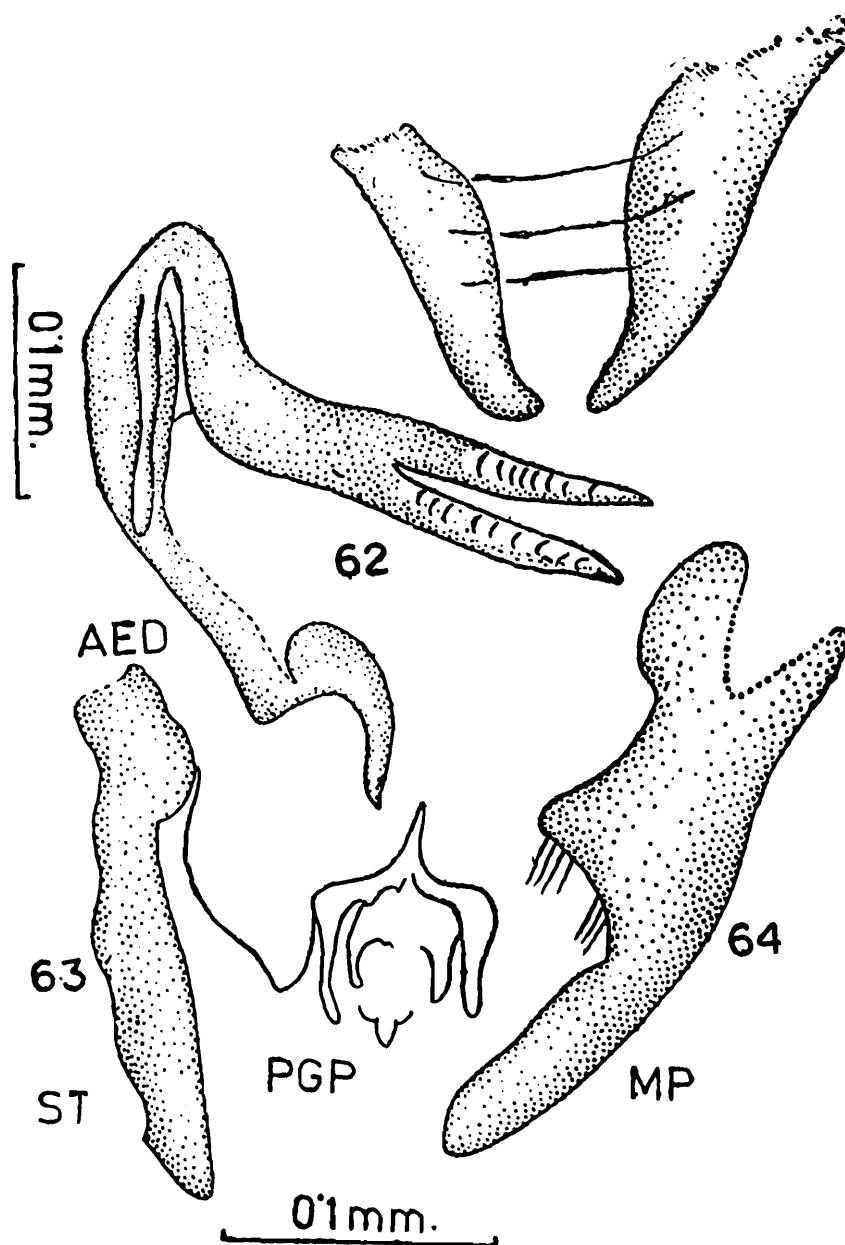
Distribution : Almora Hills (5,000'), Kumaon Hills, Punjab, Bengal, Bombay, Coorg, Madras.

Economic status : It is recorded as suspect vector of spike disease of sandal wood, *Santalum album* Linn, particularly confined to the region of Mysore and Dehra Dun forest. Even after so many years of exhaustive research and investigation to find the cause of such disease, the efforts to establish any authentic vector is confusing even today. It seems that the method of analysis should be more sophisticated and needs the execution of an intensive program inviting the combined skill and collaboration of the scientists, Indian and abroad, from divergent areas of biological sciences. It is of necessity as because the report since 1930, even earlier, till today does not exhibit any remarkable results.

Registered number : 5737/19 (male) (Ind Mus), Calcutta.

2845/21 (female) (Ind Mus.), Calcutta.

Morphology : Median length of crown half interocular width, posterior half smooth, shiny, anterior half rugulose; clypeus almost concavus, clypellus short, semicircular, lateral clypeal suture extending upto antennal bases; ocelli placed near each eye at median half; pronotal width twice transocular width laterally angulated, surface shiny; scutellar surface finely granulated; forewing with 4 apical and 3 anteapical cells, appendix developed; hind femoral setal formula 2:1:1; VIIth sternite (♀) produced followed by deep notches on each side.



Figs. 62-64. *P. compacta* 62. Aedeagus, 63. Style, 64. Male plate.

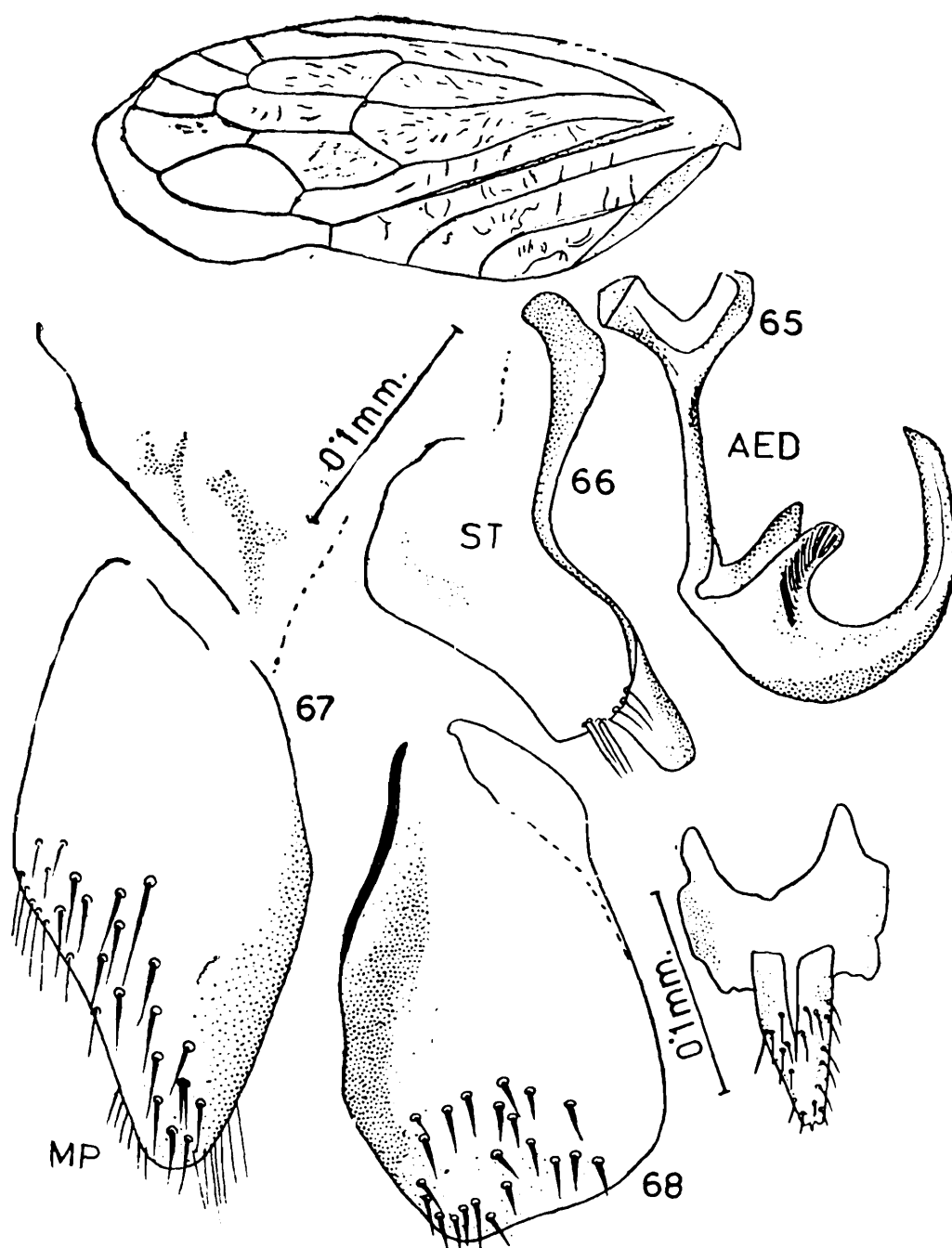
28. *Penthimia juno* Dist.

(Fig. 65—68)

1908. *Penthimia juno* Dist., *Fauna Brit. India*, 4 : 245.

Vertex finely punctate, with brownish yellow tinge; pronotum rugulose castaneous; scutellum rugulose, at base centrally carinate; tegmina castaneous, maculate medially, clavus roughly punctate, indistinctly pilose; abdomen dark brown.

Length : 3.00 mm (male).



Figs 65-68. *P. juno* 65. Aedeagus, 66. Style, 67. Male plate, 68. Pygofer.

Genitalia : Aedeagus arcus, paired basal struts prominent, apex blunt ; (fig. 65) ; style (fig. 66) with short mesal extension, apex truncate ; male plate (fig. 67) gradually converging, a tuft of hair-like setae around posteromesal margin ; pygofer on apical half with spine-like setae (fig. 68).

Distribution : Palni Hills, South India, Ceylon.

29. *Penthimia scapularis* Dist.

(Fig. 69)

1908. *Penthimia scapularis* Dist., *Fauna Brit. India*, **4** : 24

Vertex black, with transverse ridges, apically striate ; pronotum dull black, sparsely punctate, obscurely rugulose, sometimes brownish spots close to base ; scutellum punctate, rugose, a small brown spot close to middle of lateral margin ; tegmina light black, surface with brown spots, pilosus, a cluster of white spots on apical area ; abdomen ventrally black, laterally brown.

Length : 4.00 mm (male)

Genitalia : Connective Y-shaped, aedeagal strut well-developed (fig. 69), shaft stout, strongly arcuate, tip bifid, directed cephalad ; style (fig. 69) 1/3rd size of male plate, preapical lobe well-demarcated, mesal apical extension short, curvate, apex directed ; male plate (fig. 69) connivent, pygofer triangulate, basal third densely setose, hook as figured.

Distribution : Mussoorie, Himachal Pradesh, Bengal, Bombay, Assam, Madras, Tenasserim, Mergui Archipelago, Sikkim.

Comments : The genital armature of this species does not display any significant demarcation from *Penthimia juno* Dist. (1908 : 245), and I feel on the basis of page preference, existence of *P. juno* should not be retained alongwith *P. scapularis* Dist. (1908 : 244).

XII. Genus *Ledra* Fabr.

1803. *Ledra* Fabr., *Systema Rhynogorum*, **VII** : 24

Type, by subsequent designation, *Ledra aurita* (Linn.)

1758. *Ledra aurita* Linne, *Systema Naturae*, Ed. **10** : 435

Linn 1758, *Systema Naturae*, Ed. 10, rev. I : 435

Head foliaceous before eyes ; vertex laminate, anteriorly obtusely angulate spur in front of eyes ; Pronotum hexagonal, longitudinally ridged, sometimes with laminate process, posterior margin deeply sinuate ; tegmina

coriaceous or subcoriaceous; metatibiae laminate, flat, dentate and ciliate on outer margin; aedeagus with processes; stylar shaft sometimes subgeniculate; pygofer with hook.

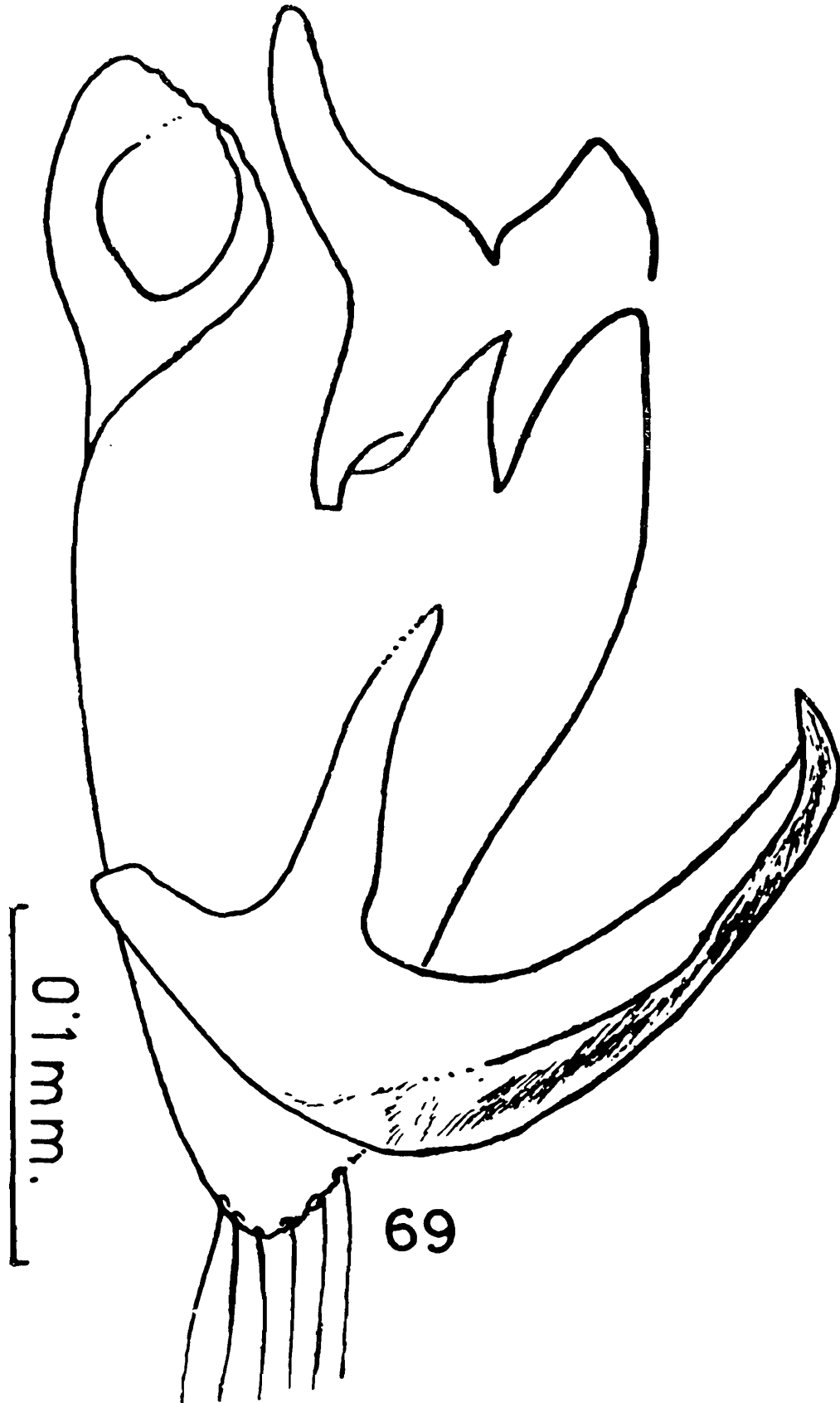


Fig. 69. *P. scapularis* 69. Aedeagus, Style, Male plate.

30. *Ledra dilatata* Walker1851. *Ledra dilatata* Walk., *List. Hom. B.M.*, 3 : 811

Crown with frontoclypeal area hood-shaped, apex triangulate, texture densely tuberculate, median suture ridged, median length of crown as interocular width; clypeus flattened, elevated, transclypeal suture distinct, clypellus distinctly shorter, clypeus, lora, gena clothed with minute soft hairs, muscular impression on clypeus distinct, lateral clypeal suture distinct, lateral clypeal suture extending upto posterior end of clypeus; pronotal width as transocular width, posterior half strongly elevated, tetralineate, texture tuberculate, finely punctate, anterolateral margin straight, posterolaterally obliquely truncate, posterior margin notched; scutellum depressus half tuberculate, distinctly bilineate; tegmina coriaceous, veins elevated, strongly reticulate beyond middle, longer than abdominal tip, veins serially nodulate, hind femoral setal formula : 2:1:1, VIIth sternite distinctly sinuate at posterior margin; pygofer with minute setae on inner margin, surface tuberculate; body color in general including tegmina deep brown, abdominal segments almost blackish,, posterior part of each reddish.

Length : 20 mm (female).

Registered number : 5720/H7 (Ind Mus.), Calcutta.

31. *Ledra quadricarina* Walk.

(Fig. 70—72)

1958. *Ledra quadricarina* Walk., *List. Hom. B.M.*, p. 249.

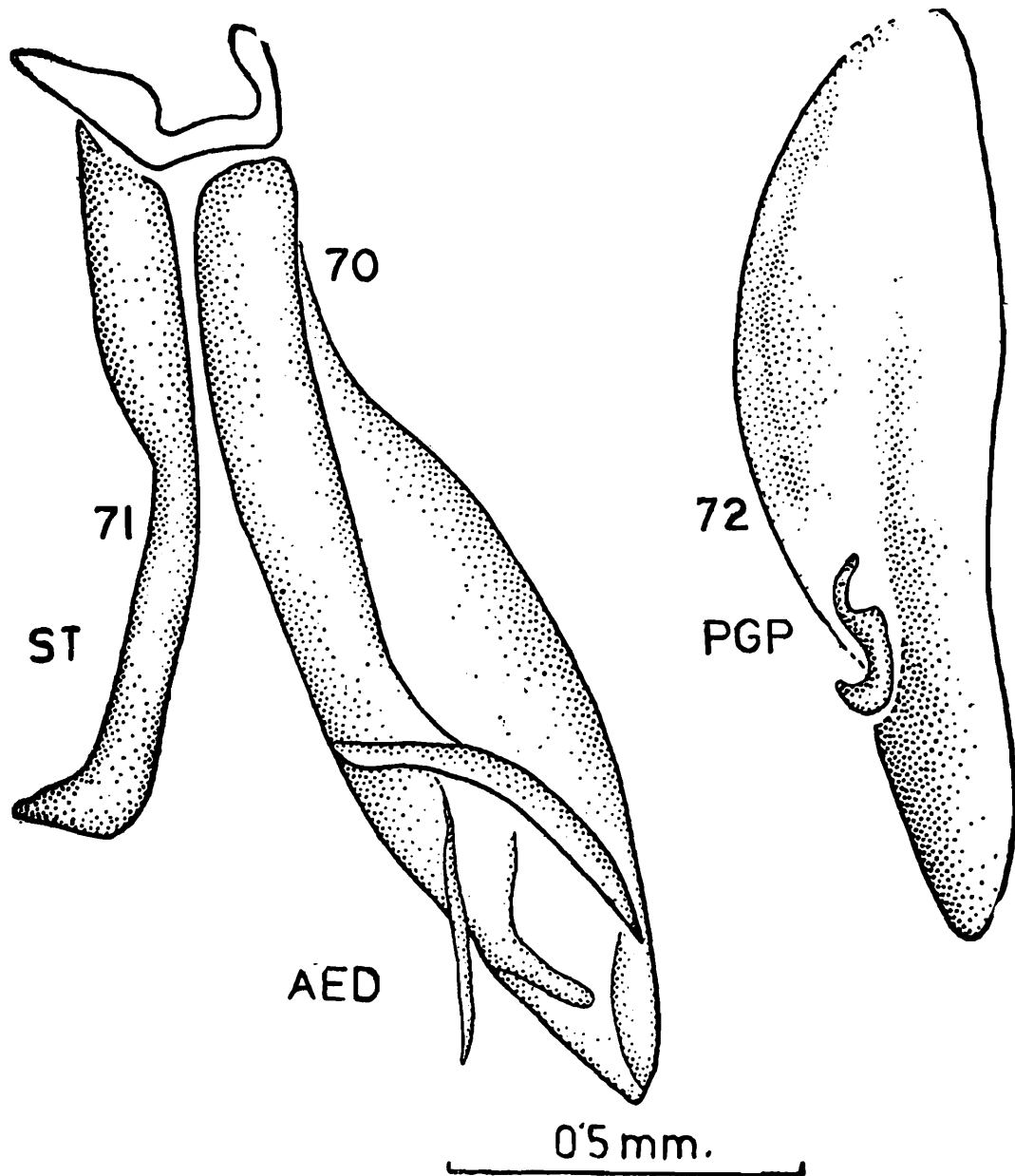
Vertex centrally ridged, anterior area tuberculate; face black anteriorly; pronotum with central ridge on each side, lateral margin oblique, punctate; tegmina with broader fascia at base, claval area tuberculate, apical veins darker; metatibiae ampliate, sulcate beneath.

Length : incl. tegmn. 14 mm (male)

Genitalia : Aedeagal shaft (fig. 70) broader mediad, a pair of subapical processes directed caudad; stylar shaft (fig. 71) cylindrate from middle onward, apex pointed, abruptly bent laterad; pygofer hook (fig. 72) arising mediad; male plate simple.

Distribution : Calcutta, Andhra Pradesh, South Canara, Hong Kong, Island,, Mysore, Coorg, U.P., China, Madras.

Economic status : The incidence of this species is observed during analysing the cause of spike disease on *Santalum album* Linn., at Mysore and Dehra Dun forests (Dover 1932 : 36).



Figs. 70-72. *L. quadricarinata* 70. Aedeagus, 71. Style, 72. Pygofer.

Morphology : Vertex crown-shaped, hexagonal, median carina well-marked, texture tuberculate; ocelli placed at point of union with outer angle of each eye, nearer to median suture; each eye notched; crown ventrally appearing hood-shaped; clypeus sub-elliptical, distinctly demarcated from short-size clypellus, lateral clypeal suture extending upto posterior end of clypeus; median length of crown same as interocular width; pronotal width equal to transocular width, postero-laterally angulated, posterior margin tetracarinate, texture densely tuberculate medially; scutel-

lum depressed antero-median half, apical half densely tuberculate; tegmina with nodulate venational arrangement, cluster of nodules (black pigmented) on costal, brachial and claval veins; hind femoral setal formula : 2:1:1; VIIth sternite (female) at posterior margin feebly concave; hind femora laminate.

Registered number : 344/H7 Z.S.I., Calcutta). (female).

Length : 14 mm (female).

XIII. Genus *Petalocephala* Stal

1854. *Petalocephala* Stal, *Sevenska Vet. Akad. Ofv. Forhandl.*, **11** : 251.

Type, by subsequent designation of Atkinson, *Petalocephala bohemani* Stal.

1854. *Petalocephala bohemani* Stal, *Sevenska Vet. Akad. Ofv. Forhandl.*, **11** : 251.

Body depressed; crown clypeiform, produced, leaf-like anteriorly; face abruptly narrowed below eyes; ocelli at base; pronotum sexangular; laterally acute; scutellum subequilateral; tegmina tough, transparent, thickly punctate, slopping from median ridge, veins anastomosing towards apex, metatibiae dentate remotely; aedeagus simple, apex sharp; styler apex may be foot-like; male plate nodulate, simple.

32. *Petalocephala conica* (Walk.)

1851. *Ledra conica* Walk *List. Homop. B.M.*, **3** : 823

Body color in general yellowish brown, crown at anterior tip including clypeal structures distinctly reddish; legs and abdominal segments dark brown; crown with median length as interocular distance, strongly spatulate to hood-shaped elliptical margin, medially elevated, otherwise depressed, ocelli placed near basal margin close to median suture, texture finely granulate; pronotal width as transocular width with a median longitudinal suture, texture finely pitted, posterior margin concave, posterolaterally wavy; scutellum rugulose without transverse suture, surface finely punctate; venational arrangement beyond middle reticulate, anterior margin slightly angulate, smoothly curvate, length more than abdominal tip; VIIth sternite (♀) posteromedially emarginate; pygofer clothed with soft hairs; hind femoral setal formula : 2:1:0.

Registered number : 7908/H7 (Ind Mus), Calcutta.

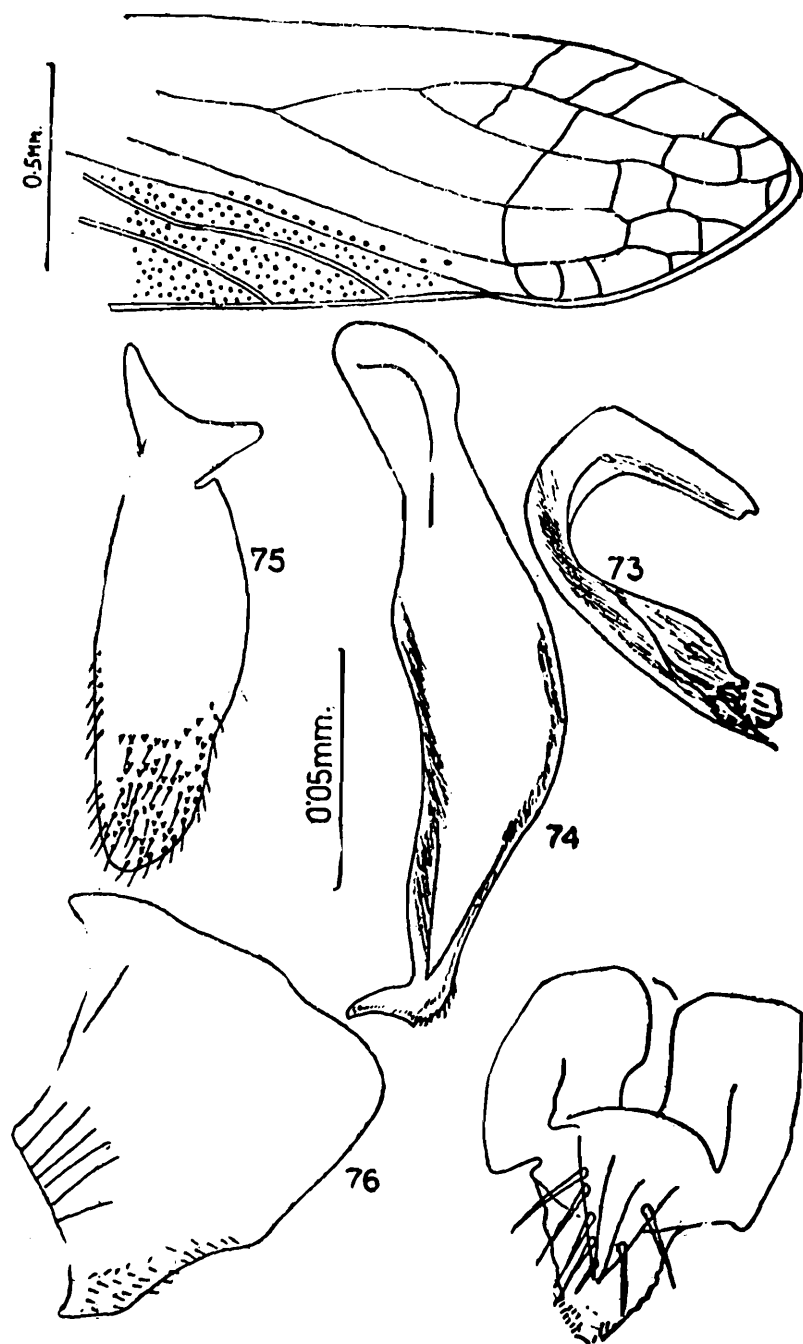
33. *Petaloccephala uniformis* Dist.

(Fig. 73—76)

1908. *Petaloccephala uniformis* Dist., *Fauna Brit. India*, 4 : 165.

Vertex luteus, thickly punctate with a central carina; pronotum punctate, rugose transversely; scutellum punctate; tegmina thickly punctate, apical cells areolate; abdomen dull brown.

Length : 3.00 mm (male).



Figs. 73-76. *P. uniformis* 73. Aedeagus, 74. Style, 75. Male plate, 76. Pygofer.

Genitalia : Aedeagus (fig. 73) with a shaft subapically broadened, apex sharp ; style (fig. 74) with mesal apical extension foot-like, postero-mesal margin terminally serrate, preapical lobe not well-differentiated ; male plate (fig. 75) appearing cucumiform, distally setose ; pygofer as figured (fig. 76).

Distribution : Jawalgiri, North Salem, Ceylon, Burma, Singapore, Coorg, Mysore, Bombay, Madras Utkamand, S. India.

Economic status : This species is considered as a suspect vector of disseminating spike disease of Sandal, *Santalum album* Linn., (Dover et al. 1932 : 13), Chatterjee (1932 : 9, 11-4), Singh-Pruthi (1934 : 3).

Morphology : Crown strongly spatulate, margin semicircular, median length of crown equal to interocular width ; ocelli placed near median suture at base, median suture prominent, texture of crown finely granulate, appearing hood-shaped ventrally ; clypeus flat, lateral clypeal suture extending upto middle of posterior part of clypeus ; pronotal width same as transocular width, posterolaterally obliquely truncate, texture densely punctate and rugulose ; scutellum densely punctate, without any depression mediad ; forewing longer than abdomen, densely punctate, reticulate beyond middle, apical margin angulate ; hind femoral setal formula : 2:1:0 ; VIIth sternite (female) distinctly wavy and feebly emarginate postero-medially.

Registered number : 4767/H7 (Calcutta, Z.S.I.).

XIV. Genus *Moonia* Dist

1908. *Moonia* Dist., *Fauna Brit. India*, 4 : 197.

Type, by original designation, *Moonia sancita* Dist.

1908. *Moonia sancita* Dist., *Fauna Brit. India*, 4 : 197.

Vertex remarkably shorter, distinctly mediad, lateral areas grooved ; ocelli beneath anterior margin of vertex ; pronotum humpbacked, laterally foveate, centrally carinate ; scutellum transversely ridged at base ; tegmina with coarse veins, five apical cells ; meta-tibiae furrowed, densely spinulate ; aedeagal shaft directed caudad, forming usually U-shaped structure together with basal apodeme ; stylar shaft appearing spindle-shaped, apex hook-shaped, tip blunt ; pygofer without hook ; posterior margin serrate,

34. *Moonia albimaculata* Dist.

(Figs. 77—79)

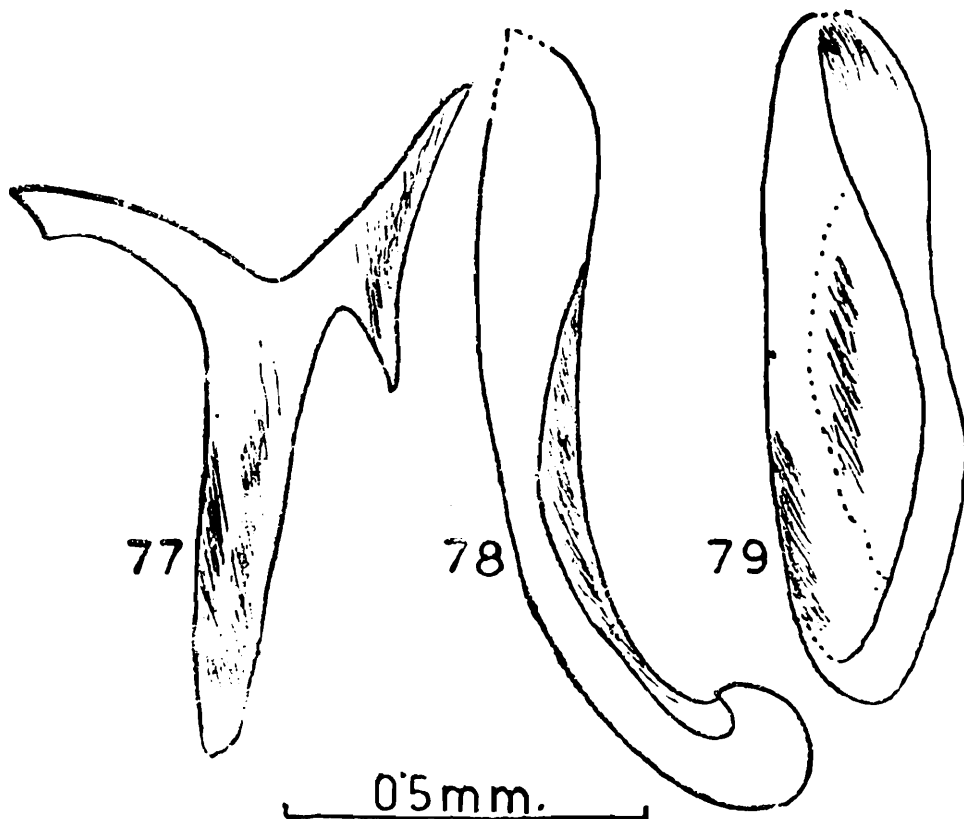
1916. *Moonia albimaculata* Dist., *Fauna Brit. India*, 6 : 233.

Vertex trinotate, brownish yellow; pronotum brownish yellow, trinotate at anterior margin, binotate basad, disc thickly punctate with a central carina; scutellum at each basal angle with a spot; tegmina light brown, claval suture blackish, venation with sparse spots; abdomen brownish.

Length : 4.00 mm (male).

Genitalia : Aedeagal shaft (fig. 77) compressus, gradually converging distad; stylar shaft (fig. 78) elongate, robust, apex rounded, with sparse setae; pygofer without hook, simple. (Fig. 79)

Distribution : Jawalgiri, North Salem, South India, Madras, Mysore, Mysore, Coorg.



Figs. 77-79. *M. albimaculata* 77. Aedeagus, 78. Style, 79. Pygofer.

Economic status : This species is considered as suspect vector of spike disease of Sandal, *Santalum album* Linn. (Dover et al. 1934 : 10, 18), (Singh Pruthi 1934 : 11), it is obtained on sticky paper during investigating spike disease of sandal wood (Chatterjee 1939 : 18, 19, 22), also reported as suspect vector of virus disease of plants (Cook 1935 : 416).

Comments : This species differ in color markings, sometimes a pair of pronotal spots may be united or absent and fasciate markings on veins may be evanescent or conspicuous.

Morphology : Characteristics do not differ from *M. sancita* ; difference is noted in having deeply pigmented posterior tegminal part ; transverse band at depressed anterior margin of crown, very prominent ; posterior femora ringed with black bands.

Registered number : 4761/H7, Z.S.I., Calcutta.

35. *Moonia albivitta* Dis

(Fig. 80)

1916. *Moonia albivitta* Dist., *Fauna Brit. India*, 6 : 236.

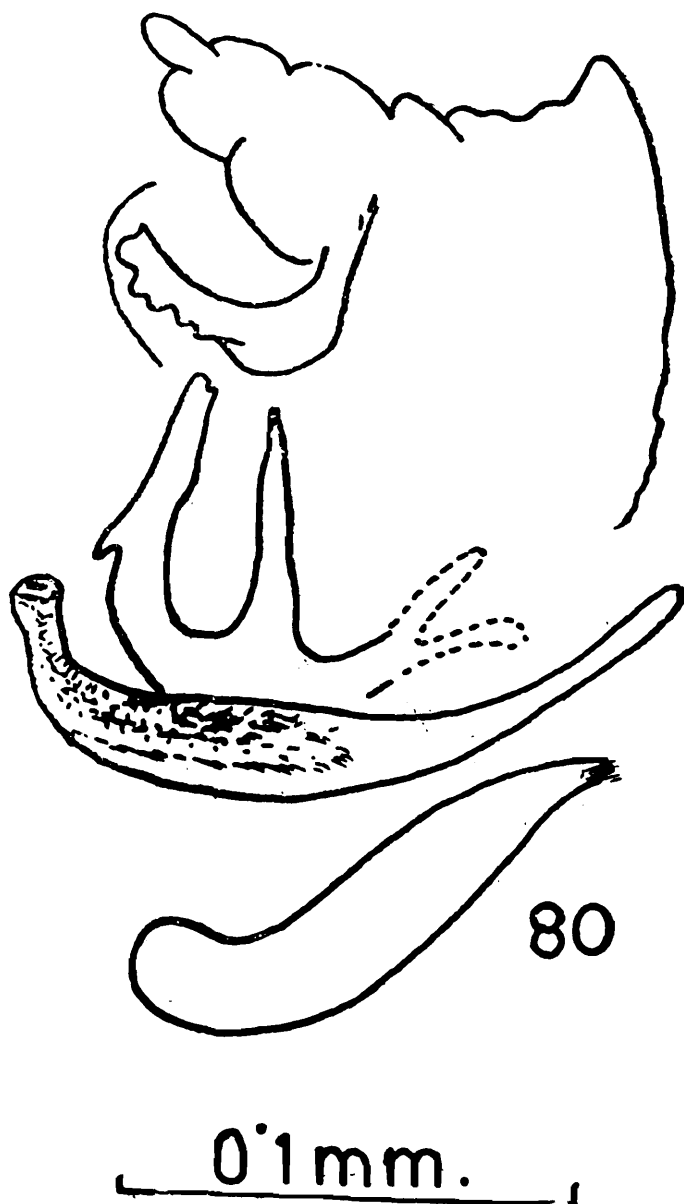


Fig. 80. *M. albivitta* 80. Aedeagus, Style, Male plate

Vertex piceous, a streak medially; scutellum piceous, lateral margin with linear spots; veins piceous; face dark laterally.

Length : 4.50 mm (male).

Genitalia : Aedeagus (fig. 80) prong-shaped, shaft notched medially; stylar shaft (fig. 80) abruptly twisted subapically, apex truncate; male plate club-shaped.

Distribution : Madras.

Morphology : Character similar as *M. sancita*; difference from any species under *Moonia* having deeply pigmented crown, pronotal surface excluding antero-medial part; tegmina having longitudinally dark-pigmented stripes; hind femoral tip and tarsi pigmented; VIIIth sternite (female) concave along posterior margin

Registered number : 4750/H7. Z.S.I., Calcutta.

36. *Moonia capitata* Dist.

(Fig. 81)

1916. *Moonia capitata* Dist., *Fauna Brit. India*, 6 : 234.

Vertex with either linear spots or piceous; pronotum with dark patches (male), scutellum piceous, apex paler; tegmina with grey patches near costal margin, apical cells and clavus; face at superior region piceous.

Length : 3 mm (♂), 3.50 mm (♀)

Genitalia : Aedeagus with basal apodeme Y-shaped (fig. 81), one arm twisted, shaft at both ends tapering, spindle-shaped, apex curved cephalad; stylar shaft (fig. 81) tube-like, geniculate; male plate as figured (fig. 81); pygofer with a short plate distinctly dentate, arising mesoapical margin.

Distribution : Dehra Dun, Madras.

Comments : *Moonia capitata* var. *variabilis* Singh-Pruthi (1934 : 73) is identified as *Moonia variabilis* Dist. (1916 : 234). The reason is that apart from minor variation in color pigmentation, the genital armatures by no means demarcate its identity as a subspecies from *M. variabilis* which is recorded by Distant in 1916.

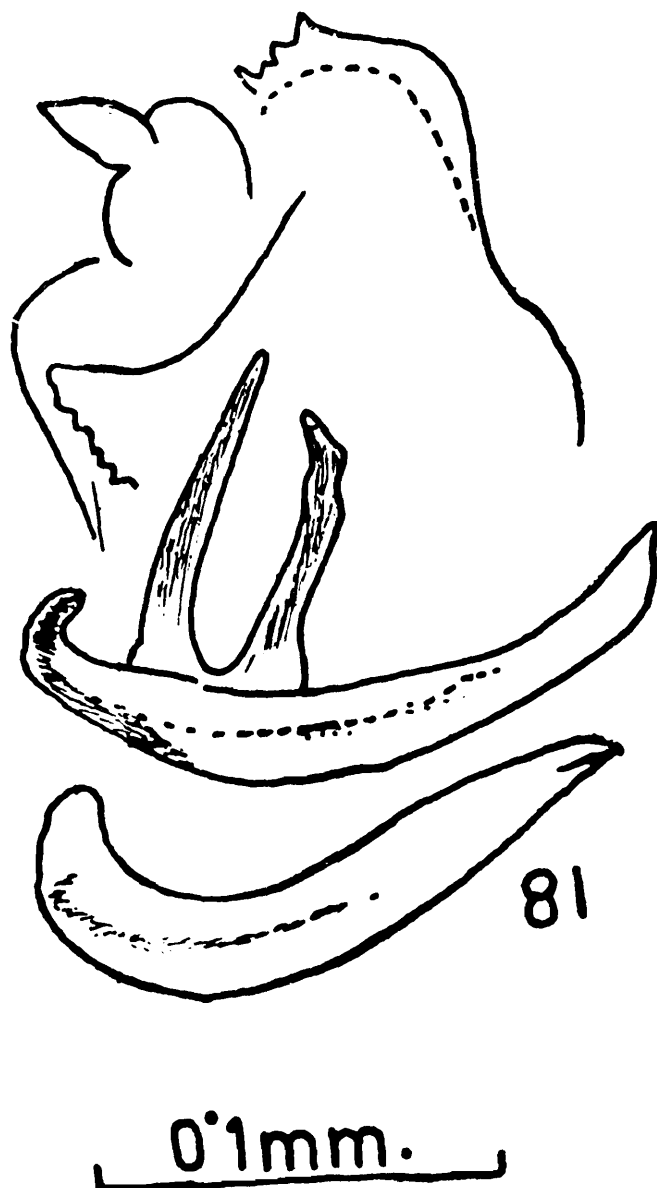


Fig. 81. *M. capitata* 81. Aedeagus, Style, Male plate

37. *Moonia sancita* Dist.

(Fig. 82—86)

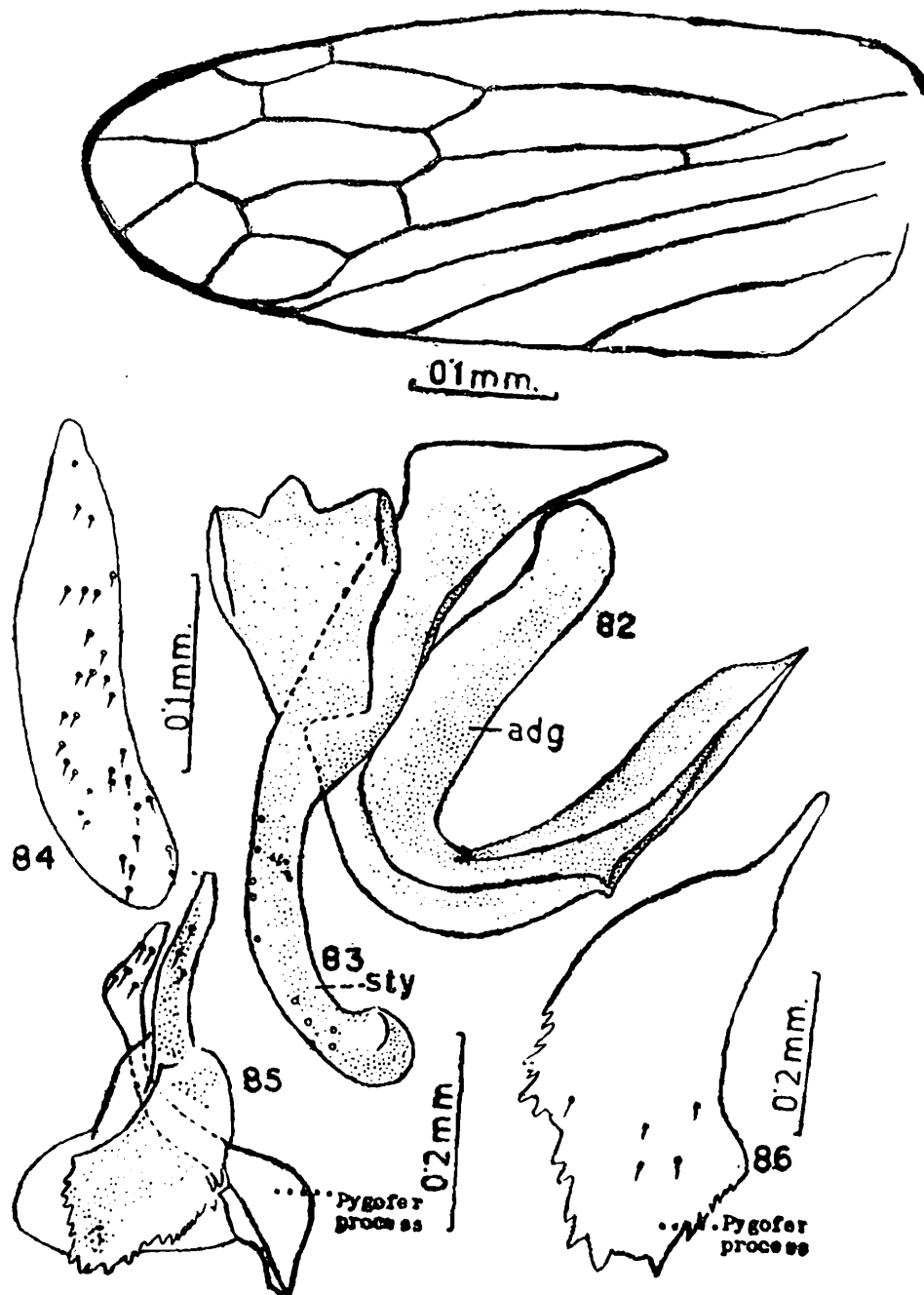
1908. *Moonia sancita* Dist., *Fauna Brit. India*, 4 : 198.

Vertex ochraceous, sparsely punctate; face binotate; pronotum centrally carinate, wrinkled; scutellum ridged at base; tegminal veins spotted brown, an indistinct fascia near middle, hindwing with piceous veins spotted brown, abdomen black.

Length : incl. tegmn. 5.00 mm (male). 4.00 mm (female).

Genitalia : Aedeagus (fig. 82) subapically narrowed, apex rotundate ; style (Fig. 83) club-shaped ; male plate (fig. 84), pygofer process (fig. 85, 86) seventh sternite (♀) with no distinct characteristic at posterior margin.

Distribution : Mussoorie, Uttar Pradesh.



Figs. 82-86. *M. sancita* 82. Aedeagus, 83. Style, 84. Male plate, 85. Pygofer.
86. Pyg. plate.

Comment : Singh-Pruthi (1934 : 70) further revised this genus *Moonia* Dist.

Morphology : Crown with extremely narrow margin, fronto-clypeal area deeply depressus, clypeus convex, clypellus elongate, distinctly demarcated by transclypeal suture; pronotal width as transocular width, anterolaterally distinctly depressed, texture mixed with punctations and also rugulose; ocelli located at basal margin of each eye followed by depressions; scutellum medially furrowed, posterior margin convex; tegmina coriaceous, punctate, veins elevated, 5 apical and 3 anteapical cells; VIIth sternite (female) feebly emarginate posteromedially.

Registered number : 1726/H7 (Z.S.I., Calcutta). (female)

38. *Moonia variabilis* Dist.

1916. *Moonia variabilis* Dist., *Fauna Brit. India*, 6 : 234.

Vertex with linear spots; pronotum dark brown; scutellum piceous; tegmina piceous with transverse fasciae at base, beyond apex creamy white.

Length : 4 mm (male).

Genitalia : Aedeagus prong-shaped, shaft with pointed lateral process, symmetrical length; stylar shaft simple, apex abruptly curved cephalad; male plate claviform; pygofer plate-shaped, without hook.

Distribution : Madras, South India.

Economic status : The species is recorded being a suspect vector of spike disease of sandal wood covering mainly Dehra Dun and Mysore forest belt in India (Dover et al., 1932 : 13; Chatterjee, 1932 : 9, 11, 16; Pruthi, 1934 : 11).

Remarks : Genital armature similar to fig. No. 25.

XV. Genus *Ulopa* Fallen

1814. *Ulopa* Fallen, *Specimen nov. Hemiptera methodum exhibens*, 1814 : 19.

Type, by subsequent designation, *Ulopa ericae* Westwood.

1840. *Ulopa ericae* Westwood, *Introduction to modern classification of Insects*, 2 : 116.

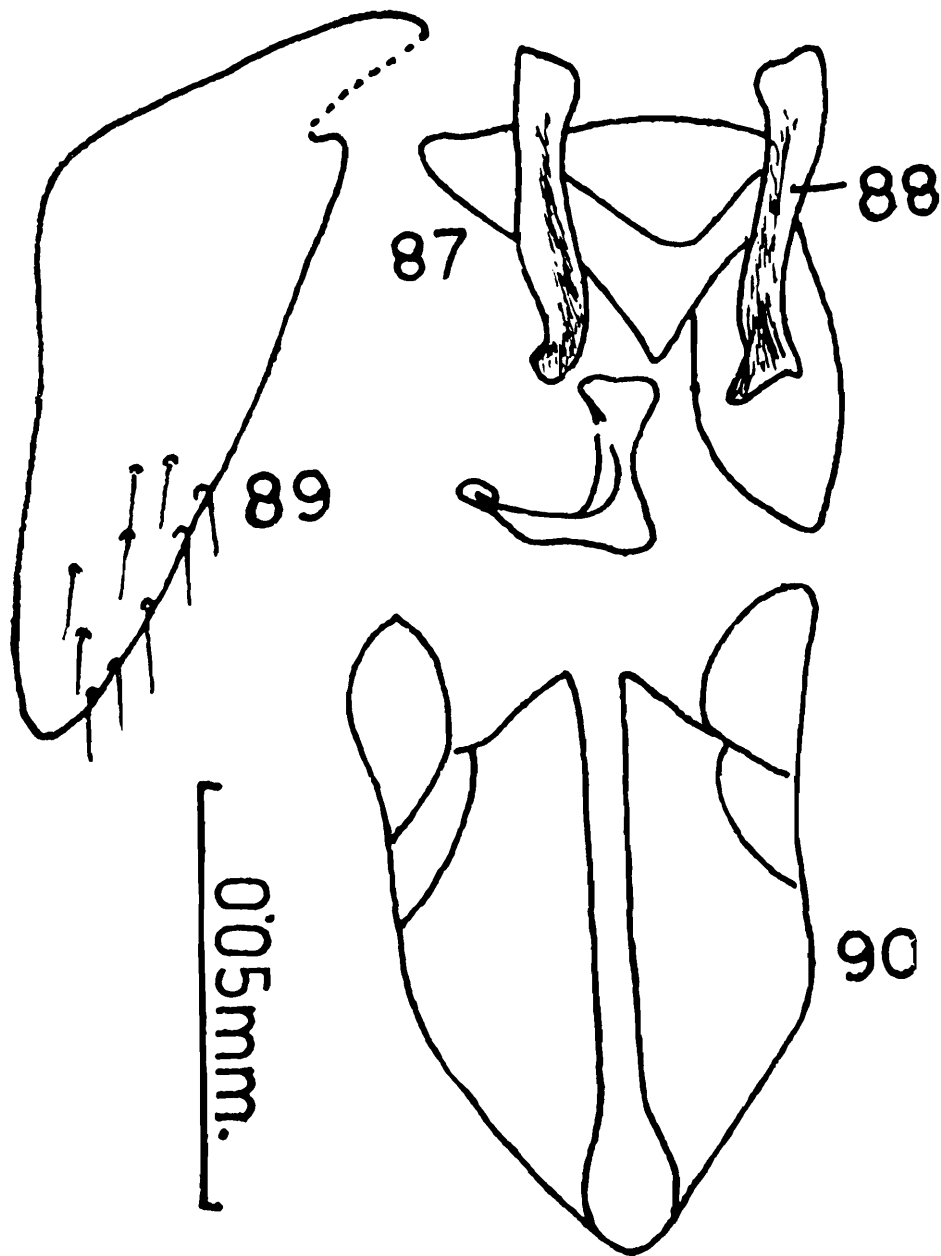
Vertex anteriorly thin, foliaceous, punctate; eyes conspicuous; face punctate; antennae with deep basal cavities, distinctly edged, first two antennal segments cylindrical, thick; lorae indistinct; pronotum centrally carinate, punctate; tegmina coriaceous, punctate each tegmina in line with

inner margin forming a roof-like structure; appendix inconspicuous; mata-tibiae sparsely spinulate; connective V-shaped, aedeagal shaft robust usually foot-shaped, tip hooked, without processes; style without any preapical lobe or feebly developed, apex in various shapes; seventh sternite (female) deeply concavus medially.

(Fig. 87—90)

1930. *Ulopa brunneus* Pruthi, *Mem. Ind. Mus.*, **XI** : 5-6.

Vertex foveate; pronotum foveate; depressus anteriorly; scutellum carinate and foveate; tegmina coarse, tough, foveate.



Figs. 87-90. *U. brunneus* 87. Aedeagus, 88. Style, 89. Male plate, 90. Seventh sternite (female).

Length : 3.75 mm (male), 4 mm (female).

Genitalia : Connective V-shaped, aedeagus (fig. 87) with developed basal apodeme, shaft at base abruptly geniculate, terminal part elongate, foot-like, apex hook-shaped; style (fig. 88) with mesal apical extension foot-like, obliquely placed at posterior margin; male plate (fig. 89) simple; pygofer with infolded lateral margin, disc spinulate; seventh sternite (female) deeply concavus at posterior margin (fig. 34).

Distribution : Central Province (M P.), India.

XVI. Genus **Dussana** Dist

1908. *Dussana* Dist., *Fauna Brit. India*, 4 : 32.

Type, by original designation, *Dussana quaerenda* Dist.

1908. *Dussana quaerenda* Dist., *Fauna Brit. India*, 4 : 322.

Vertex subtriangular, medially carinate, lateral margin ridged, apex reflexed; ocelli inconspicuous; pronotum transversely striated, medially carinate; scutellum impressed before apex; tegmina with four apical cells, slender; meta-tibiae densely spined; aedeagal apodeme developed, with processes; male plate variable in shape, multiseriate; pygofer with hook.

40. **Dussana quaerenda** Dist.

(Fig. 91—95)

1908. *Dussana quaerenda* Dist., *Fauna Brit. India*, 4 : 322.

Piceous; vertex with a central sagittal line, foveate, punctate; pronotum carinate centrally; scutellum finely rugulose basally; tegmina punctate, costal and apical areas transparent.

Length : 6.00 6 mm. (male), 6.50 mm (♀).

Genitalia : Aedeagal strut (fig. 91) well-developed, shaft stout, a pair of acicular lateral processes originating basad; style (fig. 92) with mesal apical extension sharply pointed; male plate (fig. 93) oar-shaped, multiseriate marginally, pygofer (fig. 94) spinulate, geniculate hook, posterior half twisted. VII sternite slightly projected at postero-median margin (fig. 95).

Distribution : Ceylon, South India.

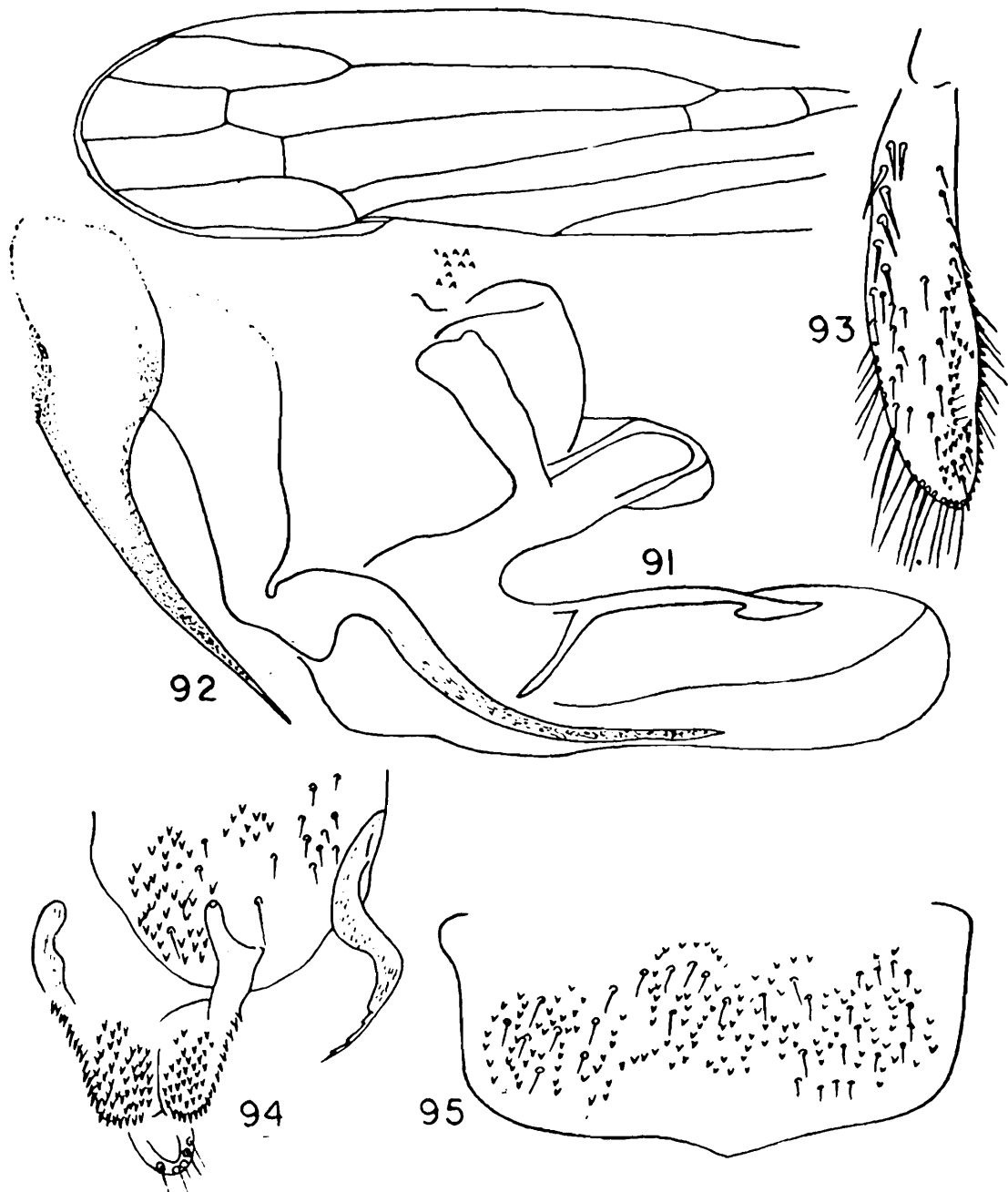
XVII. Genus **Evacanthus** Le Peltier & Serville

1825. *Evacanthus* Le Peltier & Serville.

Type, by original designation, *Evacanthus interruptus* (Linne).

1758. *Cicada interrupta* Linne., *Systema Naturae*, Ed. 10 : 438.

Color black, dark brown, yellow or with bluish tinge ; robust leafhopper ; head, thorax and tegmina with sparse soft hairs ; vertex with an anchor-



Figs. 91-95. *D. quaerenda* 91. Aedeagus, 92. Style, 93. Male plate 94. Pygofer, 95. VIIth sternite (♀).

shaped ridge stretching between ocelli ; clypeus swollen with a median carina ; pronotum short, laterally feebly carinate ; scutellum impressus before apex ;

outer anteapical cell smaller or absent, central anteapical cell larger, acuminate basally, apex truncate, apical cells short; connective Y-shaped, aedeagal shaft cylindrate, robust, sometimes basal apodeme prominent; stylar apex either foot-shaped or hook-shaped; male plate with a tuft of finer setae apicad; pygofer hook usually robust; seventh sternite (female) with spinulate surface.

41. *Evacanthus militaris* (Dist.)

(Fig. 96—99)

1918. *Eucanthus militaris* Dist., *Fauna Brit. India*, 7 11.

Vertex depressus, longitudinally carinate, brownish yellow with an angulate transverse fascia; face with a black spot anteriorly; pronotum black, proximally brownish; scutellum black, proximally brownish; scutellum black; tegmina dark brown, claval area with a broad, longitudinal fascia, similar fascia extending from middle to apical region and one from costal margin to apical area, apical cells brownish yellow.

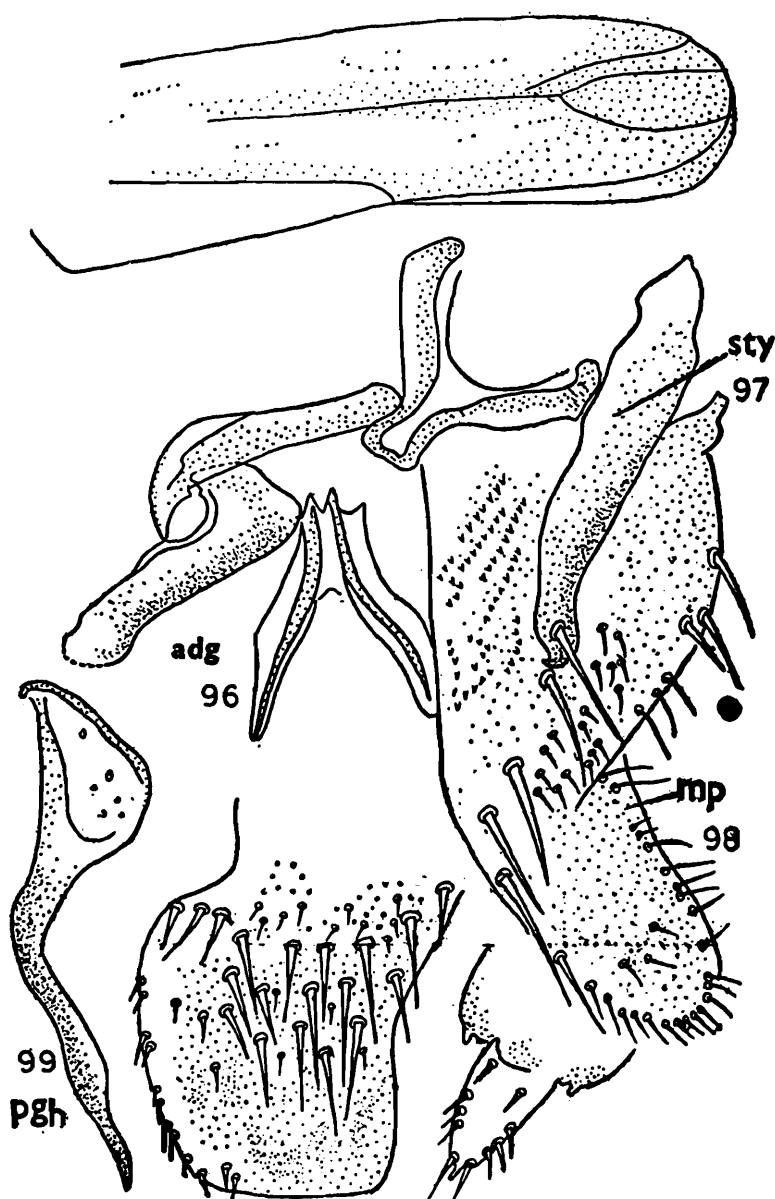
Length : incl. tegmn. 7.00 mm (male)

Genitalia : Aedeagal shaft complex by structure as figured (fig. 96); stylar shaft (fig. 97) slender, apex foot-like; male plate (fig. 98) basal third spinulate, beyond middle with macrosetae, microsetae sparsate; pygofer hook (fig. 99) dagger-shaped, robust, geniculate at middle, directed caudad, pygofer subrectangulate, truncate at posterior margin.

Distribution : Darjeeling, Eastern Himalayas, West Bengal.

Economic status : The importance of this species as pest is not yet recorded, it is recorded as phytophagus Hemipteran insect from Red wood Empire (Bliven 1955 : 10). I feel that the specific determination of this species as *E. militaris* (Dist) appears doubtful because of wide range of geographical barrier. Secondly, this species is not considered to be a significant pest on agricultural or industrial crops of commercial value.

Comment : There is every possibility that Distant (1918) might have omitted the correct spelling of generic name, and by mistake, got it printed as *Euacanthus* instead of *Evacanthus* as recorded in *catalogue Homoptera, USDA* (1971, part 6, p. 3).



Figs. 96-99. *E. militaris* 96. Aedeagus, 97. Style, 98. Male plate, 99. Pygofer.

42. *Evacanthus repexus* (Dist.)

(Fig. 100—103)

Vertex with fine ridges, margin yellow with brownish tinges; pronotum striate; scutellum subapically impressus; tegmina punctate, surface dispersed with fine setae; abdomen brown; meta-tibiae spinulate.

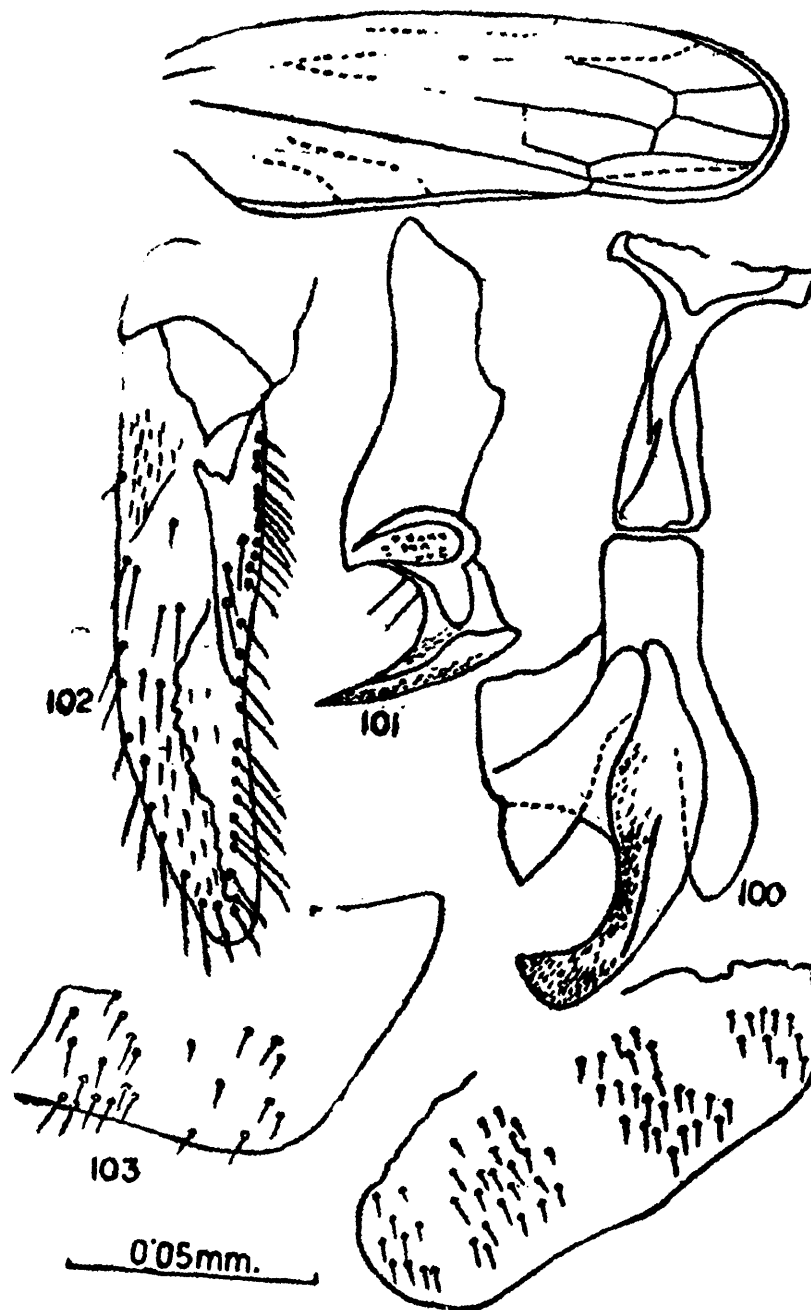
Length : incl. tegmn. 7.00 mm (male).

Genitalia : Connective Y-shaped, aedeagus with a pair of apophyses; shaft (fig. 100) concavus along margin, obliquely truncate apicad; style (fig. 101) with mesal apical extension strongly pointed, directed caudad;

male plate (fig. 102) cucumiform, uniseriate marginally; pygofer (fig. 103) square-shaped, hook rod-shaped, straight, pointed apex.

Distribution : Mungphu (Darjeeling Dist.). Bhowali, Kumaon Hills, Sikkim, Punjab.

Morphology : Crown foveolate, median length of crown half the length of inter-ocular width, apically, centrally, laterally carinate, median



Figs. 100-103. 100. Aedeagus, 101. Style, 102. Male plate, 103. Pygofer.

carina plough-shaped at apex, texture obliquely wrinkled, ocelli placed at depressed areas on anterior margin, equidistant from each eye; crown,

pronotum, scutellum densely pubescent; clypeus along median line carinate, surface flat, muscular impression indistinct, finely rugulose, lateral clypeal suture extending on crown, clypellus depressed at transclypeal suture, medially ridged, laterally depressed; pronotal width greater than transocular width, texture transversely rugulose, posterior margin concave; scutellum centrally depressed, anterior half with irregular impression, posterior half transversely rugulose; forewing with well-developed appendix, four apical cells, 2 anteapical cells, longer than abdominal tip; hind femoral setal formula : 2:1:1, VIIth sternite (female) deeply notched at posterior margin.

Registered number : 10072/H7 (Z.S.I, Calcutta).

XVIII. Genus *Vangama* Distant

1908. *Vangama* Dist., *Fauna Brit. India*, 4 : 252.

Type, by original designation, *Vangama steneosaura* Dist.

1908. *Vangama steneosaura* Dist., *Fauna Brit. India*, 4 : 260-261.

Cephalic process produced, apex recurvatus, anterior surface ventrally carinate; ocelli on lateral margins of vertex; pronotum carinate centrally, lateral areas bent downward; tegmina long, narrow, clavus broad, elongatus, four apical cells, aedeagal shaft robust with terminal processes; style foot-like; pygofer hook present.

43. *Vangama steneosaura* Dist.

(Fig 104—107)

1908. *Vangama steneosaura* Dist., *Fauna Brit. India*, 4 : 260-261.

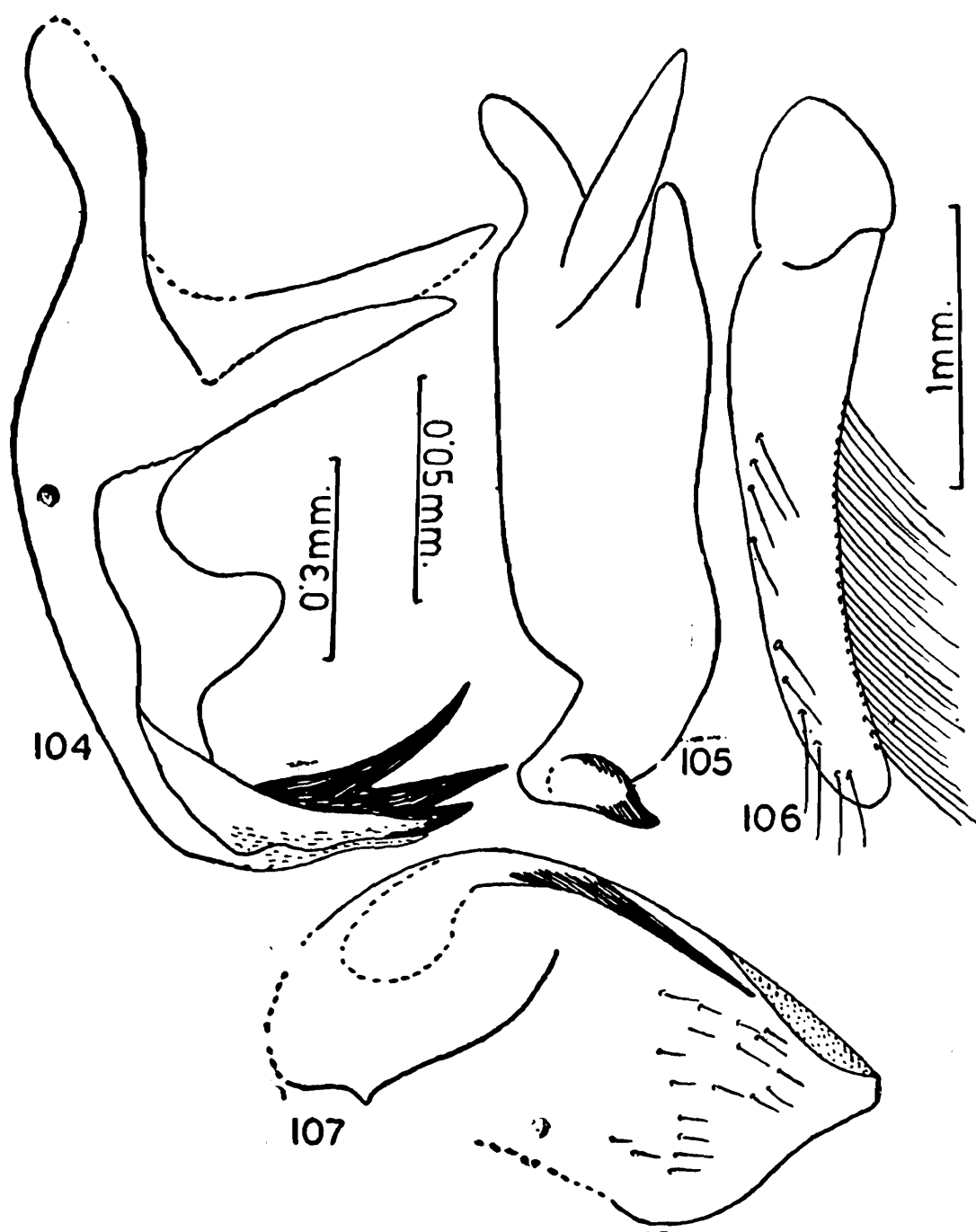
Head with long cephalic process, cyanescent, a central longitudinal ridge extending to pronotum; pronotum rugulose; scutellum and tegmina punctate; abdomen dark brown.

Length : 13 mm (male), 13.50 mm (female).

Genitalia : Aedeagus (fig 104) flattened, shaft multipartite apicad, each sharply pointed, style (fig. 105) with short mesal apical extension, foot-like laterad, pointed, male plate (fig. 106) cylindrate, lateral margins uniseriate and with rows of micro-spine-like setae; pygofer (fig. 107) rectangulate, a slender hook extending 1/2 of lateral margin; seventh sternite (female) (fig. 32a) distinctly sinuate on posterior margin

Distribution : North West Frontier Province, Eastern Himalayas, West Bengal, United province.

Morphology : Vertex prolonged, snout-shaped, with a central sharp carina; median length of crown six and half times interocular width, eyes smaller, lateral margin not in line with outer margin of eyes, each side of central carina depressed, lateral margin feebly reflex, median carina of crown continues ventrad, mid of ellipsoidal clypeus feebly demarcated from clypellus, impression of cibarial muscle distinct, lateral clypeal suture extending upto ocelli placed at extreme anterior margin of head, close to eyes, texture of crown shiny, clypeus granulated, pronotal surface one and half times transocular width, texture finely striated, lateral margin divergent, postero-



Figs. 104-107. *V. steneosaura* 104. Aedeagus, 105. Style, 106. Male plate, 107: Seventh sternite.

lateral margin smoothly rounded; legs comparatively delicate; hind femoral formula : 2:1:0; forewing coriaceous, 4 apical cells, 3 anteapical cells, appendix a narrow strip, texture deeply punctate, apical margin smoothly rounded.

XIX. Genus **Chudania** Dist.

1908. *Chudania* Dist., *Fauna Brit. India*, 4 : 268.

Type, by original designation, *Chudania delecta* Dist.

1908. *Chudania delecta* Dist., *Fauna Brit. India*, 4 : 268.

Vertex anteriorly subangulate, lateral margins reflexus, obliquely curved inwards in front of eyes; ocelli on lateral margins; eyes projecting beyond anterior pronotal angles; facial structure at base medially carinate; pronotum convex anteriorly, concavus posteriorly; scutellum impressus near apical area; tegmina extending beyond abdominal apex with four apical cells; hind tibiae densely spined; seventh sternite (female) produced medially on posterior margin.

Comments : This genus is closely allied to genus *Kana* by having similar pattern of head, ocellar position and venational arrangement.

44. **Chudania delecta** Dist.

1908. *Chudania delecta* Dist., *Fauna Brit. India*, 4 : 268.

Vertex flat, subangulate, marginally ridged, in front of eyes constricted; ocelli on lateral margin, close to eyes; frons prominently swollen, proximally carinate; clypeus subtriangulate; lorae extending apex of clypeus, very narrow; pronotum concavus at posterior margin; tegmina long venation indistinct, four apical, three anteapical cells, four longitudinal veins in region of corium; tibiae densely spinulate.

Length : 5 mm.

VIIth (female) sternite produced at posterior margin.

Distribution : Kurseong (5,000'), Eastern Himalayas, Ghumti, Lebong.

Remarks : The Holotype female is described on the basis of collection from Kurseong area, although two males, a single female had been obtained from the surrounding areas of Kurseong Hills. The males are not recorded here because of scarcity of specimens in the collection.

Morphology : Vertex anteriorly semicircular, median length of crown as interocular width, texture shiny, margin of head not in line with outer margin of each eye, extreme anterior margin distinctly reflex, posterior margin concavus; ocelli located contiguous to eyes; frontoclypeal area with fine striations; clypeus convex, muscular transverse impression distinct; clypeus well demarcated, linguiform; latero-clypeal suture extending upto anterior margin of vertex nearer to each ocellus; pronotal width greater than transocular width, lateral margin slightly divergent otherwise parallel, postero-laterally smoothly rounded, posterior margin concavus; forewing transparent, appendix absent; hind femoral setal formula: 2:1:1; posterior margin of VIIth sternite (female) triangularly projected followed by truncate lateral margin.

Registered number : 2520/21 (Ind Mus), Calcutta.

XX. Genus **Crispina** Dist.

1918. *Crispina* Dist., *Fauna Brit. India*, 7 : 76.

Type, by original designation, *Crispina nigristigma* Dist.

1918. *Crispina nigristigma* Dist., *Fauna Brit. India*, 7 : 76-77.

Vertex broadly concavus anteriorly; facial area tapering towards clypeus; pronotum anteriorly convex, posterior margin subtruncate; tegmina extending beyond abdominal tip, four apical cells, appendix well-developed; posterior tibiae densely spinulate, seventh sternite (female) concavus along posterior margin.

Female :

45. **Crispina nigristigma** Dist.

1918. *Crispina nigristigma* Dist., *Fauna Brit. India*, 7 : 77.

Vertex triangulate, medially sulcatus, anterior region deflected; ocelli on lateral margin of vertex, reddish, distinct; frons tapering distad; clypeus long, narrow; lorae extending apex of clypeus; pronotum convex, smooth, anteriorly rounded, posterior margin truncate; tegmina narrow, extending beyond extremity of abdomen, venation thin, indistinct, appendix developed, black longitudinal bands present, although may be absent in some specimens; legs thin, elongate.

Length : 4.5 mm. Incl. tegmina.

VIIth sternite (female) concavus along posterior margin.

Distribution : Kodaikanal, South India.

Remarks : The male specimen is not available. Distant did not make any comment on the position of genus. The ocellar position seems peculiar. The affinities of this Genus *Crispina* still appears contradictory.

Morphology : Median length of crown lesser than interocular width, surface slanting apicad, anterolateral margin semicircular, reflex, lateral margin in line with outer margin of eyes, depressed; ocelli placed at anterior margin near each eye; clypeal surface depressed; lora and gena indistinctly demarcated, texture finely granulated, shiny; pronotal width as greater as transocular width, lateral margin parallel, posterolateral margin obliquely truncate, posterior margin concave, texture shiny, sparsely punctate; scutellum with a medial furrow, shiny, finely wrinkled; forewing semi-transparent; VIIth sternite (female) followed by a notch on each side of pigmented postero-median margin; hind femoral setal formula : 2:1:1.

Registered number : 5576/H7 (male/female), (Ind Mus), Calcutta.

XXI. Genus *Mukaria* Dist.

1908. *Mukaria* Dist., *Fauna Brit. India*, 4 : 269.

Type, by original designation, *Mukaria penthimiodes* Dist.

1908. *Mukaria penthimiodes* Dist., *Fauna Brit. India*, 4 : 269.

Vertex slightly shorter than pronotum, anterior margin subconical submarginally with an impressed line; ocelli indistinct; facial area deeply depressus at base; eyes projecting beyond anterior pronotal angles; pronotal surface arcuate, concavus above scutellum, laterally short; scutellum with impressed line before apical area; tegmina longer than abdomen, broader distad, apical cells larger; tibiae densely spined; connective U-shaped, basal arm rectangulate, aedeagus simple by structure, style with well-developed preapical lobe, inner lobe beyond middle abruptly narrowed, apex blunt; male plate ovate, beyond middle near apex abruptly narrowed apex blunt; pygofer without hook, sparsely setose.

Comments : The general body color, facial structure draws this genus close to genus *penthimia*. It seems more allied to genus *Chudania* and *Kana* by considering position of ocelli. The venational arrangements deviate

this genus *Mukaria* from *Chudania* and *Kana*. Owing to the disputed points, even unsettled conclusion by Singh-Pruthi, it is suggested by present author to preserve the nomenclatural position as recorded by Distant.

46. *Mukaria penthimoides* Dist.

(Fig. 108)

1908. *Mukaria penthimoides* Dist., *Fauna Brit. India*, 4 : 269.

Color black, shiny; vertex with a distinct marginal ridges anteriorly; pronotum striate; scutellum finely striate, a pair of callosities close to apex; tegmina with a linear spot near middle of costal margin, before apical area an oblique transverse spot; body black ventrally; tibiae densely spinulate.

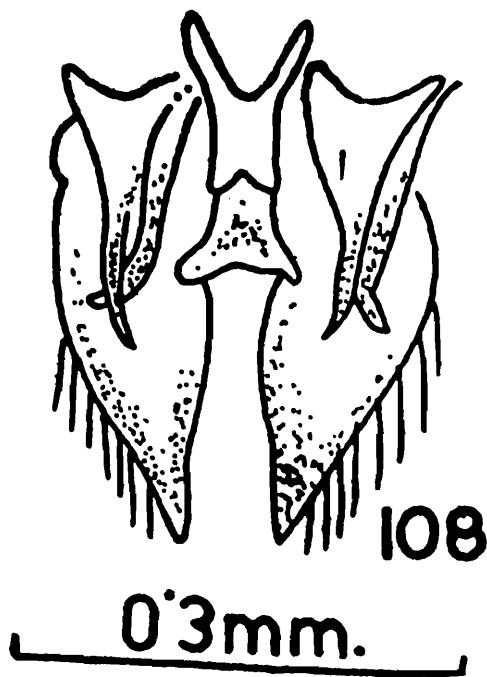


Fig. 108. *M. penthimoides* 108. Aedeagus, Style, Male Plate.

Length : 4.00 mm (male).

Genitalia : Aedeagus (fig. 108) with an Y-shaped connective, arm laminate, shaft cylindrate, curved laterally, apex sinuate; styler shaft (fig. 108) with inner outer lobes crossing each other, mesal apical extension stouter, apex blunt; male plate (fig. 108) apical third abruptly tapered to a pointed apex.

Distribution : Ceylon, Maskeliya, South India.

XXII. Genus *Nirvana* Kirk.

1900. *Nirvana* Kirkaldy, *Entomologist*, **33** : 293.

Type, by original designation, *Nirvana pseudommatos* Kirk.

1900. *Nirvana pseudommatos* Kirk., *Entomologist*, **33** : 293.

Head extending forward horizontally, lateral margins parallel, anterior margin subangular; eyes produced over pronotal angle, ocelli not distinct situated on lateral margin of vertex; tegmina with 3-4 apical cells and with a longitudinal vein indistinct, delicate; posterior tibiae spinulate; aedeagal apodeme well-developed; style simple-form; male plate gradually converging to a finger-like process, uniseriate at lateral margin; pygofer without hook.

47. *Nirvana pallida* Melichar

(Fig. 109—111)

1903. *Nirvana pallida* Melichar, *Fauna von Ceylon, Hom.*, p. 166.

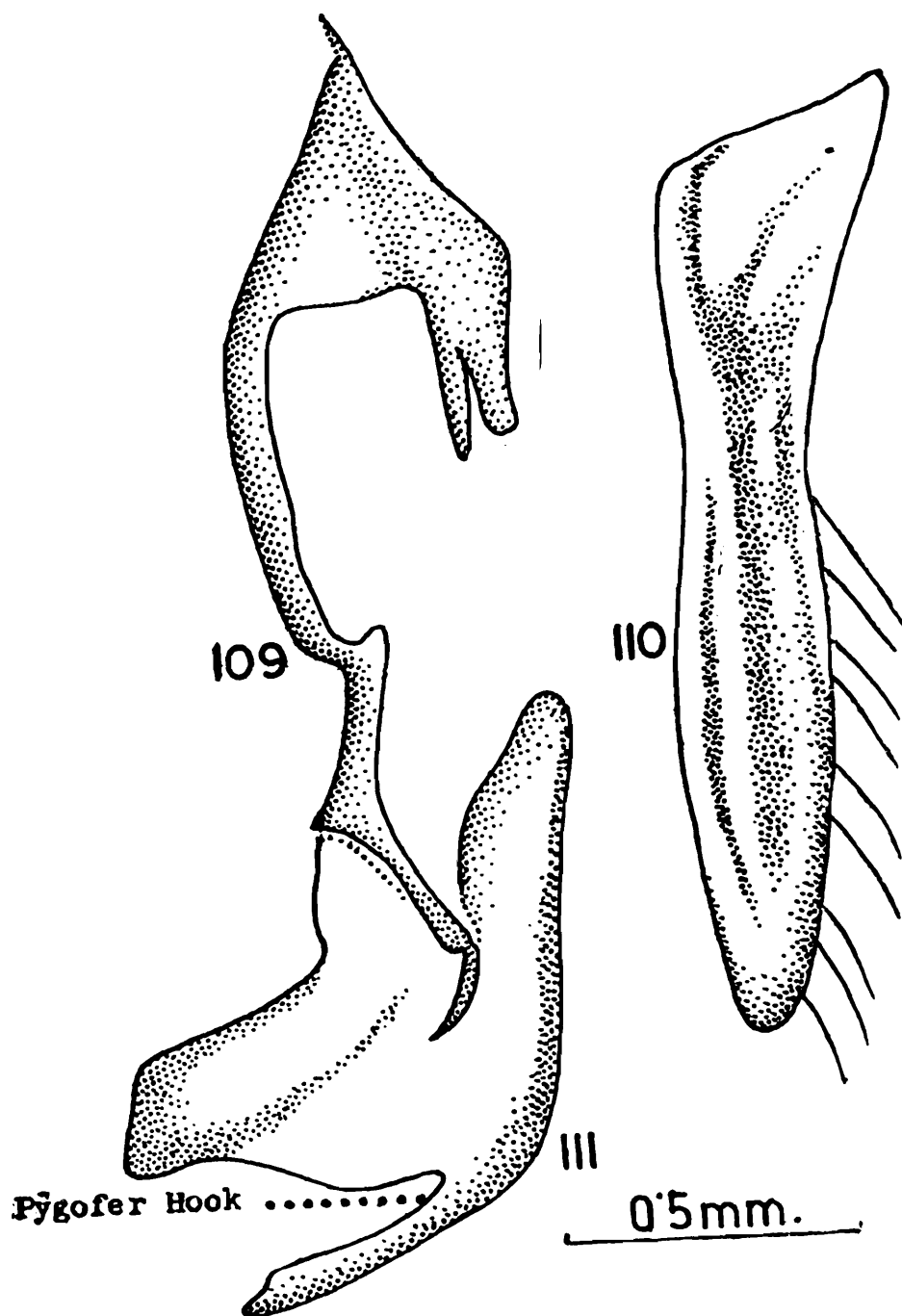
Vertex yellowish, centrally pale white, elliptical-shape; face with rows of oblique markings; pronotum with an arch-shaped depressed line close to anterior margin; scutellum transversely depressus medially; tegmina hyaline, second apical cells with brownish dots; abdomen orange-yellow.

Length : 5 mm (male)

Genitalia : Connective cup-shaped, aedeagal apophyses developed (fig. 109) shaft gradually narrowed to an uncinat apex; style simple; male plate (fig. 110) gradually converging, marginally uniseriate; pygofer (fig. 111) with a tuft of setae around apical margin, hook arising along mesal margin, projected beyond spatulate apex.

Distribution : Mysore State, Dehra Dun, Ceylon, Honshu, Kyushu, Tenasserim, Formosa, Malay Peninsula, Indo China, Hong Kong, Island, Singapore, Lombok, Southern Japan Ryukyu Island, Madras, Flores, Oshima Island, Shikoku, Burma, Malay States.

Economic status : This species is injurious to rice crop. It is reported to be injurious to citrus crop in Japan, and associated with vector of spike disease of sandal wood (Pruthi 1934).



Figs. 110-111. *N. pallida* 109. Aedeagus, 110. Male plate, 111. Pygofer.

XXIII. Genus *Omaranus* Dist.

1918. *Omaranus* Dist., *Fauna Brit. India*, 7 : 5.

Type, by original designation, *Didius sexualis* Dist.

1918. *Didius sexualis* Dist., *Fauna Brit. India*, 7 : 36.

Delicate insect; vertex with lateral margin not in line with outer margins of eyes; pronotum obliquely straight at lateral margins, basal margin centrally sinuate; scutellum with acute apex, shorter than head; tegmina with five apical cells; connective Y-shaped, stem long, stout

aedeagus simple, shaft usually rotundate at apex, no process or basal apodeme; stylar shaft smoothly curved with distinct pre-apical lobe; seventh sternite (female) convex at posterior margin, surface ventrally spinulate.

48. *Omaranus typicus* Dist.

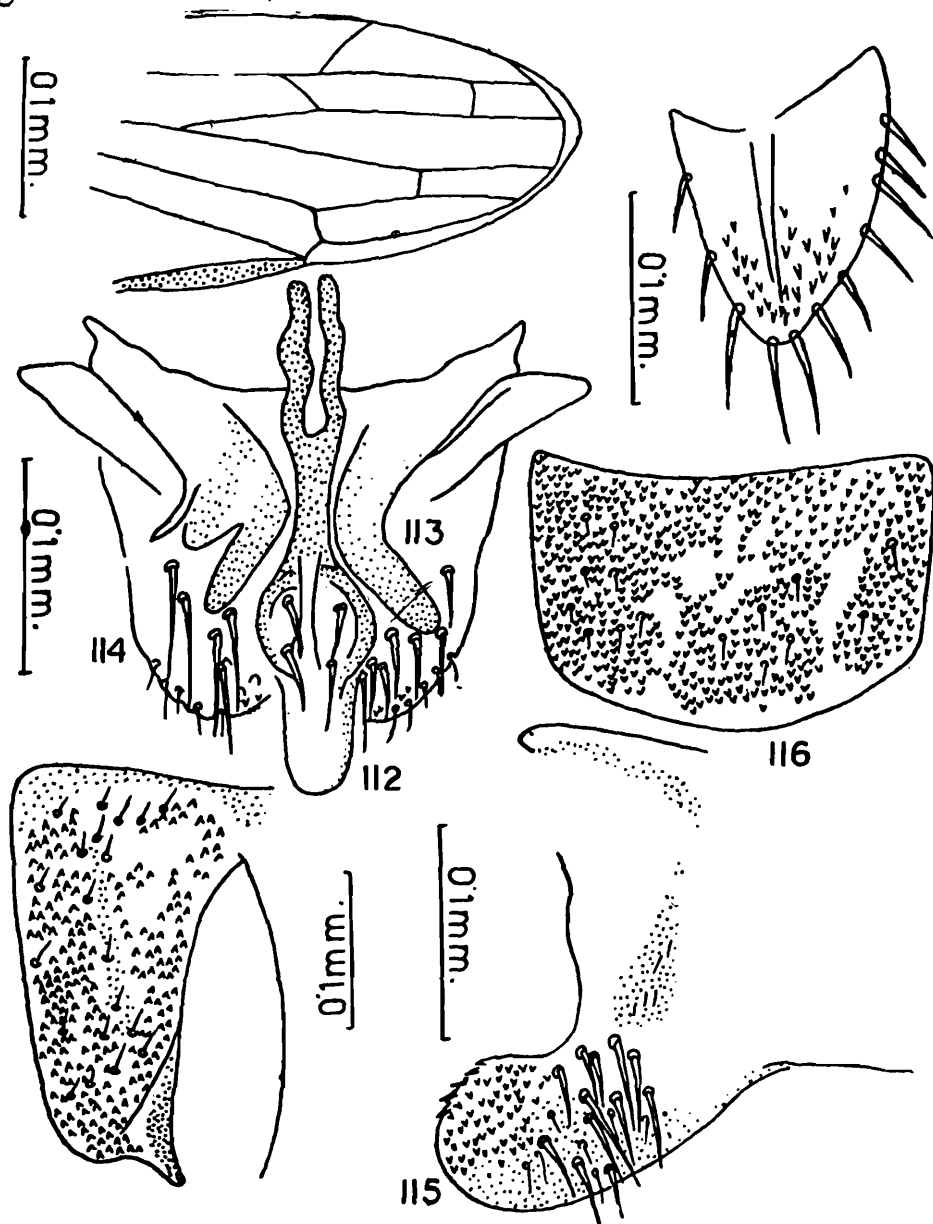
(Fig. 112—116)

1918. *Omaranus typicus* Dist., *Fauna Brit. India*, 7 : 6.

1918. *Didius sexualis* Dist. *Fauna Brit. India*, 7 : 6.

Vertex spatulate, disc with markings, ventral margin black; pronotum maculate; tegmina hyaline, half the length of abdomen; abdomen striate with dark brown lines.

Length : 8.00 mm (male).



Figs. 112-116. *O. typicus* 112. Aedeagus, 113. Style, 114. Male plate, 115. Pygofer, 116. Seventh sternite (♀).

Genitalia : Connective U-shaped, stem divergent distad, feebly notched, aedeagal shaft (fig. 112) orbicular, posterior half elliptical; style (fig. 113) with mesal apical extension distinctly verrucous, stout, long, apex obtusus, directed posterolaterad, preapical lobe differentiated; male plate (fig. 114) ellipticum with sparse setae on disk, multiseriate laterally; pygofer (fig. 115) thickly spinulose at lateral margin, disk multiseriate, without hook; seventh sternite (female) convex at posterior margin with about four patches, dark colored (fig. 116).

Distribution : Rewa State, Madhya Pradesh, India, West Bengal, United Province.

XXIV. Genus *Baileyus* Pruthi

1930. *Baileyus Pruthi*, *Mem. Ind. Mus.*, **XI** : 31.

Type, by original designation, *Baileyus brunneus* Pruthi.

1930. *Baileyus brunneus* Pruthi, *Mem. Ind. Mus.*, **XI** : 31.

Vertex foliaceous, angulated anteriorly, lateral margin and apex distinctly reflexed; ocelli indistinct; face with a furrow upper margin; genae sinuate below eyes; pronotum at posterior margin concavus; scutellum small; tegmina coriaceous, roof-like body, apices pointed, veins thick, conspicuous, five apical and three anteapical cells, one cross-vein between sector, wing shorter; connective with a linear arm, aedeagal strut developed, shaft may be serrate; stylar shaft delicate, slightly geniculate basad; male plate sinuate lateromedially; pygofer without hook, seventh sternite (female) sinuate posteriorly.

49. *Baileyus brachypterus* Pruthi

1936. *Baileyus brachypterus* Pruthi, *Mem. Ind. Mus.*, **XI** : 109-110.

Body in general, brown; vertex flattened, two third wrinkled; two reddish brown spots close to ocelli; pronotum oblong, pale brown, median plane transversely impressed; tegmina pale brown, extending beyond tip of ovipositor, veins reddish-brown. Seventh sternite wavy along posterior margin.

Length : 3.5 mm.

Holotype No. 5396/H7, Z.S.I., Calcutta.

Distribution : Yatung, (10,000'), Tibet, Eastern Himalayas.

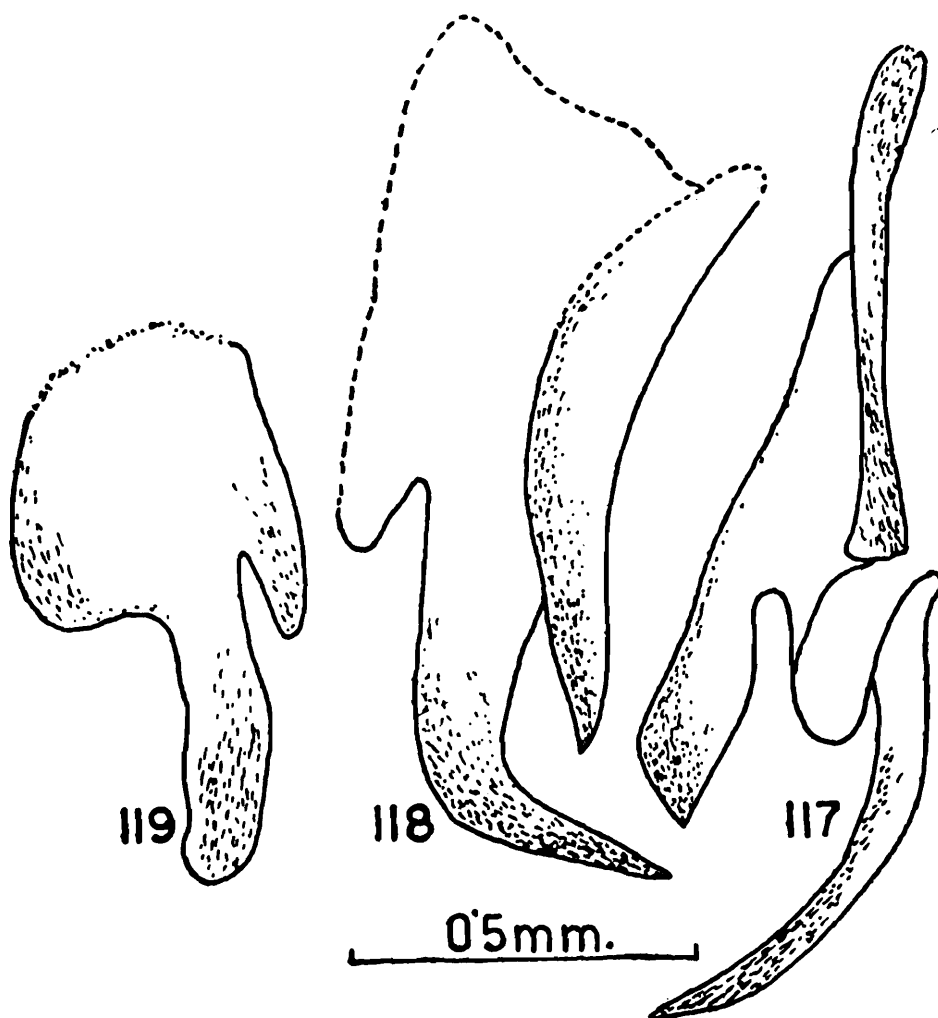
50. *Baileyus brunneus* Pruthi

(Fig. 117—119)

1930. *Baileyus brunneus* Pruthi, *Mem. Ind. Mus.*, **XI** : 31.

Vertex brown, binotate basad, margin with black dashes; face with irregular dots and patches; pronotal disc rugose, dark brown with two pairs of black transverse markings; scutellum brownish yellow, a black spot near each basal angle; tegmina bronze-colored, veins spotted white.

Length : 3.25 mm (male), 3.50 mm (female).



Figs. 117-119. *B. brunneus* 117. Aedeagus, 118. Style, 119. Male plate.

Genitalia : Connective linear-shaped, aedeagal shaft broader basad, deeply bifurcate in form of long, stout, apical processes, each serrate on inner margin, (fig. 117) strut conspicuous; style (fig. 118) with gradually connivent mesal apical extension, slanting, directed posterocephalad, outer

lobe half the length of inner lobe; male plate (fig. 119) gradually tapered to rounded apex, posterior third rugose; pygofer posterolaterally angulate; seventh sternite (female) obliquely straight, converging latero-posteriorly, posterior margin slightly sinuate

Holotypes : Nos. 691-692/H7 (Ind. Mus.), Z.S.I., Calcutta.

Type locality : Yutung, Tibet (10,000'), Eastern Himalayas (H.S.P.).

Morphology : Anterior margin of crown sub-triangulate, median length of crown as interocular width; eyes not in line with outer margin of vertex, centrally depressed, median ridge distinct; clypeus and clypellus parallel-sided, lateral clypeal suture extending base of antennae, texture granulated; pronotal width not greater than transocular width, depressed transversely, granulated texture; hind femoral setal formula : 2:0:0.

XXV. Genus *Chiasmus* Mulsant & Rey

1855. *Chiasmus* Mulsant & Rey, *Ann. Linn. Soc. Lyon*, 2(2) : 215-216.

Type, by monotypy, *Chiasmus translucidus* Mulsant & Rey.

1855. *Chiasmus translucidus* Mulsant & Rey, *Ann. Linn. Soc. Lyon*, 2(2) : 216.

Color brownish; vertex acutely angulated, marginally sharpened; frons with a flat, longitudinal furrow; pronotum large, raised at posterior margin, mottled with markings or spots; scutellum impressed apicad, mottled with spots or markings; tegmina stout, coriaceous, uncovering abdominal segments, appendix well-developed, two anteapical and four apical cells; connective either Y-shaped or linear, a split in middle; aedeagal shaft cylindrate, converging distad or obliquely truncate; stylar apical extension usually subapically sinuate, outer lobe prominent; pygofer without hook, apex round, seventh sternite (female) feebly concave centrally.

51. *Chiasmus alata* Pruthi

(Fig. 120)

1930. *Chiasmus alata* Pruthi, *Mem. Ind. Mus.*, XI : 23.

Vertex subacute with a large black marking, a black dot on each margin; pronotum near anterior margin with a number of black dots; scutellum with a deep transverse impression with five dots, three on disc and one at each basal angle; tegmina tough, light brown; abdomen dark black.

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 120). tube-like, slanting laterad; style (fig. 120) with well-developed preapical lobe, mesal apical extension nodulate posterior third, apex obtusus; male plate (fig. 120) distally ovoid; pygofer (fig. 120) at postero-lateral margin spined; anal tube as figured (fig. 120); seventh sternite simple.

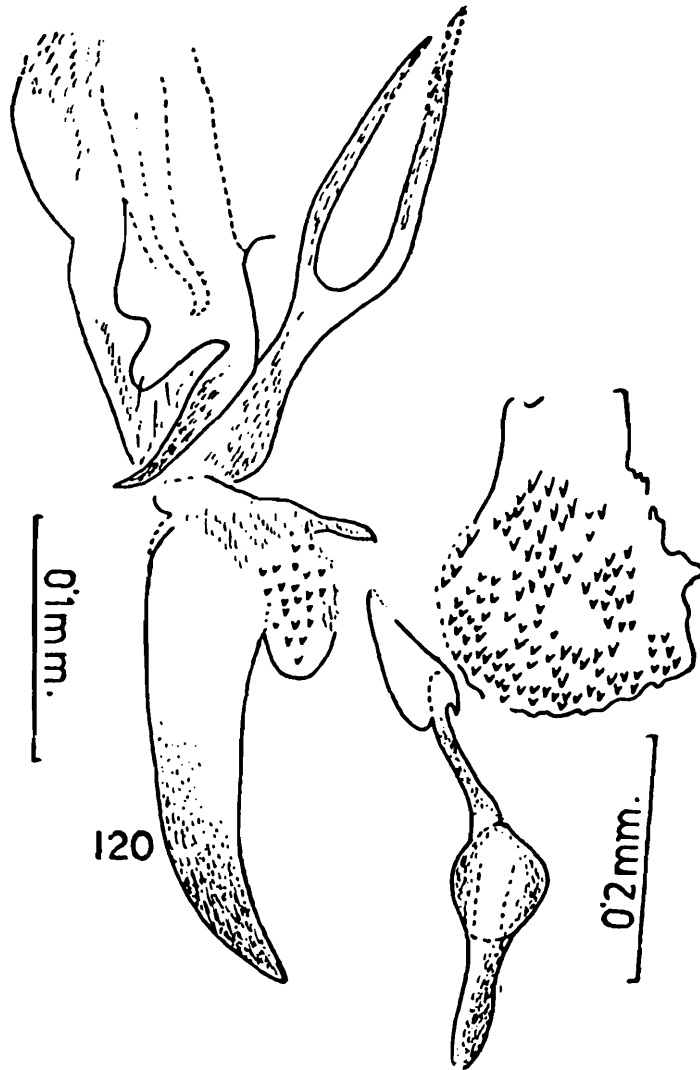


Fig. 120. *C. alata* 120. Aedeagus, style, male plate pygofer.

Holotype : Nos. 590-591/H7, Z.S.I., Calcutta.

Type-locality : Kuldana, N. W. Himalayas, October 1928 (H.S.P.).

Distribution : Calcutta, Madhya Pradesh, Rewa State, Madras.

Morphology : Median length of crown deeply depressus, half inter-ocular width, texture densely granulated, sublaterally grooved, anterior margin subtriangulate, lateral margin in line with outer margin of eyes; clypeus flattened, densely granulated, lateral margin subparallel, clypellus

rectangulate; lora and gena distinctly demarcated; pronotal width as trans-ocular width, texture densely granulated, anterolaterally depressus, posteromedian half elevated, lateral margin parallel-sided, posterior margin concavus; scutellum medially depressus, texture granulated; forewing with elevated venational arrangement, appendix developed, 3 apical and 2 ante-apical cells, hind femoral setal formula : 2:1:1; VIIth sternite (female) feebly notched medially otherwise posterior margin wavy.

Registered number : 617/H7 (female), 614/H7 (male), (Ind Mus), Calcutta.

52. *Chiasmus jagdishii* Pruthi

(Fig. 121)

1936. *Chiasmus jagdishii* Pruthi, *Mem. Ind. Mus.*, XI : 109.

Vertex with black spots and patches; face mottled brown; tegmina coriaceous with dark patches, veins marked white; abdomen piceous with light markings.

Length : 2.50 mm (male).

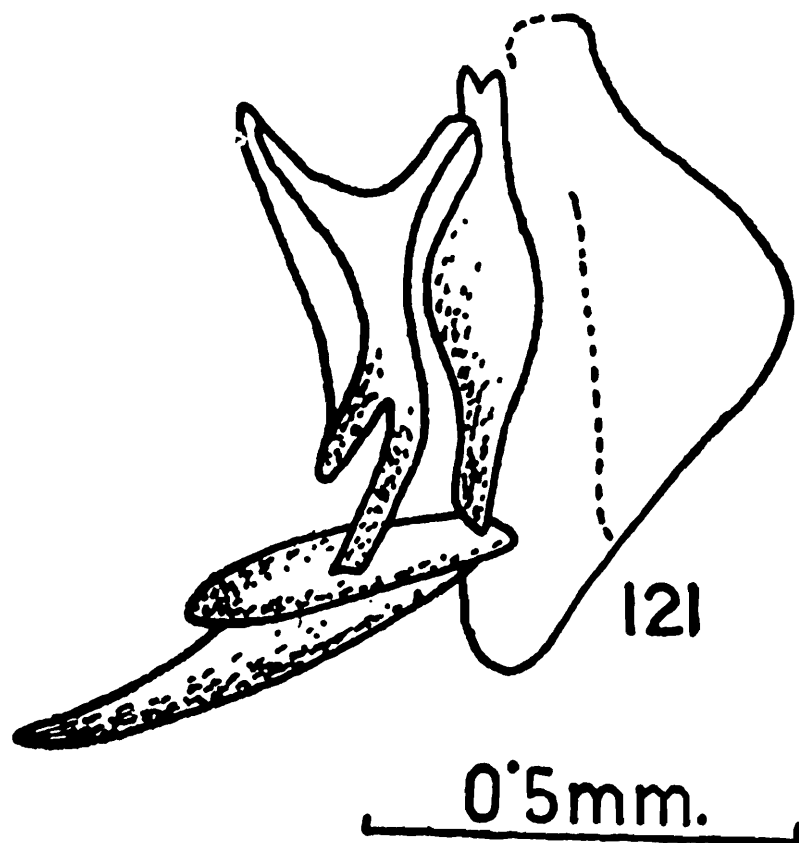


Fig. 121. *C. jagdishii* 121. Aedeagus, Style.

Genitalia : Connective Y-shaped aedeagal shaft (fig. 121) tube-like, basal part broader, gradually tapering to a point; style (fig. 121) with inner

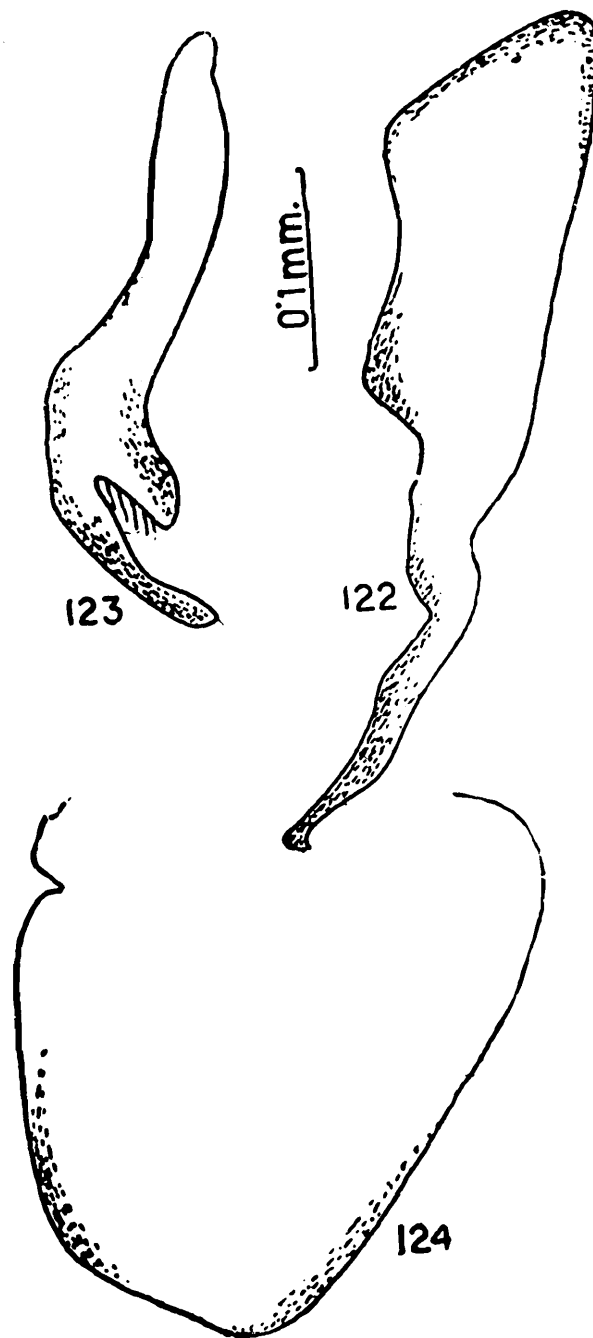
lobe narrowed, slender, preapical lobe prominent; male plate and pygofer simple by structure.

Holotype : No. 5395/H7 (Ind. Mus.), Z.S.I., Calcutta, Maidan, 6-IX-34 (Ind. Mus. Coll.).

53. ***Chiasmus mustelina*** (Dist.)

(Fig. 122—124)

1908. *Kartwa mustelina* Dist., *Fauna Brit. India*, 4 : 394.



Figs. 122-124. *C. mustelina* 122. Aedeagus, 123. Style, 124. Male plate.

Vertex dark brown, a black mark on each lateral margin, apex centrally interrupted with a black spot : pronotum brown, dark spot on each lateral margin behind eyes ; tegmina tough ; abdomen farinose dorsally.

Length : 2.50 mm (male), 3.25 mm (female).

Genitalia : Aedeagal shaft (fig. 122) massive, almost set in right angle to connective, apex sharp, directed caudad ; stylar shaft (fig. 123) with sharp, pointed mesal apical extension, preapical lobe developed ; pygofer hook broader 1/3rd, abruptly narrowed to a hook-shaped apex ; male plate simple ; (fig. 124) seventh sternite (female) straight at posterior margin.

Distribution : Tret, Muree Hills, N.W. Himalayas, Rewa State, Madhya Pradesh.

54. *Chiasmus niger* Pruthi

(Fig. 125)

1936. *Chiasmus niger* Pruthi, *Mem. Ind. Mus.*, **XI** : 108.

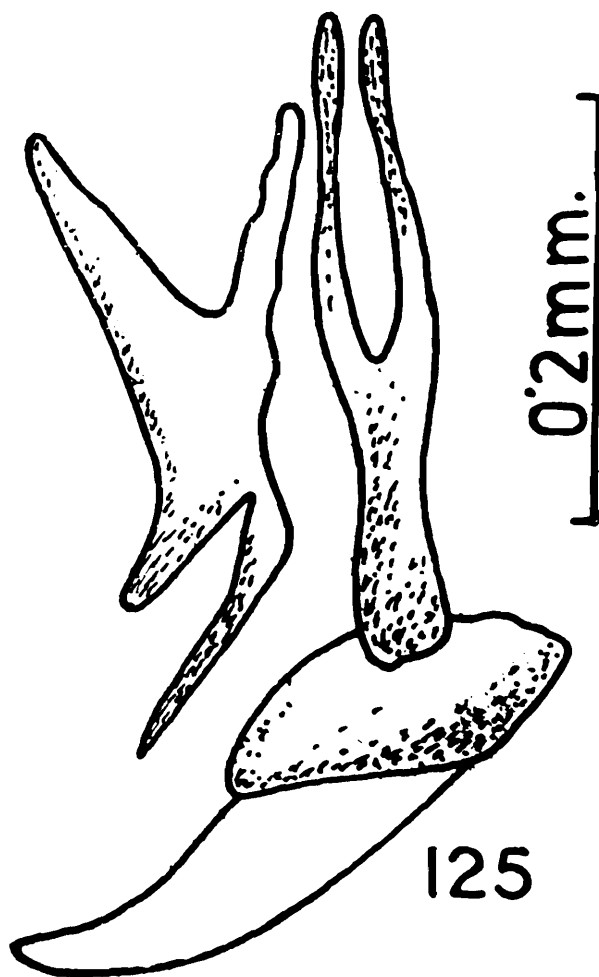


Fig. 125. *C. niger* 125. Aedeagus, Style.

Male robust, black; apex of vertex and apical margin of tegmina reddish-brown; face either black or upper part reddish brown; pronotum notched distad; tegmina densely punctate.

Length : 3.00 mm (male).

Genitalia : Connective Y-shaped, arms wider apicad, aedeagal shaft (fig. 125) tube-like broader basad, convergent distad; style with distinct preapical lobe, shaft twice length of outer lobe gradually tapering, rugulose close to apex.

Holotype : No. 5393/H7 (Ind. Mus.), Z.S.I., Calcutta.

Type locality : Sorol Garden, Chamba, Punjab, 20-V-27 (S. L. Hora).

Distribution : Punjab, Bengal

XXVI. Genus *Gurawa* Dist.

1908. *Gurawa* Dist., *Fauna Brit. India*, 4 : 263.

Type, by original designation, *Gurawa vexillum* Dist.

1908. *Gurawa vexillum* Dist., *Fauna Brit. India*, 4 : 263.

Vertex broad, basal area depressus, lateral margin in line with outer margin of eyes; eyes projecting beyond anterior pronotal angles, surface medially carinate; scutellum medially depressed; three apical cells short, claval veins curved; aedeagal base broader, shaft tube-like, strongly re-curved; style with prominent inner lobe; male plate triangulate; pygofer without hook; seventh sternite (female) with concavus posterior margin.

Comment : The foliaceous nature of head, shape of face and genital armatures place the position of this genus under subfamily Aphrodinae instead of the subfamily Gyponinae as suggested by Distant who made a confusion of two black spots as ocelli.

55. *Gurawa intermediatus* Pruthi

1936. *Gurawa intermediatus* Pruthi, *Mem. Ind. Mus.*, XI : 107-108.

Stout, brown leafhoppers; vertex reflexed at apex, marked black, proximal region faintly wrinkled; lorae, genae mottled with grey; pronotum coarsely rugulose; tegmina leather-like with thick veins, cross-veins between sectors.

Length : 8.7 mm.

Seventh sternite produced latero-caudad, concavus along posterior margin.

Holotype : No. 5391/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Gangtok (6,000'), Sikkim, Eastern Himalayas.

56. **Gurawa minorcephala** Pruthi

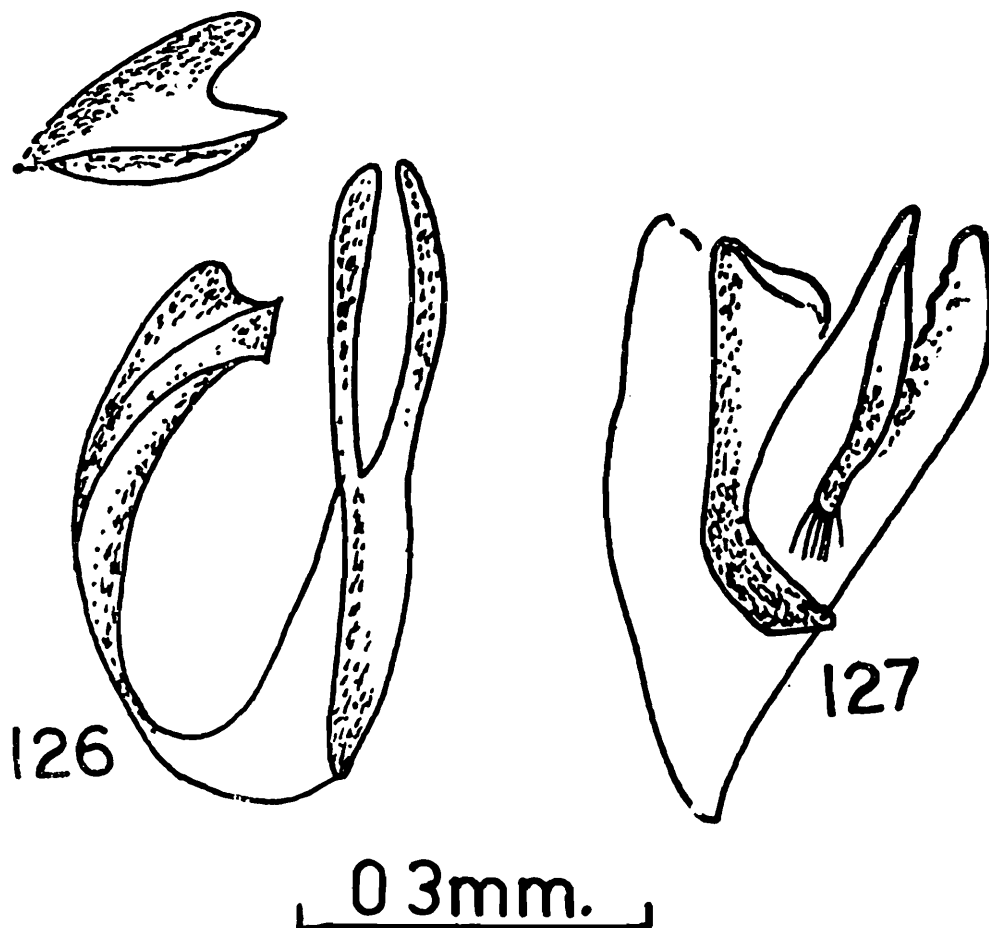
(Fig. 126—127)

1930. *Gurawa minorcephala* Pruthi, *Mem. Ind. Mus.*, **XI** : 29.

Vertex distinctly reflexed near apex, a pair of spots at base, a band extends upto apex; frons mottled black; pronotum almost black, coarsely wrinkled, scutellum banded dark at lateral margin; tegminal veins thick, dark brown, dotted white.

Length : 4.00 mm (male), 4.25 mm (female).

Genitalia : Connective with long arm, aedeagal shaft (fig. 126) broader basad, tube-like, arched, apex nicked, directed cephalad; stylar shaft (fig. 27) with a short preapical lobe, mesal margin with apical extension connivent distad; male plate (fig. 127) triangulate; pygofer robust; seventh sternite (female) deeply concavus at posterior margin.



Figs. 126-127. *G. minorcephala* 126. Aedeagus, 127. Style, Male plate.

Holotypes : 687-688/H7 (Ind. Mus.), Z.S.I., Calcutta. September 1928 (H.S.P).

Distribution : Muree Hills, Jhikka Galli (7,000'), N.W. Himalayas.

57. **Gurawa vexillum** Dist.

(Fig. 128)

1908. *Gurawa vexillum* Dist., *Fauna Brit. India*, 4 : 263.

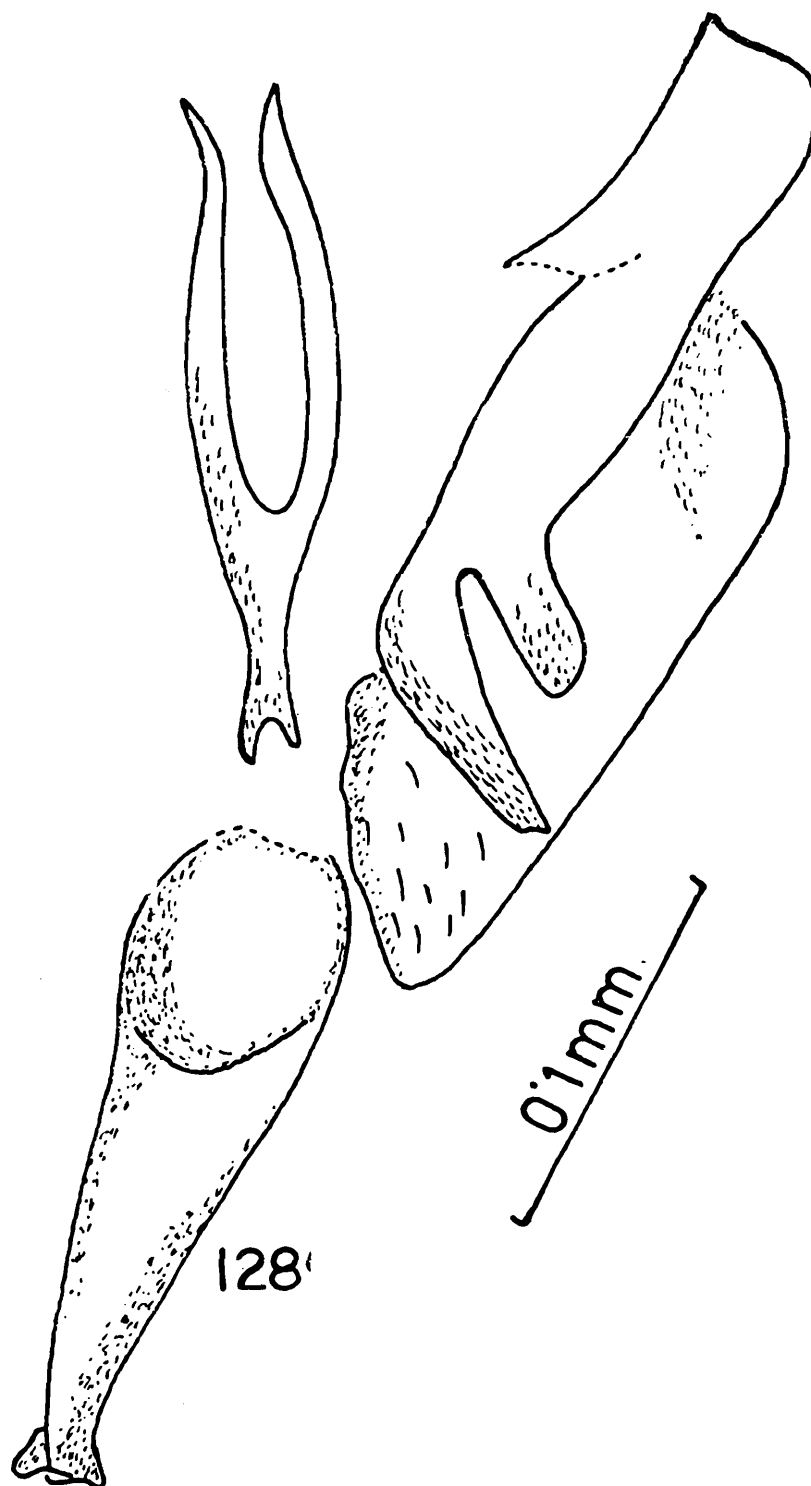


Fig. 128. *G. vexillum* 128. Aedeagus, Style, Male plate.

Vertex subtriangulate, slightly reflex, with a central black band (female) extending from middle of facial area to anterior margin of pronotum, sometimes absent in males, internal margin with a pair of black spots on each side, surface including pronotum coriaceous; scutellum with 3 minute black spots, one at tip, rest at central area; tegmina semi-transparent, apical cells short; anterior femora banded dark brown.

Length : 4 mm (male), 4.50 mm (female).

Genitalia : Connective Y-shaped, aedeagus (fig. 128) funnel-shaped, gradually attenuating; stylar shaft (fig. 128) with well-differentiated pre-apical lobe, mesal apical extension obliquely placed, apex conicoacuminate, a strip of nodulate structures from middle to apex; male plate (fig. 128) short, triangulate, setose; pygofer densely spined, anal tube with a pair of anal hooks directed cephalad.

Distribution : Sikkim, Madras, Eastern Himalayas, South India.

Morphology : Median length of crown as interocular width, anterior margin semicircular, depressed medially, laterally ridged; ocelli placed at base close to each eye, eyes not in line with lateral margin of crown; frontoclypeal area depressed basad; clypeus and clypellus distinctly demarcated, lateral clypeal suture extending upto anterior margin of crown, clypellus parallel-sided; crown ventrally appear hood-shaped; pronotal width as trans-ocular width, lateroposterior margin concavus; scutellum feebly depressed medially; texture of head, pronotum, scutellum granulated; forewing coriaceous, veins distinct, elevated, appearing boat-shaped, no appendix; hind femoral setal formula : 2:0:0.

Registered number : 5579/H7 (Ind. Mus.), Calcutta.

XXVII. Genus *Leofa* Dist

1918. *Leofa* Dist., *Fauna Brit. India*, 7:86

Type, by original designation, *Leofa mysorensis* Dist.

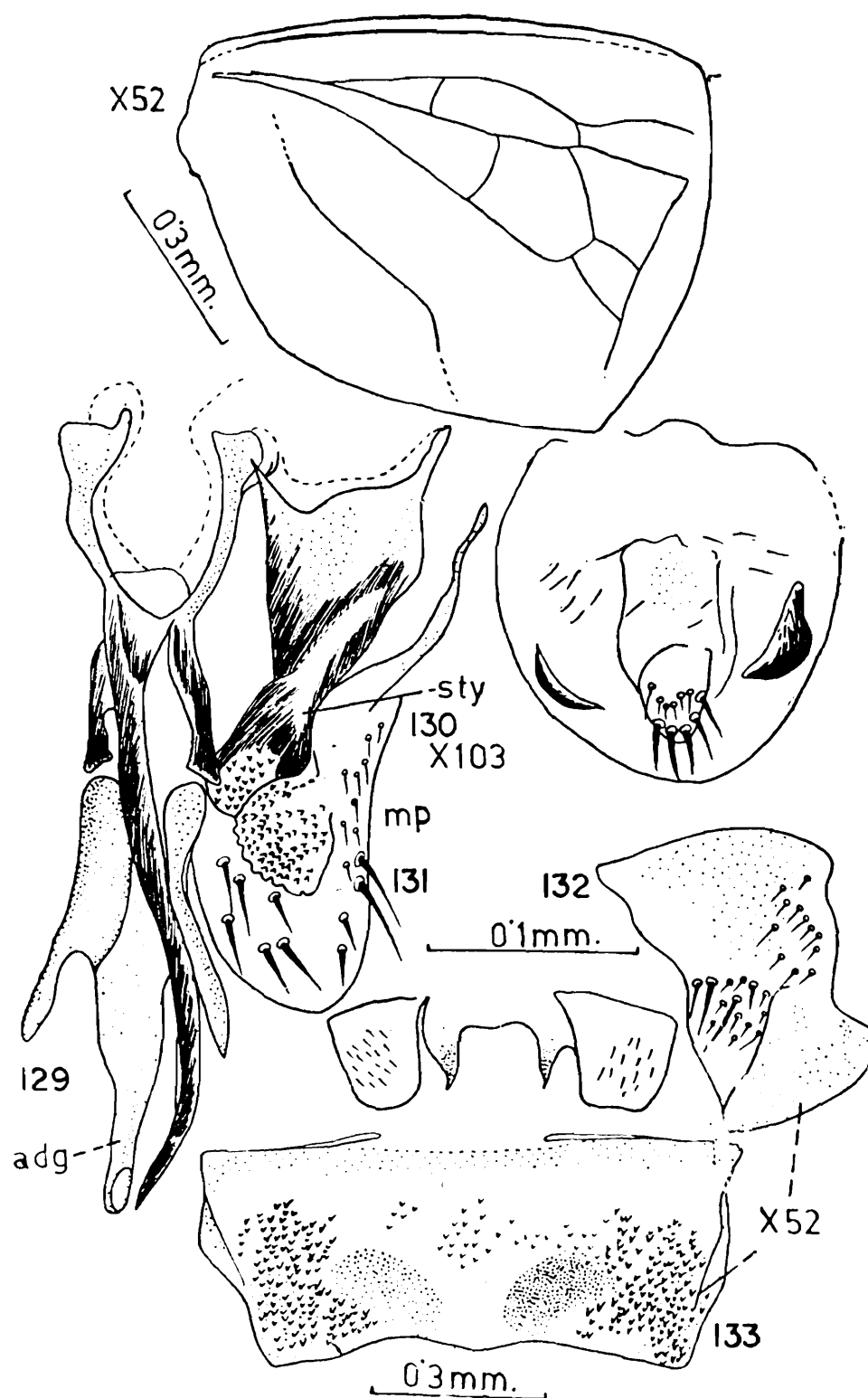
1918. *Leofa mysorensis* Dist., *Fauna Brit. India*, 7:86.

Vertex subconically produced; face oblong; vertex and pronotum of equal length; tegmina shorter, extending middle of abdomen, outer margin rounded; connective Y-shaped, basal apodeme conspicuously developed, aedeagal shaft slender, apex acuminate; stylar extension short, curved; male plate broader distad; pygofer without hook, disc spinulate.

58. *Leofa mysorensis* Dist.

(Figs. 129—133)

1918. *Leofa mysorensis* Dist., *Fauna Brit. India*, 7 : 86.



129. Aedeagus, 130. Style, 131. Male plate, 132. Pygofer, 133. Sternite.
Leofa mysorensis (fig. 129-133)

Vertex brownish-yellow, concavo-flattened; clypeus striate; pronotum and scutellum yellow with greenish tinge; tegmina dull brownish-yellow, extending half the length of body, a few black linear marginal markings, each claval region with a spot; meta-tibiae spotted black; abdomen shiny black, dorsally maculate.

Length : 2.00 mm (male).

Genitalia : Basal strut well-developed, apophyses extending tip of aedeagus (fig. 129), shaft slanting and blunt; style (fig. 130) with mesal apical extension arcus on inner margin, rugose inner half, apex truncate, preapical lobe sharply pointed; male plate (fig. 131) multiserially apically rounded; pygofer (fig. 132) posterolaterally strongly chitinated; seventh sternite (female) concave at posterior margin (fig. 133).

Distribution : Mandla Dist., Madhya Pradesh, Mysore, Madras.

Morphology : Median length of crown greater than interocular width, outer margin of eyes in line with lateral margin of head, texture granulated, shiny, anterior margin triangulate; ocelli placed on anterior margin contiguous to eyes; clypeus with distinct muscular impression, lateral margin subparallel, clypellus parallel-sided, transclypeal suture distinct; genae and lora distinctly separated, lateral clypeal suture extending upto ocelli; pronotal width not greater than transocular width, laterally angulate, posterior margin wavy, concave, texture shiny; scutellum with depressed median furrow; tegmina half length of abdominal segments, venation obsolete, subrectangulate in shape; hind femoral setal formula : 2:1:1, VIIth sternite triangulate at posterolateral margin.

Registered number : 5558/H7 (female), 5735/H7 (male), (Ind. Mus.), Calcutta.

59. *Leofa parwala* Pruthi

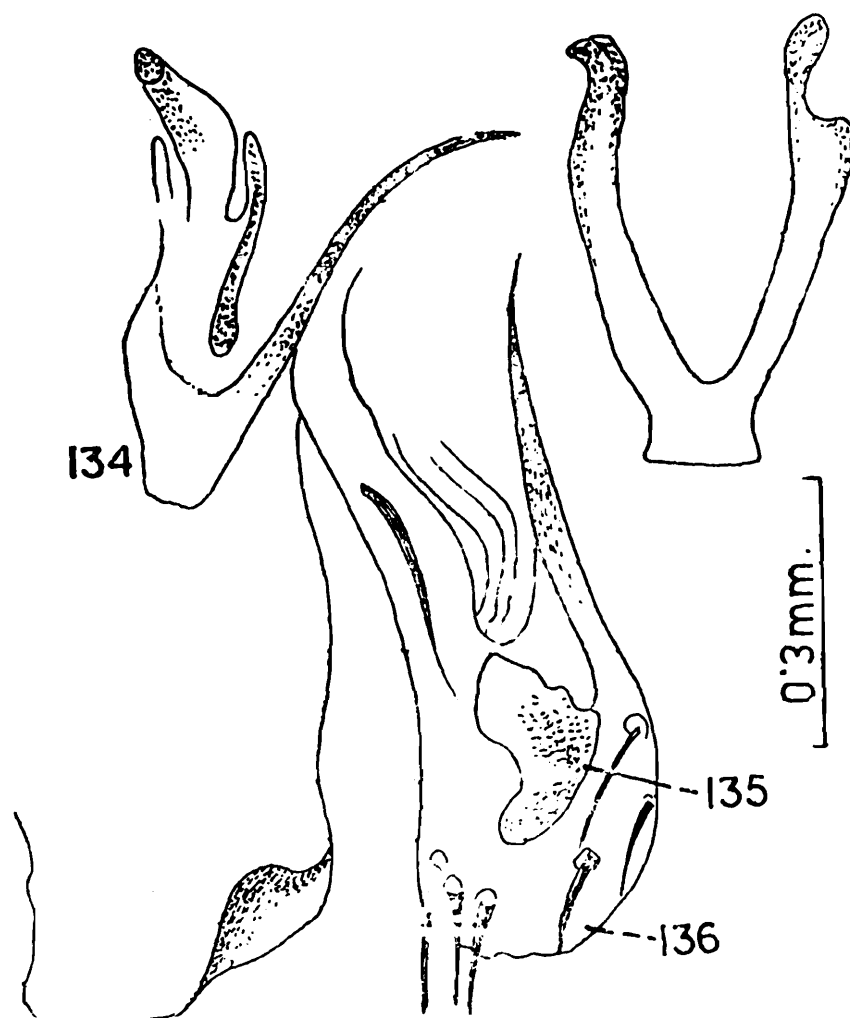
(Figs. 134—136)

1930. *Leofa parwala* Pruthi, *Mem. Ind. Mus.*, **XI** : 26

Vertex binotate basad, laterally piceous; pronotum striped black; scutellum with black stripes medially; tegmina coriaceous, extending upto abdominal fourth segment; pro-meso-legs piceous, meta-femora flat; abdomen with 8 longitudinal rows of pale spots.

Length : 3.00 mm (male), 3.50 (female).

Genitalia : Aedeagus with prominent basal strut (fig. 134), shaft flagelliform, sharply pointed; style (fig. 135) with ornamented mesal apical extension, feebly geniculate, directed laterad; male plate (fig. 136) at apical half triangulate, finely spinulate at posteromesal margin.



Leofa parwala (figs. 134-136).

134. Aedeagus, 135. Style, 136. Male plate.

Holotypes : Nos. 1062/H7 (male), 685/H7 (female), Indian Museum, Calcutta.

Type locality : Koilari (male), Hara (female), Rewa State, Madhya Pradesh, February to March, 1927 (H.S.P.).

60. *Leofa unicolor* Dist.

1918. *Leofa unicolor* Dist., *Fauna Brit. India*, 7 : 88

Color pigmentation on body does not differ sharply from *Leofa myso-rens* Dist.; vertex subtriangulate; clypeus with a pair of spots; abdomen dorsally and ventrally with a series of spots.

Length : 2 mm.

Seventh sternite (female) with posterior angle flat and truncate, posterior margin emarginate with a pair of median lobes.

Distribution : South India.

XXVIII. Genus *Bumizana* Dist.

1918. *Bumizana* Dist., *Fauna Brit. India*, 7 : 32.

Type, by original designation, *Bumizana ruberosa* Dist.

1918. *Bumizana ruberosa* Dist., *Fauna Brit. India*, 7 : 32-33.

Vertex twice length of pronotum and scutellum together, connivent apicad, centrally carinate, laterally obliquely depressed; facial structure flat, medially carinate; scutellum medially carinate; tegminal veins distinct, four apical and three anteapical cells, apex subacute; posterior tibiae densely spined; connective Y-shaped, basal prolongation rectangulate, aedeagus curved and styliform; style simple; male plate robust, uniseriate near apical area; pygofer without hook, densely hairy near apex; seventh sternite (female) postero-mesally conically emarginate.

61. *Bumizana ruberosa* Pruthi

(Figs. 137—139)

1930. *Bumizana ruberosa* Pruthi, *Mem. Ind. Mus.*, XI : 20

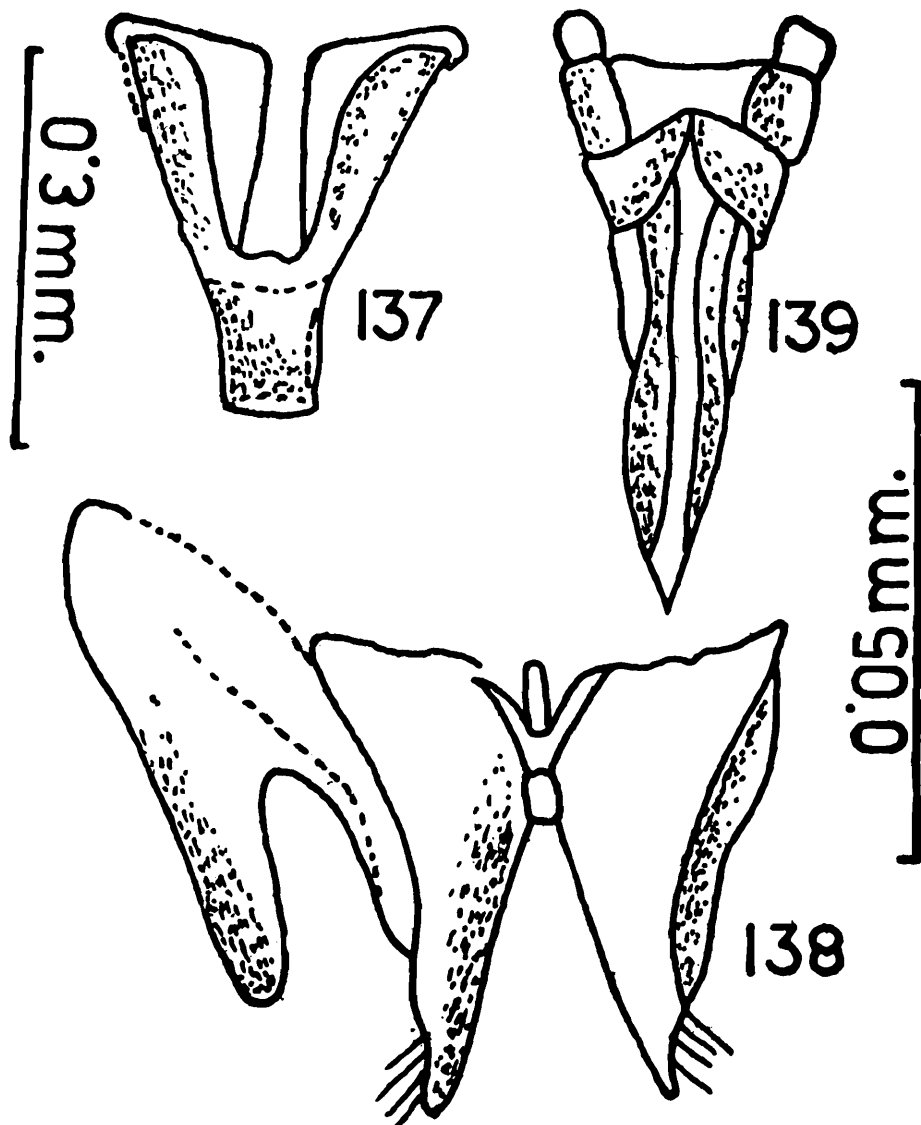
Reddish-brown; vertex three times of combined pronotum and scutellum together, spatulate, apex raised, dark color; ocelli close to eyes, minute, black; face distinctly carinate, dark brown anterior to eyes; clypeus rectangulate; pronotum coarsely punctate, medially carinate, laterally ridged; scutellum as long as pronotum; tegmina reddish-brown, thick, leather-like, apices pointed forming a roof-like pattern by uniting at inner margins, veins red, prominent; wing with a bifurcated first sector; five apical and four anteapical cells; legs delicate.

Length : 8.25 mm (male), 9 mm (female).

Genitalia : Connective Y-shaped, basal prolongation rectangulate, aedeagus curved, (fig. 137) styliform; style simple; male plate triangulate; robust, gradually tapering, uniseriate near postero-apically (fig. 138), pygofer without hook, with fine hair-like setae posteromesally; seventh sternite (female) cone-shaped centrally along posterior margin (fig. 139).

Holotypes : No. 585/H7 (male), allotype No. 586/H7 (female).

Distribution : Central and South India, Chitteri (3,000'), Eastern Ghats.



Bumizana ruberosa (figs. 137-139).

137. Aedeagus, 138. Male plate, Style, 139. VIIth Sternite.

XXIX. Genus *Parabolocratus* Fieber

1866. *Parabolocratus* Fieber, *Zool. -bot. Gesell. Wien. Verhandl.*, **16** : 502.

Type, by monotypy, *Parabolocratus sulcatus* (Fieb.)

1866. *Hecalus sulcatus* Fieber, *Zool. -bot. Gesell. Wien. Verhandl.*, **16** : 502.

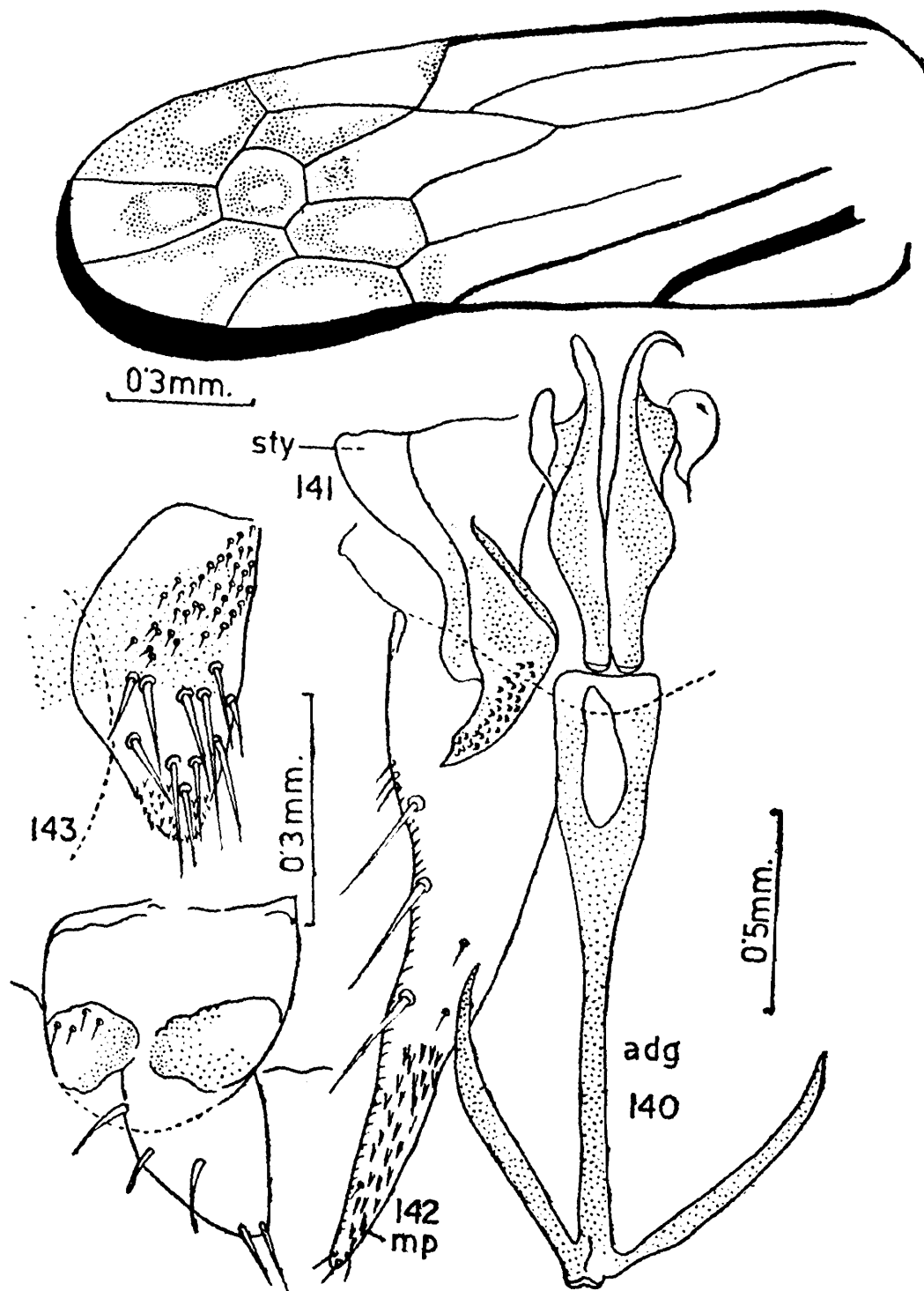
Color black or stramineous, head sometimes with a fuscous line submarginally, anteriorly subfoliaceous; clypeus swollen; genal margin notched below eyes; pronotal surface slightly rugulose, laterally carinate, diverging distad; tegmina broad, appendix small, outer anteapical cell shorter than central anteapical cell, base acuminate, apex truncate, inner anteapical cell open basally, apical cells very short; connective Y-shaped, aedeagal

shaft straight, with a pair of terminal processes, gonopore subterminal; styler shaft short, usually nodulate: male plate triangulate, gradually converging distad, spine-like setae on external margin; pygofer without hook; seventh sternite (female) sometimes medially produced at posterior margin.

62. *Parabolocratus albomaculatus* (Dist.)

(Figs. 140—143)

1908. *Thomsoniella albomaculata* Dist., *Fauna Brit. India*, 4 : 280.



Parabolocratus albomaculatus (figs. 140—143).

140. Aedeagus, 141. Style, 142. Male plate, 143. Pygofer.

Vertex black at anterior extremity, apical margin reflexed distinctly; pronotum striate; scutellum sometimes with two dark spots; apical cells brownish with white spots; abdomen dorsally black; anal segments castaneous.

Length : 4.50 mm (male), 5.00 mm (female).

Genitalia : Aedeagal shaft (fig. 140) 1/3rd broader otherwise tube-like, a pair of elongate, sharply attenuate terminal processes directed laterad; stylar shaft (fig. 141) with pointed, obliquely truncate, mesal apical extension, ventrally spinulate; male plate (fig. 142) connivent gradually, ventral surface spinulate; pygofer simple (fig. 143).

Distribution : Bengal, Ceylon, Madras, Luzon, Philippine Islands, Sumbawa, Krakatau Island, Belgian Congo.

Economic Status : It is common on paddy crop, associated with the viruliferous pests, namely, *Nephotettix virescens* (Fabr.), *N. apicalis* de Mots. and non-viruliferous *Kolla mimica* Dist., *Cicadella* (*Tettigella*) *spectra* (Dist.). The distinct shape of the aedeagal shaft with terminal processes sharply maintains its separate identity from above mentioned paddy pests. Its capacity to damage the crop and its power of transmitting any viral disease to paddy is not yet ascertained.

63. *Parabolocratius mandlensis* Pruthi

(Figs. 144—149)

1930. *Parabolocratius mandlensis* Pruthi, *Mem. Ind. Mus.*, **XI** : 20.

Vertex ridged, margin bordered black, pronotum finely striate; scutellum impressed medially; claval suture marked black.

Length : 5.25 mm (male), 6.00 mm (female).

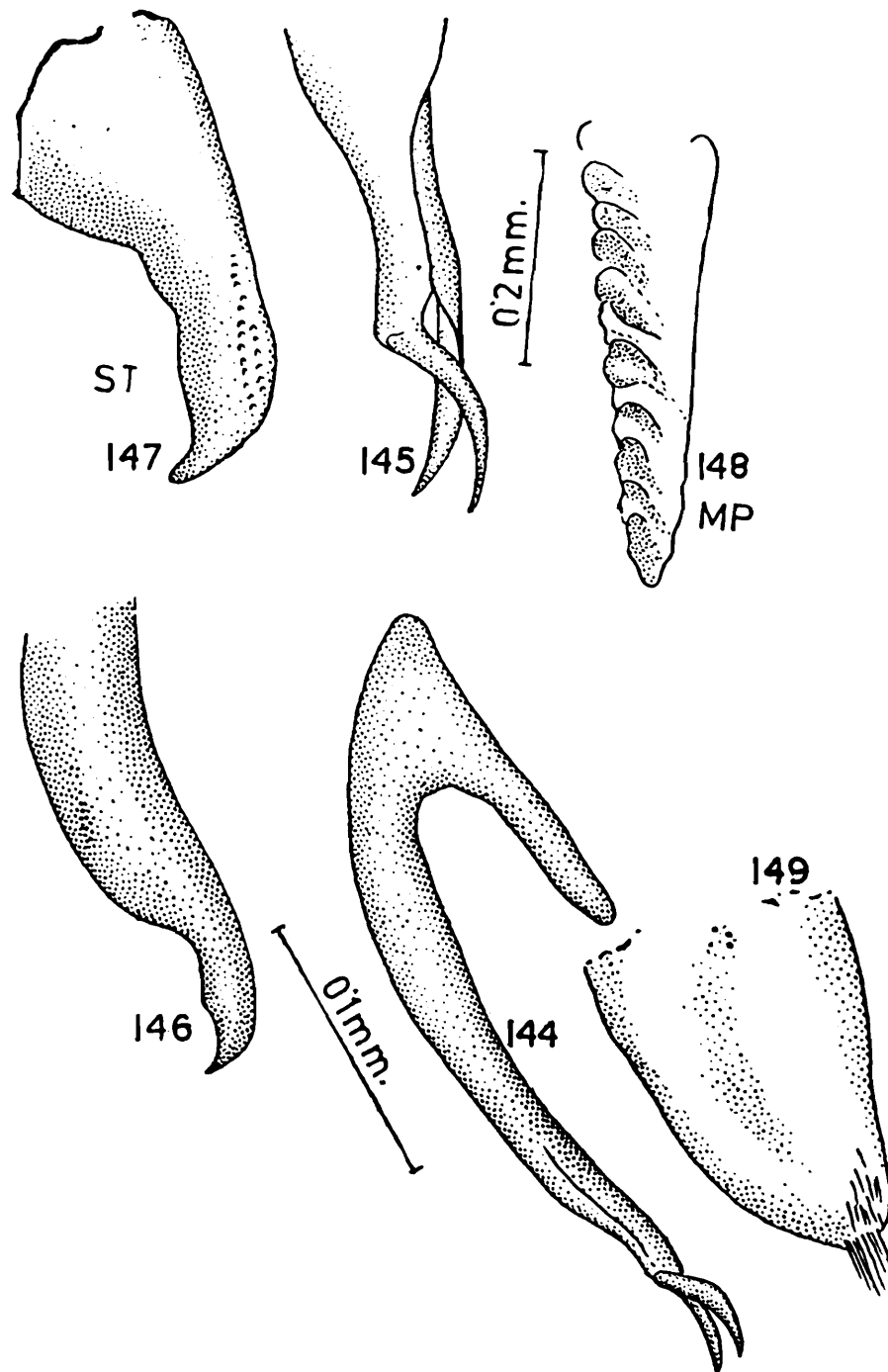
Genitalia : Aedeagal shaft (fig. 144, 145) cylindrate, apex with a circlet of long terminal processes; stylar shaft (fig. 146, 147) with apex truncate, slightly foot-like; male plate (fig. 148) broader basad, converging apicad; pygofer (fig. 149) obliquely truncate, densely spinulate.

Holotype : 1167/H7 (male), *allotype* 1168/H7 (female), Z.S.I., Calcutta.

Type locality : Dindori, Mandla Dist., Madhya Pradesh, 9-VI-27 (H.S.P.).

Distribution : Central India, Rewa.

Comment : This species is allied to *P. porrecta* Walk., but sharply differs from *porrecta* in absence of longitudinal fasciae on vertex, pronotum and scutellum.



Parabolocratus mandlensis (figs. 144-149).

144, 145. Aedeagus, 146. Style, 147. Style (tip magnified), 148. Male plate. 149. Pygofer.

XXX. Genus *Aconura* Leth.

1876. *Aconura* Leth., *Ann. Soc. Ent. Belg.*, **19** : 85

Type, by subsequent designation, *Aconura jakowlefi* Leth.,

1876. *Aconura jakowlefi* Leth., *Ann. Soc. Ent. Belg.*, **19** : 85.

Vertex triangulate, emarginate at posterior margin; clypeus quadriangular; eyes in line with lateral margins as vertex; face oblong; gena well-marked; pronotum anteriorly semicircular, with impressions; **scutellum** centrally with a transverse line; tegmina rounded behind, apical cells, anetapical and central apical cells present, veins delicate, appendix delicate; connective Y-shaped, aedeagal base spindle-shaped, remaining part tubular, apex acuminate; stylar extension slender, short, sometimes curved, apex conico-acuminate; male plate oval; seventh sternite (female) concavus at posterior margin.

64. *Aconura colombensis* Melichar

(Figs. 150—151)

1903. *Aconura colombensis* Melichar, *Hom. Fauna Ceylon*, p. 187.

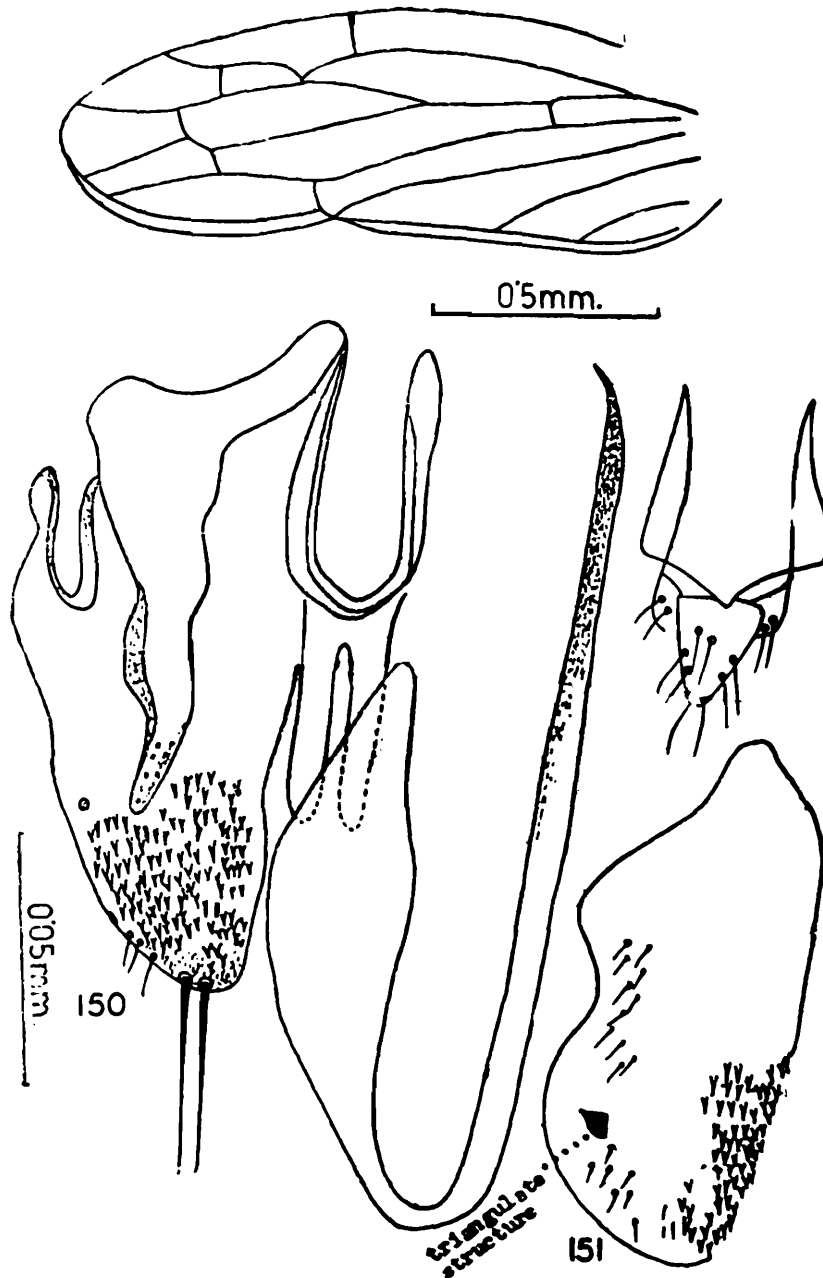
Vertex, pronotum greenish, pronotal disc with a pair of quadrangular spots in form of impressions; scutellum with a deep depression; tegmina greenish; abdomen black, laterally fuscous.

Length : 2.5 mm (male).

Genitalia : Connective U-shaped, arms lengthwise bifurcate, aedeagal shaft (fig. 150) basal 1/3rd broader, rest abruptly narrowed to an elongate, tube-like pointed apex, style (fig. 150) without any preapical lobe, mesal apical extension gradually connivent, ventrally nodulate; male plate (fig. 150) densely spinulate at apex; pygofer (fig. 151) with an extremely short hook (fig. 151) directed cephalad.

Distribution : Calcutta maidan, Mandla Dist., M.P., Chitteri Hills, Colombo, Ceylon, Sumbawa.

Morphology : Median length of crown slightly greater than interocular width, texture granulated, median suture at base distinct, anterior margin at apex triangulated, lateral margin in line with outer margin of eyes covering half the length of lateral margin of head; ocelli placed contiguous to eyes at extreme anterior margin of head; lateral clypeal suture extending



Aconura colombensis (figs. 150-151).

150. Aedeagus, Style, Male Plate, 151. Pygofer.

to ocelli, lora and gena demarcated, clypeus lamellate, granulated; pronotal width greater than transocular width, texture wrinkled, posterolateral margin obliquely truncated, posterior margin concavus; scutellum centrally depressed, granulated; forewing finely granulated, hyaline, appendix well-developed, 4 apical and 3 anteapical cells, inner anteapical cell one half times longer than central anteapical cell; hind femoral setal formula : 2:1:0; VIIth sternite (female) emarginate at posterior margin.

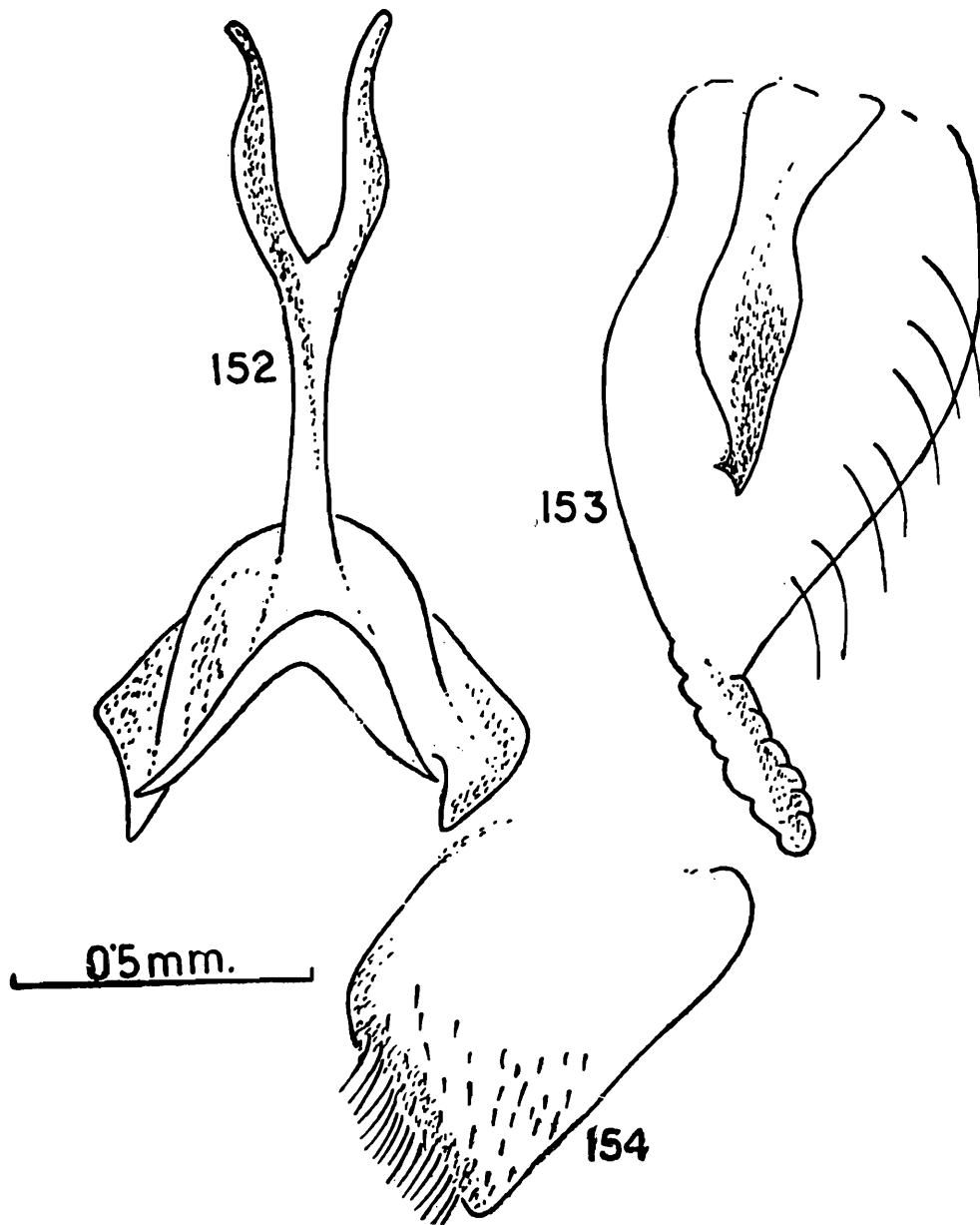
Registered number : 5287/H7 (male), (Ind. Mus.), Calcutta.

65. *Aconura solitaris* Melichar

(Figs. 152—154)

1903. *Aconura solitaris* Melichar, *Hom. Fauna Ceylon*, p. 188.

Vertex with a pair of spots at base; pronotum with a transverse impression at anterior margin, a distinct central ridge; tegmina pale brown.



Aconura solitaris (figs. 152–154).

152. Aedeagus, 153. Style, Male Plate, 154. Pygofer.

Length : 3 mm (male).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 152) damaged; rugulose; pygofer (fig. 154) marginally spinulose; seventh sternite (female) concave at posterior margin, style, male plate (fig. 153), as figd.

Distribution Calcutta Maidan, Koilari, Rewa State, M.P., India, Ceylon, Pattipola.

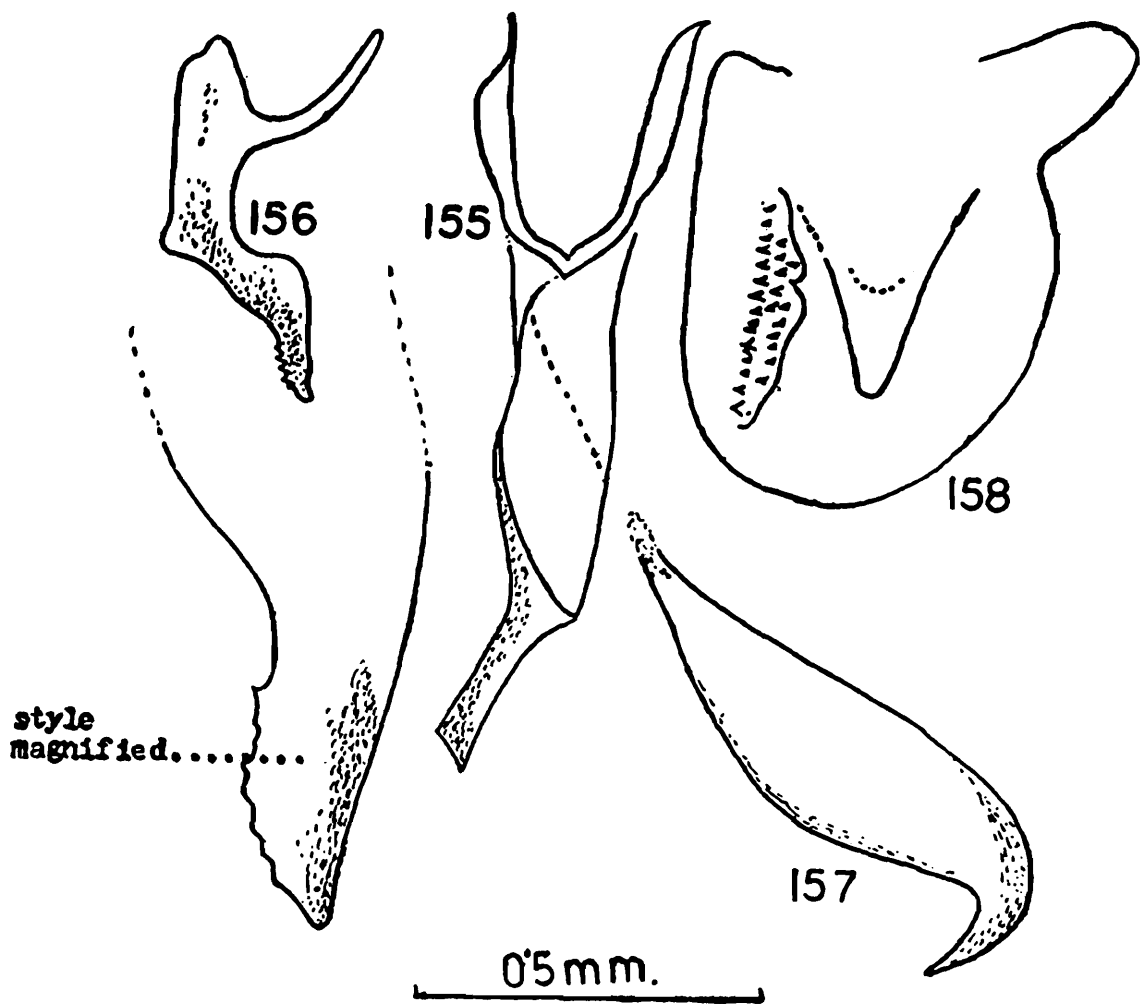
66. *Aconura tolla* Pruthi

(Figs. 155--158)

1930. *Aconura tolla* Pruthi, *Mem. Ind. Mus.*, **XI** : 39.

Vertex and pronotum brownish yellow; pronotum with two spots close to anterior margin; scutellum yellowish; tegmina greenish.

Length : 3 mm (male).



Aconura tolla (figs. 155-158).

155. Aedeagus, 156. Style, tip magnified 157. Male Plate, 158. Pygofer

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 155) basally fusiform, tubular, apex acuminate; styler shaft at (fig. 156) apical 1/3rd abruptly narrowed, with no pre-apical lobe; male plate (fig. 157) converging

gradually, apical part spinulate; pygofer (fig. 158) massive, mesal margin infolded, lateral margin with a dark, minute, pointed structure.

Distribution : Calcutta maidan, Koilari, Rewa State, Eastern Himalayas. Holotype No. 727/H7 (male), allotype : 728/H7 (female) (Inds. Mus.), Calcutta; Tollygunge, Calcutta, November 1930 (H.S.P.).

Comments : *A. tola* Pruthi displays close semblance with *A. colombensis* Melichar by similar pattern of aedeagus, shape of male plate, presence of a pointed structure on lateral margin of pygofer, and the shape of stylar shaft are seen with slight variations which may be due to orientation during mounting on slides, otherwise, I should suggest its merging with *A. colombensis* Melichar rather maintaining its separate identity as recorded by Singh-Pruthi (1930).

XXXI. Genus *Allophleps* Bergrowth

1920. *Allophleps* Bergroth, *Arkiv. Zool.*, **12** : 27.

Type, by monotypy, *Allophleps inspersa* Bergroth.

1920. *Allophleps inspersa* Bergroth, *Arkiv. Zool.*, **12** : 27.

Vertex flat, apex angulate, 2/3rd sagittally sulcate; ocelli at anterior margin close to each eye; face longer than broad; frons raised at posterior region; pronotum flat, posterior margin truncate; scutellum spotted at each basal angle; tegmina longer than body, pigmented, venation thicker, appendix distinct, superior anteapical cell of characteristic shape; connective linear, aedeagal shaft tubular, bifid apically; stylar extension sharp; male plate convergent apicad, multiseriate marginally; pygofer densely setose; seventh sternite (female) medially produced.

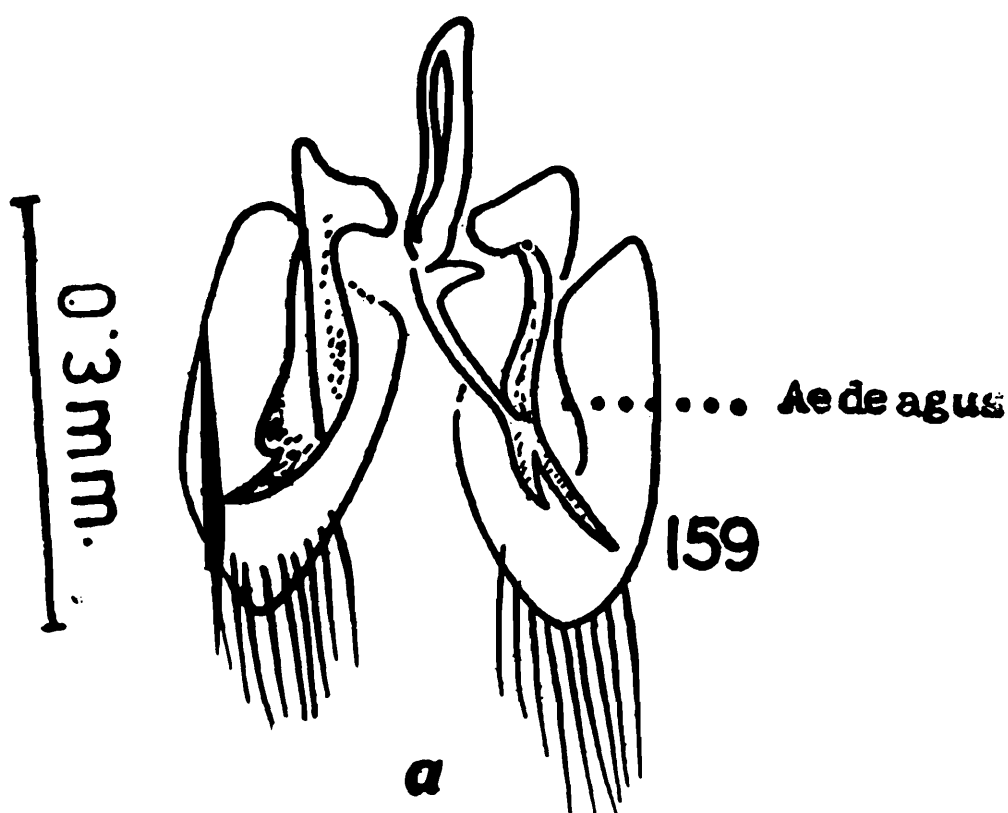
67. *Allophleps indicus* Pruthi

(Fig. 159)

1936. *Allophleps indicus* Pruthi, *Mem. Ind. Mus.*, **XI** : 120.

Vertex with a fuscous comma-shaped marking on each side of sulcatus base, a triangular area with a pair of dark spots at apex; pronotum dark grey at posterior region; scutellar angle spotted; tegmina with apical and claval regions dark brown.

Length : 3.50 mm (male), 4 mm (female).



Allophleps indicus (fig. 159). 159. Aedeagus, Style, Male Plate.

Genitalia : Aedeagal shaft (fig. 159) styliform, apex bifid, sharply pointed dissimilar length; stylar shaft (fig. 159) with mesal apical extension curved laterad, sharp; male plate (fig. 159) apical half triangulate, densely setose.

Holotype No. 5410/H7 (male), allotype ; -5411/H7 (female), Z.S.I., Calcutta.

Lyallpore, Punjab, 10.X.89 (H.S.P.)

Distribution : Punjab, India.

Economic status : This species was recorded from Derha Dun Forest, yet its relationship with spike disease of *Santalum sanctus* Linn, needs extensive investigation.

XXXII. Genus *Arya* Dist.

1908. *Arya* Dist., *Fauna Brit. India*, **4** : 338.

Type, by original designation, *Arya rubrolineata* Dist.

1908. *Arya rubrolineata* Dist., *Fauna Brit. India*, **4** : 338.

Vertex subconical apically; ocelli on anterior margin of eyes; pronotum shorter than vertex, margin oblique, posterior margin truncate; scutellum

subtriangular; posterior tibiae spinulate; tegmina longer, four apical cells, radical area defined by a transverse vein; connective V-shaped, aedeagal shaft broader basad, abruptly narrowed; style with pointed apical process, basally broader; male plate subtriangulate; pygofer with a fine hook; VIIth sternite (female) concave along posterior margin.

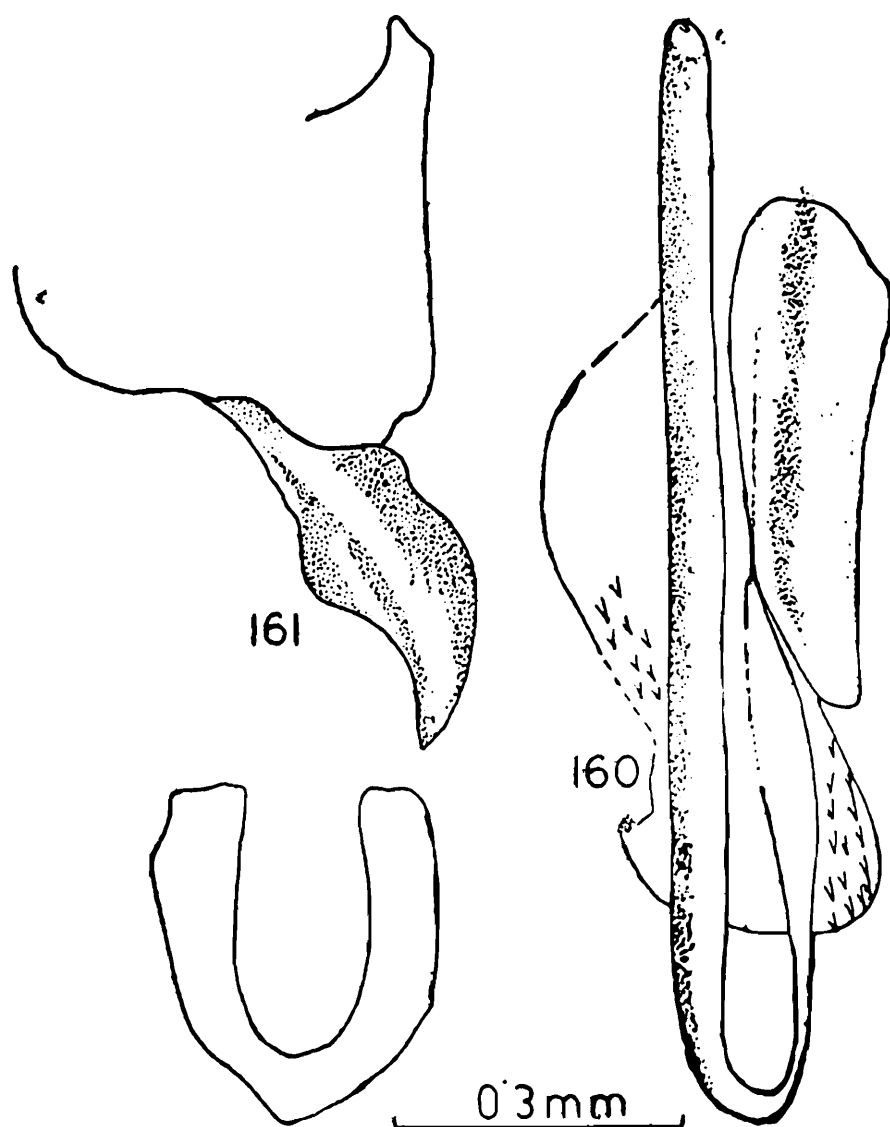
68. *Arya rotunda* Pruthi

(Figs. 160—161)

1930. *Arya rotunda* Pruthi, *Mem. Ind. Mus.*, XI : 40.

Vertex castaneous, dark linear impression at base; pronotum with a pair of dark impressions (male), black stripe (female) close to anterior margin; tegmina subhyaline; abdomen black (male), brown (female).

Length : 4 mm (male), 4.5 mm (female).



Arya rotunda (figs. 160-161). 160. Aedeagus, 161. Style, 160. Male Plate.

Genitalia : Aedeagal shaft (fig. 160) beyond middle tubular, basal part three times broader than rest, apex attenuate without any process; stylar shaft (fig. 161) with mesal apical extension attenuate distad, pre-apical lobe not prominent; male plate (fig. 160) oblong, apical half sinuate, spined; pygofer subtriangulate, hook extending 3/4th part of male plate.

Holotype : 736/H7 (male), 737/H7 (female), Z S.I., Calcutta.

Distribution : Madhya Pradesh, India.

XXXIII. Genus *Balclutha* Kirk.

1901. *Balclutha* Kirk., *Entomologist*, **34** : 338.

Type, by subsequent designation, *Cicada punctata* Fabr.

1775. *Cicada punctata* Fabr., *Systema Entomologiae*, p. 687.

Dull green to stramineous; slender, small leafhoppers; vertex semi-circular apicad, 1/3rd as long as pronotum, never carinate; pronotum wider posteriorly; tegmina overlapping apex, appendix large, submarginal veins never confluent; connective Y-shaped; aedeagus recurved, acuminate, gonopore terminal; male plate terminating in a slender, membranous process, uniseriate with spine-like setae; pygofer without hook; seventh sternite (female) with concave posterior margin.

69. *Balclutha indica* (Pruthi)

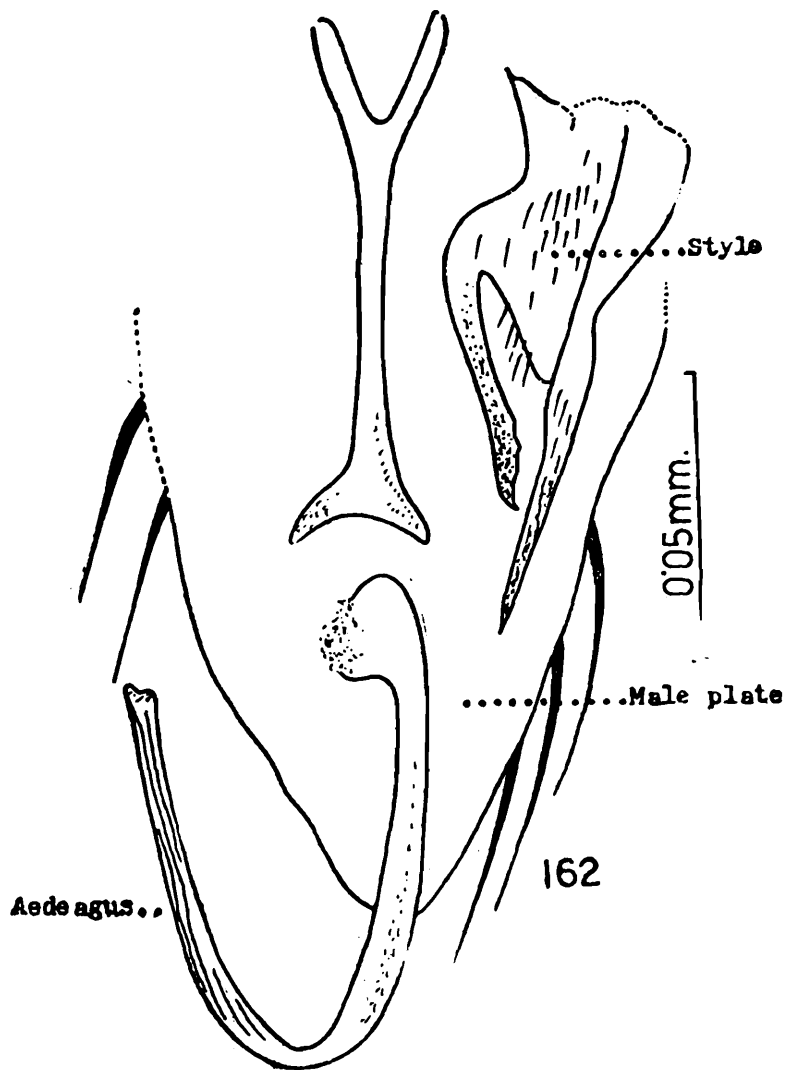
(Fig. 162)

1930. *Eugnathodus indica* Pruthi, *Mem. Ind. Mus.* **XI** : 48-49.

Vertex sulcate medially, pale yellow; pronotum and scutellum dull color, later impressus medially; tegmina hyaline; abdomen dorsally black.

Length : 3.5 mm (male), 4 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 162) strongly curved, cylindrate, with a sharp lateral process, apex directed caudad; male plate (fig. 162) with concave lateral margin, disc spined; pygofer serrate at posterior margin, hook stout, directed laterocaudad; seventh sternite (female) concave at posterior margin.



Balclutha indica (fig. 162). 162. Aedeagus. Style, Male plate.

Holotype : 794/H7 (male), 795/H7 (female) (allotype), Zoological Survey of India, Calcutta.

Type locality : Koilari (male), Rewa State, Amarkantak (female), M.P. February, March, 1927 (H.S.P.).

Distribution : Punjab, M.P., Madras.

70. *Balclutha micropteros* (Pruthi)

(Figs. 163—165)

1930. *Eugnathodus micropteros* Pruthi, *Mem. Ind. Mus.*, **XI** : 50.

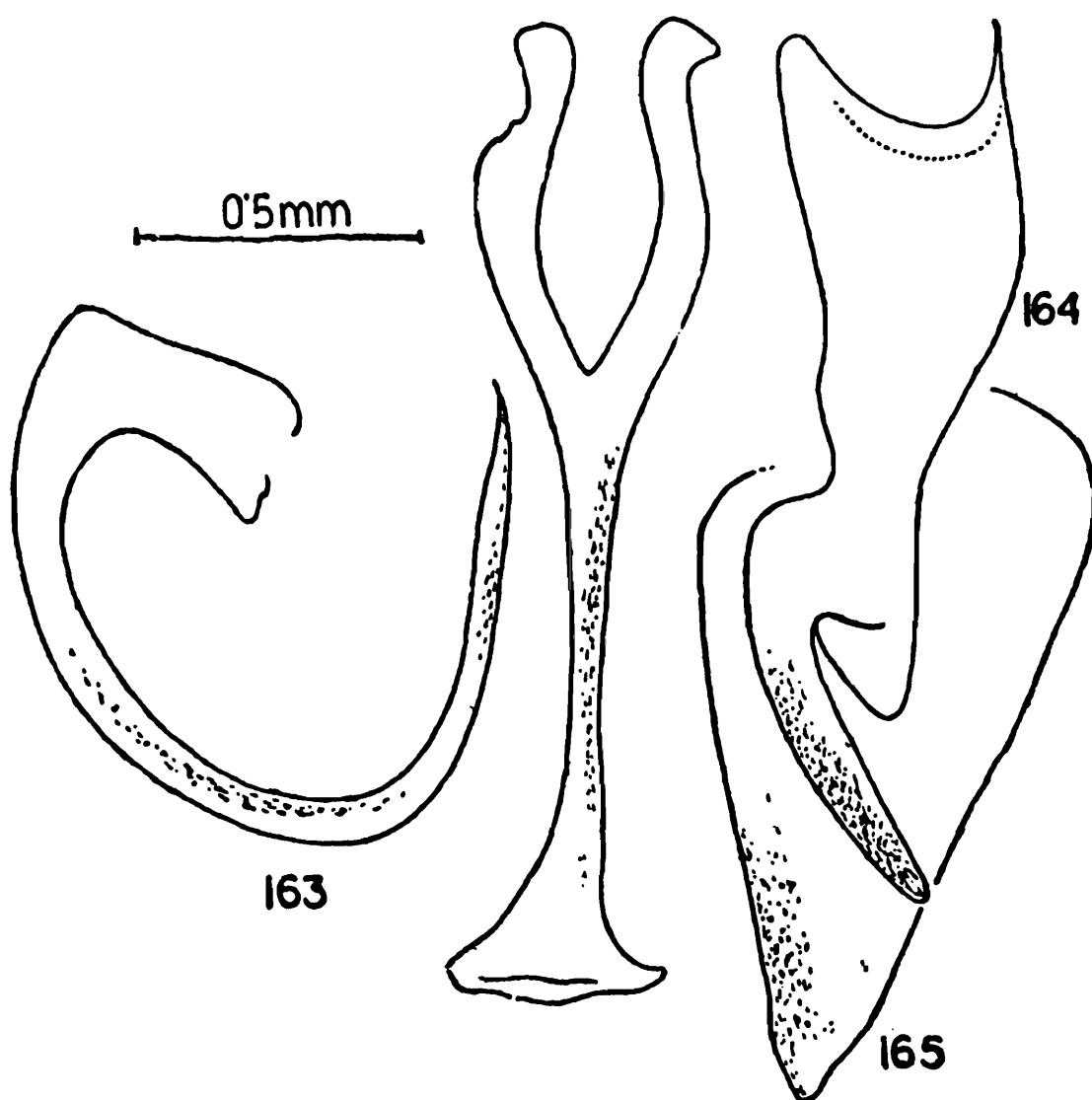
Vertex binotate basad; scutellum, pronotum pale yellow; tegmina with greenish veins; abdomen pale brown.

Length : 2.7 mm (male).

Genitalia : Aedeagal apodeme developed (fig. 163), shaft arcus, tip sharp, directed laterocaudad; style (fig. 164) with sharp mesal apical extension, curved, laterally directed; male plate (fig. 165) uniseriate laterally, 2/3rd broader; pygofer hook sharp.

Holotype : male, 870/H7, Zoological Survey of India, Calcutta.

Distribution : Madras.



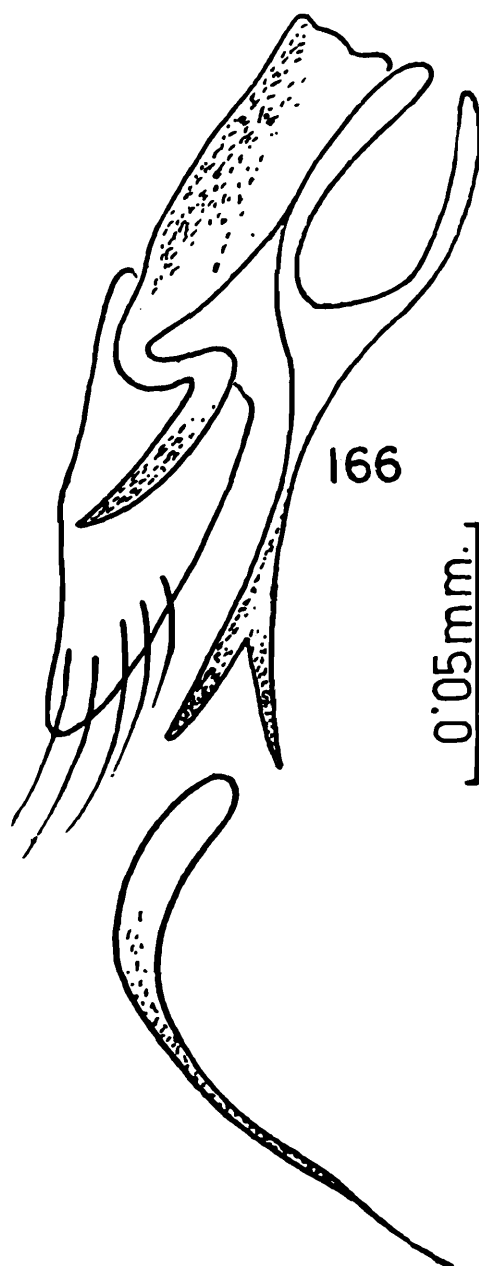
Balclutha micropteros (figs. 163–165).
163. Aedeagus, 164. Style, 165. Male Plate.

71. *Balciutha versicoloroides* Ghauri

(Fig. 166)

1971. *Balclutha versicoloroides* Ghauri, *Bull. ent. Res.*, **61** : 117.

Vertex with shades of dark and pale markings; each ocellus around by an eyelet, a black spot below each eyelet, with a median whitish marking surrounded by dark fascia; pronotum and scutellum with uniform shades of dark, pale markings; ventrally black; tegminal cells on margin deeply pigmented.



B. versicoloroides (fig. 166). 166. Aedeagus, Style, male plate

Genitalia : Connective Y-shaped (fig. 166) aedeagal shaft broader at base, extremely narrower, tube-like, elongate; style (fig. 166) 3/4th broader basad, mesal apical extension pointed apically, directed laterad; male plate narrow, short, thick, pygofer simple.

Length : 2.7 mm (male), 3.20 mm (female).

Type locality : Simla, India, 30. IX. 79 (C.P.I.R.I.).

Holotype (male), paratype 6 (males), 1 (female) (British Museum).

Comment : *Balclutha versicolor* Vilbaste (1968) with its shape of the genital armature does not differ sharply from *B. versicoloroides*. Ghauri, besides color pigmentation on vertex, therefore, establishment of *B. versicoloroides* Ghauri as separate species remains controversial. The significant point is elucidated here whether the species described by Ghauri (1971) is collected from the inner range of Simla Hills, the part with eternal snow zoogeographically pertains to Palaearctic region.

XXXIV. Genus *Banus* Dist.

1908. *Banus* Dist., *Fauna Brit. India*, 4 : 353.

Type, by original designation, *Banus oblatus* Dist.

Distant 1908. *Fauna Brit. India* 4 : 353.

Yellow, brown color; vertex subconical anteriorly, distinctly concave at base, anterior margin in line with outer margin of each eye projecting over lateral pronotal margin; face twice length of clypeus, pronotum subangularly produced between eyes, posterior margin feebly sinuate; scutellum transversely impressed before apex; tegmina longer than abdomen, broad, large, four apical and three anteapical cells, one fourth from base two angularly united transverse veins posterior tibiae densely spinulate; connective Y-shaped, aedeagus curved, pointed, style with finely pointed apex, male plate subtriangulate; pygofer subquadrate, disc spinulate.

72. *Banus oblatus* Dist.

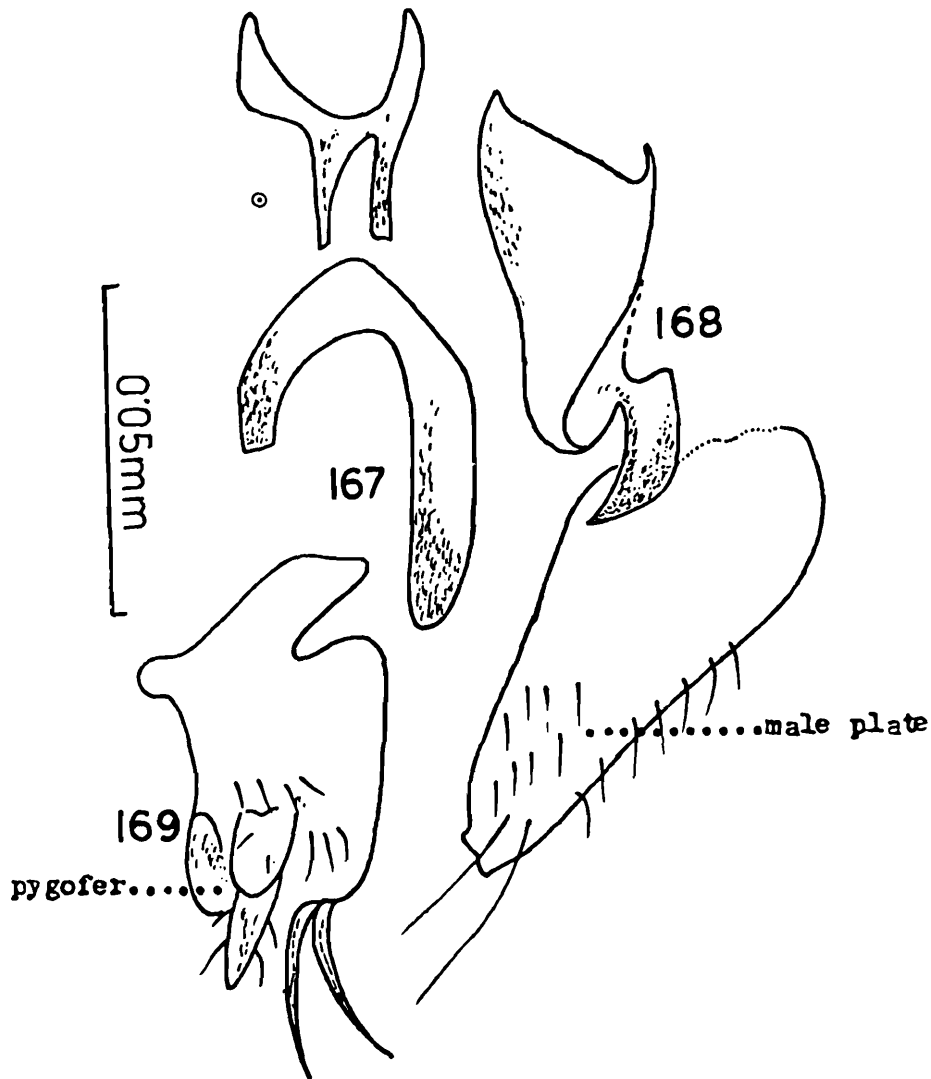
(Figs. 167—169)

1908. *Banus oblatus* Dist., *Fauna Brit. India*, 4 : 353.

Vertex subtriangulate, line with outer margin of each eye, posterior margin deeply emarginate with distinct central suture, surface with blackish spots or lines, general body color with tegmina reddish brown; body shiny;

costal margin beyond middle and apical cells with dark brown patches (male); legs reddish-brown.

Length : 4.50 mm (male), 5 mm (female).



B. oblatius (figs. 167–169). 167. Aedeagus, 168. Style, Male Plate, 169. Pygofer.

Genitalia : Connective Y-shaped, arm short, aedeagal shaft (fig. 167) well-developed, tubular, sharply curvate, apex distinctly narrowed to a pointed process directed cephalad; stylar shaft (fig. 168) broader, mesal apical extension slender, sharply pointed, directed mesally; male plate (fig. 168) subtriangulate, lateral margin multiseriate; pygofer (fig. 169) subquadrate, apex obliquely truncate, mesal margin with a bunch of setae, dark spinulate.

Distribution : Ceylon, Tenasserim, Burma.

XXXV. Genus **Bella** Pruthi

1930. *Bella* Pruthi, *Mem. Ind. Mus.*, **XI** : 44.

Type, by original designation, *Bella apicalis* Singh-Pruthi.

1930. *Bella apicalis* Pruthi, *Mem. Ind. Mus.*, **XI** : 44.

Vertex very long, gradually narrowed to an acute apex, anterior margin slightly deflected, face and vertex demarcated by a distinct line; ocelli at lateral margin; genae large and expanded; pronotum anteriorly angularly produced, posterior margin straight; tegmina broad, not extending tip of abdomen (male, female), appendix hardly developed, veins thick, prominent, 3 antapical and 5 apical cells; legs delicate; aedeagus funnel-shaped, converging distad; style with no distinct preapical lobe, apex rugulose, blunt; pygofer without hook, nodulate on margin; seventh sternite (female) concavus at posterior margin, spinulate.

Comment : This genus bears close semblance to Genera *Viridomarus* Dist., and *Bituitus* Dist., but pattern of pronotum and shape of genital armatures draw it more near to genus *Aconura* Lethierry.

73. **Bella apicalis** Pruthi

(Figs. 170—172)

1930. *Bella apicalis* Pruthi, *Mem. Ind. Mus.* **XI** : 44.

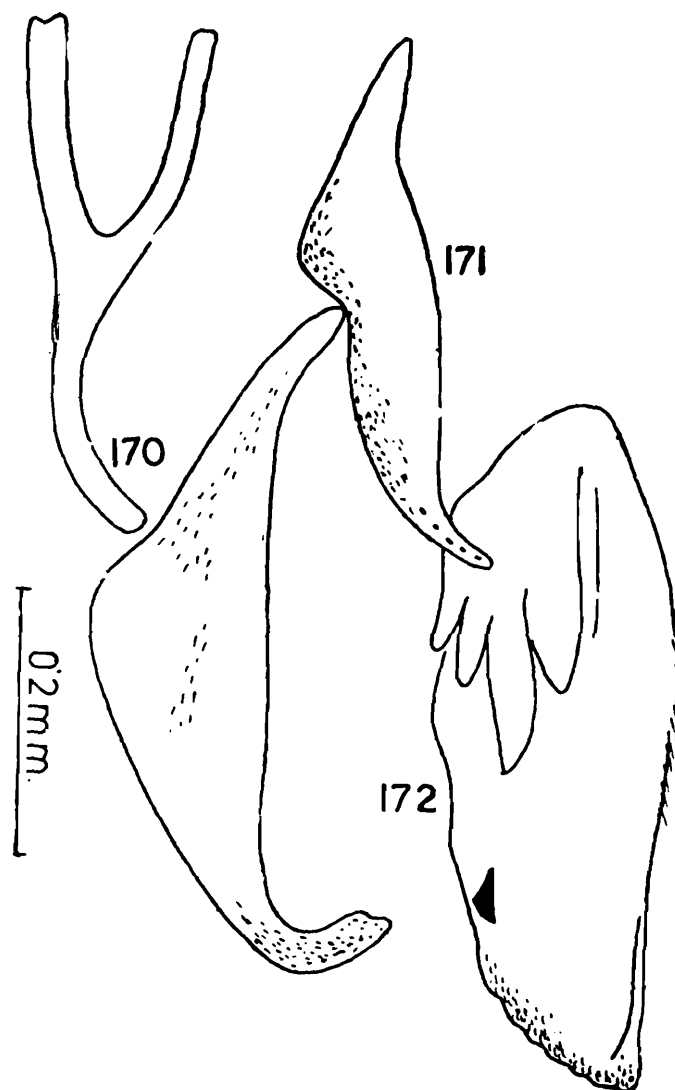
Vertex triangulate, sulcate basad, a black dot at extreme anterior margin, laterally light brown; clypeal region dark brown; tegmina smoky; tibiae dotted black; abdomen black ventrally.

Length : 3.25 mm (male), 5.00 mm (female).

Genitalia : Connective V-shaped, aedeagal shaft (fig. 170) 3/4th broader, rest part abruptly narrowed; style (fig. 171) with slender mesal apical extension, rugulose, apex obtusus, directed laterad; male plate with margins covering apicad; pygofer (fig. 172) distinctly nodulate at posterolateral margin, with a dark structure at lateromedial margin; seventh sternite (female) with posterior margin spined and concavus.

Holotype Nos. : 766-767/H7 (Ind. Mus.), Z.S.I., Calcutta. Dist., South India, 18-23-VIII-1929 (H.S.P.).

Distribution : South India.



B. apicalis (figs. 170-172). 170. Aedeagus, 171. Style, 172. Pygofer.

Morphology : Vertex sharply triangulate, apex blunt, eyes elongate, margin not in line with lateral margin of head; median length of crown three times than interocular width, median suture at base distinct, basal margin truncate, sublateral margin depressus, texture granulated; ocelli placed near eyes at anterior margin; lateral clypeal suture extending upto ocelli, texture granulated, widening out at antennal bases, gradually attenuated, lora and gena demarcated, texture granulated; pronotal width greater than transocular width, texture with fine striations, granulated, posterior margin truncate; scutellum finely foveate; forewing shorter than abdomen, leathery, apical cells very short, inner anteapical cell split into two, central anteapical cell shorter than rest, venational arrangement distinct; hind femoral setal formula : 2:1:0; VIIth sternite (female) deeply notched medially, lateral margin obliquely truncate.

Registered number : 2613/H7 (female), 777/H7 (male), Z.S.I., Calcutta.

XXXVI. Genus **Campbellinella** Dist.

1918. *Campbellinella* Dist., *Fauna Brit. India*, 7 : 69.

Type, by original designation, *Campbellinella illustrata* Dist.

1918. *Campbellinella illustrata* Dist., *Fauna Brit. India*, 7 : 69.

Vertex longer than between eyes, apex produced, laterally carinate, a faint central carina present, eyes extending over lateral pronotal angles; pronotum centrally carinate, posterior margin sinuate; tegmina extending over abdominal tip, three apical and two anteapical cells; posterior tibiae densely spinulate; connective with parallel arms, aedeagal shaft strongly curved; stylar apical extension stout, bluntly pointed; male plate uniseriate; pygofer with hooks.

74. **Campbellinella illustrata** Dist.

(Figs. 173—174)

1918. *Campbellinella illustrata* Dist., *Fauna Brit. Indian*, 7 : 69.

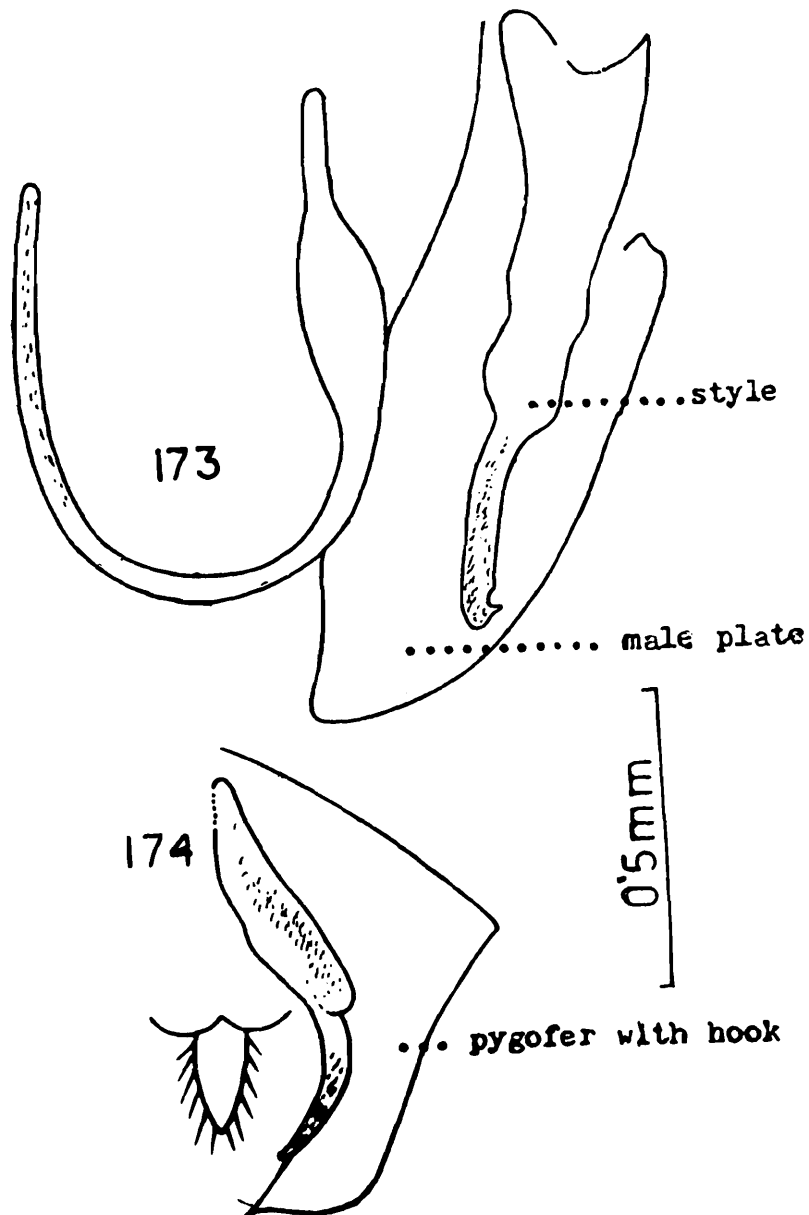
Vertex subacutely produced, longer than width between eyes, laterally carinate, central carina faintly marked; eyes extending over pronotum, centrally carinate; scutellum medially impressed; tegminal veins darker, three apical and two anteapical cells; tarsal claws black, metatibiae spinulate densely.

Length : 6 mm (male), 7 mm (female).

Genitalia : Aedeagal shaft (fig. 173) elongate, slender strongly curve cephalad, broader basad otherwise tubular-shaped; stylar shaft (fig. 173) 3/4th twisted, stout, apex subtruncate; male plate subtriangulate beyond middle, uniseriate laterally; pygofer hook as figured (fig. 174), arising ventrally.

Distribution : South India, Madras.

Morphology : Vertex triangulate at anterior margin, apex blunt, outer margin of eyes not in line with lateral margin of crown, basal half of crown appears constrictus due to closeness of interocular width; eyes covering more than half of lateral margin; median length of crown twice interocular width, clypeus subtriangulate, flat as clypellus, rectangulate; ocelli located on extreme inner angle of each eye, contiguous; lateral clypeal suture extending upto ocelli, texture granulated; pronotal width greater than transocular width, posterior margin concave, texture rugulose; scutellar surface with a trans-



C. illustrata (figs. 173-174). 173. Aedeagus, Style, Male Plate, 174. Pygofer.

verse depression; forewing semitransparent; VIIth sternite (female) deeply emarginate at posterior margin, lateral lobe elongated, directed posteriorly; hind femoral setal formula : 2:1:0.

Registered number : 5557/H7 (male), 280/H7 (female), (Ind. Mus.), Calcutta.

XXXVII. Genus *Chlorotettix* Van Duzee

1892. *Chlorotettix* Van Duzee, *Psyche*, 6 306.

Type, by original designation, *Bythoscopus unicolor* Van Duzee.

1892. *Bythoscopus unicolor* Van Duzee, *Psyche*, 6 : 306.

Color green, brown or pale red head wider than pronotum, anterior margin rounded, crown short, median length slightly greater than length next to each eye; pronotum marginally carinate; forewing with a distinct appendix, connective Y-shaped, aedeagus with well-developed basal apodeme and terminal processes; gonopore terminal, sometimes subapical; style modified in various shapes; male plate with spine-like setae on outer margin; pygofer with spine or hook; seventh sternite (female) at postero-medially usually notched.

Female :

75. *Chlorotettix maculatus* Singh-Pruthi

Singh-Pruthi 1936, *Mem. Ind. Mus.*, **11** : 118.

Body ventrally green; vertex basally smooth, greenish yellow; face at upper part raised, lower part flat; frons laterally obliquely stripped; pronotum globose, dark green, anterior margin pale yellowish; tegmina green, apices dark brown, mottled with minute black spots and large clear spots and areas, four apical and three anteapical cells; seventh sternite obliquely truncate at postero-laterally, feebly notched medially.

Length : 7.50 mm.

Holotype No. 5410/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Pusa, Bihar, India.

XXXVIII. Genus *Cicadula* Zetterstedt

1840. *Cicadula* Zetterstedt, *Insecta Lappoinica*, **I** : 296.

Type, by subsequent designation, *Cicada quadrinotata* Fabr.

1794. *Cicada quadrinotata* Fabr., *Entomologia Systematica*, **4** : 43.

Color yellow or green with black band or spots on anterior margin of crown; head wider than pronotum; vertex bluntly angulate; ocelli on anterior margin of head; pronotum without carina; tegmina elongate, slender, venation normal, well-developed appendix, three anteapical cells, four apical cells; connective Y-shaped, arm linear, rod-shaped; aedeagal base wider, shaft attenuate, recurved strongly or sometimes split up into long processes; style usually sparrow-shaped distad, heavily sclerotised; male plate with spine-like setae, uniseriate, marginal setae finer or filamentous; pygofer without hook; tenth segment inverted trough-like; seventh sternite (female) concavus on posterior margin.

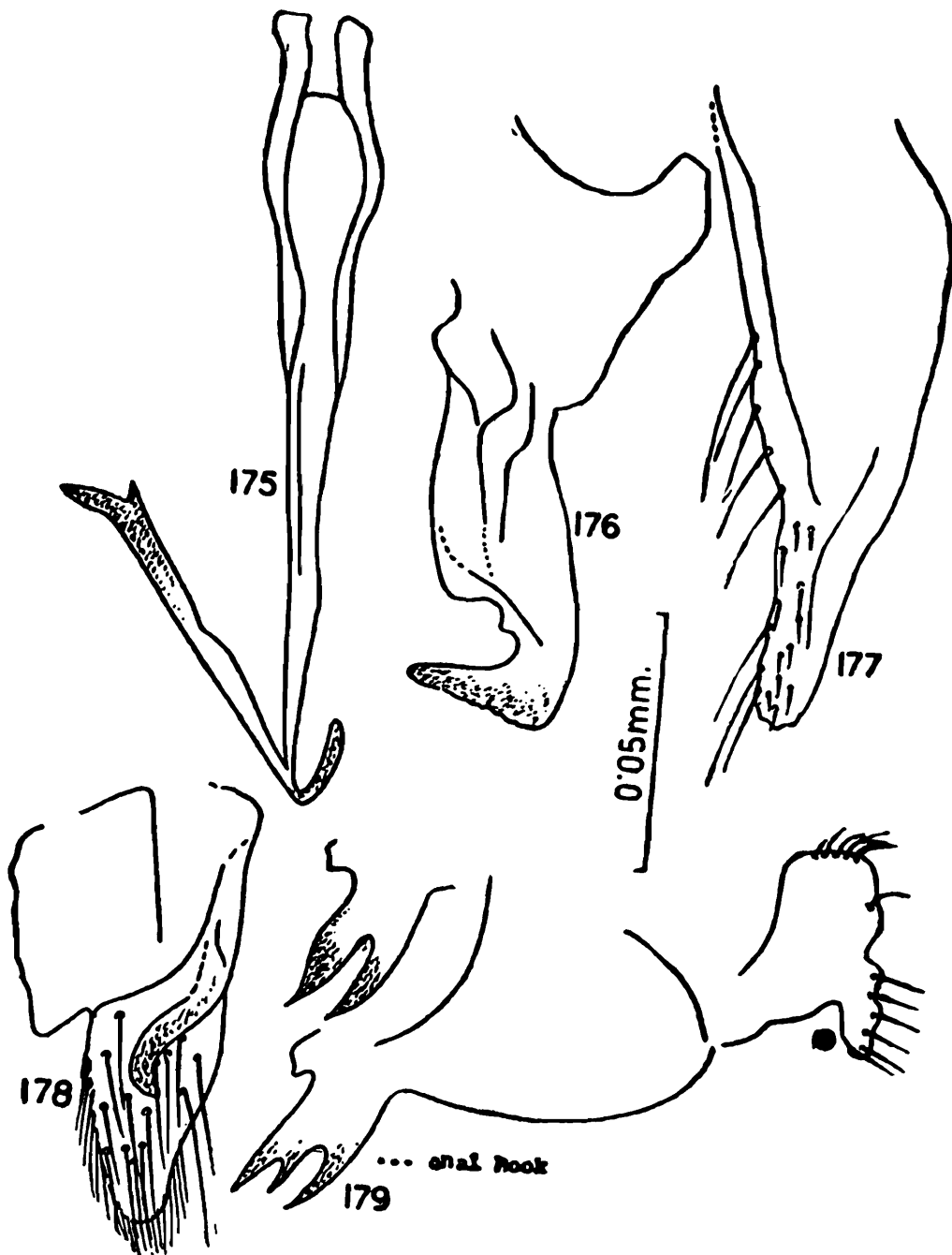
76. *Cicadula bipunctata* Pruthi

(Figs. 175—179)

1930. *Cicadula bipunctata* Pruthi, *Mem. Indian Mus.*, **II** : 59-60.

Vertex binotate on lateromedial margin, apex triangulate; antennal bases marked black; pronotum brownish yellow; scutellum close to each angle with a large brown spot; tegmina sub-hyaline; brownish; abdomen dorsally black.

Length : 2.50 mm (male) 3 mm (female).



Cicadula bipunctata (figs. 175-179).

175. Aedeagus, 176. Style, 177. Male Plate, 178. Pygofer, 179. Anal hook.

Genitalia : Aedeagal shaft (fig. 175) cylindrate, elongate, with a pair of asymmetrical terminal processes, longer one slightly bifid, directed cephalad; style with mesal apical extension (fig. 176) 3/4th broader basad, rest slightly scooped subapically, apex foot-like; male plate (fig. 177) abruptly narrowed apical third, lateral margin setose; pygofer (fig. 178) with a structure reaching half the length, arising postero-laterally; anal hook (fig. 179) deeply bifurcate as figured.

Holotype, male, 1047/H7, allotype, female, 1048/H7 (Zoological Survey of India), Calcutta.

Type locality : Sarai, Rewa State, M.P., 19. 11. 27 (H.S.P.).

Morphology : Median length of crown as interocular width, posterior margin arcuate, outer margin of eyes in line with lateral margin of head, anterior margin triangulate, apex blunt, texture granulated; clypeus and clypellus convex; ocelli placed middle of ocello-ocular space on lateral clypeal suture; pronotal width same as transocular width, texture with fine striations; scutellum depressed medially; VIIth sternite (female) subtruncate, lateral margin oblique; forewing with developed appendix, 3 apical and 2 anteapical cells, inner antiapical shorter than outer one; hind femoral setal formula : 2:1:1.

Registered number : 3184/H7 (male), 3182/H7 (female), (Ind. Mus.), Calcutta.

77. *Cicadula fletcheri* Pruthi

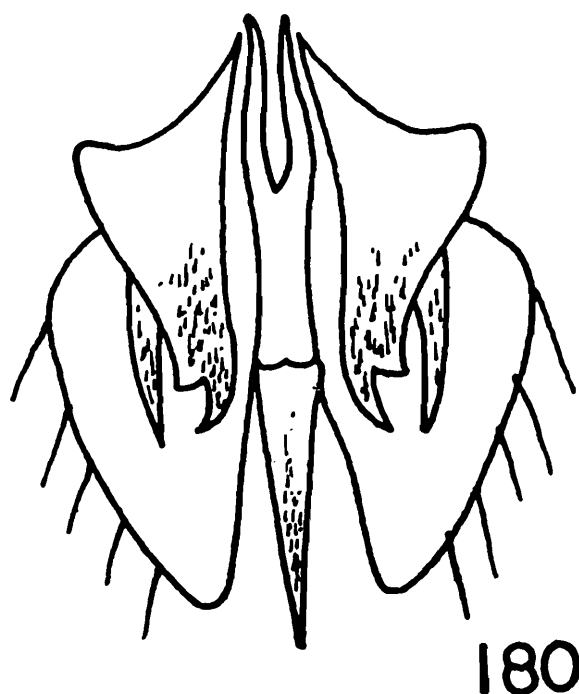
(Fig. 180)

1930. *Cicadula fletcheri* Pruthi, *Mem. Ind. Mus.*, 11 : 60.

Vertex dark fuscous distad, a piceous marking between each eye; face and clypeus dark; antennal base marked black; tegmina dark brown mediad; abdomen black.

Length : 4.5 mm (male), 4.75 (female).

Genitalia : Connective Y-shaped, arms elongate, aedeagal shaft (fig. 180) tubular, convergent to pointed apex; stylar shaft (fig. 180) with distinct preapical lobe, mesal apical extension smooth curved.



0.2 mm

C. fletcheri (fig. 180).

180. Aedeagus, Style, Male Plate.

Holotype (male) and allotype (female) Nos. : 1044-1056/H7, (Z.S.I.), Calcutta; type locality, Kodaikanal (7,000'), Madras).

Distribution : South India.

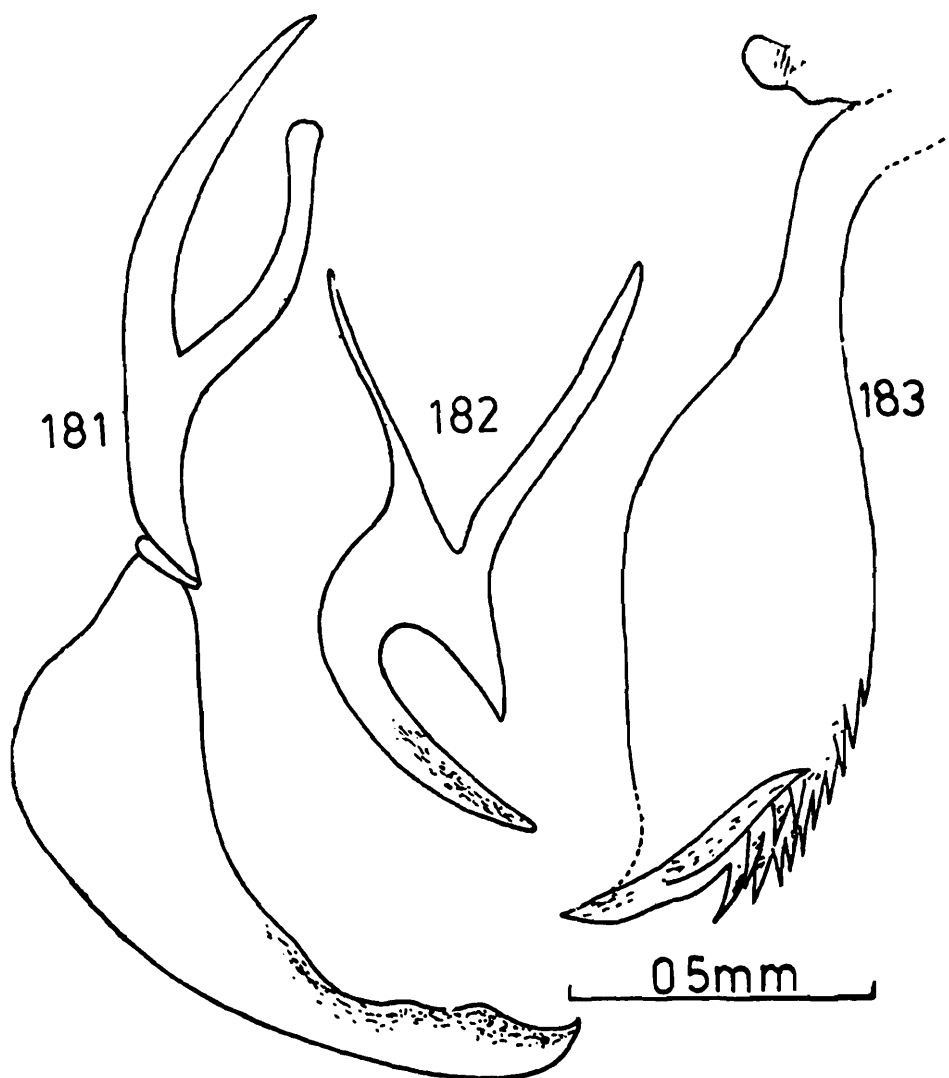
78. *Cicadula indica* Pruthi
(Figs. 181—183)

1930. *Cicadula indica* Pruthi, *Mem. Ind. Mus.*, **II** : 54.

Vertex paler; face fasciate; pronotum and scutellum greenish; thoracic sterna black; tegmina transparent; abdomen black.

Length : 3 mm (male).

Genitalia : Aedeagal shaft (fig. 181) robust, arch-shaped laterad, tubular; lengthwise, margin infolded, subapically sinuate; style (fig. 182) with mesal apical extension well-developed, laterally curvate, sharply attenuate, outer lobe prominent, slightly shorter; male plate converging apicad; pygofer (fig. 183) distinctly spinulate at lateral margin, hook shorter, arising laterocaudad.



Cicadula indica (figs. 181-183).

181. Aedeagus, 182. Style, 183. Pygofer.

Holotypes : 920-921/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Bengal, Punjab, Central Province, Madras, E. Himalayas.

Economic status : The species was trapped along with viruliferous insects on sticky paper exposed to sandal forest during investigation of spike disease on sandal trees. (Chatterjee 1939 : 22), its viral characters are not yet ascertained by any entomologist.

79. *Cicadula indrina* Pruthi

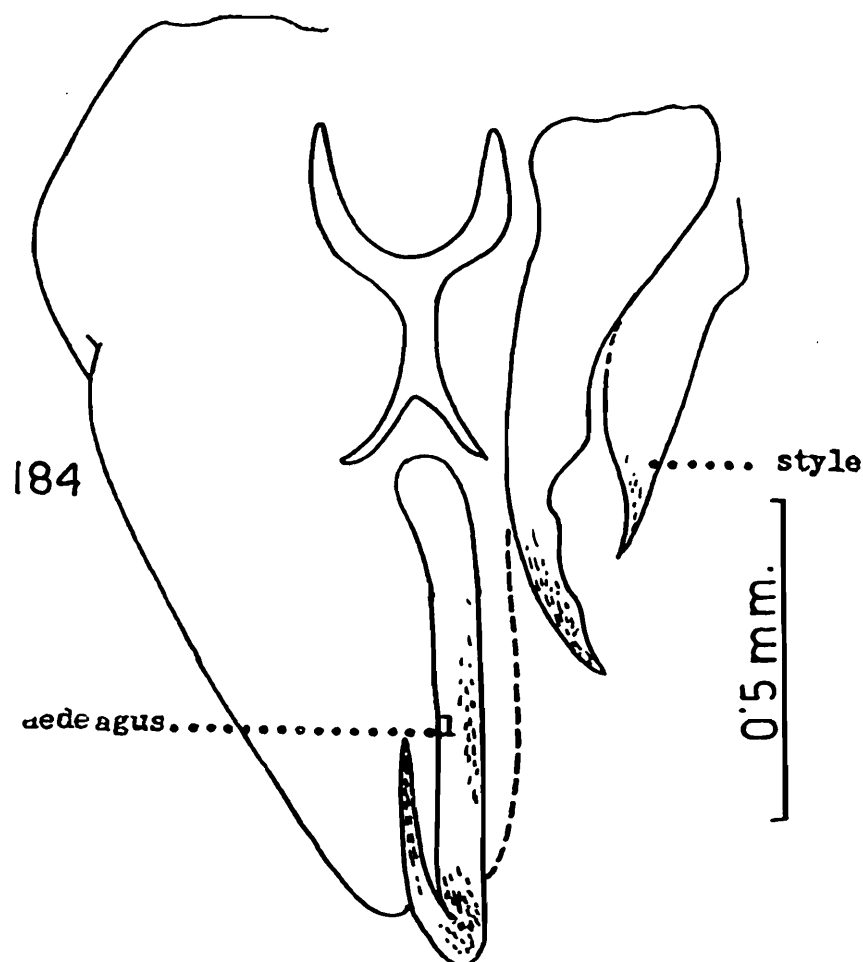
(Fig. 184)

1930. *Cicadula indrina* Pruthi, *Mem. Ind. Mus.*, **XI** : 61-62.

Vertex brownish yellow, binotate basad, apex with a pair of black markings, medially with red stripes, notum with black patches; scutellum

greenish yellow, medially impressed, tegmen pale yellow ; abdomen dorsally black.

Length : 3.25 mm (male).



Cicadula indrina (fig. 184).

184. Aedeagus, Male Plate, Style.

Genitalia : Aedeagus (fig. 184) cylindrical, extreme tip feebly notched, a pair of terminal processes directed cephalad ; style (fig. 184) broader beyond middle, mesal apical extension abruptly narrowed, apex truncate obliquely ; male plate (fig. 184) gradually connivent ; pygofer simple ; seventh sternite (female) with posterior margin emarginate.

Holotype : 1058/H7 (male), allotype, 1059/H7 (female), Zoological Survey of India, Calcutta,

Type locality : Chamba (3,000'), May, 1927 (S. L. Hora).

Distribution : Punjab, Kashmir.

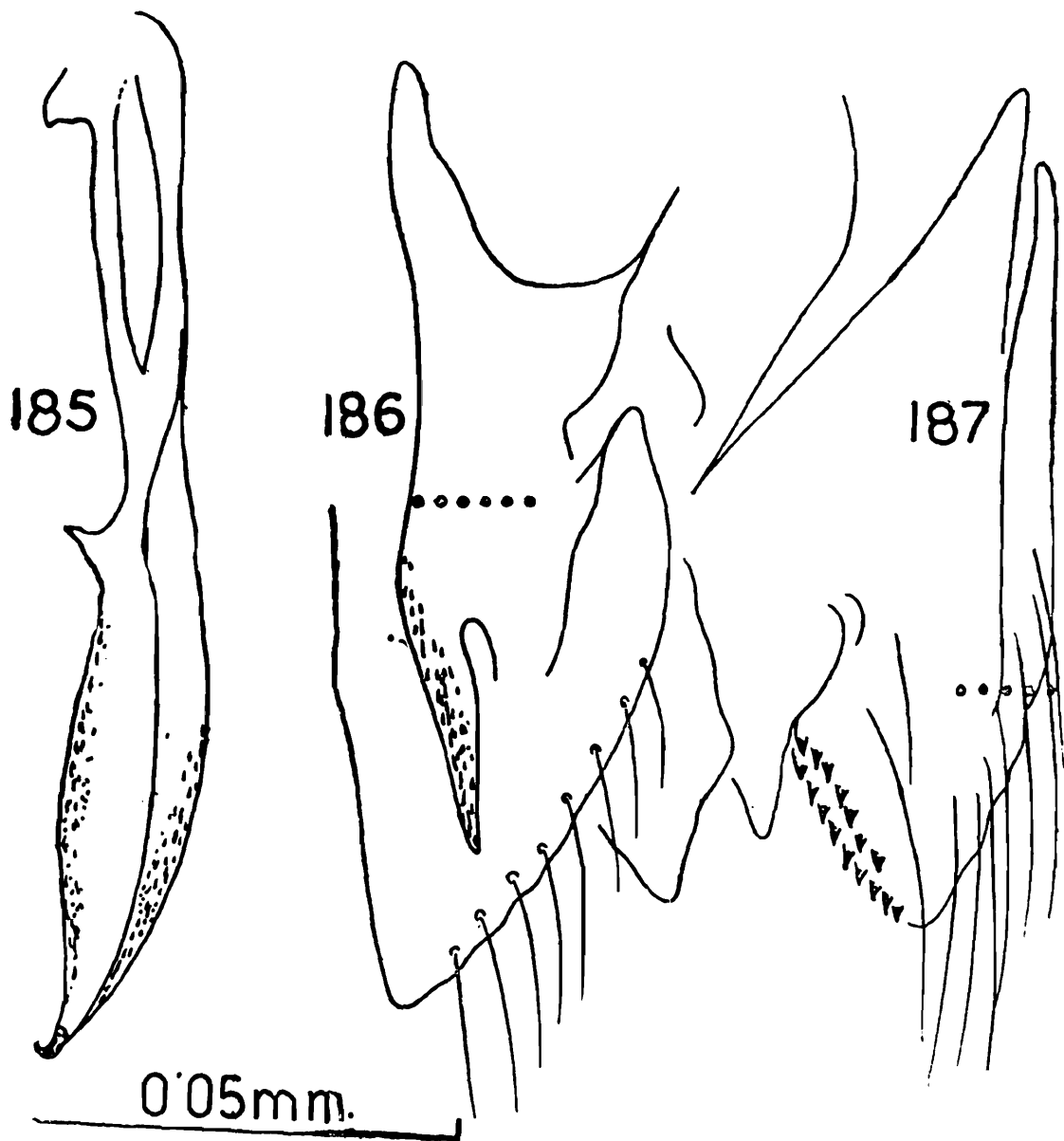
80. *Cicadula maculata* Pruthi

(Figs. 185—187)

1930. *Cicadula maculata* Pruthi, *Mem. Ind. Mus*, **XI** : 58.

Vertex binotate near apex; antennal bases with black patches; pronotum with piceous patches anteriorly; scutellar angle spotted; tegmina pale brown color, wings dark grey; abdomen black (male), dark brown (female).

Length : 3.25 mm (male), 3.50 mm (female).



C. maculata (figs. 185—187).

185. Aedeagus, 186. Style, male plate, 187. Pygofer.

Genitalia : Connective Y-shaped; aedeagal shaft (fig. 185) with a pair of fine terminal processes, hook-shaped, medially swollen, apically connivent; style with linear mesal apical extension (fig. 186); male plate simple (fig. 186); pygofer spined at margin (fig. 187).

Holotype : 1009/H7 (male), allotype 1010/H7 (female), Zoological Survey of India, Calcutta.

Type locality : Gangtok (6,000'), Sikkim (H.S.P.).

Economic status : The relation of the species to spread spike disease of sandal wood at Dehra Dun is not yet recorded.

Morphology : Anterior margin of crown semicircular, in line with outer margin of each eye, median length of crown as interocular width, suture distinct; ocelli placed at anterior extremity, close to each eye; clypeus convex, transclypeal suture demarcated with reddish brown depression, lateral clypeal suture with dark pigmentation, muscular impression obsolete; pronotal width same as transocular width, posterolaterally obliquely truncate; scutellum with a series of transverse impressions; texture of crown pronotum glabrous; posterior femoral formula : 2 : 1 : 1; forewing shorter than abdomen, appendix a narrow strip, 4 apical, 3 anteapical cells, veins elevated; seventh sternite (female) at posterior margin notched medially; pygofer uniseriate along mesal margin, setose beyond middle.

81. *Cicadula montana* (Dist.)

(Figs. 188—190)

1908. *Deltocephalus montanus* Dist., *Fauna Brit. India*, 4 : 384

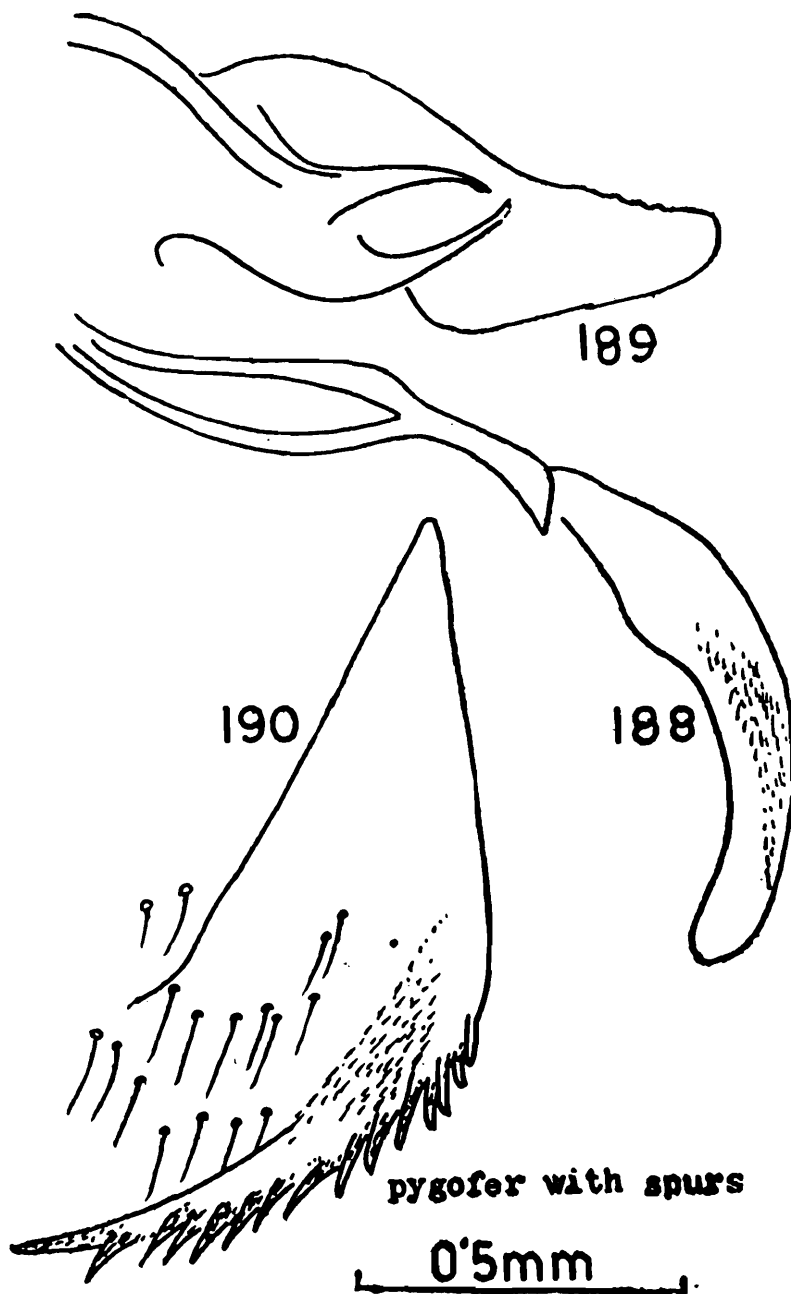
Vertex brownish yellow with a transverse band, dark color at middle, a pair of spots at base; pronotum with a series of dark brown spots at anterior margin; scutellum with two spots, impressed medially; tegmina subhyaline, veins brown; legs with black patches; abdomen black.

Length : 2 mm (male), 3 mm (female).

Genitalia : Connective Y-shaped, arms anteriorly approximate each other, aedeagal shaft (fig. 188) conspicuous, broader basad, gradually recurved, cylindrical, apex obtuse; style (fig. 189) with well-developed preapical

lobe, apex spanner-shaped, attenuate; male plate (fig. 189) with concave lateral margin, connivent gradually; pygofer (fig. 190) densely spined distally, apex with a stout spur; seventh sternite (female) sinuate at posterior margin.

Distribution : Punjab, Assam, India.



Cicadula montana (figs. 188-190).

188. Aedeagus, 189 Style, Male Plate, 190, Pygofer.

XXXIX. Genus *Circulifer* Zachvatkin

1935. *Circulifer* Zachvatkin, *Wiss. Ber. Moskauer Staatsuniv.*, 4 : 111.

Type, by original designation, *Jassus haematocephus* Mulsant & Rey.

1855. *Jassus haematocephus* Mulsant & Ray, *Ann. Linn. Soc. Lyon.*, 2(2) : 229.

Color stramineous to olive brown with fuscous blotches; vertex round anteriorly, short, broad; pronotum anteriorly convex, scutellum medially transversely impressed; appendix well-developed, outer apical cell either elongate, ovate in shape, central anteapical cell constrictus mediad, apical cells short; connective Y-shaped, divergent at point of union with aedeagus; aedeagal shaft stout, tapering apicad, a pair of terminal processes placed on horizontal plane forming a circular loop, sometimes tip over-lapping; gonopore, paired, each at apex of terminal process; stylar extension developed, tapering apicad; male uniseriate, spine-like setae; tenth segment with a broad, sclerotised distal band; pygofer with a hook on caudoventral submargin; seventh segment (female) sinuate along posterior margin, medially emarginate deeply.

82. *Circulifer nausharensis* (Pruthi)

(Figs. 191—195)

1936. *Circulifer nausharensis* Pruthi, *Mem. Indi. Mus.*, **XI** : 113.

Vertex greenish yellow, sulcate medially; frons centrally white, laterally brown; pronotum, scutellum greenish; tegmina with irregular patches.

Length : 3.2 mm (male), 3.75 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 191) with a pair of fine terminal processes, nicked at base, medially swollen, connivent distad, directed cephalad; style (fig. 193) geniculate, converging distad; plate (fig. 192) simple; pygofer (fig. 194) with a long, arched hook; seventh sternite (female) posteriorly wavy (fig. 195).

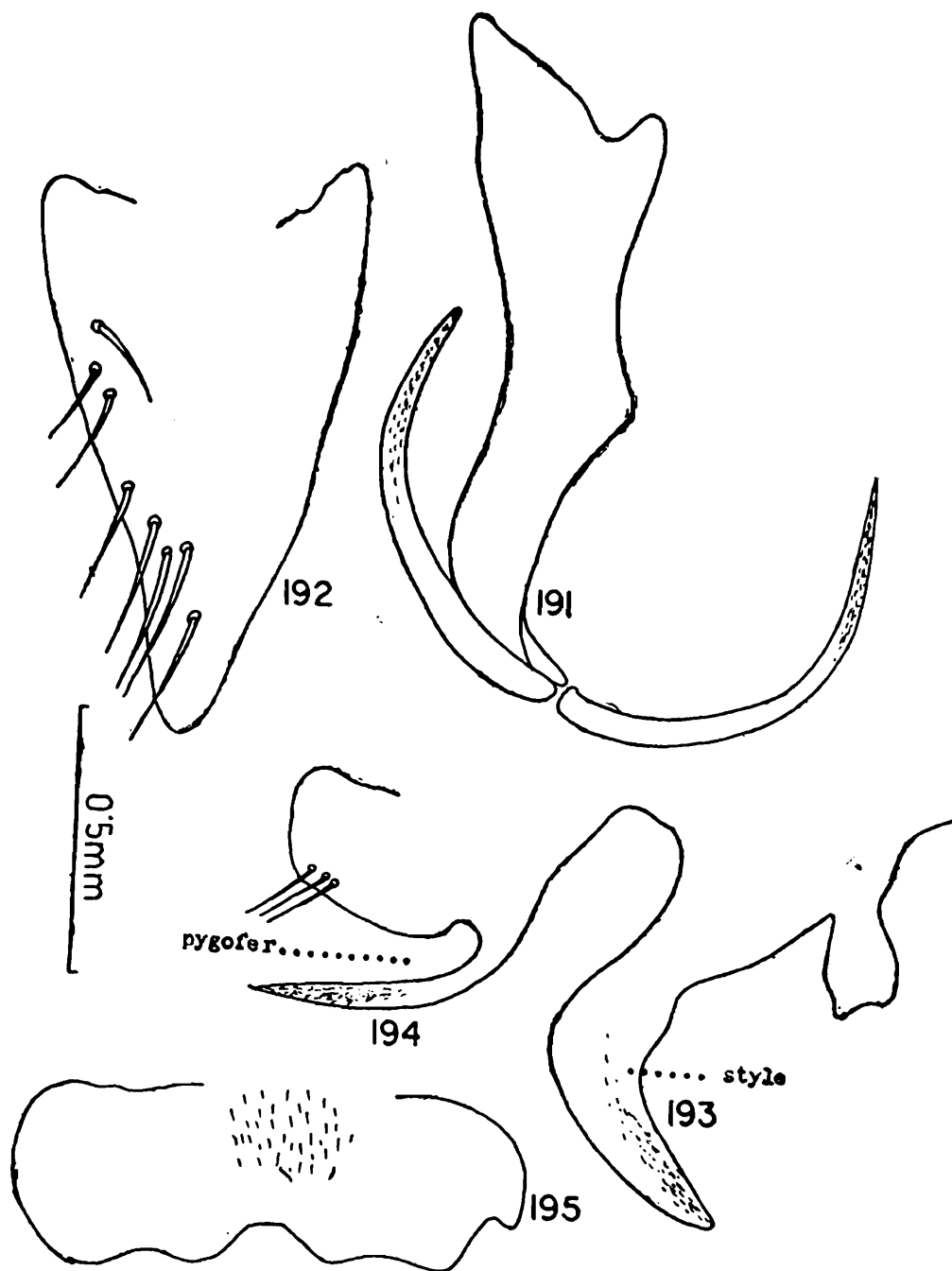
Holotype, male, 1009/H7, allotype, female, 1010/H7, Zoological Survey of India, Calcutta.

Distribution : Eastern Himalayas.

Economic status : It is reported that the species occurs with the vectors but its relation to spike disease of sandal wood, Dehra Dun. is not recorded.

Morphology : Anterior margin of crown semicircular, in line with outer margin of each eye, median length of crown same as interocular width, suture distinct; ocelli placed at anterior extremity, close to each eye; clypeus con-

vex, transclypeal suture demarcated with reddish brown depression; lateral clypeal suture with dark pigmentation, muscular impression obsolete; pronotal width same as transocular width, posterolaterally obliquely truncate; scutellum with a series of transverse impressions; texture of crown and pronotum glabrous; posterior femoral setal formula : 2:1:1; forewing shorter than abdomen, appendix a narrow strip, four apical and three anteapical cells, veins elevated; seventh sternite (female) at posterior margin distinctly nicked medially.



Circulifer nausharens (figs. 191-195).

191. Aedeagus, 192. Male plate, 193. Style, 194. Pygofer hook, 195. Seventh sternite

XL. Genus **Deltocephalus** Burmeister

1838. *Deltocephalus* Burmeister, *Genera Insectorum*, I : 15.

Type, by subsequent designation, *Cicada pulicaris* Fallen.

1806. *Cicada pulicaris* Fallen, *Svenska Vet. Akad. Hya Handl.*, 27 : 21.

Small, frequently robust leafhoppers; vertex pointed or obtusely produced, never carinate; face hexagonal; pronotum wider than longer; tegmina rounded off posteriorly, veins usually bordered brown to black; three ante-apical cells, central one usually divided, inner one basally closed, a transverse vein extending from claval vein to claval suture; connective linear, short, fused with aedeagal base, aedeagal shaft may be funnel-shaped, sharply curved, cylindrate with sharp apex, gonopore terminal, dorsal apodeme strap-like; stylar process may be foot-like, narrowed and pointed; male plate uniseriate on outer margin, triangulate distally, may be truncate at apex; pygofer setose; seventh sternite (female) may be concave or rounded at posterior margin.

83. ***Deltocephalus campbelli*** Dist.

(Figs. 196—197)

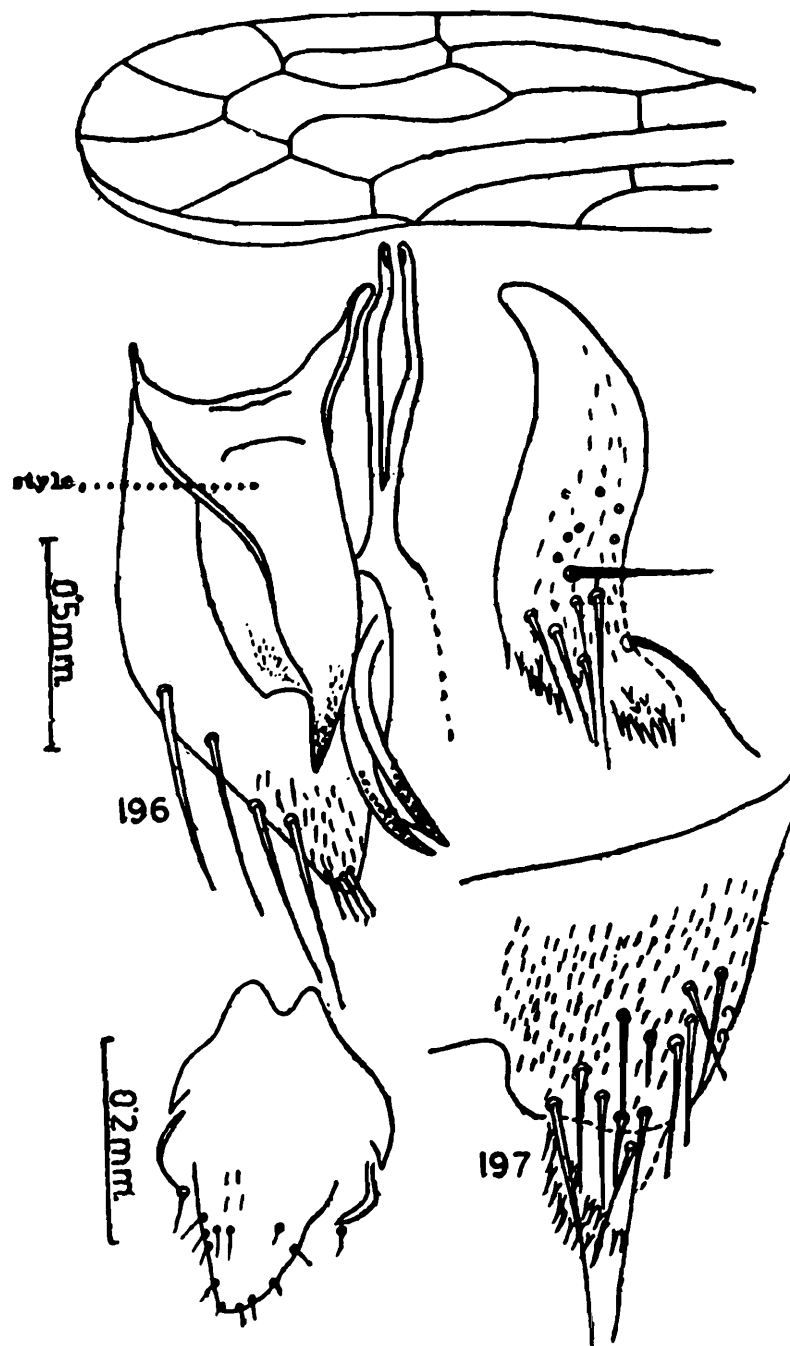
1918. *Deltocephalus campbelli* Dist., *Fauna Brit. India*, 7 : 52.

Vertex pale yellow, anterior margin maculose; pronotum greyish, anteriorly furnished with tubercles; tegmina pale; tibiae and tarsi spotted.

Length : 3 mm (male).

Genitalia : Connective V-shaped, aedeagus (fig. 196) compressus dorso-ventrally; apex sharply pointed, three basal processes, pointed, directed caudad; style (fig. 196) with mesal apical extension, short, converging distad; male plate (fig. 196) at lateral margin uniseriate, disc spinulate, apex with a fine set of setae; pygofer (197) at posterior margin setose, laterally spined.

Distribution : South India, Kodaikanal, Chikkaballapura.



Deltocephalus campbelli (figs. 196-197).

196. Aedeagus, Style, Male plate, 197. Pygofer.

84. *Deltocephalus deletus* (Dist.)
(Figs. 198—199)

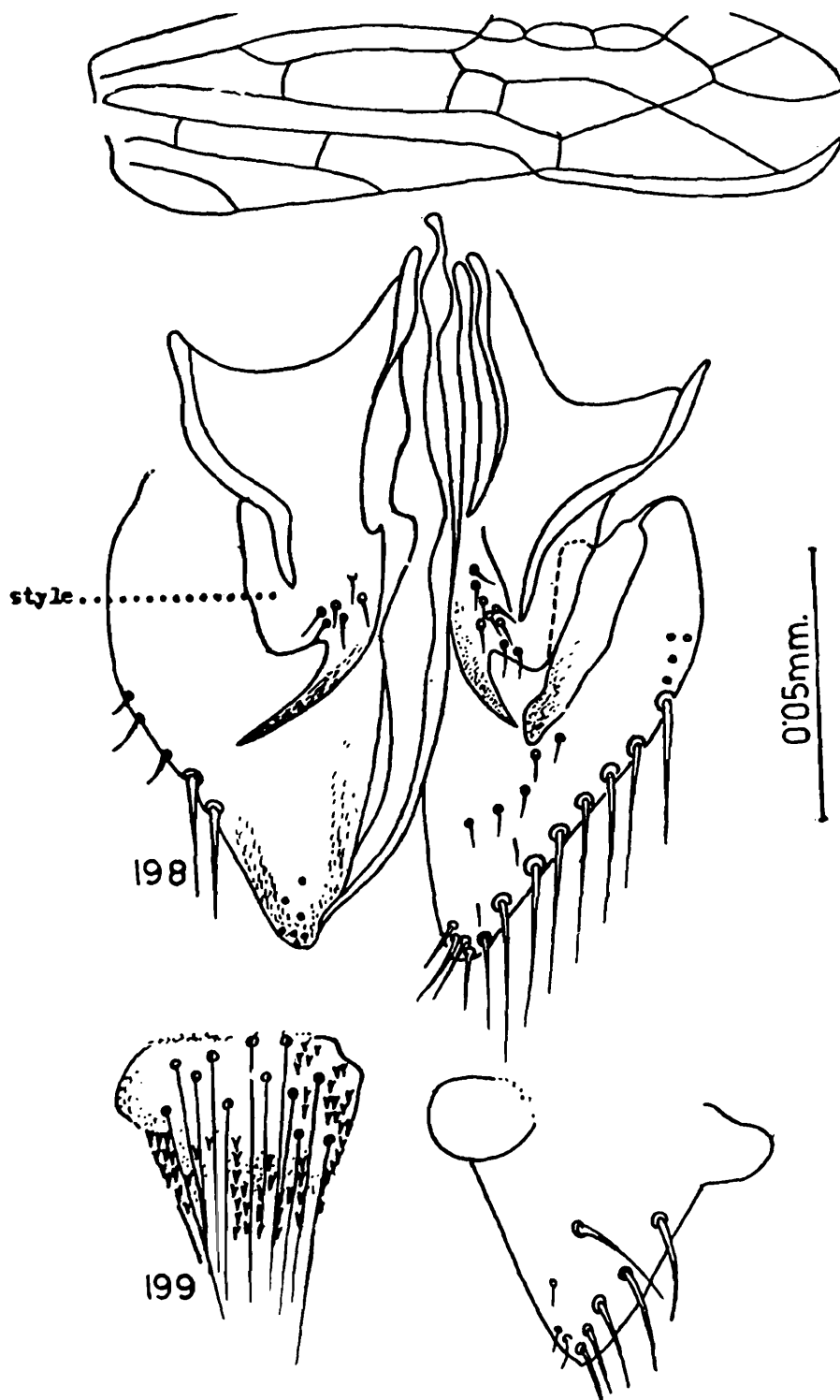
1924. *Deltocephalus deletus* Baker, Phil. J. Sci., 24 : 367.

1908. *Deltocephalus thoracicus* Dist., Fauna Brit. India, 4 : 385.

Vertex with darker shades between eyes, tetra-notate ; pronotum fuscous,

striate, sometimes coalescent ; scutellum with an inverted T-shaped red mark ; tegmina with dark brown shades inside cells ; abdomen dorsally black.

Length : 1.5 mm (male).



Deliocephalus deletus (figs. 198-199).

198. Aedeagus, Style, Male plate, 199. Pygofer.

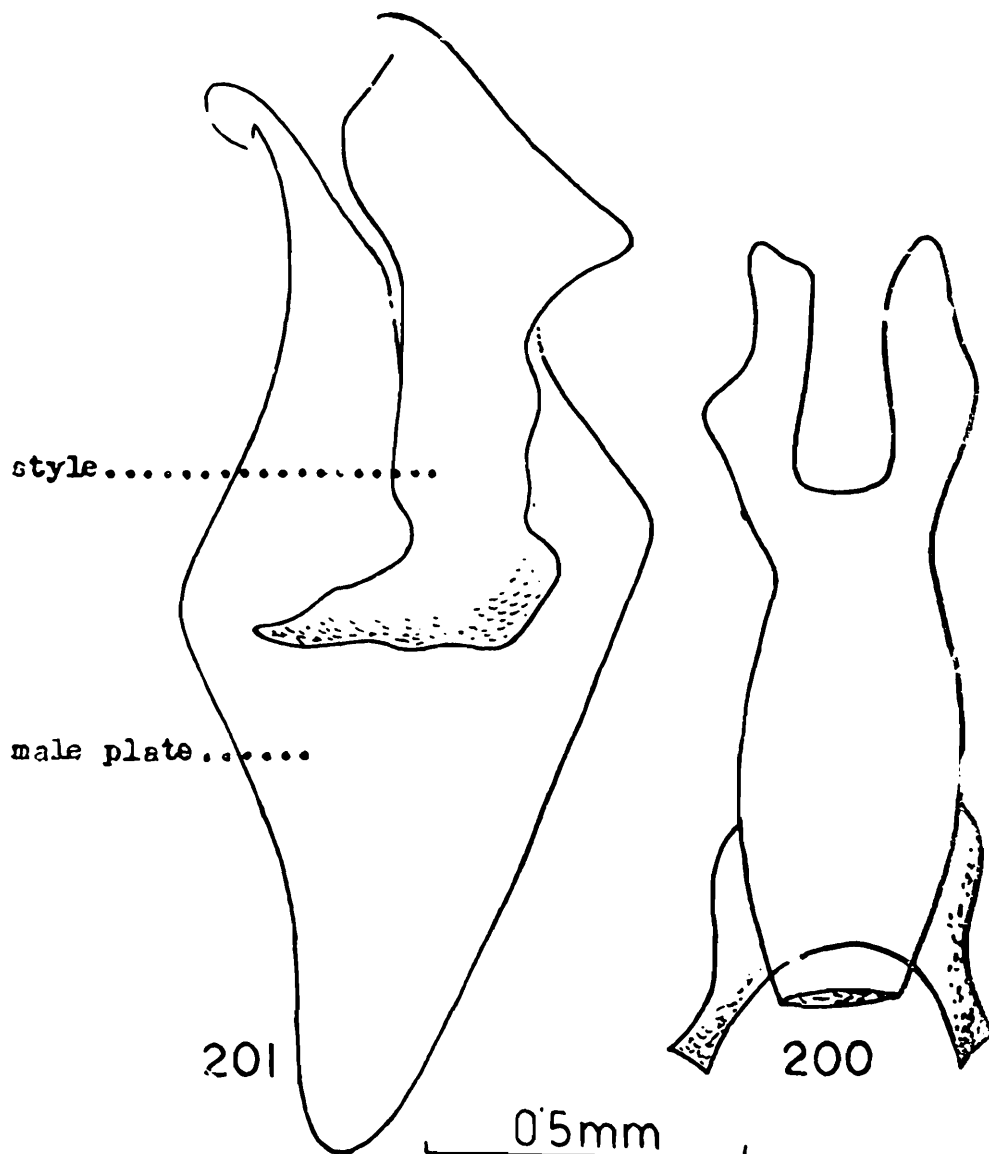
Genitalia : Connective Y-shaped, stem elongate, aedeagal shaft (fig. 198) slightly arcuate laterad, lengthwise sulcate, apex sharply pointed, sinuate; stylar shaft (fig. 198) sharply pointed, pre-apical lobe not well-developed; male plate (fig. 198) laterally attenuate, uniseriate, disk spinulate; pygofer uniseriate, disk spinulate; pygofer (fig. 199 at apical half densely spined, setose, VIIth sternite (female) concavus at posterior margin.

Distribution : Peshok (2,600), North Bengal, Mariambari Tea Estate, Assam, Nalamalai Hills, South India.

85. *Deltocephalus gopii* Pruthi

(Figs. 200—201)

1936. *Deltocephalus gopii* Pruthi, *Mem. Ind. Mus.*, **11** : 127.



Deltocephalus gopii (figs. 200-201).

200. Aedeagus, 201. Style, Male plate.

Body brown, ventrally black (male) ; vertex with a dark spot on each side of sulcus at base ; face black (male), dark brown (female) clypeal apex black ; pronotum with an arcuate stripe anteriorly ; scutellum binotate in front of an impression before middle ; tegmina brown, veins intercepted with black pigments ; legs mottled with dark patches.

Length : 3.0 mm (male), 3.70 mm (female).

Genitalia : Aedeagal shaft (fig. 200) funnel-shaped, basal strut well-developed, covering shaft on each side by semicircular fashion ; stylar shaft (fig. 201) stout, robust, apex truncate, foot-like ; male plate (fig. 201) beyond middle smoothly convergent.

Holotype (male) and allotype (female) Nos. : 5419-5420/H7, Z.S.I., Calcutta.

Type locality : Kuldana, Muree Hills, East Punjab (H.S.F.), 1930.

Distribution : N. W. Himalayas.

86. *Deltocephalus infirmus* Melichar
(Figs. 202—203)

1903. *Deltocephalus infirmus* Melichar, *Hemiptera Fauna von Ceylon* p. 203.

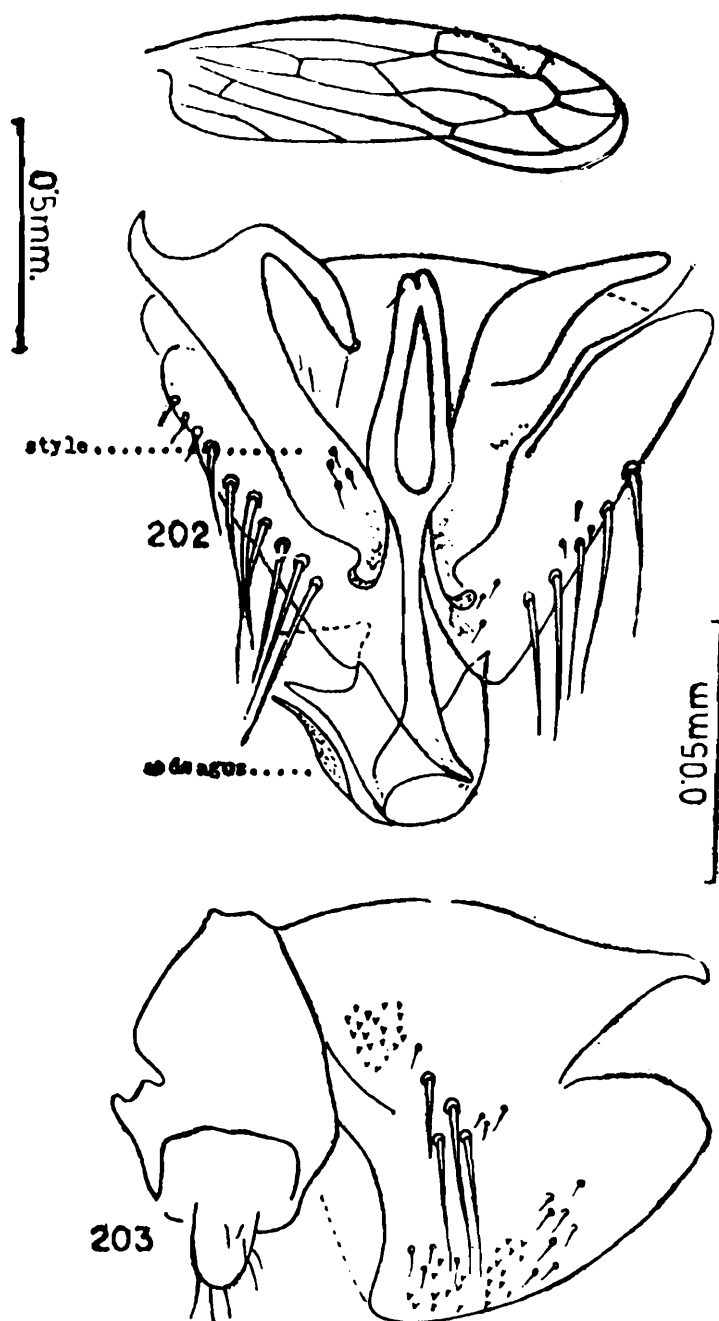
Vertex maculose ; pronotum castaneous, tetrastriate ; scutellum striate, each basal angle with a spot ; tegminal veins distinct.

Length : 3.0 mm (male).

Genitalia : Aedeagal shaft complex as figured (fig. 202) ; stylar shaft uniform lengthwise, mesal apical extension very short, corniform, curved, preapical lobe not prominent (fig. 202) ; male plate (fig. 202) at posterior margin with sparse, fine setae, uniseriate laterally ; pygofer (fig. 203) deeply notched laterobasally, sparsely spinulate, without hook.

Distribution : Simla Hills (6,000'), Pusa, Ramporehat ; Almorah (5,500'), U.P., India, Ceylon, Madras, Punjab, Christmas Island.

Remark : Metcalf (1962) renders the possibility of re-studying the species on an abrupt spread over the vast stretch of areas of South and South East Asian countries and Christmas island in Indian ocean.



Deltocephalus infirmus (figs. 202-203).

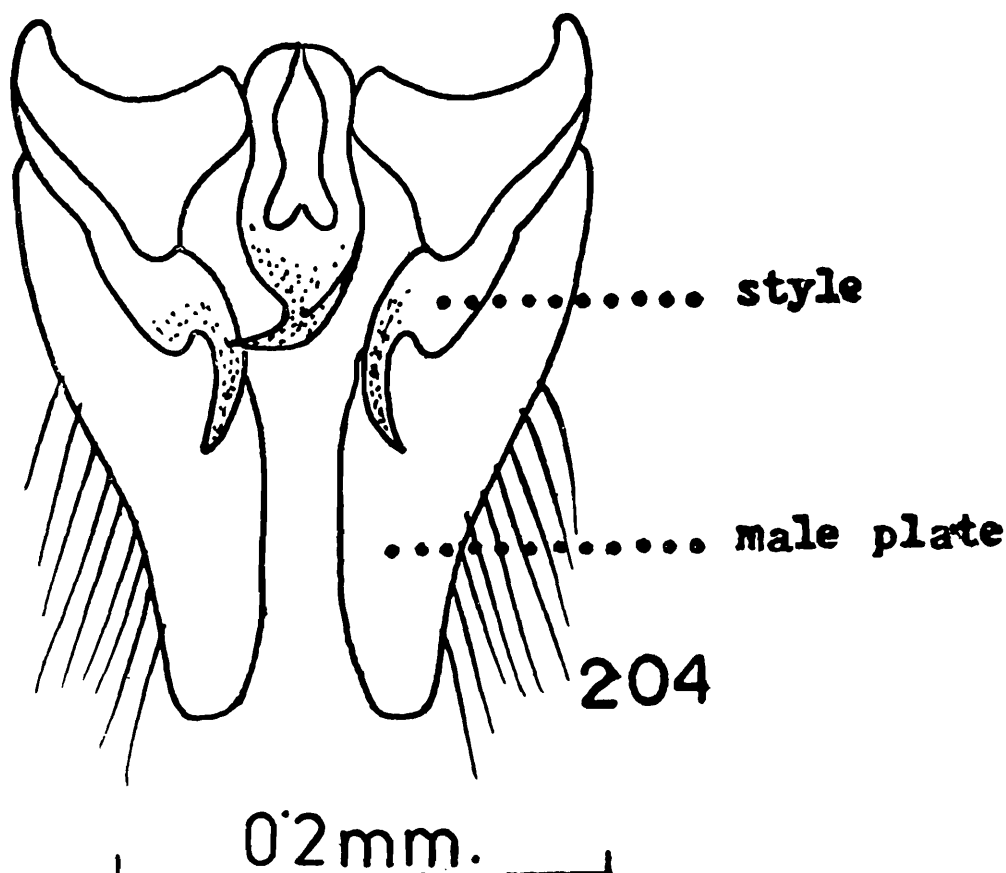
202. Acceagus, Style, Male plate, 203. Pygofer.

87. *Deltocephalus mota* Pruthi

(Fig. 204)

1936. *Deltocephalus mota* Pruthi, *Mem. Ind. Mus.*, **11** : 126.

Vertex pale; pronotum with dark, arcuate, irregular stripe at anterior margin; scutellum with a pair of spots at margin; tegmina dark brown; body piceous.



Deltocephalus mota (fig. 204).

204. Aedeagus, Style, Male plate.

Length : 3.5 mm (male), 4.0 mm (female).

Genitalia : Aedeagal shaft (fig. 204) dorsoventrally compressus, elongate, apex truncate; stylar shaft (fig. 204) with a simple mesal apical extension; male plate (fig. 204) robust, apex truncate.

Holotype (male) and allotype (female) Nos. 5417-5418/H7, Z.S.I. Calcutta.

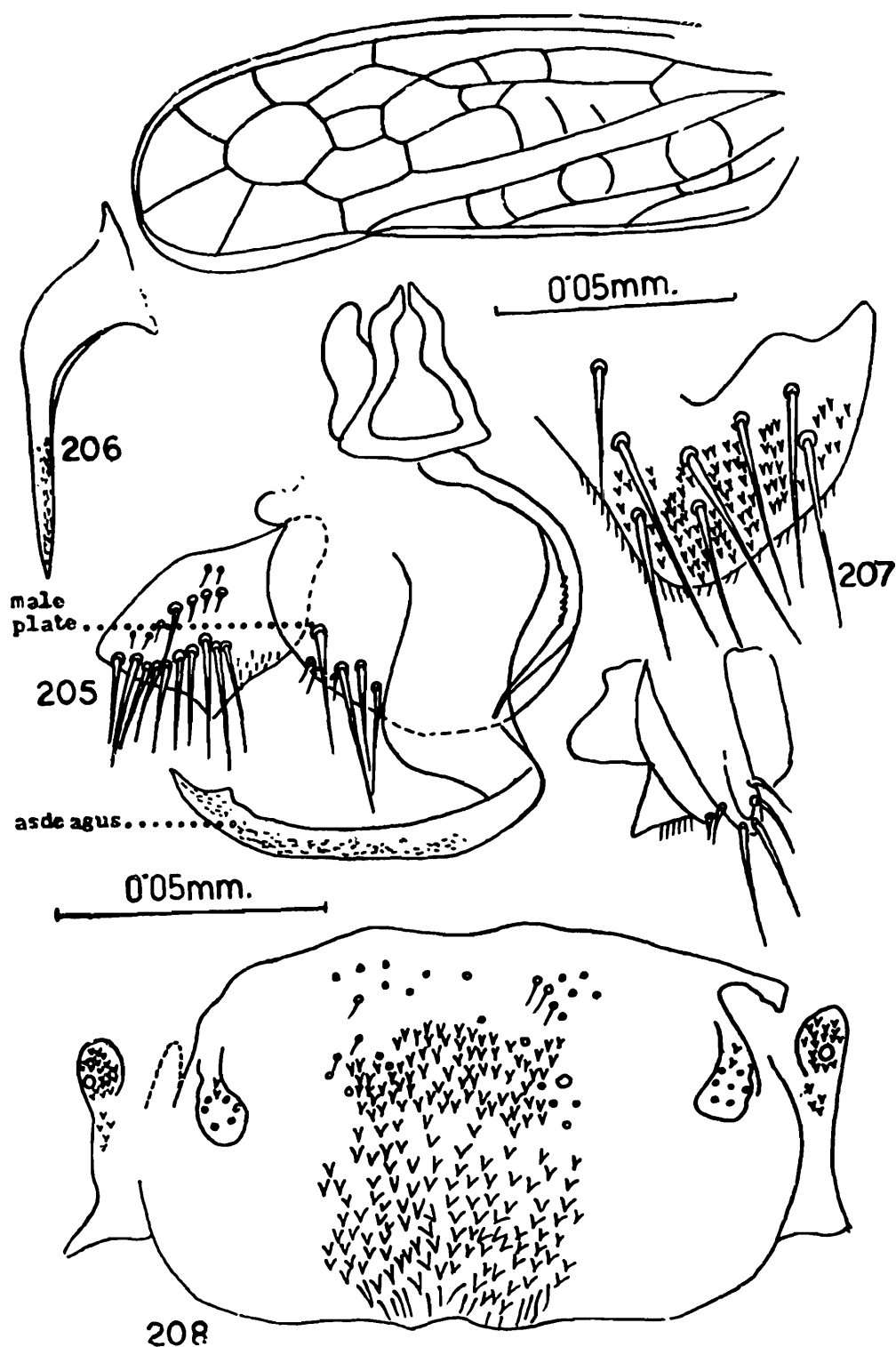
Type locality : Sandakphu, Sikkim (8,000'-9,000').

Distribution : Eastern Himalayas, Sikkim.

88. *Deltocephalus nigrifacialis* Dist.

(Figs. 205—208)

1918. *Deltocephalus nigrifacialis* Dist., *Fauna Brit. India*, 7 : 81.



Deltocephalus nigrifacialis (figs. 205-208).

205. Acedeagus, Male plate, 206. Style, 207. Pygofer, 208. Seventh sternite.

Vertex, pronotum, scutellum fuscous, vertex with two pairs of spots; pronotum tetrastriate; scutellum at each basal angle with a spot, apex with a single spot; tegmina with dark patches; meta-tibiae finely spotted.

Length : 3.0 mm (male).

Genitalia : Connective as figured, aedeagal shaft (fig. 205) gradually attenuate, directed caudad; stylar shaft (fig. 206) 3/4th robust, strongly geniculate, apex obliquely truncate, latero-cephalad, pointed; male plate (fig. 205) rotundate at apex, densely spined; pygofer hook (fig. 207) arcuate, margin curved, distinctly serrate; seventh sternite (female) postero-laterally curvate, a semilunar notch at posterior margin centrally (fig. 208).

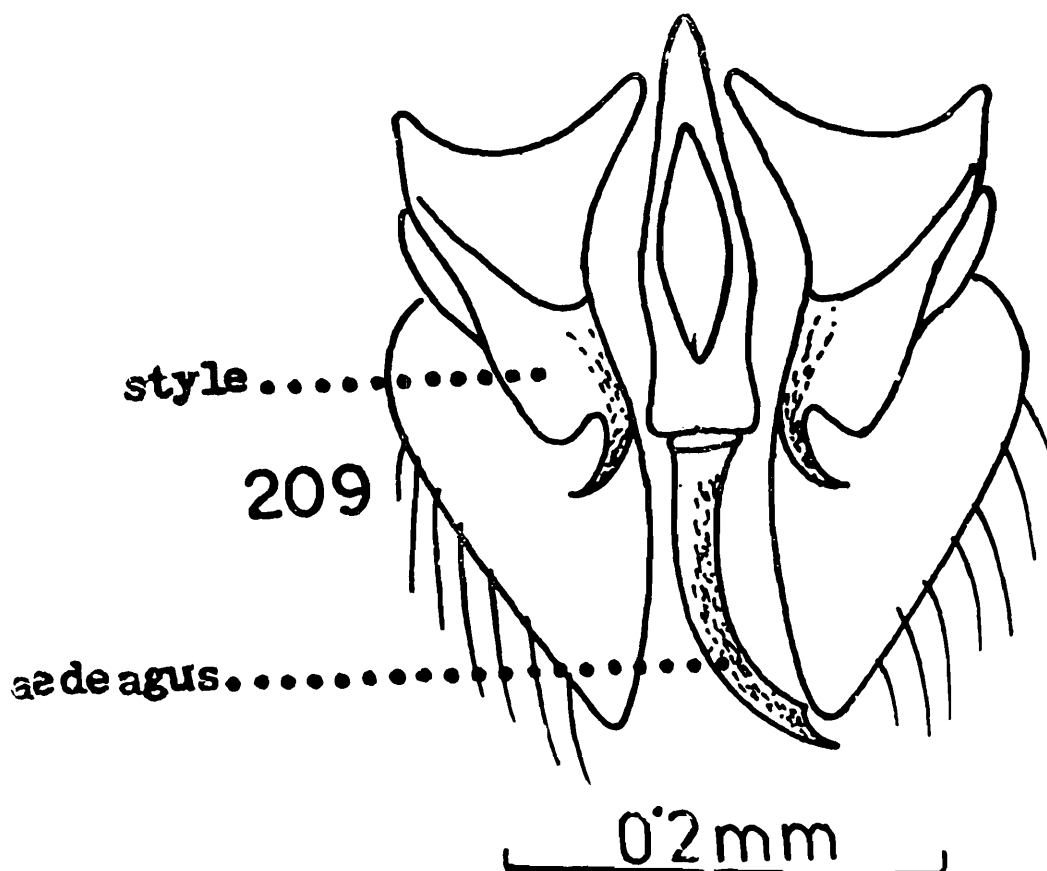
Distribution : Gangtok (6,000'), Sikkim, Darjæling.

89. *Deltocephalus notatus* Pruthi

(Fig. 209)

1936. *Deltocephalus notatus* Pruthi, *Mem. Ind. Mus.*, **11** : 128.

Vertex subanteriorly pale brown, a row of dark colored markings anteriorly; pronotum bordered with black markings anteriorly; body-color pale, simple.



Deltocephalus notatus (fig. 209)

209. Aedeagus, Style

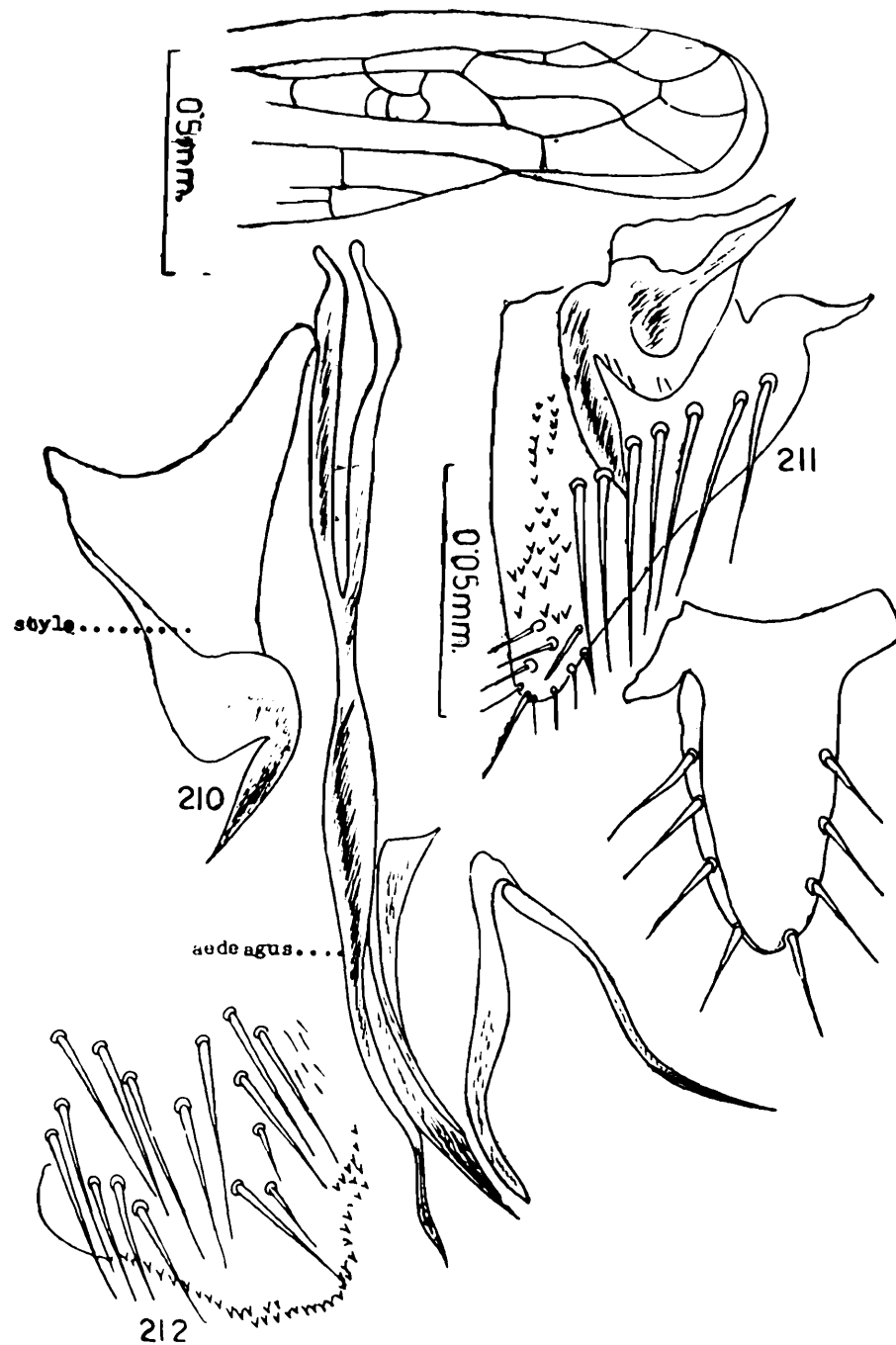
Genitalia : Aedeagus (fig. 209) tubular, subapically nicked, apex sharp; stylar shaft (fig. 209) sharply curved; male plate simple.

Distribution : Punjab, North India.

90. *Deltocephalus pulvisculus* Dist.

(Figs. 210—212)

1908. *Deltocephalus pulvisculus* Dist., *Fauna Brit. India*, 4 : 381.



Deltocephalus pulvisculus (figs. 210-212).

210. Aedeagus, Style, 211. Male plate, 212. Pygofer.

Vertex with six spots, pronotum with a central and arched darker lines on each lateral margin; scutellar angle spotted; tegminal surface sparsely spotted.

Length : 3 mm (male).

Genitalia : Aedeagal shaft (fig. 210) with two lateral processes, sharply pointed; stylar shaft (fig. 210) with an indistinct pre-apical lobe, mesal apical extension sharp at apex; male plate (fig. 211) subtriangulate, a row of long lateral setae, surface minutely spined; pygofer (fig. 212) spinulate at lateral margin.

Distribution : Calcutta, Pusa, Bihar.

XLI. Genus *Togacephalus* Matsumura

1940. *Togacephalus* Mats., *Insecta Matsumurana*, 15 : 38.

Type, by original designation, *Deltocephalus distinctus* de Mots.

1859. *Deltocephalus distinctus* Motschulsky, *Etud Ent.*, 8 : 112.

Vertex triangulate, acutely produced anteriorly, disc concavus; face semi-circular; rostrum longer than clypeus; gena rectangulate; pronotum as long as vertex mediad; tegmina longer than abdomen, two medial cells, clavus without cross-veins; connective linear, aedeagus simple, shaft curved, apex pointed, sometimes hook-shaped; style with apical process sharp, sometimes serrate on inner margin; male plates converging distad; pygofer simple

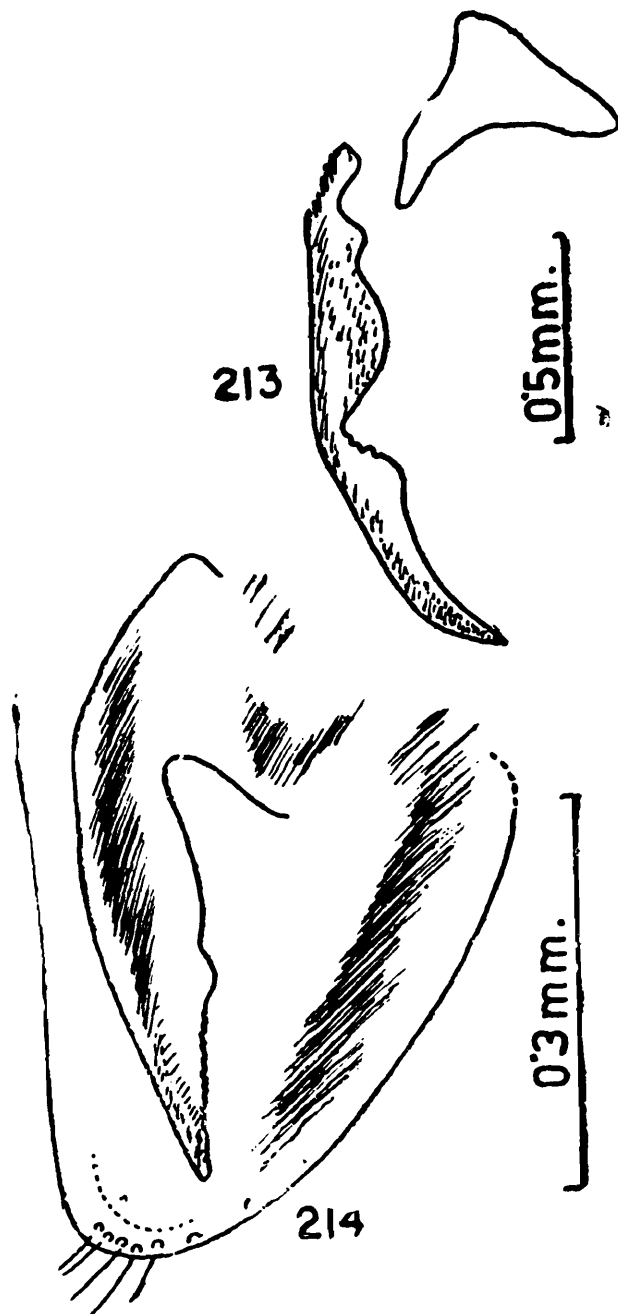
91. *Togacephalus distinctus* (de Mots)

(Figs. 213—214)

1859. *Deltocephalus distinctus* De Mots., *Etud Ent.*, 8 : 112.

Vertex subtriangulate, anteriorly piceous intercepted by a series of creamy brown spots (appx. six); vertex, facial structure, pronotum and scutellum reddish brown; wings semi-transparent; tibiae spotted dark.

Length : 3 mm (male), 3.50 mm (female).



Togacephalus distinctus (figs. 213-214).

213. Aedeagus, 214. Style, Male plate.

Genitalia : Aedeagal shaft (fig. 213) elongate, slender, medially sinuate, subapically notched, apex pointed; style (fig. 214) broader basad, sharply geniculate basad, tubular beyond middle, connivent latero-mesally, scimitar-shaped, outer margin with fine serrations, preapical lobe distinctly differentiated; male plate (fig. 214) subquadrate, lateral margin converging, uniseriate, apex rounded; pygofer hook slender, short, outer, margin spinulate.

Distribution : West Bengal, India.

Economic status : The occurrence of the species is noted along with the viruliferous paddy pests such as *Nilaparvata lugens* (Stål), *Inazuma dorsalis* (de Mots) and *Nephotettix virescens* (Stal). The viruliferous traits of the species and the intensity of damages caused by it is not yet known. The prime reason of its unknown role as pests in spreading virus disease to paddy crop in West Bengal (N.E. Part of India) remains obscure because the scientists are experimenting more on above-mentioned two to three species rather than devoting any attention to the role of other cicadellids which frequent the crop along with the vector during winter season, in general. Therefore, the vectorial status of the species is under investigation.

XLII. Genus *Dio* Dist.

1918. *Dio* Dist., *Fauna Brit. India*, 7 : 56.

Type, by original designation, *Dio facialis* Dist.

1918. *Dio facialis* Dist., *Fauna Brit. India*, 7 : 56.

Vertex short, broader, face angularly produced, distinctly longer, laterally depressed; pronotum rounded at basal angle; tegmina extending tip of abdomen, 3 apical and 2 anteapical cells; hindtibiae densely spinulose; aedeagal shaft arcuate with terminal processes; style stout, apical extension modified; male plate gradually connivent, uniseriate marginally; pygofer with a distinct hook; seventh sternite (female) concavus along posterior margin.

92. *Dio facialis* Dist.

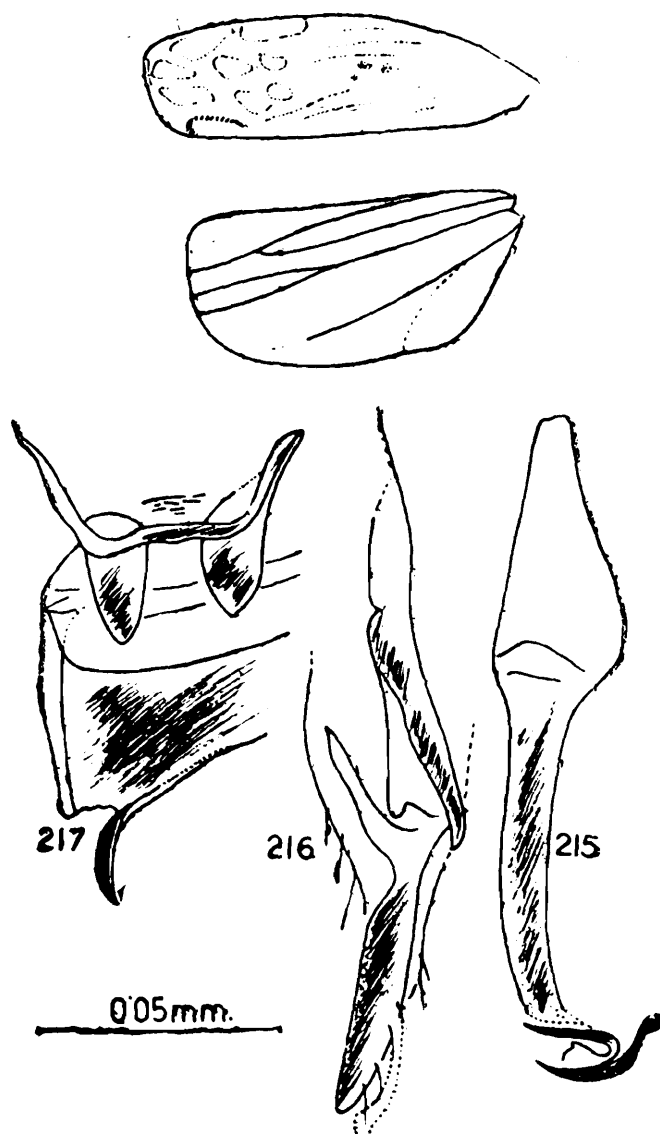
(Figs. 215—217)

1918. *Dio facialis* Dist., *Fauna Brit. India*, 7 : 56.

Vertex, pronotum fuscous with greenish tinge; vertex subtriangulate; anterior half of pronotum, tegmina marked with spots; face very long, obliquely depressed; tegmina spotted, 3 apical and 2 anteapical cells shaded brown.

Length : 3 mm incl. tegmn.

Genitalia : Aedeagal shaft (fig. 215) twisted medially, arcuate lengthwise, apex recurved with a pair of terminal processes; style (fig. 216) with mesal apical extension obliquely truncate, serrate, apex hook-shaped; male plate gradually converging, Pygofer hook (fig. 217) sharp, short, directed caudad.



Dio facialis (figs. 215-217).
215. Aedeagus, 216. Style, 217. Pygofer.

Distribution : Gangtok (6,000'), Sikkim, Yatung (10,000'), Tibet, Eastern Himalayas.

Morphology : Anterior margin of crown triangulate, median length of crown shorter than interocular width ; ocelli placed at base, close to each eye ; clypeus feebly convex, cibarial impression distinct, transclypeal suture distinct ; pronotal width greater than transocular width, posterior margin straight ; scutellum depressed centrally, texture uneven, anterior surface reticulate, posterior surface rusty, hind femoral setal formula : 2:1:1, tegmina longer than abdominal tip.

XLIII. Genus **Divitiacus** Dist.

Type, by original designation, *Divitiacus primus* Dist.

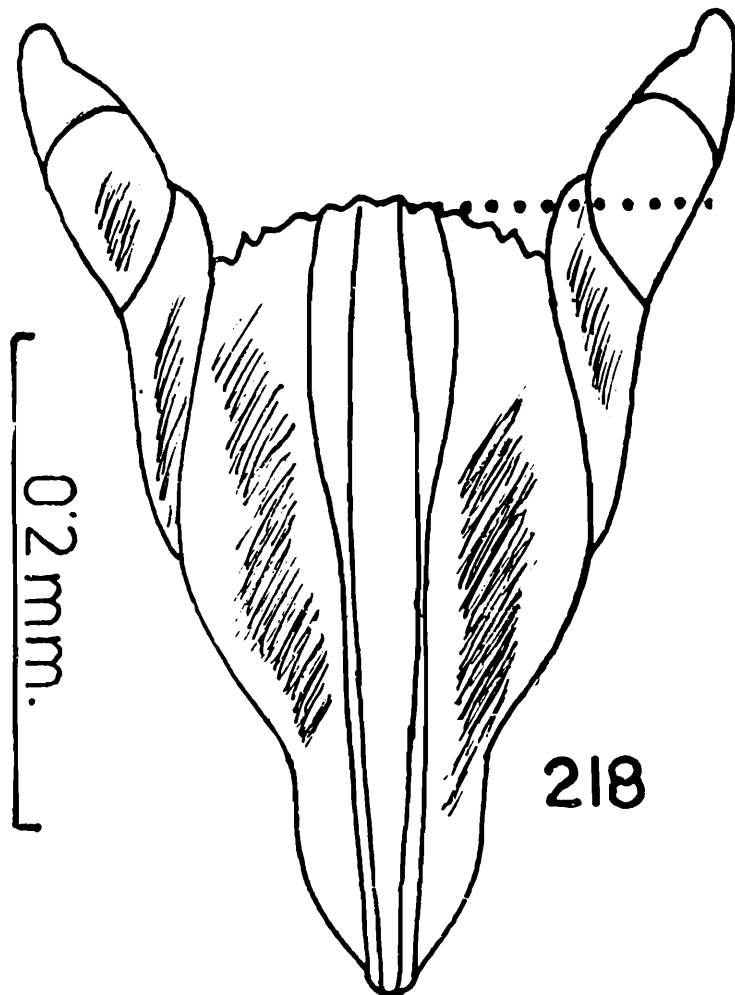
1981. *Divitiacus primus* Dist., *Fauna Brit. India*, 7 : 59.

Vertex conically produced anteriorly; face narrowed toward apex; scutellum subtriangulate, impressed near middle; tegmina with 4 apical cells, 2 anteapical cells; posterior tibiae spinulose; seventh sternite emarginate at posteromedial margin.

93. **Divitiacus primus** Dist.

(Fig. 218)

1918. *Divitiacus primus* Dist., *Fauna Brit. India*, 7 : 59.



Divitiacus primus (fig. 218).

218. Seventh sternite.

Vertex flat, anterior margin subtriangulate; ocelli indistinct; clypeus rectangulate; lorae reaching clypeal area; pronotum twice length of vertex, posterior margin truncate; tegmina semi-transparent, veins creamy-white, distinct, 5 apical and 3 anteapical cells, 2 cross-veins between two sectors; legs long, delicate; seventh sternite (female) concavus along posterior margin (fig. 218).

Distribution : Nilgiri Hills, South India.

XLIV. Genus *Eutettix* Van Duzee

1892. *Eutettix* Van Duzee, *Psyche*, 6 : 307.

Type, by original designation, *Thamnotettix luridus* Van Duzee.

1890. *Thamnotettix luridus* Van Duzee, *Canad Ent.* 22 : 250.

Robust, flattened leafhoppers; head with anterior margin subangular; ocelli large; vertex short, apex blunt, dorsally longitudinally striate, a shallow furrow behind anterior margin; pronotum broader, longitudinally faintly striate, rugulose; tegmina with small appendix, velvety at apex, a transverse nervure between 1st and 2nd sectors; connective Y-shaped, arm short, broad, aedeagus stout, recurved, with or without processes, gonopore subapical; style simple, male plate triangulate, spine-like setae, uniseriate on outer margin; pygofer setose, ventral margin extended as single or double hook-like process; seventh sternite (female) with a tooth-like projection at postero-medially.

94. *Eutettix apricus* Melichar

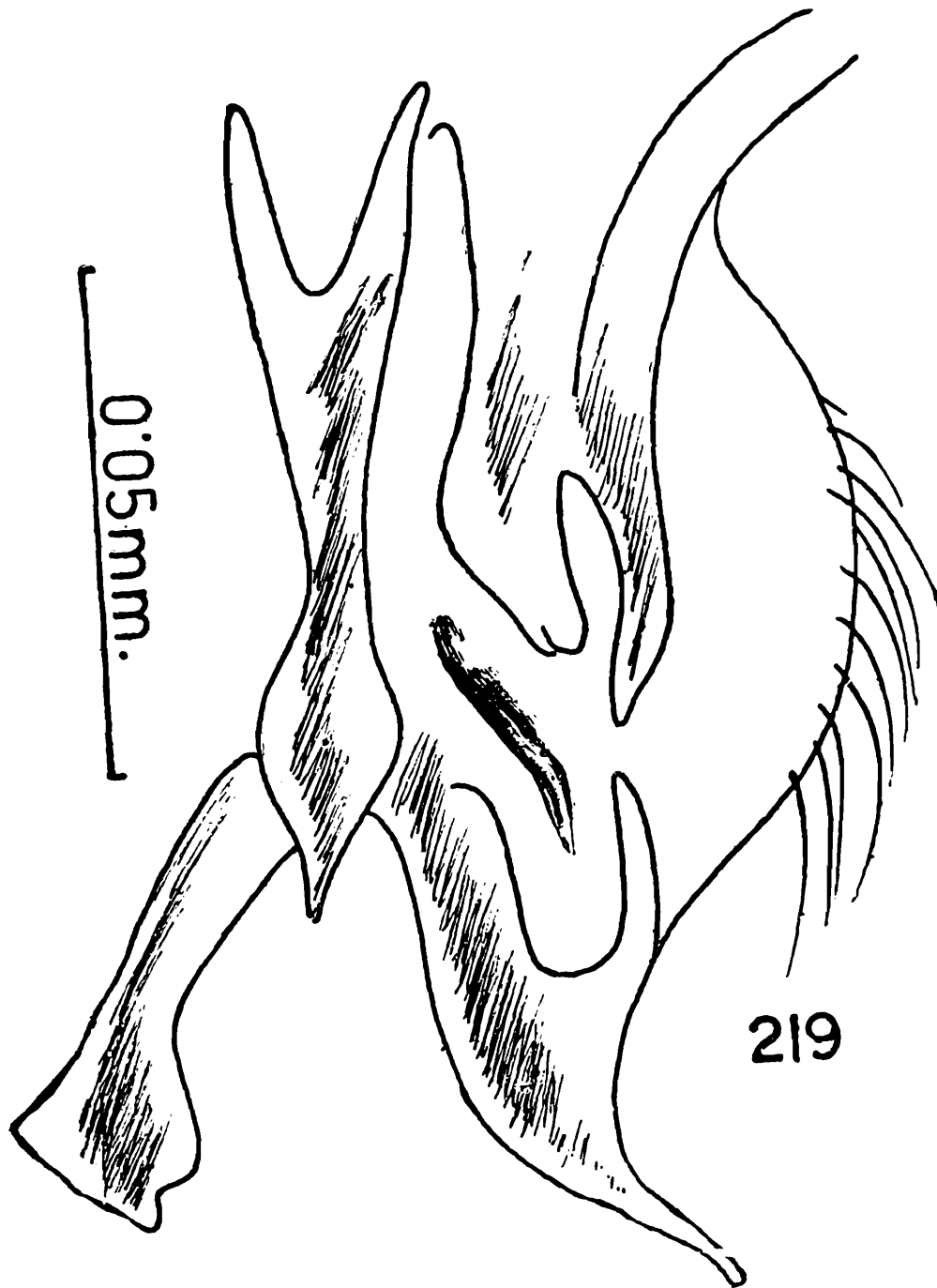
(Fig. 219)

1903. *Eutettix apricus* Melichar, *Hom. Fauna Ceylon*, p. 190.

Vertex shiny, greenish yellow, without markings; pronotum with no markings on disk; scutellum rusty yellow with four striae; tegmina with four striae; tegmina with numerous dashes, spots, apical and margins bordered with white spots, apical cells black bordered with white hyaline spots, dorsally.

Length : 3 mm (male).

Genitalia : Connective Y-shaped, aedeagus with developed apophyses, shaft (fig. 219) short, apex abruptly connivent; stylar shaft (fig. 219) converging beyond middle, mesal apical extension subapically truncate, pre-



Eutettix apricus (fig. 219).

219. Aedeagus, Style, Male plate.

cal lobe longer than inner lobe, sharp at apex ; male plate (fig. 219) broader basad, apical half drawn out to a process, transversely rugose on lateral margin, basal third setose ; pygofer ovoid, margin densely spined with rows of setae ; VIIth sternite concavus at posterior margin (female).

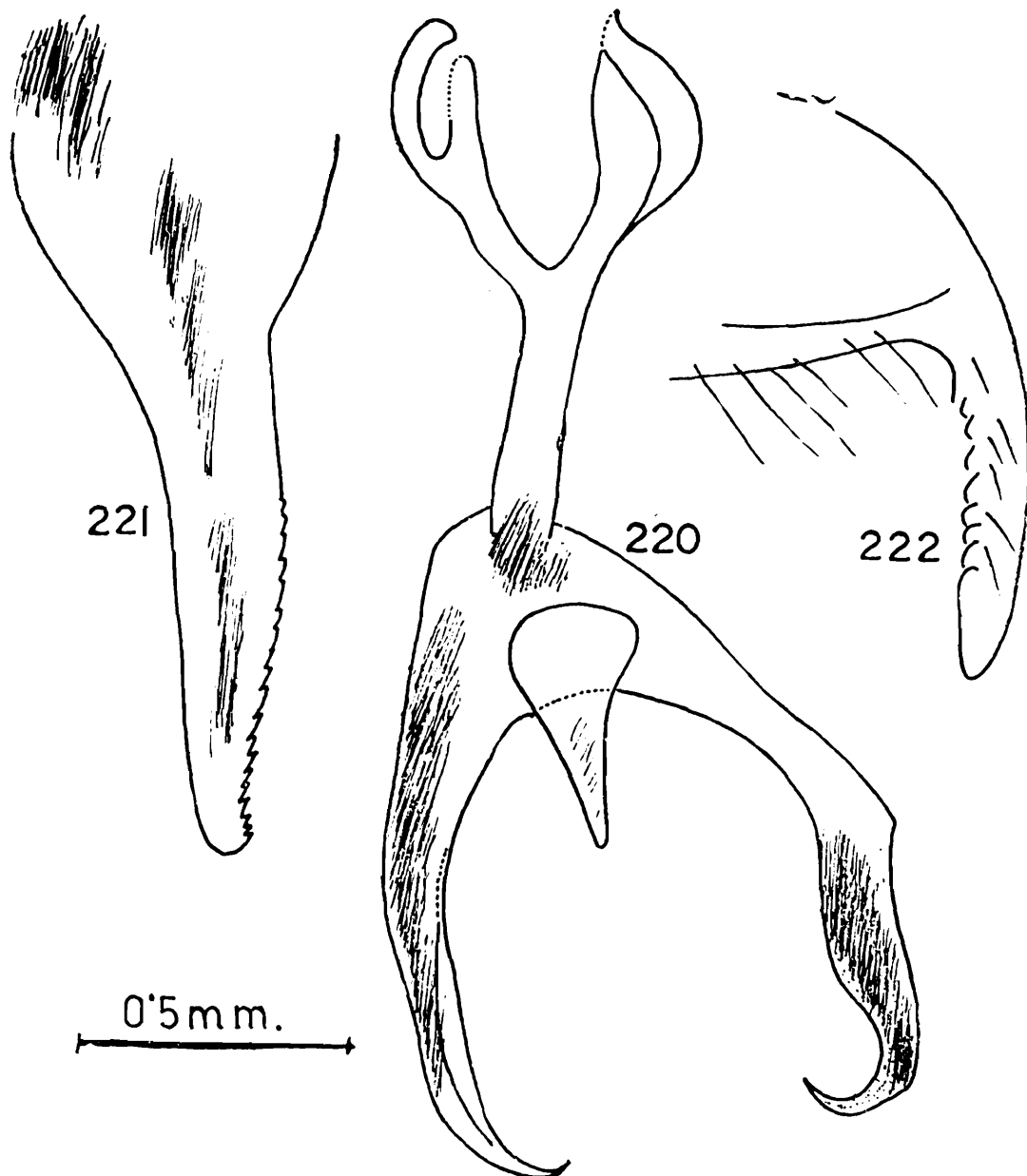
Distribution : Ceylon, Java, Madras, Coorg, Mysore.

Economic status : This species is recorded during investigation on spike disease of sandal (Pruthi 1934 : 24) and obtained on sticky paper exposed to sandal forest to find out the suspected vector of the spike disease.

95. *Eutettix phycitis* Dist.

(Figs. 220-222)

1908. *Eutettix phycitis* Dist., *Fauna Brit. India*, 4 : 363.



Eutettix phycitis (figs. 220-222).

220. Aedeagus, 221. Style, 222. Male plate.

Vertex anteriorly rounded, including facial area and clypeus dark yellow, pronotum dark yellow with blackish tinge, lateral margin obliquely truncate ;

tegmina surfaces finely ornamented with reddish brown patches and spots excluding costal areas; abdomen dark yellow; legs pale color.

Length : 3.60 mm (male), 3.50 mm (female).

Genitalia : Connective Y-shaped, aedeagus with a pair of tube-like shafts (fig. 220), outer margin subapically sinuate, apex sharp, strongly curved, basal apodeme short, triangulate; style (fig. 221) attenuate, inner margin beyond middle indistinctly serrate, apex infolded posteromesally, blunt, beak-shaped; male plate (fig. 222) with convergent contour, lateral margin uniseriate, pygofer obliquely slanting, mesal margin around apex densely spinulate, without hook.

Distribution : Bengal, Shillong, Madras, Bihar, Australia.

Comment : The distribution of this species in Australian region seems confusing although possibility may be due to its being a common pest on *Solanum* sp., and expansion is done through cosmopolitan distribution of the food commodities.

Economic Importance : This species is recorded as vector of little leaf virus of Brinjal, *Solanum melongena* Linn Host range is extended to *Datura* Sp., tomato, tobacco (Thomas et al, 1939 : 207-209). This is reported as a suspect vector of spike disease of sandal, *Santalum album* Linn. (Singh-Pruthi 1934 : 24). further record is made on its transmitting big bud disease to tomato (Hill 1934 : 85), (Sukhev 1946 : 367), as non-specific transmission of California aster yellow virus (Severin 1946 : 27).

XLV. Genus *Exitianus* Ball

1929. *Exitianus* Ball, *Trans. Amer. Ent. Soc.*, **55** : 5.

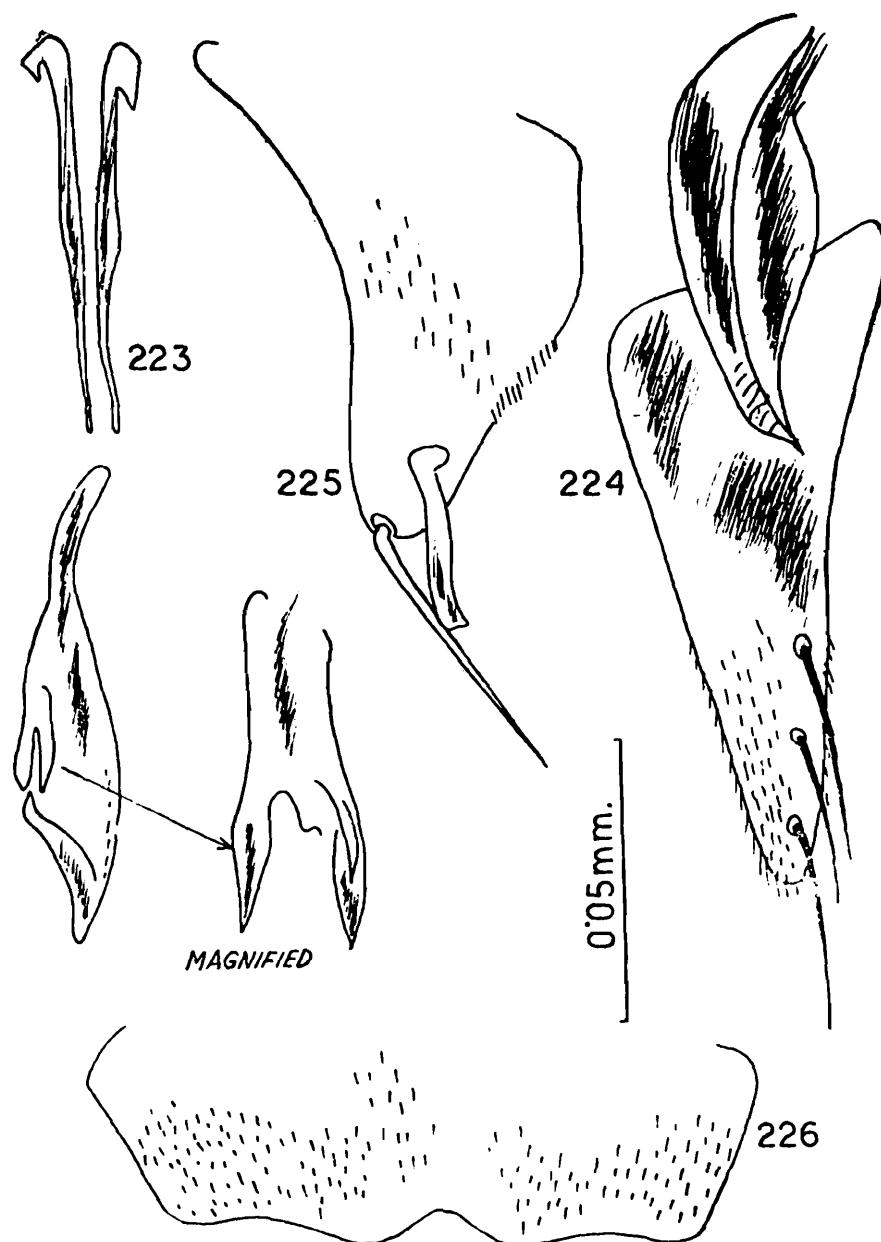
Type, by original designation, *Exitianus obscurinervis* (Stål).

1859. *Jassus* (*Thamnotettix*) *obscurinervis* Stål, *Svenska Vet. Akad. Zool.* **4** : 293.

Vertex rounded anteriorly; ocelli large; disc convex; tegmina hyaline, appendix large, expanded, antepical cells closed, two in number; connective Y-shaped, aedeagus stout, base broader, sometimes with processes; style smaller, apex acuminate; male plate triangulate, lateral margin uniseriate; with prominent spurs or spines.

96. *Exitianus atkinsoni* (Dist.).

(Figs. 223-226)

1908. *Athysanus atkinsoni* Dist., *Fauna Brit India*, 4 : 348.*Exitianus atkinsoni* (figs. 223-226).

223. Aedeagus, 224. Style, Male plate, 225. Pygofer, Seventh sternite.

Vertex brownish yellow. an arcuate fascia between eyes, a black spot on each apical margin; pronotum distinctly rugose, blackish, an arcuate series of black spots on anterior margin, scutellum with large spot on each basal angle and two linear discal spots, sternum spotted, abdomen fuscous.

Length : 4.00 mm (male).

Genitalia : Connective Y-shaped, aedeagal shaft massive (fig. 223) sub-apically sulcate, a pair of lateral processes arising mediad apex pointed, directed caudad; style (fig. 224) with no distinct pre-apical lobe, mesal apical extension obliquely truncate, distal third rugulose; male plate (fig. 224) densely spinulate, apex rotundate; pygofer (fig. 225) 1/3rd postero-laterally thickly spinulose, sub-apical spur spatulate, twice length of terminal spur; seventh sternite (female) with a pair of median lobe, separated by a dark brown notch, disc spinulate (g. 226).

Distribution : Calcutta maidan, Darjeeling (6,000'), Pusa, Kodaikanal, (7,000'), Ceylon, Luzon, Philippines.

Comment : This species displays remarkable adaptability to varied altitudinal niches and covers an extensive areas of dissimilar climatic factors.

97. *Exitianus fusconervosus* Mots.

(Figs. 227-230)

1863. *Athysanus fusconervosus* Mots., *Bull. Soc. Nat. Moscou*, **36**(3) : 97.

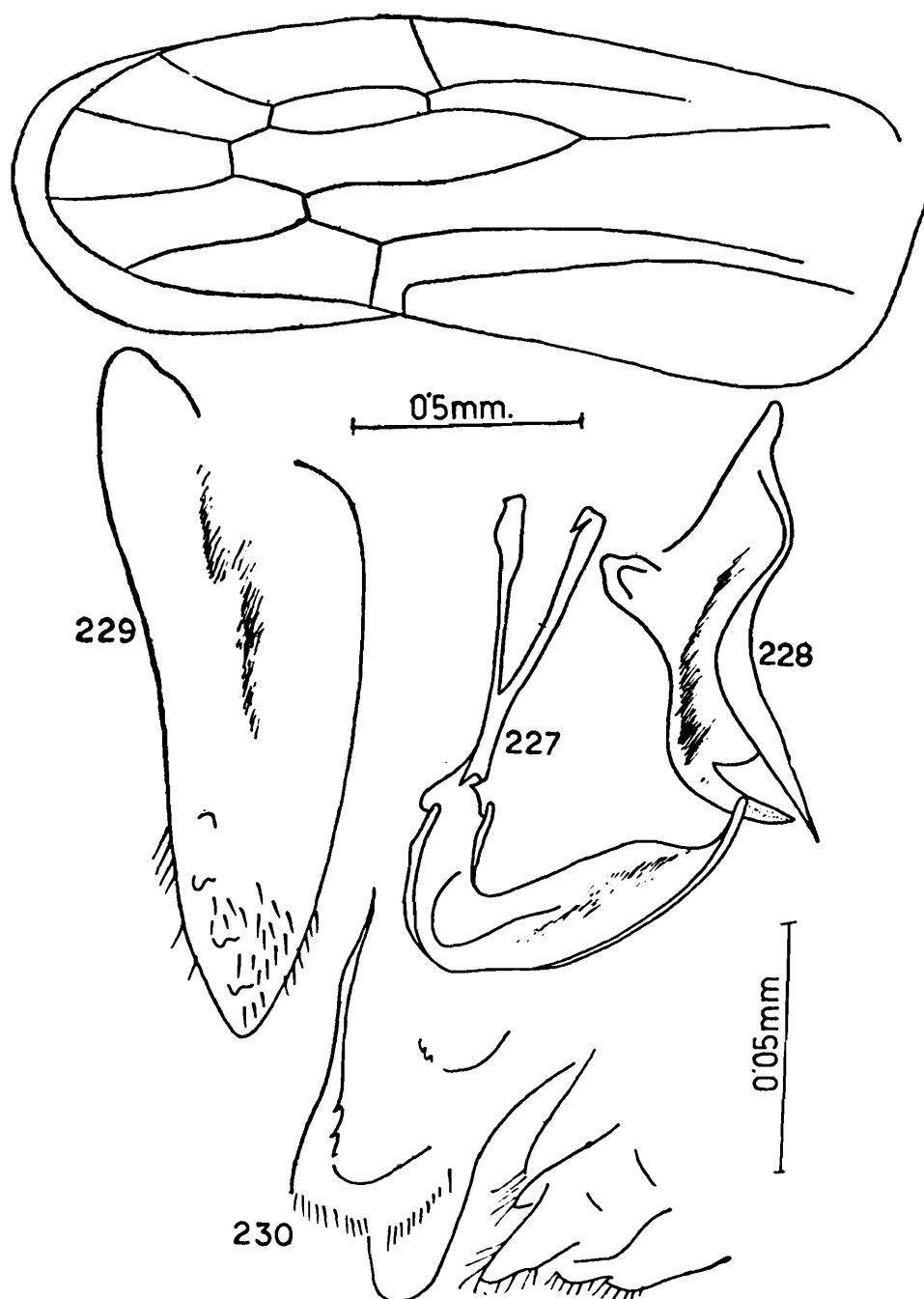
Vertex with an arcuate fascia between eyes; pronotum pale grey, face centrally with a longitudinal fascia, margin transversely striate; tegminal veins dark brown.

Length : 4.00 mm (male).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 227) massive, sub-apically sulcate, apex beak-shaped, pointed, directed latero-cephalad; stylar shaft (fig. 228) with 1/3rd mesal apical extension of equal length to pre-apical lobe; male plate (fig. 229) uniseriate laterally, disc spinulate, sub-triangulate beyond median half, pygofer (fig. 230) infolded laterally, posterolaterally spinulate.

Distribution : Songara, U.P., Ceylon, Colombo, Bombay, Japan, Java, Madras, Bali, Philippines, Lombok, Florce, Palestine.

Comment : This species has embraced the areas of South East and Far East Asian countries including Indian localities by patches. The record of its distribution from the West Asian country as being more dry and arid, subject the species for re-identification.



Exitianus fusconervosus (figs. 227-230).

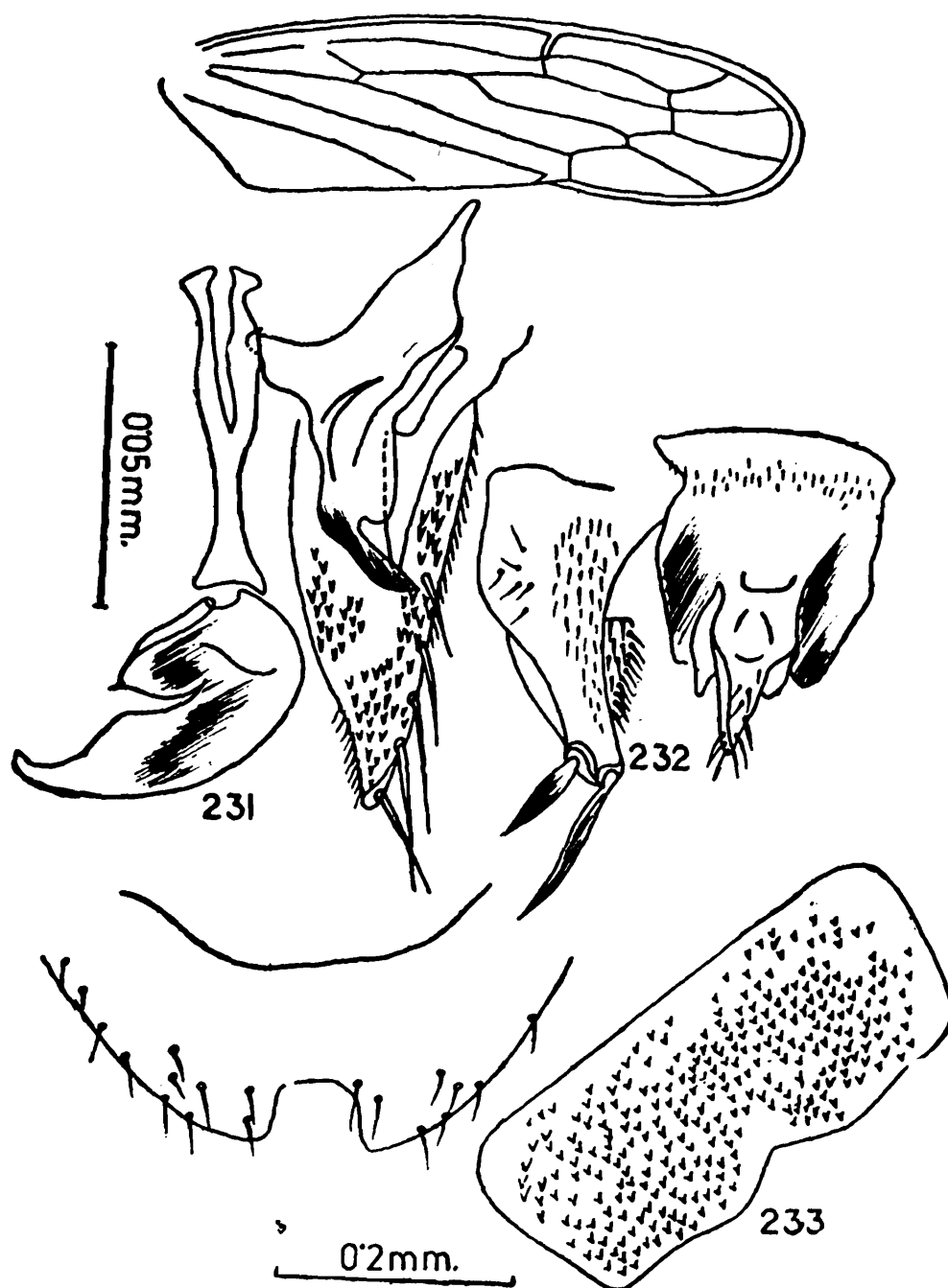
227. Aedeagus, 228. Style, 229. Male plate, 230. Pygofer.

Economic status : It has been recorded together with *Nephotettix* spp., on paddy crop, although the capacity to disseminate any virus disease to the crop is yet to be re-investigated (Misra 1920 : 229, 441).

98. *Exitianus indicus* (Dist.)

(Figs. 231-233)

1908. *Athysanus indicus* Dist., *Fauna Brit. India*, 4 : 344.



Exitianus Indicus (figs. 231-233).

231. Aedeagus, Style, Male plate, 232. Pygofer, 233. Seventh sternite.

Vertex brownish-yellow, a black fascia between eyes; clypeus with dark bands; face granulate; pronotum maculate; tegminal veins pale brown; abdominal segments dark brown.

Length : 5.0 mm (male), 5.7 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft robust (fig. 231) laterally compressus, beak-shaped, sub-apically sulcatus, apex sharp; style

(fig. 231) with mesal apical extension obtuse-angulate, apex acuminate, pre-apical lobe not developed; male plate (fig. 231) triangulate, densely spinulose, lateral margin uniseriate mixed with microzeloe; pygofer (fig. 232) with a pair of terminal spurs, extreme terminal one longer; seventh sternite (female) medially emarginate at posterior margin (fig. 233).

Distribution : Calcutta maidan, Kalimpong 4,500' Nainital (6,000') Terai (Nepal), Formosa, Punjab, Madras, Chekiang, China, Christmas island (Indian ocean), Australian capital territory, Kansu, Kiangsu, Philippines.

Economic status : This species occurs along with *Nephotettix* spp. on paddy crop (recorded by Datt 1976, Chinsura farm, West Bengal), its a blood sucker although its importance as carrying disease is uncertain (Andrews 1929); during investigation of spike disease of sandal wood it is reported being trapped on sticky paper (Singh-Pruthi, 1934), reported being injurious to economic plants in China (Cheo 1935), listed as transmitting Witches' broom virus of Lucerne and collected from sugar cane (Helson 1951).

99. *Exitianus nanus* (Dist.)

(Figs. 234-237)

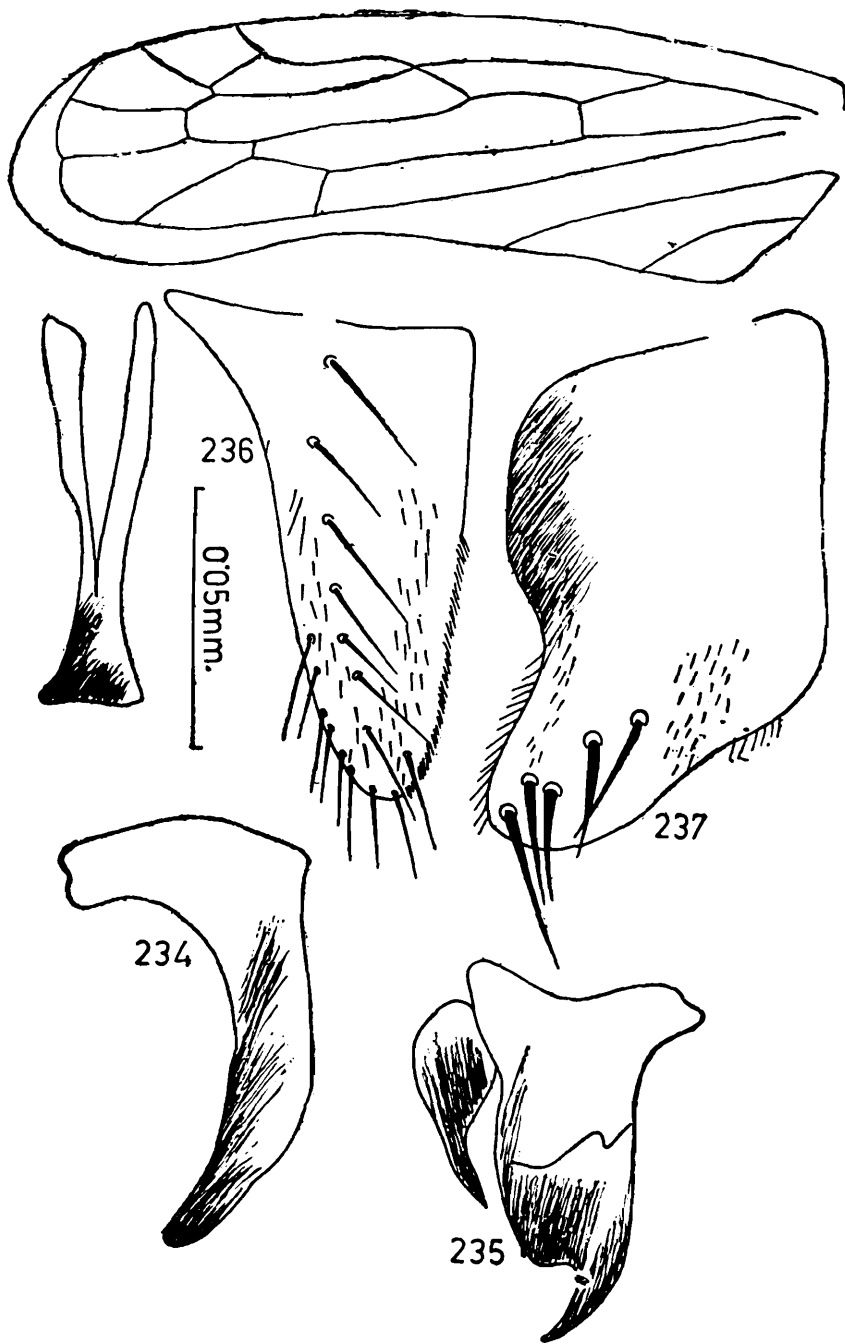
1908. *Athysanus nanus* Dist., *Fauna Brit. India*, 4 : 345.

Vertex with an arcuate fascia between eyes; pronotum yellowish-green, disk punctate as well as maculate; scutellum at basal angle with a dark spot; tegminal veins brown; abdomen pale brown.

Length : 4 mm (incl. tegm).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 234) robust, curvate lengthwise, cylindrate, apex rotundate; stylar shaft (fig. 235) with short, sharp, beak-shaped mesal apical extension, slightly curvate lateral; male plate (fig. 236) rotundate apical half densely spined, multiseriata; pygofer (fig. 237) at posterior third with 3-4 spurs, terminal spur longer than rest.

Distribution : Calcutta Madian, Simla Hills (6,000'), Punjab, Madras, Bombay, Iraq.



Exitianus nanus (figs. 234-237).

234. Aedeagus, 235. Style, 236. male plate, 237. Pygofer.

XLVI. Genus *Galerius* Dist.

1918. *Galerius* Dist., *Fauna Brit. India*, 7 : 78.

Type, by original designation, *Galerius indicatrix* Dist.

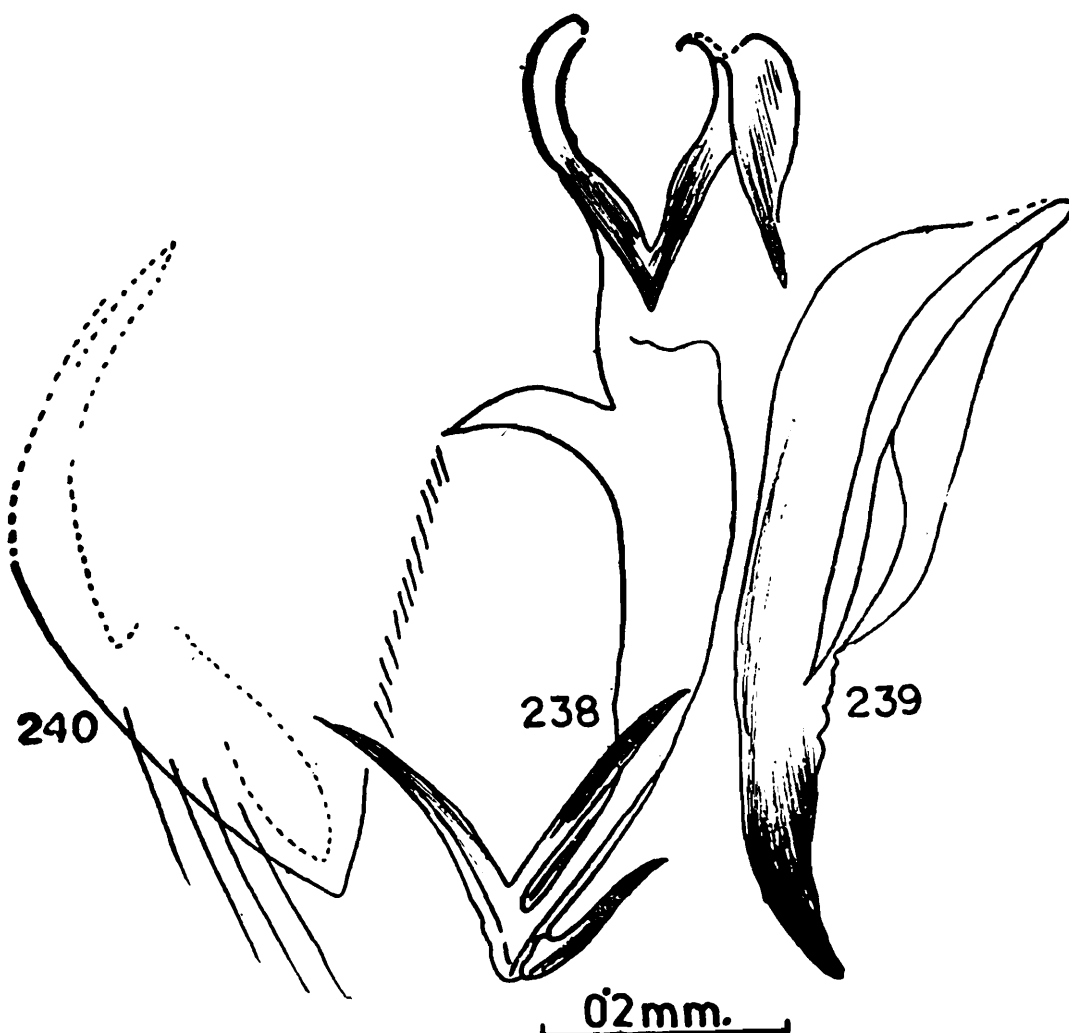
1918. *Galerius indicatrix* Dist., *Fauna Brit. India*, 7 : 78.

Vertex anteriorly angularly produced ; face gradually convergent ; pronotum laterally straight below each eye, transversely impressed medially apical

calls long, narrow, anteapical cell long, distinct; meta-tibiae densely spinulate; connective Y-shaped, aedeagus with well-developed apodeme, terminal processes usually present; style with preapical lobe developed, male plate and seventh sternite (female) simple by structure.

100. *Galerius indicatrix* Dist.

(Figs 238-240)



Galerius indicatrix (figs. 238-240).

238. Aedeagus, 239. Style, 240. male plate.

Vertex on apical margin bordered black, preceded by an indistinct submarginal line, pronotum tetrastriate; scutellum at each basal angle spotted brown; meta-tibiae spotted; abdomen dark brown.

Length: 4 mm (male), 4.50 mm (female).

Genitalia: Connective Y-shaped, aedeagal shaft (fig. 238) cylindrate, gradually connivent, apical third abruptly narrowed, terminally hook-shaped

and sub-apically with a pair of apical processes directed cephalad; stylar shaft (fig. 239) cylindrate, one fourth distally rugulose, inner margin serrate, outer lobe forming a finer process; male plate (fig. 240) triangulate distally, lateral margin with rows of macrosetae.

Distribution : Madas, South India.

XLVII. Genus **Goniagnathus** Fieber

1866. *Goniagnathus* Fieber, *Verh. Z-b-Ges. Wien.*, 16-506.

Type, by monotypy, *Jassus brevis* Herrich-Sch.

1835. *Jassus brevis* Herrich-Sch. *Nomenclator Entomologicus*, I(I-IV) : 71.

Body robust, compressed; vertex three to four times broader as middle length, anterior margin rounded; ocelli on inner side of frontal suture; face punctate with transverse stripes; genae forming an obtuse angle on outer side; pronotum three times as long as as vertex, striped, wrinkled, anterior margin smooth; tegmina with thick veins; two oblique veins connecting inner sector with inner fork of outer sector; posterior tibiae densely spined; connective linear, aedeagus with distinct apodeme and paraphyses; style robust, apical extension modified; male plate truncate apically, VIIth sternite (female) emarginate at postero-medial margin, often deeply sinuate.

101. **Goniagnathus punctifer** (Walk.)

(Figs. 241-242)

1858. *Bythoscopus punctifer* Walker, *Insecta Saundersiana*, p. 108.

Vertex brownish yellow with obscure dark spots; face with transverse striations interrupted by longitudinal stripes; pronotum finely striate; tegmina smoky, veins with fuscous spots, wing smoky with a grey-white streak at radial area; legs ringed with black markings; abdomen dark-brown.

Length : 5 mm (male)

Genitalia : Aedeagus (fig. 241) with a prominent apodeme, shaft concavus laterally, a pair of sharp terminal processes, slender, acute, directed caudad; style (fig. 241) with mesal apical extension dorsoventrally laminate, apical margin distinctly bifurcate, apical third rugose; male plate simple (fig. 241); pygofer (fig. 242) apical third densely spined, hook dagger-shaped, stretching along margin.



Goniagnathus punctifer (figs. 241-242).

241. Aedeagus, Style, Male plate, 242. Pygofer.

Distribution : Kurseong, Pusa, Mussorrie, Paradeniya, Colombo, Kandy, Burma, Maldives, Island, Madagascar.

Economic status : This species is considered as suspect vector of spike disease of *Santalum album sanctus* Linn. (Singh-Paruthi, 1934).

XLVIII. Genus **Maximianus** Dist.

Type, by original designation, *Maximianus notatus* Dist.

1918. *Maximianus notatus* Dist., *Fauna Brit. India*, **7** : 79.

Vertex narrowed to apex; eyes yellowish; pronotum laterally oblique, posterior margin truncate; scutellum subtriangulate, finely impressed tegmina with 3 apical cells; posterior tibiae densely spinulate; connective V-shaped, aedeagal shaft complex; style pointed at apex; male plate and pygofer simple.

102. **Maximianus notatus** Dist.

(Figs. 243-246)

1918. *Maximianus notatus* Dist., *Fauna Brit. India*, **7** : 79.

Vertex ochraceous; face laterally with dark striations; pronotum and scutellum stramineous, pronotum with a spot behind each eye; tegmina with a black spot medially, sometimes a small spot close to apex.

Length : 3 mm, incl. tegmn.

Genitalia : Aedeagus (fig. 243), with a V-shaped connective, shaft pitcher-shaped; stylar shaft (fig. 244) tapering, male plate (fig. 245), pygofer hook as figured (fig. 246).

Distribution : Kodaikanal, S. India.

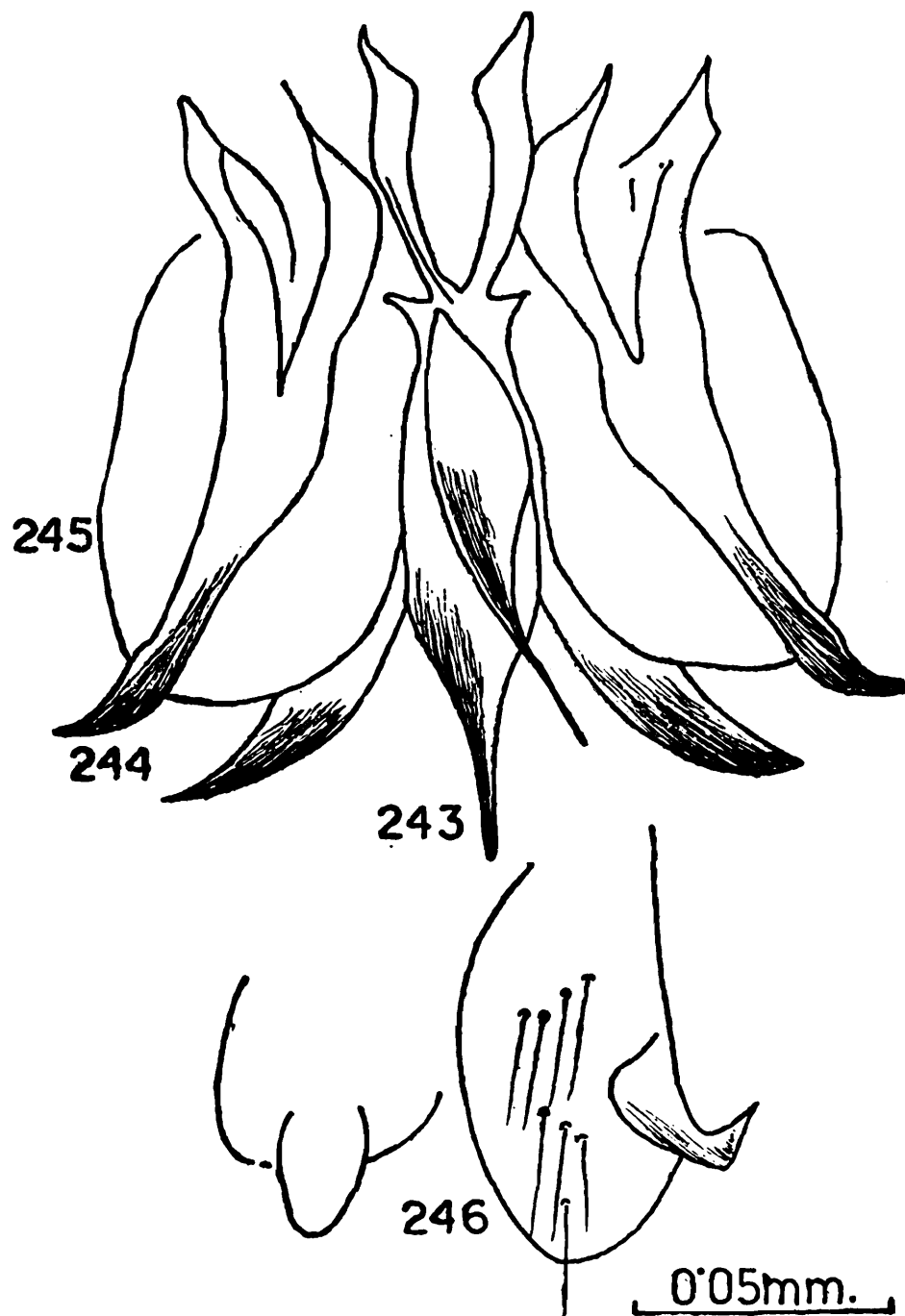
XLIX. Genus **Nandidrug** Dist.

1918. *Nandidrug* Dist., *Fauna Brit. India*, **7** : 74.

Type, by original designation. *Nandidrug speciosum* Dist.

1918. *Nandidrug speciosum* Dist., *Fauna Brit. India*, **7** : 74.

Vertex anteriorly subacutely projected; eyes obliquely directed on pronotal angles; face gradually narrowed; pronotum posteriorly truncate, anterior margin concave; scutellar apex acute; tegmina with 3 apical and 3 antepical cells; posterior tibiae spined; connective U-shaped, aedeagal shaft broader basad, elongate, narrowed to a pointed apex; male plate connivent, uniseriate on lateral margin; style broader basad, apical process abruptly narrowed to a pointed apex; without hook, distally spined; seventh sternite (female) deeply emarginate at postero-medial margin.



Maximianus notatus (fig. 243-246).

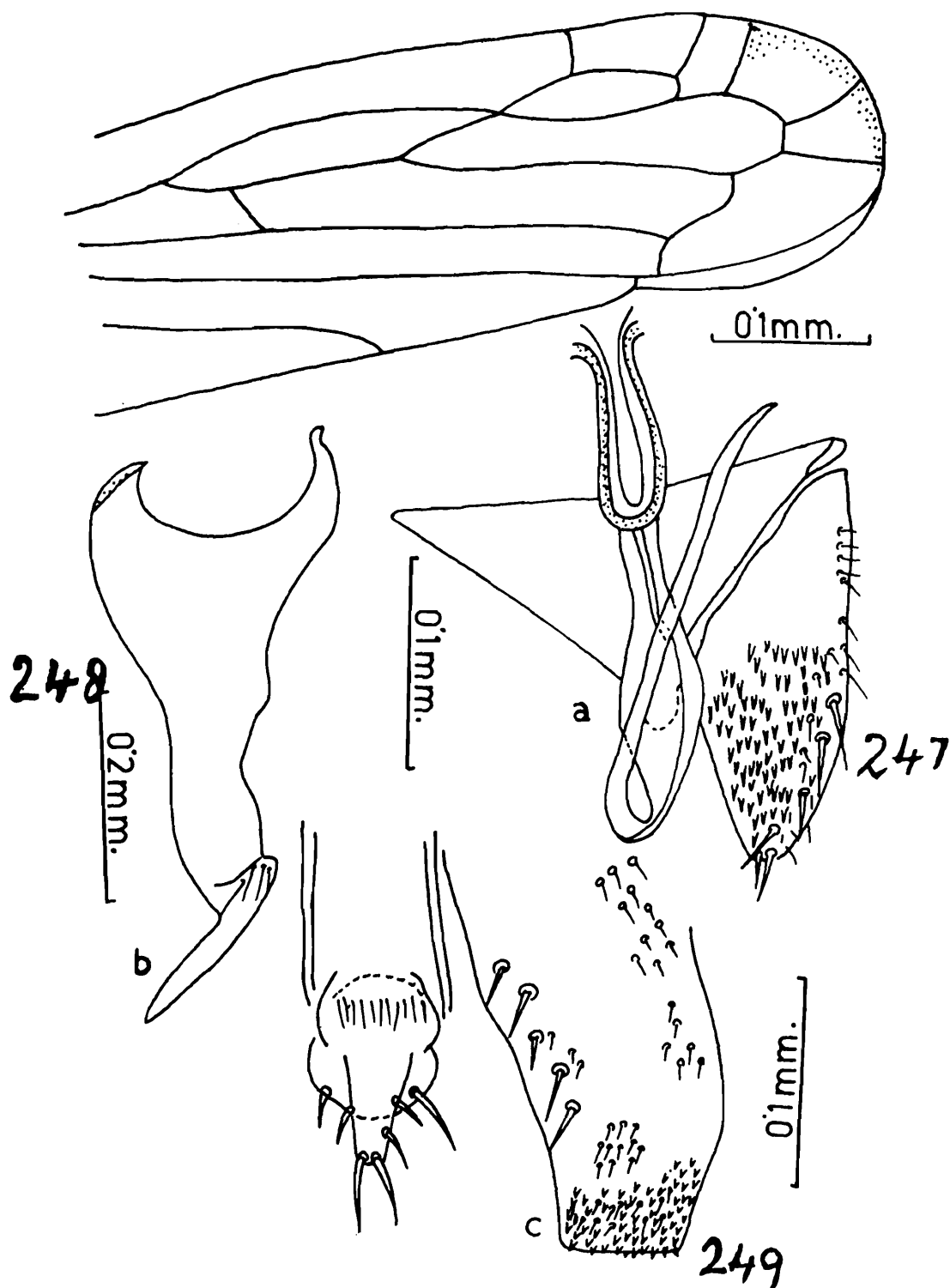
243. Aedeagus, 244. Style, 245. Male plate 246. Pygofer.

103. *Nandidrug speciosum* Dist.

(Figs 247-249)

1918. *Nandidrug speciosum* Dist., *Fauna Brit. India*, 7 : 74.

Vertex with a pair of brownish yellow stripes; pronotum brownish with 3 stripes; scutellum sanguineous with a single stripe; tegmina pale brown, costal margin striped with dark pigmentation, apical cells bordered black;



Nandidrug speciosum (figs. 247-249).
247. Aedeagus, 248. Style, 249. Pygofer.

abdomen brown; eyes obliquely directed on pronotal angle; posterior tibiae spined.

Length : 5 mm (male).

Genitalia : Connective U-shaped, aedagal shaft (fig. 247) spindle-shaped basal third, otherwise abruptly narrowed, tubular, elongate, apex

pointed, style (fig. 248) with mesal apical extension broader basad, rest slender, apically pointed; male plate (fig. 247) laterally uniseriate, apex rounded; pygofer (fig. 249) densely spined posterior third, apex truncate, without hook.

Distribution : Nandidrug, Kodaikanal, S. India.

Morphology : Median length of crown twice interocular width, lateral margin not in line with outer margin of eyes, anterior margin of eyes extending on lateral pronotal margin; lora and gena demarcated; lateral suture extending to ocelli; pronotal width greater than transocular width, depressus sub-anteriorly, texture wrinkled, postrolaterad smooth, rounded, margin concave; scutellum granulated, medially depressus; forewing transparent, appendix developed, 4 apical and 3 anteapical cells, inner anteapical cell two and half times longer than outer anteapical cell; ovipositor projected beyond abdominal tip; hind femoral setal formula : 2:1:1; VIIth sternite (female) truncate at posterior margin.

Registered number : 284/H7 (female), 282/H7 (male), Z.S.I., Calcutta.

104. *Nandidrug viridicans* Dist.

(Figs. 250-251)

1918. *Nandidrug viridicans* Dist., *Fauna Brit. India*, 7 : 75.

Vertex pale brown, lateral margin re-curved; pronotum brownish-yellow, finely rugulose with granules; scutellum sub-triangular; tegmina with costal and apical cells pale brown; abdomen dark.

Length : 4 mm (male).

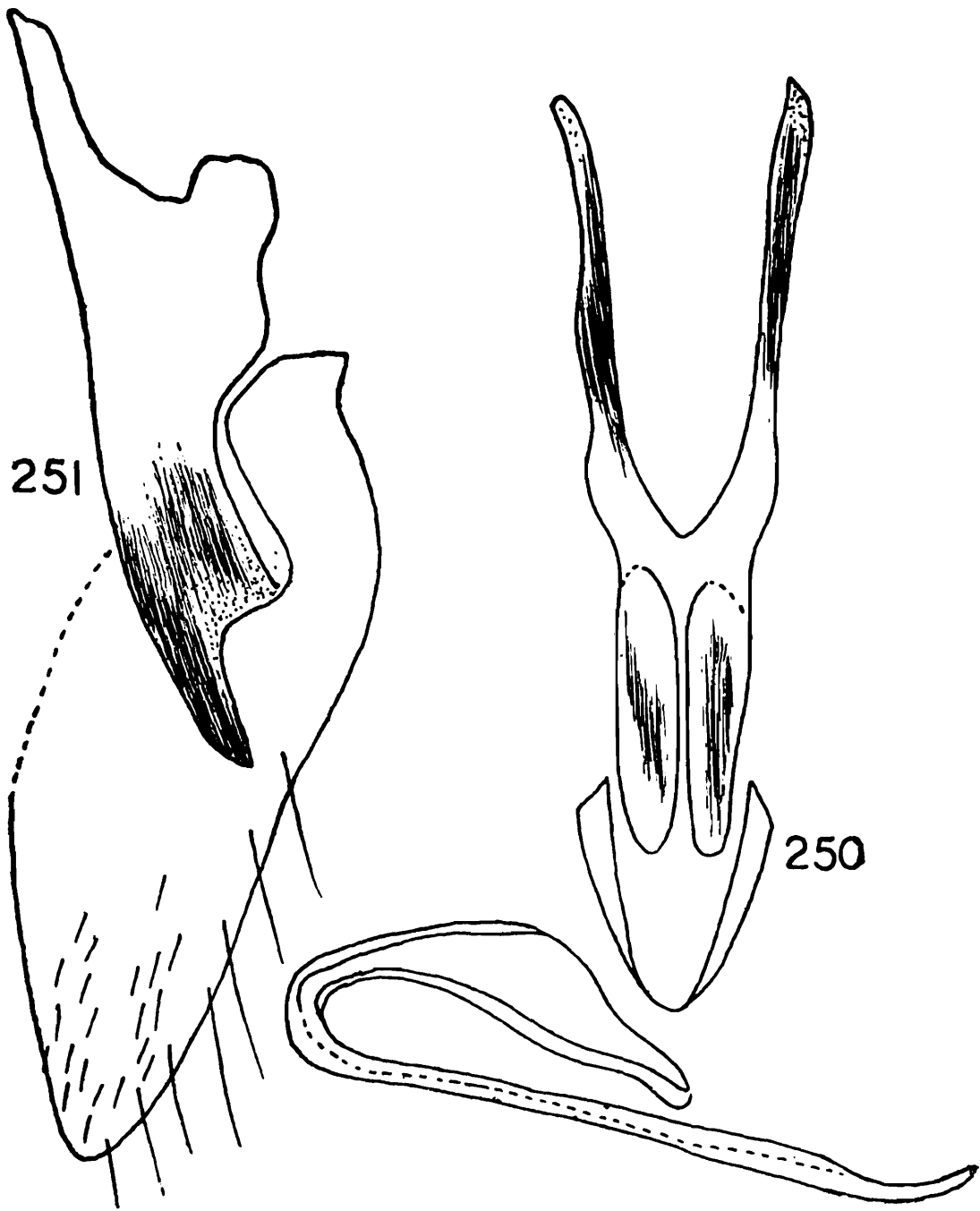
Genitalia : Aedeagal shaft broader (fig. 250), three fourth distally abruptly pointed; stylar shaft (fig. 251) with a straight mesal apical extension, apex blunt; male plate (fig. 251) triangular at apical half, minutely spined; pygofer without hook, mesal margin infolded.

L. Genus *Nephotettix* Matsumura

1902. *Nephotettix* Mats., *Term. Fuzetek*, 25 : 356.

Type, by subsequent designation, *Selenocephalus cincticeps* Uhler.

1896. *Selenocephalus cincticeps* Uhler, *Proc. U.S. Nat. Hist. Mus.*, 19 : 292.



Nandidrug viridicans (figs. 250-251).

250. Aedeagus, 251. Style, Male plate.

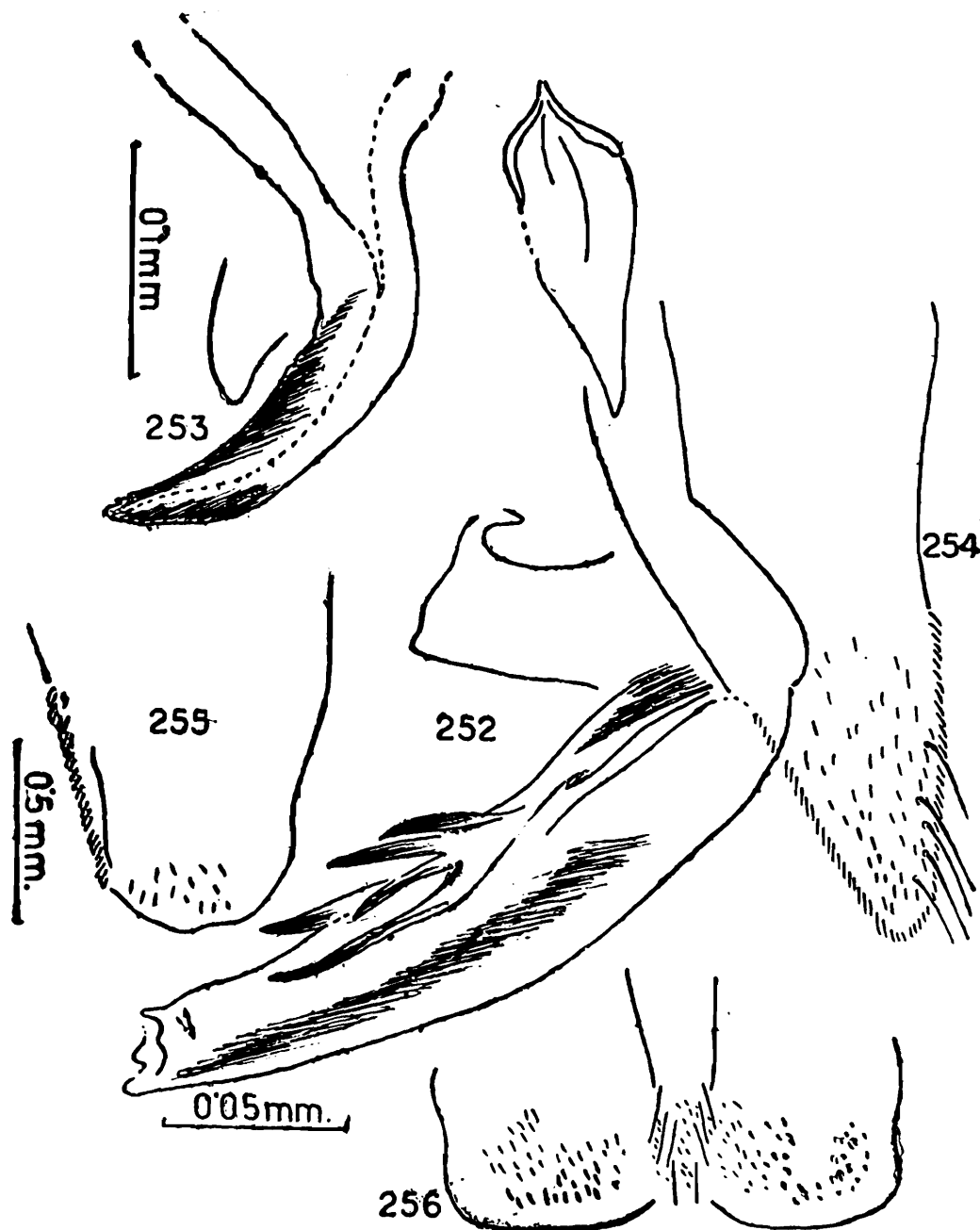
Color opaque green, black markings on head, face, pronotum, tegmina, parts of body (male) mottled with black markings; body narrow; vertex short, union of vertex with frons angled with transverse furrow; tegmina with 4 apical cells, 3 anteapical cells, 2 discal cells, 2 claval veins; hindwing with complete marginal veins, CU1 bifurcate, vannal veins 1 and 2 separate; aedeagus with developed lateral paraphyses, sclerotised carinae having variable numbers of spines directed apicad, connective Y-shaped; stylar shaft

usually obliquely truncate at apex, preapical lobe feebly developed; pygofer with spurs of variable length.

105. *Nephotettix nigropictus* (Stal)

(Figs. 252-256)

1870. *Thamnotettix nigropicta* Stal, Svenska Vet. Akad. Oft. Forhandl, **27** : 740.



Nephotettix nigropictus (figs. 252-256).

252. Aedeagus, 253. Style, 254. Male plate, 255. Pygofer, 256. Seventh sternite.

Vertex with a transverse line between eyes; tegmina with an oblique broad stripe extending mediad to claval suture, attenuate hindward; apical 3rd of tegmina, sternum, abdomen, femora, pro-tibia black.

Length : 5.5 mm (male), 6 mm (female).

Genitalia : Aedeagus (fig. 252) with well-developed apodeme, 3 pairs of lateral processes arising mediad, first pair shorter than rest; stylar shaft (fig. 253) with mesal apical extension obliquely truncate, postero-laterally feebly nicked; male plate (fig. 254) beyond middle spinulate on both margins, pygofer (fig. 255), 7th Sternite (female) (Fig. 256).

Distribution : India, East Africa, Ceylon, Philippines, South East Asia, Japan, Hokkaido, Belgian Congo, Lambay Island, Haunan, Palestine, Luzon, Lombok, Micronesia, Sumbawa, Malay Peninsula, Manchuria.

Economic status : The species is recorded being viruliferous on paddy crop. It occurs with *N. virescens* (Fabr) during winter period in the Eastern and Southern zones of India but population density is reported lower than *N. virescens* in the Eastern Zone when population counting is done on specimens collected through light-trap technique at the Calcutta Airport during 1977-1978 (Datta et al, *Ecology Symposium, Zoological Survey of India*). The viral diseases disseminated by this species are dwarf disease, only restricted to Japan; Tungro disease (India, Philippine), Transitory yellowing (Taiwan), Yellow-orange leaf (Thailand). Regarding dissemination of the diseases this species does not bear any difference from *N. virescens* and *Recilia dorsalis* (= *Inazuma dorsalis*).

This species has close semblance with *N. virescens*, apparently confusing to distinction but variation is observed when detailed study is made on color pigmentation and on structure of genital armatures.

106. *Nephotettix virescens* (Dist.)

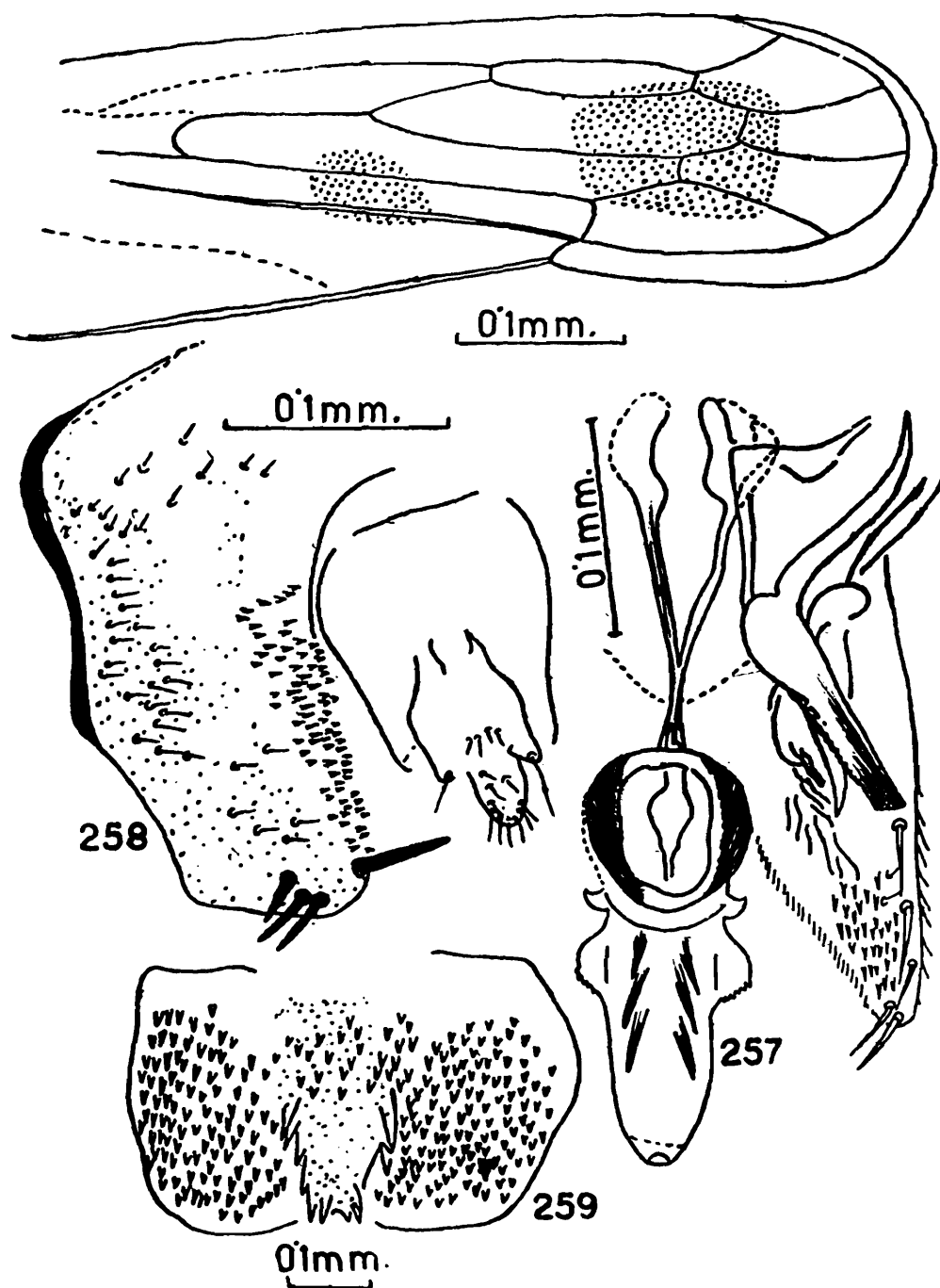
(Figs. 257—259)

1908 *Selenocephalus virescens* Dist., *Fauna Brit. India*, 4 : 291.

Greenish yellow; face black basad (male); clypeus on each side with black spot (male), without spot (female); 2/5th apical cells of tegmina pitchy black (male), absent in female.

Length : 4 mm (male), 4.5 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 257) linguiform, short, flat, apex rotundate with 3 pairs of spur-like processes as figured; style (fig. 257) with mesal apical extension saw-like, apex obliquely truncate; male plate (fig. 257) gradually converging, apex obtuse, mesal margin spined;



Nephotettix virescens (figs. 257-259).

257. Aedeagus, Style, Male plate, 258. Pygofer, 259. Seventh sternite.

pygofer (Fig. 258) sub-rectangulate, postero-mesal margin with a long, sharp spur, directed laterad; seventh sternite (female) at posterior margin feebly concavus in middle with a bulging (fig. 259).

Distribution : Calcutta, Taiwan, Philippines, Malayasia, Thailand, Japan, Formosa, Siam, Tanganyika, Natal, Korea, Singapore, Palestine, Micronesia, Sumbawa, Fukin, Indonesia.

Economic status : Notable contribution to economic importance of this species has been done by various workers, at present, I.R.R.I. Philippines, and workers are deeply concerned with the severe damage being done to paddy crop in S.E. Asia and concentrating their sincerest devotion to delve into the rational cause of destruction having been carried on by this viruliferous insect embracing Far Eastern countries and are applying all sorts of sophisticated analysis to solve and protect paddy belt from attack of viral diseases. The species transmits viruses consisting of Transitory yellowing (Taiwan), Tungro (Philippines and India), Penyakit morah (Tungro) (Malayasia) and rice dwarf virus (Japan). Pesticide application, with systemic insecticides, is yet under experimental stage because the control through this measure involves tremendous cost.

LI. Genus *Nesosteles* Kirkaldy

1906. *Nesosteles* Kirkaldy, *Bul. Hawaii. Sugar Planters' Assoc., Div. Ent.*, I(9) : 343.

Type, by original designation, *Nesosteles hebe* Kirk.

1906. *Nesosteles hebe* Kirk., *Bul. Hawaii. Sugar Planters' Assoc., Div. Ent.*, I(9) : 345.

Color stramineous; crown very short; connective Y-shaped, aedeagus recurvate, tapering apically, gonopore terminal; stylar shaft with acuminate apex; male plate terminating in a slender membraneous process, exterior margin with spine-like setae.

107. *Nesosteles sanguinescens* Kirk.

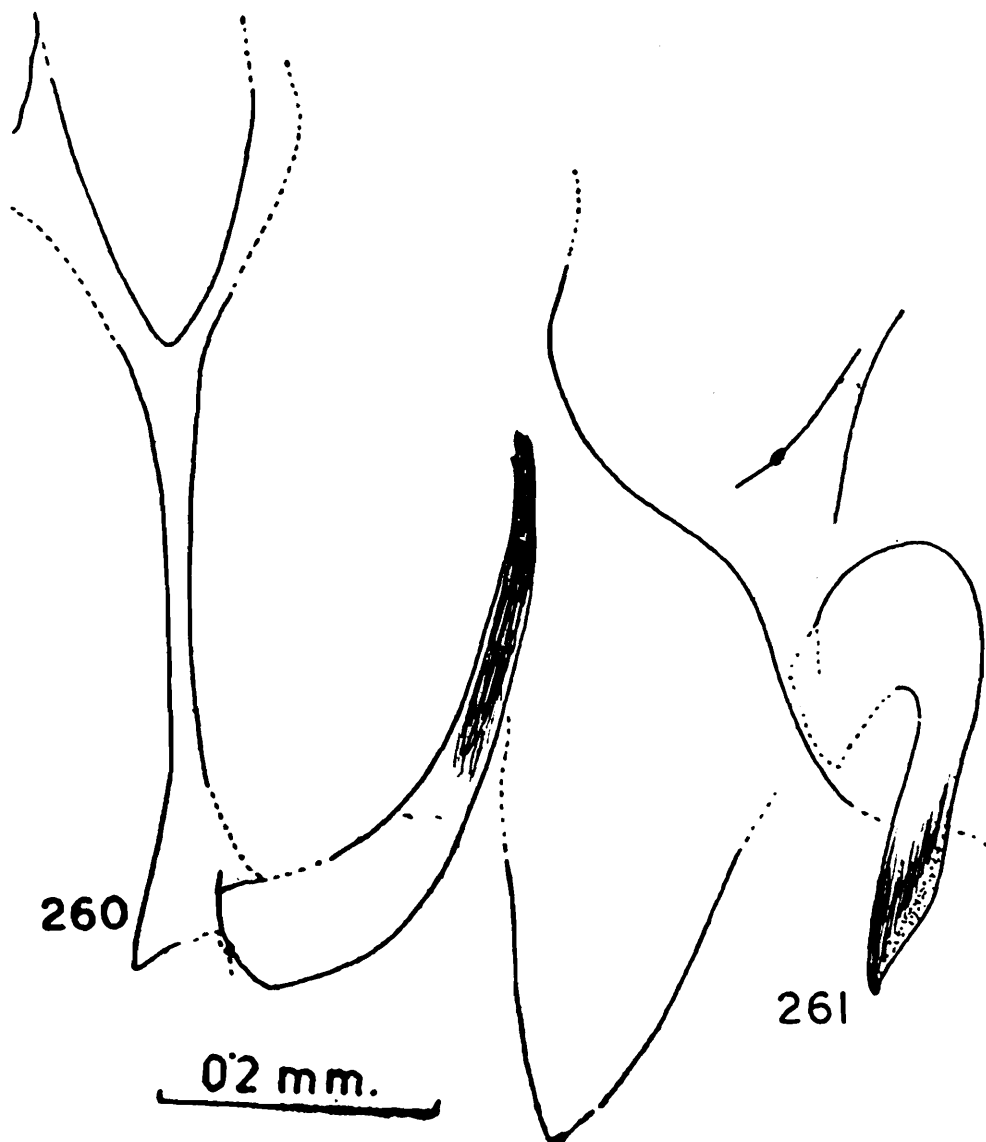
(Figs. 260—261)

1906. *Nesosteles sanguinescens* Kirk., *Bul. Hawaii. Sugar Planters' Assoc., Div. Ent.*, I(9) : 343.

Vertex brownish yellow, sulcatus; pronotum with greenish tinge, 3 pink discal stripes extending to scutellum; tegmina with reddish stripes; abdomen dark brown.

Length : 4 mm (male), 4.5 mm (female).

Genitalia : Connective Y-shaped, aedeagus (fig. 260) broader one third, rest abruptly narrowed to pointed apex, directed laterocephalad; style (fig. 261) with scimitar-shaped mesal apical extension, apex sharp, directed caudad; male plate (fig. 261) covering distad, uniseriate on margin; pygofer without hook, ovoid, densely setose.



Nesosteles sanguinescens (figs. 260-261).

260. Aedeagus, 261. Style, Male plate.

Distribution : Quænsland, Fiji Island, Christmas Island, Punjab, Bengal, Madhya Pradesh, Calcutta.

Morphology : Median length of crown narrow, one fourth of interocular width; ocelli placed along median length of each eye, margin of eyes in line with lateral margin of head, texture granulated, clypeus gradually narrowed apical, tumid, texture granulated, clypellus rectangulate, lateral clypeal suture extending inner margin of each coellus, muscular impression on clypeus absent; pronotal width greater than transocular width, texture granulate, lateral margin angulated; scutellum deeply impressed medially; forewing transparent, three apical, two antecapical cells, appendix developed; seventh

sternite (female) distinctly notched posteromedially, lateral margin truncated, hind femoral setal formula : 2:1:1.

Registered number : 907/H7 (female), 3070/H7 (male), Ind Mus., Calcutta.

LII. Genus *Ophiola* Edwards

1922. *Ophiola* Edwards, *Ent. Mon. Mag.*, **58** : 206.

Type, by subsequent designation, *Athysanus striatus* Van Dizee.

1890. *Athysanus striatus* Van Duzee, *Amer. Ent.*, **6** : 134.

Straw color with linear dark brown markings, occasionally dark brown; robust leafhoppers; clypellus laterally parallel; vertex longer medially than next to eyes, pronotum broader behind eyes; central anteapical cell constricted mediad, inner anteapical cell open basally; male plate subtriangular, multiseriate spine-like setae on lateral margin; connective Y-shaped, elongate, aedeagus arcuate, broad, short, gonopore terminal, with lateral hook-like subapical processes and a tube-like extension; style with short mesal apical extension; sternite (female) subtruncate, or emarginate each side of middle of posterior margin.

108. *Ophiola bicolor* Pruthi

(Fig. 262)

1936. *Ophiola bicolor* Pruthi, *Mem. Ind. Mus.*, **II** : 123.

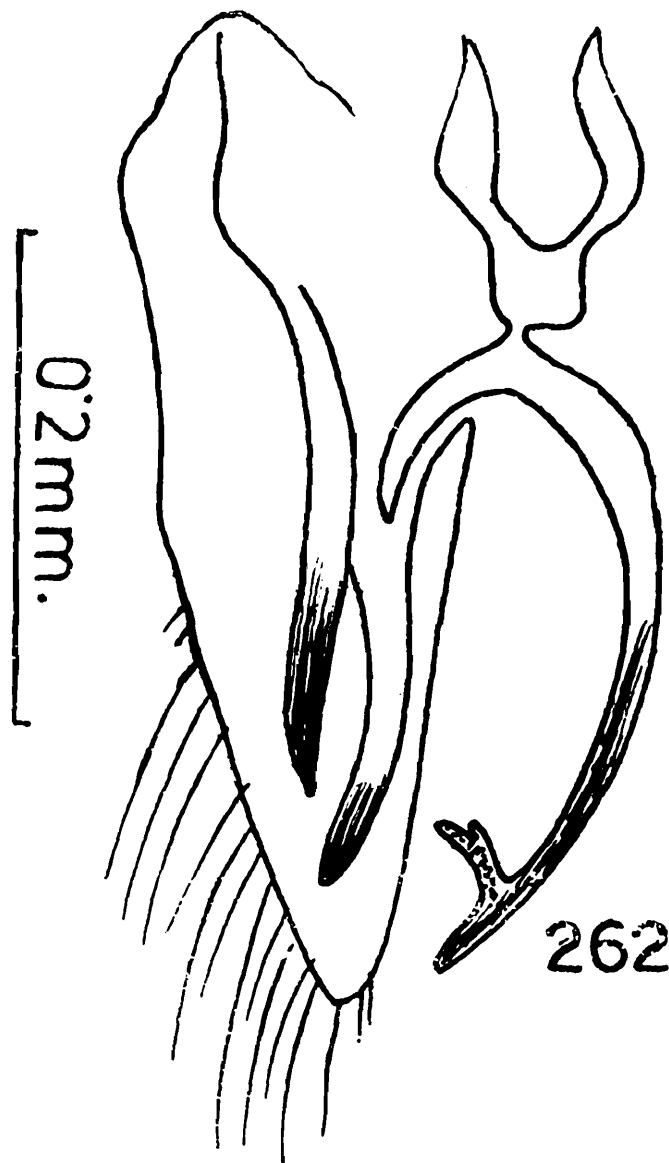
Vertex piceous, anterior margin with dark markings, binotate basad; face piceous (male), with markings (female); pronotum intercepted with markings anteriorly, binotate distad; scutellum spotted; tegmina ochraceous (female), piceous (male).

Length : 3 mm (male), 4.20 mm (female).

Genitalia : Aedeagal shaft (fig. 262) tubular, smoothly arched, subapical process distinctly bifid, apex spoon-shaped; stylar lobes (fig. 262) prominent, inner one longer, apex rounded; male plate and pygofer simple, pygofer without hook.

Holotype No. : 5413/H7 (male), allotype 5414/H7 (female), Zoological Survey of India, Calcutta.

Distribution : Punjab, Pakistan, North India.



Ophiola bicolor (fig. 262).

262. Aedeagus, Style, Male plate.

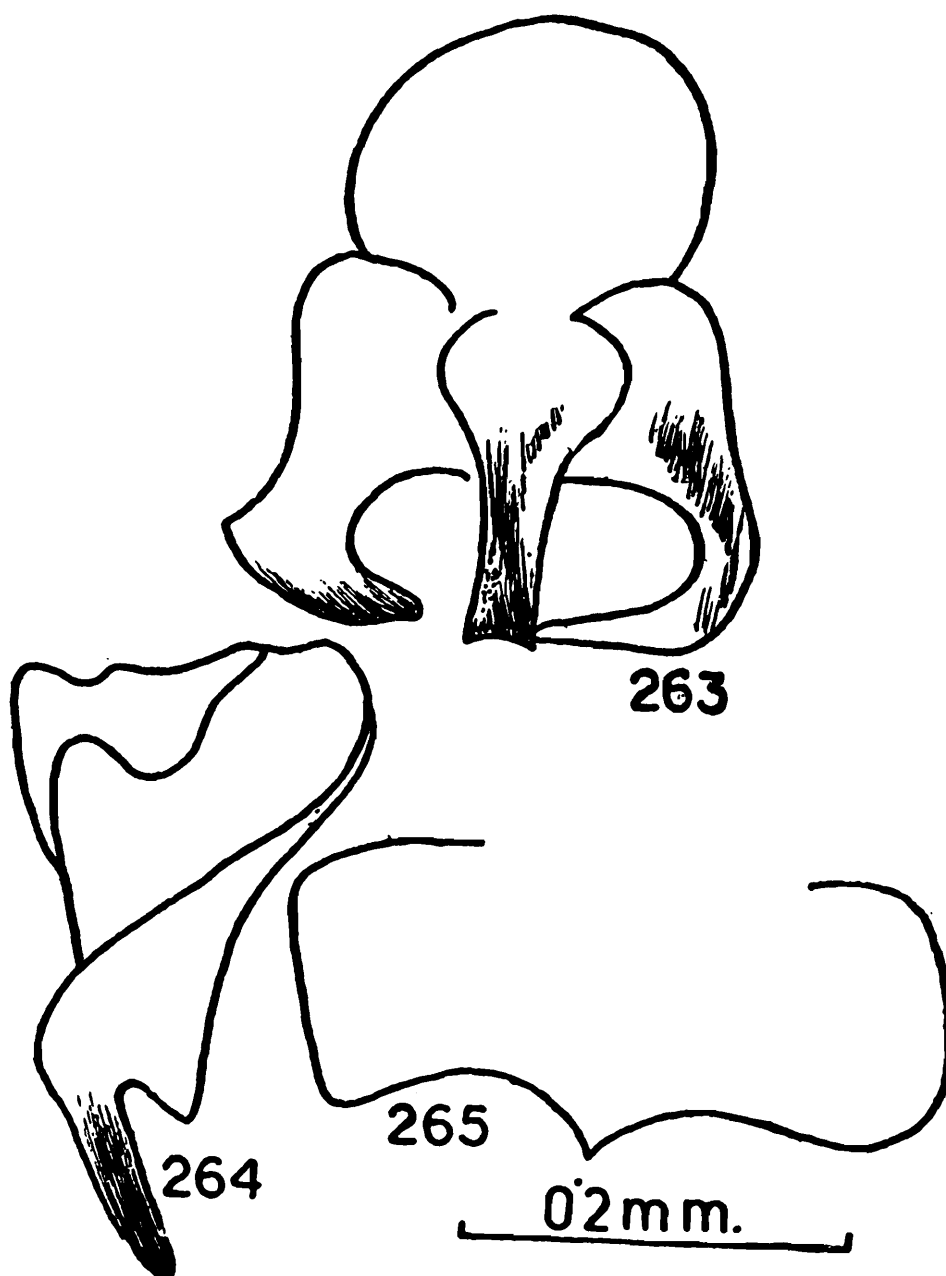
109. ***Ophiola vaccinii*** (Van Duzee)
(Figs. 263—265)

1890. *Athysanus vaccinii* Van Duzee, *Amer. Ent.*, 6 : 134.

Vertex with dark transverse lines ; pronotum with black markings ; tegmina blackish, veins light brown.

Length : 3.60 mm (male), 4.25 mm (female).

Genitalia : Aedeagal shaft (fig. 263) curved laterally, a pair of hook-shaped subapical processes ; style (fig. 264) broader 3/4th, mesal apical extension shorter, obliquely included ; male plate simple ; pygofer with a lobe on posterior margin. VIIth sternite fig. 265).



Ophiola vaccinii (figs. 263-265).

263. Aedeagus, 264. Style, 265. Seventh sternite.

Distribution : United States, Canada, Alaska region, Mount Desert Island.

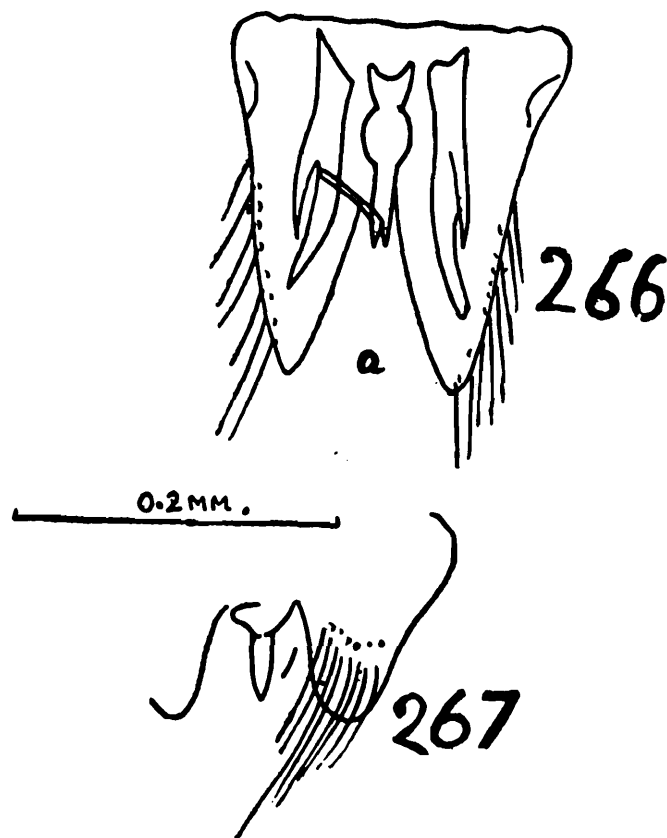
Economic status : Dobrosky (1928) reported this species as vector of false blossom virus of cranberry in Eastern United States, he (1929) (1931) successfully transmitted disease from diseased plant to healthy ones. It is common on blueberry and huckleberry (Philips 1930 : 188), pest on agriculture crops in Alaskan area (Chamberlin 1949 : 31), disseminating cranberry false blossom (Oman 1949 : 11), considered nonvector of blue

berry stunt disease (Tomlinson *et al.* 1950 : 658-662), testing made on *Vaccinium* as secondary host plant of *O. vaccinii* (Van Duz) (Hutchinson *et al.* 1954 : 8-10), systox applied for control of virus by eliminating vectors (Hutch. 1955 : 222-223), vector's control made by using kerosene on cranberry but result was not satisfactory. (Marucci 1954 : 18-22).

110. *Ophiola yatungensis* Pruthi

(Figs. 266—267)

1936. *Ophiola yatungensis* Pruthi, *Mem. Ind. Mus.*, II : 125.



Ophiola yatungensis (Figs. 266-267).

266. Aedeagus, Style, 267. Pygofer.

Male dark yellow, tinged brown; vertex with a pair of longitudinal streaks, two spots at base (male), four spots (female); face piceous (male); pronotum mottled black (female), with patches and spots (male); scutellum binotate medially (female), dark stripes (male); tegmina extending beyond abdomen, veins black, thick, distinct (male); body venrally piceous (male), with black markings (female); metatibiae densely spinulose.

Length : 3 mm (male), 3.50 mm (female).

Genitalia : Aedeagal shaft (fig. 266) basally pitcher-shaped, otherwise tubular, apex nicked with a subterminal slender process directed laterad; style (fig. 266) with a broad base, esal apical extension conico-acuminate, preapical lobe sharp at apex; male plate (fig. 266) subtriangular, apex rotundate, lateral margin with a row of setae, pygofer (fig. 267).

Holotype No. 5415/H7, (male), allotype 5416/H7 (female), Zoological Survey of India, Calcutta.

Type locality : Yatung, Tibet (10,000'), 13-7-1927 (F.M. Bailey).

Distribution : Tibet.

LIII. Genus *Orosius* Dist.

1918. *Orosius* Dist., *Fauna Brit. India*, 7 : 85.

Type, by original designation, *Orosius albicinctus* Dist.

1981. *Orosius albicinctus* Dist., *Fauna Brit. India*, 7 : 85.

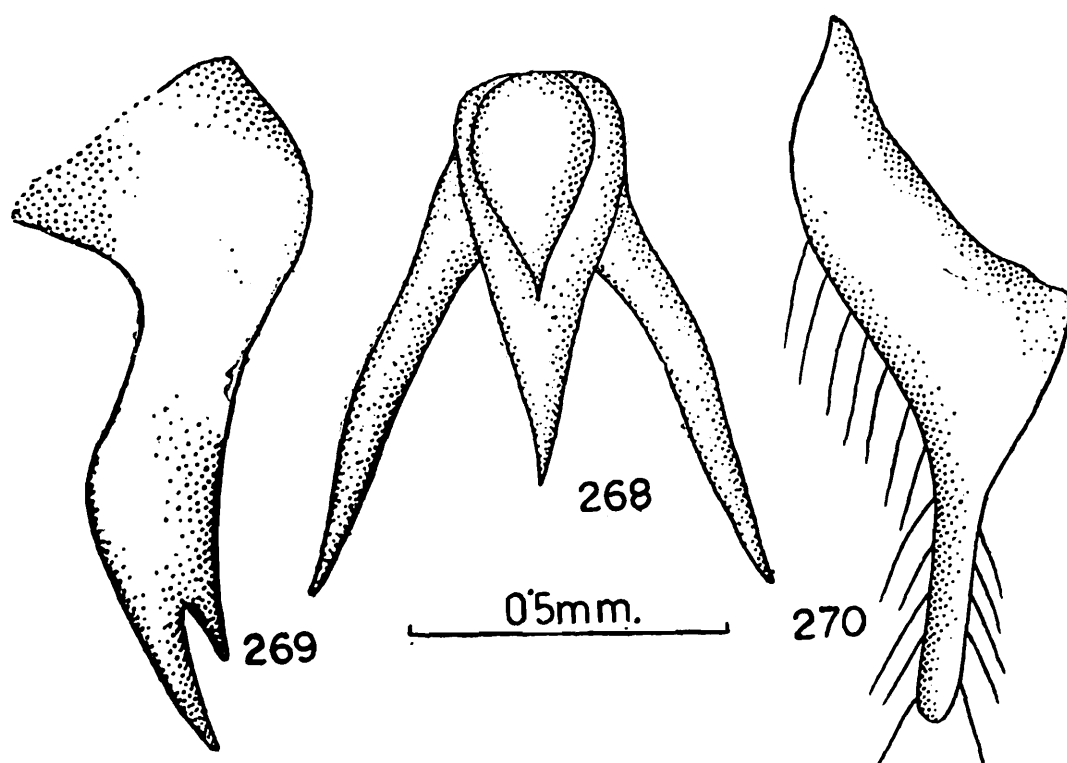
Vertex subconically produced; face concavus, gradually converging to lateral margins; pronotum anteriorly convex, posterior margin truncate; scutellar surface medially with transverse impression; tegmina rounded on apical margin, apical area with net work of cells; posterior tibiae densely spinulate; aedeagus with a basal apodeme, shaft either cylindrate, bifidus or oval shaped, occasionally with a pair of long paraphyses; stylar extension curved; no pygofer hook; seventh sternite (female) convex along posterior margin.

111. *Orosius albicinctus* Dist.

(Figs 268—270)

1918. *Orosius albicinctus* Dist., *Fauna Brit. India*, 7 : 85.

Vertex binotate at apex; clypeal region centrally striate; thorax with markings; scutellum with a pair of black spots at base; ocelli red color;



Orosius albicinctus (figs. 268-270).

268. Aedeagus, 269. Style, 270. Male plate.

tegmina finely mottled with reticulations of dark brown color; body color (male) darker than female.

Length : 2.90 mm (male), 3 mm (female).

Genitalia : Aedeagal shaft (fig. 268) triangulate, apex gradually connivent sharply, well-developed paraphyses projecting laterally, one and half times longer than shaft; style (fig. 269) with short, stout, apical extension, obliquely directed laterad; male plate at (fig. 270) distal half with a finger-like process, basal half set with both fine and macrosetae; pygofer simple, distal half multiseriate.

Biology : Eggs creamy color, oblongus, gradually becoming yellow, eyespots become evident with increasing maturity.

Ist. Instar : Nymphs creamy color, becoming dark grey color gradually, eyes dark brown, ecdysal line prominent proximad.

IInd Instar : Body pale yellow, dark eyes with rusty tinge, ecdysal line appears along dorsal line.

IIIrd Instar : Body color pale white, eyes deep brown.

IVth Instar : Body color pale yellow, eyes pale brown, appearance of both micro- and macrosetae on abdominal surface, ecdysal line evident along dorsal line.

Vth Instar : Body creamy color, vertex with black stripes, pleurites dark chocolate, ecdysal line on verge of rupture.

Distribution : Madras, Norfolk, Punjab, Uttar Pradesh.

Remarks : It's distribution at Norfolk Islands seems confusing, although recorded by Metcalf, I feel it's a misinterpretation since as vector the dissemination of viral diseases is confined to Oriental region, and variation in zoogeographical factors.

Economic status : This species is considered to be the vector of phyllody virus of sesamum in India (Vasudeva *et al.* 1955), tobacco yellow virus (dwarf) and tobacco big bud (Hill 1943) ; legume little leaf virus (Hutton *et al.* 1956) ; spike disease of sandal (Pruthi 1934) and lucerne witch's broom (Helson 1951). Transovarial transmission is not yet proved.

Morphology : Anterior margin of crown semicircular, median length of crown half interocular width, basally raised forming a depressed area ; ocelli located on anterior margin of each eye, equidistant from median suture and eyes ; clypellus convex, posterolaterally depressed, transclypeal suture marked brown ; hind femoral setal formula : 2:1:1 ; pronotal width same as transocular width, laterally angulated, posterolaterally smoothly curved, texture glabrous ; a line of depression below anterior margin ; scutellum with a line of median depression, posteriorly finely rugulose ; tegmina slightly longer ; VIIth sternite (female) densely pigmented, concave-emarginate.

112. *Orosius maculatus* Pruthi

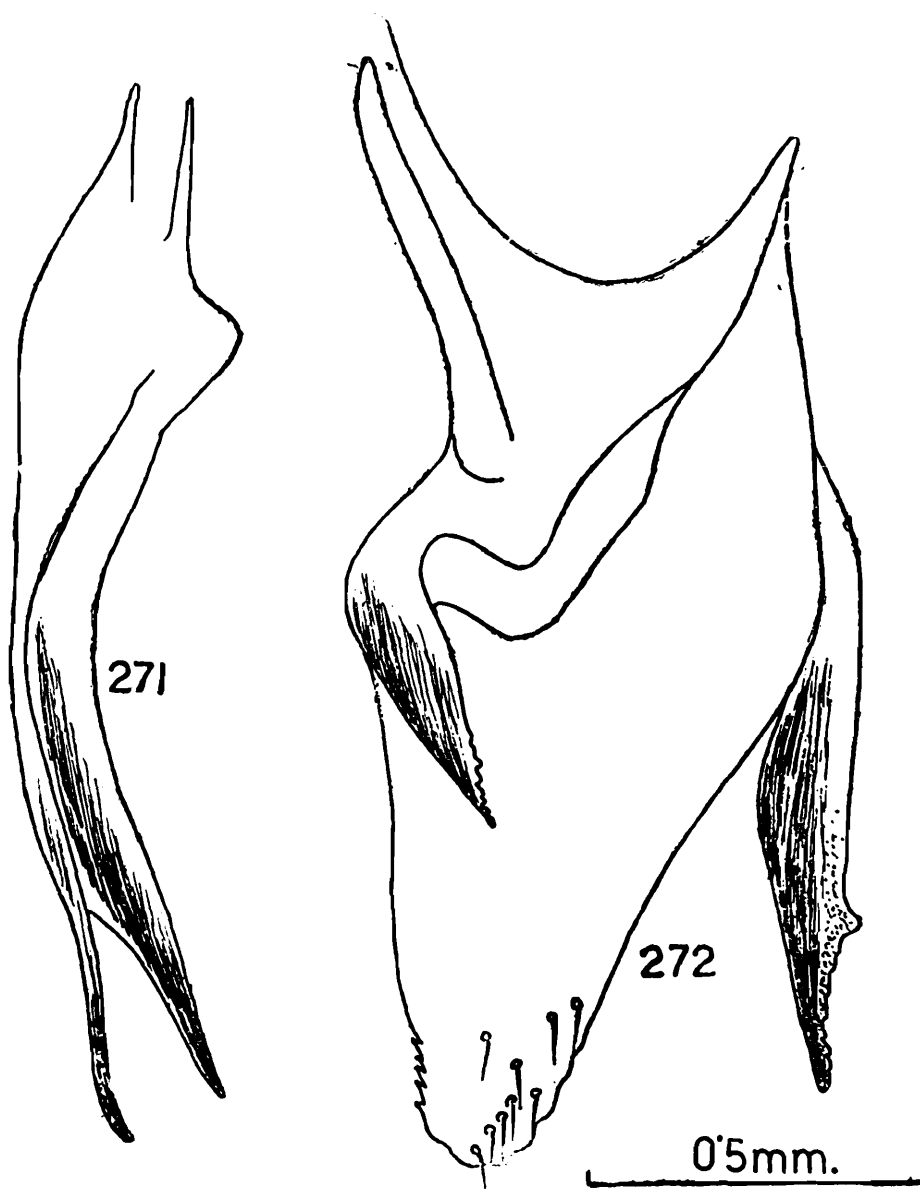
(Figs. 271—272)

1930. *Orosius maculatus* Pruthi, *Mem. Ind. Mus.*, **II** : 67.

Vertex abruptly reflexed downward, anterior margin with numerous spots and patches ; frons laterally dark colored ; pronotum with black markings anteriorly ; scutellum each at basal angle spotted ; tegmina with spots and patches, one at corium, two close to claval suture.

Length : 3 mm (male), 3.25 mm (female).

Genitalia : Aedeagal shaft (fig. 271) split into two flagelliform processes, base broader, gradually connivent to a finer point ; style (fig. 272) with mesal apical extension conico-acuminate ; male plate (fig. 272) rugulose ; pygofer simple.



Orosius Maculatus (figs. 271-272).

271. Aedeagus, 272. Style, Male plate.

Holotype, male.—1166/H7, female.—1171/H7, (Zoological Survey of India), Calcutta.

Type locality : Serai, Rewa State, Madhya Pradesh, India, 21. 11. 27 (H.P.).

Distribution : Madhya Pradesh, India.

LIV. Genus *Paivanana* Dist.

1918. *Paivanana* Dist., *Fauna Brit. India*, 7 : 95.

Type, by original designation, *Paivanana indra* Dist.

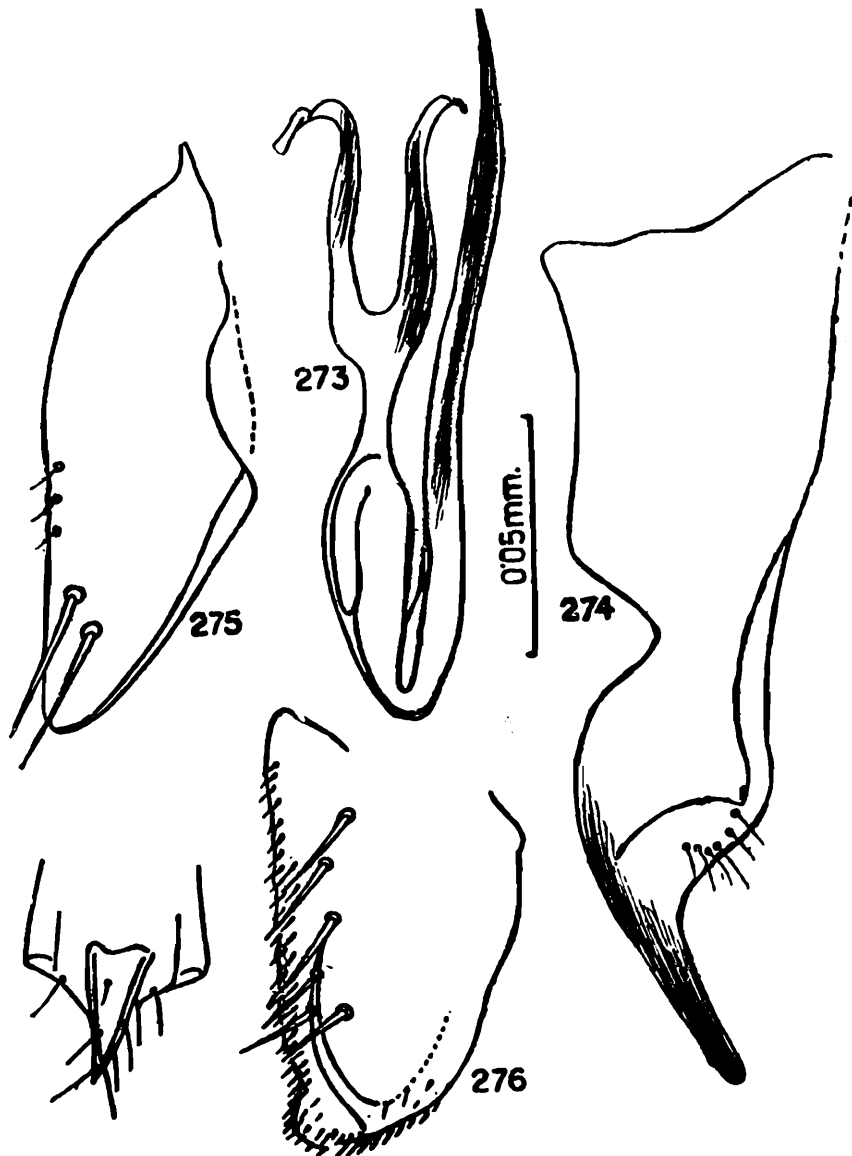
1918. *Paivanana indra* Dist., *Fauna Brit. India*, 7 : 95.

Vertex anteriorly subangulate, centrally longitudinally impressed; eyes larger, prominent; pronotum slightly rounded between eyes, laterally obliquely straight, posterior margin truncate; tegmina extending beyond abdominal tip, appendix distinct; connective with parallel arms, aedeagal shaft usually linear with processes, stylar apical extension broader apicad, male plate with spine-like *setae* uniseriate, usually beyond middle narrowed; pygofer hook present; seventh sternite (female) projected prominently; bulging medially.

113. **Paivanana indra** (Dist.)

(Figs. 273—276)

1908. *Typhlocyba indra* Dist., *Fauna Brit. India*, 4 : 415.



Paivanana indra (figs. 273-276)

273. Aedeagus, 274. Style, 275. Male plate, 276. Pygofer.

Vertex yellowish grey, anterior margin binotate, apex subtriangulate with a median stripe; face with a brownish stripe, sub-apically binotate; pronotum yellowish-grey, anterior margin slightly rounded, posterior margin truncate; scutellum subtriangular; tegmina extending beyond abdominal apex, venation delicate, indistinct, costal and claval margins pale brownish yellow, wing iricolor.

Length : 4 mm (male).

Genitalia : Connective U-shaped, aedeagal shaft (fig. 273) elongate, slender, flagelliform, directed cephalad; style broader basal third (fig. 274), mesal apical extension rugous, tapered to a point, directed posterocephalad, male plate (fig. 275) gradually connivent, discal and lateromarginal setae sparsate; pygofer (fig. 276) without hook, posteromesally densely spined, a minute sclerotised structure on posterolateral part.

Distribution : Calcutta, Chatterji Hills, Panchmari (3,000'), Madhya Pradesh, South India.

LV. Genus *Paralimnus* Mats.

1902. *Paralimnus* Matsunura, *Term. Fuzetek*, **25** : 386.

Type, by subsequent designation, *Paralimnus fallaciosus* Mots.

1902. *Paralimnus fallaciosus* Mots., *Term. Fuzetek*, **25** : 387.

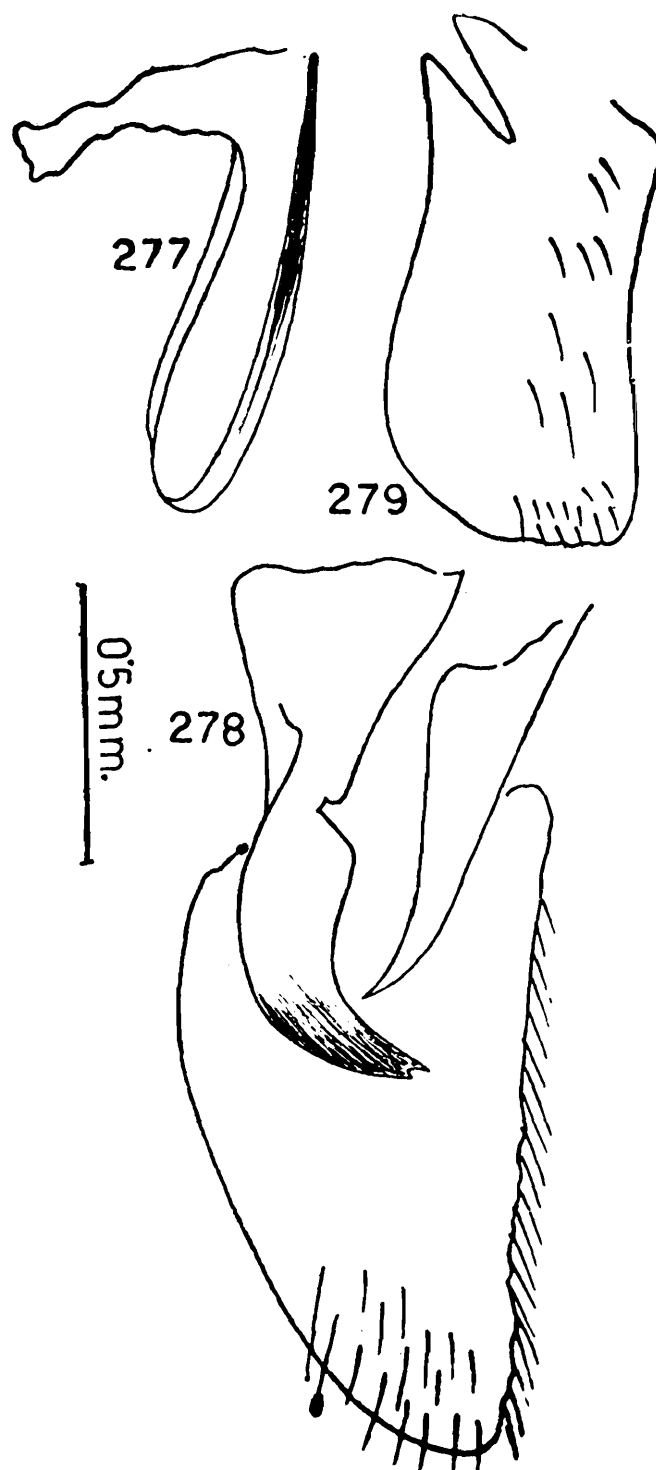
Vertex subacutely produced in front of eyes; ocelli on anterior margin close to each eye; face sinuate near each eye; pronotum reflexed laterally, arched impressions at anterior margin; scutellum transversely impressus before eyes; tibiae densely spined; tegmina with 4 apical cells, 3 ante-apical cells, disc with a transverse vein; aedeagus with well-developed basal apodeme, shaft tube-like, sometimes U-shaped; both stylar lobes prominent, approaching each other towards mesal margin; pygofer spinulate apicad.

114. *Paralimnus albomaculatus* Dist.

(Figs. 277—279)

1908. *Paralimnus albomaculatus* Dist., *Fauna Brit. India*, **4** : 397.

Vertex brownish yellow, apical margin bordered black, anterior margin white; pronotum dark brown, anterior margin with obscured white spots; scutellum dark brown, a black spot at each basal angle; tegmina dark



Paralimnus albomaculatus (figs. 277-279).

277. Aedeagus, 278. Style, Male plate, 279. Pygofer

brown with number of spots at costal area, claval suture and apical cells; metatibiae and tarsi black; abdomen dark brown.

Length : 5 mm (male).

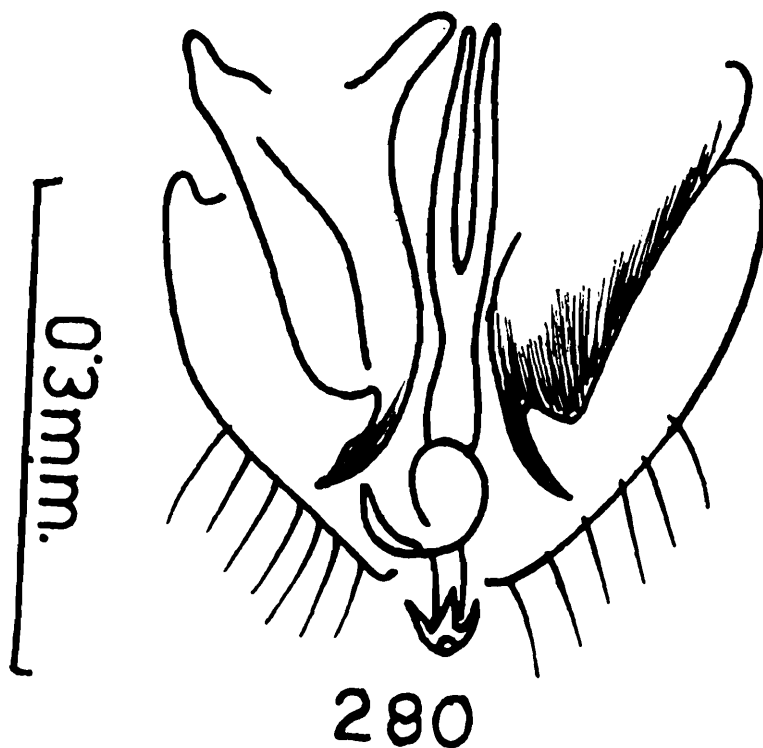
Genitalia : Connective Y-shaped, basal strut well-developed, aedeagal (fig. 277) shaft appearing U-shaped, apex acute, directed cephalad ; style (fig. 278) with differentiate preapical extension lengthwise concavus, apex acuminate, directed posterolaterad ; male plate (fig. 278) gradually converging, apically rounded, mesal margin uniseriate, disc with macrosetae ; pygofer (fig. 279) without hook, postero-laterally densely spined.

Distribution : Fraserpet, Coorg, Ceylon, Java, Bengal, Bombay, Belgian, Congo.

115. *Paralimnus confuscus* Pruthi

(Fig. 280)

1936. *Paralimnus confuscus* Pruthi, *Mem. Ind. Mus.*, II : 129.



Paralimnus confuscus (fig. 280).

280. Aedeagus, Style, Male plate.

Vertex with pale patches on disc, arranged in two rows at anterior margin, a minute dark brown spot on each side basad ; pronotum mottled with dark brown spots ; scutellar spotted at each basal angle, margin with dark brown patches, two spots mediad.

Length : 4.5 mm (male).

Genitalia : Aedeagal apodeme (fig. 280) club-shaped, shaft tubular, apex with a circlet of short processes directed cephalad ; styler shaft (fig. 280) with mesal apical extension tapered, curved, pointed ; male plate (fig. 280) oblong, laterally uniseriate.

Holotype No. : 5423/H7, (Ind. Mus.), Zoological Survey of India, Calcutta. (H.S.P.).

Distribution : South India.

116. *Paralimus lateralis* (Walk.)

(Figs. 281—284)

1957. *Bythoscopus lateralis* Walk., *Proc. J. Linn. Soc. Lond.*, **1** : 173.

Vertex angulate apicad, a transverse line between eyes ; pronotum binate on arcuate line near apical margin ; scutellum spotted on each basal angle ; tegminal cells with brownish patches ; abdomen light brown.

Length : incl. tegmn. 5 mm (male), 6 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 281) narrowed basad, apically spanner-shaped ; style (fig. 282) with short mesal apical margin knob-like, hook-shaped, directed mesad ; male plate (fig. 283) gradually connivent distally ; multiseriate ; pygofer (fig. 284) with a slender hook laterobasally, directed laterad ; seventh sternite (female) on posterior margin feebly concavus.

Distribution : Borneo, Ceylon, Tanganyika, Bombay, Java, Madras, E. Africa, Sarawak, Bihar.

Economic status : The occurrence on sandal wood is yet to be confirmed along with *P. albomaculatus*.

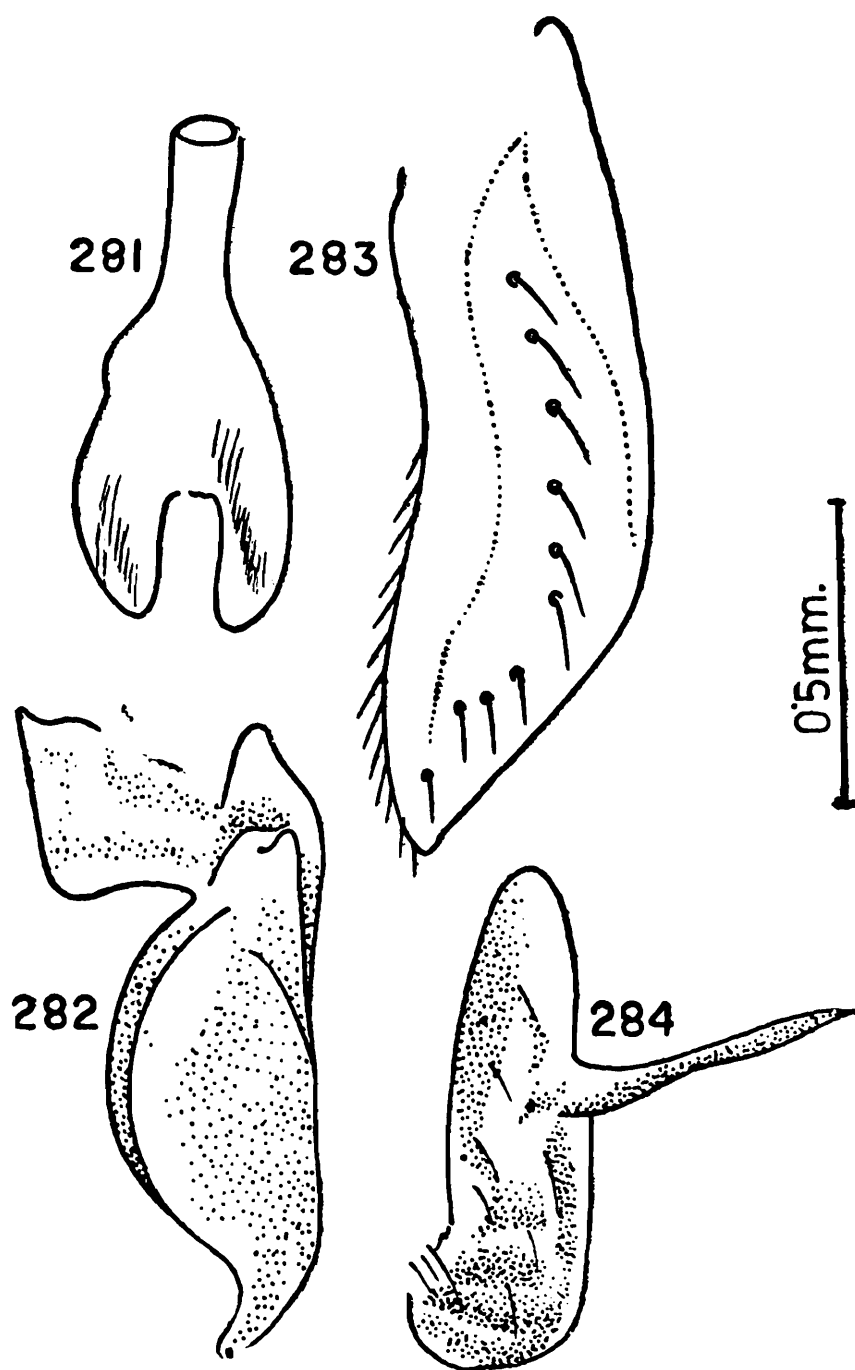
LVI. Genus *Paternus* Dist.

1918. *Paternus* Dist., *Fauna Brit. India*, **7** : 71.

Type, by original designation, *Paternus pusanus* Dist.

1918. *Paternus pusanus* Dist., *Fauna Brit. India*, **7** : 71.

Vertex gradually converging apicad, longer than width between eyes, apex subacute ; face rounded laterally ; eyes projecting over lateral pronotal



Paralimnus lateralis (figs. 281-284).

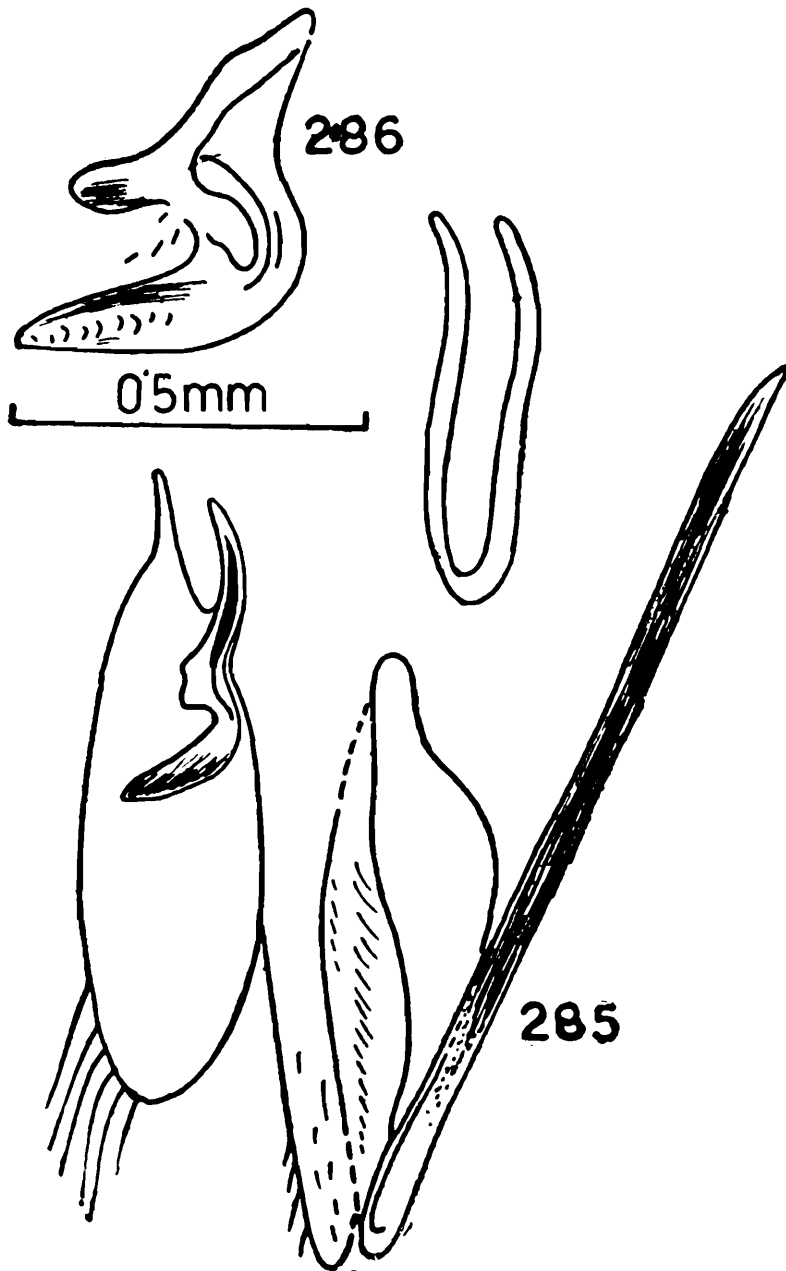
281. Aedeagus, 282. Style, 283. Male plate, 284. Pygofer.

angles; pronotum at anterior margin slightly sinuate below eyes, lateral margin short, disc longitudinally sulcatus; scutellum transversely depressus before apex; tegmina with 3 apical cells, slenderer, longer than subapical cell; connective U-shaped, aedeagal shaft arcuate, stylar shaft pointed apically; male plate of varied shapes, either egg-shaped or subtriangulate; seventh sternite (female) concavus at posterior margin.

117. *Paternus verticus* Pruthi

(Figs. 285—286)

1930. *Paternus verticus* Pruthi, *Mem. Ind. Mus.*, II : 44.



Paternus verticus (figs. 285-286).

285. Aedeagus, Style, 286. Style, Male plate.

Vertex pale brown, frons with reddish patches laterally.

Length : 3.75 mm (male).

Genitalia : Aedeagal shaft (fig. 285) attenuate apicad, shape as figd. ; style dagger-shaped, (fig. 285, 286) mesal apical extension third rugulose male plate (fig. 285) simple ; pygofer without hook, sparsely setose.

Holotype : 761/H7 (male), allotype 762/H7 (female), (Ind. Mhs.), Calcutta.

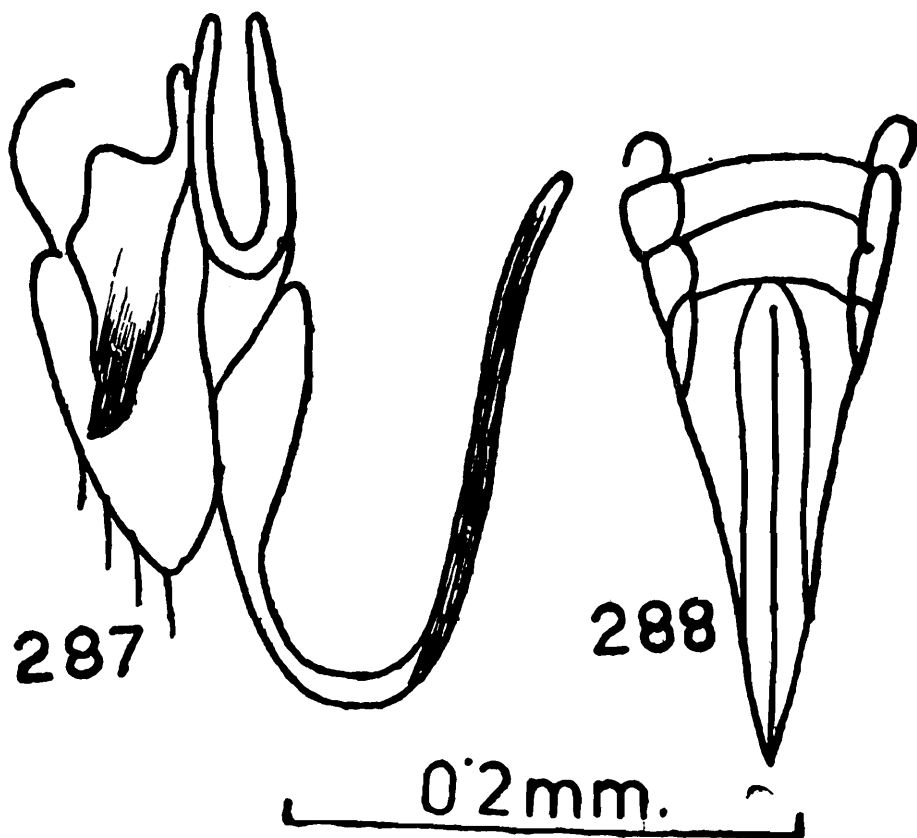
Distribution : Ceylon, Colombo, South India.

Comment : The species differs insignificantly from *P. viridula* Pruthi, because of having similar shaped genitalia, it must miss its species identity.

118. *Paternus viridulus* Pruthi

(Figs. 287—288)

1930. *Paternus viridulus* Pruthi, *Mem. Ind. Mus.*, II : 42.



287. Aedeagus, Style, Male plate, 288. Seventh sternite.

Vertex stramineous, acute apex, sulcatus basally; ocelli close to eyes, pronotum with a pair of linear impressions on anterior margin; scutellum depressed distad; veins slenderer, indistinct; wings smoky; abdomen ventrally greenish.

Length : 4 mm (male), 4.5 mm (female).

Genitalia : Connective U-shaped, aedeagal shaft (fig. 287) gradually attenuate, tube-like, strongly arcuate, directed cephalad ; style (fig. 287) with mesal apical extension sharply pointed, directed caudad ; male plate (fig. 287) oviform, setose posteriorly ; pygofer simple ; seventh sternite (female) concavus at posterior margin (fig. 288).

Holotype No : 748/H7 (male), allotype, 750/H7 (female), (Ind. Mus.) Calcutta.

Type locality : Kodaikanal, Palni Hills, 3-4-VII-29 (H.S. Pruthi).

Distribution : Kangumadugu (3,000'), Palkonda Hills, Cuddapah Dist., S. India.

Morphology : Vertex triangulate, eyes elongate, median length of crown twice interocular width, texture granulated, median suture at basal half distinct, posterior margin truncate ; lateral margin of head in line with outer margin of eyes ; clypeus flat, gradually attenuated apicad ; ocelli placed close to outer angle of each eye ; lateral clypeal suture extending upto each ocellus ; antennal bases placed in cavities ; pronotal width greater than transocular width, with a distinct longitudinal carina, texture with striations, posterior margin concavus ; scutellum granulated and foveate ; forewing transparent, appendix developed, 4 apical and 3 antepical cells, outer antepical cell shorter ; VIIth sternite (female) concavus at posterior margin ; hind femoral setal formula : 2:1:0.

Registered No. : 755/H7 (male), 2770/H7 (female), Entomological Division, Zoological Survey of India, Calcutta.

LVII. Genus *Platyrectus* Melichar

1903. *Platyrectus* Melicher, *Hom. Fauna Ceylon*, p. 174.

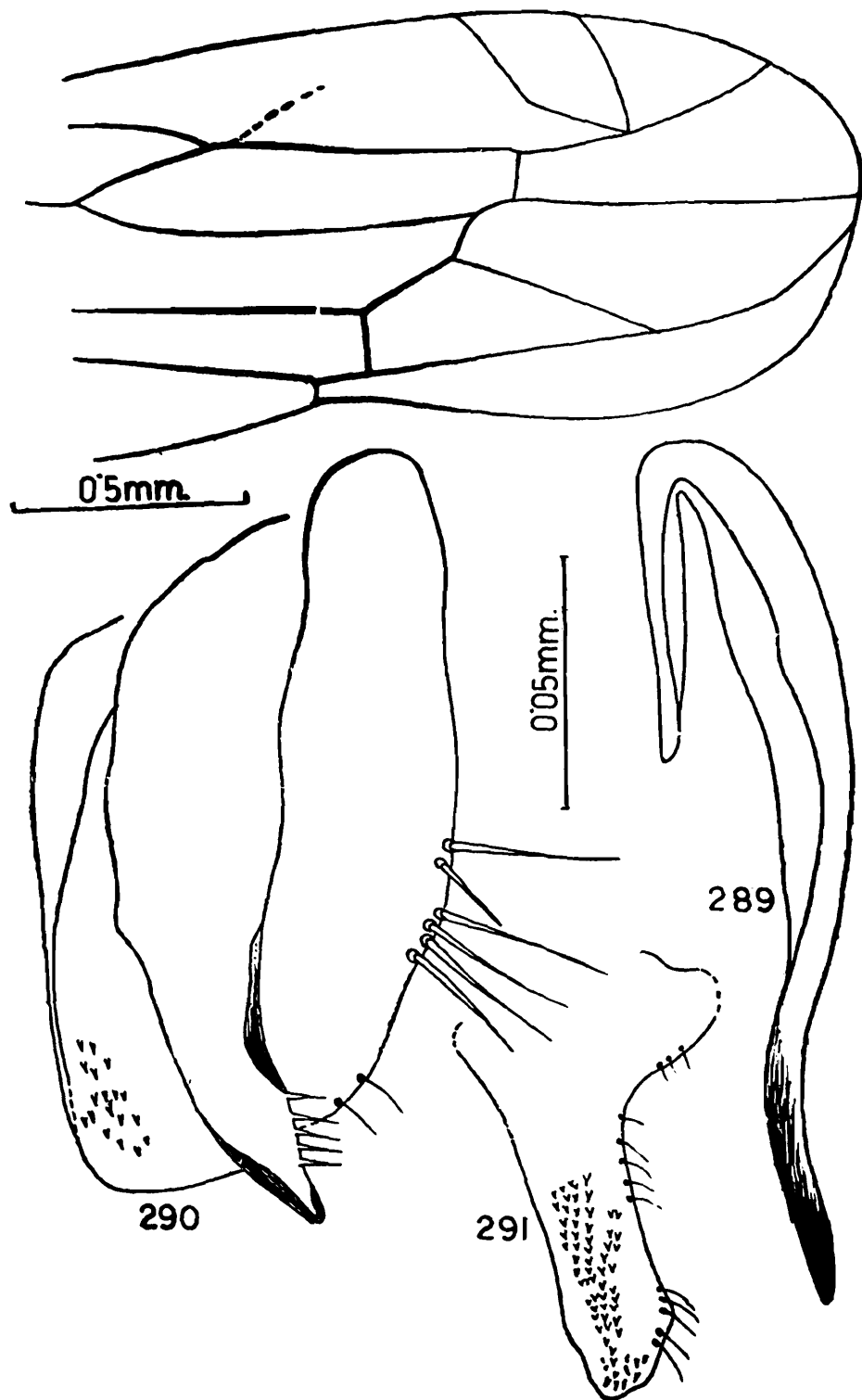
Type, by original designation, *Platyrectus marginatus* Melicher.

1903. *Platyrectus marginatus* Melicher, *Hom. Fauna Ceylon*, p. 174.

Vertex spatulate, outer margin of eyes in line with vertex ; ocelli at anterior margin ; disc with a longitudinal carination, depressus laterad, anterior margin produced between eyes centrally carinate ; tegmina longer than abdominal tip, costal margin near middle arched slightly, apically obliquely narrowed, 4 apical cells, two transverse veins before apex ; aedeagus with an acute apex, sometimes drawn out to a finer process ; stylar shaft with definite shape ; pygofer without hook.

119. *Platyrectus marginatus* Melicher

(Figs. 289—291)

1903. *Platyrectus marginatus* Melicher, *Hom. Fauna Ceylon*, p. 174.*Platyrectus marginatus* (figs. 289-291).

289. Aedeagus, 290. Style, Male plate, 291. Pygofer.

Vertex spatulate, apex subconical, centrally carinate; pronotum with sinuate posterior margin, carinate medially; scutellum carinate; tegmina castaneous, costal margin eburneus, longer than abdomen; tibiae finely spinulate.

Length : 6 mm (male).

Genitalia : Aedeagal shaft (fig. 289) drawn out to a whip-like process, apex acute; style (fig. 290) with mesal apical extension dagger-shaped, apex pointed, directed caudad; male plate (fig. 290) with lateral margin convex, setose; pygofer without book (fig. 291).

Distribution : Ceylon, Java, Bengal, Tenasserim, Lower Burma, Sumbawa, Madras, India.

LVIII. Genus *Recilia* Edwards

1922. *Recilia* Edwards, *Ent. mon. Mag.*, 58 : 206.

Type, by original designation, *Deltocephalus dorsalis* Mots.

1859. *Deltocephalus dorsalis* de Motschulsky, *Etude Ent.*, 8 : 114.

General color pale grey; vertex obliquely angulate; face hexagonal, eyes in line with outer margin of vertex; pronotum slightly sinuate below eyes, lateral margin obliquely truncate; tegmina longer than abdomen, apically rounded, veins distinctly pigmented; connective linear, aedeagus tubular, apex conico-acuminate; stylar shaft gradually tapered; pygofer simple; seventh sternite (female) truncate at posterior margin.

120. *Recilia dorsalis* (de Mots.)

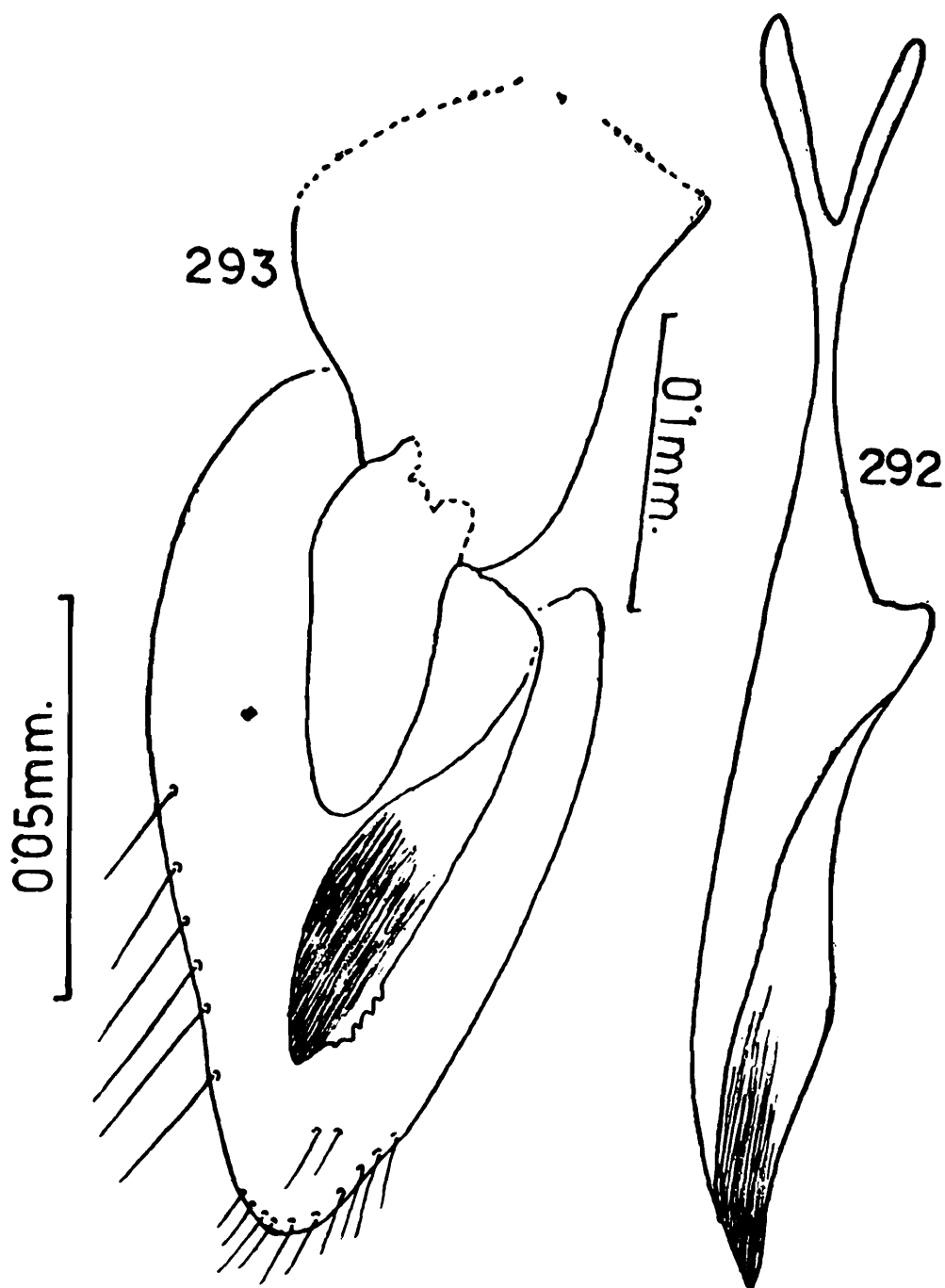
(Figs. 292—293)

1859. *Deltocephalus dorsalis* de Mots., *Etude Ent.*, 8 : 114.

Vertex binotate basad, pronotum with shades, scutellum at each basal angle with a spot; tegmina with oblique fuscous forming as central spot at claval suture, a row of fuscous spots, brown color, extend from apex of clavus to apical cells, a linear dark line beyond costal margin; face at base with a pale spot.

Length : 3 mm (male), 4 mm (female).

Genitalia : Aedeagal shaft (fig. 292) cultriform, stout, elongate; stylar shaft (fig. 293) beyond middle tapered to a point; male plate and pygofer simple by structures; VIIth sternite (female) truncate posteriorly.



Recilia dorsalis (figs. 292-293).

292. Aedeagus, 293. Style, Male plate.

Distribution : Bengal, Ceylon, Burma, Madras, South East and Far East Asian countries.

Economic status : Concerning the investigation of the interaction between rice virus and their vectors, this species is considered to be disseminating the viral diseases as Dwarf disease (restricted to Japan), orange leaf virus virus (South East Asian Countries) and Tungro in Thailand.

Despite very high density in Bengal the viruliferous trait of the species is not yet recorded from India.

LIX. Genus *Rhombopsana* Metcalf

1952. *Rhombopsana* Metcalf, *J. Wash. Acad. Sci.*, **42** : 299.

Type, by subsequent designation, *Rhombopsis virens* Haupt.

1927. *Rhombopsis virens* Haupt, *Bul. Palestine Agr. Expt. Station*, **8** : 23.

Vertex feebly reflexed near subacute apex, anterior margin sharp; ocelli placed on lateral margin; face rhomboid, lateral side slanting; clypeus flat at apex; pronotum posteriorly concavus; tegmina longer than abdomen, 4 to 5 apical cells, appendix distinct, a narrow strip; connective Y-shaped, aedeagus with developed base, curvate along axis, tubular, linear, rod-shaped, with processes; style broader at maximum length, apex hook-shaped; male plate triangulate; VIIth sternite (female) distinctively wavy and feebly notched medially at posterior margin.

121. *Rhombopsana viridis* (Pruthi)

(Fig. 294)

1930. *Rhombopsis viridis* Pruthi, *Mem. Ind. Mus.*, **II** : 34.

Vertex with reddish patches close to eyes, frons marginally reddish; scutellum binotate basad, impressus apically; claval margin spotted black; both meso-meta tibiae mottled black.

Genitalia : Aedeagal shaft (fig. 294) with a pair of terminal processes, shaft arched, converging; stylar shaft (fig. 294) rotundate apically, cylindrical; male plate (fig. 294) simple; anal hook having heavily pigmented tip, directed laterocaudad; pygofer simple, without hook.

Holotype ♂ and allotype ♀ 717-718/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Lyallpur, Punjab, Oct. 1919 (Anandale).

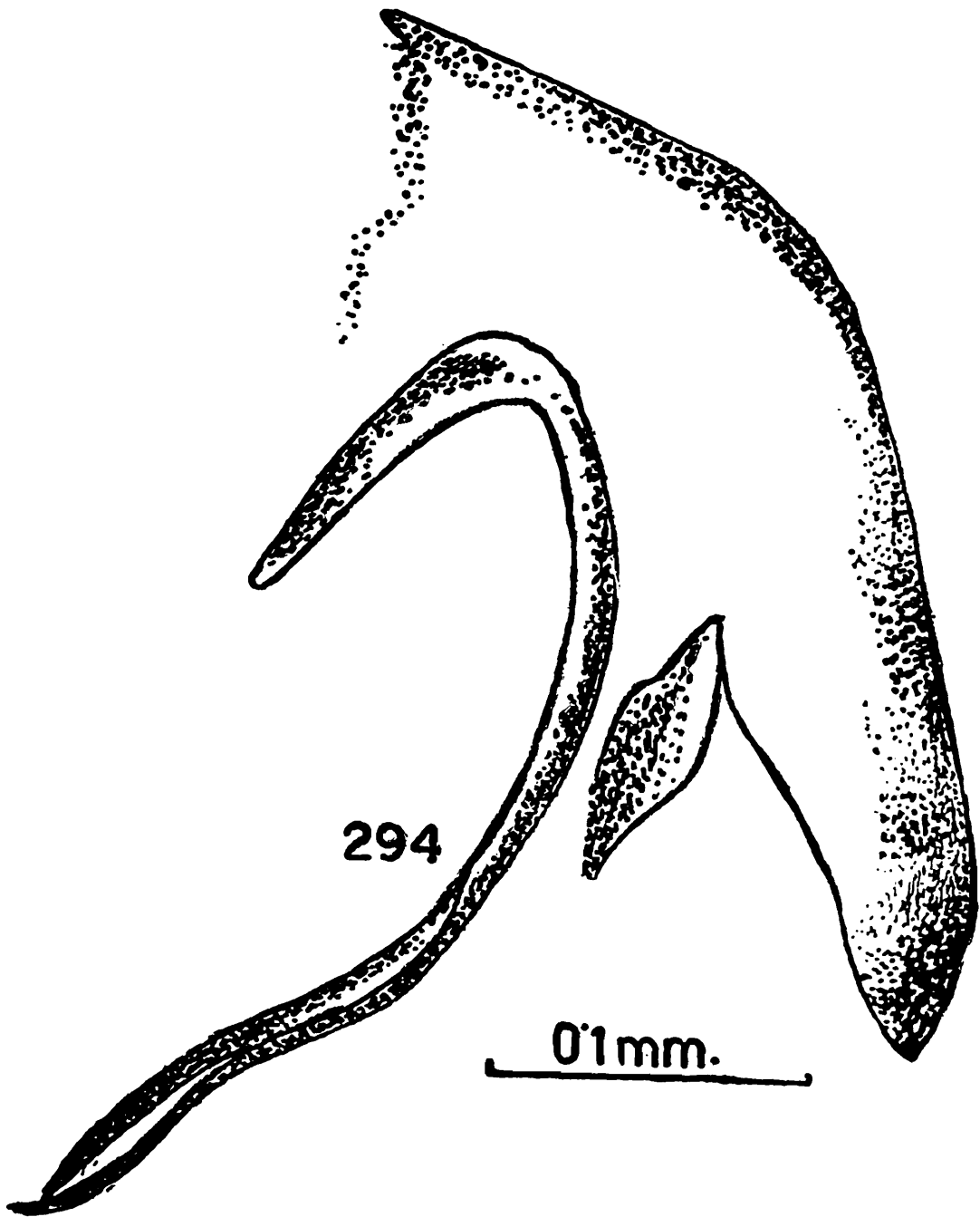
Economic status : This species is considered to be a suspect vector of disseminating spike-disease to sandal plantations in Dehra Dun area.

LX. Genus *Scaphoideus* Uhler

1889. *Scaphoideus* Uhler, *Trans. Maryland Acad. Sci.*, **I** : 33.

Type, by original designation, *Jassus immistus* Say.

1830. *Jassus immistus* Say, *J. Acad. Sci. (Phil.)*, **6** : 306.



Rhombopsana viridis (fig. 294).
294. Aedeagus, Style, Male plate.

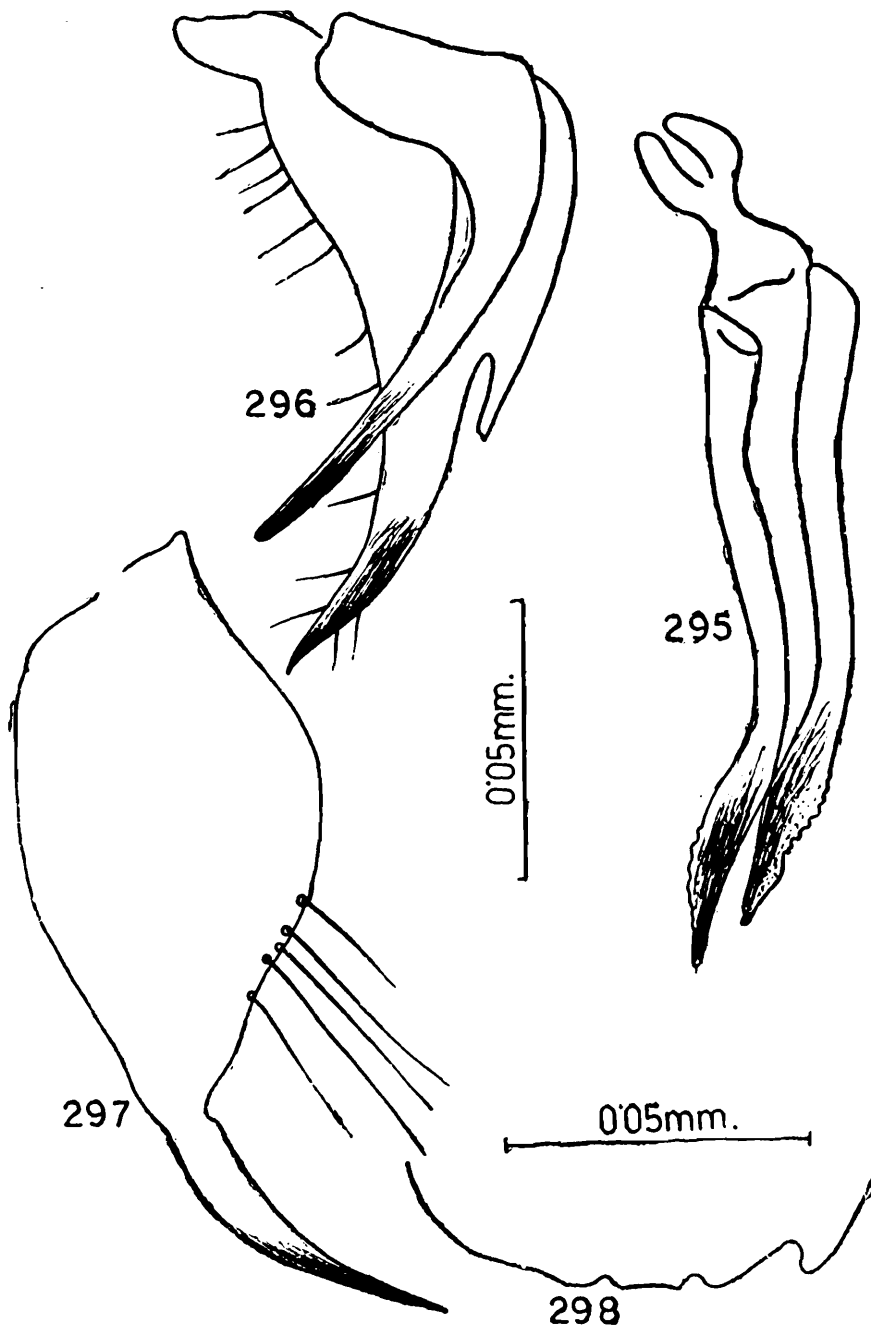
Body color brown or yellowish brown, mottled with dark brown, orange or yellow patterns, streaks and spots, beads or lines; head same width or narrower than pronotum; crown with bluntly pointed anterior margin; tegmina with well-developed appendix, outer anteapical cell small, acuminate distally, claval veins strongly curved; connective Y-shaped, fused or attached to style, aedeagus with tubular shaft, elongate, with or without a pair of apical or subapical processes, gonopore terminal; style varied shaped; male

plate triangular with spine-like setae; pygofer variously modified, with stout setae; seventh sternite (female) twice as long as sixth sternite.

122. *Scaphoideus elegantulus* Melichar

(Figs. 295—298)

1903 *Scaphoideus elegantulus* Melichar, *Hom. Fauna Ceylon*, p. 198.



Scaphoideus elegantulus (figs. 295-298).

295. Aedeagus, 296. Style, Male plate, 297. Pygofer, 298. Seventh sternite.

Vertex with a pair of apical and discal spots ; pronotum with 3 pairs of spots, anterior, in front of discal and one pair at discal plate ; scutellar spots indistinct at anterior margin, one pair each at basal angle, a pair at apical area ; face with a pair of piceous lines followed by 4 discal spots and 2 spots postero-laterally ; clypeus tetra-spotted ; gena spotted piceous ; tegmina with grey-white and black spots, white spots on claval suture, costal and apical areas.

Length : 4.0 mm (male), 4.5 mm (female).

Genitalia : Aedeagal shaft (fig. 295) with a pair of processes, serrate ; abruptly tapered at distal margin ; pygofer (fig. 297) sharply pointed, elongate, directed laterad, style and male plate (fig. 296) 7th. sternite (female), (fig. 298).

Distribution : Ceylon, Lyallpore, Punjab.

123. *Scaphoideus immistus* (Say)

(Figs. 299—300)

1830. *Jassus immistus* Say, *J. Acad. Nat. Sci. (Phil.)*, 6 : 306.

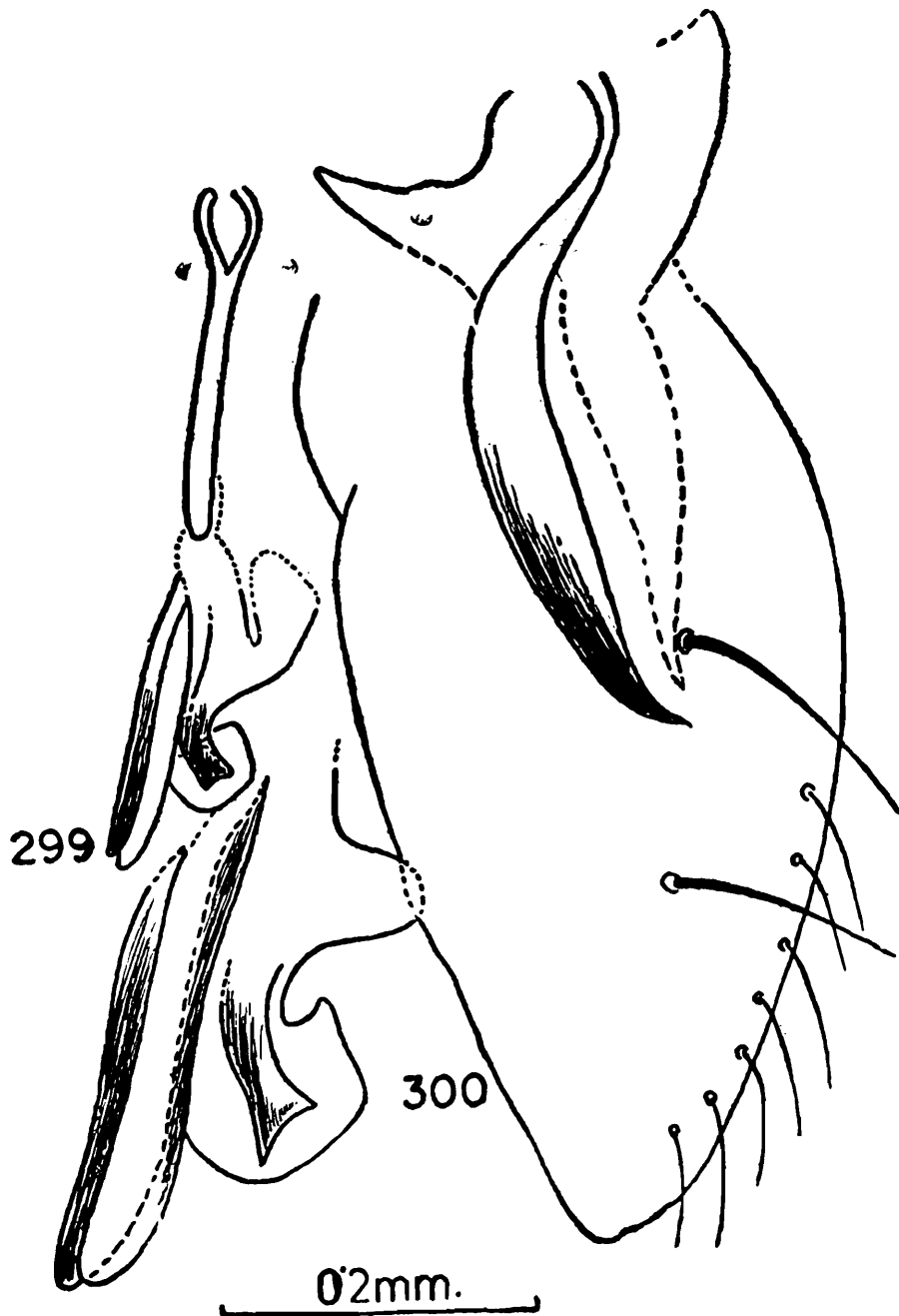
Vertex with a dark band, anterior margin finely bordered ; tegminal veins dark brown, cells with colored patches, apical cells dark brown ; abdominal segments and legs pale color.

Length : 5 mm (male), 5.50 mm (female).

Genitalia : Aedeagal shaft (fig 299) robust, apically sharp, serratus ; stylar shaft (fig. 300) attenuate, twisted ; male plate (fig. 300) and pygofer simple, seventh sternite (female) sinuate at posterior margin.

Distribution : Missouri, Kansas, Quebec, Florida, Texas, Maryland, Iowa, Colorado, Alabama, Vermont, Staten Island, South Carolina, Long Island, California, Virginia, Delaware, Utah, Washington, Georgia, Ohio.

Economic status : The species is very common in occurrence on evening primrose in New Jersey area (Dikkers *et al.* 1920), associated with sugarbeet in Ontario (Stirrett 1935), recently it is recorded from Chinsura Research Farm, West Bengal, along with common Homopteran pests on paddy crop (Datta, 1976).



Scaphoideus immistus (figs. 299-300).

299. Aedeagus, 300. Style, Male plate.

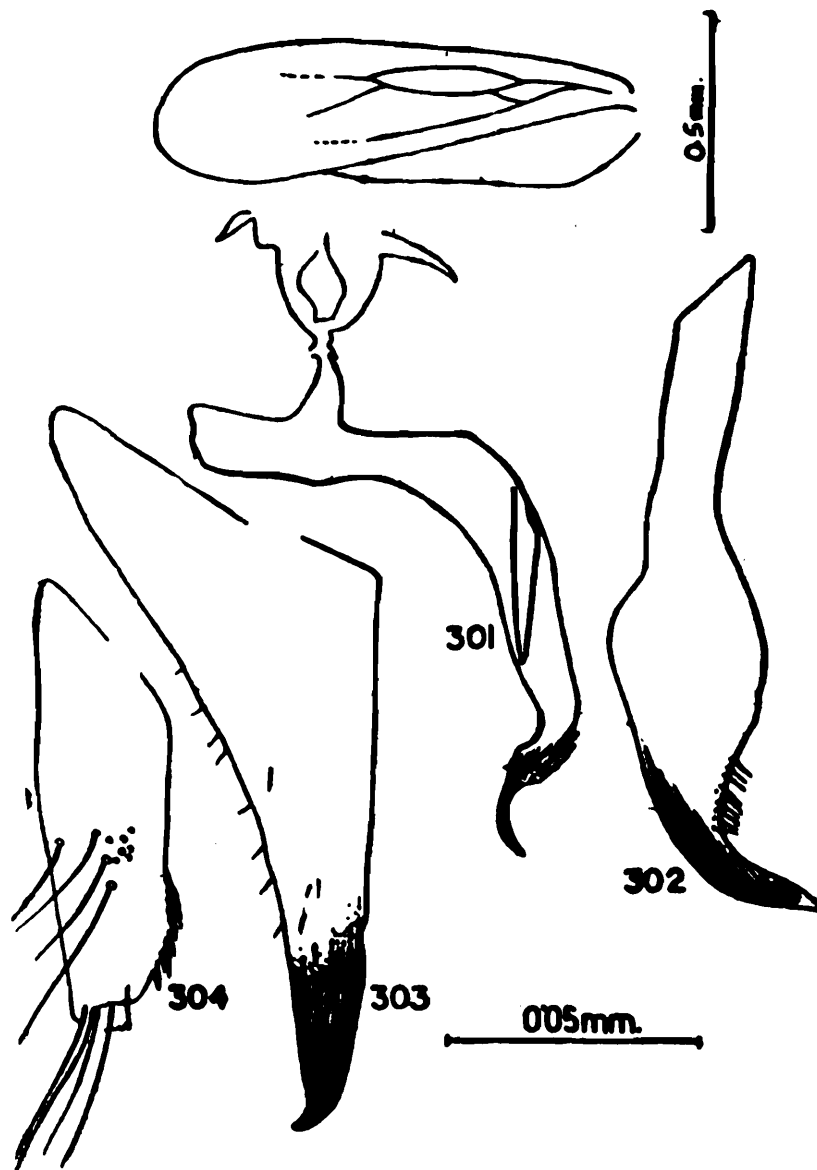
Morphology : Anterior margin of vertex triangulate, median line transversely depressus, outer margin of eyes in line with lateral margin of crown, median suture distinct, texture granulate; clypeus subparallel laterad, transclypeal suture distinctly marked, lora and gena defined; ocelli placed contiguous to each eye on anterior margin; lateral clypeal suture extending to antennal bases; pronotal width greater than transocular width, lateral margin straight, posterolateral margin obliquely desected, posterior margin

concavus texture granulated; scutellum depressed medially with deep transverse striations, texture shiny; forewing with well-developed appendix, 4 apical and 3 anteapical cells, inner and central cells of equal length, outer anteapical cell short; hind femoral setal formula : 2:1:1; VIIIth sternite feebly sinuate at posterior margin.

124. **Scaphoideus morosus** Melicher

(Figs. 301—304)

1903. *Scaphoideus morosus* Melicher, *Hom. Fauna Ceylon*, p. 197.



Scaphoideus morosus (figs. 301-304).

301. Aedeagus, 302. Style, 303. Male plate, 304. Pygofer.

Vertex, pronotum, scutellum pale white, vertex with a fine subapical line and a broad fascia between eyes; pronotum with 4 broad longitudinal

fasciae; face with a pair of angulated transverse stripes and central spot; tegmina with 3 stripes on posterior half, apical cells with piceous spots preceded by white spots.

Genitalia : Aedeagal shaft (fig. 301) fissate and furcate in form of processes, stout, divergent, apex attenuate sharply, outer margin subapically with distinct serrations; stylar shaft (fig. 302) without preapical lobe, apex feebly nicked; male plate (fig. 303) tapered gradually, pygofer (fig. 304).

Distribution : Bengal, Ceylon, Formosa, Java, Luzon, Philippines, Assam, Sumbawa.

Economic status : The species occurs along with viruliferous paddy pest namely *N. nigropicta*, *R. dorsalis*, but its involvement in dissemination of viral disease is not yet ascertained by any entmologist.

LXI. Genus *Sunda* Pruthi

1936. *Sunda* Pruthi, *Mem. Ind. Mus.*, II : 112.

Type, by original designation, *Sunda rebeiroi* Pruthi.

1936. *Sunda rebeiroi* Pruthi, *Mem. Ind. Mus.*, II : 112.

Vertex triangulate, apex acute, surface sulcatus, marginally carinate; ocelli below lateral carina of vertex, close to eyes; antennae elongate, slender; promotal surface distinctly carinate, deeply curved below each eye; tegmina extending beyond abdominal tip, appendix small, 4 apical and 3 antepical cells; connective Y-shaped, arms laminate, aedeagus tubular; stylar shaft curvate, acuminate; male plate triangulate; 7th sternite (female) truncate at posterior margin.

125. *Sunda rebeiroi* Pruthi

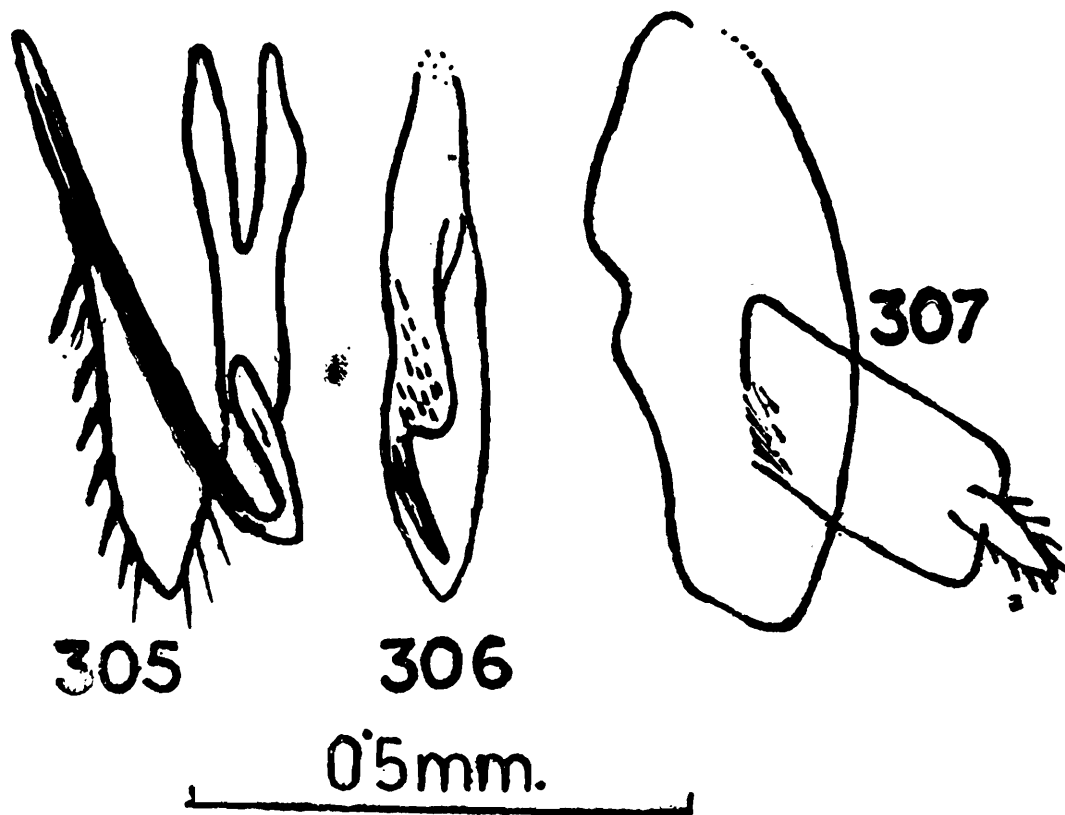
(Figs. 305—307)

1936. *Sunda rebeiroi* Pruthi, *Mem. Ind. Mus.*, II : 112.

Vertex spatulate, pale brown; frons posteriorly black, otherwise brown, laterally striped; scutellum apically depressus; tegminal veins distinct; abdomen reddish-brown ventrad; prosternum with black patches.

Length : 6 mm (male).

Genitalia : Connective Y-shaped, arms laminate, $\frac{1}{3}$ rd aedeagal base oviform, (fig. 305) otherwise tubular, apex pointed, directed laterocephalad;



Sunda ribeiroi (figs. 305-307).

305. Aedeagus, 306. Style, 307. Pygofer.

styler shaft (fig. 306) without distinct preapical lobe, $\frac{3}{4}$ th laminate, mesal apical extension abruptly narrowed, arcuate, sharp; male plate (fig. 305) simple, apex convergent; pygofer without hook (fig. 307) simple; seventh sternite (female) truncate posteriorly.

Holotype.—5401/H7, (Z.S.I.), Calcutta.

Distribution : Ramporehat, West Bengal, India.

LXII. Genus *Thamnotettix* Zetterstedt

1840. *Thamnotettix* Zetterstedt, *Insecta Laponica* I : 292.

Type, by subsequent designation, *Cicada prasina* Fallen.

1806. *Cicada prasina* Fallen, *Sevenska Vet. Akad. Nya Handl.*, 27 : 27.

Fallen 1806, *Sevenska Vet. Akad. Nya Handl.*, 27 : 27.

Color green, greenish stramineous; head anteriorly rounded; genal margin sinuated below eyes; crown bluntly pointed or angled apex; pronotal margin

feebly carinate; tegmina with outer anteapical cell about half as large as central anteapical cell, inner anteapical cell open basally; connective Y-shaped, stem broad, stout, short, aedeagus asymmetrical, shaft reflexed strongly, gonopore subterminal, opening through a tube-like projection; style short; pygofer at inner margin densely spined, without hook; seventh sternite (female) sub-truncate at posterior margin.

Comments : Ribaut (1942:269) remarked that Fallen (1806:27) misidentified *Cicada prasina* Fabr. (1794). Zetterstedt queried the inclusion of species, *prasina* Fabr., but agreed upon considering validity of *prasina* Fall., (1806) and the subsequent authors adopted the concept of Zetterstedt without further questioning or contradicting over this disputed points. Oschanin (1912) placed *prasina* under genus *Macropsis* Lewis and cited *prasina* Fall. as type species of genus *Thamnotettix* Zetterstedt. Present author adopted the procedure as equivalent of citing '*prasina* Fallen nec Fabr, as valid.

126. *Thamnotettix brunescens* Pruthi

(Fig. 308)

1936. *Thamnotettix brunescens* Pruthi, *Mem. Ind. Mus.*, **II** : 115.

Vertex with a dark brown discal spot close to each eye; face and frons purple brown, laterally striped; scutellum at each basal angle spotted; tegmina semitransparent; meta-tibiae spinulate.

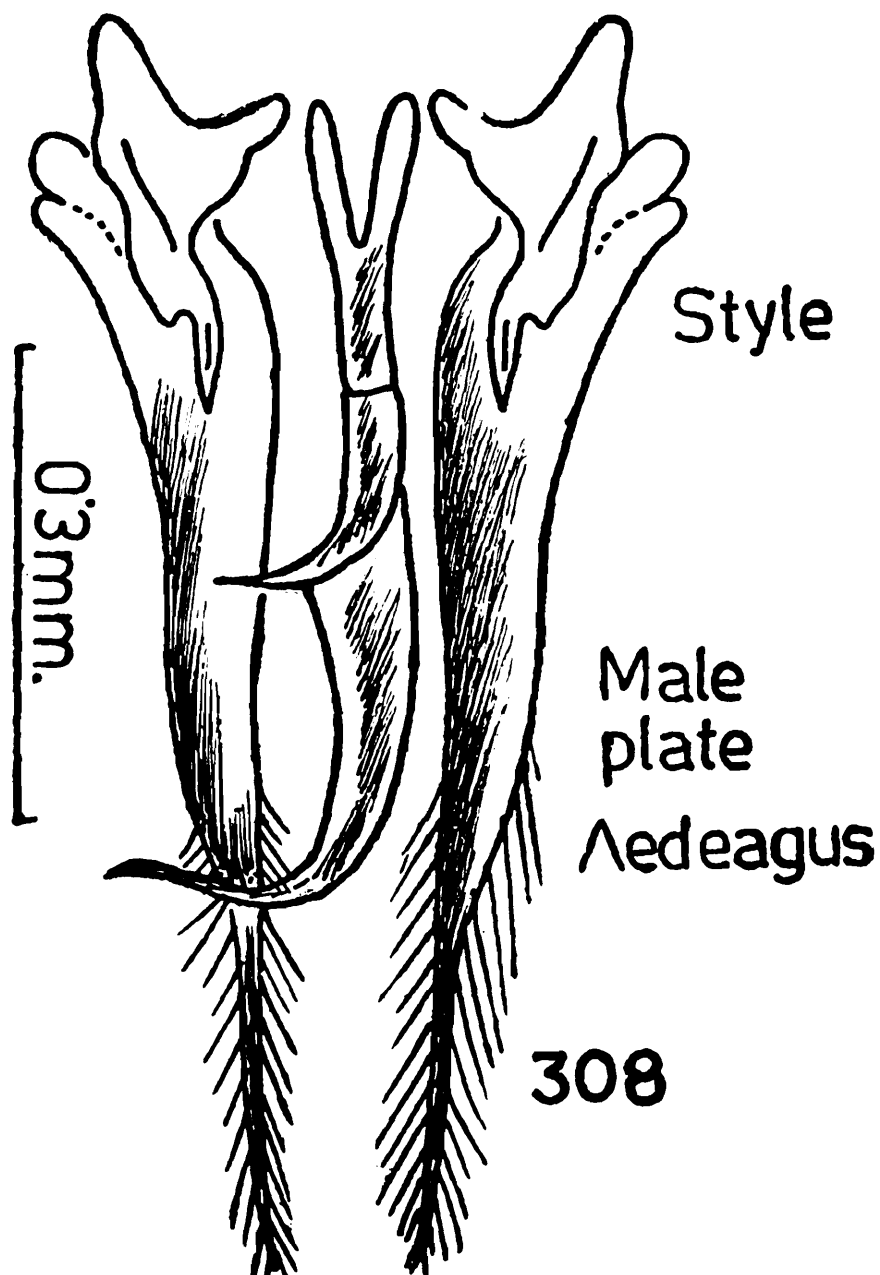
Length : 4.5 mm (male), 5 mm (female).

Gentalia : Connective Y-shaped, aedeagus (fig. 308) as figured, apex extremely sharp, geniculate subapically; stylar shaft (fig. 308) with apex sharply attenuate; male plate (fig. 308) attenuate beyond middle to a point, set with fine setae, long, filamentous.

Holotype No. : 5405/H7, Z.S.I., Calcutta.

Type locality : Mahanadi (800'), Nallamalai Hills, 12.8.1929 (H. S. Pruthi). Allotype No : 5406/H7, (Ind Mus), Z.S.I., Calcutta, Nallamalai Hills, 12-14-8-29 (H. S. Pruthi).

Distribution : Nallamalai Hills, South India.



Thamnotettix brunescens (fig. 308).

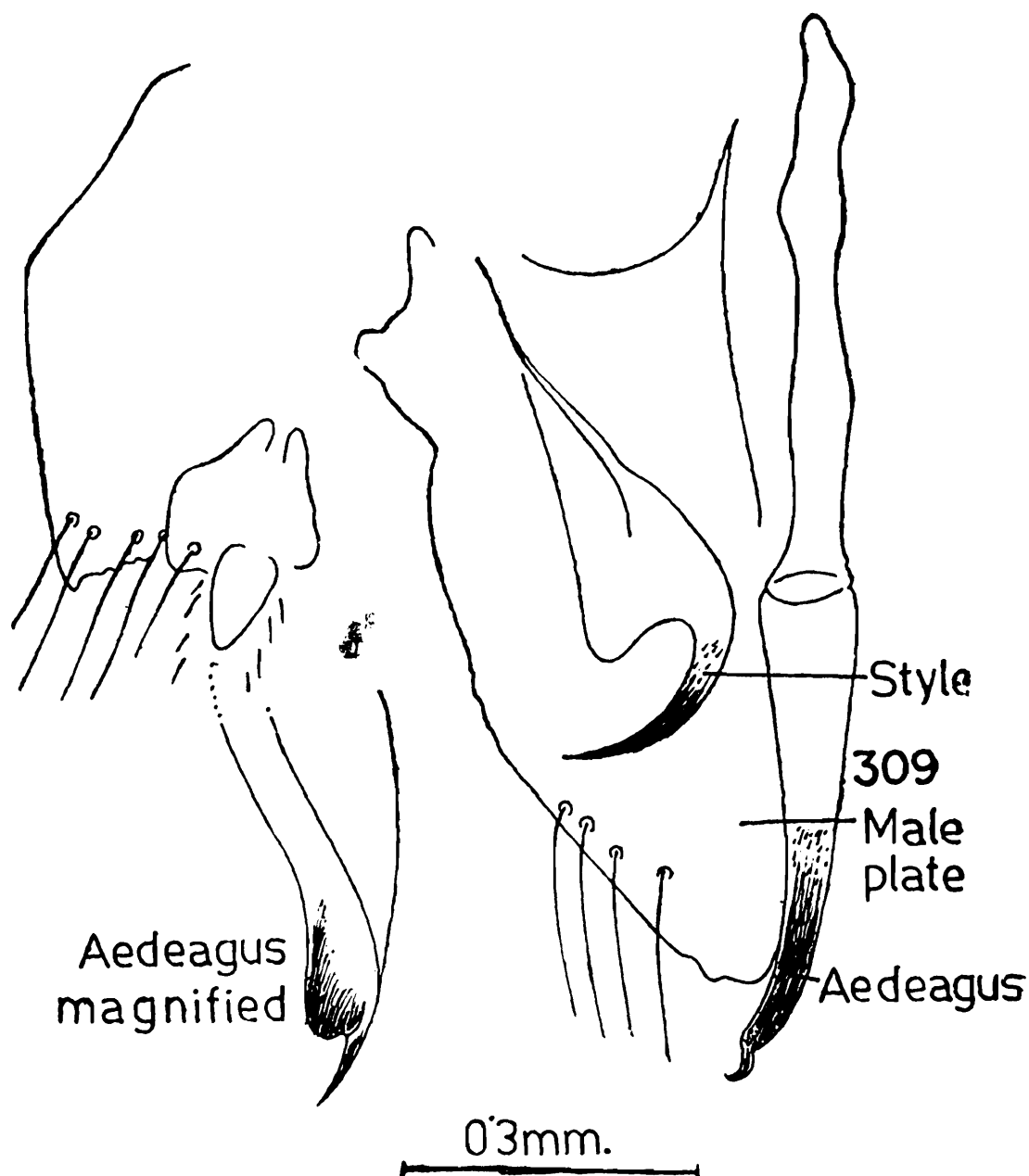
308. Aedeagus, style, male plate.

127. *Thamnotettix chhota* Pruthi

(Fig. 309)

1930. *Thamnotettix chhota* Pruthi, *Mem. Ind. Mus.*, **XI** : 64.

Vertex sulcate basad; frons castaneous with a longitudinal median fascia; pronotum anteriorly dark colored, depressus; scutellum and remaining body parts pale color.



Thamnotettix chikota (fig. 309).
309. Aedeagus, style, male plate.

Length : 3 mm (male), 2.5 mm (female).

Genitalia : Aedeagal shaft (fig. 309) robust, base broader, attenuating distally, directed posterolaterad ; style (fig. 309) with a mesal apical extension short, dagger-shaped ; male plate (fig. 309) oblong, uniseriate laterally.

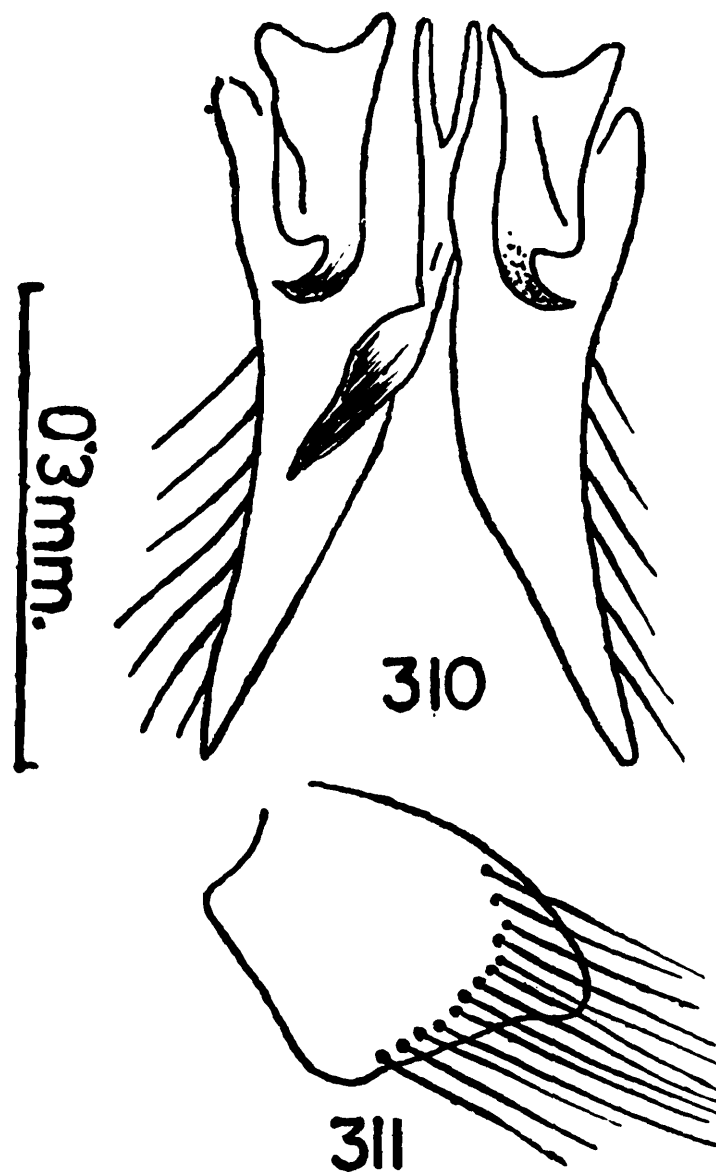
Holotype : male— 1162/H7, allotype, female, 1163/H7, Zoological Survey of India, Calcutta.

Type locality : Calcutta, April-July, 1927 (H.S.P.).

Distribution : Bengal, Punjab, North India.

128. *Thamnotettix nigricans* Pruthi

(Figs. 310—311)

1936. *Thamnotettix nigricans* Pruthi, *Mem. Ind. Mus.*, **XI** : 116.*Thamnotettix nigricans* (figs. 310-311)

310. Aedeagus, style, male plate, 311. Pygofer.

Vertex chestnut brown, with two spots; clypeus black; pronotum (female) dark brown, piceous (male), with dots and patches anteriorly (male); scutellum castaneous with markings (female), piceous (male). Tegminal veins thick, black; body ventrally piceous; meta-tibiae with black markings, spinulate.

Length : 5 mm (male), 5.5 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 310) pitcher-shaped basally, beyond middle cylindrate; style (fig. 310) $\frac{3}{4}$ th sub-rectangulate, mesal apical extension arched, pointed laterad; male plate uniseriate marginally, gradually converging; pygofer simple (fig. 311).

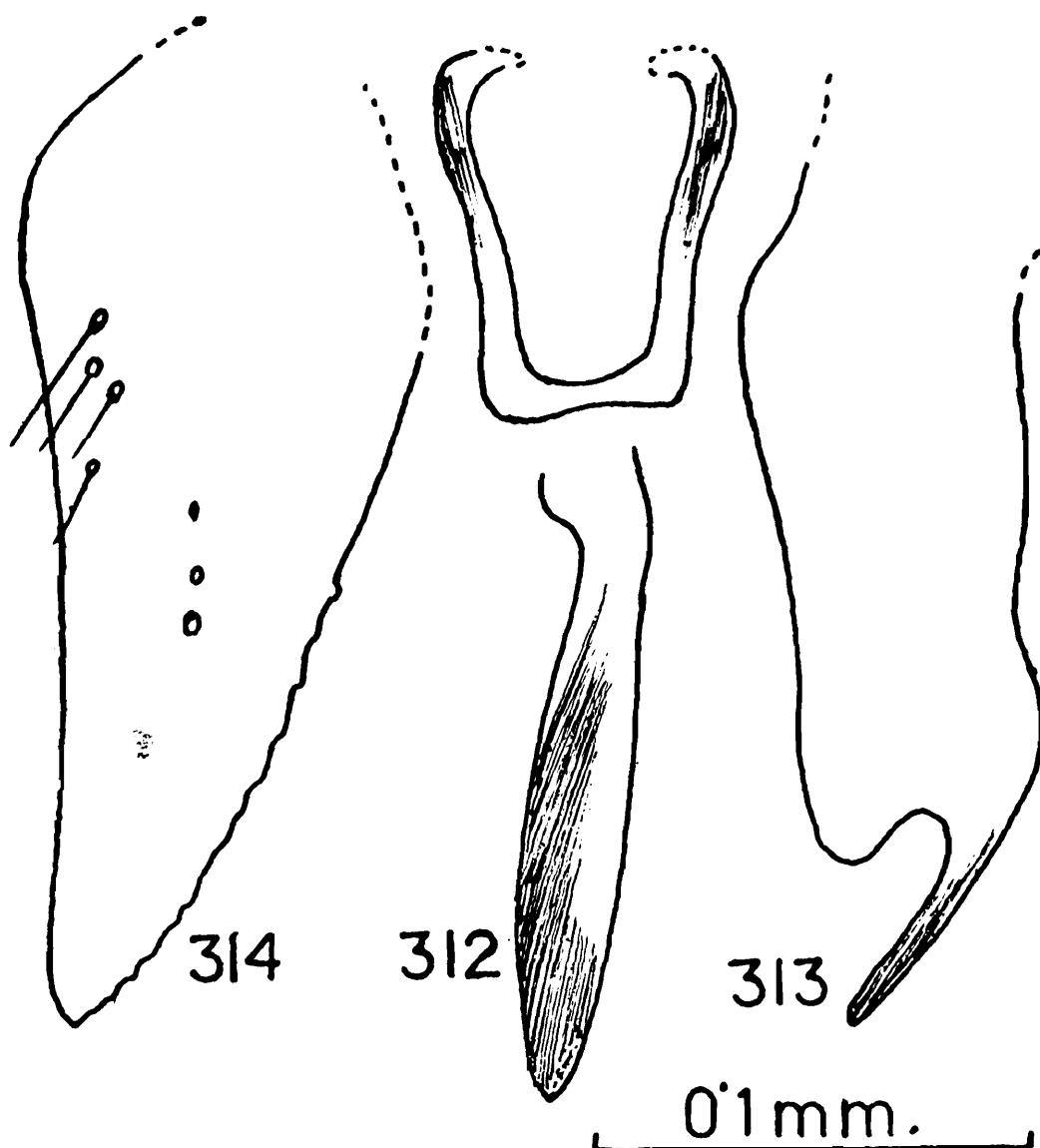
Holotype, male, 5407/H7, allotype, female, 5408/H7, Z.S.I. Calcutta.

Type locality : Kodaikanal, South India (T. V Campbell).

129. *Thamnotettix paraveinatus* Pruthi

(Figs. 312—314)

1936. *Thamnotettix paraveinatus* Pruthi, *Mem. Ind. Mus.*, **XI** : 117-118.



Thamnotettix paraveinatus (figs. 312-314).

312. Aedeagus, 313. Style, 314. Male plate.

Body dark brown; vertex anteriorly deflexed, base sulcate, acute apically, surface with sparse stripes, spots marginally with a row of black markings, a black spot on inner margin of each eye; pronotum globose with brown stripes; tegminal veins thick, dark pigments along venational margins; legs dark brown, marked black; abdomen black (female), dark brown (male).

Length : 3.5 mm (male).

Genitalia : Connective U-shaped, arms short, aedeagal shaft (fig. 312) arched basad, cylindrate, clavate feebly; style (fig. 313) $\frac{3}{4}$ th broader, apex hook-shaped; male plate (fig. 314) triangulate beyond middle, setose ventrad, mesal margin uniseriate; pygofer simple.

Holotype No : 5409/H7, (Ind. Mus), Z.S.I., Calcutta.

Distribution : Sikkim, Bengal, Mysore, Kodaikanal,

Comments : The pattern of genitalia differs this species from *T. veinatus* Pr

130. *Thamnotettix veinatus* Pruthi

(Fig. 315)

1930. *Thamnotettix veinatus* Pruthi, *Mem. Ind. Mus.*, II : 63-64.

Vertex brownish yellow, with dark patches and spots, basally sulcatus; pronotum brownish yellow, anterior margin with a dark brown mark; scutellum at anterior margin with a pair of dark stripes, a distinct black spot at each basal angle; tegmina brown, veins pigmented brown or dark; metatibial spines dotted black at each base; abdomen dorsally black.

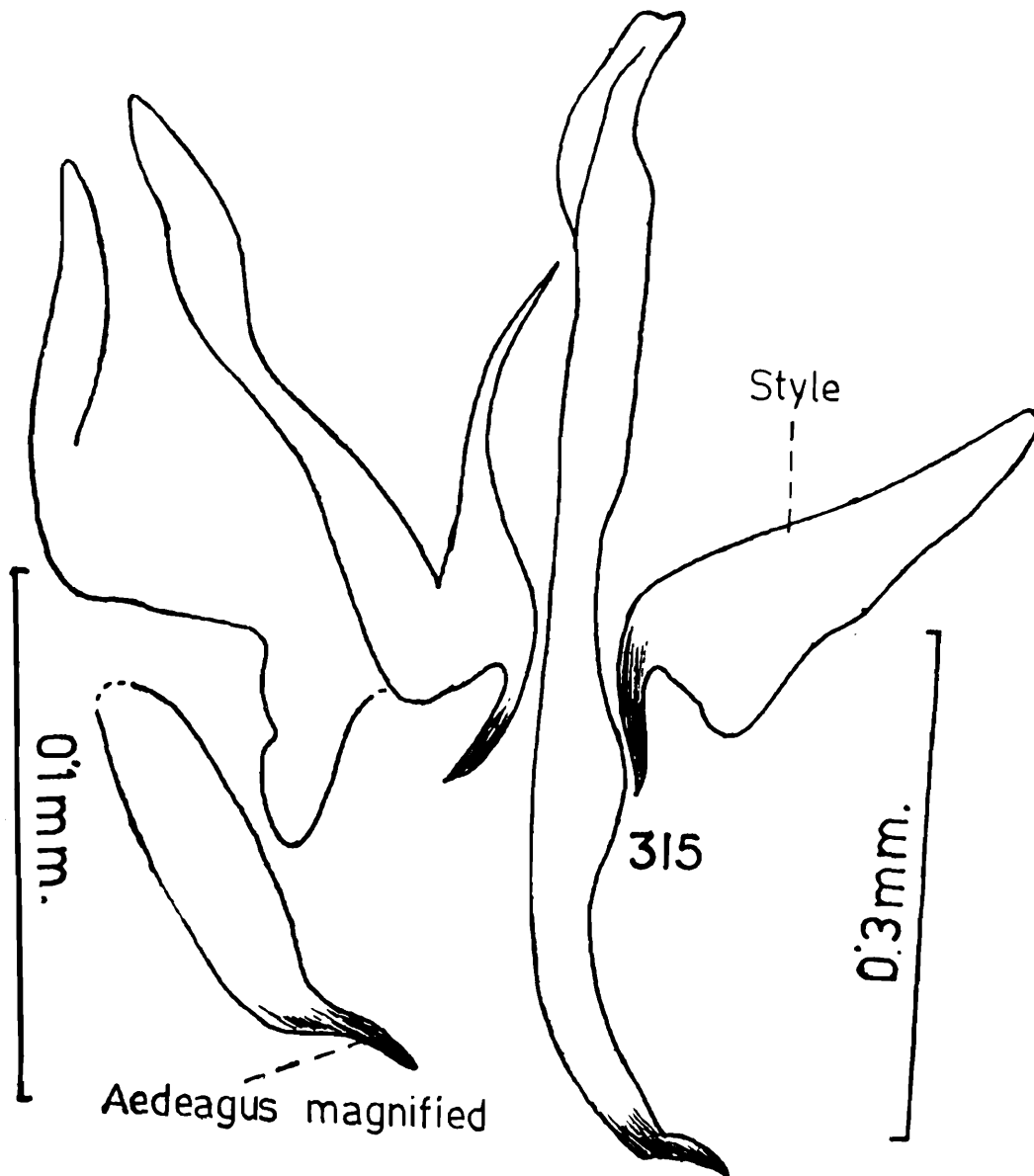
Length : 3 mm (male), 4 mm (female).

Genitalia : Aedeagal shaft (fig 315) simple, with a sharp pointed tip, directed laterad; style (fig. 315) with a developed preapical lobe, equal to length of mesal apical extension, both sharply pointed and converging each other; male plate (fig. 315) subtriangulate apical half; pygofer at posterior margin densely spinulate; seventh sternite (female) produced at posterior margin medially.

Holotype No. : 1160/H7, allotype, female, 1161/H7, Z.S.I., Calcutta.

Type locality : Sarai (2,700') (male), Amarkantak (female), Rewa State, M.P. January to February, 1927 (H. S. Pruthi).

Distribution : Central India, Mysore, South India.



Thannotettix veiratus (fig. 315)

315. Aedeagus, style, male plate.

Economic status : The species is recorded as suspect vector of spike disease of sandal wood, *Santalum album* Linn., in the forest of Mysore and Dehra Dun (Pruthi, 1930).

LXIII. Genus **Thomsoniella** Signoret

1879. *Thomsoniella* Sign., *Ann. Soc. Ent. de France*, **9** (5) : 51.

Type, by monotypy, *Thomsoniella kirschbaumi* Sigh.

1880. *Thomsoniella kirschbaumi* Sign., *Ann. Soc. Ent. de France*, **10** (5) : 52.

Body depressus; head extended anteriorly, vertex at anterior margin foliaceous, sulcatus lengthwise, frons depressus, sulcatus, frontal suture

reaching to border of head anteriorly; lora occupying space between genae and frontal sutures; pronotum broader than head including eyes; tegmina hyaline, with a narrow marginal rim; aedeagal shaft with processes terminally; stylar shaft sometimes foot-like or may be variable; male plate converging; pygofer without hook, spined; seventh sternite (female) truncate at posterior margin.

Comments : Signoret (1879) spelled the genus as *Thomsonia* but this proposition appears insufficient in demarcating this term from *Thomsonia* being used in Crustacea, as well as *Thomsonia* under cicadellidae appears invalid concerning application of the Law of Priority, therefore, to make it convenient, he adopted the term *Thomsoniella* Signoret.

131. *Thomsoniella arcuata* (de Mots.)

(Figs. 316—319)

1859. *Platymetopius arcuatus* Motschulsky, *Etud. Ent.*, 8 : 115.

Vertex semicircular with an arcuate croceus band; pronotum with a pair of arcuate ferrugineous bands, posterior one smaller; scutellum trifasciate; tegmina with orange colored longitudinal fascies, veins croceous.

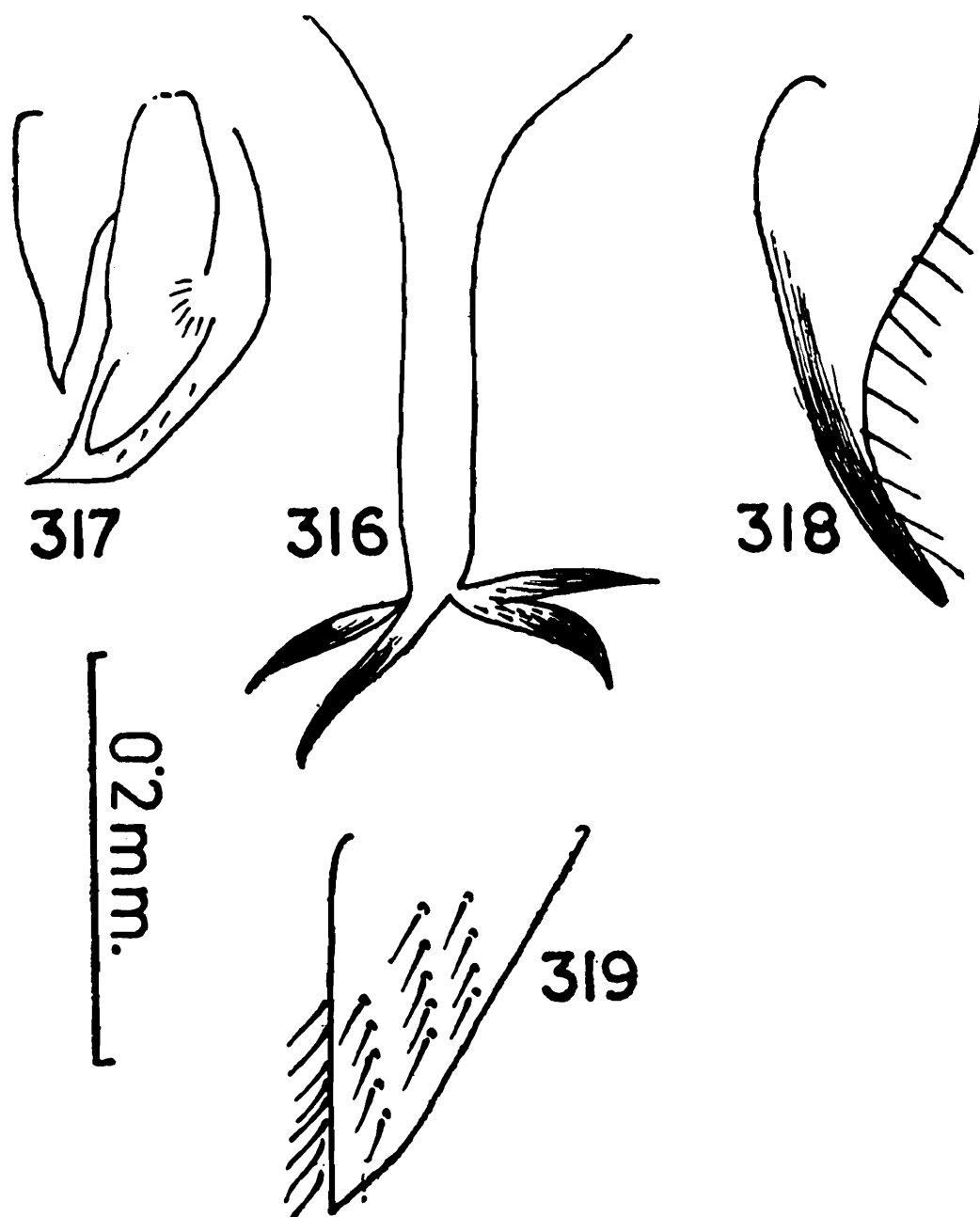
Length : 5 mm (male).

Genitalia : Aedeagal shaft (fig. 316) cylindrate, two pairs of terminal processes, directed laterad; style (fig. 317) 1/4th length of male plate, posterior margin obliquely truncate, foot-like; male plate (fig. 318) concave along lateral margin, gradually converging; pygofer (fig. 319) obliquely truncate, inner margin densely spinulate; seventh sternite (female) subtruncate at posterior margin.

Distribution : Madras, Maldiva Islands, Ceylon, Flores, Queens; and, Java.

Economic status : The species is parasitised by *Halictophagus serratus* Boh. (*Halictophagidae* : *Strepsiptera*) (Bohart 1943 : 354).

Morphology : Median length of crown not greater than transocular width, anterior margin arcuate, reflex, not in line with outer margin of eyes; ocelli located at extreme anterior margin close to each eye, texture finely sculptured; clypeus with suture extending to base of ocelli, broader, clypellus parallel-shaped; pronotal width not greater than trans-ocular width,



Thomsoniella arcuata (figs. 316-319).

316. Aedeagus, 317. Style, 318. Male plate, 319. Pygofer.

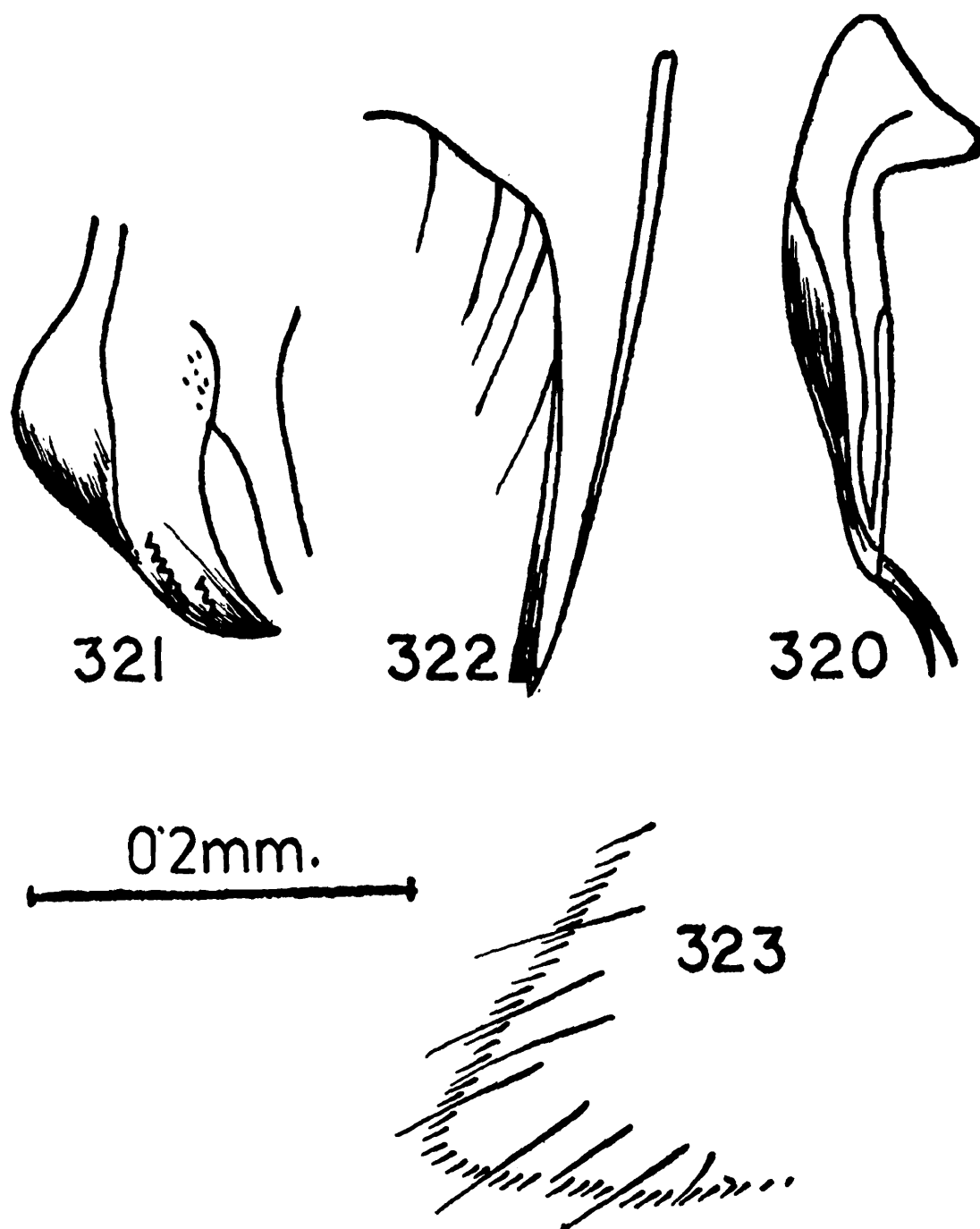
lateral margin parallel-sided, posterior margin concavus, texture sculptured; scutellum depressed medially, muscular impression distinct, texture granulated; forewing semi-transparent, 4 apical and 3 anteapical cells, central anteapical cell split twice the length of inner and outer cells combined, inner anteapical cell split up longitudinally; venational arrangement indistinct; hind femoral setal formula : 2:1:1:1; VIIIth sternite (female) at posterior margin projected, lateral margin truncate.

Registered No. : 1580/H7 (female), 5637/H7 (male), (Ind Mus),
Calcutta.

132. *Thomsoniella porrecta* (Walk.)

(Figs. 320—323)

1858. *Acocephalus porrectus* Walk., List. Hom. Brit. Mus., p. 362.



Thomsoniella porrecta (figs. 320-323).

320. Aedeagus, 321. Style, 322. Male plate, 323. Pygofer.

Vertex with four orange-red fasciae, pronotum with six fasciae, scutellum with three striae, in some specimens fasciae obsolete; vertex deflexed anteriorly; tegmina with a small spot at apex of clavus and at middle of apical cell (first).

Length : 4.5 mm (male), 5.5 mm (female).

Genitalia : Aedeagus (fig. 320) with a pair of superior processes; stylar shaft connivent (fig. 321), foot-shaped, apical margin spined; male plate (fig. 322), connivent distad, beyond middle spinulose marginally; pygofer (fig. 323) as figured.

Distribution : West Bengal, Burma, Philippine Islands, Queensland, Formosa.

Economic status : The species is recorded as rice leafhopper pest as well as common on sandal wood trees as reported during investigation of spike disease (Pruthi, 1934:16). The species is also associated with microbes (symbionts) (Steinhaus, 1946:374), (Muller, 1949:356). The biochemical investigation is done on finding out the significance of proteases and amylases in salivary secretion (Nuorteva, 1954:79).

LXIV. Genus *Varta* Dist.

1908. *Varta* Dist., *Fauna Brit. India*, 4 : 320.

Type, by original designation, *Varta rubrofasciata* Dist.

1908. *Varta rubrofasciata* Dist., *Fauna Brit. India*, 4 : 320.

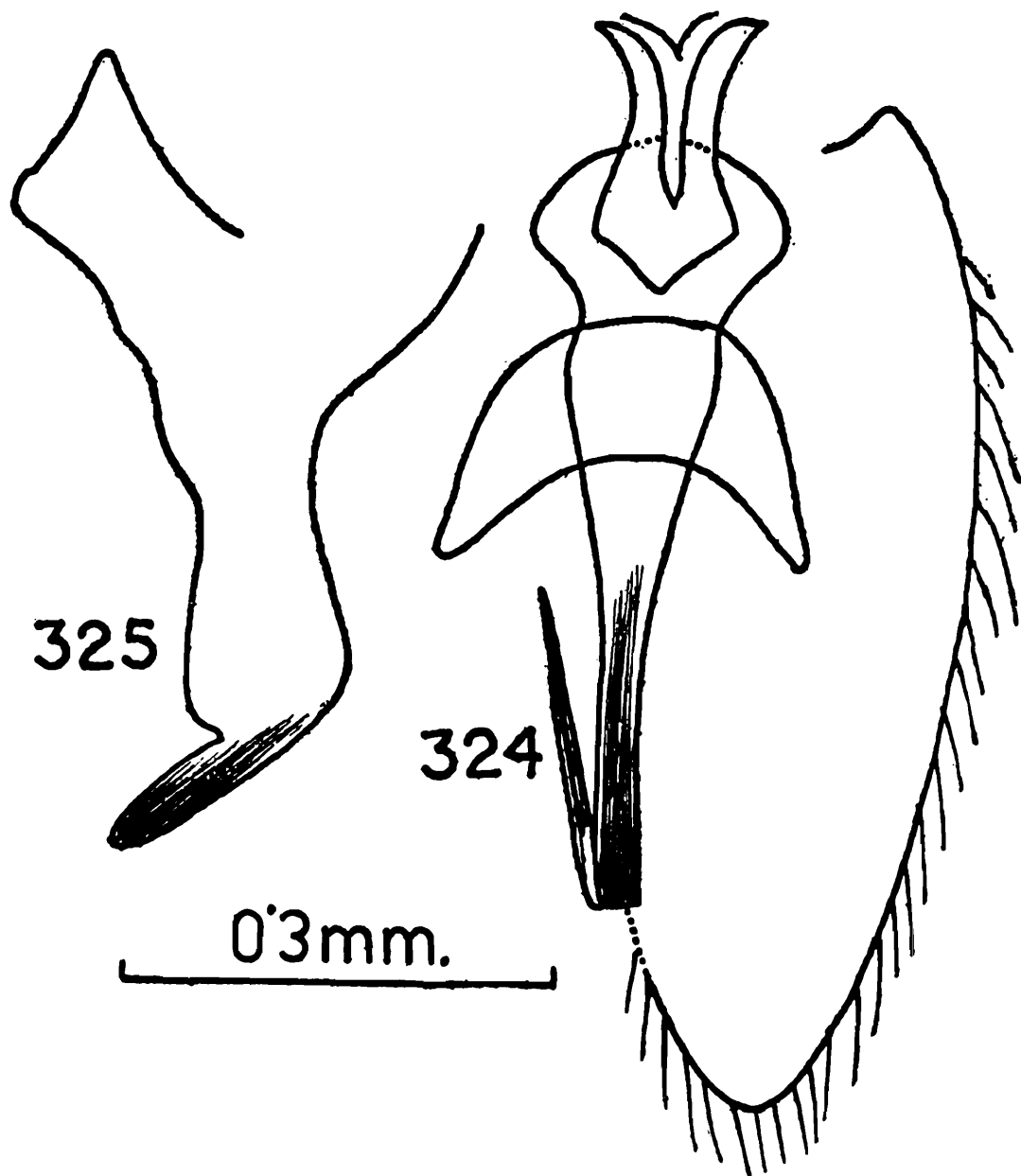
Vertex subtriangular, margin carinated, medially dentate; pronotum anteriorly angularly produced, laterally oblique; scutellum subtriangulate; tegmina with 3 subapical and 4 apical cells, longer than abdomen; aedeagal apodeme developed, shaft geniculate; style short; male plate usually triangulate beyond middle pygofer without hook.

133. *Varta rubrofasciata* Dist.

(Figs. 324—325)

1908. *Varta rubrofasciata* Dist., *Fauna Brit. India*, 4 : 320.

Vertex with a fine dark line, flat, sulcate medially, central suture fine, on each side sanguineous fascia, laterally ridged; face at base black, an oblique red band on each side touching clypeal area; pronotum with four



Varta rubrofasciata (figs. 324-325).

324. Aedeagus, male plate, 325. Style.

stripes, red color; scutellum with two red stripes; tegmina apically truncate, each cell with longitudinal fascia, 4 apical cells, apical cells with angulate piceous marking; abdomen stramineous.

Length : 5.5 mm (male).

Genitalia : Connective short, laminate, aedeagal shaft (fig. 324) linear, basal apodeme distinct, a terminal process directed posteromesally; style (fig. 325) broader $\frac{3}{4}$ th, apex narrowed to a blunt structure; male plate (fig.

324) uniseriate on outer margin; pygofer with a fine hook posterodorsally produced; seventh sternite (female) truncate along posterior margin.

Distribution : Pusa, Bihar, Eastern India.

LXV. Genus **Zizyphoides** Dist.

1918. *Zizyphoides* Dist., *Fauna Brit. India*, 7 : 73.

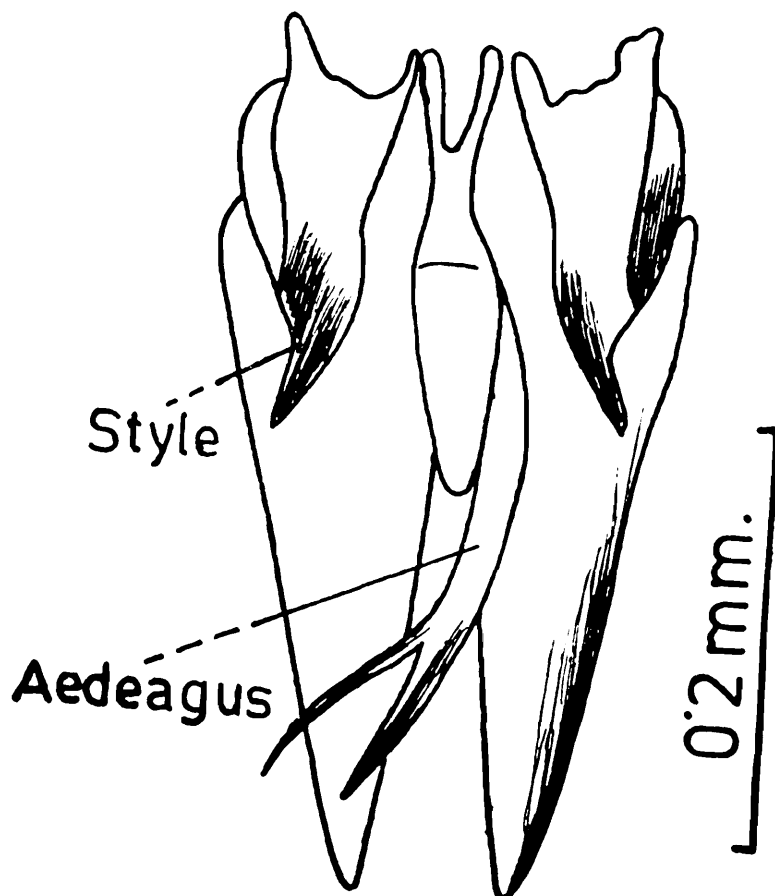
Type, by original designation, *Zizyphoides indicus* Dist.

1918. *Zizyphoides indicus* Dist., *Fauna Brit. India*, 7 : 73.

Vertex as long as pronotum, anteriorly triangulate; outer margin of each eye in line with lateral margin of vertex, medially sulcate; face spindle-shaped, emarginate at antennal pits; pronotum convex, angulate; tegmina longer than abdomen, apical cells distinct; metatibiae densely spined; connective Y-shaped, aedeagal shaft cylindrate, sometimes bifurcate; style simple, conico-acuminate; male plate robust, triangulate.

134. ***Zizyphoides indicus*** Dist.

(Fig. 326)



326

Zizyphoides indicus (fig. 326).

Paternus viridulus (figs. 287-288).

Vertex greenish with dark markings on each eye, sulcate medially, angulate anteriorly; face ochraceous marginally; pronotum greenish, marked with fine transverse lines, a series of dark spots close to anterior margin; tegmina pale brown, claval margin with 3 spots; body marked green.

Length : 7 mm incl. tegmn. (male).

Genitalia : Connective Y-shaped, arms rod-shaped, aedeagal strut laminate, convergent distad; shaft (fig. 326) arcuate along length, cylindrate, apex bifid in the form of a pair of processes of non-uniform length, pointed; stylar shaft (fig. 326) 3/4th laminate, mesal apical extension connivent distad; male plate (fig. 326) triangulate.

Distribution : Calcutta, B'har, ex. *Zizyphus jujuba*.

LXVI. Genus *Coelidia* Germar

1821. *Coelidia* Germar, Mag. Ent., 4 : 38, 75.

Type, by subsequent designation, *Coelidia venosa* Germar.

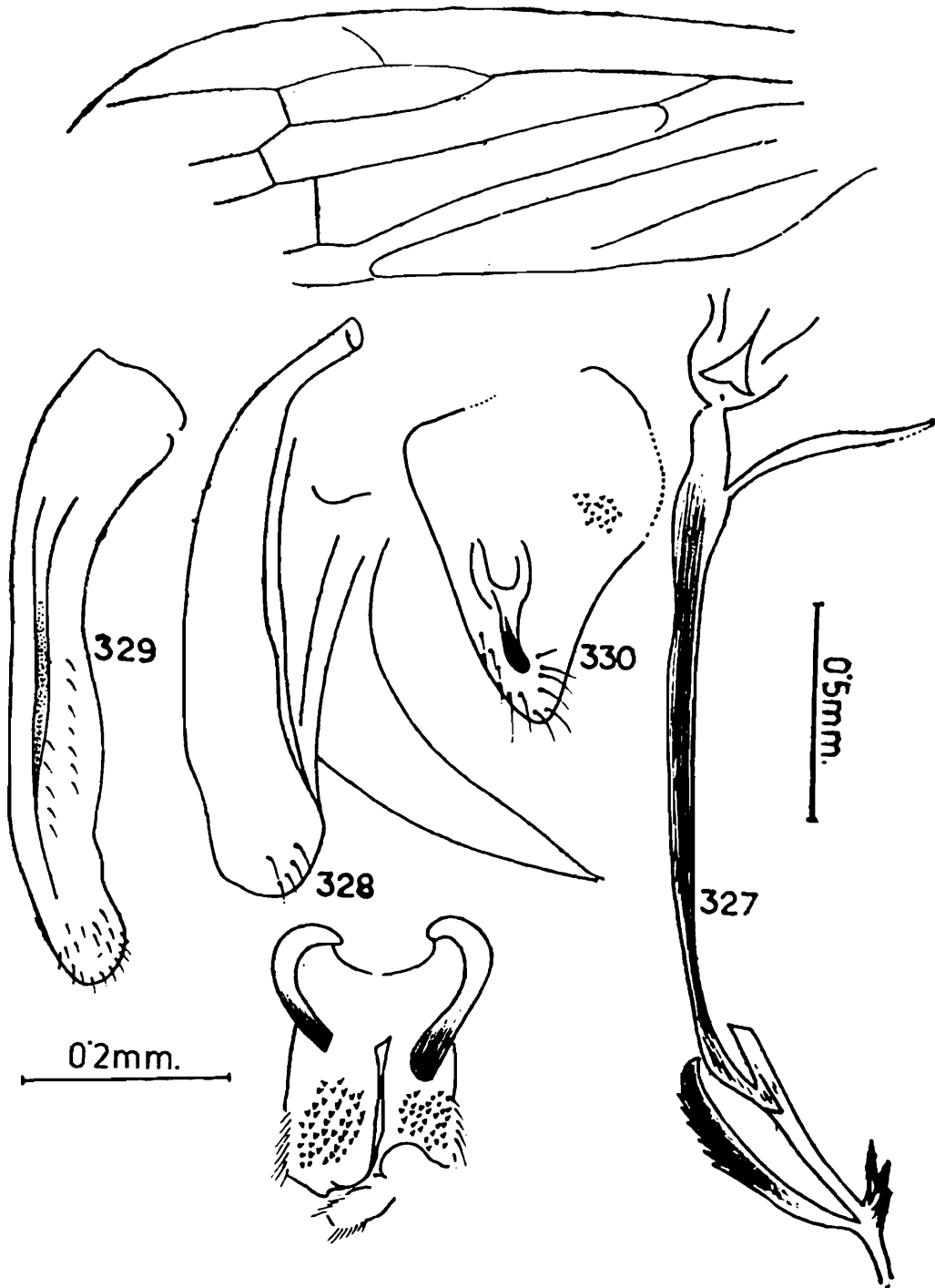
1821. *Coelidia venosa* Germar, Mag. Ent., 4 : 76.

Large, robust leafhoppers; vertex anteriorly bluntly rounded, disk raised above eye-level and separated by a short perpendicular space on each side; clypeus amplified and truncated apically; pronotal margin divergent laterally, shorter than scutellum; tegmina broader medially, central and basal anteapical cells open at base, apical cells parallel-sided; posterior tibiae densely spined; connective Y-shaped, aedeagal shaft asymmetrical, slender, elongate, basal apodeme distinct, occasionally with subapical processes, gonopore either terminal or subterminal; style with varied pattern.

135. *Coelidia elegans* (Spangberg)

(Figs. 327—330)

1878. *Jassus elegans* Spangberg, Svenska Vet.-Akad. Forhand, 35 (8) : 6.



Coelidia elegans (figs. 327-330).

327. Aedeagus, 328. Style, 329 Male plate, 330. Pygofer.

Vertex with brownish yellow shades, a finely elevated carination on each side of deep depression; blackish, granulate; scutellum granulate finely; tegmina pale brown, veins farinosus; abdomen fuscous with bands.

Length : 8 mm (male).

Genitalia : Aedeagus (fig. 327) elongate, shaft with a long superior process, serrate on outer margin, directed cephalad, sub-branched with a few short processes directed laterocephalad ; style (fig. 328) with well-developed preapical lobe, mesal apical extension dagger-shaped, tip serrate ; male plate (fig. 329) cylindrate, setose ; pygofer (fig. 330) disc densely spined, hook arising medially, short, laminate.

Distribution : North Salem, Bombay, Coorg, Philippines, Mysore.

Comments : The distribution is recorded from South and Western part of India and extended to Philippines, surprisingly, the extension of species is not so far reported from North and North East India and along the vast tract of South East Asian countries, its occurrence from the areas left needs extensive survey and study.

Economic status : Pruthi (1934) considered the species as suspect vector of spike disease of sandal forest. The species was trapped on sticky paper exposed in sandal forest to find out the cause of the spread of this virulent viral disease (Chatterjee, 1939).

136. *Coelidia fusca* (Melichar)

(Figs. 331—333)

1903. *Jassus fusca* Melichar, *Fauna von Ceylon*, p. 179.

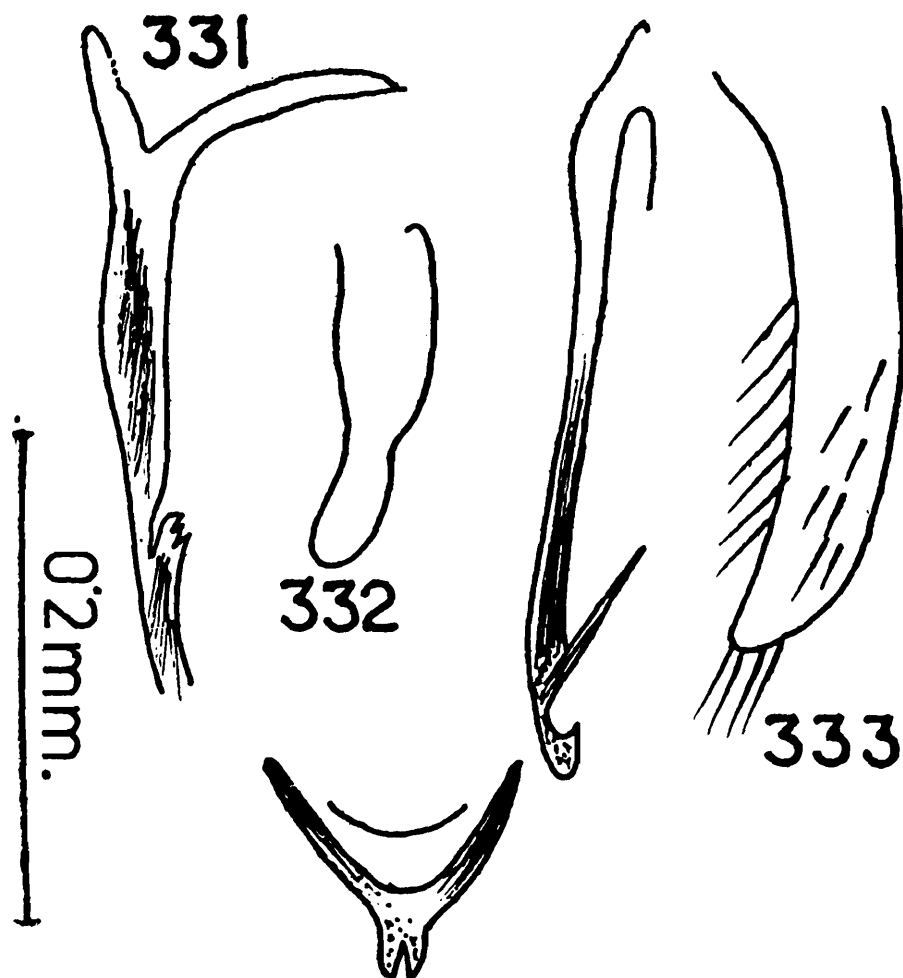
Vertex blackish with central ridge, face reddish on anterior margin ; clypeus fusco-rufous ; pronotum and scutellum black ; tegmina black, apical cells brown ; abdomen slightly darker.

Length : 7 mm (male), 7.5 mm

Genitalia : Aedeagus shaft (fig. 331) attenuate, a pair of subapical processes directed cephalolaterad, apex finely serrate, a few sharp processes originating mediad ; style (fig. 332) clavate, depressus medially ; male plate (fig. 333) cylindrate, rotundate on anterior margin, surface setose ; pygofer triangulate distal half, posteromesal margin setose.

Distribution : Ceylon, Madras Eastern Himalayas, Coorg, Mysore.

Economic status : The species is reported to be the 'suspect vector' in spreading spike disease to sandal wood forest (Pruthi, 1934:22).



Coelidia fusca (figs. 331-333).

331. Aedeagus, 332. Style, 333. Male plate.

137. *Coelidia indica* (Walk.)

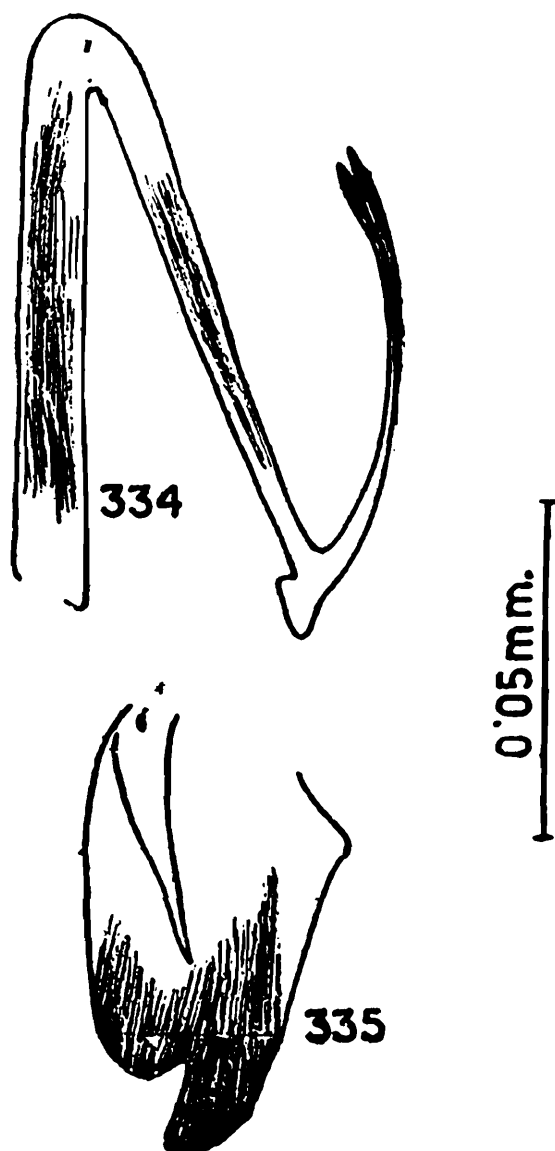
(Figs. 334—335)

1851. *Jassus indica* Walk., *List Homop. Coll. BtM.*, p. 855.

Vertex brownish yellow, striped; pronotum piceous, granulate; scutellum subtriangulate, piceous, granulate; tegmina with rusty brown maculations;

Length : 6 mm (male).

Genitalia : Aedeagal shaft (fig. 334) elongate, with a terminal process extending third of shaft, apically bifid, directed cephalad, two pairs of apical processes of variable length, sharp; style damaged; male plate (fig. 335) cylindrate, apex with fine setae; pygofer with sparsate discal and marginal setae, hook arising medially, short.



Coelidia indica (figs. 334-335).

334. Aedeagus, 335. Male plate.

Holotype, male (British Museum), allotype —4333/H7, Z.S.I., (Ind Mus).

Distribution : North India, Burma, Eastern India, Nallamalai Hills, Lombok, Sumatra, Formosa, Ceylon, Seychelles, Flores, Fukien.

Economic status : The species is recorded as 'suspect vector' of spike disease of sandal, *Santalum album* Linn, (Rangaswami et al. 1941) and evidence of transmitting virus to healthy sandal wood recorded by Forester, 1941:387.

Biology : The adults lived about 90 days. Highest population occurred in the month of June and July owing to the overlapping of the breeds. The

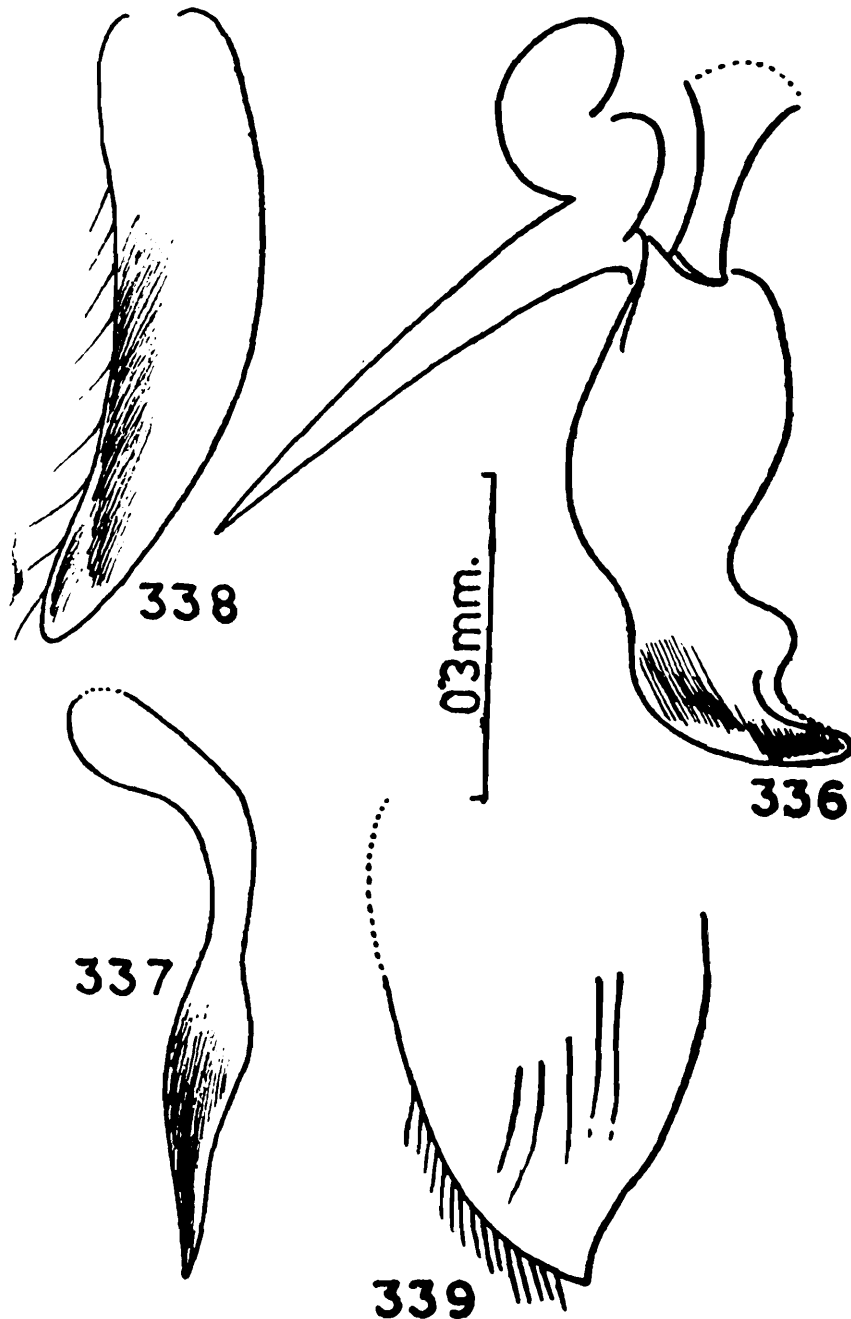
species is known as sandal leafhopper, being common on sandal trees, *Santalum album*, (Linn), and on *Dodonaea viscosa* (L), *Zyziphus oenoplia* Miller.

Comments : Evens (1938) detailed the morphology of head structure, Beeson (1940) recorded its economic importance in *Forest Res. Report*, in 1938-1939.

138. ***Coelidia pauperculus*** (Spang.)

(Figs. 336---339)

1878. *Jassus pauperculus* Spangberg, *Öfv. Vet. -Adad. Förh.*, **35** (8) : 35.



C. pauperculus (figs. 336-339).

336 Aedeagus, 337. Style, 338. Male plate, 339. Pygofer.

Vertex blackish with central ridge; facial structure black with reddish anterior margin; clypeus fusco-rufous; pronotum and scutellum black; tegmina black, apical cells brown, shiny, claval suture blackish; abdomen dorsally faintly darker.

Length : 2 mm (male).

Genitalia : Aedeagus (fig. 336) slender, elongate, attenuate gradually, a number of short, sharp medial and a pair of subapical processes, spatulate and distinctly serrate apicad; style as figured (fig. 337) without preapical lobe; male plate (fig. 338) cylindrate, apex setose, outer margin rotundate, surface with setose; pygofer (fig. 339) without hook, distal half triangulate, postero-mesal margin setose.

Distribution : Pundaluoya, Maskeliya, Kandy, Ceylon.

LXVII. Genus *Tartessus* Stal

1865. *Tartessus* Stal, *Svenska Vet. Akad. Oft. Forhandl.*, **22** : 156.

Type, by subsequent designation, *Bythoscopus malayus* Stal.

1859. *Bythoscopus malayus* Stal., *Svenska Vet. Akad. Zool.*, **4** : 290.

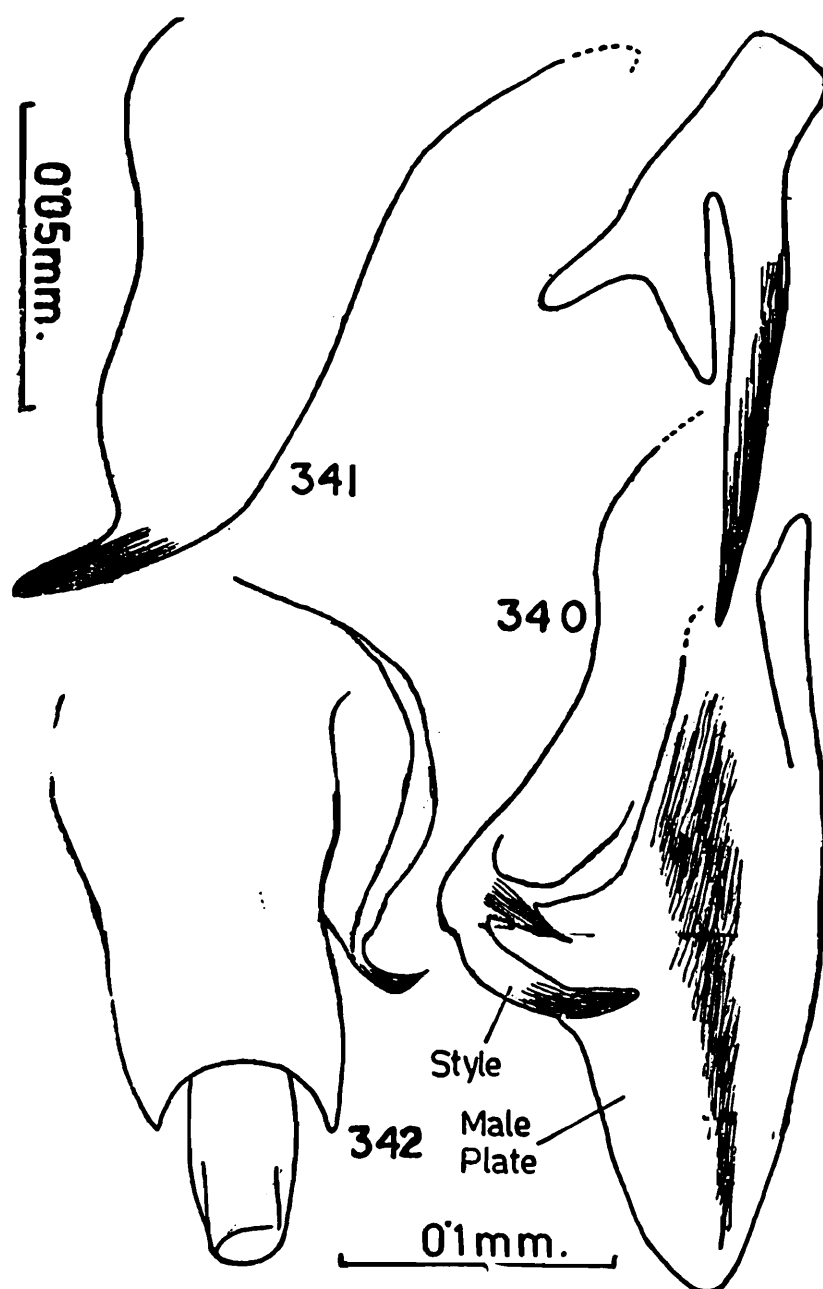
Vertex angularly produced in front of eyes, narrower apicad, ventrally strongly reflexed; ocelli placed on anterior margin close to eyes; pronotum strongly subangularly rounded; scutellum depressed mediad, apex sharply pointed; tegmina with 5 apical and 2 antepical cells; posterior tibiae densely spined; aedeagal shaft well-developed, apex pointed, sometimes serrate; style broader major part, shaft sharply pointed at apex; male plate triangulate, bunch of setae beyond middle; pygofer hook present; anal hook of various shapes prominent.

139. *Tartessus ferrugineus* Walk.

(Figs. 340-342)

1851. *Tartessus ferrugineus* Walk., *List. Homop. B. M.*, p. 290.

Vertex angularly rounded, produced anteriorly, apex narrower, head ventrally reclinated, yellow sulfur color, extreme anterior margin with black, transverse, smoothly arcuate band between eyes; pronotum, scutellum and abdomen golden yellow; pronotum with fine transverse impression; scutellar surface rough; sternal plates black laterad; tegmina bronzy-yellow, venation black or dark brown, costal area beyond middle blue-black; abdomen dorsally black.



Tartessus ferrugineus (figs. 340-342).

340. Aedeagus, Style, Male plate, 341. Pygofer, 342. Anal hook.

Length : 8 mm (male), 10.5 mm (female).

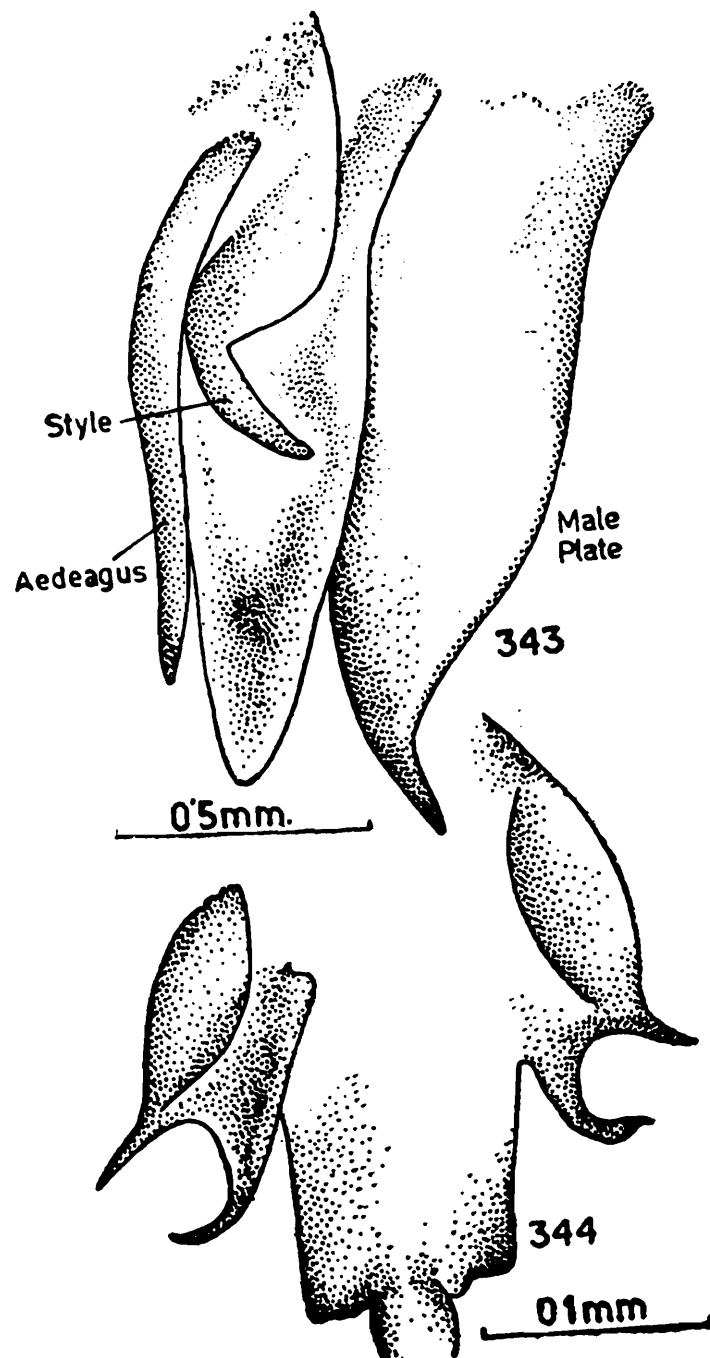
Genitalia : Aedeagus (fig. 340) with developed basal apodeme, shaft baculiform, laterobasally convex, serrate, converging toward apex; style (fig. 340) 3/4th broader, elongate, extending half the length of male plate, mesal apical extension sharply arcuate, apex strongly acuminate, nodulate along outer margin; male plate (fig. 340) triangulate apicad, laterally infolded, a tuft of microsetae confined to subapical part; pygofer (fig. 341) rectangulate, posterolateral margin densely spined, apical margin desected, with a short, stout hook arising posteromesally, directed laterad; anal hook (fig. 342) prominent, rostriform.

Distribution : South East and Far East Asian countries ; Japan, Australian region.

Economic status : The species is reported as common pest on trees (Watanabe : 1937:114, 212, 248) ; on citrus and on subtropical fruit trees (Quayle : 1958:276).

140. *Tartessus ferrugineus* var. a. Datta & Dhar

(Figs. 343-344)



T. ferrugineus var-a (figs. 343-344).

343. Aedeagus, Style, Male plate, Pygofer, 344. Anal hook.

A pair of spots on clypeus, sometimes costal margin without linear dark blue patches.

Length : 7 mm (male).

Genitalia : Connective Y-shaped, arm very short, aedeagal shaft (fig. 343) baculiform, attenuating to pointed structure; style (fig. 343) $\frac{2}{3}$ broader, mesal apical extension arcuate, directed laterad, apex pointed, series of nodulate structures extending subapically; male plate (fig. 343) converging distad, subgeniculate, tuft of setae apicad; pygofer (fig. 343) apically rostriform, a short unciform structure arising apicad, directed posterolaterad; anal hook stout, prominent, inner one cheliform (fig. 344).

141. *Tartessus ferrugineus* Var. b. Datta & Dhar

(Figs. 345-348)

Anterior margin of vertex with two bands, clypeus spotted.

Length : 8 mm (male), 9 mm (female).

Genitalia : Connective Y-shaped, arm short, aedeagal shaft (fig. 345) with developed apodeme, shaft baculiform, basally concavus along inner margin; outer margin feebly serrate; apex salient to a pointed structure; style (fig. 346) $\frac{2}{3}$ rd broader, mesal apical extension strongly geniculate, apex with a sharp spine directed laterally, nodulate; apex of male plate with a bunch of setae; pygofer (fig. 347) with a rostriform hook arising posterolaterally; anal hook (fig. 348) prominent each side, cheliform.

Distribution : Formosa.

Remarks : The variety *a.* differs from original one by having a pair of spots on clypeus and without having any marking on costal area. The two bands on vertex establish variety *b* as conspicuous demarcation from *var. a* and original one.

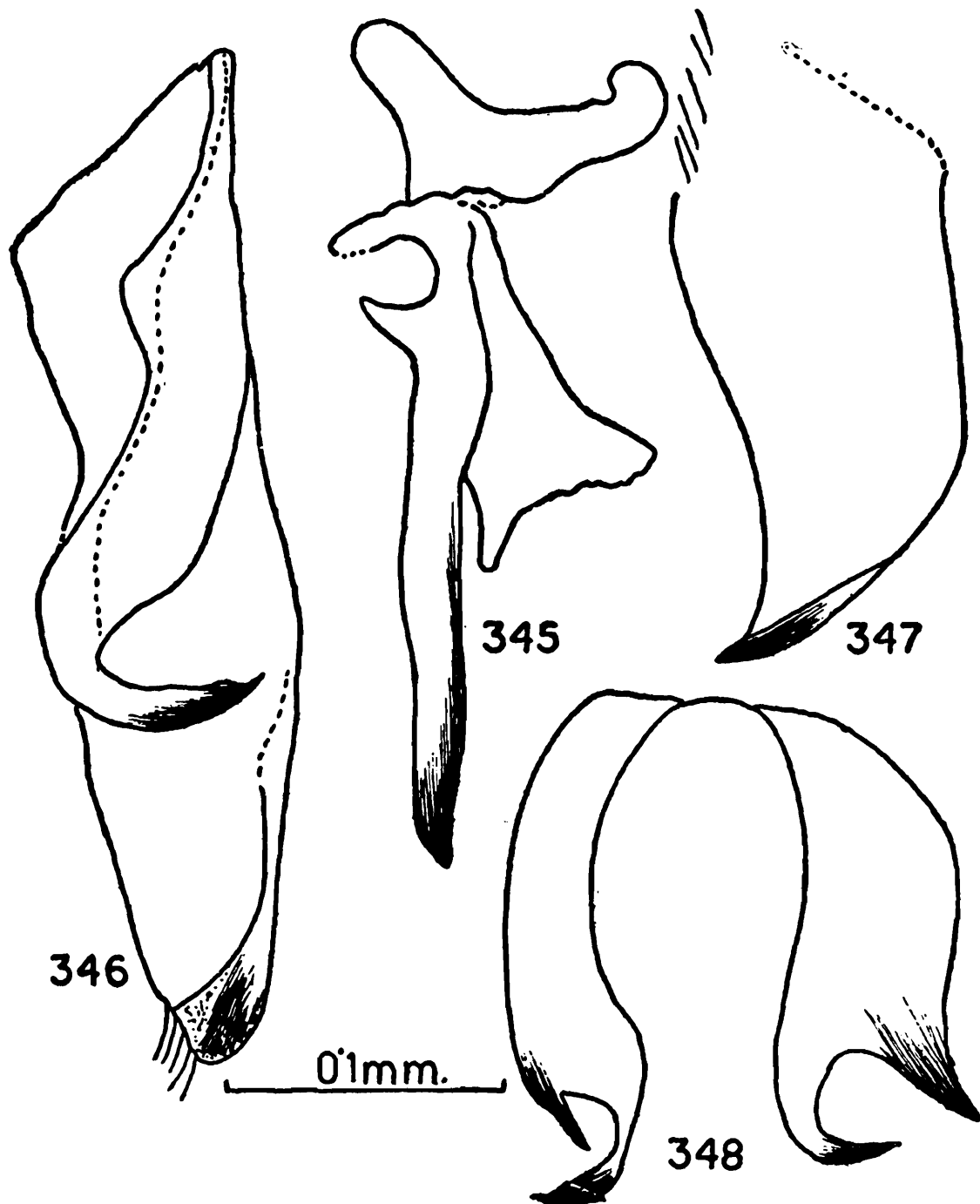
LXVIII. Genus *Magentius* Pruthi

1930. *Magentius* Pruthi, *Mem. Ind. Mus.*, **XI** : 6.

Type, by original designation, *Magentius clavatus* Pruthi..

1930. *Magentius clavatus* Pruthi, *Mem. Ind. Mus.*, **XI** : 7-8.

Vertex extremely narrow; pronotum on anterior margin with semilunar ridge; ocelli on face; frons strongly raised; pronotum with transverse striations; tegmina coriaceous, thick appendix developed, veins thick, coarse,



T. ferrugineus var. b. (figs. 345-348).

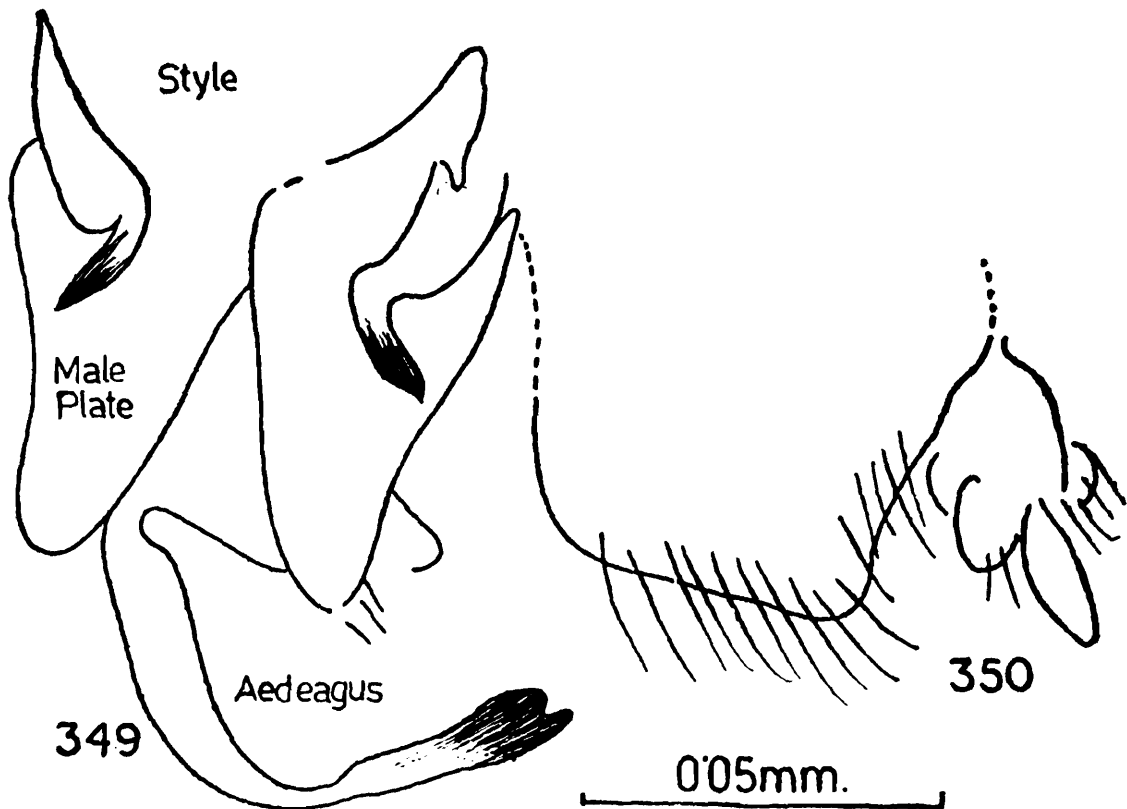
345. Aedeagus, 346. Style, male plate, 347. Pygofer, 348. Anal hook.

five apical and four antepical cells; posterior legs densely spined; connective Y-shaped; aedeagal shaft usually geniculate basad; styler lobes undifferentiated; male plate connivent distad.

142. *Magnentius clavatus* Pruthi

(Figs. 349-350)

1930. *Magnentius clavatus* Pruthi, *Mem. Ind. Mus.*, **XI** : 7-8.



Magnentius clavatus (figs. 349-350).

349. Aedeagus, Style, Male plate, 350. Pygofer.

Vertex blackish; pronotum, scutellum, tegmina punctate; tegmina with white pubes.

Length : 5.5 mm (male), 6 mm (female).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 349) abruptly arcus basad, almost looped, terminally spatulate, bifid, directed laterad; style (fig. 349) with preapical lobe undifferentiated, mesal apical extension obliquely extended; male plate (fig. 349) subtriangulate, gradually connivent; seventh sternite (female) concave on posterior margin, median lobe protuberant; pygofer (fig. 350).

Holotype : male, 506/H7, allotype, female, 508/H7, Z.S.I., Calcutta.

Type locality : Kangamalugu (3,000'), Cuddapah Dist., South India, 21. 23. VII. 27 (H.P.).

Distribution : Madras.

LXIX. Genus *Agallia* Curtis

1833. *Agallia* Curtis, *Ent. Mag.*, I : 193.

Type, by monotypy, *Agallia consobrina* Curtis

1833. *Agallia consobrina* Curtis, *Ent. Mag.*, I : 193.

Vertex uniform, short, not extended beyond eyes laterally; pronotal surface granulated; connective fused with aedeagal shaft as a strap-like structure; aedeagus simple, reflex, gonopore terminal, dorsal aspect furcate; stylar shaft cheliform; nymphal crown with a pair pair of lobes; abdominal tergites subcarinate medially.

Remarks : *Agallia* is restricted to species from temperate zone and bears resemblance to Tropical forms as *Euragallia* Oman and *Agalliota* Oman.

143. *Agallia pararobusta* Pruthi

1936. *Agallia paraobusta* Pruthi, *Mem. Ind. Mus.*, XI : 104-105.

Vertex with a distinct oblique black; frons with black spots laterally; pronotum with dark stripe on antero-lateral angle; scutellum at each basal angle with a black spot and a minute black spot on each side of median line; tegmina with dark brown stripes on claval region; thoracic region with black patches, pale brown ventrad; seventh sternite (female) deeply concave along posterior margin.

Length : 3 mm.

Holotype : 5387/H7, (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Guvalucherru (500'), Palkonda Hills, South India.

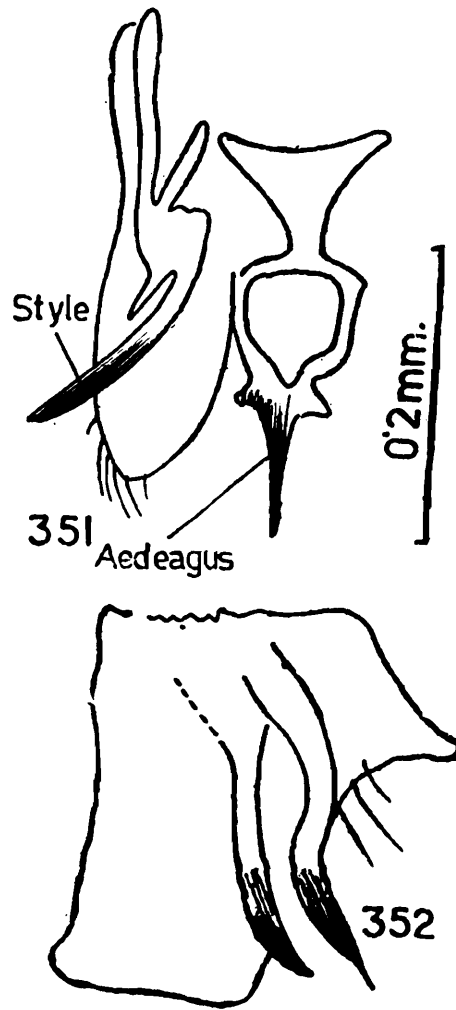
144. *Agallia robusta* Pruthi

(Figs. 351-352)

1930. *Agallia robusta* Pruthi, *Mem. Ind. Mus.*, XI : 10.

Male dark brown, vertex with a pair of black spots and paired stripes on each side of median line; pronotum with a pair of spots on anterior margin; scutellum at each basal angle with a black mark; legs and abdomen black.

Length : 3 mm (male), 3.5 (female).



Agallia robusta (figs. 351-352).

351. Aedeagus, Style, 352. Pygofer hook.

Genitalia : Aedeagal shaft (fig. 351) gradually tapering, basal strut sub-triangular; stylar shaft (fig. 351) sharply arcuate laterally, tapering; Pygofer hook (fig. 352) apically pointed.

Holotype : 511/H7, allotype-512/H7 (female), Z.S.I., Calcutta.

Distribution : N. W. Himalayas; Jhika Gali (6,700'), Murree Hills.

LXX. Genus **Durgades** Dist.

1912. *Durgades* Dist., *Ann. Nat. Hist. Mag.*, **10** (8) : 608.

Type, by monotypy, *Durgades nigropictus* Dist.

1912. *Durgades nigropictus* Dist., *Ann. Nat. Hist. Mag.*, **10** (8) : 608.

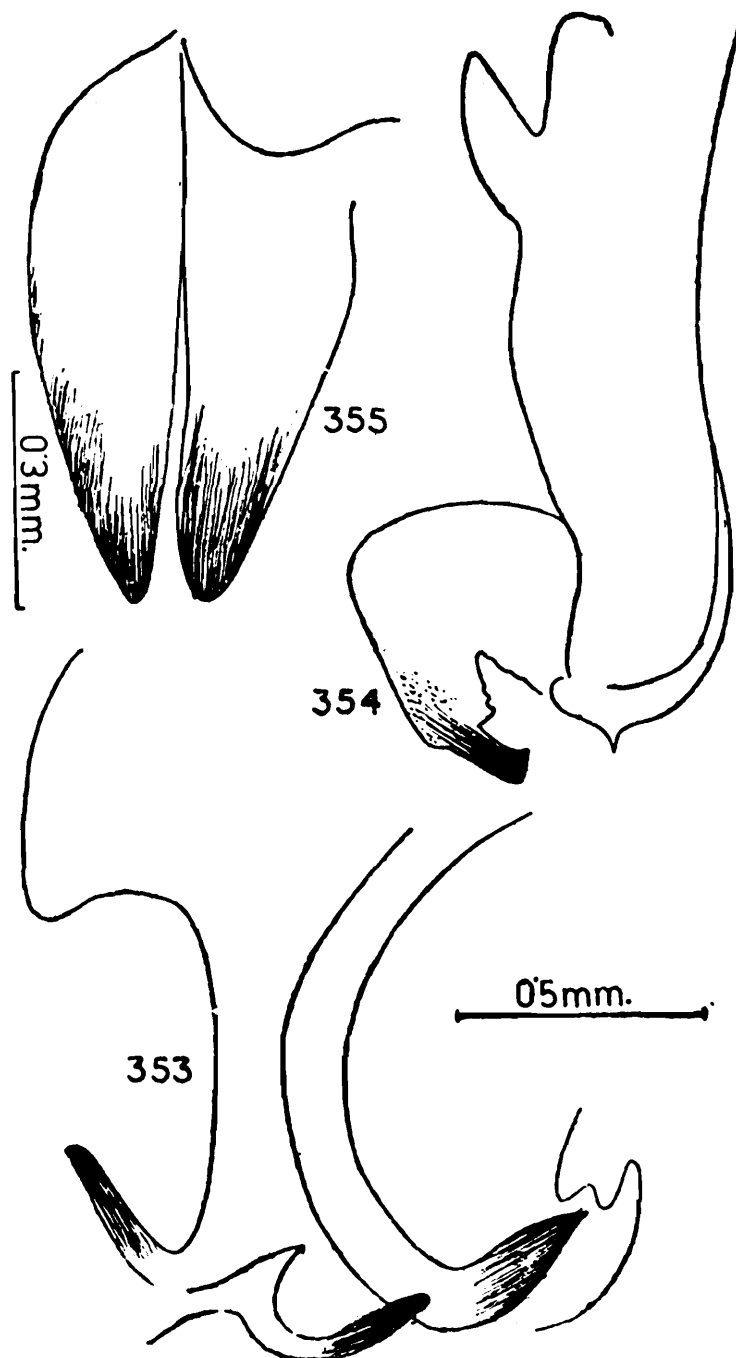
Vertex medially carinate, eyes salient beyond anterior pronotal angle; ocelli placed front, close to each eye; pronotum anteriorly rounded, posterior margin sinuate slightly, posterolateral angles obliquely truncate; scutellar

apex angularly sharp; tegmina extending beyond abdominal tip, costal margin convex, veins distinct, claval veins inwardly rounded; connective laminate-shaped, aedeagal shaft flat at base, with a circlet of processes apicad; stylar shaft chelate or hamate at apex; 7th sternite (female) feebly sinuate along posterior margin.

145. *Durgades idiocerus* Pruthi

(Figs. 353-355)

1930. *Durgades idiocerus* Pruthi, *Mem. Ind. Mus.*, **XI** : 13.



Durgades idiocerus (figs. 353-355).

353. Aedeagus, 354. Style, 355. Male plate.

Body with white and black patches; pronotum with black central tripe abdomen black.

Length : 3 mm (male), 5.75 mm

Genitalia : Aedeagus (fig. 353) broader basad, shaft short, apex notched, two pairs of sharp processes terminally, lateral ones stouter, longer than central one; style centrally with a short digitiform process (fig. 354) directed cephalad, inner lobe tapered, preapical lobe well-developed; male plate (fig. 355) gradually connivent; pygofer triangulate, short hook close to inner margin, directed cephalad.

Holotype (male) -517/H7, allotype -518/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : N.W. Himalayas, Muree Hills (4,000'-7,000').

146. *Durgades mirabilis* Pruthi

1930. *Durgades mirabilis* Pruthi, *Mem. Ind. Mus.*, **XI** : 12-13.

Male darker and stouter than female; vertex with 3 stripes continued on frons, median one bifid touching antennal bases; pronotum binotate, posterior margin deeply notched at median plane, a median longitudinal stripe, black (male); tegmina hard, horny.

Length : 3 mm (male). 4 mm (female).

Genitalia : The genital armatures are not dissected out owing to paucity of male specimens excluding male plate which appears robust; seventh sternite (female) sinuate along posterior margin.

Holotype (male)—514/H7, allotype (female)—515/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Yatung (10,000'), Tibet, Sikkim.

Comments : *Durgades mirabilis* differs from *D. nigropictus* having markings on facial structure, scutellum and tegmina. It is inconvenient to put a question of comparasion between two species through genital armatures, the main reason encountered is the paucity of materials pertaining to males, in the National Collection.

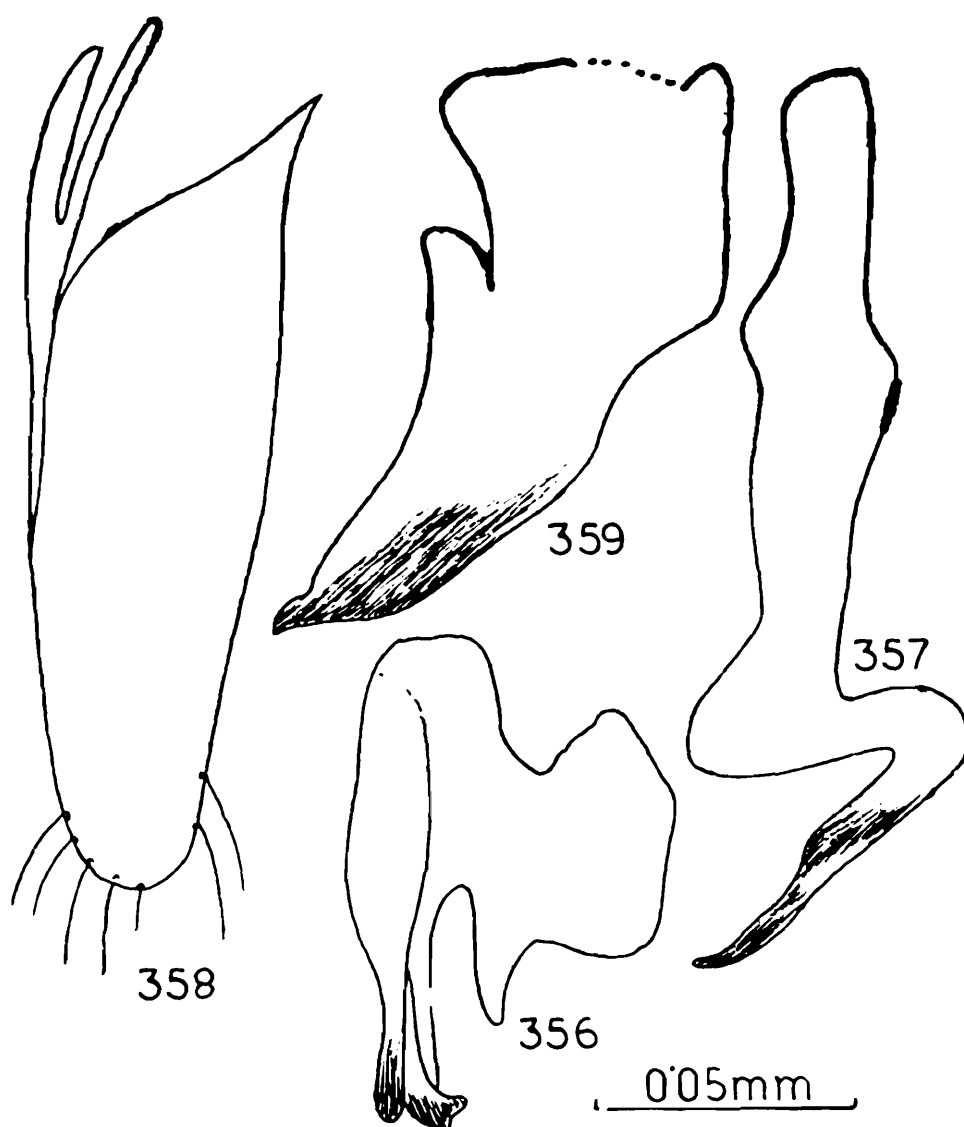
Morphology : Median length of crown $1\frac{1}{7}$ th interocular width; pronotal width as transocular width; clypeus at base distinctly depressed, otherwise convex, transclypeal suture prominent, lateral clypeal suture extending upto

antennal bases, textures of crown, clypeus, pronotal surface finely granulated ; pronotum laterally angulated, posterior margin convex, notched centrally ; scutellum depressed medially, texture granulated ; tegmina with prominent venational arrangement, 4 apical 3 anteapical cells ; hind femoral setal formula ; 2:1:0 ; 7th st. (female) medially notched at posterior margin.

147. **Durgades nigropicta** Dist.

(Figs. 356-359)

1912. *Durgades nigropicta* Dist., *Ann. Mag. Nat. Hist.*, **10** (8) : 608-609.



Agallia robusta (figs. 351-352).

356. Aedeagus, 357. Style, 358. Male plate, 359. Pygofer.

Head with short vertex, binotate, a central line between two spots ; eyes extending beyond pronotal angle ; ocelli placed between eyes ; face with central creamy longitudinal band, piceous excepting part of gena below

antennal base (male) ; bases of antennae, face with a pale streak (female) ; pronotum and scutellum pitchy black, granulated, scutellum creamy at posterior margin ; tegmina coriaceous, costal margin reddish tinge (male) ; pronotum, scutellum reddish brown ; tegminal veins with blackish tinge or streaks ; femora dark black (male), dark brown (female) ; legs black or dark brown.

Length : 4 mm (male), (female).

Genitalia : Connective Y-shaped, aedeagus (fig. 356) with broad apodeme, shaft short, dorsoventrally compressus, apex hamate, a pair of basal processes directed caudad ; stylar shaft (fig. 357) 2/3rd cylindrate, stout with torsion feebly, rest geniculate abruptly at base, mesal apical extension serrate on inner margin, apex rostriform ; male plate (fig. 358) laterally infolded, converging ; pygofer (fig. 359) convergent, apex salient into a stout hook-shaped structure.

Distribution : E. Himalayas, N. India.

LXXI. Genus *Gunhilda* Dist.

1918. *Gunhilda* Dist., *Fauna Brit. India*, 7 : 88.

Type, by original designation, *Gunhilda noctua* Dist.

1918. *Gunhilda noctua* Dist., *Fauna Brit. India*, 7 88

Vertex before eyes truncate, otherwise rotundate ; face carinate medially ; pronotum convex, posterior margin truncate ; scutellum smaller ; tegmina shorter in length, extending on 1st to second segments of abdomen, apical margin round ; posterior tibiae densely spined ; seventh sternite (female) deeply concavus along posterior margin.

Female

148. *Gunhilda noctua* Dist.

1918. *Gunhilda noctua* Dist., 7 : 88.

Vertex short, carinate centrally, anterior margin rotundate ; pronotum punctate ; tegmina coarsely punctate.

Length : 3 mm.

Seventh sternite deeply concavus along posterior margin.

Distribution : Nilgiri Hills, South India.

Comments : Mr. T. V Campbell made collections of both genotype along with two more specimens, consisted of females, from the locality of Nilgiri Hills. The later two specimens are retained in the repository of National collection, Z.S.I. The present author is in conformity with Pruthi's publication, 1934, it seems that the original author confused the male with female specimens and diagram of seventh sternite maintains a separate identity of the species but should be recorded more close to *Doratulina*, *Driotura* rather than *Chiasmus*.

Morphology : Median length of crown half the interocular width, texture densely punctate, granulated, surface medially tumescent; eyes protruded, not in line with lateral margin of head; ocelli on anterior margin of head equidistant from median suture and eyes; clypeus densely granulated, posterolateral margin hood-shaped over antennal bases, clypellus constrictus basad, tumescent along median line; lorae and genae indistinctly separated; antennal bases deeply grooved; pronotal width greater than transocular width, texture finely rugulosa, posterior margin desected; forewing coriaceous, densely granulated, apical margin truncated, venational arrangement obsolete, length upto abdominal tip; hind femoral setal formula : 2:1:1; 7th sternite (female) deeply notched posteromedially.

Registered number : 397/H7, (Ind. Mus.), Z.S.I., Calcutta.

LXXII. Genus *Symphypyga* Haupt

1917. *Symphypyga* Haupt, *Wien. Ent. Ztg.*, **36** : 239.

Type, by subsequent designation, *Symphypyga obsoleta* Haupt.

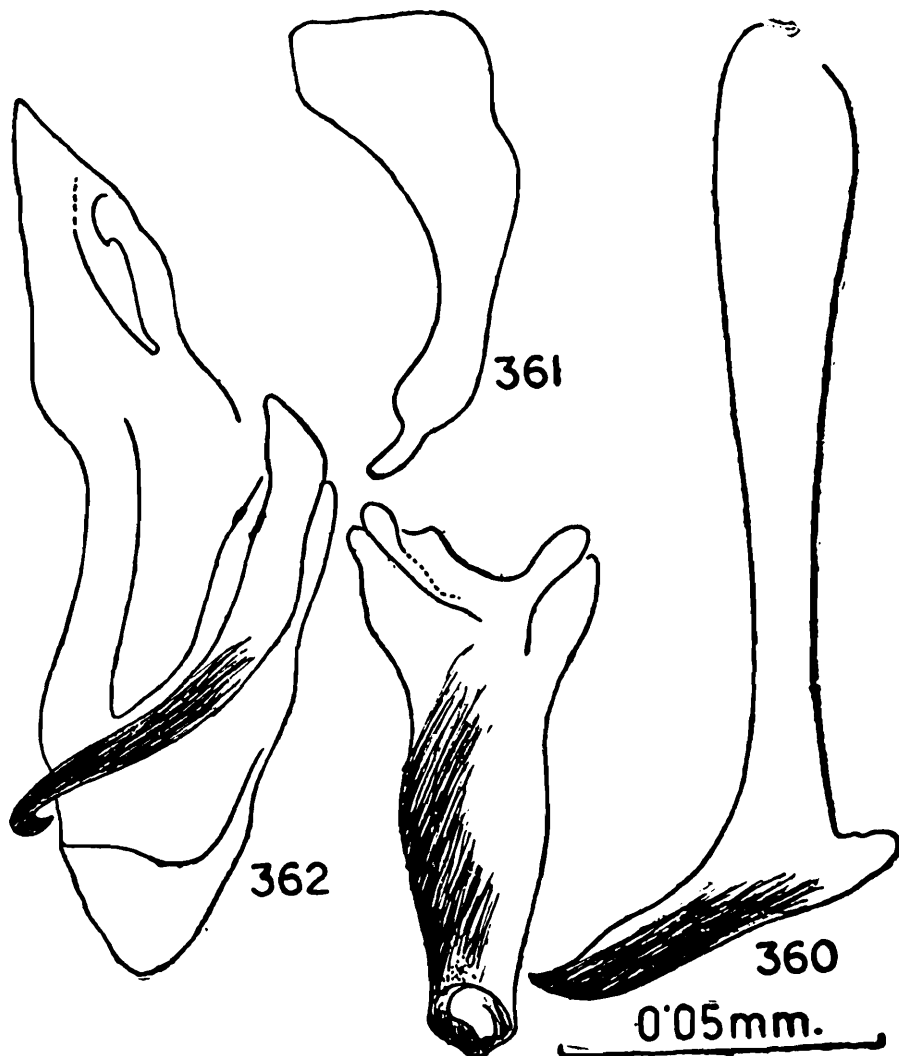
1917. *Symphypyga obsoleta* Haupt, *Wien. Ent. Ztg.*, **36** : 241.

Vertex distinctly narrowed in middle; frons flattened; ocelli placed close to eyes; clypeus rectangular; pronotum raised, anterior angle produced between eyes; posterior margin sinuate; tegmina long, narrow, appendix present, very small, numerous cross-veins on clavus in distal half of tegmina; connective elongate, fused with aedeagal base as a distinct trap-like structure, aedeagus simple, broader basad, gonopore terminal; style with long, hamate-shaped mesal apical extension; male plate triangulate; pygofer hook present; 7th sternite (female) truncate at posterior margin.

149. *Symphypyga maculata* Pruthi

(Fig. 360-362)

1930. *Symphypyga maculata* Pruthi, *Mem. Ind. Mus.*, **XI** : 17.



S. maculata (figs. 360-362).

360. Aedeagus, 361. Style, 362. Male plate, Pygofer hook.

Vertex pink ; clypeus bordered black ; scutellum with a faint dark spot near basal angle, binotate in front of impression ; tegminal veins darkly pigmented ; pro-meso femora spotted black ; body ventrally with greenish patches.

Length : 5 mm (male), 5.25 mm (female).

Genitalia : Aedeagal shaft (fig.360) broader basad, cylindrate along axis, apical process hook-shaped ; styler shaft (fig. 361) attenuate, mesal apical extension hamate, preapical lobe torose ; male plate (fig 362) round at apex, lengthwise parallel, apex chitinised ; pygofer hook (fig. 362) extending along lateral margin, uniform.

Holotype (male)-528/H7, allotype-529/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Punjab.

Economic status : The species is recorded along with forest pests from Dekra Dun area but its importance as vector of viral disease of sandal forest is yet to be investigated (Mathur 1953:159).

Morphology : Anterior margin of vertex in line with outer margin of eyes, median length of crown $\frac{1}{4}$ th length of interocular width, posterior margin concavus, tumid behind each eye ocelli located at extreme anterior margin, equidistant from each eye; clypeus convex, clypellus demarcated by suture, very short; antennal base depressed, texture of crown and clypeus granulate, pronotal width as transocular width, posteromedially concavus, lateral margin angulate, surface granulate; scutellum depressed medially, tegminal length beyond abdominal tip, appendix developed; 7th sternite (female) truncate at posterior margin.

Registered No. 533/H7, (Ind. Mus.), Calcutta.

LXXIII. Genus *Carvaka* Dist.

1918. *Carvaka* Dist., *Mauna Brit. India*, 7 : 40.

Type, by original designation, *Carvaka picturata* Dist.

1918. *Carvaka picturata* Dist., *Fauna Brit. India*, 7 : 40.

Vertex anteriorly rounded, in line with outer margin of eyes, central suture fine; pronotal margin convex, posterior margin truncate, posterolateral margin obliquely angled; scutellum triangulate, transversely impressed near apex; tegminal apex longer than abdomen, 3 apical and 2 anteapical cells; hindtibia densely spinulate; connective Y-shaped, longer arm, aedeagus baculiform, axis; male plate of uniform length.

150. *Carvaka thoracica* Dist.

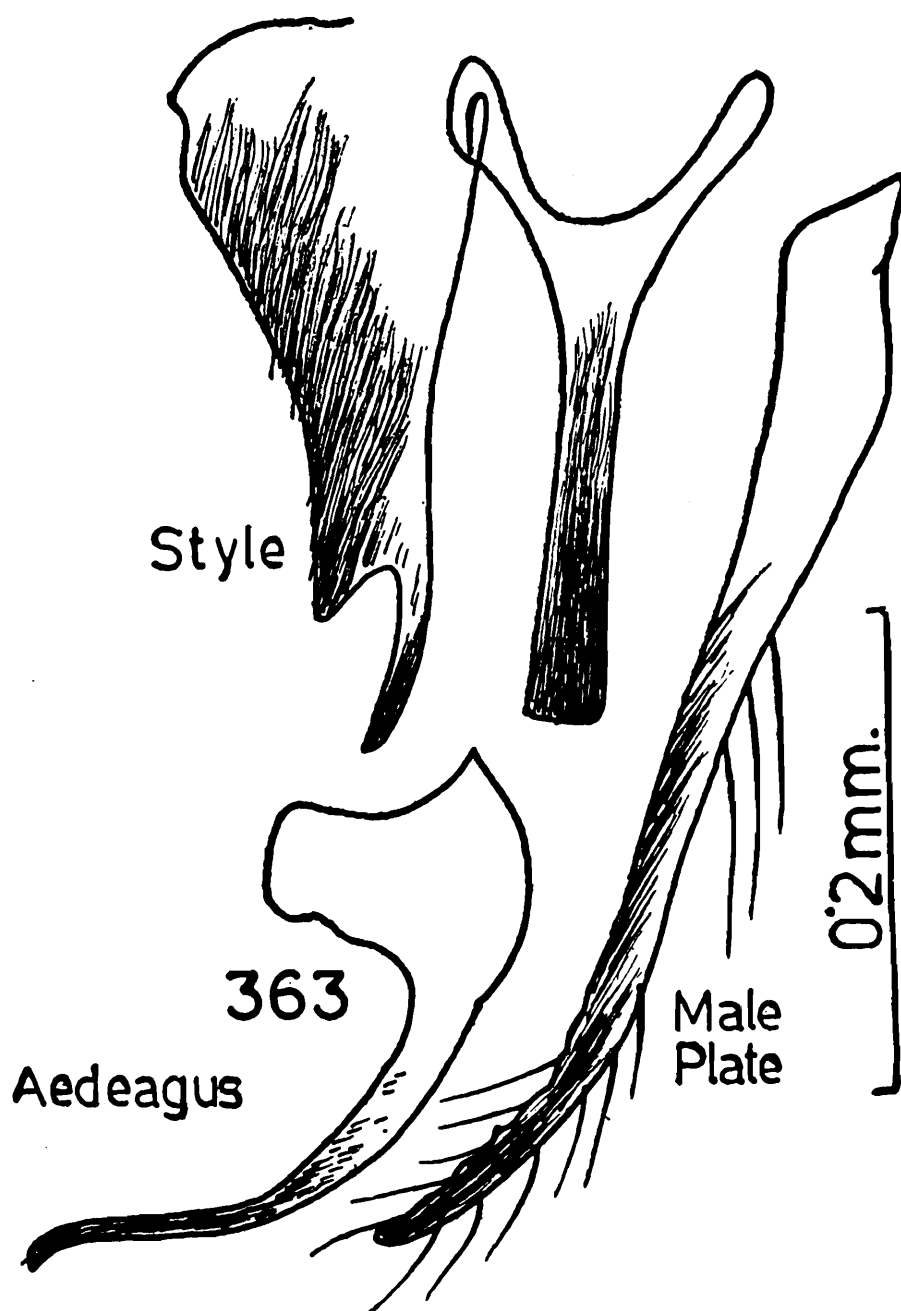
(Fig. 363)

1918. *Carvaka thoracica* Dist., *Fauna Brit. India*, 7 : 41.

Vertex, pronotum, scutellum stramineous; pronotum at anterior margin with a series of small dark spots; basal angle of scutellum spotted; excluding clypeus, face dark chestnut brown, obscured by dark color with transverse and oblique striations; femoral bases chestnut brown.

Length : 7 mm (male), incl. tegmn.

Genitalia : Connective Y-shaped, arm elongate, divergent apically; aedeagus (fig. 363) broader basally, shaft tubular, attenuate, directed laterad, sinuate; style (fig. 363) with slender mesal apical extension, curved along



Carraka Thoracia (Fig. 363).

363. Aedeagus, Style, Male plate.

axis; male plate (fig. 363) uniform throughout length, beyond middle twisted, setose marginally; pygofer with a few strong spines at posterior margin.

Distribution : Nilgiri Hills, Ootcamund, South India.

LXXIV. Genus *Cestius* Dist.

1908. *Cestius* Dist., *Fauna Brit. India*, 4 : 310.

Type, by original designation, *Cestius versicolor* Dist.

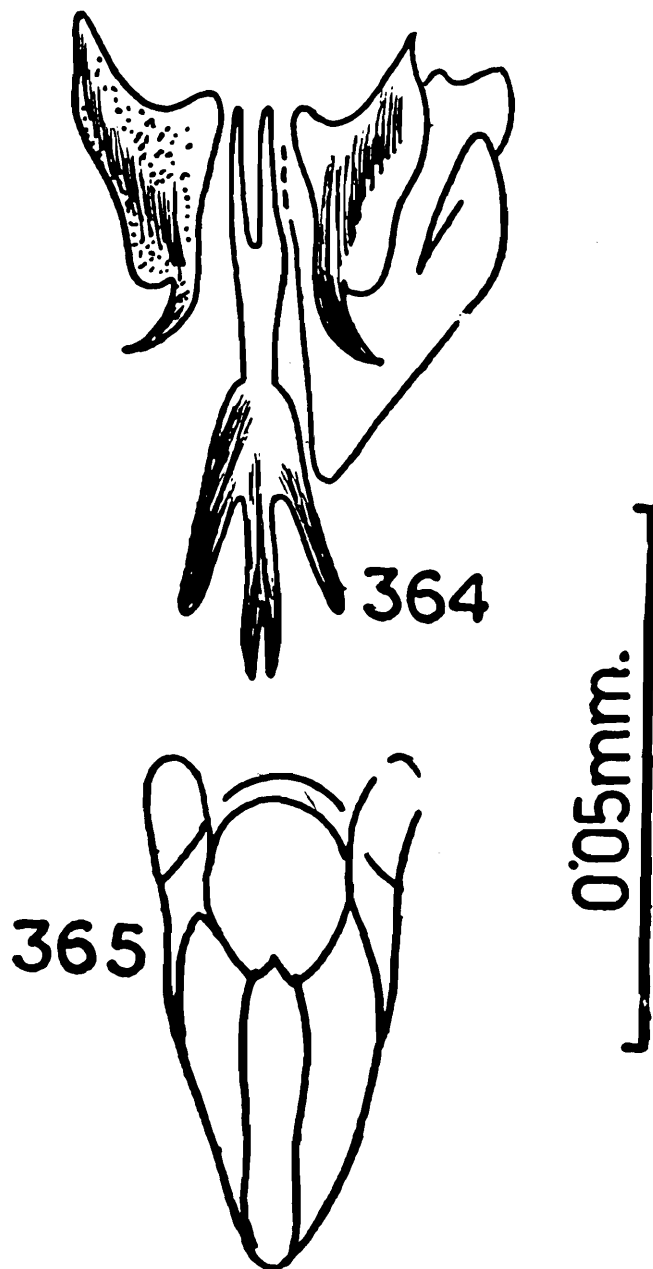
1908. *Cestius versicolor* Dist., *Fauna Brit. India*, 4 : 309.

Vertex globosus, eyes salient beyond pronotal margin; facial area below antennal insertion angularly narrowed to clypeus; pronotum convex dorsally, hind tibiae spinulose; tegmina extending beyond abdominal apex, four apical cells, one or two transverse veins near base; connective Y-shaped, aedeagal shaft sometimes bifid apicad; styler shaft usually unciform.

151. *Cestius versicolor* Dist.

(Figs. 364—365)

1098. *Cestius versicolor* Dist., *Fauna Brit. India*, 4 : 310.



Cestius versicolor (Figs. 364-365).

364. Aedeagus, style, male plate; 365. VIIth sternite.

Vertex binotate at base; tegmina with dark brown spots in three transverse rows; thorax with dark brown patches; body ventrally greenish yellow.

Length : 4.5 mm (female), 4 mm (male).

Genitalia : Aedeagal base (fig. 364) Y-shaped, shaft short, bifid at apex; style 3/4th broader, apically unciform, arcuate laterad; male plate and pygofer simple, style, male plate (fig. 364), VIIth sternite (fig. 365).

Distribution : Bihar, Bengal, Java.

Economic status : The species is of common occurrence in Dehra Dun forest, the importance of the species as vector of spike disease of sandal wood is not yet ascertained. (Mathur, 1953 : 160).

LXXV. Genus *Divus* Dist.

1908. *Divus* Dist., *Fauna Brit. India*, 4 : 365.

Type, by subsequent designation, *Divus bipunctatus* Melichar.

1903. *Divus bipunctatus* Melichar, *Fauna Hom. Ceylon*, p. 192.

Vertex rounded anteriorly; eyes obliquely salient beyond anterior pronotal angles; face distinctly concave near antennal pit; pronotum prominently reflexed downward on each side, surface impressed; scutellum transversely depressed; tegmina longer than abdomen, 4 apical, 2 anteapical cells, base with two transverse veins; hind tibiae densely spined; connective Y-shaped, shaft baculiform, with processes; stylar shaft parallel-sided, foot-like; male plate beyond middle usually abruptly narrowed.

152. *Divus bipunctatus* (Melichar)

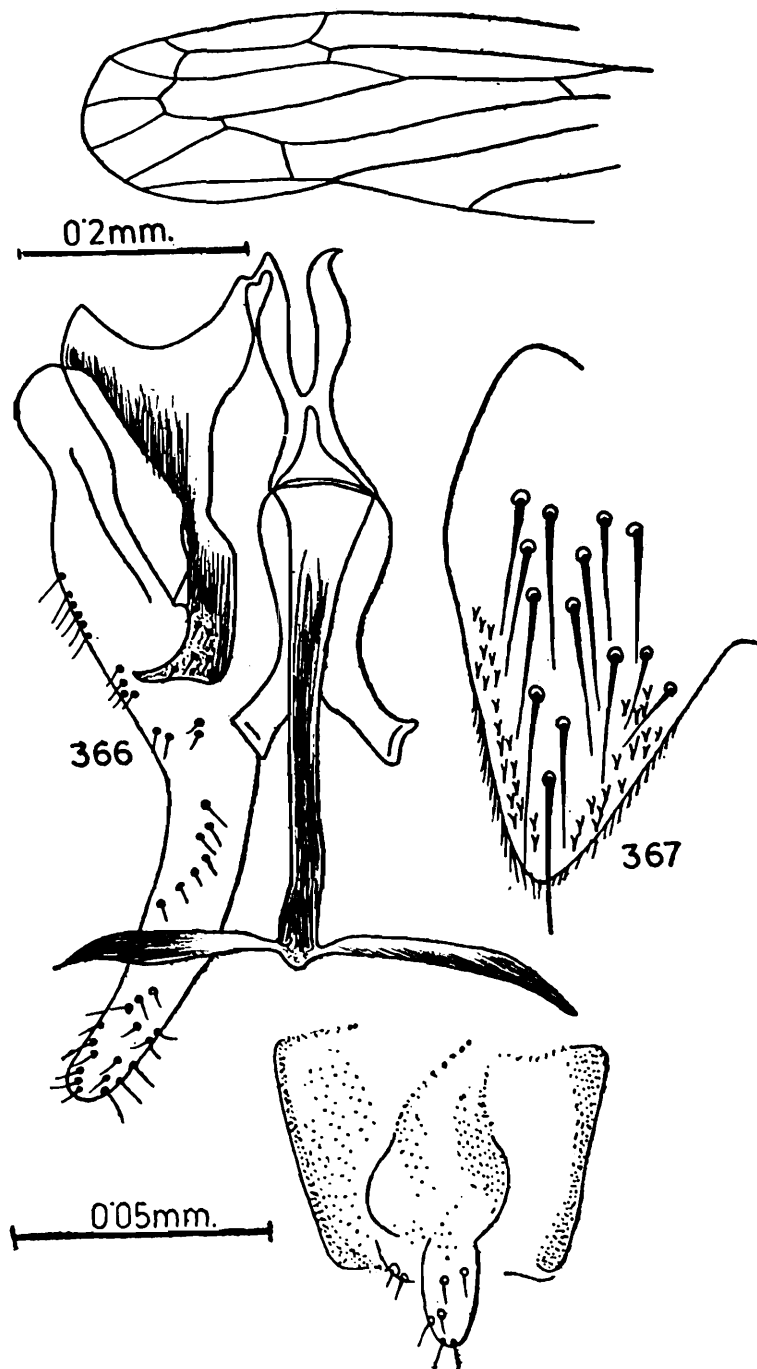
(Figs. 366—367)

1903. *Eutettix bipunctatus* Melichar, *Fauna Hom. Ceylon*, p. 192.

Vertex binotate; pronotum with yellow transverse impression, anteriorly obscurely shaded; tegmina smoky, veins dark; abdomen dark brown dorsally.

Length : 6 mm (male).

Genitalia : Aedeagal shaft (fig. 366) broader basad, baculiform, a pair of terminal processes directed laterad, style (fig. 366) with mesal apical extension L-shaped apicad, laterad; male plate (fig. 366) with posterior half abruptly narrowed, arcuate lengthwise, basal half spiniferous, sparsely setose; pygofer (fig. 367) densely spined on margin.



Divus bipunctatus (Figs. 366-367).

366. Aedeagus, style, male plate; 367. Pygofer.

Distribution : North Salem, Ceylon, Madras.

Economic status : The species is reported to be the suspect vector of disseminating spike disease of sandal wood, *Santalum album* Linn. The incidence of the species is confirmed by having it trapped on sticky paper during investigation of the cause of the disease involved in tremendous economic loss to the country, Pruthi (1934 : 24), Chatterjee (1939 : 22), Mathur (1953 : 161).

Morphology : Anterior margin of vertex semicircular, median length of crown half interocular width, outer margin of eyes in line with lateral margin of head, median suture distinct, anterior margin feebly reflex, texture granulated with oblique and longitudinal striations; ocelli placed contiguous to each eye, clypeus and clypellus flattened, granulated, lateral clypeal suture extending upto anterior margin of crown, clypellus linguiform; pronotal width as transocular width, texture with transverse striations, lateral margin obliquely rounded, posterior margin truncated; scutellum medially depressed with transverse striations; fore-wing semi-transparent, longer than abdomen; 4 apical and 3 anteapical cell, hind femoral setal formula : 2 : 1 : 1; 7th sternite (female) simple.

Registered number : 213/H5, (Ind. Mus.), Z.S.I., Calcutta.

LXXVI. Genus *Gessius* Dist.

1908. *Gessius* Dist., *Fauna Brit. India*, 4 : 301.

Type, by original designation, *Gessius verticalis* Dist.

1908. *Gessius verticalis* Dist., *Fauna Brit India*, 4 : 302.

Vertex broader than long, outer margin in line with eyes; ocelli placed close to eyes; facial structure tapering towards clypeus; genae and clypeus ridged and reflexed laterally and apically (clypeus); pronotal surface arched; scutellum subtriangulate; tegmina longer than abdominal apex, behind clavus valvate, 4 apical and 3 anteapical cells, appendix well-developed, clavus linearly punctate; metatibiae densely spined; 7th sternite (female) concavus along posterior margin.

Female :

153. *Gessius verticalis* Dist.

1908. *Gessius verticalis* Dist., *Fauna Brit. India*, 4 : 302.

Vertex distinctly short, anteriorly broadly rounded; ocelli on anterior margin of vertex; clypeus broader at apex; genae expanded; pronotum with fine transverse striations, widening distad; scutellum very large; tegmina semi-transparent, appendix well-developed, venation distinct, 5 apical 3 anteapical cells, 2 cross-veins between sectors; legs stout, large. 7th sternite (female) concavus along posterior margin.

Distribution : Kurseong (5,000'), Eastern Himalayas.

LXXVII. Genus *Iassus* Fabr.

1803. *Iassus* Fabr., *Systema Rhynogotorum*, p. 85.

Type, by subsequent designation, *Cirada lanio* Fallen.

1826. *Cicada lanio* Fallen, *Hemiptera Sveciae*, 2 : 58.

Color stramineous brown to fuscous red; body robust; vertex blunt at apex, rounded; ocelli placed remotely from each other; frons abruptly raised above cheeks; antennal base short, thick, apical one with a short bristle; pronotum posterolaterally oblique, anterior angles feebly rounded; tegmina narrowing towards tip, costal margin arcuate, apical cells short, middle one shortest, quadrangular, outer one twice as long as former one, outer antepical cell longer, reticulate, inner antepical cell acute at tip; posterior tibiae densely spined; connective usually transverse. T-shaped, aedeagus short, stout, shaft recurved with lobes, semi-transparent; gonopore terminal; style either flattened, acuminate or hook-shaped; male plate ligulate, setae minute, appressed; pygofer with spine-like setae distally, hook slender.

154. *Iassus indicus* (Leth.)

(Figs. 368—371)

1892. *Macropsis indica* Lethierry, *Bull. Zool. Soc. France*, 1892 : 209.

Head, pronotum, scutellum pale yellow; pronotum finely striate; scutellum depressed at base; tegmina brownish yellow, coarsely punctate, claval region with a spot; abdomen brown.

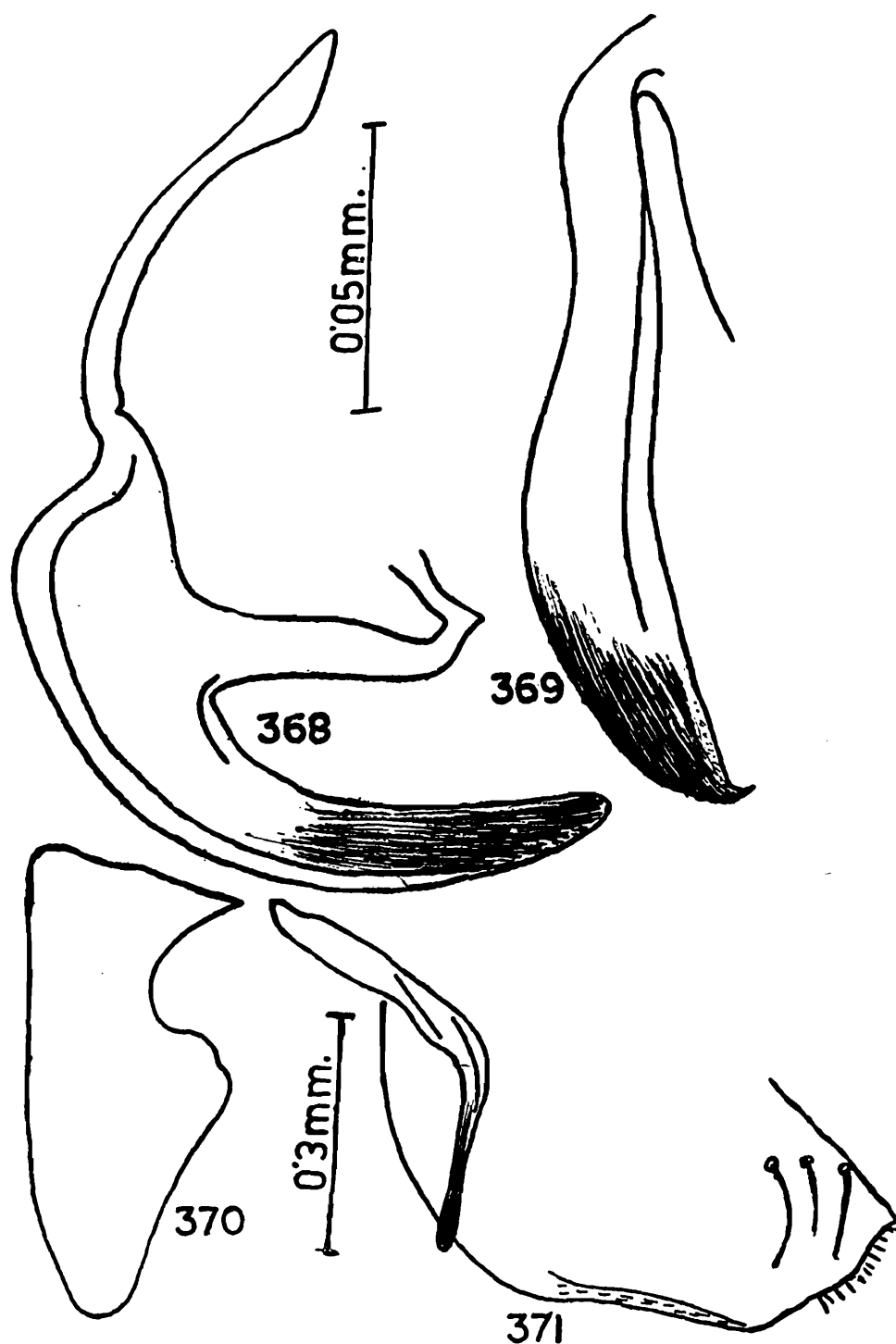
Length : 4 mm (male), 4.50 mm-5 mm (female) incl. tegmen.

Genitalia : Aedeagal shaft (fig. 368) massive, dorsoventrally flattened, deeply notched at base, a stout lateral process arising medially, curved lengthwise in lateral direction, inner margin at apex distinctly serrate; male plate, stylar shaft (fig. 369) at tip beak-shaped as figd., pygofer at posterior margin with a sharply geniculate hook (fig. 371); male plate (fig. 370).

Distribution : South Andaman, Madras, Ceylon, Tanganyika, Malabar, Bengal, Tenasserim, Java, Formosa, Seychelles, Seychelles, Sihoutte Island, Samoa, Flores, Sumbawa, Fukien, Mysore, Upolu.

Economic status : Reported as suspect vector of spike disease of sandal wood. (Pruthi 1934), Mathur (1953:158).

Morphology : Median length of crown one-fourth interocular width; pronotal width greater than transocular width; pronotal width greater than



Iassus indicus (Figs. 368-371).

368. Aedeagus, 369. Style, 370. Male plate, 371. Pygofer.

transocular width, lateral margin angulate; ocelli placed at median line of eyes, equidistant from median suture and each eye; clypeus flat including clypellus, transclypeal suture indistinct, lateral clypeal suture extending upto antennal bases; scutellum medially with transverse depression; textures of crown, clypeal structures, pronotum, scutellum with fine dense transverse

furrows; forewing finely granulated, venational arrangement distinct; hind femoral setal formula : 2:1:0; VIIth sternite (female) with a deep circular notch medially.

Registered No. : 9706/H7 (male), 8879/H7 (female), Z.S.I., Calcutta.

According to some authors the species is recorded under *Bythoscopus indicus* (Letn.).

155. *Iassus rubrofrontalis* (Dist.)

1908. *Bythoscopus rubrofrontalis* Dist., *Fauna Brit. India*, 4 : 192.

Ground color dark brown, sometimes V-shaped shiny reddish brown pigmentation at clypeal base; abdomen creamy white; laterally dark brown; forewing with punctation; seventh sternite (female) truncate at posterior margin.

Distribution : Himalayan mountains, Philippine Islands, Lombok, Uttar Pradesh, India.

LXXVIII. Genus *Krisna* Kirk.

1900. *Krisna* Kirkaldy, *Entomologist*, 33 : 243.

Type, by subsequent designation, *Siva strigicollis* Spinola.

1850. *Siva strigicollis* Spinola, *Mem. Soc. Ital. Modena*, 25(1) : 128.

Body somewhat depressus; vertex subangularly produced; clypeus spatulate; genal angle emarginate; ocelli on anterior margin of head; pronotum acute laterad; tegmina apically narrow, venation irregular; meta-femora compressus; meta-tibiae densely spined; aedeagal shaft robust pattern, in general, apex pointed; style baculiform, either acuminate or hamate; pygofer hook present.

156. *Krisna kirbyi* Kirk.

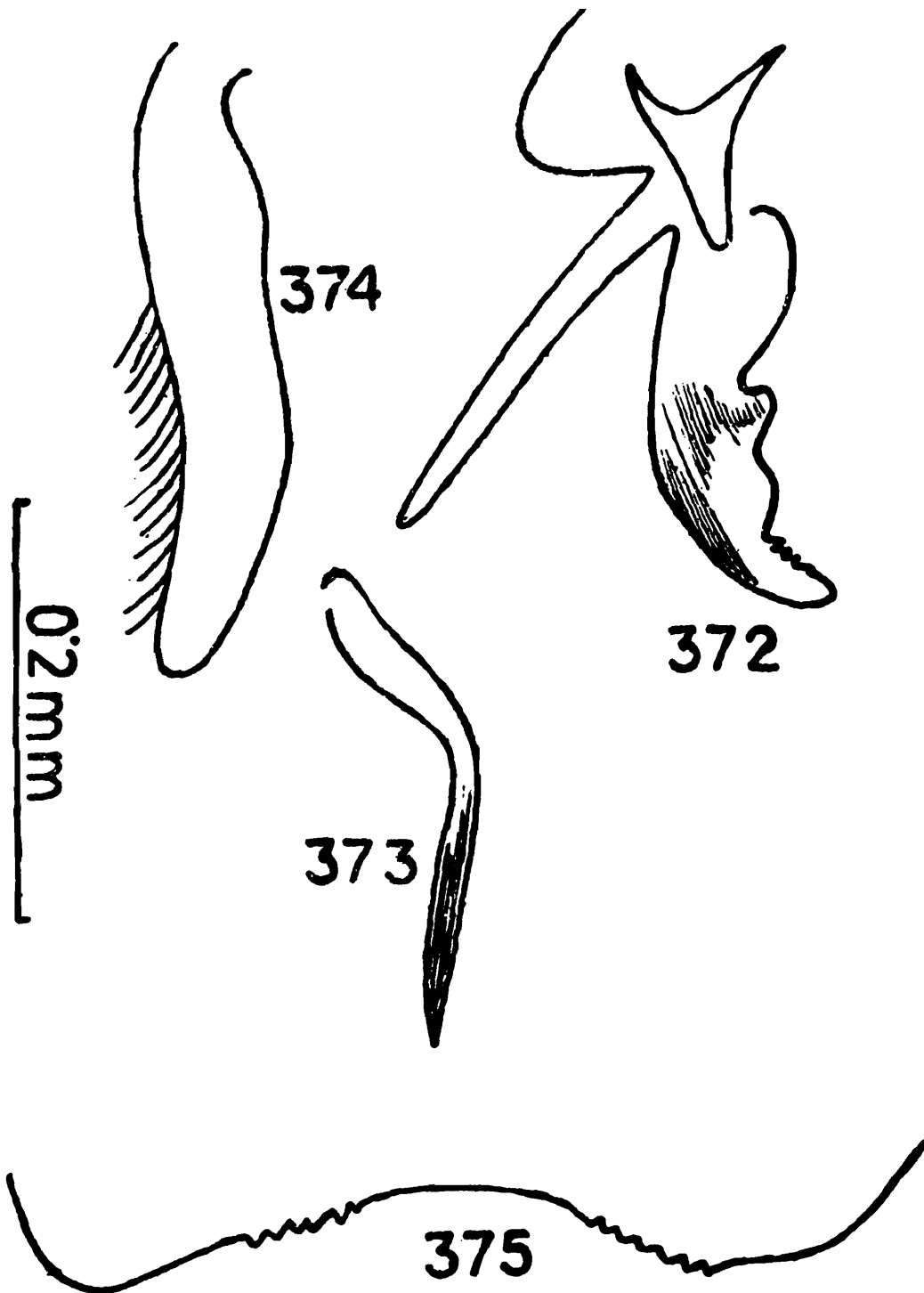
(Figs. 372—375)

1901. *Krisna kirbyi* Kirkaldy, *Entomologist*, 34 : 39.

Vertex reddish apicad, bordered black; pronotum and scutellum transversely striated; tegmina with apical third reticulous.

Length : 10 mm (male), 1.5 mm (female).

Genitalia : Aedeagal shaft (fig. 372) robust as figured, tip slightly reflex; male plate (fig. 374) connivent distad, uniseriate laterad, curved smoothly; pygofer on outer margin serrate (fig. 373), hook acuminate.



Krisna kirbyi (Figs. 372-375).

372. Aedeagus, 373. Pygofer hook, 374. Male plate, 375. VIIth sternite.

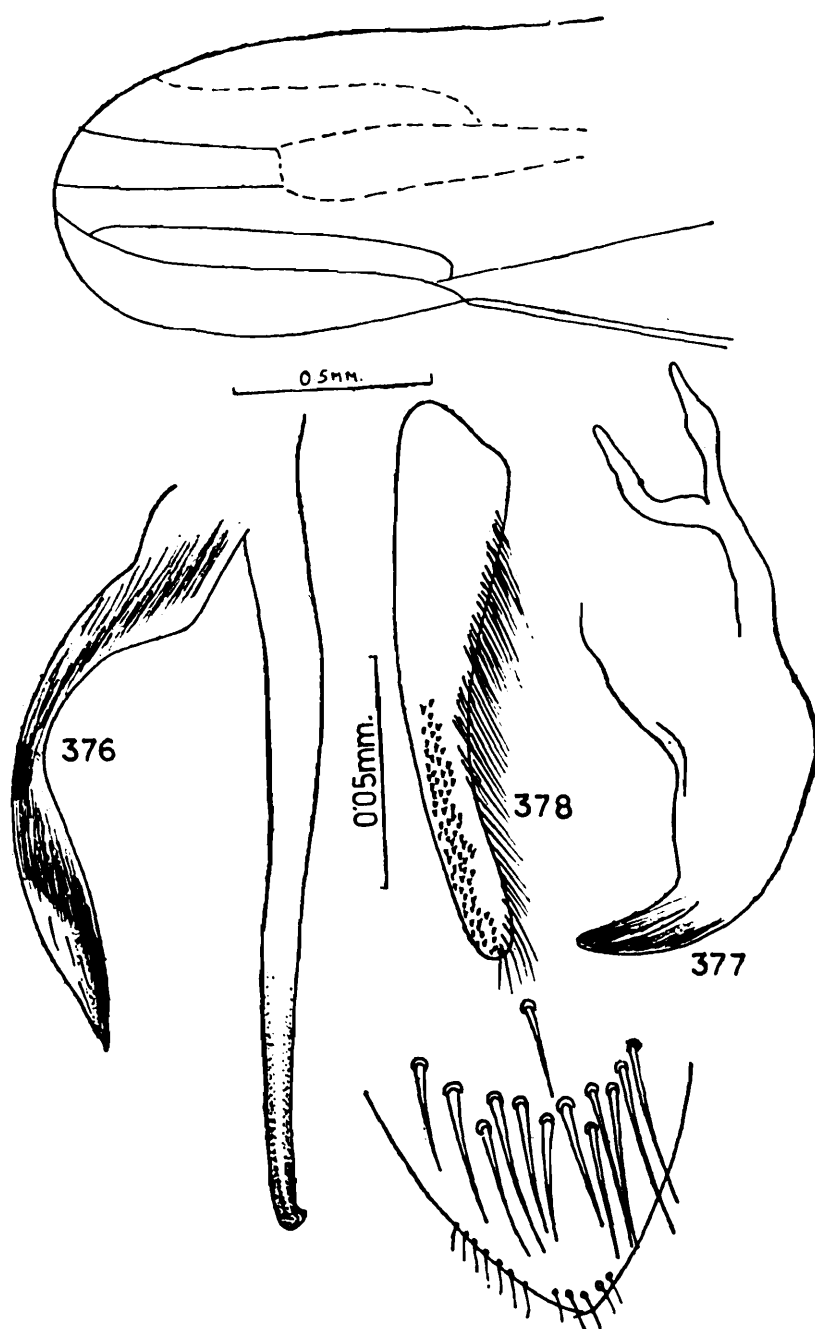
apically, slender, arising basad; seventh sternite (female) concave along posterior margin, sparsely serrated; (fig. 375) style damaged.

Distribution : Ceylon, Luzon, Philippines.

Comments : The species bears close resemblance to *Krisna strigicollis*, I could not find any significant variation in the shape of male genitalic characteristics and color pigmentation on vertex between *kirbyi* and *strigicollis* that enable me to justify separate identities as species. The morphological similarities of the key traits led me merge the species, *kirbyi* (=striata) with *strigicollis*, in accordance with International Nomenclatural priority.

157. *Krisna strigicollis* (Spinola)
(Figs. 376—378)

1850. *Siva strigicollis* Spinola, *Mem. Soc. Ital. Modena*, 25(1) : 128.



Krisna strigicollis (Figs. 376-378).

376. Aedeagus, 377. Style, 378. Male plate, 376. Pygofer hook.

Vertex with anterior margin recurved, dark brown, binotate; pronotum with transverse lines, connivent apicad; scutellum salebrose, striate transversely; tegmina brownish-yellow, rugulose, punctate; wings milky-white, hind tibiae densely spined; abdomen pale brown.

Length : 10 mm (male).

Genitalia : Connective Y-shaped, aedeagal shaft (fig. 376) as figured; style (fig. 377) with elongate mesal apical extension, apical part spatulate; male plate (fig. 378) converging distad, mesal margin rugulose distinctly; pygofer hook (fig. 376) scimitar-shaped, impressed lengthwise.

Distribution : Madras, Philippines, Java, Bengal, Indo-China, Dutch East Indies, Singapore, Malay Peninsula.

Economic status : The species is reported during investigating the vector of spike disease of sandal (Pruthi, 1934 : 18), (Mathur, 1953 : 163).

LXXIX. Genus *Selenocephalus* Germar

1833. *Selenocephalus* Germar, *Rev. Ent. Silbermann*, I : 180.

Type, by monotypy. *Jassus obsoletus* Germar.

1817. *Jassus obsoletus* Germar, *Homoptera*, p. 281.

Vertex flat, rounded apically, sulcate apex; face depressus at base; ocelli placed either side or near eyes; pronotum convex anteriorly, truncate posteriorly; tegmina extending beyond abdominal tip; membranous, 4 apical cells; hind tibiae densely spined; connective Y-shaped, stem robust, aedeagal apodeme developed, shaft sometimes arcuate; stylar extension abruptly narrowed, apex pointed or blunt; male plate square-shaped.

158. *Selenocephalus disparatus* Melichar

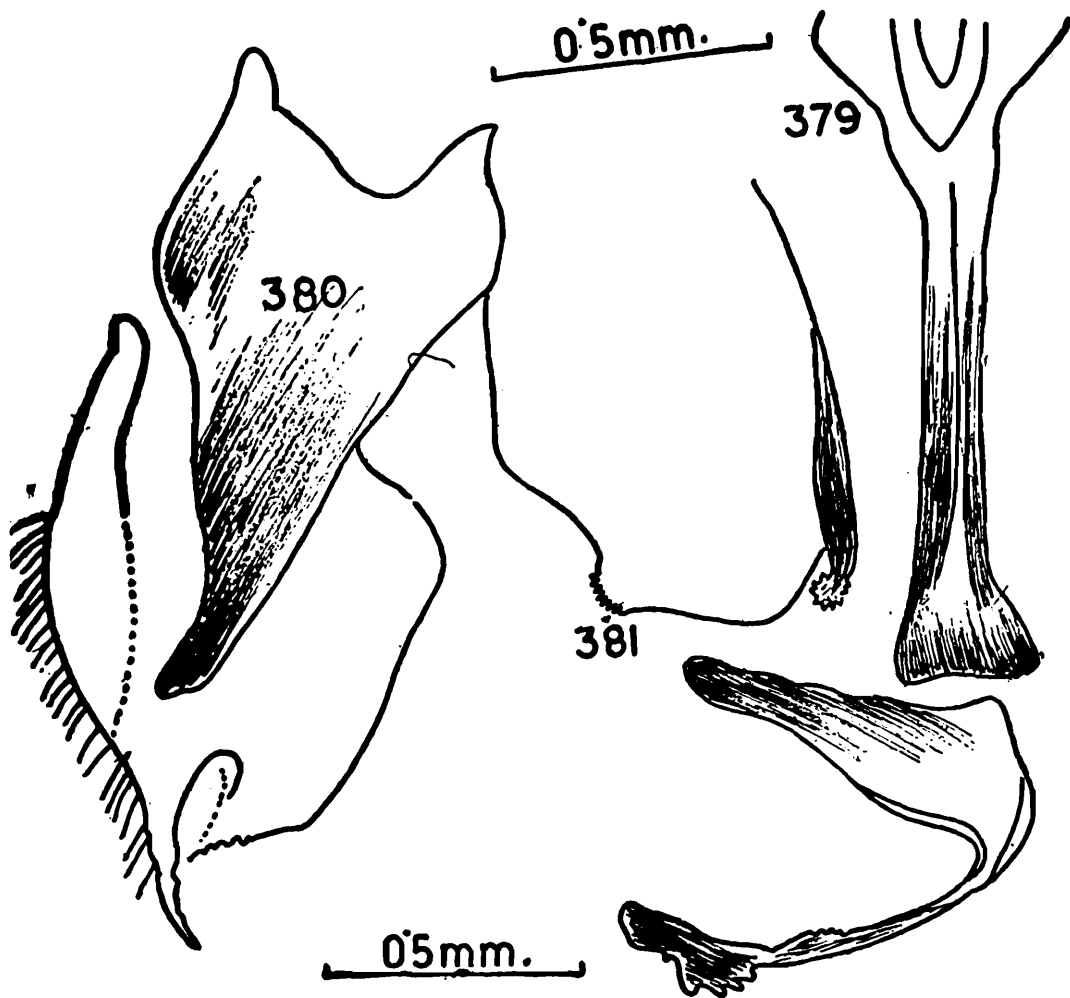
(Figs. 379—381)

1903. *Selenocephalus disparatus* Melichar, *Hom. Fauna Ceylon*, p. 169.

Vertex bordered above and below with black stripes; pronotum spotted brown; tegmina with dashes and spots between veins, hind tibiae with black spots around each spine; first and second thoracic tibiae with 4-5 black spots.

Length : 6.5 mm (male), 7 mm (female).

Genitalia : Aedeagal shaft (fig. 379) with developed apodeme, distal part attached with serrated plate; stylar shaft (fig. 380) with stout mesal



S. disparatus (Figs. 379-381)

379. Aedeagus, 380. Style, Male plate, 381. Pygofer.

apical extension, apex desected; male plate (fig. 380) square-shaped, apically drawn out to a medium process; pygofer hook (fig. 381) extending along mesal margin, apex spatulate and densely spined.

Distribution : Ceylon Madras, Mysore, Coorg.

Economic status : The species is recorded along with the suspect vectors of spike disease of sandal, although its role as a vector is not yet ascertained by the entomologists (Pruthi, 1934:18), (Mathur, 1953:166).

LXXX. Genus *Trochnadella* Pruthi

1930. *Trochnadella* Pruthi, *Mem. Ind. Mus.*, **XI** : 8.

Type, by original designation, *Trochnadella shillongensis* Pruthi.

1930. *Trochnadella shillongensis* Pruthi, *Mem. Ind. Mus.*, **XI** : 8.

Head including eyes narrower than pronotum, vertex extremely narrower, rounded anteriorly; face depressed lower half; ocelli frons; clypeus

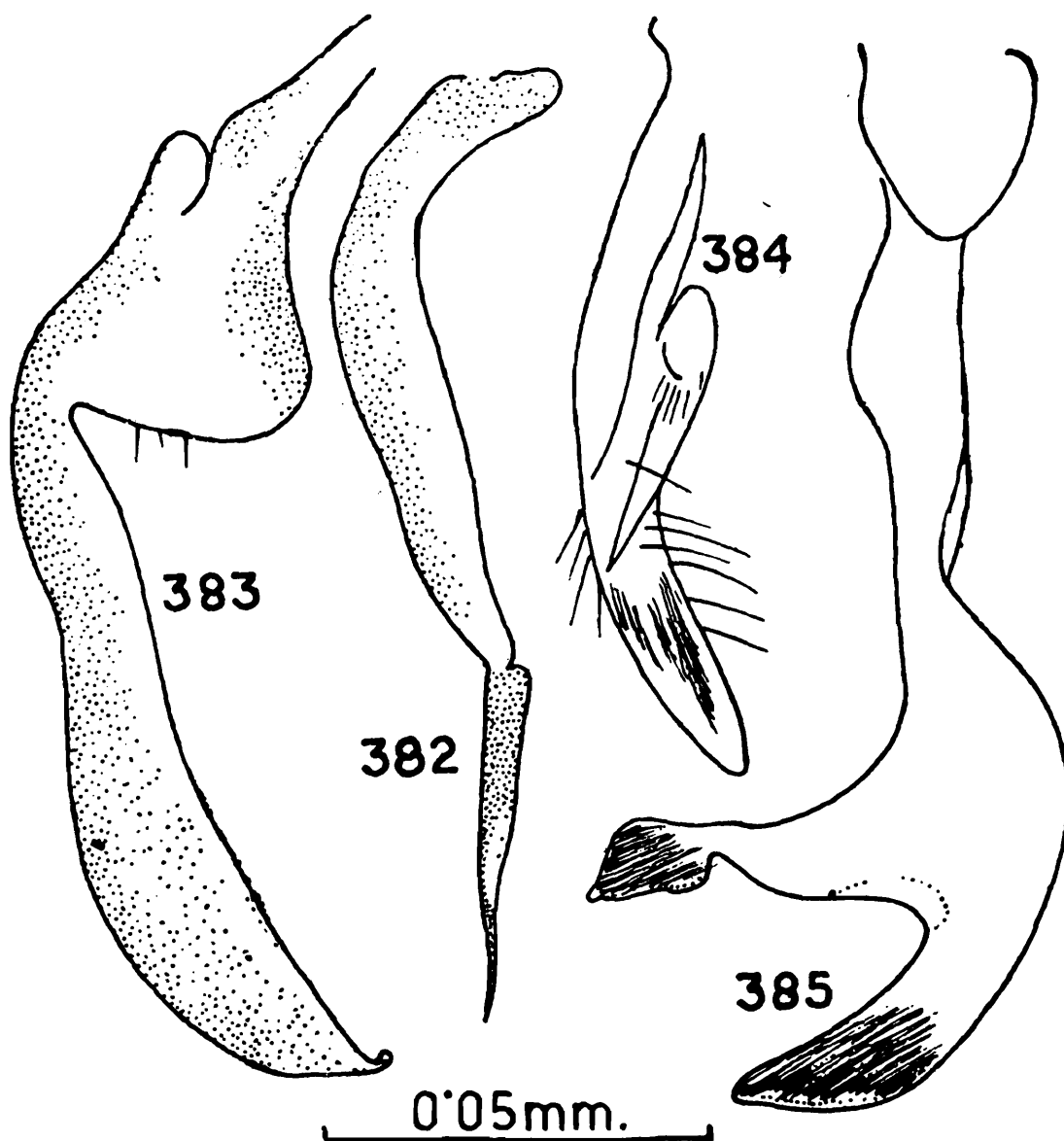
rectangulate; genae deeply sinuate close to eyes. Type, by original designation, *Trocnadella shillongensis* Pruthi 1930, *Mem. Ind. Mus.*, II:8

Pronotum convex anteriorly, distal margin truncate, finely impressed including scutellum; tegmina longer than abdomen, number of cross-veins opposite to outer anteapical cells, 3 anteapical cells longer; aedeagal complex with distinct basal apodeme; stylar shaft hamate; 7th st. (female) concavus along posterior margin.

159. *Trochnadella punctata* Pruthi

(Figs. 382—385)

1930. *Trachnadella punctata* Pruthi, *Mem. Ind. Mus.*, XI : 10.



T. punctata (Figs. 382-385).

382. Aedeagus, 383. Style, 384. Male plate, 385. Pygofer.

Body yellowish green with lateral margin of eyes having patches; vertex, pronotum, scutellum striated transversely; tegminal surface salebrose, pigmented, pale reddish color.

Length : 9.0 mm (male).

Genitalia : Aedeagal characteristics as figured (fig. 382), basal apodeme distinct, prominent, converging; style (fig. 383) with mesal apical extension unciform at apex; male plate and pygofer as figured (fig. 384, 385).

Holotype (female)—509/H7, Yatung (10,000'), (Ind. Mus.), Z.S.I., Calcutta, allotype (male)—367/H15, paratype—368/H15 (genitalia on slide), Z.S.I., Calcutta.

Distribution : Calcutta Air Port, by light trap, (B. Datta & Maya Dhar).

Comments : *T. punctata* Pruthi (Holotype) (female) was collected from Tibet. The allotype was recorded from Calcutta Air Port during the study of Homopteran specimens trapped through process of light-trap method in the year 1978-79. We had collection of 4 specimens (male), the incidence of this species is linked with the regular flow of commercial traffic from High Altitudinal area of Eastern Himalayan region to plains. The vegetation and associated pests of major or minor importance remain undisturbed inside Calcutta Air Port. The undisturbed growth of vegetation fosters the increase of virulent insect pests namely, *Nilaparvata lugens* Stål, and *N. vurens* pertaining to Fulgoridae and cicadellidae.

160. *Trochнадella shillongensis* Pruthi

(Figs. 386—387)

1930. *Trochнадella shillongensis* Pruthi, *Mem. Ind. Mus.*, **XI** : 9.

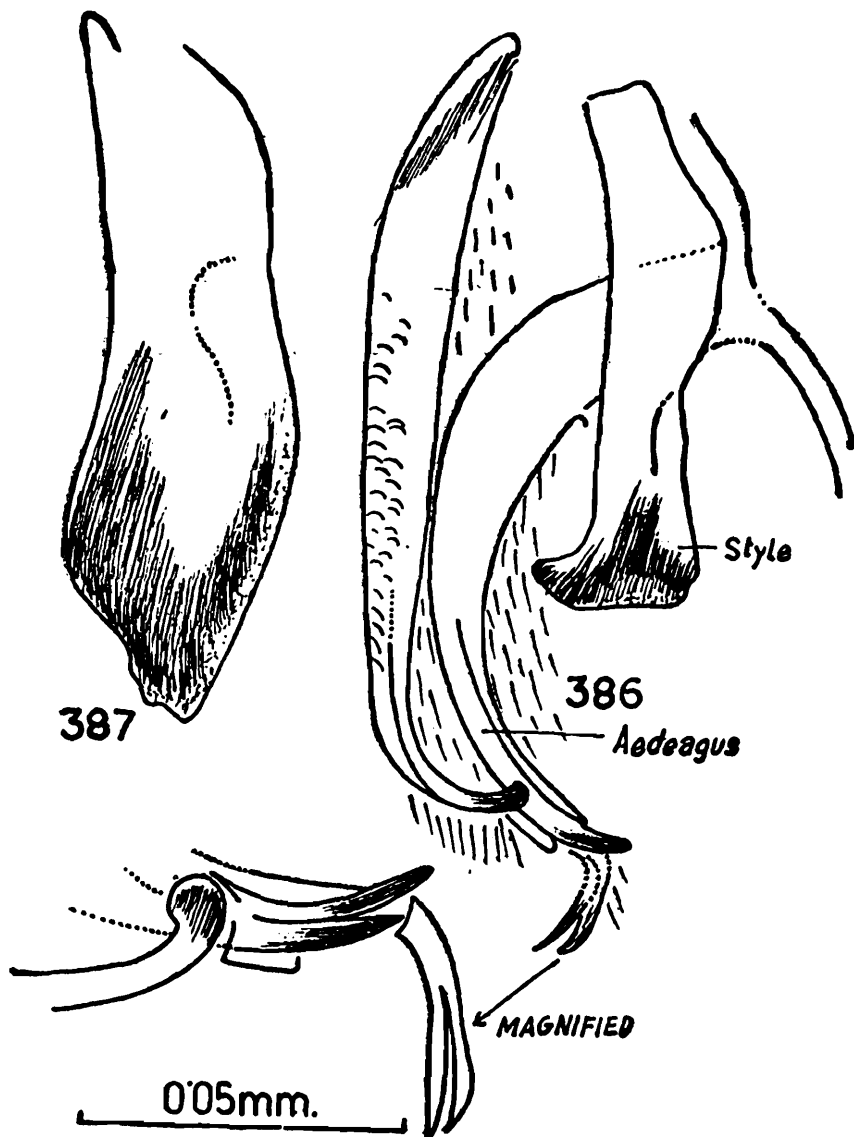
Robust, castaneous; vertex striped; pronotum and scutellum striate; costal and claval areas spotted; hind tibiae densely spined.

Length : 7 mm.

Genitalia : Aedeagal shaft (fig. 386) with a pair of lateral processes; style (fig. 386) with mesal apical extension densely spined; male plate having verrucose surface, abruptly narrowed, (fig. 387) directed laterad; pygofer hook stout, obtuse.

Holotype (male)-505/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Assam, Calcutta Air Port, (Light Trap).



T. shillongensis (Figs. 386-387).

386. Aedeagus, style, 387. Male plate,

LXXXI. Genus *Amritodus* Anufriev

1970. *Amritodus* Anufriev, *J. Nat. Hist. Soc.*, 4 : 375-376.

Type, by subsequent designation, *Idiocerus atkinsoni* Leth. *J. Asiatic Soc. Beng.*, 58 : 252.

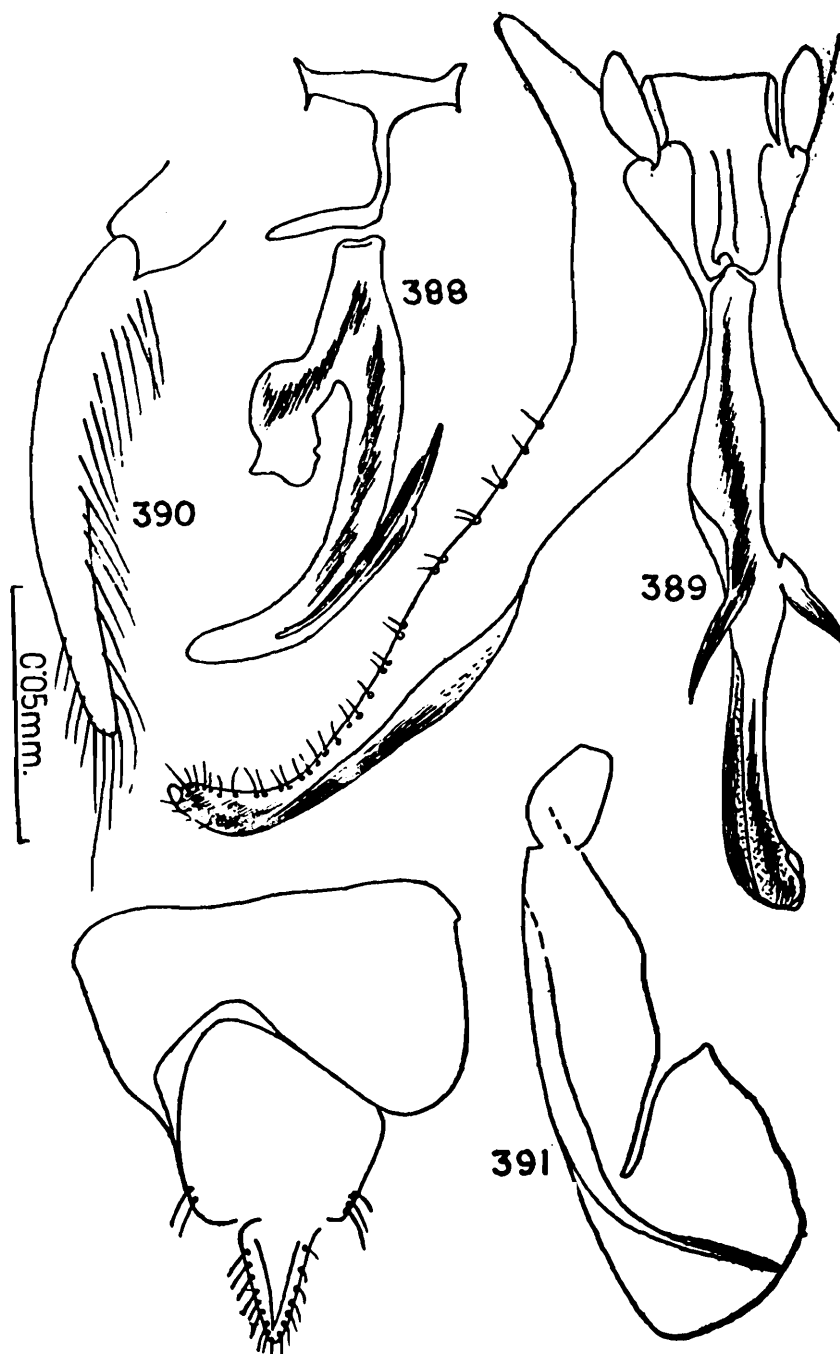
Head wider than pronotum, vertex with anterior and posterior margin parallel; ocelli placed near apex of frontal suture; antennal filaments hair-like; forewings longer than abdomen, with 4 apical and one ante-apical cells, discal cell absent; aedeagus S-shaped, without appendages apicad; styles arcuate apically, outer margin with prominent macrosetae; genital plates very long and narrow; pygofer lobes long, narrow with caudal margin rounded, inner surface with a slender elongate process. The genus is related

to *Idioscopus* Baker, 1915, apparently in arrangement of wing venations, although differs in the shape of pygofer lobes, in the presence of long pygofer appendages on inner surface, in absence of aedeagal processes and by shape of styles arcuate apically with prominent macrosetae.

161. *Amritodus atkinsoni* (Leth.)

(Figs. 388—391)

1889. *Idiocerus atkinsoni* Leth, *J. Asiatic Soc. Beng.*, 58 : 252.



A. atkinsoni (Figs. 388-391).

388. Aedeagus, 389. Style, 390. Male plate, 391. Pygofer.

Vertex smoky, grey-brown centrally; clypeus with black stripes, laterally striate; pronotal disk brown, anterior margin with a pair of spots and a dark brown stripe; scutellum with a dark brown streak medially, spot at each basal angle triangulate; tegminal veins dark brown; prosternal disk with a pair of black spots; abdomen and legs yellow.

Length : 5 mm (male).

Genitalia : Aedeagal shaft (fig. 388) with pairs of subapical processes of asymmetrical lengths, a pair of short processes arising medially; stylar shaft (fig. 389) robust, longer than aedeagal shaft, lateral margin uniseriate, subapically twisted, spoon-shaped apex; male plate (fig. 390) arcuate laterad, uniseriate lateroapically; pygofer hook (fig. 391) sharp, arising laterad, reaching tip of apical margin.

Distribution : West Bengal, Bihar, Gujrat, Dehra Dun, Ceylon, South India, Japan, Coorg, Burma.

Economic status : The species is reported as virulent pests on mango trees, serious damage is caused to the flowering stages of the trees, and the infestation leads to heavy financial losses to growers. Usual remedy is carried on by spraying the trees in flower with DDT mixed with low dosage of sulfur to kill mites on trunks, twigs. The commercial use of systemic insecticides like 'Schraden' is not feasible because it involves enormous expenditure to cover a vast tract of the plantation of *Magnifera indica* Linn.

Biology : The species is two brooded, adults deposit eggs in Spring on younger twigs or near tip of flower itself. The species is parasitised by *Halictophagus* sp. (Strepsiptera), Bohart, 1943.

Morphology : Vertex anteriorly rounded, median length of crown less than interocular width; clypeus flattened, well-developed, lateral clypeal suture extending upto ocelli placed at extreme anterior margin of vertex, texture finely granulate; pronotal width greater than transocular width, lateral margin angulated, posterior margin convex, scutellum depressed, medially textured, finely granulate; tegmina than abdominal tip, appendix developed; 7th sternite (female) deeply emarginate, posteromedian margin angulated; hind femoral setal formula : 2:1:1:

Registered number : 6492/H7, (Ind. Mus.), Z.S.I., Calcutta.

LXXXII. Genus *Idioscopus* Baker

1915. *Idioscopus* Baker, *Philippine J. Soc.*, **10**(6) : 338.

Type, by original designation, *Idiocerus clypealis* Leth.

1889. *Idiocerus clypealis* Leth., *J. Asiat. Soc. Beng.*, **58** 252.

Small species, length extends upto 5 mm; vertex as long as $\frac{1}{3}$ rd of pronotum, finely rugose transversely, anterior margin convex, posterior margin parallel; eyes located on posterior margin of head; antennal filaments short, hair-like, slightly enlarged apically; ocelli on face, closer to eyes; clypeus well-developed, clypellus well-developed, clypellus longer than wide, laterally short, concavus, wider apically; pronotum anteriorly convex; scutellum short, triangulate, narrower than long, medially longer than head and pronotum combined; hind tibiae strongly spined; tegmina longer than abdomen in both sexes, 4 apical and 1 anteapical cells may be absent, no discal cell, usually absent, appendix relatively broader, reaching IInd apical cell in most species; VIIth st. (female) longer than VIth st, posterior margin medially concavus; aedeagus with developed apodeme expanded laterad, salient upward, aedeagal shaft elongate, arcuate with 4 apical processes, 2 short and 2 longer, gonopore subapically located, connective inverted T-shaped on frontal aspect, laterally flat; base of anal tube or tenth segment semilunar; pygofer short, apically directed mesally, cupuliform, caudal margin wavy, upper margin non-chitinised.

162. *Idioscopus bimaculatus* (Pruthi)

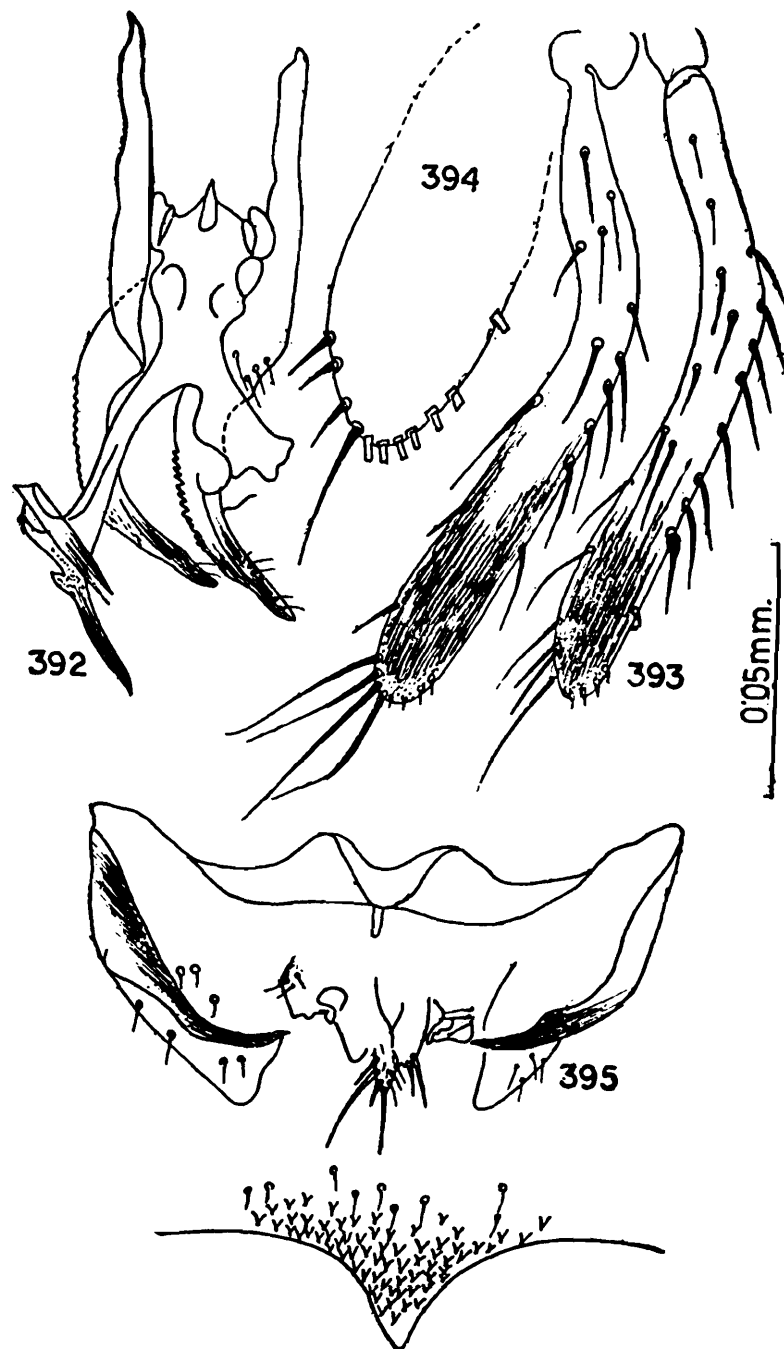
(Figs. 392—395)

1936. *Idiocerus bimaculatus* Pruthi, *Mem. Ind. Mus.*, **XI** : 102.

Pale brown body color; vertex sulcatus medially, rostral tip black; pronotum without markings; scutellum impressed medially, each basal angle marked black; tegmina longer than body, claval region deeply colored, opaque, 1 anteapical and 3 apical cells; hind tibiae densely set with spines; tarsi black.

Length : 4.4 mm (male), 4.5 mm (female).

Genitalia : Connective subtriangulate, basal plate developed, aedeagal shaft (fig. 392) cylindrate, lengthwise wavy, apical part attenuate, apex obliquely truncate, serrate laterad, sub-apically two pairs of sharp, slender, elongate processes directed cephalad; stylar shaft (fig. 393) baculiform, mesal apical extension twisted medially, geniculate laterad; apex sharply pointed; male plate (fig. 394) digitiform, widening distad, margin setose; pygofer (fig. 395) apical half triangulate, hook as figd.



392. Aedeagus, 393. Style, 394. Male plate, 395. Pygofer.

T. bimaculatus (Figs. 392-395).

Holotype (male)-5382/H7, allotype (female)-8533/H7, including paratypes retained in Z.S.I., Calcutta.

Type locality : Kasanri (6,00'), Kumaon Hills, 30-V-2-VI-1930 (H. S. Pruthi).

Economic status : The species is reported along with other forest pests, Dehra Dun, but its vectorial activity is not yet ascertained (Mathur, 1953 : 158).

Morphology : Morphological characteristics do not differ from *I. clypealis*, texture granulated; differences being scutellum at each basal angle spotted, no such spots on body parts; vertex with rectangulate grey patch on each side of median suture; VIIth sternite (female) at posteromedially prominently pointed.

Registered number : 532/H7, (Ind. Mus.), Z.S.I., Calcutta.

Morphology : Texture granulated, crown, clypeal structure, pronotal surface, scutellum usually deep creamy yellow, scutellar base spotted; forewing transparent; vertex with rectangulated grey patch on each side of median suture; VIIth st. (female) strongly projected, pointed at posteromedial margin.

Registered number : 532/H7 (Ind. Mus.), Z.S.I., Calcutta.

163. *Idioscopus clypealis* (Leth.)

(Figs. 396—399)

1889. *Idiocerus clypealis* Leth., *J. Asiatic Soc. Beng.*, 58 252.

Vertex binotate, anteriorly black; face binotate, medially black; clypeus longitudinally fasciate; scutellar angle each with a black spot; tegmina yellowish; prosterna with black patch.

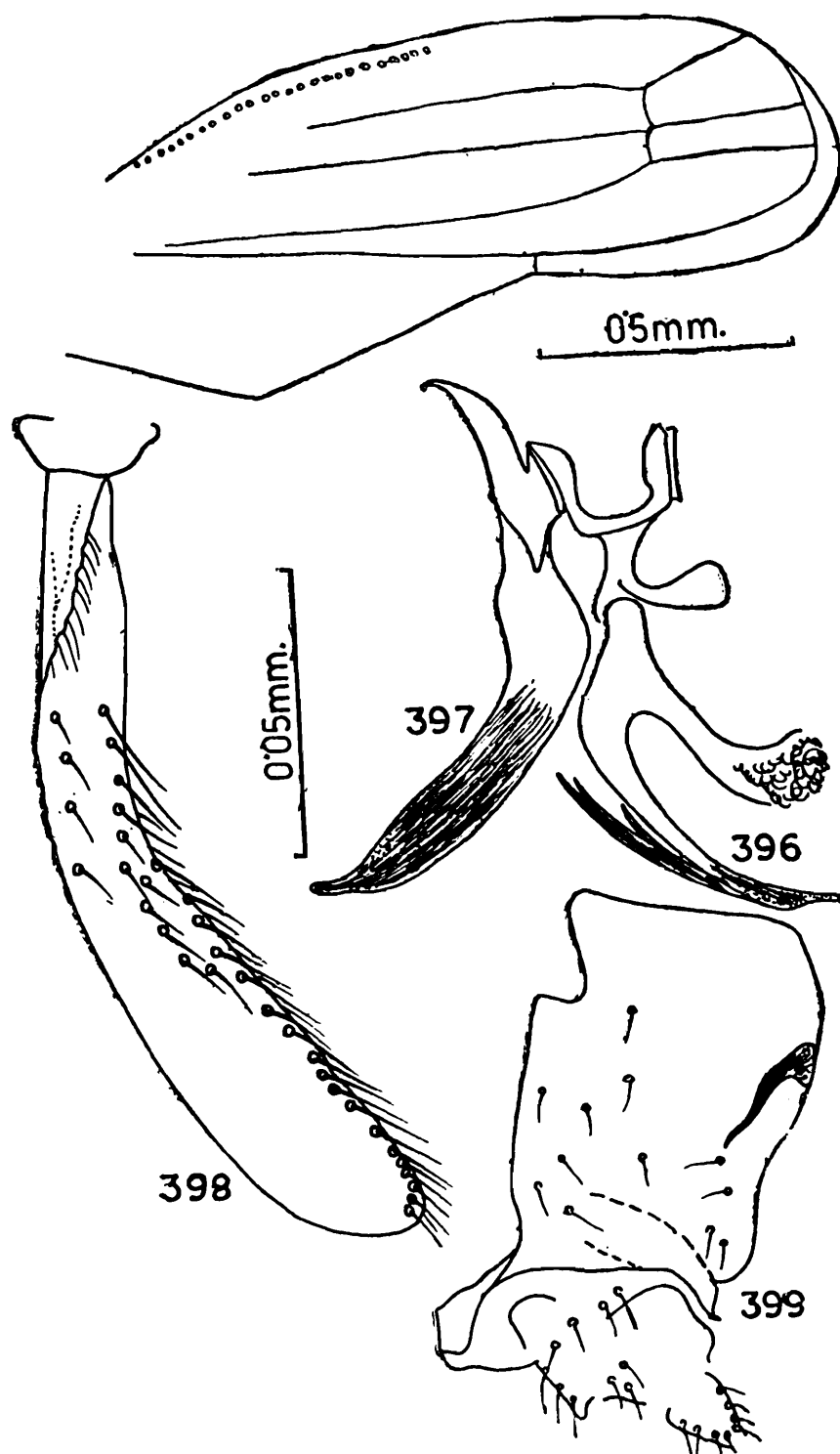
Length : 3.5 mm (male), 4 mm (female).

Genitalia : Aedeagus (fig. 396) with two pairs of belonoid subapical processes in reflex condition, basal apodeme developed; stylar shaft (fig. 397), (fig. 398) claviform; pygofer hook (fig. 399) short, pointed, arising laterad.

Distribution : Bengal, Ceylon, Madras, Bihar, Formosa, Java, Luzon, Assam, Malaya, Coorg, Bombay, Sind, Southern China.

Economic status : The species is recorded as virulent pests on mango inflorescence, *Magnifera indica* Linn., the use of power sprayer sometimes lessen the activity of pests by mixing DDT with sulfur dust in order to control both the pests and mites. The untimely step to control the pest population does not benefit to the growers which lead to huge economic loss. The species occur along with *I. atkinsoni*. The importance of disseminating viral disease to plantation is not yet investigated, according to observation made by the author (1956). The report as 'Suspect vector' is recorded by Pruthi (1934), Dover (1934) during investigation of spike disease of Sandal wood forest. The species is parasitised by *Halictophagus* sp. (Strepsiptera), Bohart (1934).

Morphology : Median length of crown half of interocular width, median suture at base distinct, ocelli placed at end of each lateral clypeal suture; crown finely wrinkled, clypeal texture granulated; pronotal width as



I. clypealis (Figs. 396-399).

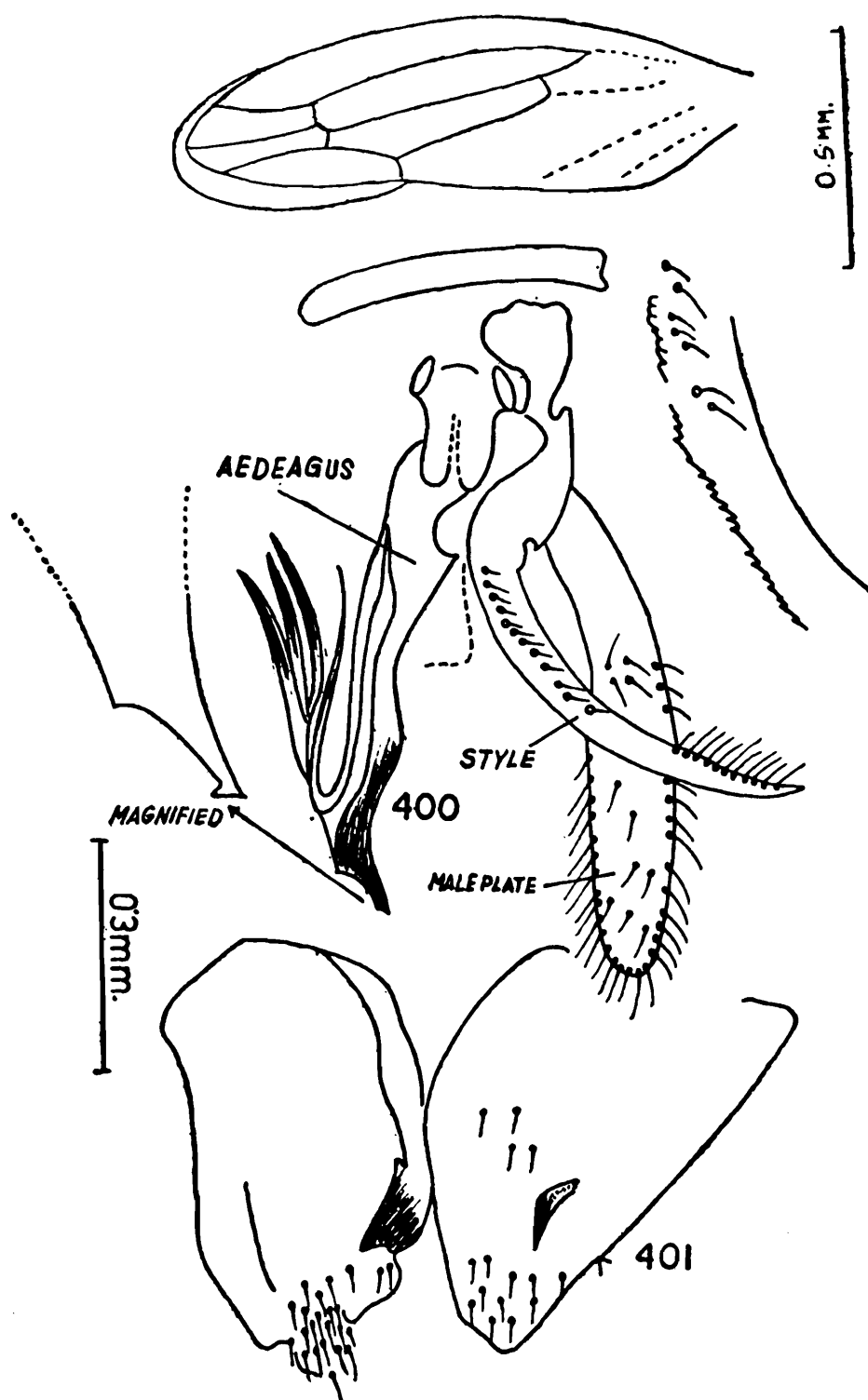
396. Aedeagus, 397. Style, 398. Male plate, 399. Pygofer.

transocular width, texture granulated, laterally angulate, posterior margin concavus; scutellum medially depressed; tegmina extending tip of abdomen, veins distinct; hind femoral setal formula : 2:1:1., VIIth st. truncate at posterior margin.

Registered number : 10114/H7, (Ind. Mus.), Z.S.I., Calcutta.

164. *Idioscopus confuscus* (Pruthi)

(Figs. 400—401)

1936. *Idiocerus confuscus* Pruthi, *Mem. Ind. Mus.*, XI : 104.*I. confuscus* (Figs. 400-401).

400. Aedeagus, style, male plate, 401. Pygofer.

Vertex medially sulcate, binotate, sometimes connected by a stripe; pronotum with piceous patches close to each eye; scutellum at each basal angle with a piceous spot; tegmina castaneous; abdomen ventrally with black patches in male, brown in female.

Length : 4.8 mm (male), 4.9 mm (female).

Genitalia : Aedeagus (fig. 400) with pointed apex, a pair of sharp terminal processes; stylar (fig. 400) shaft with no preapical lobe, mesal apical extension subapically recurved and twisted; male plate (fig. 400) geniculate basad, set with setose, pygofer (401) hook along mesal margin.

Holotype, male-5385/H7 (Ind. Mus.), allotype, female-5386/H7 (Ind. Mus.), Z.S.I., Calcutta.

Type locality : Kausari (6,000'), Almora Dist., Kumaon Hills, U.P., India, 30-V-2-VI1930 (H. S. Pruthi).

Distribution : Central Himalayan Region.

Morphology : Median length of crown half the interocular width, median suture at base distinct; ocelli placed at end of lateral clypeal suture; crown finely wrinkled, texture finely granulated; pronotal width same as transocular width, texture granulated, laterally angulate, posterior margin concavus; scutellum medially depressed, wrinkled on each side of depression; forewing extending tip of abdomen, veins distinct; hind femoral setal formula : 2:2:1; VIIth st. (female) projected at posteromedial margin.

165. *Idioscopus incertus* (Baker)

1924. *Idiocerus incertus* Baker, *Philippine Jour. Sci.*, **24** : 367.

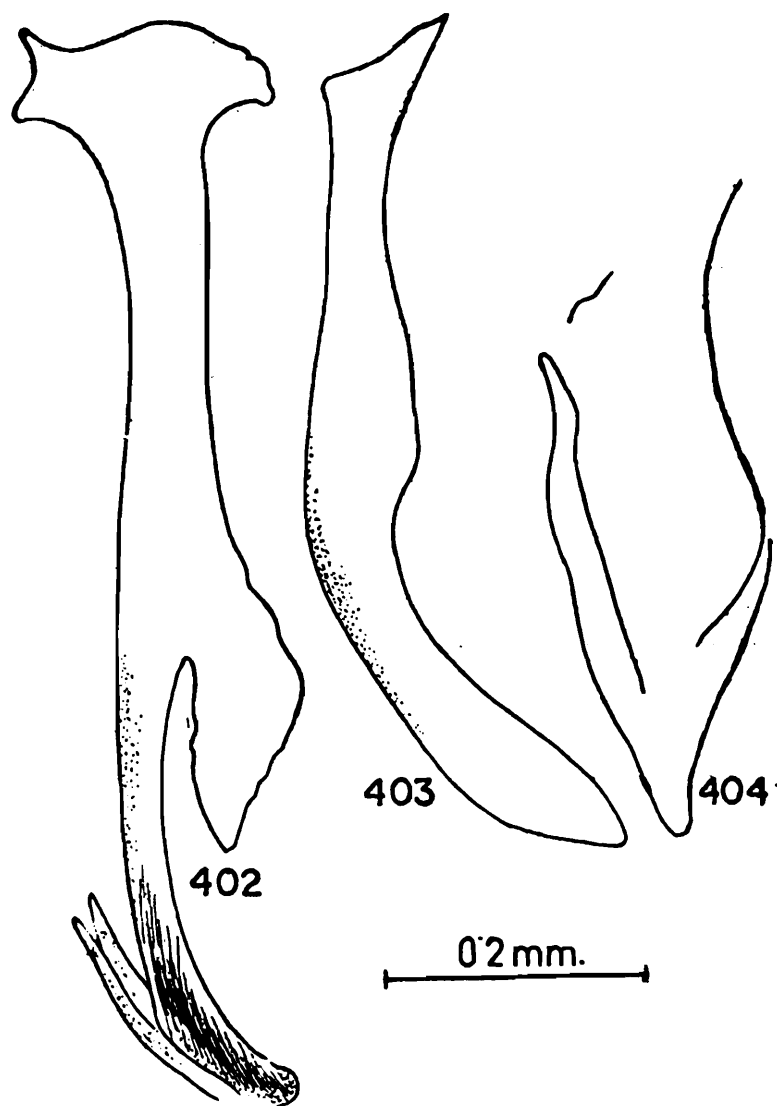
Morphology and texture of crown and facial structure same as *I. clypeals*; vertex without spots, a scimitar-shaped black marking from extreme anterior margin of vertex attenuate towards clypeus; pronotal surface dark grey, reticulate red-marking on anterolateral surface; scutellum centrally red, basal angle with black marking, posterior part without pigmentation; tegmina transparent, veins reddish, costal end with dark chocolate patch, apical margin pale brown; pro-meso-meta coxal bases black.

Registered number : 1635/H7 (Ind. Mus.), Z.S.I., Calcutta.

166. *Idioscopus nagpurensis* (Pruthi)

(Figs. 402--404)

1930. *Idiocerus nagpurensis* Pruthi, *Mem. Ind. Mus.*, **XI** : 17-18.



Idioscopus nagpurensis (figs. 402-404).

402. Aedeagus, 403. Style, 404. Male plate.

Vertex brownish yellow, anterior margin b'notate; scutellum at each basal angle with a dark spot, a dark spot, a stripe on disc; tegmina-costal margin opaque; abdomen dorsally black.

Length : 4.5 mm (male).

Genitalia : Aedeagus with basal apodeme (fig. 402) developed, shaft dorsoventrally compressus, apex torose, subapically with 3 to 4 pointed processes directed cephalad; style (fig. 403) with compressed mesal apical extension, arcuate smoothly laterad, digitiform; male plate (fig. 404) with mesal margin infolded, pygofer damaged.

Holotype, male-558/H7 (Ind. Mus.), Z.S.I., Calcutta.

Type locality : Nagpur, Maharastra, India, April, 1975 (J. B. Fletcher).

Economic status : The species is yet to be investigated respecting its incidence with *I. atkinsoni* Leth., *I. clypealis* Leth. and *I. bimaculatus* Pruthi as the later three species are considered to be the severe pests on damaging mango crops and incurring serious economic damage to growers.

Comments : Description of a male species is recorded on the basis of a slide prepared by Pruthi, unfortunately he has not reported the cause of missing entire specimen from the repository.

167. *Idioscopus niveosparsus* (Leth.)

(Figs. 405—406)

1889. *Idiocerus niveosparsus* Leth., *J. Asiatic Soc. Beng.*, 58 : 252

Vertex creamy white; facial area including clypeus ornamented with black patches, sometimes reddish brown without black marking (female), vertex finely wrinkled; pronotum mottled with dark markings, ground color creamy shiny, wrinkled; scutellum centrally depressed, with 3 spots, one at central, rest at each basal angle, posterior half depressed, tegmina shiny, bluish-brown, black patches, beyond costal area at apical cells. venation reddish-brown; abdomen with segments dark including legs.

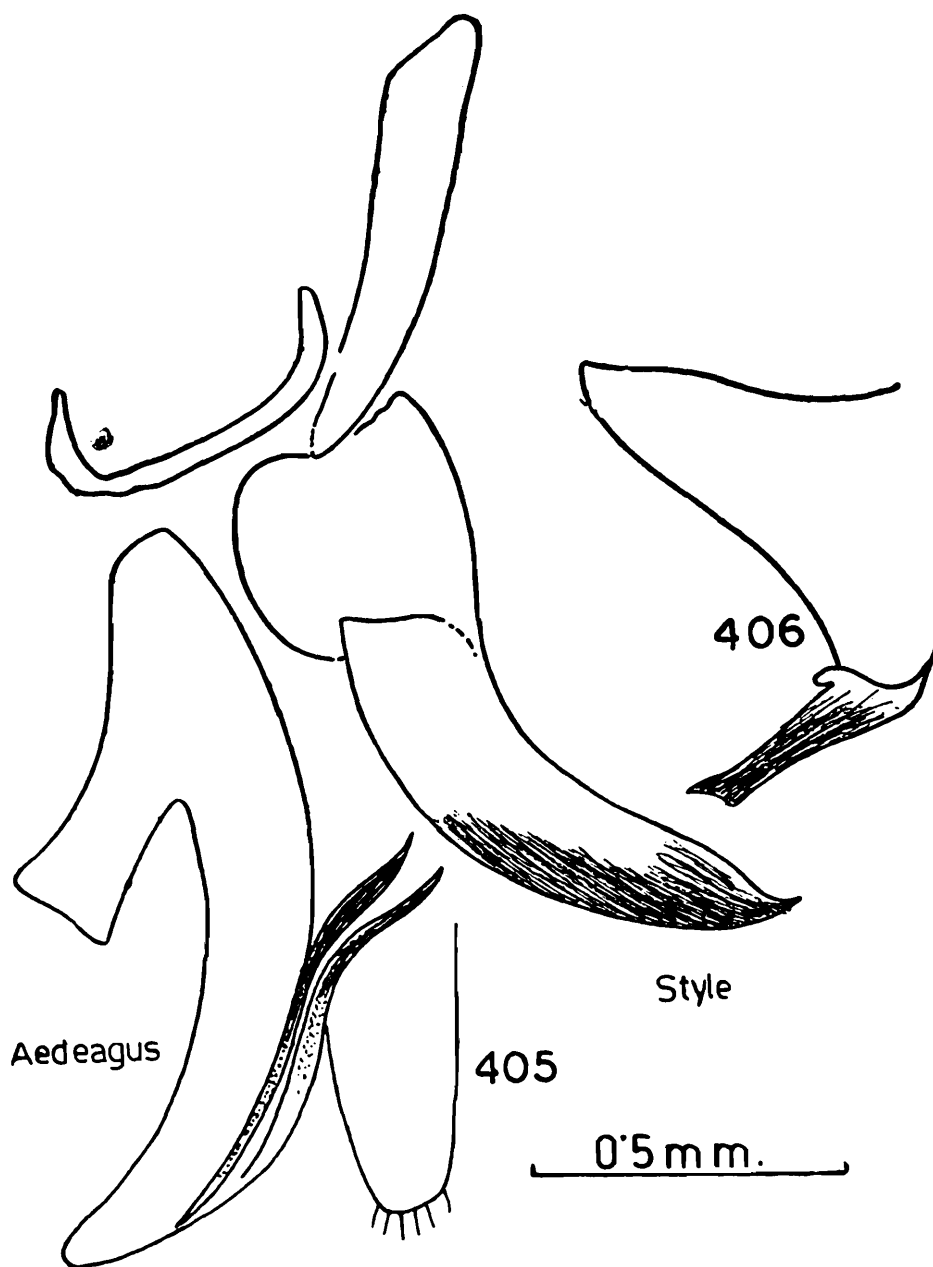
Length : 4.5 mm (male), 5 mm (female).

Genitalia : Aedeagus (fig. 405) with developed apodeme, shaft tubular, arcuate, terminal processes slenderer, directed cephalad; stylar shaft (fig. 405) tubular, apex rostriform; male plate (fig. 405) elongate, arcuate mediad, margin with filamentous setae, apex with a circlet of setae; pygofer (fig. 406) robust, a stout hook arising apicad, directed postero-laterad.

Distribution : U.P., Bengal, Bombay, Ceylon, Java, Japan, Madras, Burma, Formosa, Hongkong, Philippines, Malaya, Singapore.

Economic status : The importance of the species is not yet investigated. The incidence along with *I. clypealis* needs clarification because of the later one being recorded as virulent pest on mango.

Morphology : Median length of crown half the length of interocular width, texture granulate, clypeus oval-shaped, lateral clypeal suture extending upto ocelli which are placed at extreme anterior margin; transclypeal suture indistinct; pronotal width equal to transocular width, texture granulated obliquely truncate laterad; scutellum medially depressed; forewing with 4 apical and 3 anteapical cells; hind femoral setal formula : 2:1:0; VIIth st. (female) notched at posterior margin, latero-posteriorly sinuate.



I. noveosparsus (figs. 405-406).

405. Aedeagus, Style, Male plate, 406. Pygofer.

LXXXIII. Genus *Amrasca* Ghauri

1967. *Amrasca* Ghauri, *Proc. R. Ent. Soc. Lond (B)*., 36(11-12) : 159.

Type, by original designation, *Amrasca splendens* Ghauri.

1967. *Amrasca splendens* Ghauri, *Proc. R. Ent. Lond (B)*., 36(11-12) : 159-163.

Delicate leafhoppers; head with eyes wider than pronotum, vertex narrowed, anterior and posterior margins not parallel; ocelli placed on margin between vertex and frons close to eyes; tegmina translucent, with first

and second apical veins from cell 'M', third apical vein from radial cell; hindwing with marginal vein extending around apex of wing to CU1 and CU2 and vannal veins; connective short, aedeagal shaft short, elongate, densely setose.

168. *Amrasca biguttula biguttula* (Ishida)

(Figs. 407—409)

1912. *Amrasca biguttula biguttula* (Shiraki), *Spec. Rpt. Formosa Agr. Sta.*, 5 : 96.

Vertex with a pair of dark spots on anterior margin; pronotum, scutellum brownish yellow, spotted; tegmina with greenish tinge, a black spot near claval region; abdomen pale.

Length : 3 mm (male).

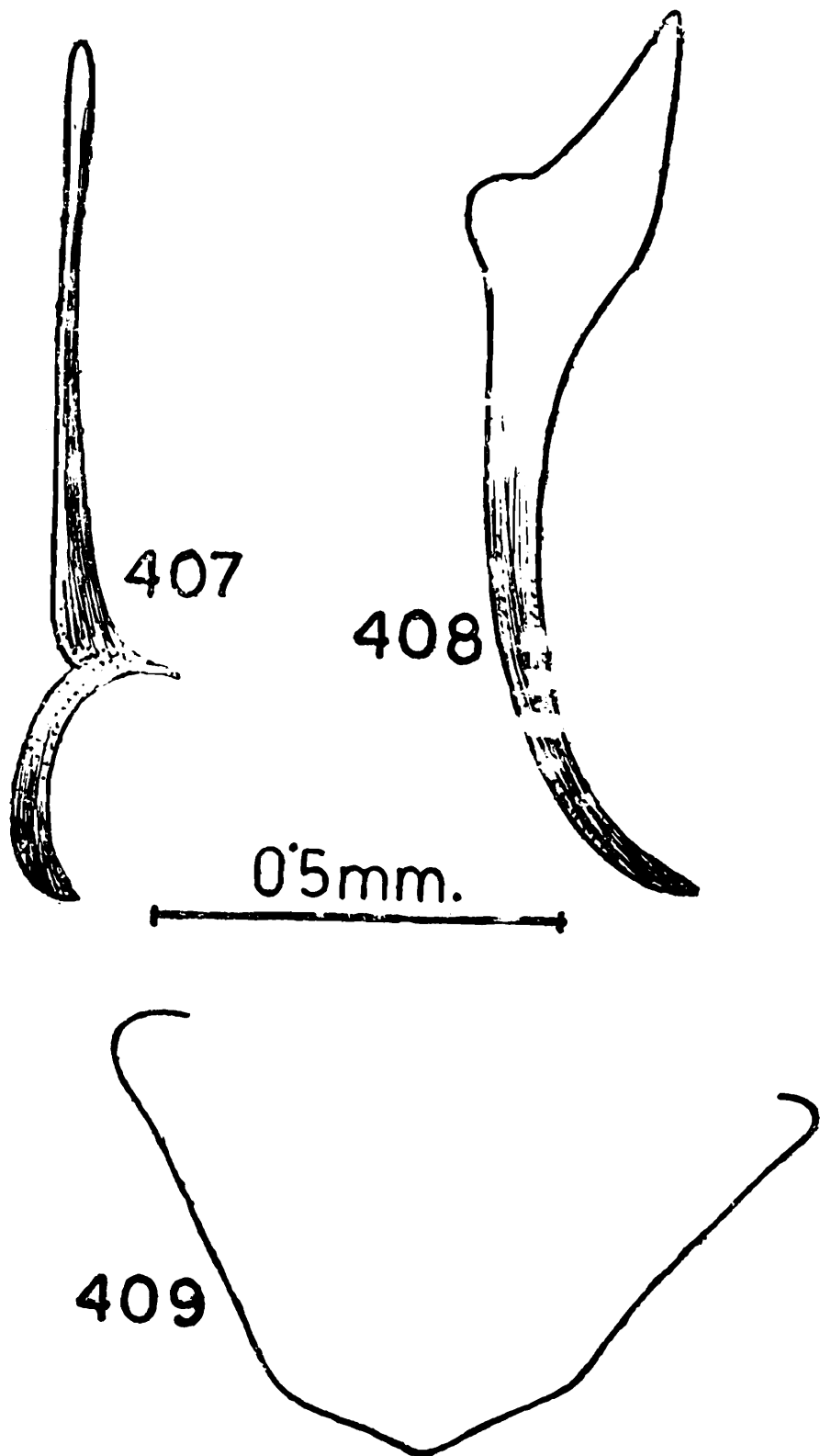
Genitalia : Aedeagal shaft (fig. 407) linear, apical third abruptly narrowed to rounded apex, stylar shaft (fig. 408) linear, posterior third serrate, laterally concave; male plate uniseriate connivent distad, disk with stout spurs; pygofer hook elongate, apex sharp, lateral margin arcuate along axis, VIIIth sternite (fig. 409).

Distribution : Burma, Sind Sudan, Pakistan, Nagpur, and covers cotton growing areas in India.

Economic status : The species is a serious pest on cotton, on potato crop. It is recorded as vector of little leaf brinjal (egg plant) and 1:9 plants after test have been found diseased. The capability of disseminating viral disease is confirmed, its association with cotton plants. Hill (1943) recorded the species as vector of *big bud of tomato* which bears relation to *yellow of koksaghyz* and *yellow aster*, Roychas (1947) reported the species as cause of *mosaic disease* of egg plants.

Biology : The species breeds on hollyhock, castor plants, brinjal, potato, bhindi (*Hibiscus esculentus* L), ground nuts (*Arachis hypogaeal*).

Comments : Severin (1946) reported that the disease from various sectors of the World was caused by a single vector which had capability to spread the disease to various crops of economic importance. The male pygofer with spine-like process maintains its separate identity although genital armature bears close resemblance to *Empoasca papayae* Oman.



A. biguttula biguttula (figs. 407-409),

407. Aedeagus, 408. Style, 409. VIIth sternite.

LXXXIV. Genus *Dikraneura* Hardy

1850. *Dikraneura* Hardy, *Trans. Tyneside Nat. Club.*, I 423.

Type, by monotypy, *Dikraneura variata* Hardy.

Color green, greenish white, sanguineous; grass feeding forms; vertex produced, angled, rounded at anterior margin; facial structure divergent; pronotum elongate, scarcely divergent distad; width of pleural part either equal or greater than width of ocello-ocular area; tegmina with first, second and third apical cells longer than broad, outer apical cell elongate, attaining apex of wing; hind with 'IV' vein branches from 'V' at mid-point, submarginal vein present, extending beyond apex of 'R+M', vein CU2 confluent with submarginal vein connective U-shaped, aedeagus with or without processes on shaft; style with broad pre-apical lobe, mesal apical extension sharply rounded at apex, digitate; male plate triangulate, row of macrosetae on exterior margin, pygofer with or without hooks; VIIth st. (female) on posterior margin incised laterally or medially.

169. *Dikraneura baileyi* Datta & Ghosh

(Figs. 410—412)

1973. *Dikraneura baileyi* Datta & Ghosh, *Zool. Anz. Leipzig.*, 191(5/6) : 415-416.

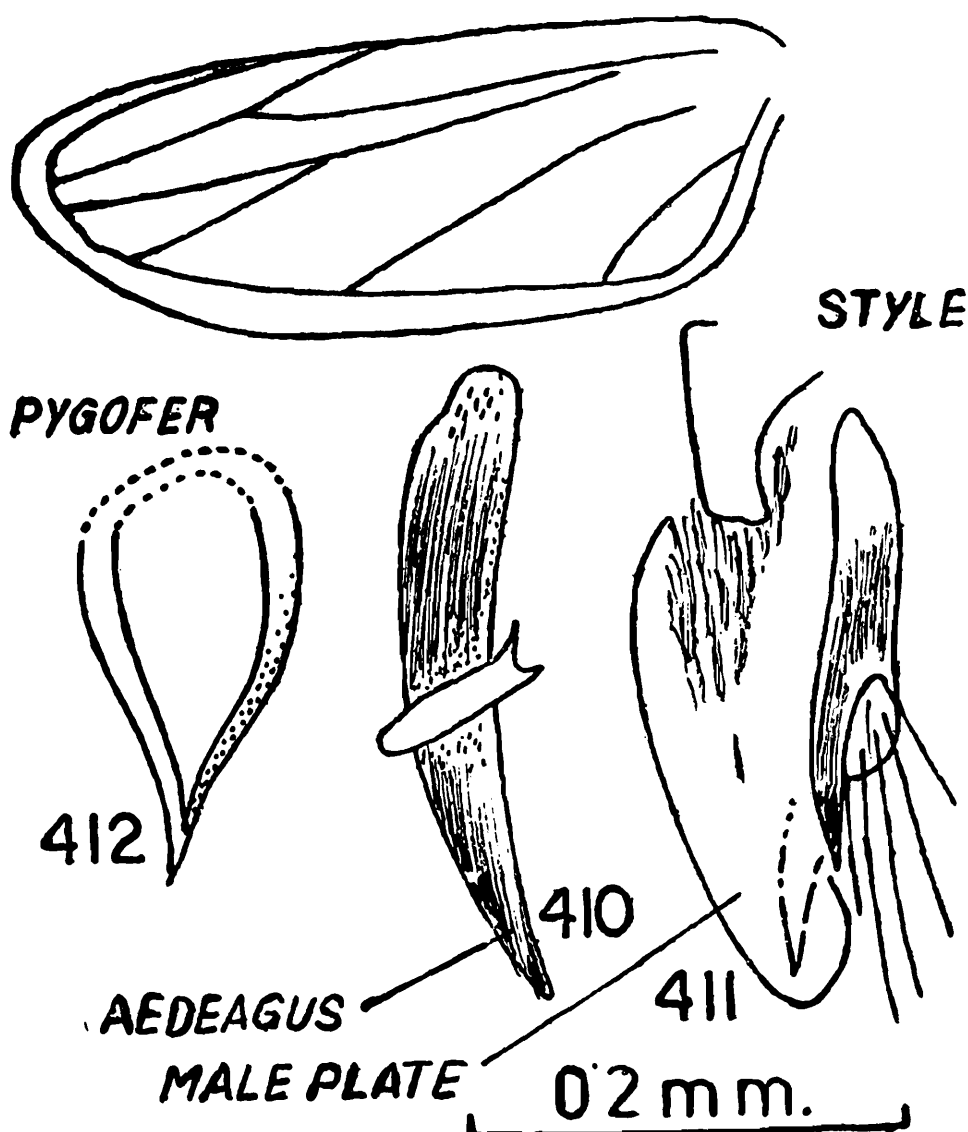
Light brown; vertex without any spot, with a central faint-white longitudinal mark; pronotum blackish; scutellum creamy, without any mark; tegmina transparent, veins brown; abdominal tergites dark brown, sternites pale brown color; legs brown.

Length : 3 mm (male, female).

Genitalia : Aedeagus (fig. 410) with developed basal apodeme, shaft stout, apex pointed with a pair of precurved subapical processes; style (fig. 411) with developed preapical lobe, mesal apical extension apically blunt; male plate (fig. 411) broader, twisted near apex, posterior margin torose; pygofer hook (fig. 412) pointed, linear. Abdominal apodemes thrice the width, extending to third abdominal segment, apex narrowed; hindwing with submarginal vein extending around and along costal margin beyond veins 'R+M'

Holotype No. 9809/H7 (male), allotype No. 9812/H7 (female), paratype Nos. 9810-9811/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Sikkim, Gangtok (6,000').



D. baileyi (figs. 410-412).

410. Aedeagus, 411. Style, male plate, 412. Pygofer.

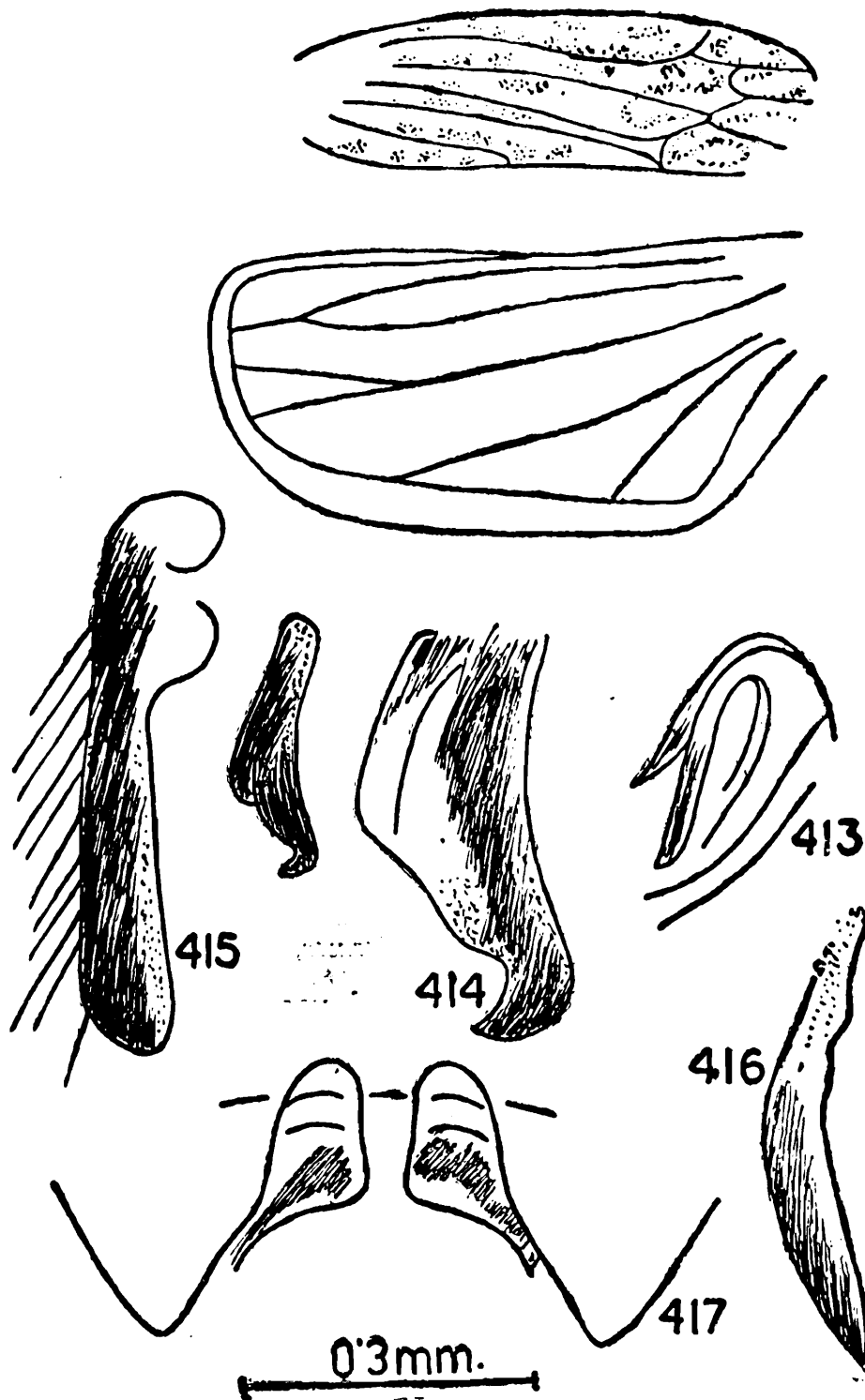
The species differs from other Oriental species in having no apical processes.

Morphology : Median length of crown half the interocular width, median suture distinct at basal half, anterior margin rounded, posterior margin concavus, texture granulated, lateral margin in line with outer margin of eyes; clypeus at posterior half convex otherwise flattened, muscular impression feebly marked; pronotal width as transocular width, lateral margin parallel, texture wrinkled; scutellum depressed along median line; hind femoral setal formula : 2:1:0.

170. *Dikraneura superba* Datta & Ghosh

(Figs. 413—417)

1947. *Dikraneura superba* Datta & Ghosh, *Ind. J. Ent.*, 36(2) : 118-124.



D. superba (figs. 413-417).

413. Aedeagus, 414. Style, 415. Male plate, 416. Pygofer, 417. abdominal apodeme.

Vertex creamy, binotate, dark brown near antennal margin; pronotum with patches on anterior and posterior margins, a central transverse black band; central suture on vertex dark brown, a semilunar ring on each side of coronal suture close to posterior margin; forewing mottled dark brown.

Length : 2.90 mm (male).

Genitalia : Aedeagal shaft (fig. 413) recurved, cylindrate with a pair of pointed, slender, curved terminal processes about $1/2$ as long as shaft; style (fig. 414) less than half length of male plate, apical margin sinuate, apex hamate, directed laterad; male plate (fig. 415) broader, close to middle otherwise abruptly narrowed distad, apex clavate, setose; pygofer (fig. 416) at caudo-ventral margin with a short pointed process (=hook) directed caudad; abdominal (male) apodemes spatulate (fig. 417), each with length twice the width, extending near middle of 3rd segment.

Holotype, male, 135/H15, paratype—136/H15 (wings), 137-138/H15.

Distribution : Kalimpong, West Bengal.

Comments : The comparative analysis made on the basis of literatures (Knight, 1968, Matsumura, 1931-32), (Usha Ramakrishnan & Menon, 1971, Young, 1952) contains the details of genital armatures and color pigmentation that maintain the existence of *D. superba* from other known species by different pattern of armatures and by having pigmented wings.

LXXXV. Genus *Empoasca* Walsh

1862. *Empoasca* Walsh, *Prairie Farmer*, (n.s.) 10 : 149.

Type, by subsequent designation, *Empoasca viridescens* Walsh.

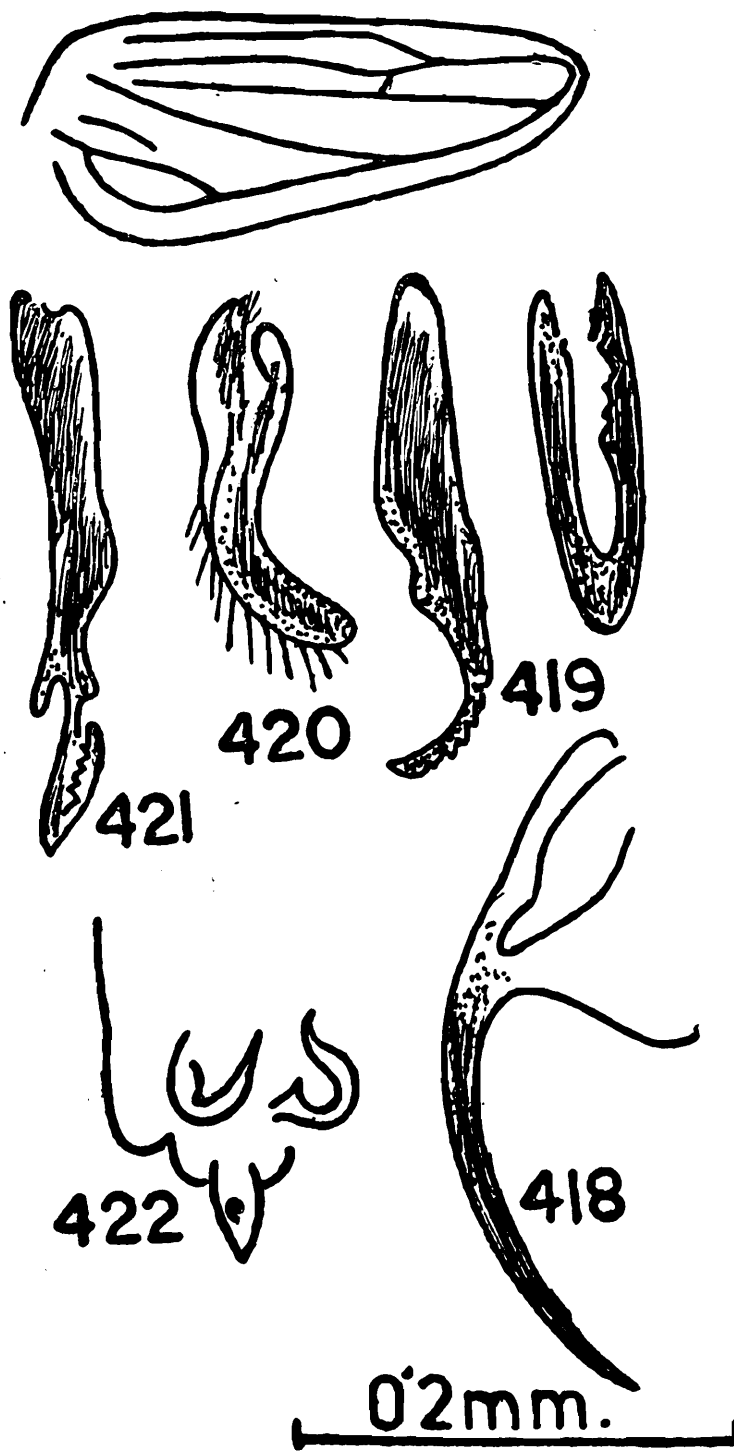
1862 *Empoasca viridescens* Walsh, *Prairie Farmer*, 10 : 149.

Color green, sometimes with markings of various colors; fragile leaf-hoppers, head as wide as pronotum, anterior margin rounded, never angled; ocelli may be present or absent; vertex sometimes pointed otherwise rounded; pronotum broader distad; tegmina with obscure venations, anteapical cells open basally, hind wing with submarginal veins extending around apex of wing to apex of vein 'R+M' and confluent with the vein, apex of CU1 confluent with apex of M3+4, CU2 confluent with submarginal vein in basal half of wing; connective transverse, posterior margin bilobed, aedeagus elongated, slender, shaft short, occasionally with preatrial paired processes from base of shaft; style without preapical lobe, apical extension slender, elongate, tapering, arcuate posterolaterad, apical portion serrate in most species; male plate in various arrangement, seldom uniseriate; pygofer hooks arising antero-ventral wall, anal hook prominent.

171. *Empoasca abnormis* Datta & Ghosh

(Fig. 418—422)

1973. *Empoasca abnormis* Datta & Ghosh, *Zool. Anz.*, **191** (5/6) : 416-418.



E. abnormis (figs. 418-422).

418. Aedeagus, 419. style, 420. Male plate, 421. Pygofer, 422. Anal hook.

Vertex, pronotum and scutellum dark brown; without spots; sometimes pronotum with a central faint mark; eyes grey with black patches; tegmina faintly brown, hind wing hyaline; abdomen dark brown.

Length : 3 mm (male), 3.5 mm (female).

Genitalia : Aedeagus linear (fig. 418) non-ornamented; style (fig. 419) without preapical lobe, tuft of fine hairs arising from middle, 1/3rd abruptly narrowed, apically pointed, mesal margin curved, lateral margin serrate; male plate (fig. 420) robust, infolded medially, apex claviform, a cluster of setae at mesal base, uniseriate along mesal margin; pygofer (fig. 41) with a long pointed hook, directed laterad; anal hook strongly arcuate, sharp, directed cephalad (fig. 422).

Holotype, male, 9815/H7, paratypes—9816/H7 (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Gyantse (10,000'), Tibet.

Comments : Considering the invaluable contribution made by Anufriev (1969) Matsumura (1931), Ramakrishnan & Menon (1971, 1972), Vilivaste (1968), Young (1952), the species obtained from the high altitude of Tibetan plateau does not fit with any of the species so far described, therefore, this is characterised as a new species particularly on the basis of structural distinctiveness observed in internal male genitalia.

LXXXVI. Genus *Empoascanara* Dist.

1918. *Empoascanara* Dist., *Fauna Brit. India*, 7 : 94.

Type, by original designation, *Empoascanara prima* Dist.

1918. *Empoascanara prima* Dist., *Fauna Brit. India*, 7 : 94.

Vertex little longer than width; eyes prominent, a fine central line on vertex, pronotum truncate over scutellum, obliquely straight at lateral margin; tegmina extending beyond abdominal tip; aedeagus simple, acuminate distad, gonopore terminal or subterminal on anterior surface; stylar apical mesal extension rugosus; pygofer marginally spinulose.

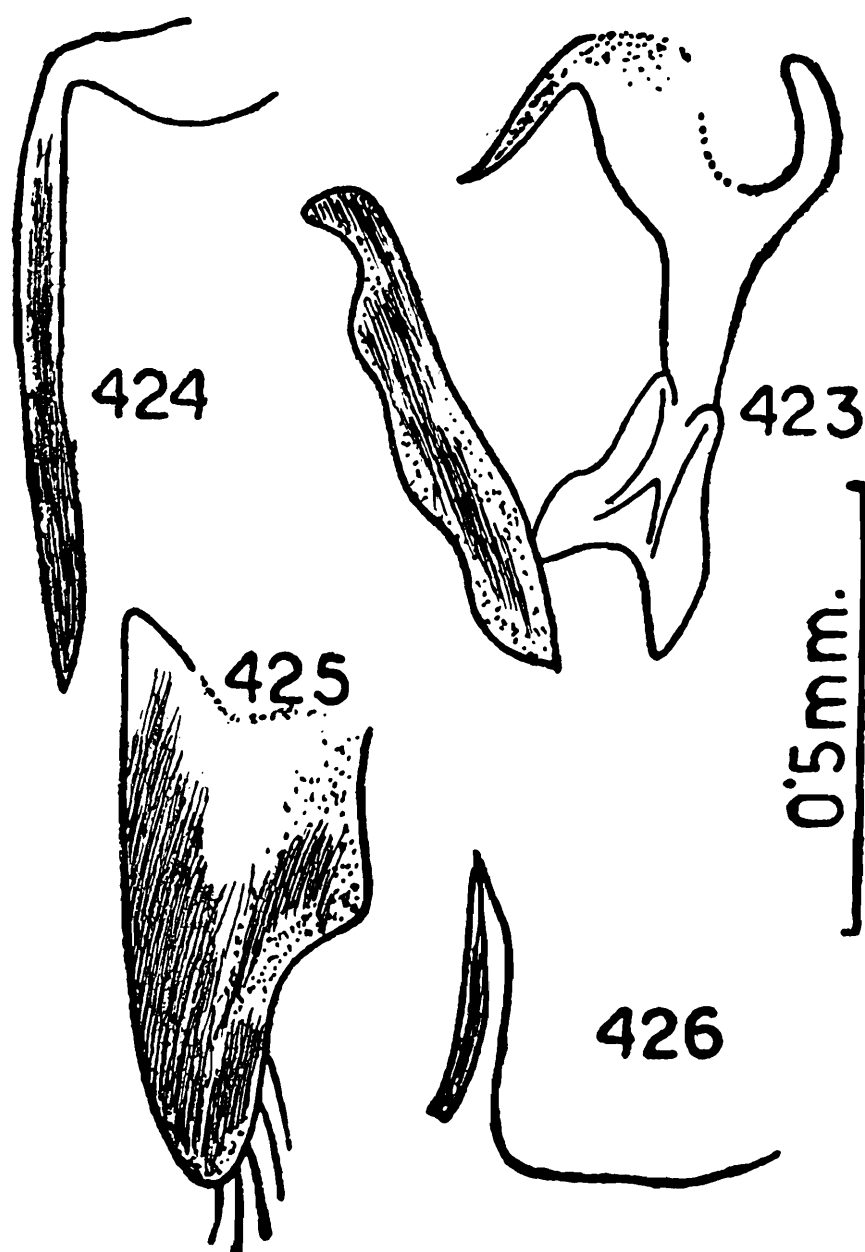
172. *Empoascanara binotata* Dist.

(Fig. 423—426)

1918. *Empoascanara binotata* Dist., *Fauna Brit. India*, 7 : 94.

Vertex yellow with greenish tinge, subconical apex with pale shade; pronotal base with wavy shades; scutellum with a pair of spots; tegmina at costal margin darker; abdomen with shades.

Length : 3 mm (male).



E. bonotata (figs. 423-426).

423. Aedeagus, 424. Style, 425. Male plate, 426. Pygofer.

Genitalia : Connective Y-shaped, aedeagal base fusiform (fig. 423) remaining part narrowed, tubular, apically attenuate, sharp, directed cephalad; styler shaft (fig. 424) 3/4th broader, robust, gradually converging, ventrally rugulose; pygofer spined at lateral margin (fig. 426), VIIth sternite (female) simple; male plate (fig. 425).

LXXXVII. Genus *Typhlocyba* Germar

1833. *Typhlochyba* Germar, *Silbermann Rev. Ent.*, I : 180.

Type, by subsequent designation, *Cicada quercus* Fabr.

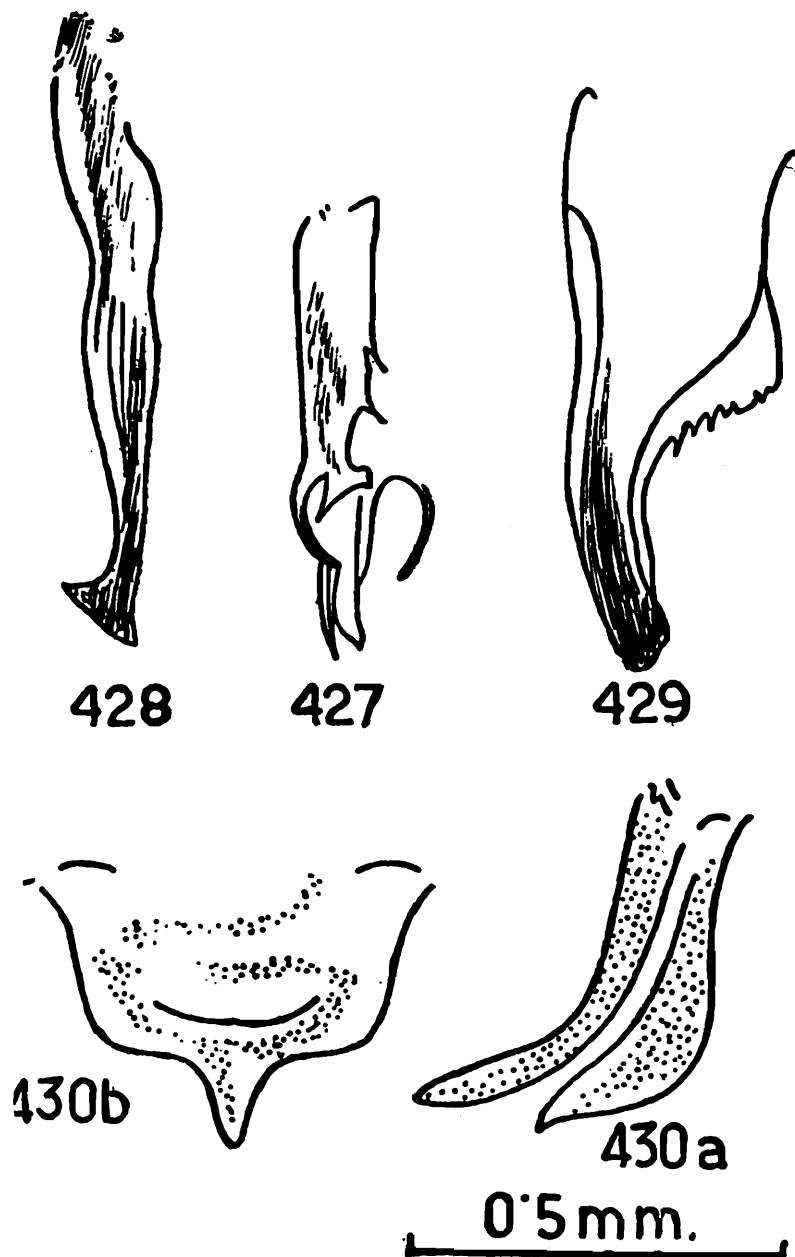
1777. *Cicada quercus* Fabr., *Genera Insectorum*, p. 298.

Anterior margin of head rounded, narrower than pronotum, vertex longer medially; pronotum broader distad; tegmina with three triangulate apical cells, stalked; hind wing with radius and media confluent distad, with two open apical cells; aedeagus usually with inferior processes, short, erect; style elongate, slender or, baculiform, sometimes sagittally arched; male plate near middle with peg-like setae on outer margin; pygofer and anal hook present; abdominal apodeme of variable length.

173. *Typhlocyba atrosignata* Dist.

(Fig. 427—430)

1918. *Typhlocyba atrosignata* Dist., *Fauna Brit. India*, 7 : 100.



T. atrosignata (figs. 427-430)

427. Aedeagus, 428. Style, 429. Male plate, 430(a). Pygofer Hook, 430b. Anal margin.

Vertex brownish yellow; pronotum brownish; scutellum with a spot at each basal angle; tegmina grey-white, subcostal cell dark brown.

Length : 5 mm (male).

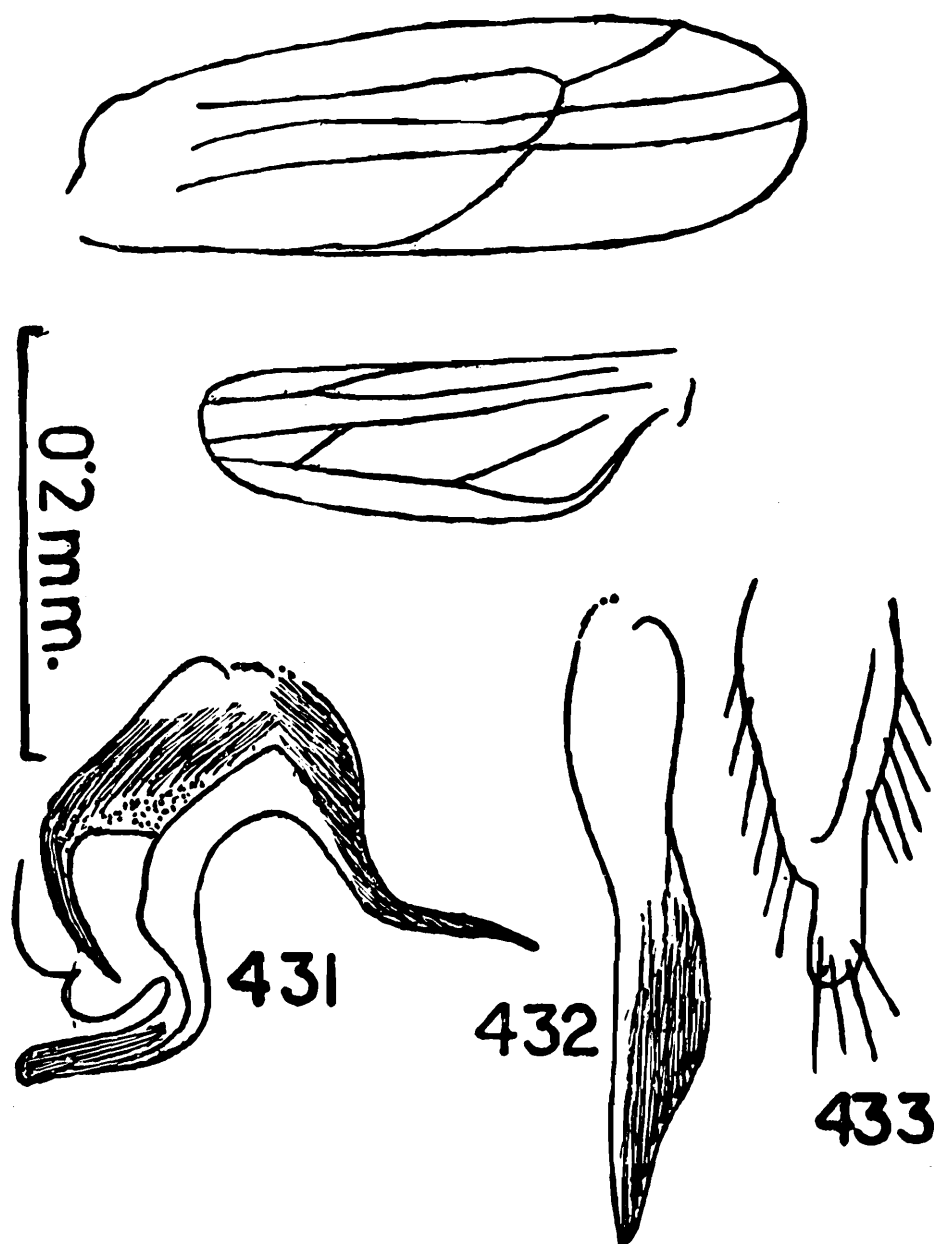
Genitalia : Aedeagal shaft (fig. 427) with a pair strongly arcuate subapical processes, directed caudad, apex bifurcate as figured; stylar extension (fig. 428) baculiform, arched along longitudinal axis, constricted subapically, apex divergent, margin as figured; male plate (fig. 429) infolded laterad, a row of peg-like setae, apex setose, rotundate; pygofer hook (fig. 430a) arising laterad; anal posterior margin projected (fig. 430b).

Distribution : Kodaikanal, Madras.

174. *Typhlocyba gemmata* Dist.

(Fig. 431—433)

1918. *Typhlocyba gemmata* Dist., *Fauna Brit. India*, 7 : 99.



T. gemmata (figs. 431-433).

431. Aedeagus, 432. Style, 433. Male plate,

Vertex with a pair of spots apicad; pronotum and scutellum brownish yellow; scutellum impressed medially, each basal angle with a spot; tegmina with a bluish reflection, apical cells with pale brown shades.

Length : 4 mm (male).

Genitalia : Connective V-shaped, aedeagus (fig. 431) with a pair of basal apodeme, shaft deeply notched, a pair of lateral and terminal processes; style (fig. 432) elongate, mesal apical extension linear, pointed; male plate (fig. 433) gradually connivent, margin laterad with a set of peg-like setae followed by spinous projection; pygofer oval-shaped, hook arising anteromesally, sharp, directed posterolaterad.

175. *Typhlocyba sikkimensis* Datta & Ghosh

(Fig. 434—437)

1973. *Typhlocyba sikkimensis* Datta & Ghosh, *Zool. Ans.*, **191** : 418-419.

Vertex, pronotum dark brown, vertex binotate apicad; scutellum at each basal angle with a triangulate patch; tegmina brownish, costal area with red elliptical patches, veins reddish, hindwing hyaline; abdominal segment black.

Length : 2 mm (male).

Genitalia : Connective sub-rectangulate, aedeagus (fig. 434) with an apodeme, apex distinctly hamate, an elongate, slender basal process, sharply pointed, bifid apex; style (fig. 435) tumid mediad, gradually connivent to a sharp pointed apex, without preapical lobe; male plate (fig. 436) gradually converging, apex appears twisted, laterobasally uniserate; pygofer simple, anal hook sharply pointed, hook-shaped (fig. 437).

Holotype No. 9821/H7 (male), paratypes Nos. 9822-23/H7 (males), (Ind. Mus.), Z.S.I., Calcutta.

Distribution : Gangtok (6,000'), Sikkim.

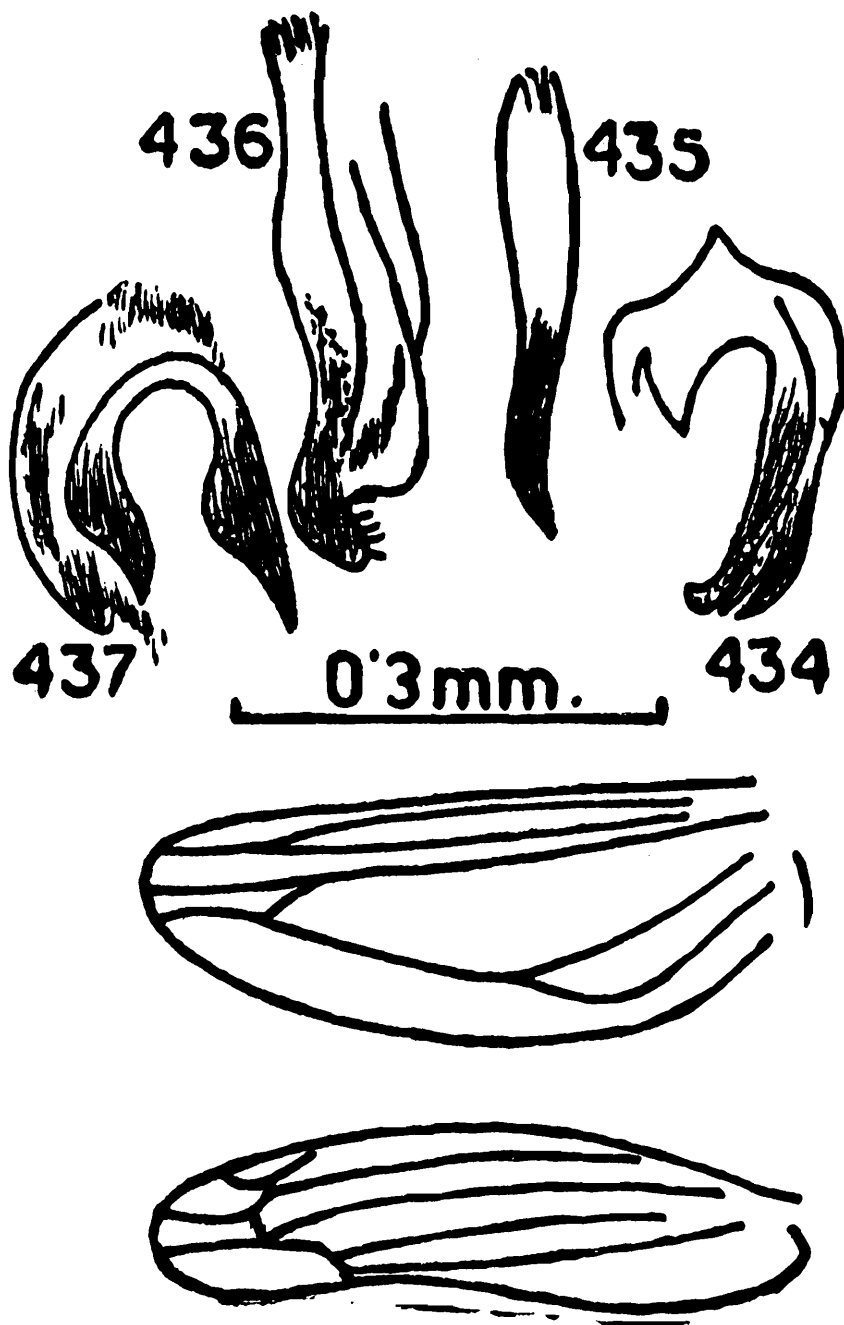
Comments : *T. sikkimensis* is closely allied to *T. gemmata* Dist., in having binotate vertex and spotted scutellar angles but differs in the shape of genital armatures which prove its identity as a separate species.

I.XXXVIII. Genus *Zygina* Fieber

1866. *Zygina* Fieber, *Zool. -bot. Ges. Wien.*, **16** : 509.

Type, by monotypy, *Typhlocyba nivea* Mulsant & Rey.

1855. *Typhlocyba nivea* Mulsant & Rey, *Ann. Linn. Soc. Lond.* **2**(2) s 246.



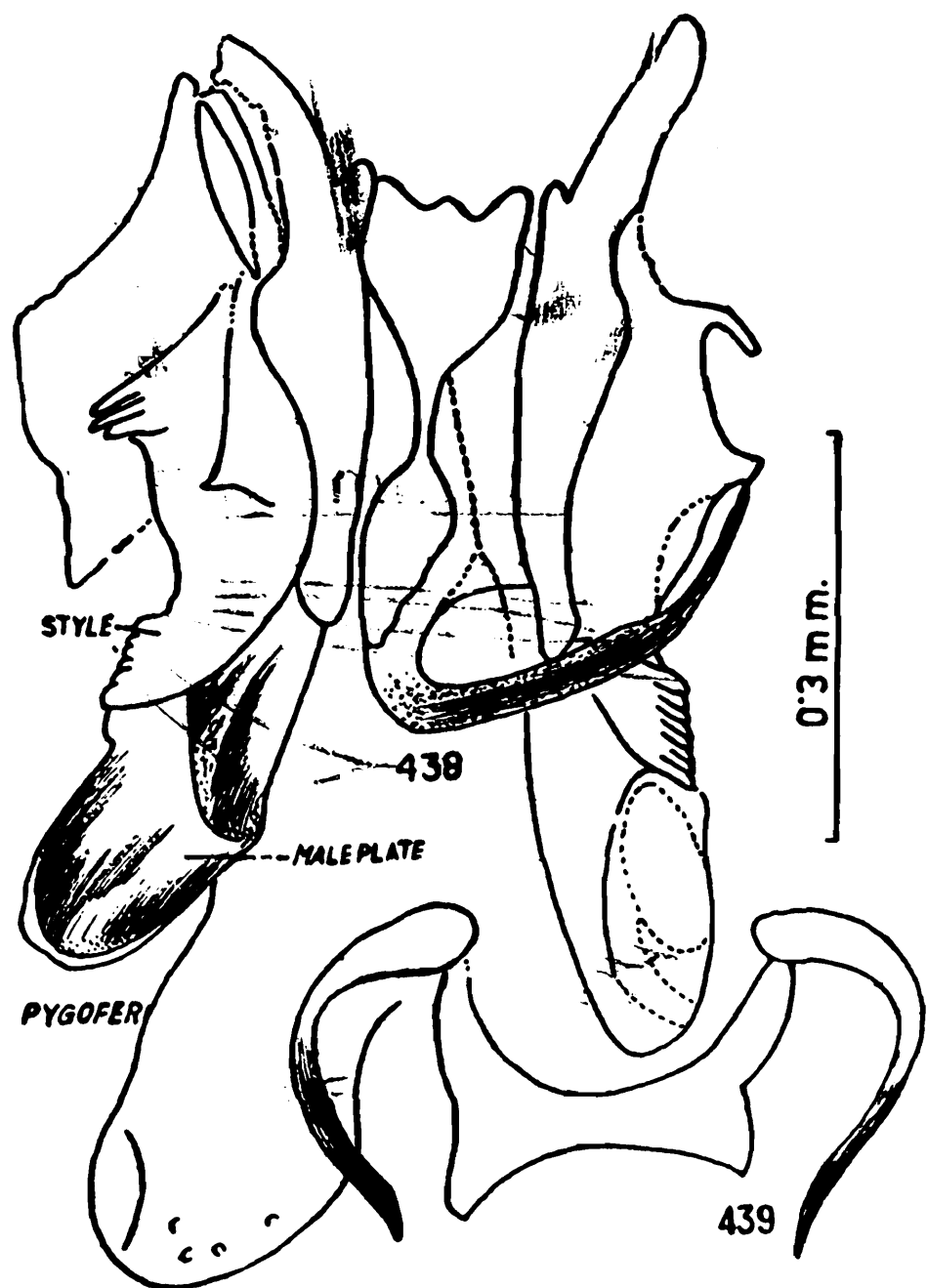
T. sikhimensis (figs. 434-437).

434. Aedeagus, 435. Style, 436. Male plate, 437. Pygofer Hook.

Varied color markings; broad and robust to narrow and delicate insects; hindwing with submarginal veins confluent with CU1 apically, posterior branch of 'R' fused with M 1+2, vein CU2 confluent with submarginal vein at basal half of wing; tegmina with inner apical cell having base oblique to angulate; connective U- or V-shaped, occasionally papilionaceous in form; aedeagal shaft with or without processes; style with distinct preapical lobe, apical mesal extension excluding *Z. kiperi* (Beamer) (1929:124); male plate multiseriate along lateral margin including base; pygofer hook present, arising from mesal margin.

176. *Zygina indica* Datta

(Fig. 438—439)

1969. *Zygina indica* Datta, *Zool. Anz.*, 182 (5/6) : 391-392.*Zygina indica* (figs. 438-439).

438. Aedeagus, 439. Anal Hook.

Crown with large black spot; scutellum with a pair of dark brown spots proximad; each abdominal segment dark brown; forewing transparent white

Length : 2 mm (both male and female).

Genitalia : Connective (438) V-shaped, aedeagus arched, pointed apically; style (438) with developed preapical lobe, mesal apical extension laminate without defined heel; male plate (438) laterally with a row of setae basad, apex heavily sclerotised; anal hook (439) with a pair of strongly curved hooks.

Holotype No. 9183/H7 (male), allotype : 9187/H7 (female), Zoological Survey of India, Calcutta.

Type locality : Agricultural Station, Warrangal, Andhra Pradesh, India, February, 1968 (T. Venkataswamy).

177. *Zygina rajani* Datta & Ghosh

(Fig. 440—444)

1973. *Zygina rajani* Datta & Ghosh, *Zool. Anz.*, **191**(5/6) : 412-414.

Crown with two black spots; pronotum pale greenish; scutellum without any dark brown spot; each abdominal segment dark brown; apical cells distinctly brownish; abdominal apodeme large.

Length : 2 mm (male).

Genitalia : Connective V-shaped, stem short, aedeagal shaft (fig. 440) stout, elongate, laminate dorsoventrally. a pair of prominent, sharp terminal processes directed laterocephalad; style (fig. 441) with developed preapical lobe, basal third abruptly narrowed, apex foot-like sharp, directed laterad; male plate (fig. 442) with sparse microspines on laterobasal margin, uniseriate laterally; pygofer (fig. 443) hook originating from basal part of mesal margin, dorsoventrally 3/4th laminate; abdomen apodeme (fig. 444).

Female :

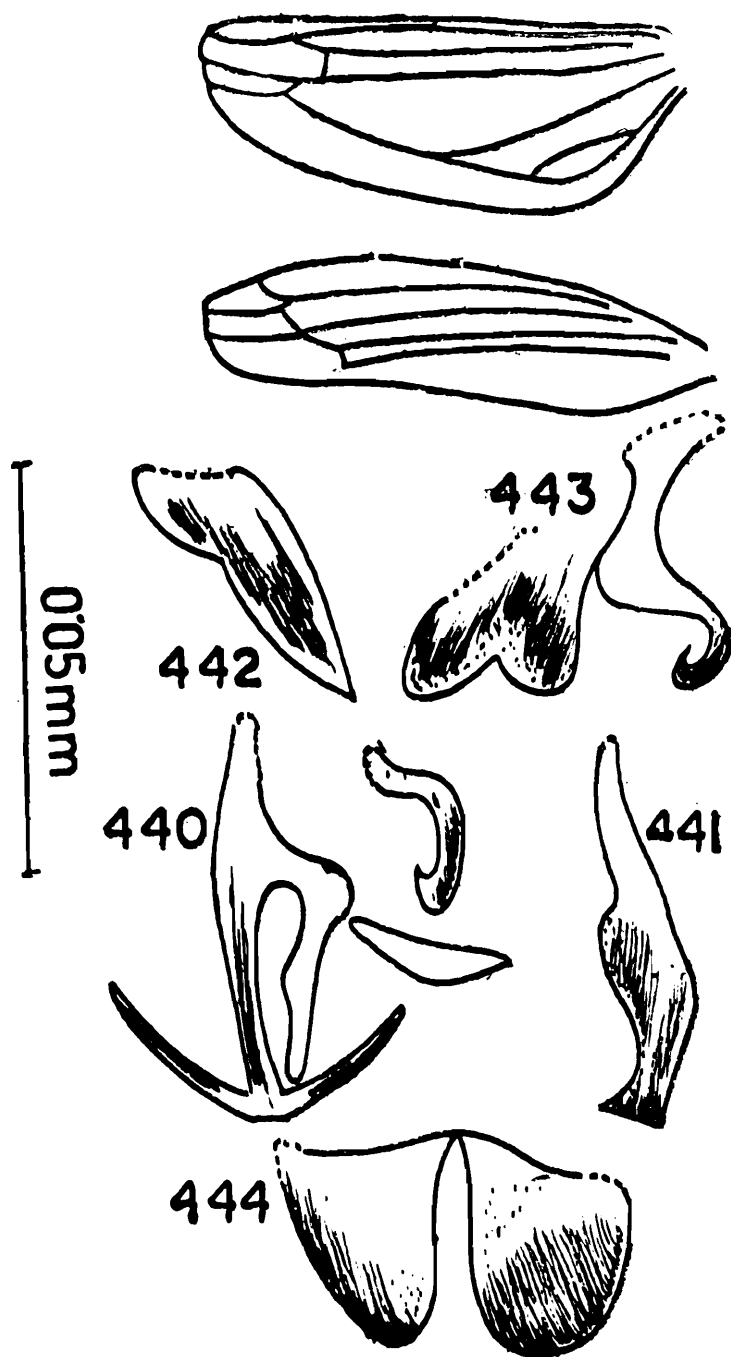
Crown and scutellum without black spot; abdominal segments black, tip brown.

Length : 1.5 mm.

Holotype : male, allotype, female, 9791/H7 (in spirit), Z S.I., Calcutta.

Distribution : Kovilpatti, Agricultural Research Station, Tamilnadu.

Comments : The species is allied to *Typhlocyba* (*Zygina*) *bipunctula* Mal., but differs without having any spot on scutellum, and may be distin-



Zygina rajani (figs. 440-444).

440. Aedeagus, 441. Style, 442. Male plate, 443. Pygofer, 444. Abdominal apodeme.

guished from *Zygina indica* Datta by having hook-shaped pygofer process and aedeagal process and foot-like style at apex.

Economic status : The species is common on crop usually grown in the month of March, although its vectorial status is not at the early stage ascertained by any worker.

SUMMARY

The author has reviewed one hundred seventy-seven cicadellid species in eighty-eight genera under seventeen subfamilies and emphasized the bearing of genital armature being correlative to substantiate the identities of the species involved. The structural parallelism of the facies confutes the validity of the species and sustains the anomalies of the original one. Studies of the genital armature for identification of the diverse cicadellid forms restrict the superfluous tangibility of the species. Details of other taxonomical features of the cicadellid species are further supplemented with economic status and bionomics of a few species. The vectorial status of Indian cicadellid fauna is notably worked out by Bindra (1973). A series of contributions to the systematics of Indian fauna has been rendered by Distant (1908, 1918), Pruthi (1930, 34, 36), Ghauri (1971), Datta (1971, 72), Usha Rama Ramakrishnan and Menon (1971, 72, 73, 74), Viraktamath (1973), and Sohi and Dworakowska (1983). The abundant occurrence of the group along the Sub-Himalayan region hitherto remains unexplored as compared to the knowledge on the taxo-economic aspects of other recorded species from the Palaearctic and Nearctic regions. The present paper reviews the taxonomy of the common Oriental cicadellids being mainly based on the detailed structures of the genital armature of both sexes.

In addition, very few species are included other than Oriental region to enrich further knowledge on taxonomy and zoo-geographic distribution.

On Mounting Procedures : A drop of mixed carbolic acid and glycerine (Ratio 3 : 1) is used over tip of abdominal segments. After waiting for 24 hours or more, the armature is squeezed out of the segments by slowly making pressure on the segments with a flat-tipped insect forcep. The structure is treated with 10% KOH for a period of 24 hours, next with acid fuchsin (a pinch of fuchsin power in a few drops of acetic acid) for 10 mins. It is to be re-treated with 10% KOH till fuchsin stain disappears. Prior dissecting the genital structure, we should follow the usual method of treatment with acetic acid, clove oil subsequently. Final mounting should be done on canada balsam or other media.

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