

STUDIES ON INDIAN JASSIDAE (HOMOPTERA).

PART III.—DESCRIPTIONS OF SOME NEW GENERA AND SPECIES, WITH FIRST RECORDS OF SOME KNOWN SPECIES FROM INDIA.

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The first and second parts of these studies¹ were published in 1930 and 1934 respectively and mostly contained descriptions of some genotypes and revisions of some important genera. In the present study a few new genera and species, mostly collected by the writer himself, are described. Some known species and genera are recorded from India for the first time. Extensive notes elucidating the true relationship of the species concerned have been added.

The work was started while I was in charge of the Entomological Section of the Zoological Survey of India at Calcutta and was continued and finished at the Imperial Institute of Agricultural Research, Pusa. No special collection of this family of undoubted agricultural importance had ever been made at Pusa, therefore even a few months' collection of forms especially attracted to light at this locality has yielded several interesting forms descriptions of which are included in the present communication.

In the systematic arrangement of sub-families and genera I have followed the system adopted by Distant in his work on Jassidae in *the Fauna of British India, Rhynchota*.

The terminology used in the following pages is the same as was employed in the previous two parts of the studies (*vide supra*, p. 3). I have, however, modified the terminology of types in view of Horn's paper on this subject at the 10th International Congress of Zoology held at Budapest in 1929. The term 'holotype' has been used for the type male and 'allotype' for the type female where both sexes were available. If only the female was available, 'holotype' has been used for the type female and ♀ in brackets added after 'holotype'.

Petaloccephala kempi, sp. nov.

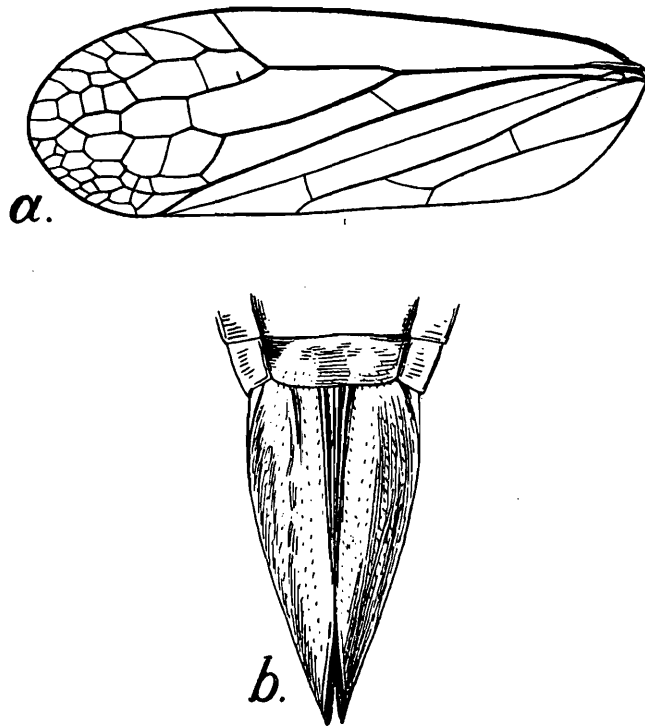
(Pl. VIII, fig. 1.)

Female.—Body elongate (9.7 mm. × 2.4 mm.), brown. Vertex much longer than the breadth between the eyes, thickly coarsely punctate, medially prominently carinate, moderately deflexed on either side. Ocelli prominent, reddish, located in shallow depressions. Eyes comparatively small, dark. Face flattened, prominently foveate at the bases of the antennae, pale brown with frons reddish brown; clypeus very small, rectangular; lorae large and prominent. Pronotum about $\frac{2}{3}$ the length of vertex, flattened, punctate, irregularly transversely striate, brown, with some dark spots and patches in the anterior region;

¹ Pruthi, *Mem. Ind. Mus.*, XI, pp. 1-98 (1930-34).

² Horn, X *Congrès International de Zoologie* (Budapest, 1927), pt. 2, pp. 1021-1042 (1929).

the posterior margin deeply notched. Scutellum large, about $\frac{2}{3}$ the length of pronotum, with extensive dark patches or wholly dark, coarsely punctate, deeply impressed in the apical region. Tegmina densely finely punctate, extending up to the extremity of abdomen, touching each other along the inner margins; appendix not developed; veins fine but fairly prominent; venation as illustrated in text-fig. 116a, numerous cross veins in the apical region. Ventral surface of the body pale brown, with extensive reddish patches in the regions of the thorax and the genitalia. Legs rather short and thin.



TEXT-FIG. 116.—*Petalocephala kempi*, sp. nov. a. Tegmen of female; $\times 10$. b. Female genitalia, ventral view; $\times 16$.

Genitalia.—(Text-fig. 116b.) Valve short, narrow, flat, almost straight at the anterior and posterior margins. Pygofers large, fairly swollen, covered with fine pubescence. Ovipositor delicate, hardly reaching the posterior extremity of abdomen.

Male.—Not known.

Holotype (♀).—Kodaikanal (6,900-7,200 ft.), Palni hills, South India; September 1922 (Coll. S. Kemp). In the Indian Museum (No. $\frac{5380}{H7}$).

Paratypes.—Two female specimens also in the Indian Museum.

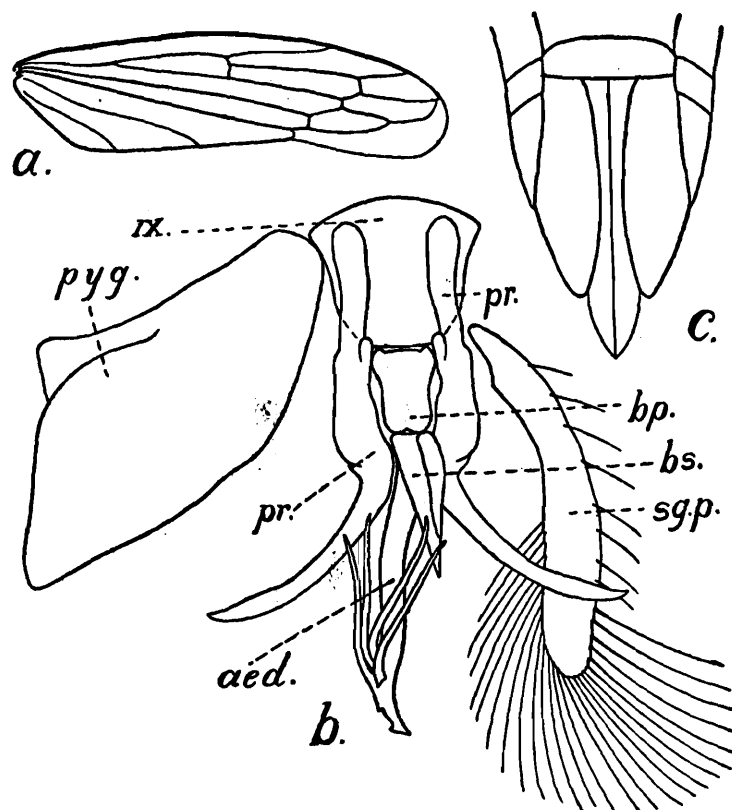
According to Mr. W. E. China there are some unnamed specimens of this species also in the British Museum collection.

Idiocerus bimaculatus, sp. nov.

(Pl. VIII, figs. 2-2a.)

Pale yellow, yellow or pale brown (old specimens). Vertex short, about six times as broad as long in the middle, smooth, medially finely sulcate. Eyes small, chestnut brown. Face pale, convex, slightly longer than broad, frons fairly raised, clypeus large, broader in the apical region; lorae conspicuous; genae comparatively narrow. Ocelli shining and conspicuous; tip of the proboscis marked with black. Pronotum three times the length of the vertex, smooth, without any markings; the anterior and posterior margins slightly

convex and concave respectively. Scutellum almost as long as the pronotum, transversely deeply impressed in middle, with a large black round marking near each basal angle. Tegmina much longer than the body in both sexes, transparent except in the region of the clavus where they are more deeply coloured and opaque; veins distinct but inconspicuous; venation as illustrated in text-fig. 117a, only three apical and one ante-apical cells. Wings transparent, whitish, nervures distinct. Posterior tibiae thickly spinulose; all tarsi black.



TEXT-FIG. 117.—*Idiocerus bimaculatus*, sp. nov. a. Tegmen; $\times 14$. b. Male genitalia, dorsal view, with right pygofer and left sub-genital plate removed; $\times 60$. c. Female genitalia; $\times 38$. aed., aedeagus; bp., basal plates; bs., basal strut of the aedeagus; pr., parameres; pyg. pygofers; sg. p., sub-genital plates; IX, ninth abdominal sternite.

Male genitalia.—(Text-fig. 117b.) Pygofers long, tapering in the distal region to narrow apices. Subgenital plates long, narrow, covered with numerous long hairs. Parameres long, rod-like, twisted, very much projecting into the body cavity, almost pointed at the apices. Basal plates small, hardly distinguishable from their prolongation which is large and flattened. Aedeagus long, cylindrical, with four long appendages near the gonopore; basal strut very well developed.

Female genitalia.—(Text-fig. 117c.) Valve short, its posterior margin straight. Pygofers short and broad, almost smooth. Ovipositor stout, slightly projecting beyond the posterior extremity of the abdomen.

Length.—Male 4.4 mm.; female 4.6 mm.

Holotype and Allotype.—Kausani (ca. 6,000 ft.), Almora Dist., Kumaon Hills, U. P., 30.V.—2.VI.30 (Coll. H. S. Pruthi). In the Indian Museum (Nos. $\frac{5382}{H7}$, $\frac{8533}{H7}$).

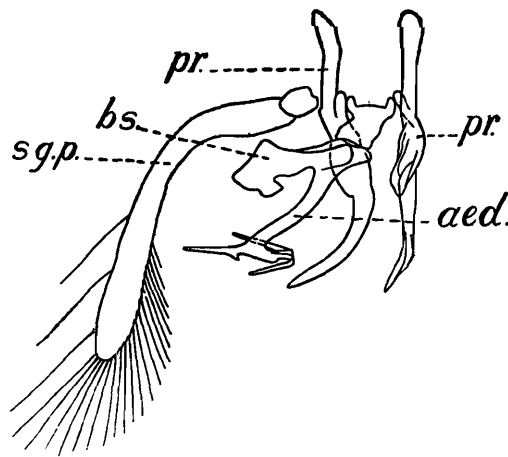
Paratypes.—A large series of specimens of both sexes collected from the type-locality along with the type specimens. In the Indian Museum.

Distribution.—Kumaon Hills, Central Himalayas.

Idiocerus confuscous, sp. nov.

(Pl. VIII, fig. 3.)

Vertex short, about eight times as broad as long in middle, medially deeply sulcate at base, anteriorly broadly rounded, ochraceous, with a conspicuous minute black dot near each eye, the two dots connected by an irregular dark grey stripe in some specimens. Eyes small, dark grey. Face ochraceous, with brownish patches in the lateral regions of frons. Ocelli colourless, rather inconspicuous. Pronotum dark ochraceous, diffused with piceous markings near eyes, about three times as long as vertex. Scutellum about as long as pronotum, ochraceous, with a large angular dark brown or piceous spot near each basal angle. Tegmina long, much longer than the body in both sexes, semi-transparent, castaneous; veins dark brown and conspicuous. Abdomen black on dorsal side in both sexes, ventrally brown in the female and marked with extensive black patches in the male. Legs brown, long; posterior tibiae thickly spinulose.



TEXT-FIG. 118.—*Idiocerus confuscous*, sp. nov. Male genitalia; *aed.*, aedeagus; *bs.*, basal strut of the aedeagus; *pr.*, parameres; *sg. p.*, sub-genital plates.

Male genitalia.—(Text-fig. 118.) Chiefly differ from those in the above species in the shape of the aedeagus, which is short, extremely twisted and bent and pointed at the apex where there is only one pair of stiff appendages. Parameres short and slender.

Length.—Male 4.8 mm.; female 4.9 mm.

Holotype and *Allotype.*—Kausani (ca. 6,000 ft.), Almora dist., Kumaon Hills, U. P.; 30. V—2. VI. 1930 (Coll. *H. S. Pruthi*). In the Indian Museum (Nos. $\frac{5385}{H7}$, $\frac{5386}{H7}$).

Paratypes.—Numerous specimens collected along with the types in the Indian Museum.

Distribution.—Kumaon Hills, U. P., Central Himalayas. Kausani—very common; Ranikhet and Bhowali, a few specimens; May 1930 (*H. S. Pruthi*).

Remarks.—This species on superficial examination resembles *I. atkinsoni* Leth.¹

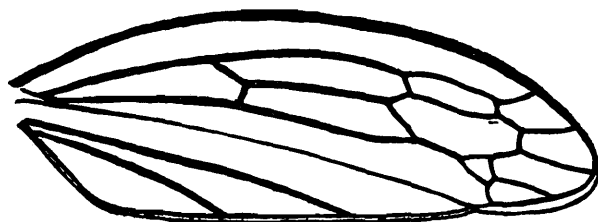
Agallia pararobustus, sp. nov.

(Pl. VIII, fig. 4.)

Female.—Ochraceous. Vertex with a conspicuous oblique black spot and a faint brown stripe near the median line, the brown stripes being continued on the forehead as far as the

¹ Distant, *Faun. Brit. Ind. Rhynch.*, IV, p. 186 (1908).

Ocelli where they turn outwards and end near the bases of the antennae. Ocelli margined with black. Frons with numerous minute but well defined black dots in the lateral region; clypeus margined with black. Pronotum finely transversely striated, with a dark oblique stripe near each antero-lateral angle, a broad castaneous stripe on each side of the median line and an extensive patch of the same colour near the posterior-lateral angles. In some specimens the markings on the pronotum rather faint. Scutellum transversely impressed



TEXT-FIG. 119.—*Agallia pararobustus*, sp. nov. Tegmen; $\times 28$.

in middle, with a large angular black spot near each basal angle and a minute spot of the same colour on each side of the median line near the anterior margin. Tegmina large, broad, ochraceous, with extensive dark brown stripes in the region of the clavus; veins dark brown, very conspicuous; venation as illustrated in text-fig. 119, 3rd ante-apical cell of variable shape. Body pale brown on the ventral side, with extensive black areas in the region of the thorax. Legs short and robust, ochraceous, marked with black patches and stripes here and there.

Female genitalia.—Valve deeply concave at the posterior margin. Pygofer short and broad, almost smooth. Ovipositor stout, slightly projecting beyond the posterior extremity of the abdomen.

Length.—3.0 mm.

Holotype (♀).—Guvvalucherru (500 ft.), base of Palkonda Hills, South India; at light, 1-3.VIII.1929 (Coll. *H. S. Pruthi*). In the Indian Museum (No. $\frac{5387}{H7}$).

Paratype.—One female specimen in the Indian Museum.

Distribution.—South India. Guvvalucherru (Type locality); Prema (800 ft.), base of Nallamalai Hills, South India; at light two specimens, 12-14.VIII.1929 (Coll. *H. S. Pruthi*).

Remarks.—This species is allied to *A. robustus* Pruthi, described from the Murree Hills and to the Palaearctic species *A. venosa* Fall¹.

***Agallia sinuata*, M. & R.**

(Pl. VIII, fig. 5.)

This species is very widely distributed in the Palaearctic region. It has not been so far recorded from any part of India. I obtained a female specimen of this species at Khewra (Salt Range, Punjab) in October 1930 and another at Uchhali in the same area in March 1931. The Indian Museum collection contains two more specimens of which one was collected at light by Mr. K. A. Rahman at Lyallpur.

¹ Vide Melichar, *Cicad. Mit. Europ.*, p. 174 (1896).

Female.—Stramineous. Vertex short, especially in middle, with a minute black dot midway between the median line and the eye. Eyes small, dark grey with a tinge of purple. Ocelli conspicuous, margined with black. Frons very much swollen. Antennal cavities slightly marked with black. Pronotum long, very much gibbous in the posterior region, with a minute black dot (sometimes very faint in colour) near each postero-lateral angle. Scutellum short, deeply transversely impressed in middle. Tegmina long, comparatively narrow, semi-transparent; veins conspicuous, here and there marked with brown. Legs and ventral surface of the body pale yellow.

Female genitalia.—Valve narrow. Pygofers fairly long, smooth. Ovipositor stout, slightly marked with black in the proximal two thirds, apex yellow, projecting beyond the posterior extremity of the abdomen.

Length.—Female 3.5 mm.

Distribution.—North India.

Parasitades, gen. nov.

Head slightly broader than the pronotum. Vertex extremely short, much shorter in middle than in the lateral regions. Eyes small, rounded. Face slightly broader (in the region of the eyes) than long, flattened. Ocelli on the front, nearer the anterior margin of the vertex than to the base of the face, between the eyes, nearer the eyes than to each other. Pronotum broader than long, distinctly transversely striated, foveately depressed in the antero-lateral regions, gibbous in the posterior region, the anterior margin convex, produced between the eyes, the posterior margin slightly sinuate. Scutellum large, almost as long as the pronotum. Tegmina hard and coriaceous, without appendix, apically rounded, long, extending beyond the abdomen even in the female. Veins thick and prominent; venation as in *Sitades*, *Durgades*, *Moonia*, etc., apical cells five, ante-apical cells three.

This genus is allied to *Sitades* Dist., from which it differs in the position of the ocelli, an important generic character, and in the shape of the pronotum.

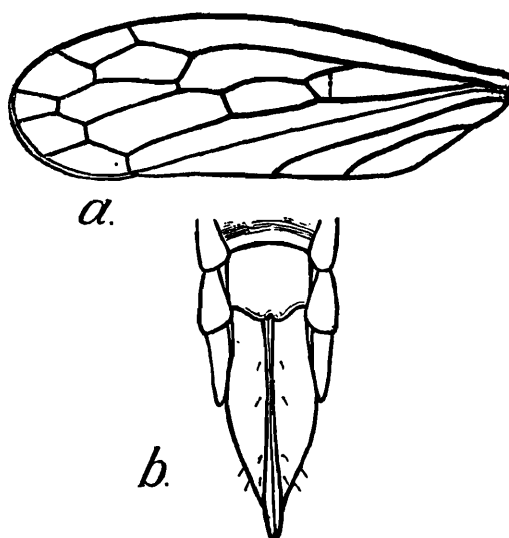
Genotype.—*Parasitades baileyi*, sp. nov.

Parasitades baileyi, sp. nov.

(Pl. VIII, figs. 6, 6a.)

Female.—Large and stout. Head, face, pronotum and tegmina tawny brown. Face with extensive dark patches all over and with a pale carination along the median line in the upper region. Clypeus, lorae and genae well marked from each other. Pronotum with pale lines or patches at the posterior margin. Scutellum dark brown, with a broad longitudinal black stripe in middle and large patches of the same colour near the anterior corners. Tegmina with two clear areas in the apical region near the costal margin; venation as illustrated in text-fig. 120a. Wings pale brown, nervures dark brown and prominent. Body brown on both dorsal and ventral sides.

Female genitalia.—(Text-fig. 120b.) Valve large, convex at the posterior margin, which is slightly notched in middle. Pygofers long, fairly broad and convex, with a few stiff hairs



TEXT-FIG. 120.—*Parasitades baileyi*, sp. nov. a. Tegmen; $\times 15$. b. Female genitalia, ventral view; $\times 18$.

in the distal region. Ovipositor moderately stout, slightly protruding beyond the posterior extremity of the abdomen.

Length.—5.0 mm.

Holotype (♀).—Gangtok (6,000 ft.), Sikkim; 11.X.27 (Coll. *F. M. Bailey*). In the Indian Museum (No. $\frac{5390}{H7}$).

***Gurawa intermedius*, sp. nov.**

(Pl. VIII, figs. 7, 7a.)

Only two species of this genus are already known, namely *G. vexillum* Dist.¹ and *G. microcephala* Pruthi². The new species described below chiefly differs from the old species in the size of the vertex, the length of which affords an important specific character.



TEXT-FIG. 121.—*Gurawa intermedius*, sp. nov. Tegmen; $\times 24$.

Female.—Stout, brown or tawny brown. Vertex about two-thirds the breadth between the eyes, slightly wrinkled and depressed in the proximal region, highly reflexed at the apex which is marked with black. Ocelli distinct, on the lateral margin of the vertex, midway between the eyes and the apex. Face longer than broad, with a long shallow depression in the upper region; lorae and genae dark brown, mottled with grey. Pronotum slightly

¹ Distant, *Faun. Brit. Ind. Rhynch.*, IV, p. 262 (1908).

² Pruthi, *Mem. Ind. Mus.*, XI, p. 29 (1930).

shorter than the vertex, flat, transversely coarsely wrinkled, both the anterior and the posterior margins straight. Tegmina long, broad, thick and coriaceous; veins fairly thick, and prominent; venation as shown in text-fig. 121, only one cross vein between the sectors.

Female genitalia.—Similar to those in the two known species of *Gurawa*.

Length.—8.7 mm.

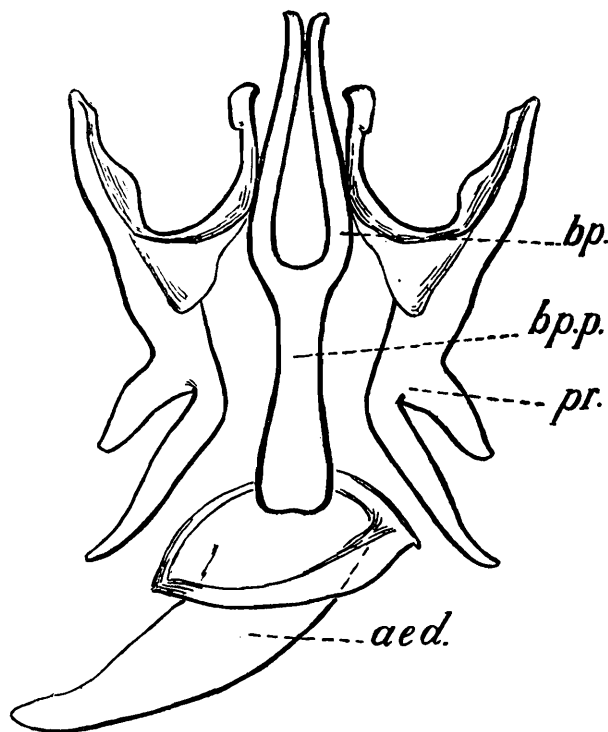
Holotype (♀).—Gangtok (6,000 ft.), Sikkim, Eastern Himalayas; 13.VIII.27 (Coll. *F. M. Bailey*). In the Indian Museum (No. $\frac{5391}{H7}$).

Paratype.—One female specimen collected by Col. Bailey along with the holotype female in Indian Museum.

***Chiasmus niger*, sp. nov.**

(Pl. VIII, fig. 8.)

Male.—Robust, black, excepting the apex of the vertex and the apical margin of the tegmina which are reddish brown and white respectively. Vertex slightly shorter than the breadth between the eyes, flat in the proximal region, depressed before apex which is distinctly reflexed. Ocelli on the lateral margin of vertex, midway between its apex and the eyes, conspicuous. Face reddish brown in the upper region, dark in the lower, sometimes entirely black. Pronotum about two-thirds the length of the vertex, smooth, distinctly notched at the posterior margin. Scutellum about as long as the vertex. Tegmina short,



TEXT-FIG. 122.—*Chiasmus niger*, sp. nov. Male genitalia, pygofers removed, dorsal view; $\times 168$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *pr.*, parameres.

covering only the first three abdominal segments, coriaceous, thickly punctate; venation hardly visible. Abdomen highly convex on the dorsal side, flattened on the ventral. Legs long.

Length.—3.0 mm.

Male genitalia.—(Text-fig. 122.) Differ from those in other species of *Chiasmus* in the shape of the parameres which are elongated and of the aedeagus which is pointed at apex.

Holotype.—Sarol Garden, Chamba, Punjab; 20.V.27 (Coll. S. L. Hora). In the Indian Museum (No. $\frac{5393}{H7}$).

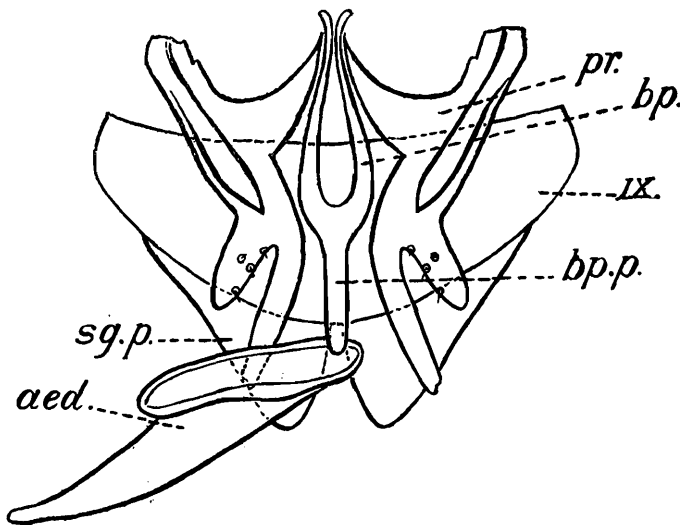
Paratype.—Calcutta Maidan; 10.IV.34 (H. S. Pruthi). In the Indian Museum.

Distribution.—Punjab and Bengal.

***Chiasmus jagdishii*, sp. nov.**

(Pl. VIII, fig. 9.)

Male.—Vertex about two-thirds the breadth between the eyes, of the same shape as in the above species, medially sulcate in the proximal half, ochraceous with numerous black spots and patches all over. Eye large, protruding beyond the lateral margins of the pronotum. Face pale ochraceous, mottled with dark brown. Pronotum about half the length of the vertex, dark, with light patches in the anterior region; the posterior margin concave. Scutellum almost as long as the pronotum (5 : 4) and of the same colour. Tegmina coriaceous, short, ochraceous, with irregular dark patches; some veins marked with white. Abdomen piceous, with light mottlings, fairly convex on the dorsal side. Legs long, the posterior tibiae thickly spinulose.



TEXT-FIG. 123.—*Chiasmus jagdishii*, sp. nov. Male genitalia, pygofer removed, dorsal view; $\times 116$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *pr.*, parameres; *sg. p.*, sub-genital plates; IX, ninth abdominal sternite.

Length.—2.5 mm.

Male genitalia.—(Text-fig. 123.) Chiefly differ from those of *Chiasmus niger* in the shape of the parameres.

Holotype.—Calcutta (Maidan); 6.IV.34 (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5395}{H7}$).

***Baileyus brachynotus*, sp. nov.**

(Pl. VIII, figs. 10, 10a.)

So far only one species of this genus, *B. brunneus* Pruthi, has been described, which was collected by Col. F. M. Bailey at Yatung in August 1927. The specimens of the

second species, which is described below, were collected by the same collector at the same locality and at about the same time. The new species chiefly differs from the genotype (*B. brunneus* Pruthi) in colour and in the shape and size of the pronotum which is comparatively very short, consequently the vertex and the scutellum appear much longer than those of the latter species. I have only two specimens before me, unfortunately both are females.

Female.—Body brown or pale brown. Vertex flattened, slightly wrinkled in the proximal two-third, with a pair of minute reddish brown dots near the ocelli. Face brown, frons grey, especially in the lateral regions. Pronotum more than three times as broad as long, flat, greyish brown, distinctly transversely impressed in middle; the anterior margin straight, the posterior distinctly concave. Scutellum about one and a half times as broad as long, brown. Tegmina long, extending beyond the tip of the ovipositor, pale brown, veins reddish brown, conspicuous; venation similar to that in *B. brunneus*.

Female genitalia.—Similar to those in *B. brunneus*.

Length.—3.5 mm.

Holotype (♀).—Yatung (10,000 ft.), Tibet Frontier, Eastern Himalayas; VIII. 27 (Coll. *F. M. Bailey*). In the Indian Museum (No. $\frac{5396}{H7}$).

Paratype.—A female specimen collected along with holotype in the Indian Museum.

***Doratulina macrocephala*, sp. nov.**

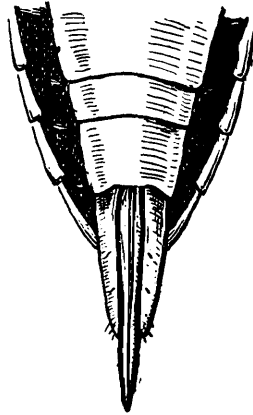
(Pl. VIII, figs. 11, 11a.)

The genus *Doratulina* which was erected by Melichar,¹ at present consists of one species only, viz., *D. jacosa* Melich., which was described from Ceylon. The present species differs from the genotype in several characters and was obtained in fairly large numbers at Calcutta. Unfortunately all specimens are females. Melichar also figured only the female sex, thus the description of a male of this genus is yet not available.

Female.—Vertex pale brown or ochraceous, flat, much longer than the breadth between the eyes (7 : 4), anteriorly angulate, medially sulcate in the proximal half; the lateral margins in line with the outer margins of the eyes. Ocelli black, distinct, on the lateral margins of the vertex, visible from above, close to the eyes. Eyes large, dark grey. Face slightly longer than broad, frons long, fairly raised, brown with dark brown oblique striations in the lateral regions. Clypeus brown, rectangular; genae and lorae greenish yellow, the latter not reaching the apex of the clypeus. Pronotum greenish, short, about one half the length of the vertex (4 : 7), the anterior margin straight between the eyes, curved in the lateral regions behind the eyes, the posterior margin concave. Scutellum small, about as long as broad, of the same colour as the pronotum. Tegmina greenish, short, covering about one third of the abdomen, opaque, apical margins almost straight and truncate. Abdomen long, tapering in the distal region where it is brownish, pale green in the proximal region, a row of minute

¹ Melichar, *Hom. Faun. Ceyl.*, p. 198 (1903).

black dots near the anterior margin of each abdominal segment. Ventral surface of the body brown, or dark brown. Legs long, brown.



TEXT-FIG. 124.—*Doratulina macrocephala*, sp. nov. Female genitalia, ventral view; $\times 26$.

Female genitalia.—(Text-fig. 124.) Valve large, posterior margin wavy. Pygofers moderately large, narrow, smooth. Ovipositor stout, protruding beyond the posterior extremity of the abdomen.

Length.—3.0 mm.

Holotype (♀).—Calcutta (Maidan); January, 1934 (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5427}{H7}$).

Paratype.—Several female specimens collected from the same locality along with the holotype in Indian Museum.

***Paternus khewrensis*, sp. nov.**

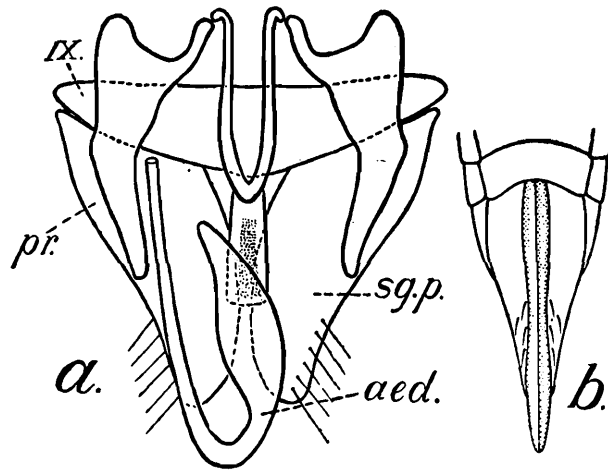
(Pl. VIII, figs. 12 & 13.)

The genus *Paternus* includes three species, all from India. The genotype was described from Pusa, while the other two were obtained by the writer in South India. The present species was collected from several localities in the Salt Range, Punjab, and differs from the three previously known species in the shape of the vertex and the structure of the genitalia, and is described as new below. No figure of the male sex of any species of *Paternus* is available and as the genus shows distinct sexual dimorphism especially in size, both male and female sexes of the new species are illustrated.

Pale yellow (♂) or greenish yellow (♀). Vertex about twice as long as the breadth between the eyes, sulcate at base, apically acute, the lateral margins almost in line with the outer margins of the eyes. Eyes large, dark grey. Pronotum half as long as the vertex, flat, medially longitudinally carinate, finely irregularly striate. Scutellum as long as the vertex, transversely impressed in middle, dark grey in the interior half. Tegmina long, pale yellow, veins yellowish, venation as in *P. viridula* Pruthi. Legs long. Posterior tibiae richly spinulose.

Male genitalia.—(Text-fig. 125a.) Sub-genital plates large, leaf-like, tapering in the distal region. Parameres long, narrow, flattened, almost pointed at the apices. Basal plates long, rod-like, their prolongation flattened. Aedeagus long, of the same form as in other species of *Paternus*.

Female genitalia.—(Text-fig. 125b.) Valve rather narrow. Pygofers long and narrow, with a few hairs in the distal region. Ovipositor long and stout, but only slightly exposed beyond the apices of the tegmina.



TEXT-FIG. 125.—*Paternus khewrensis*, sp. nov. a. Male genitalia, pygofers removed, dorsal view; $\times 120$. b. Female genitalia; $\times 22$. aed., aedeagus; pr., parameres; sg. p., sub-genital plates; IX, ninth abdominal sternite.

Length.—Female 5.0 mm.; male 4.50 mm.

Holotype and Allotype.—Khewra, Salt Range, Punjab; 24.IX—2.X.1930 (Coll. H. S. Prun). In the Indian Museum (Nos. $\frac{5398}{H7}$, $\frac{5399}{H7}$).

Paratypes.—Several specimens in the Indian Museum.

Distribution.—North India.

Khewra—Very Common. Lyallpur—At light, a few specimens, October, 1929 (A. K. Rahman).

Sunda, gen. nov.

Vertex more than three times as long as the breadth between the eyes, flat, sulcate at base, acute at apex, lateral margins distinctly carinate and rigid. Eyes small, elliptical. Ocelli minute, close to the eyes, just below the lateral carina of the vertex. Face much longer than broad; clypeus long, rectangular; lorae small, distinct, not reaching the apex of the clypeus; genae moderately expanded. Antennae very long and thin. Pronotum flat, about half the length of the vertex, medially prominently carinate, the anterior margin straight between the eyes, deeply curved in the lateral regions behind the eyes, the posterior margin slightly concave. Tegmina long, protruding beyond the posterior extremity of the abdomen, but not beyond the ovipositor which is extraordinarily long; venation of the same type as in *Aconura*, *Paternus*, etc.

This genus is allied to *Paternus* Dist., *Volusenus* Dist., etc., from which it chiefly differs in the size and shape of the vertex of the head which is very long and laterally carinate.

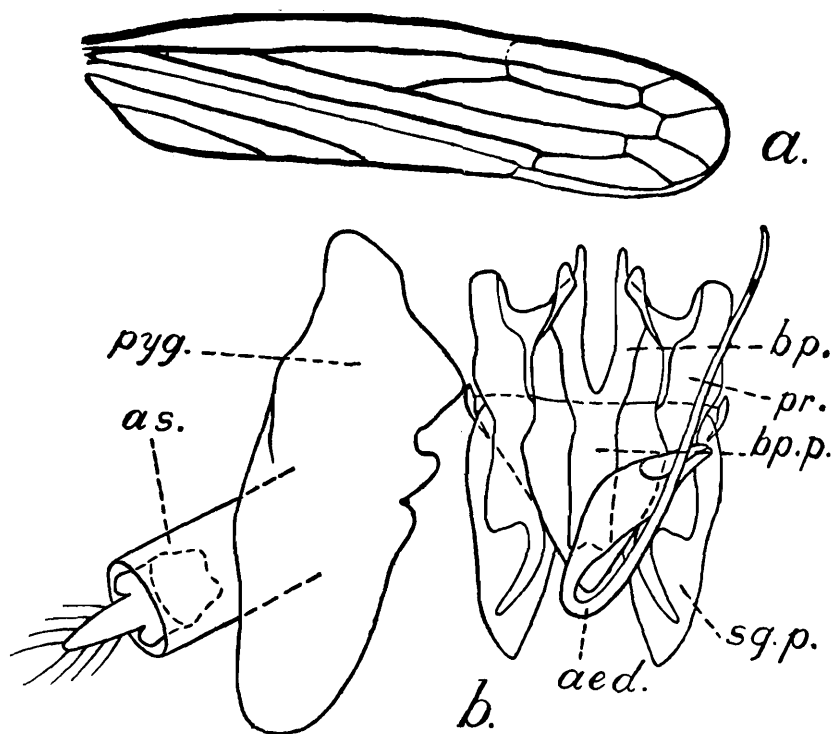
Genotype.—*Sunda ribeiroi*, sp. nov.

Sunda ribeiroi, sp. nov.

(Pl. VIII, figs. 14, 14a.)

Female.—Large, yellowish, pale brown. Vertex spatulate. Face black in the upper half, with a couple of pale oblique stripes in the lateral regions, and brown in the lower half.

Eyes dark grey. Pronotum smooth. Scutellum almost as long as the thorax, with a circular depression near the apex. Tegmina long and narrow, semi-transparent, almost clear in the apical region, veins thin but conspicuous, venation as illustrated in text-fig. 126a. Ventral surface of the body reddish brown, with black patches in the lateral regions of prosternum. Legs brown.



TEXT-FIG. 126.—*Sunda rebeiroi*, sp. nov. a. Tegmen; $\times 20$. b. Male genitalia, right pygofer removed, dorsal view; $\times 88$. aed., aedeagus; as., anal segments; bp., basal plates; bp. p., basal plates prolongation; pr., parameres; pyg., pygofers; sg. p., sub-genital plates.

Male genitalia.—(Text-fig. 126b.) Of *Aconura*-type. Pygofers very much elongated. Sub-genital plates small, flat. Parameres large, narrow. Basal plates flattened, their prolongation long and flattened. Aedeagus very much elongated, wide at base beyond which it is deeply bent and extremely narrow.

Female genitalia.—Valve large, almost straight at the posterior margin. Pygofers relatively small, covered over with long stiff hairs. Ovipositor extremely long and stout, with a few stiff hairs near apex.

Length.—6.0 mm. (excluding ovipositor).

Holotype (♀).—Rampore Haut, W. Bengal; 2-3.III.31 (Coll. S. Ribeiro). In the Indian Museum (No. $\frac{5401}{H7}$).

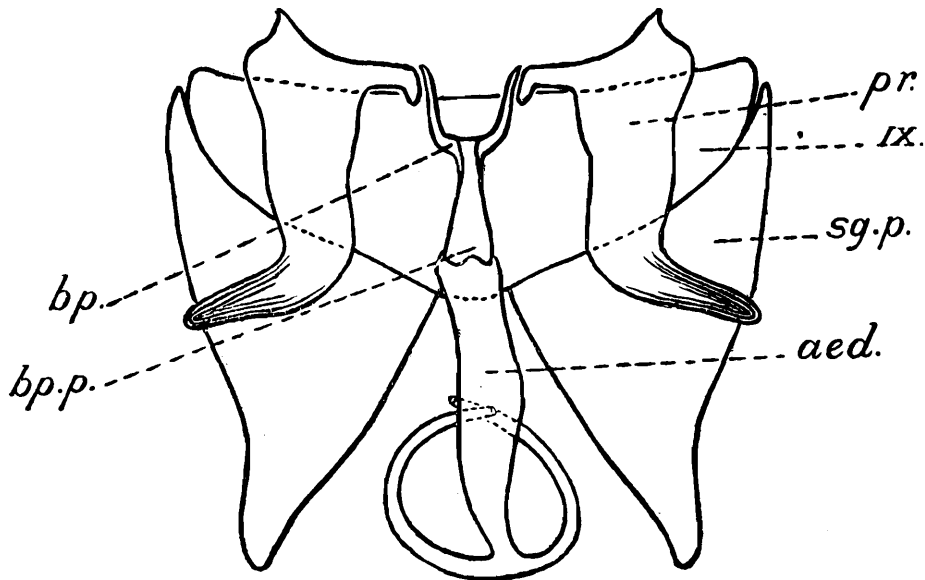
There is another female specimen without any locality label in the Indian Museum.

***Cicadula nausharensis*, sp. nov.**

(Pl. VIII, fig. 15.)

Vertex yellowish green, short, about half the breadth between the eyes, flat, anteriorly broadly rounded or almost angulate, medially longitudinally sulcate. Eyes fairly large, rectangular when seen from above, testaceous. Ocelli on the anterior margin of the vertex,

at short distance from the eyes, dark purple, conspicuous, visible from above. Face greenish yellow; frons medially streaked with white, the lateral areas brown. Pronotum green, long, almost twice the length of the vertex (5 : 3), the anterior margin broadly rounded, the posterior slightly concave. Scutellum greenish, about as long as the vertex, very deeply transversely impressed in middle. Tegmina long, narrow, pale, almost transparent; veins yellowish green, thin but conspicuous. Dorsal surface of the abdomen dark blue, posterior margins of some tergites yellow; ventral surface yellowish, marked with dark irregular patches here and there.



TEXT-FIG. 127.—*Cicadula nausharensis*, sp. nov. Male genitalia, pygofers removed, dorsal view; $\times 110$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *pr.*, parameres; *sg. p.*, sub-genital plates; IX, ninth abdominal sternite.

Male genitalia.—(Text-fig. 127.) Sub-genital plates triangular, leaf-like. Parameres large, flattened in the proximal two-thirds, narrow and turned outwards in the distal region. Basal plates small and rod-like, their prolongation fairly large and flattened. Aedeagus long, cylindrical, with a pair of large hook-like appendages at the apex.

Female genitalia.—Valve fairly broad, sinuate at the posterior margin. Pygofers moderately long, fairly broad and convex, almost smooth. Ovipositor moderately stout, hardly projecting beyond the posterior extremity of the abdomen.

Length.—Male 3.2 mm.; female 3.75 mm.

Holotype and Allotype.—Naushara (ca. 2,000 ft.), Salt Range, Punjab; 22.IV.31 (Coll. H. S. Pruthi). In the Indian Museum (Nos. $\frac{5402}{H7}$, $\frac{5403}{H7}$).

Paratypes.—Several specimens, collected along with the types, in the Indian Museum.

Distribution.—North India.

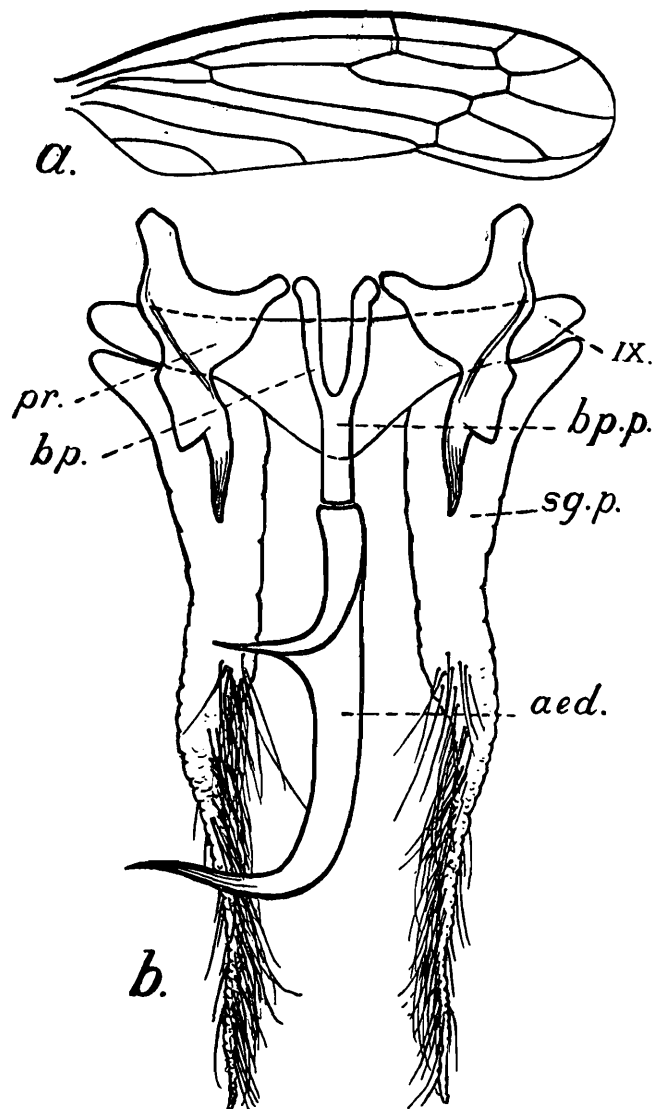
Naushara, common. Uchhali (ca. 2,800 ft.), about 10 miles from Naushara, six specimens; 16-18.IV.31 (H. S. Pruthi). Sohawa, district Jhelum, Punjab, one specimen; 14.IV.31 (H. S. Pruthi). Lyallpur, Punjab, two specimens at light; 10.X.29 (K. A. Rahman).

Remarks.—This species resembles *C. indica* in general shape of the body, but it is much larger and differs in the structure of the male genitalia.

***Thamnotettix brunnescens*, sp. nov.**

(Pl. VIII, figs. 16, 16a.)

Brown. Vertex more than half as long as the breadth between the eyes, raised, broadly rounded or sub-angular anteriorly, medially sulcate at base, with a dark brown spot on disc near each eye. Eyes large, dull purple or castaneous. Ocelli on the anterior margin of the vertex, close to the eyes, of the same colour as the eyes, conspicuous. Face brown, frons marked with purplish brown oblique stripes in the lateral regions. Pronotum about twice as long as the vertex, narrower than the head, slightly raised, the anterior margin broadly rounded, the posterior almost straight. Scutellum as long as the pronotum, with a large dark spot near each basal angle. Tegmina long, narrow, semi-transparent; veins thin, of the same colour as the tegmina, rather inconspicuous; venation as illustrated in text-fig. 128a, five apical and three ante-apical cells. Ventral surface of the body brown. Legs long and thin, the posterior tibiae very richly spinulose.



TEXT-FIG. 128.—*Thamnotettix brunnescens*, sp. nov. a. Tegmen; $\times 16$. b. Male genitalia, pygofer removed, dorsal view; $\times 92$. aed., aedeagus; bp., basal plates; bp. p., basal plates prolongation; pr., parameres; sg. p., sub-genital plates; IX, ninth abdominal sternite.

Male genitalia.—(Text-fig. 128b.) Sub-genital plates very long, narrow, covered with numerous long hairs in the distal one-third which is extremely narrow. Parameres small,

flattened, thick and hard at apices. Basal plates rod-like, their prolongation fairly long. Aedeagus styliform, fairly large.

Female genitalia.—Valve broad, posterior margin semicircular. Pygofers long and narrow, thickly covered with short but stiff hairs. Ovipositor stout, hardly projecting beyond the posterior extremity of the abdomen.

Length.—Female 5.0 mm. ; male a little smaller.

Holotype.—Mahanandi (800 ft.), foot of Nallamalai Hills, South India ; 12.VIII.29 (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5405}{H7}$).

Allotype.—Prema (800 ft.), foot of Nallamalai Hills ; 12-14.VIII.29 (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5406}{H7}$).

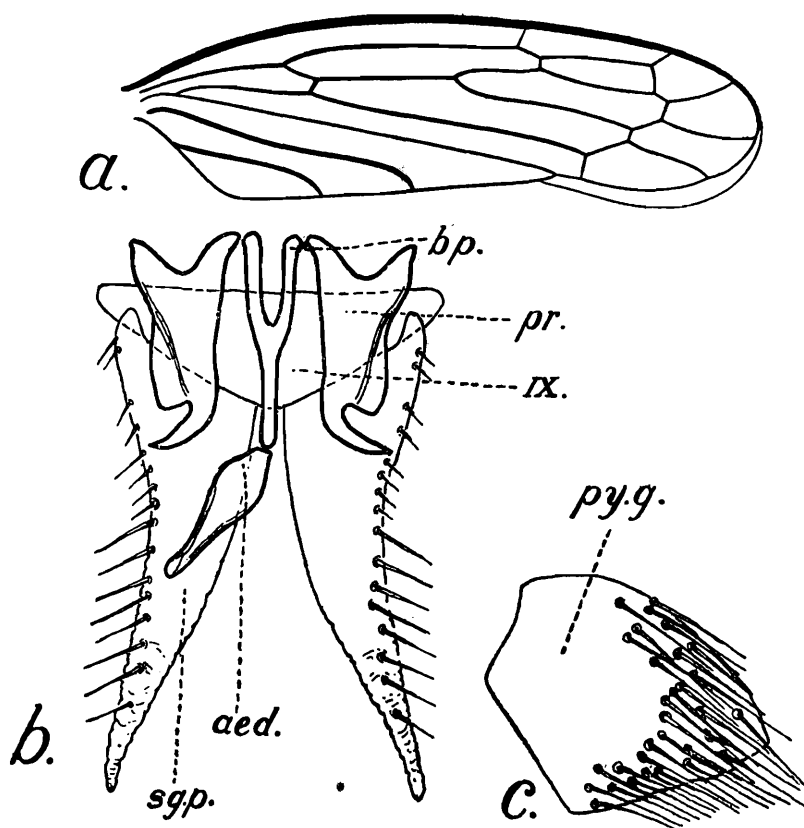
Paratypes.—Ten specimens in the Indian Museum from the Nallamalai Hills.

Distribution.—Nallamalai Hills, South India.

Thamnotettix nigricans, sp. nov.

(Pl. VIII, figs. 17, 17a.)

Vertex about half the breadth between the eyes, anteriorly broadly rounded, sulcate at base, castaneous with two pairs of black spots, one (small) near base and the other (large) on the anterior margin, the former pair sometime absent. Eyes moderately large. Face almost as long as broad, frons raised and flat ; clypeus black, narrow in the proximal region ;



TEXT-FIG. 129.—*Thamnotettix nigricans*, sp. nov. a. Tegmen ; $\times 16$. b. Male genitalia, pygofers removed, dorsal view ; $\times 64$. c. pygofer (part) ; $\times 58$. aed., aedeagus ; bp., basal plates ; pr., parameres ; pyg., pygofer ; sg. p., sub-genital plates ; IX, ninth abdominal sternite.

lorae flat, raised about the level of the genae, well marked and conspicuous, orange coloured. Pronotum dark brown ($\text{\textit{f}}$) or piceous ($\text{\textit{m}}$), with a row of black dots and irregular stripes near

the anterior margin in the female, about two and a half times as long as the vertex, finely transversely striate. The anterior margin rounded, the posterior concave. Scutellum about two-thirds the length of the pronotum, reddish brown with large black markings in the anterior half in the female, entirely piceous in the male. Tegmina long, narrow, dark grey; veins thick, black and conspicuous, venation of typical *Thamnotettix*-type (Text-fig. 129a), five apical and three ante-apical cells. Ventral surface of the body dark brown or almost black in the female, piceous in the male. Legs long, thin, dark brown in the female, the posterior tibiae dotted with black in both sexes, thickly spinulose.

Male genitalia.—(Text-fig. $\frac{1}{2}$ 129b & c.) Sub-genital plates long, narrow, gradually tapering in the distal region to pointed apices. Parameres about one-third the length of the sub-genital plates, almost of the same shape as the latter. Basal plates rod-like, their prolongation small. Aedeagus short, cylindrical, wider at base, narrow but blunt near apex.

Female genitalia.—Valve very large, rounded at the posterior margin. Pygofers long, narrow, fairly swollen, piceous, dark brown near the inner margin, with numerous stiff hairs in the posterior region. Ovipositor fairly stout, hardly projecting beyond the posterior extremity of the abdomen.

Length.—Female 5.5 mm.; male about 5.0 mm.

Holotype and *Allotype*.—Kodaikanal (7,000 ft.), South India. Date of collection not mentioned (Coll. *T V Campbell*); in the Indian Museum (Nos. $\frac{5407}{H7}$, $\frac{5408}{H7}$).

Paratypes.—Three specimens in the Indian Museum.

Distribution.—South India.

***Thamnotettix paraveinatus*, sp. nov.**

(Pl. IX, fig. 1.)

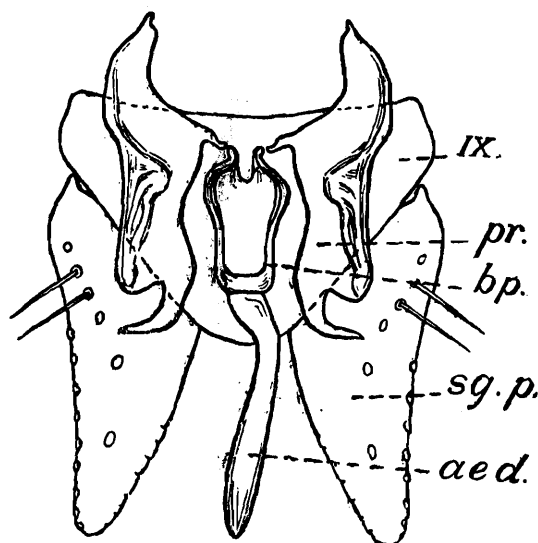
Fuscous. Vertex about as long as the breadth between the eyes, slightly deflexed in the anterior region, apically acute, medially sulcate at base, brown, with white streaks and spots here and there and a row of confluent black markings along the margins and a minute black spot near the inner margin of each eye. Face ochraceous, with dark brown patches and stripes all over. Pronotum slightly longer than the vertex, moderately globose, greyish with brown broad stripes; scutellum large, of the same colour as the pronotum. Tegmina much longer than the body in both sexes, fuscous, with a dark brown pigment deposited along the course of the veins which are thick, white and very conspicuous. Legs fuscous, spotted with black. Ventral surface of the body brown, dark brown or piceous (♀).

Length.—Male 3.5 mm.

Male genitalia.—(Text-fig. 130.) Pygofers moderately long, gradually tapering in the distal region. Sub-genital plates very much expanded in the proximal half, gradually tapering in the distal region. Basal plates very much reduced; their prolongation very long and flattened. Aedeagus long, cylindrical.

Female genitalia.—Valve deeply notched at the posterior margin. Pygofers narrow, with numerous stiff hairs in the posterior region. Ovipositor rather delicate, not extending beyond the posterior extremity of the abdomen.

Holotype.—Kodaikanal (7,000 ft.), Palni Hills, South India; 27-30.VI.29 (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5409}{H7}$).



TEXT-FIG. 130.—*Thamnotettix paraveinatus*, sp. nov. Male genitalia, pygofers removed, dorsal view; $\times 94$. *aed.*, aedeagus; *bp.*, basal plates; *pr.*, parameres; *sg. p.*, sub-genital plates; IX, ninth abdominal sternite.

Distribution.—This species seems to be very widely distributed. There are specimens of this species from Sikkim, Bengal, Mysore and Kodaikanal (South India) in the Indian Museum collection.

Remarks.—The species is closely allied to *T. veinatus* Pruthi, from which it can be distinguished by the structure of the genitalia.

Chlorotettix Van Duzee.

This genus is very common in America. Naude¹ described three species from South Africa. Hitherto the genus has not been recorded from India. I obtained a large number of specimens (unfortunately all females) of a species of *Chlorotettix* at Pusa last spring which is distinct from other species of the genus and is described as new below :—

Osborn's² diagnosis of the genus is as follows :—

“Vertex broad, usually broadly rounded or obtusely angled, a little longer at middle than next the eyes. Vertex rounding to front without a definite margin. Elytra long, appendix well developed, venation obscure. Usually of a uniform green or yellowish green, with few markings.”

Chlorotettix maculatus, sp. nov.

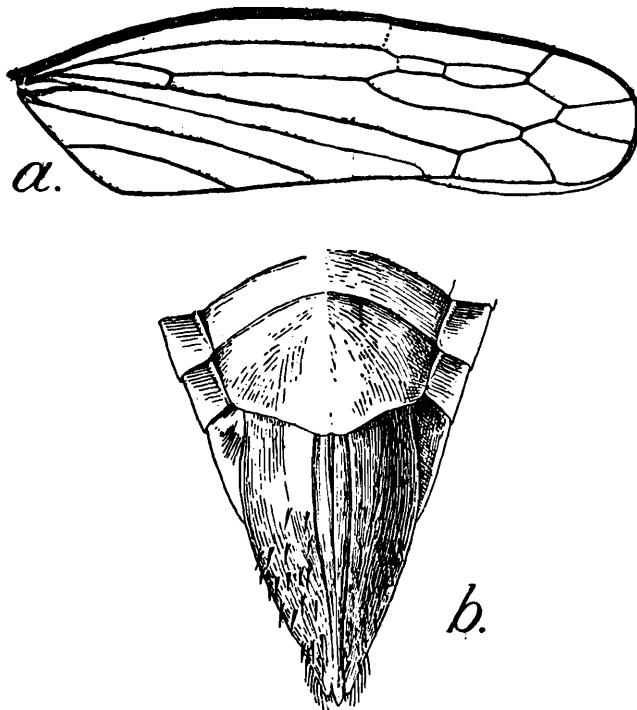
(Pl. IX, figs. 2, 2a.)

Yellowish green. Vertex about one-third the breadth between the eyes, slightly raised at base, gradually inclined anteriorly, smooth, shining yellowish green. Ocelli dark, at the

¹ Naude, *Dept. Agric. South Africa, Ent. Mem.*, No. 4, (1926).

² Osborn, *Ohio Biol. Sur. Bull.*, 14 [Vol. III, No. 4], (1928).

margin of the vertex, almost midway between the eyes and apex, visible from above. Face about as long as broad, raised in the upper region, flat in the lower, of the same colour as vertex; frons with oblique dark striae in the lateral areas. Eyes of moderate size. Pronotum large, more than twice as long as vertex, slightly narrower than the head, fairly globose, dark green except near the anterior margin where it is light yellowish. Scutellum



TEXT-FIG. 131.—*Chlorotettix maculatus*, sp. nov. a. Tegmen; $\times 26$. b. Female genitalia, ventral view; $\times 40$.

about two-thirds the pronotum, yellowish. Tegmina long, narrow, green, apices dark brown, with numerous minute black dots and large clear spots and areas scattered all over. Venation (Text-fig. 131a) of *Thamnotettix*-type. Ventral side of the body green. Legs fairly stout, tibiae pale, brownish.

Female genitalia.—(Text-fig. 131b.) Valve long, convex at the posterior margin. Pygo-fers globose, covered with small hairs, ovipositor moderately stout, not extending beyond the extremity of the abdomen.

Holotype (♀).—Pusa, Bihar; at light, 25.III.35 (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5410}{H7}$).

Allophleps Bergroth.

This genus was founded by Bergroth,¹ with *A. inspersa* Berg. as genotype, on the material collected by Prof. Lounberg in British East Africa. Bergroth distinguished *Allophleps* from *Thamnotettix* by the form of the vertex and the shape of the superior ante-apical cell of the tegmina. No other species of the genus seems to have been described hitherto. I have collected numerous specimens of a species from several parts of India which resembles *Allophleps inspersa* in the chief generic characters but has two cross veins between the

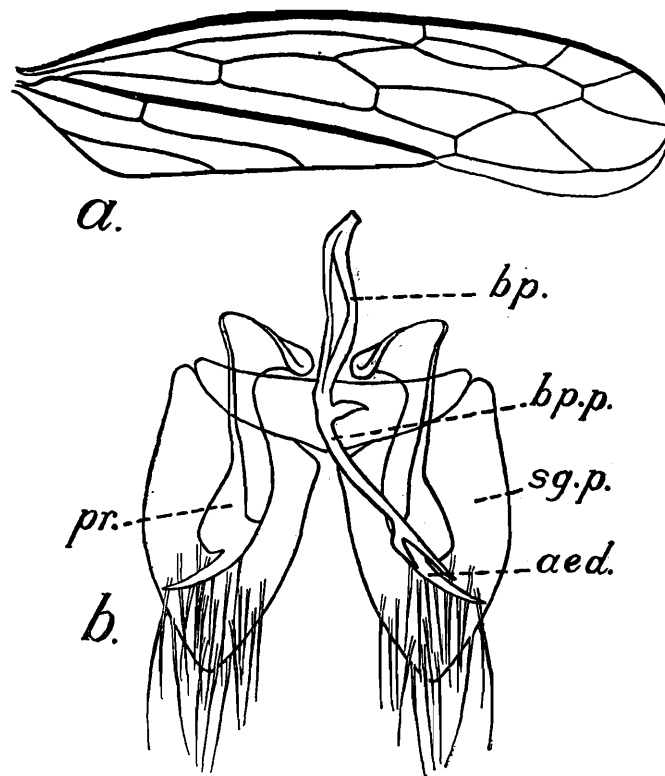
¹ Bergroth, *Ark. Zool.*, XII, No. 17, p. 27, (1920).

first and second sectors and thus exhibits a Deltocephaloid feature. The species is described as new below :—

Allophleps indicus, sp. nov.

(Pl. IX, fig. 3.)

Vertex about as long as the breadth between the eyes, flat, angulate at apex, medially longitudinally sulcate for two-thirds of its length, fuscous, with a comma-shaped marking on each side of the sulcus near the base, and a triangular pale area containing a pair of dark spots at apex. Eyes large, violaceous. Ocelli on the anterior margin of the head, close to the eyes and of the same colour as the latter. Face longer than broad, fuscous, frons prominent, raised especially in the upper region, with oblique pale striae in the lateral regions. Pronotum longer than vertex, almost flat, the anterior margin slightly convex, the posterior almost straight, brown, the posterior region dark grey. Scutellum large, brown, with large dark spot near each basal angle. Tegmina longer than the body in both sexes, fuscous, with some dark brown pigment deposited in the apical and claval regions, veins thick and prominent, venation as illustrated in text-fig. 132*a*, superior ante-apical cell of characteristic shape and sometimes very small.



TEXT-FIG. 132.—*Allophleps indicus*, sp. nov. a. Tegmen; $\times 24$. b. Male genitalia, pygofer removed, dorsal view; $\times 74$. aed., aedeagus; bp., basal plates; bp. p., basal plates prolongation; pr., parameres; sg. p., sub-genital plates.

Male genitalia.—(Text-fig. 132*b*.) Sub-genital plates very broad and leaf-like, with numerous long stiff hairs near the apices. Parameres elongated, narrow, stiff and pointed at the apices. Basal plates long, rod-like, their prolongation extremely long. Aedeagus small, styliform.

Female genitalia.—Valve large, rounded and slightly produced at the posterior margin. Pygofer narrow, covered all over with long stiff hairs, ovipositor delicate.

Length.—Female 4.0-4.5 mm.; male a little smaller and lighter in colour.

Holotype (♀).—Lyallpur, Punjab, at light; 10.X.29 (Coll. A. Rahman). In the Indian Museum (No. $\frac{5411}{H7}$).

Distribution.—North India.

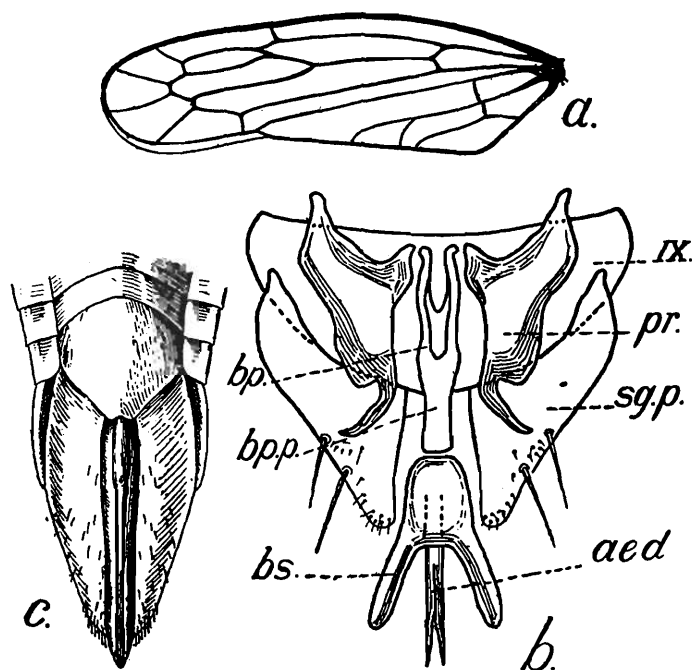
There are four other specimens from the type locality and numerous specimens from several other localities in the Indian Museum collection.

Cestius versicolor Dist.

(Pl. IX, figs. 4, 4a.)

The genus *Cestius* was erected by Distant¹ and consists of one species only, *viz.*, *Cestius versicolor*, the genotype, which was obtained at Pusa by Lefroy. As Distant's description of this species is rather incomplete and the illustrations appended by him are inadequate, the species is described in detail below. I collected a large number of specimens of both sexes of *C. versicolor* at Pusa in March last. They were attracted to light.

Vertex yellow, with a pair of minute black dots near base, anteriorly rounded, imperceptibly continuous with the face without the intervention of distinct margins. Ocelli on the anterior margin, near eyes, colourless but fairly conspicuous. Eyes fairly large, dark purple. Face one and a half times as broad as long, flat, distinctly sinuate below eyes, yellowish, smooth, with obscure oblique striations in the lateral regions. Pronotum greenish, about twice as long as the vertex, narrower than the head, moderately globose, anteriorly slightly convex, concave at the posterior margin. Scutellum greenish, about two-thirds the length of the pronotum. Tegmina long, extending beyond the tip of the abdomen in both



TEXT-FIG. 133.—*Cestius versicolor* Dist. a. Tegmen; $\times 15$. b. Male genitalia, pygofer removed, dorsal view; $\times 90$. c. Female genitalia, ventral view; $\times 30$. aed., aedeagus; bp., basal plates; bp. p., basal plates prolongation; bs., basal strut of the aedeagus; pr., parameres; sg. p., sub-genital plates; IX, ninth abdominal sternite.

sexes, semi-transparent, pale brown, with dark brown spots concentrated in three transverse rows, veins brown, venation as illustrated in text-fig. 133a, of *Thamnotettix*-type.

¹ Distant, *Faun. Brit. Ind., Rhynch.*, IV, p. 309 (1908).

Ventral surface of the body greenish yellow, with large dark patches in the region of the thorax; dorsal surface of the abdomen almost black.

Male genitalia.—(Text-fig. 133b.) Sub-genital plates small, triangular, with a few strong marginal hairs. Parameres flat except in the distal region where they are narrow and rod-like. Basal plates long, their prolongation very much flattened. Aedeagus small, with powerful basal struts.

Female genitalia.—(Text-fig. 133c.) Valve large, very much produced in the posterior direction. Pygofers long, narrow, fairly globose, with a few stiff hairs in the posterior region. Ovipositor moderately stout, slightly projecting beyond the extremity of the abdomen.

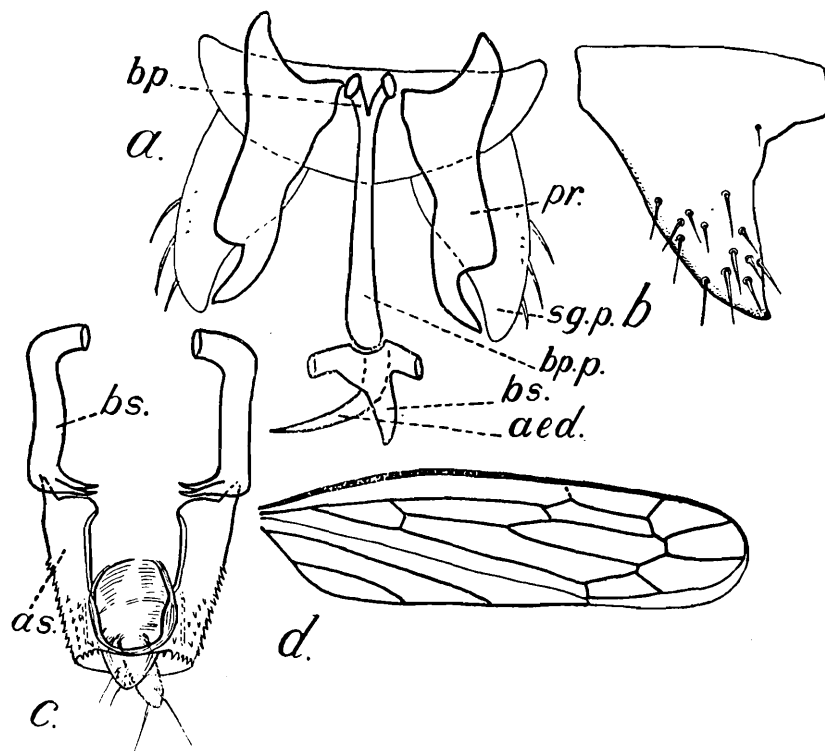
Length.—Female 4.50 mm.; male slightly smaller.

Monobazus grandis, sp. nov.

(Pl. IX, figs. 5, 5a.)

Monobazus was erected by Distant (*Faun. Brit. Ind., Rhynch.*, IV, p. 351) and the genotype was collected at Kurseong (E. Himalayas). No other species of the genus has been described so far. The new species which is described below was also obtained in the E. Himalayas at Gangtok by Col. F. M. Bailey.

Vertex slightly deflexed in the apical region, brownish, with numerous black patches and stripes; the lateral margins rounded. Ocelli pale, conspicuous, close to the eyes, visible from above. Face of the same colouration as vertex, lorae well marked off from the adjoining sclerites. Eyes chocolate colour. Pronotum greyish brown, covered all over with



TEXT-FIG. 134.—*Monobazus grandis*, sp. nov. a. Male genitalia, pygofers removed, dorsal view; $\times 65$. b. Pygofer; $\times 43$. c. Basal strut of aedeagus and anal segments d. Tegmen; $\times 13$. aed., aedeagus; as., anal segments; bp., basal plates; bp. p., basal plates prolongation; bs., basal strut of the aedeagus; pr., parameres; sg. p., sub-genital plates; IX, ninth abdominal sternite.

black markings. Scutellum with cream, orange and black spots arranged in a beautiful pattern. Tegmina long, narrow, dark grey, with several large bluish or creamy spots arranged

in rows; veins dark brown or piceous, conspicuous, venation of *Thamnotettix*-type (Text-fig. 134d). Body beneath brown, with extensive dark or piceous patches. Legs long, posterior tibiae thick and strongly spinulose.

Length.—Female 5.8 mm.

Breadth.—1.5 mm.

Male genitalia.—(Text-fig. 134a-c.) Pygofers short, slightly produced in the postero-ventral region. Sub-genital plates short, broad, leaf-like, with a few strong marginal hairs. Parameres larger than the sub-genital plates, flat. Basal plates very small, their prolongation extremely long. Aedeagus small, styliform, with very strong basal strut.

Holotype.—Gangtok (6,000 ft.), Sikkim; May, 1928 (Coll. *F. M. Bailey*). In the Indian Museum (No. $\frac{5412}{H7}$).

Paratype.—One male specimen in the Indian Museum.

There are two other slightly mutilated specimens (1♂, 1♀), collected along with the holotype and paratype specimens, in the Indian Museum collection.

Ophiola Edwards.

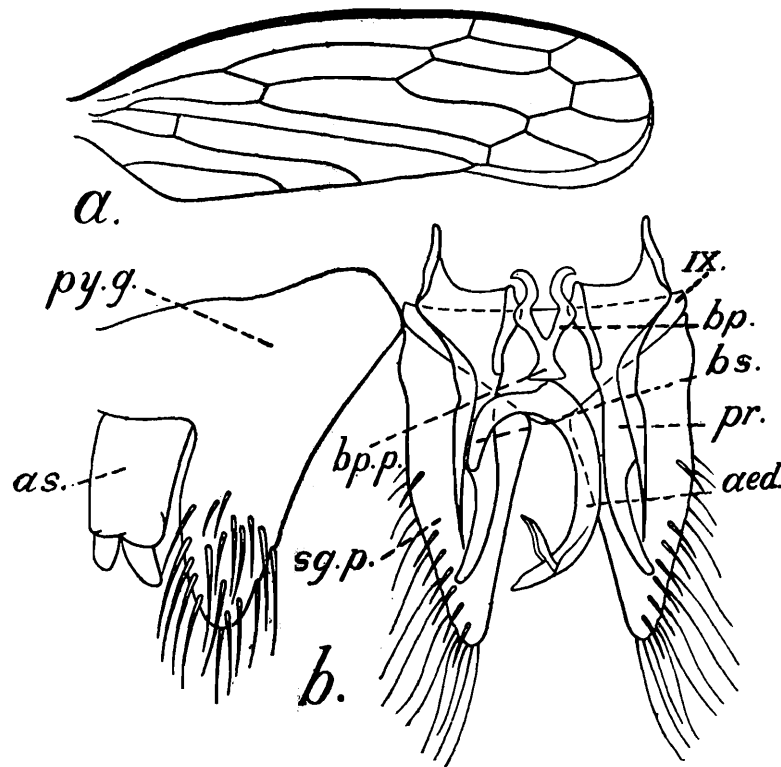
This genus was erected by J. Edwards (*Ent. Month. Mag.*, LVIII, 1922) to hold some species previously included under *Thamnotettix*, e.g., *T. striatula* Fall., *T. striatulella* Edw., etc. He distinguished the new genus from *Thamnotettix* chiefly by the appearance of the tegmina which with the dorsum are almost straight in *Ophiola* and consequently their apices only slightly overlap in repose. E. D. Ball in 1928 (*Bull. Brookley Ent. Soc.*, XXIII) transferred several species of *Athysanus* to this genus. No species of *Ophiola* has yet been described from India. Two new species of the genus from this country are described below, the specimens of which were kindly compared by Mr. W. E. China with the collection in the British Museum.

Ophiola bicolor, sp. nov.

(Pl. IX, figs. 6, 6a.)

This species shows distinct sexual dimorphism. The male is small, delicate and of dark colour, the female being large, robust and dark grey or ochraceous in colour. Vertex about half the breadth between the eyes, flat, medially faintly sulcate, anteriorly sub-angulate, dark grey in the female, almost piceous in the male, with a row of dark markings near the anterior margin and a pair of minute black dots near the base in both sexes. Face almost as long as broad, dark brown and marked with extensive black markings in the female, almost entirely piceous in the male; frons fairly raised, clypeus rectangular; lorae large and well marked. Eyes small. Pronotum slightly narrower than the head, about twice as long as the vertex, slightly raised, anteriorly almost rounded, the posterior margin straight, with a pair of minute black dots and an arcuate stripe of the same colour, sometimes broken into small markings, near the anterior margin, especially distinct in the female. Scutellum about half the length of pronotum, with two pairs of black dots, one minute near the medial line, the other large near the anterior margin. Tegmina longer than

the body in both sexes, very slightly overlapping at apices, ochraceous (♀) or piceous (♂), semi-transparent; venation of *Thannotettix*-type (Text-fig. 135a).



TEXT-FIG. 135.—*Ophiola bicolor*, sp. nov. a. Tegmen; $\times 16$. b. Male genitalia, right pygofer removed, dorsal view; $\times 60$. aed., aedeagus; as., anal segments; bp., basal plates; bp. p., basal plates prolongation; bs., basal strut of the aedeagus; pr., parameres; pyg., pygofers; sg. p., sub-genital plates; IX, ninth abdominal sternite.

Male genitalia.—(Text-fig. 135b.) Pygofers long, produced in the posterior direction, with numerous stiff hairs in the distal region. Sub-genital plates leaf-like, triangular. Parameres large, elongated and narrow in the distal region. Basal plates small, their prolongation short. Aedeagus large, curved, with a stout basal strut.

Female genitalia.—Valve very large, narrow and deeply concave at the posterior margin. Pygofers elongated and narrow, with a few long hairs in the posterior region. Ovipositor rather delicate.

Length.—Female 4.25 mm.; male 3.0 mm.

Holotype and Allotype.—Dayankund Nallah, below bridge between milestones 14 and 15 on the Dalhousie-Khajiar Road (ca. 8,000 ft.), Punjab; 9.V.27 (Coll. S. L. Hora). In the Indian Museum (Nos. $\frac{5413}{H7}$, $\frac{5414}{H7}$).

Paratypes.—Several specimens in the Indian Museum collection.

Distribution.—North India.

In addition to the types a large number of specimens were obtained by Dr. Hora from near Hurst Cottage, Bakrota Hill (7,000 ft.), Dalhousie.

I obtained several specimens of this species from Chhangla Gali (8,450 ft.), Hazara dist., N. W. Frontier Province, on 3rd October, 1928.

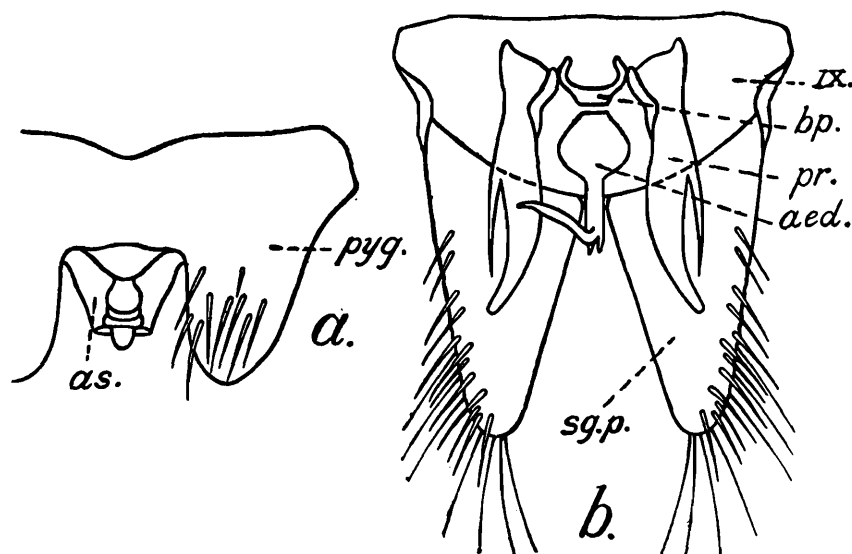
Remarks.—The above species is allied to the palaearctic species *O. striatula* Fall (see Edwards, *op. cit.*).

***Ophiola yatungensis*, sp. nov.**

(Pl. IX, fig. 7.)

This species shows less sexual dimorphism than *O. bicolor*. The male is dark ochraceous, whereas the female is lighter in colour, and the two sexes differ only slightly in size, the female as usual being bigger than the male.

Vertex about half the breadth between the eyes, anteriorly more angulate than in the above species, with a pair of irregular dark oblique stripes parallel to the lateral margins and one pair of black dots near the base in the female and two pairs in the male. Eyes small, dark, with a tinge of purple. Face dark ochraceous, with darker (♀) or piceous (♂) markings, frons with oblique black striae in the lateral regions. Pronotum slightly longer than the vertex (9 : 7), dark ochraceous, with some dark patches and spots near the anterior margin in the female, mottled all over with black in the male. Scutellum two-thirds the length of the pronotum, brown and with a pair of minute dots near the median line in the female, dark ochraceous and with a broad median dark stripe in the male. Tegmina comparatively shorter and more broad than those in the above species, very slightly extending beyond the tip of the abdomen; veins thick and conspicuous especially in the male. Ventral surface of the body and legs dark brown, with large black markings in the female, almost piceous in the male. Legs long and thin, posterior tibiae thickly spinulose.



TEXT-FIG. 136.—*Ophiola yatungensis*, sp. nov. a. Pygofers and anal segments flattened out; $\times 40$. b. Rest of the male genitalia; $\times 78$. aed., aedeagus; as., anal segments; bp., basal plates; pr., parameres; pyg., pygofers; sg. p., sub-genital plates; IX, ninth abdominal sternite.

Male genitalia.—(Text-fig. 136a & b.) Pygofers moderately produced in the posterior direction. Subgenital plates triangular, leaf-like, with numerous marginal hairs. Parameres of the same shape as in the above species but smaller. Basal plates very small. Aedeagus very wide, bulb-shaped in the proximal region, with a short appendage near the apex.

Female genitalia.—Resemble those in *Ophiola bicolor* except in the form of the valve which is longer and more notched.

Length.—Female 3.5 mm.

Holotype and *Allotype*.—Yatung (10,000 ft.), Tibet; 13.VII.1927 (Coll. *F. M. Bailey*).
In the Indian Museum (Nos. $\frac{5415}{H7}$, $\frac{5416}{H7}$).

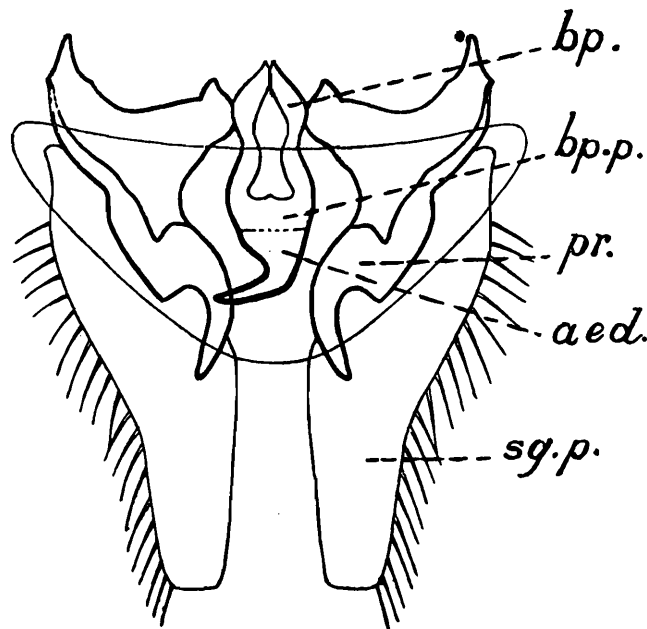
Paratypes.—Several specimens in the Indian Museum collection.

Distribution.—Tibet.

***Deltocephalus mota*, sp. nov.**

(Pl. IX, fig. 8.)

Short and stout. Fuscous or dark fuscous. Vertex about two-thirds the breadth between the eyes, flat, sub-angulate at apex, medially sulcate up to two-thirds its length, with an oblique piceous short stripe near apex, parallel to the lateral margins. Frons piceous, with oblique fuscous striation in the lateral regions; clypeus medially piceous; genae dark fuscous, with irregular piceous markings. Pronotum slightly longer than vertex (9:7), somewhat flattened, with dark arcuate irregular stripes in the anterior region. Scutellum two-thirds the length of prothorax, with a pair of minute but distinct spots near the anterior margin. Tegmina short and broad, not covering the extremity of the abdomen in either sex, fuscous, with a dark pigment deposited here and there along the course of the veins which are pale brown, thick and conspicuous; venation typically *Deltocephaloid*. Legs long. Under surface of the body piceous in both sexes.



TEXT-FIG. 137.—*Deltocephalus mota*, sp. nov. Male genitalia, pygofers removed, dorsal view; $\times 75$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *pr.*, parameres; *sg. p.*, sub-genital plates.

Male genitalia.—(Text-fig. 137.) Sub-genital plates long, narrow, truncate at apices, with numerous marginal hairs. Parameres large, stout, very much flattened in the proximal region. Basal plates curved, narrow, rod-like, their prolongation short. Aedeagus short, hard, hook-like.

Female genitalia.—Valve long and fairly broad. Pygofers short and broad, with a few short and stiff hairs near the apices. Ovipositor thin and rather delicate.

Length.—Male 3.5; female slightly bigger.

Holotype and *Allotype*.—Sandakphu (8,000-9,000 ft.), Sikkim, Eastern Himalayas; October, 1927 (Coll. *F. M. Bailey*). In the Indian Museum (Nos. $\frac{5417}{H7}$, $\frac{5418}{H7}$).

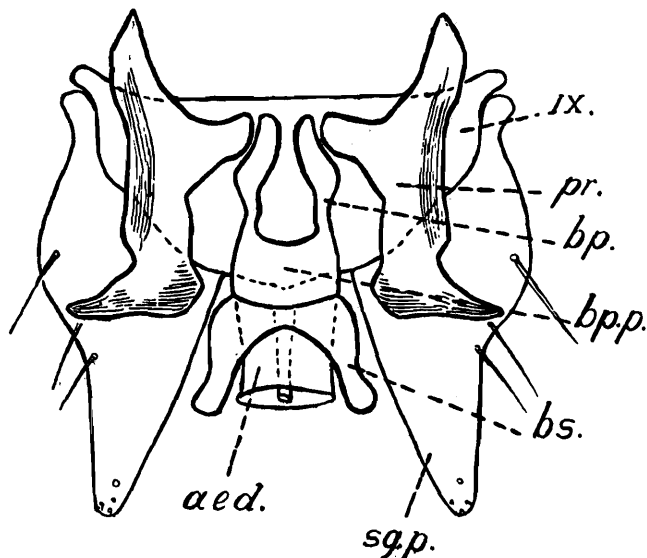
Paratypes.—Several specimens collected along with the holotype and allotype in the Indian Museum.

Distribution.—Eastern Himalayas.

***Deltocephalus gopii*, sp. nov.**

(Pl. IX, fig. 9.)

Body brown (♀) or dark brown (♂) on dorsal side, almost black on ventral side especially in the male. Vertex very slightly shorter than the breadth between the eyes, anteriorly angulate, medially sulcate for half of its length, with a dark spot on each side of the sulcus near base. Eyes fairly large; ocelli on the anterior margin of the head, close to the eyes, reddish, conspicuous. Face longer than broad, dark ochraceous (♀) or piceous (♂), frons with oblique pale striae in the lateral regions; apex of the clypeus and the outer margins of the lorae black. Pronotum almost as long as the vertex, greyish ochraceous, with an arcuate dark stripe in the anterior region, almost flat; the anterior margin rounded, the posterior almost straight. Scutellum short, deeply transversely impressed before middle, with a pair of minute dots in front of the impression. Tegmina brown, extending just up to the extremity of abdomen, almost truncate at the apices; veins thick, pale, margined with black here and there and very conspicuous; venation of the usual *Deltocephalus*-type. Legs brown or dark brown, with extensive dark patches.



TEXT-FIG. 138.—*Deltocephalus gopii*, sp. nov. Male genitalia, pygofers removed, dorsal view; $\times 124$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *bs.*, basal strut of the aedeagus; *pr.*, parameres; *sg. p.*, sub-genital plates; IX, ninth abdominal sternite.

Male genitalia.—(Text-fig. 138.) Sub-genital plates broad in the proximal half, abruptly narrowed in the distal region. Parameres large, flattened, narrow and pointed outwards at the apices. Basal plates small, their prolongation short, fairly expanded at the base of aedeagus, which is very short and wide, funnel-shaped, with a strong basal strut.

Female genitalia.—Valve small, rounded at the posterior margin. Pygofers fairly convex, with numerous stiff hairs in the distal region. Ovipositor rather delicate.

Length.—Female 3.7 mm.

Holotype and *Allotype*.—Kuldanna (7,006 ft.), Murree Hills, Punjab (Coll. H. S. Pruthi). In the Indian Museum (Nos. $\frac{5419}{H7}$, $\frac{5420}{H7}$).

Paratypes.—14 specimens collected near Murree at the same time as the type specimens, in the Indian Museum.

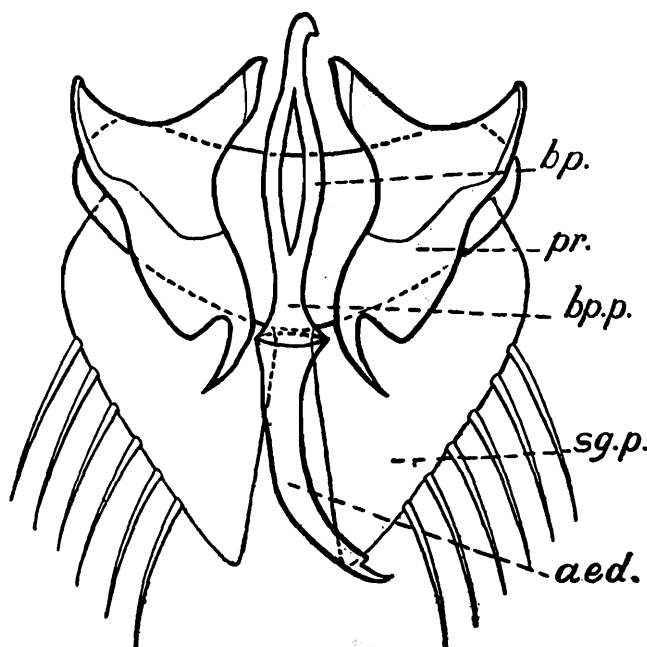
Distribution.—North-West Himalayas.

Remarks.—This species somewhat resembles the widely distributed palaeartic species *D. abdominalis* Fabr.¹, but it can be readily distinguished from the latter by the general colour and the size of the vertex and pronotum.

***Deltocephalus notatus*, sp. nov.**

(Pl. IX, fig. 10.)

Vertex about one-third longer than the breadth between the eyes, flat, anteriorly sub-acute, medially longitudinally sulcate for two-thirds of its length, pale brown, with a row of black minute but well-defined markings at the anterior margin and a pair of similar markings in the apical one-third, close to the median line. Eyes large, dark purple, ocelli colourless. Frons dark brown, with a medial longitudinal stripe and a series of oblique pale ochraceous striations in the lateral area; clypeus dark ochraceous, medially and near base marked with black; lorae margined with black; genae dark ochraceous, speckled all over with dark brown. Pronotum almost as long as the vertex, greyish ochraceous, with an irregular row of minute black markings near the anterior margin. Scutellum about two-thirds of pronotum, pale brown, with large dark spots near the basal angle, deeply



TEXT-FIG. 139.—*Deltocephalus notatus*, sp. nov. Male genitalia, pygofers removed, dorsal view; $\times 166$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *pr.*, parameres; *sg. p.*, sub-genital plates.

transversely impressed in middle. Tegmina much longer than the body in both sexes, narrow, brown, with a dark brown pigment thickly deposited near veins, which are pale

¹ Fabricius, *Syst. Rhynch.*, p. 98 (1803).

bluish, broad and conspicuous; numerous cross veins. Body beneath and legs brown (♂), dark brown or almost black (♀); tibiae minutely spotted with black.

Male genitalia.—(Text-fig. 139.) Sub-genital plates triangular, leaf-like, with a few strong marginal hairs. Parameres flattened. Basal plates very long, rod-like, united with each other at both ends. Aedeagus long, styliform, strong.

Female genitalia.—Valve large, deeply concave at the posterior margin. Pygofers narrow, with numerous stiff hairs in the distal region. Ovipositor delicate.

Length.—Female 3.50 mm.; male about 3.0 mm.

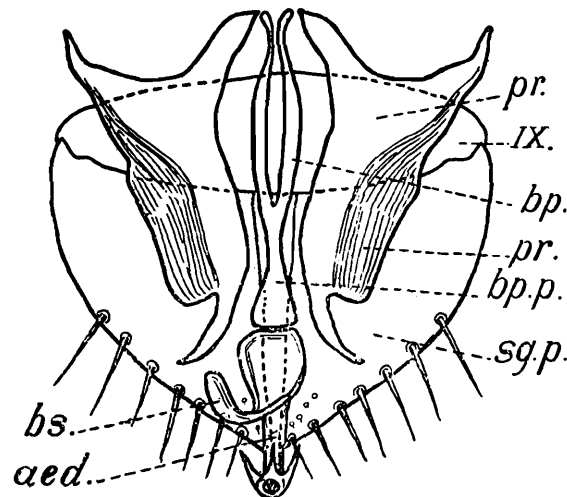
Holotype and Allotype.—Lyallpur, Punjab, at light, 10.X.29 (Coll. K. A. Rahman). In the Indian Museum (Nos. $\frac{5421}{H7}$, $\frac{5422}{H7}$).

Distribution.—North India.

***Paralimnus confuscus*, sp. nov.**

This species differs from other species of the genus *Paralimnus* Matsum, in the absence of the anterior sub-marginal pale line on the vertex and the slightly larger size of the pronotum. In the former character it resembles *Paralimnus umbratnus* Melich.,¹ which was originally included under *Thamnotettix* but transferred (provisionally) under *Paralimnus* by Distant, who did not personally examine the species. The present species, though it also lacks one of the generic characters referred to above, is however included as a new species in the genus *Paralimnus* till more material is available and is studied in detail.

Vertex slightly longer than half the breadth between the eyes, brown with a number of pale patches on disc which are arranged in two transverse rows in the anterior region, one between the two ocelli and the other just behind the apex; a medial longitudinal line, with a minute spot on each side at the base of the vertex dark brown. Eyes very large, dark vinous. Ocelli colourless, visible from above. Face about as long as broad across the eyes, brown, with dark brown transverse patches in the lateral regions of the frons.



TEXT-FIG. 140.—*Paralimnus confuscus*, sp. nov. Male genitalia, Pygofers removed, dorsal view; $\times 160$. aed., aedeagus; bp., basal plates; bp. p., basal plates prolongation; bs., basal strut of the aedeagus; pr., parameres; sg. p., sub-genital plates; IX, ninth abdominal sternite.

Pronotum about one and a half times as long as vertex, mottled all over with minute black dots. Scutellum large, ochraceous, with a large brown spot near each basal angle, a pair of

¹ Meliohar, *Hom. Faun. Ceyl.*, p. 185 (1903).

dark brown minute spots in middle and white patches on the margins. Tegmina brown, transparent, large, with three dark brown markings on the claval margin near the ends of the veins and a pair of large markings of the same colour on the costal margin in the apical region; veins dark brown, conspicuous, venation of *Thamnotettix*-type. Legs strong. Body brown.

Length.—Male 4.5 mm.

Male genitalia.—(Text-fig. 140.) Pygofers moderately long, with numerous hairs in the distal region. Sub-genital plates large, very much expanded, with a few strong marginal bristles. Parameres large, expanded, with the apices narrow and pointed. Basal plates long, rod-like, their prolongation of moderate length. Aedeagus small, comparatively very wide in the proximal region, uniformly narrow in the distal, with a strong basal strut; gonopore surrounded by a few spines.

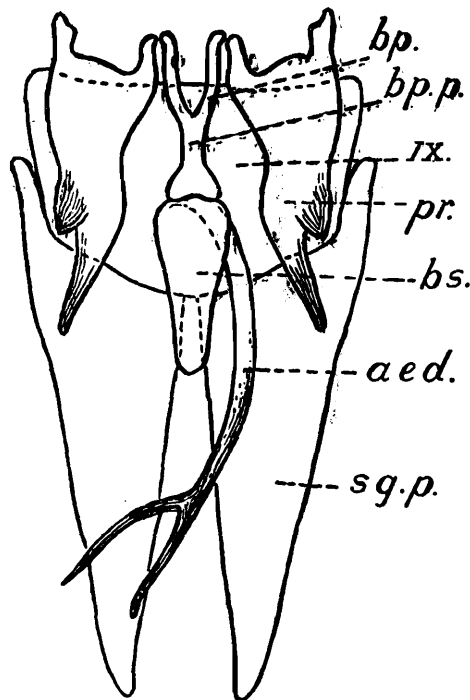
Holotype.—Guvvaluchervu (500 ft.), foot of Palkonda Hills, South India (Coll. H. S. Pruthi). In the Indian Museum (No. $\frac{5428}{B7}$.)

Distribution.—South India.

Zizyphoides indicus Dist.

(Pl. IX, figs. 12, 12a.)

The genus *Zizyphoides* was erected by Distant,¹ and includes two species. The genotype (*Z. indicus*) was described from Calcutta. Distant's description is very in-



TEXT-FIG. 141.—*Zizyphoides indicus* Dist. Male genitalia, pygofers removed, dorsal view; $\times 106$. *aed.*, aedeagus; *bp.*, basal plates; *bp. p.*, basal plates prolongation; *bs.*, basal strut of the aedeagus; *pr.*, parameres; *sg. p.*, sub-genital plates; IX, ninth abdominal sternite.

adequate, specially with reference to the male sex of the species. I collected a few male specimens last April at Pusa and a detailed description of this sex is given below :—

Vertex about as long as the breadth between the eyes, flat, anteriorly angulate, medially sulcate throughout its length, greenish with a dark marking near each eye. Ocelli on the

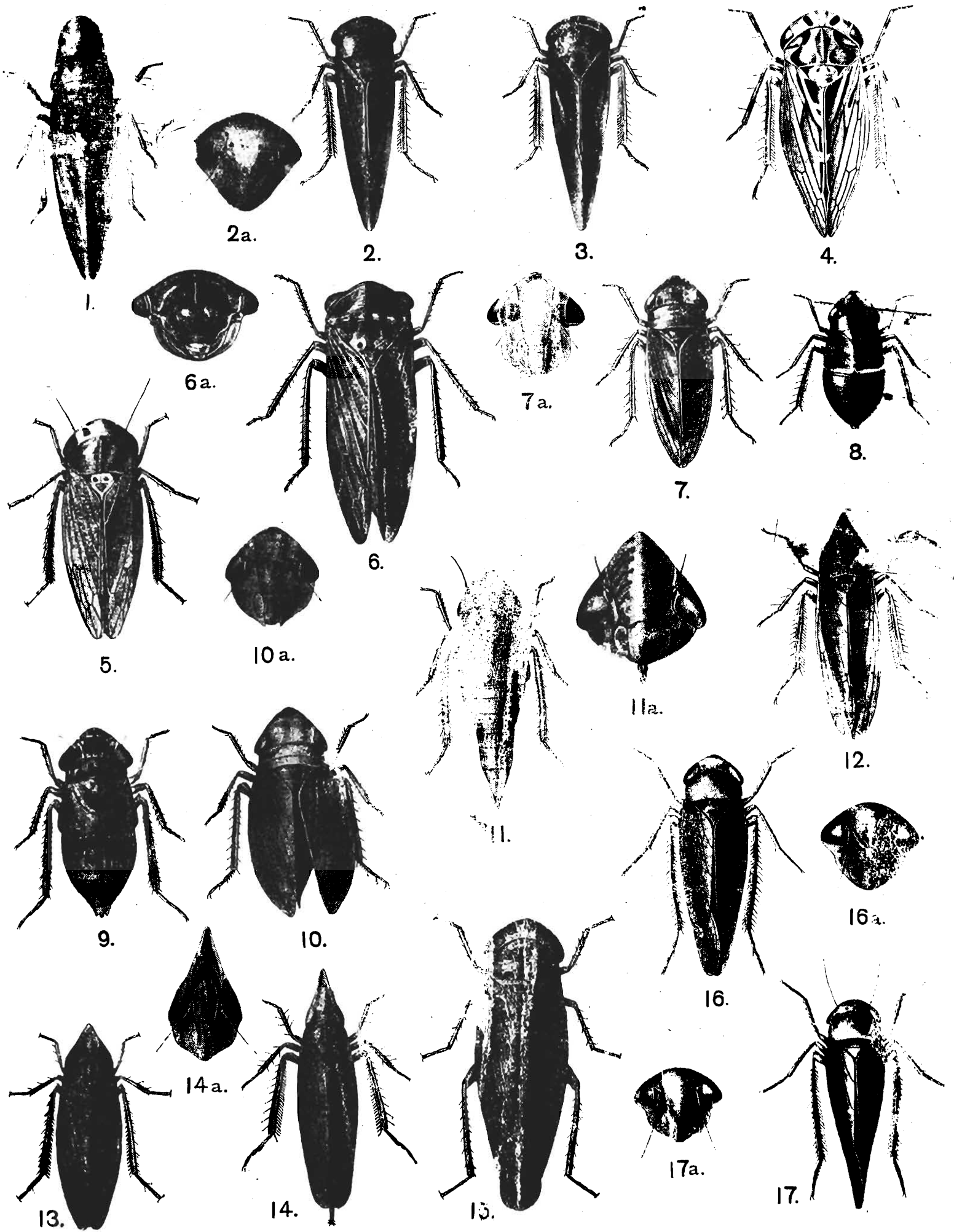
¹ Distant, *Faun. Brit. Ind. Rhynch.*, VII, p. 73 (1918).

lateral margins of vertex, midway between its apex and eyes, colourless but conspicuous. Eyes larger than those shown in Distant's figure. Face yellow, ochraceous near margin. Pronotum about as long as the vertex, finely transversely striate; convexly produced at the anterior margin, greenish with a row of dark spots near the anterior margin. Scutellum greenish. Tegmina long, pale brown, transparent, with three dark brown spots on the claval margin; veins inconspicuous. Legs pale brown. Body marked with green.

Male genitalia.—(Text-fig. 141b.) Sub-genital plates long, broad at base, gradually tapering in the distal region. Parameres small, flattened and thin, at the apices, however, thick, narrow and pointed. Basal plates rod-like, their prolongation fairly well developed. Aedeagus very long, cylindrical, bifurcated at apex, with a strong basal strut.

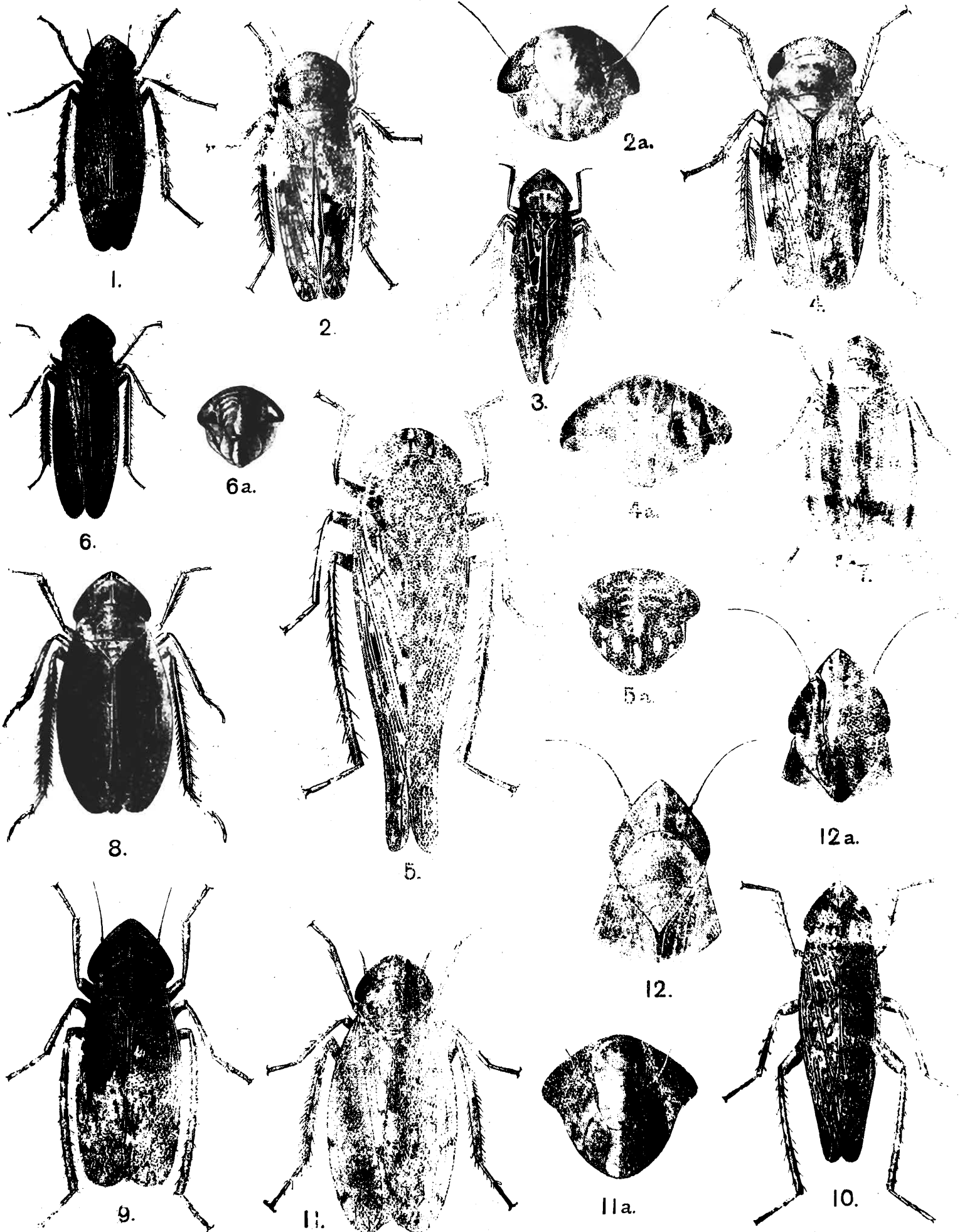
EXPLANATION OF PLATE VIII.

- Fig. 1.—*Petalocephala kempfi*, sp. nov. Female; $\times 6$.
Fig. 2.—*Idiocerus bimaculatus*, sp. nov. Male; $\times 10$.
Fig. 2a.—*Idiocerus bimaculatus*, sp. nov. Face of the male; $\times 15$.
Fig. 3.—*Idiocerus confuscus*, sp. nov. Male; $\times 9$.
Fig. 4.—*Agallia pararobustus*, sp. nov. Female; $\times 15$.
Fig. 5.—*Agallia sinuata*, M. & R. Female; $\times 12$.
Fig. 6.—*Parasitades baileyi*, sp. nov. Female; $\times 12$.
Fig. 6a.—*Parasitades baileyi*, sp. nov. Face of the female; $\times 18$.
Fig. 7.—*Gurawa intermediatus*, sp. nov. Female; $\times 9$.
Fig. 7a.—*Gurawa intermediatus*, sp. nov. Face of the female; $\times 14$.
Fig. 8.—*Chiasmus niger*, sp. nov. Male; $\times 9$.
Fig. 9.—*Chiasmus jagdishii*, sp. nov. Male; $\times 14$.
Fig. 10.—*Baileyus brachynotus*, sp. nov. Female; $\times 12$.
Fig. 10a.—*Baileyus brachynotus*, sp. nov. Face of the female; $\times 17$.
Fig. 11.—*Doratulina macrocephala*, sp. nov. Female; $\times 17$.
Fig. 11a.—*Doratulina macrocephala*, sp. nov. Face of the female; $\times 35$.
Fig. 12.—*Paternus khewrensis*, sp. nov. Female; $\times 9$.
Fig. 13.—*Paternus khewrensis*, sp. nov. Male; $\times 12$.
Fig. 14.—*Sunda ribeiroi*, sp. nov. Female; $\times 8$.
Fig. 14a.—*Sunda ribeiroi*, sp. nov. Face of the female; $\times 15$.
Fig. 15.—*Cicadula nausharensis*, sp. nov. Female; $\times 14$.
Fig. 16.—*Thamnotettix brunnescens*, sp. nov. Female; $\times 9$.
Fig. 16a.—*Thamnotettix brunnescens*, sp. nov. Face of the female; $\times 15$.
Fig. 17.—*Thamnotettix nigricans*, sp. nov. Female; $\times 8$.
Fig. 17a.—*Thamnotettix nigricans*, sp. nov. Face of the female; $\times 11$.



EXPLANATION OF PLATE IX.

- Fig. 1.—*Thamnotettix paraveinatus*, sp. nov. Female; ×12.
 Fig. 2.—*Chlorotettix maculatus*, sp. nov. Female; ×12.
 Fig. 2.—*Chlorotettix maculatus*, sp. nov. Face of the female; ×23.
 Fig. 3.—*Allophleps indicus*, sp. nov. Female; ×10.
 Fig. 4.—*Cestius versicolor*, Dist. Male; ×12.
 Fig. 4a.—*Cestius versicolor*, Dist. Face of the male; ×23.
 Fig. 5.—*Monobazus grandis*, sp. nov. Female; ×15.
 Fig. 5a.—*Monobazus grandis* sp. nov. Face of the female; ×23.
 Fig. 6.—*Ophiola bicolor*, sp. nov. Female; ×9.
 Fig. 6a.—*Ophiola bicolor*, sp. nov. Face of the female; ×14.
 Fig. 7.—*Ophiola yautungensis*, sp. nov. Female; ×12.
 Fig. 8.—*Deltocephalus mota*, sp. nov. Male; ×15.
 Fig. 9.—*Deltocephalus gopii*, sp. nov. Male; ×14.
 Fig. 10.—*Deltocephalus notatus*, sp. nov. Female; ×16.
 Fig. 11.—*Paralimnus confuscus*, sp. nov. Female; ×12.
 Fig. 11a.—*Paralimnus confuscus*, sp. nov. Face of the female; ×23.
 Fig. 12.—*Zizyphoides indicus*, Dist. Head and thorax of the male, dorsal view; ×15.
 Fig. 12a.—*Zizyphoides indicus*. Dist. Face of the male; ×15.



Indian Jassidae.