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Oriental Lophopidae: new taxa and taxonomic changes (Insecta: Hemiptera: Auchenorrhyncha: Fulgoroidea)

With 66 figures

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Abstract. Eight new species representing 5 genera in the planthopper family Lophopidae are described and illustrated from the Oriental Region. These are the following: *Lacusa orientalis* sp. n. (Laos, N. Vietnam, S.W. China: Yunnan); *Pitambara assamensis* sp. n. (N.E. India: Assam); *P. nigrofuscata* sp. n. (S.W. China: Yunnan); *P. rubrofasciata* sp. n. (N.E. India: Assam); *Podoschtroumpfa rubrolineata* sp. n. (Thailand); *Bisma indica* sp. n. (S. India); *B. longicephala* sp. n. (S. China: Hainan Island, Indochina); and *Aluma sabahensis* sp. n. (Malaysia: Sabah). Three new generic synonymies are proposed (senior synonym listed first): *Lacusa* STÅL = *Sarebasa* DISTANT; *Lophops* SPINOLA = *Corethrura* HOPE = *Serida* WALKER. Eight new or reinstated combinations are presented: *Lacusa celebris* (DISTANT) comb. n.; *Lophops balteatus* (DISTANT) comb. rev.; *L. elasmoscelis* (JACOBI) comb. n.; *L. excisus* (MELICHAR) comb. n.; *L. fuscovarius* (HOPE) comb. n.; *L. gorgopis* (FENNAH) comb. n.; *L. latens* (WALKER) comb. n.; *L. latens papuensis* (BAKER) comb. n.; and *L. latens sherwilli* (DISTANT) comb. n. Keys to the known species in the genera *Lacusa* STÅL and *Podoschtroumpfa* SOULIER-PERKINS are given. *Lacusa fuscofasciata* (STÅL) is reported from Thailand, and *Podoschtroumpfa magna* SOULIER-PERKINS from Vietnam and Thailand for the first time. Scanning electron micrographs of the antennal sensilla and wax glands of several lophopid species are provided.

Introduction

The planthopper family Lophopidae is one of the smallest of the twenty Fulgoroidea families currently recognized, including about 44 genera and 137 species. The family is essentially found in the Oriental and Australasian regions, with the exception of *Lophops* SPINOLA and *Elasmoscelis* SPINOLA which are also present in Africa, and *Carrionia* MUIR, found in the Neotropical region.

The Lophopidae can be recognized by the following combination of characters: head narrower than pronotum; vertex much narrower than its length, sometimes protuberant, lateral margins strongly elevated; frons longer than wide, with median carina in addition to angulate margins; clypeus with lateral carinae; rostrum short, stout, with apical segment short; pronotum and mesonotum short and broad, tricarinate; tegulae large; forewings with apical margin narrow, much shorter than anal margin, clavus not extending to apical part of forewing, precostal area usually with many oblique transverse crossveins; fore and middle tibiae usually compressed and expanded, second hind tarsomere very small and without apical row of spines; male genitalia with pygofer short, genital styles large, aedeagus robust with a complicated set of apical spines; and female genitalia incomplete, anal tube expanded apically to large leaf-like wax-secreting plates.

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Lophopidae is one of the most advanced groups and is the sister group of the Eurybrachidae within Fulgoroidea (EMELJANOV, 1991). The monophyly of the Lophopidae has been well established. The expanded apex of anal tube, absence of gonocoxae IX, and lack of gonospiculum support monophyly of the family Lophopidae (SOULIER-PERKINS & BOURGOIN, 1997).

Several lophopids are of economic importance (WILSON & O'BRIEN, 1986; WILSON & CLARIDGE, 1991). *Pyrilla perpusilla* (WALKER) is a major pest of sugarcane and rice in India (BRAR & BAINS, 1979; RAHMAN & NATH, 1940; KUMARASINGHE & WRATTEN, 1996) and *Zophiuma lobulata* GHOURI causes injury to coconut palms in Papua New Guinea (SMITH, 1980). *Pitambaria radians* KIRBY is found on bamboo in Sri Lanka (DISTANT, 1906).

The only comprehensive treatment for Oriental Lophopidae were that of DISTANT (1906, 1916) dealing with the fauna of India, Sri Lanka and Burma and MELICHAR (1915) in his synopsis of world genera. There is no modern revisionary work at any taxonomic level.

In the present paper I describe eight new species in five genera and propose three new generic synonymies and eight new or reinstated combinations. The antennal sensilla, pretarsus, and wax glands in several lophopid planthoppers were examined with scanning electron microscopy and the scanning electron micrographs (Figs. 1–16) are provided to draw attention to further future study on these character systems, since they may be of phylogenetic significance.

Materials and methods

The specimens studied in the course of this work are deposited in the following institutions, whose names are abbreviated in the text as follows:

- AMNH – American Museum of Natural History, New York, USA;
- BMNH – The Natural History Museum (formerly British Museum, Natural History), London, UK;
- BPBM – Bernice P. Bishop Museum, Honolulu, Hawaii, USA;
- CAS – California Academy of Sciences, San Francisco, California, USA;
- CAUIC – China Agricultural University Insect Collection, Beijing, China;
- HU – Laboratory of Systematic Entomology, Hokkaido University, Sapporo, Japan;
- IZCAS – Institute of Zoology, Chinese Academy of Sciences, Beijing, China;
- NCSU – Department of Entomology Insect Collection, North Carolina State University, Raleigh, North Carolina, USA;
- NU – Department of Biology Insect Collection, Nankai University, Tianjin, China;
- NWAU – Entomological Museum, Northwestern Agricultural University, Shaanxi, China;
- SIE – Shanghai Institute of Entomology, Chinese Academy of Sciences, Shanghai, China;
- SMTD – Staatliches Museum für Tierkunde, Dresden, Germany;
- TMNH – Tianjin Museum of Natural History, Tianjin, China;
- USNM – [US National Museum] National Museum of Natural History, Smithsonian Institution, Washington, DC, USA.

The structural terminology followed is that of KRAMER (1950).

Scanning electron micrographs were taken with a Zeiss DSM 950 microscope. Specimens for SEM were air-dried, mounted on stubs with double-sided sticky tape and then coated with carbon and gold-palladium.

Descriptive taxonomy

Summary of nomenclatural changes established in this paper

Aluma DISTANT, 1909
sabahensis, sp. n.

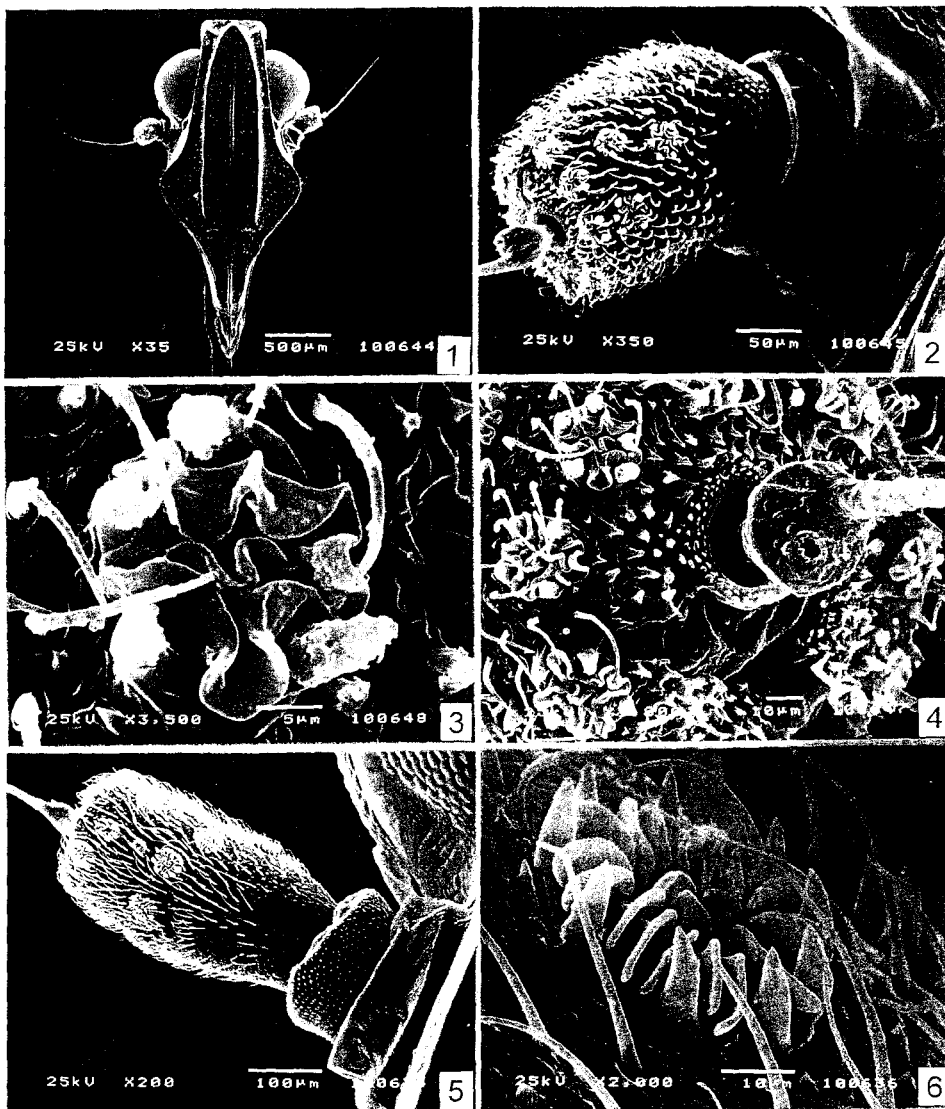
- Bisma* DISTANT, 1906
greeni DISTANT, 1906
indica, **sp. n.**
longicephala, **sp. n.**
- Lacusa* STÄL, 1862
Sarebasa DISTANT, 1909, **syn. n.**
celebris (DISTANT, 1909), **comb. n.**
fuscofasciata STÄL, 1854
orientalis, **sp. n.**
- Lophops* SPINOLA, 1839
Corethrura HOPE, 1843, **syn. n.**
Serida WALKER, 1857, **syn. n.**
balteatus (DISTANT, 1909), **comb. rev.**
elasmoscelis (JACOBI, 1944), **comb. n.**
excisus (MELICHAR, 1915), **comb. n.**
fuscovarius (HOPE, 1843), **comb. n.**
gorgopis (FENNAH, 1978), **comb. n.**
latens (WALKER, 1857), **comb. n.**
latens papuensis (BAKER, 1925), **comb. n.**
latens sherwilli (DISTANT, 1912), **comb. n.**
- Pitambara* DISTANT, 1906
assamensis, **sp. n.**
nigrofuscata, **sp. n.**
rubrofasciata, **sp. n.**
- Podoschtroumpfa* SOULIER-PERKINS
rubrolineata, **sp. n.**

Genus *Lacusa* STÄL

- Lacusa* STÄL, 1862: 309; ATKINSON, 1886: 42; DISTANT, 1906: 323; MELICHAR, 1915: 354; MUIR, 1930: 478; METCALF, 1955: 32; CHOU *et al.*, 1985: 125, 127. Type species: *Elasmoscelis fuscifasciata* STÄL, 1854: 248, by monotypy.
- Sarebasa* DISTANT, 1909: 169; MELICHAR, 1915: 356, 369; MUIR, 1930: 478; METCALF, 1955: 34. Type species: *Sarebasa celebris* DISTANT, 1909: 170, pl. 11, figs. 11, 11a, by original designation and monotypy. **New synonymy.**

Diagnosis: Head short, narrower than pronotum; vertex short and slightly broad, broader than long and shorter than pronotum, anterior margin straight in dorsal aspect and not produced anteriorly beyond proximal margin of eyes, posterior margin arched anteriorly, lateral margins carinate, with an obsolete median longitudinal carina; frons a little amplified basally, lateral margins carinate, with distinct sublateral carinae which are fused apically and then connected to median carina of vertex, with or without a faint median carina; postclypeus centrally and laterally carinate. Antennae with scape very small, short and ring-like, pedicel distinct and cylindrical. Rostrum short, not passing hind coxae, apical segment short. Pronotum short, slightly longer than vertex, truncate at base, rounded anteriorly behind vertex, tricarinate on disc, lateral areas curved down. Mesonotum tricarinate on disc. Forewings somewhat ample, outer and inner margins nearly parallel, broadly round at apex, precostal area moderately broad with many oblique transverse parallel crossveins; hindwings slightly narrower than forewings. Legs of moderate length, fore femora and tibiae compressed laterally, sometimes strongly foliaceously dilated, hind tibiae gradually slightly dilated towards apex, with 3 lateral spines and 3–4 pecten rows with more than 70 small spines apically, hind tarsomere I incrassate, robust, with a dense vestiture of adhesive setae ventrally and a strong apical spine on each side and more than 15 small apical spines (more than 10 outside, less than 5 inside), hind tarsomere II very small.

Remarks: *Lacusa* STÄL can be distinguished from other Oriental lophopid genera by the following combination of characters: hind tibiae with 3 lateral spines and numerous small apical spines; hind tarsomere I incrassate, with a dense vestiture of adhesive setae ventrally and many



Figs. 1–6. *Pitambara dawnana* DISTANT: 1, head, ventral view; 2, antenna; 3, a sensory plaque organ; 4, apex of pedicel; *Bisma longicephala* sp. n.: 5, antenna; 6, a sensory plaque organ.

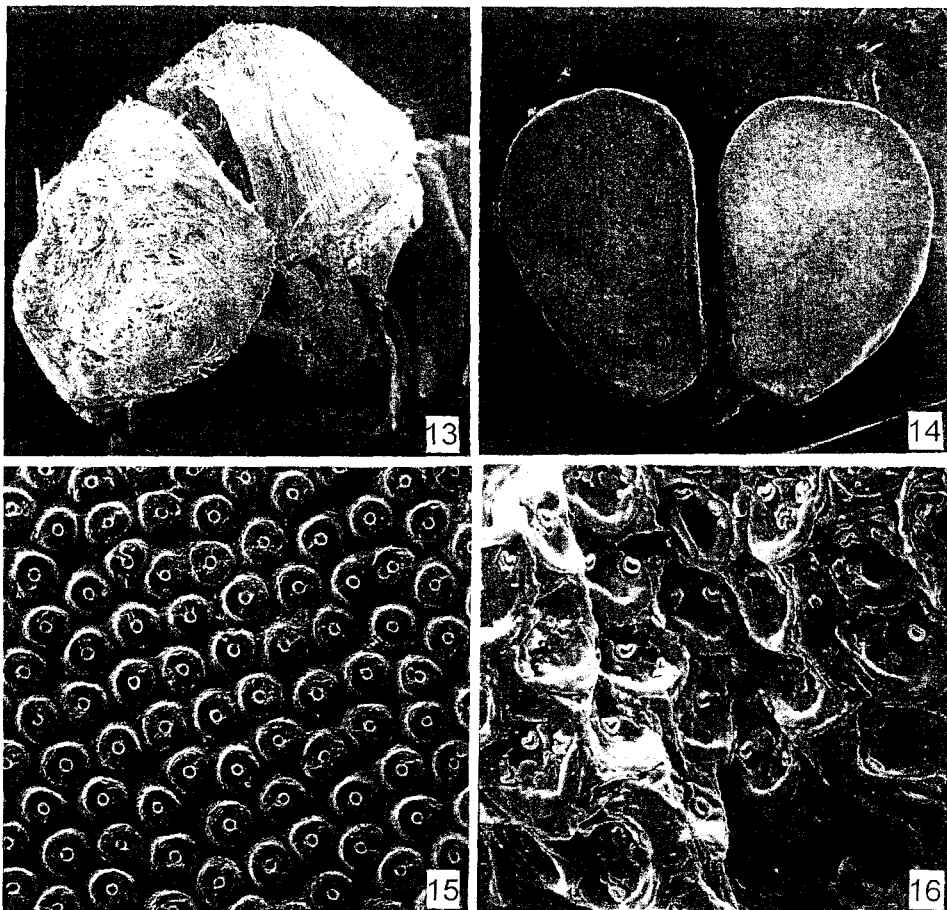
small apical spines; and vertex short, broader than long, anterior margin straight, not produced anteriorly beyond proximal margin of eyes. It differs from *Pitambara* DISTANT in the vertex shorter than broad with its anterior margin straight.

Included species and distribution: Three species; northeast India, south and southwest China, Indochina, Malay Peninsula and north Borneo (new record).

Discussion: The monotypic genus *Sarebasa* was established by DISTANT (1909) to contain *S. celebris* DISTANT from Selangor, Malay Peninsula. I have examined the holotype of *S. celebris* DISTANT at the BMNH and a series of specimens of *Lacusa fuscofasciata* (STÄL) from northeast



Figs. 7–12. *Zophiuma lobulata* GHAURI: 7, surface of pedicel; 8, a sensory plaque organ; 9, Bourgoin organ; *Lacusa fuscofasciata* (STÄL): 10, a sensory plaque organ; *Pyrilla sinica* LIANG: 11, adhesive setae on ventral surface of metatarsomere I; 12, same (after LIANG, 1997).



Figs. 13–16. *Pyrilla sinica* LIANG: 13, abdominal apex of an adult female, showing extruded wax threads (after LIANG, 1997); 14, wax plates (modified anal segment) of an adult female (after LIANG, 1997); 15, wax glands on wax plates (after LIANG, 1997); *Lophops angustipennis* STÅL: 16, wax glands of nymph.

India and south and southwest China and am of the opinion that the minor differences do not warrant the recognition of two separate genera.

Key to species of *Lacusa*

1. Body smaller, length 7.5–9.5 mm; frons without median carina; fore femora and tibiae strongly foliaceously dilated; forewings crossed by three broad piceous fasciae; male genitalia as in figures 18–22; N.E. India, N. Burma, N. Thailand, S. China (Yunnan, Guizhou, Guangdong and Hainan). *fuscofasciata* (STÅL)
- Body larger, length greater than 12.5 mm; frons with faint median carina; fore femora and tibiae moderately dilated; forewing colour pattern not as above. 2
2. Frons with 2 piceous brown linear transverse spots in central area; genae with a piceous brown oblique transverse fascia in subapical area; postclypeus and lora piceous brown; Malay Peninsula and north Borneo. *celebris* (DISTANT)

- Frons with 4 blackish brown spots in central area; genae without oblique transverse fascia in subapical area; postclypeus and lora pale luteous, the former with 2 longitudinal, subapically broken, fuscous brown fasciae along middle carina; male genitalia as in figures 23–27; Laos, N. Vietnam, S.W. China (Yunnan). *orientalis* sp. n.

Lacusa fuscofasciata (STÅL) (Figs. 10, 18–22)

Elasmoscelis fuscofasciata STÅL, 1854: 248.

Cixius eminens WALKER, 1858: 42. Holotype ♀, India (BMNH) [examined]. [Synonymized by ATKINSON, 1886: 42.]

Lacusa fuscofasciata (STÅL); STÅL, 1862: 309; ATKINSON, 1886: 42; DISTANT, 1906: 324, fig. 159; MELICHAR, 1915: 355, fig. 10; METCALF, 1955: 33.

Lacusa yunnanensis CHOU & HUANG in CHOU *et al.*, 1985: 128, 137, fig. 119-a,b. Holotype ♀, China 'Yunnan' (NWAU) [examined]. [Synonymized by LIANG, 1996: 147.]

Diagnosis: Relatively small species, length: ♂, 7.5–8.8 mm; ♀, 8.0–9.5 mm. Head pale luteous, suffused with ochraceous brown or piceous brown; frons with short piceous transverse fasciae in lateral areas; genae with extreme base and a broad oblique transverse fascia crossing ocellus piceous; postclypeus and lora ochraceous brown to piceous brown; anteclypeus pale luteous with basal lateral areas ochraceous brown to piceous brown; rostrum ochraceous; pronotum and mesonotum ochraceous brown, with piceous brown suffusion; thorax beneath ochraceous brown, suffused with piceous brown; fore and middle legs blackish brown, speckled with luteous; hind legs luteous, femora suffused with piceous, tibiae with base and apex piceous; forewings semi-opaque, venation sparingly and irregularly spotted with piceous, costal areas with some linear oblique piceous spots, disk crossed by three broad piceous fasciae, the first oblique before middle, the second and third oppositely oblique and united at posterior margin, apical margin either completely or maculately piceous; hindwings semihyaline, apical and posterior margins pale fuscous; abdomen piceous brown.

Structural characters as in generic diagnosis. Legs with fore femora and tibiae relatively short and strongly foliaceously dilated; frons without median carina.

Male genitalia: Pygofer (Fig. 18) short in lateral aspect; anal tube (Figs. 18, 19) long, apical part expanded laterad, extended posteroventrally, and forked in caudal view; anal styles (Fig. 18) very short and small; genital styles (Fig. 20) short and broad, dorsolateral hook near posterior margin; aedeagus (Figs. 21, 22) with 4 strong, spinose processes, two situated posterolaterally and directed dorsally and two situated lateroventrally and directed posteriorly in lateral aspect.

Remarks: This species was adequately described and illustrated by DISTANT (1906) and MELICHAR (1915). It can easily be recognized by its relatively small size, legs with fore femora and tibiae strongly foliaceously dilated, and the distinct markings on forewings.

This species has been recorded from India, Burma, and China (Yunnan, Guizhou, Guangdong, Hainan) (LIANG, 1996). I here provide new locality records in Thailand, India and Nepal.

Distribution: N.E. India, Nepal (new record), north Burma, south China (Yunnan, Guizhou, Guangdong, Hainan), north Thailand (new record).

Type specimens examined: Holotype ♀ of *Cixius eminens* WALKER, [small round white label with green margin] Type; [underside] Ind.; [WALKER's handwriting] *eminens*; 68 4 (BMNH). Holotype ♀ of *Lacusa yunnanensis* CHOU & HUANG, 1985), CHINA, YUNNAN: Xishuangbanna, Menglun, 21–30.iv.1974 (I. CHOU, F. YUAN & Y.-Y. HU) (NWAU).

Other specimens examined: **Thailand**: 1 ♂, E. slope, Doi Sutep, 260 m, 15.vii.[19]62 (E. S. ROSS & D. Q. CAVAGNARO) (CAS). **India**: 1 ♂, Assam, Sadiya, 13.ii.1944 (D. E. HARDY) (USNM). **Nepal**: 1 ♂, Narayani Tarai Forest, Pathraia, 300 m, 9–10.ix.1983 (HU). **China**: 1 ♀, Yen-ping, 13.ix.1917, Ac. 5148 (AMNH). E. GUANGDONG [KWANTUNG]: 1 ♀, Yim Na San, 17.vi.1936 (J. L. GRESSITT) (NCSU). GUIZHOU: 2 ♂♂, Huangguoshu, 24.vii.1958 (D.-Y. BI & REN) (SIE). HAINAN: 1 ♂, Ta Hau, 7.vii.1935 (J. L. GRESSITT) (NCSU); 1 ♀, Yinggen, 200 m, 8.vii.1960 (C.-Q. LI) (IZCAS). YUNNAN: 1 ♂, Cheli, 620 m, 8.iv.1957 (L.-C. ZANG); 1 ♂, Hekou, Xiaonanxi, 200 m, 8.vi.1956 (K.-R. HUANG *et al.*); 1 ♂, 765 km S of Kunlun highway, 1000 m, 26.iv.1957 (F.-J. PU); 1 ♀, same locality, but 1050 m, 26.iv.1957 (Q.-Z. LIANG); 1 ♂, Mangshi City, 900 m, 18.v.1955 (V. POPOV); 1 ♂, 1 ♀, Xiaomengyang, 850 m, 2.iv. & 4.v.1957 (S.-Y. WANG); 2 ♂♂, same locality, but 3.iv.1957 (L.-C. ZANG); 2 ♂♂, Xishuangbanna, Menga, 1050–1080 m, 17.20.viii.1958 (F.-J. PU); 1 ♀, same locality, but 7.viii.1958 (S.-Y. WANG); 1 ♂, Xishuangbanna, Menghun, 750 m, 9.vi.1958 (Y.-R. ZHANG); 1 ♂, Xishuangbanna, Yunjinghong, 850 m, 26.vi.1958 (L.-Y. ZHENG) (all in IZCAS).

Lacusa celebris (DISTANT), **comb. n.**

Sarebasa celebris DISTANT, 1909: 170, pl. 11, figs. 11, 11a; MELICHAR, 1915: 370, fig. 16; METCALF, 1955: 34. Holotype ♂, Malay Peninsula (BMNH) [examined].

Diagnosis: Relatively large species, length: ♀, 13.6 mm. Head pale luteous, suffused with piceous brown; vertex with base and lateral margins (excluding basal angles) piceous brown; frons with 2 linear transverse spots in central area (one in middle and another near base) and about 10 linear transverse spots in lateral areas piceous brown; genae with an oblique transverse fascia in subapical area and the area surrounding ocellus piceous brown; postclypeus and lora piceous brown; anteclypeus ochraceous with piceous brown suffusion; rostrum ochraceous; pronotum ochraceous, posterior and lateral margins suffused with fuscous brown, a series of small spots at posterior margin fuscous brown area ochraceous; mesonotum ochraceous; thorax beneath fuscous brown, with ochraceous suffusion; fore and middle legs fuscous brown or piceous, middle legs much paler, spots on fore and middle tibiae ochraceous or pale luteous, hind legs ochraceous or pale luteous, hind tibiae with apex fuscous; forewings piceous, a subbasal transverse fascia, a large spot on disk of corium, a series of transverse linear spots on costal and apical areas whitish ochraceous and semihyaline; hindwings hyaline, veins and broad apical and outer margins fuscous; abdomen fuscous brown, segmental margins ochraceous.

Structural characters as in generic diagnosis. Legs with fore femora and tibiae relatively elongate, moderately, but not foliaceously dilated; frons with median carina.

This species was adequately described and illustrated by DISTANT (1909).

Distribution: Malay Peninsula and north Borneo (new record).

Type specimen examined: Holotype ♂, Type; [DISTANT's handwriting] *Sarebasa celebris* Dist., Type; H.E. Durham, Selangor, 1903-139; Pahang, Pahang Rd., 2000 ft., 3.vii.02 (BMNH).

Other specimens examined: **West Malaysia**: 1 ♀, State of Selangor, Ulu Gombak, 20.vi.1970 (JAMES E. TOBLER) (CAS). **Malay Peninsula**: 2 ♂♂, 1 ♀, Selangor, Bukit Kutu, 3500 ft., 10.ix.1929 (H. M. PENDLEBURY) (EX F.M.S. Museum, B.M. 1955-354) (BMNH). **N. Borneo**: 1 ♂, 1 ♀, Bettotan, nr. Sandakan, 27.vii.1927 (EX F.M.S. Museum, B.M. 1955-354) (BMNH).

Remarks: This species is similar externally to *L. orientalis* sp. n. from Laos, north Vietnam, and southwest China, but can be distinguished from it by the characters given in the above key.

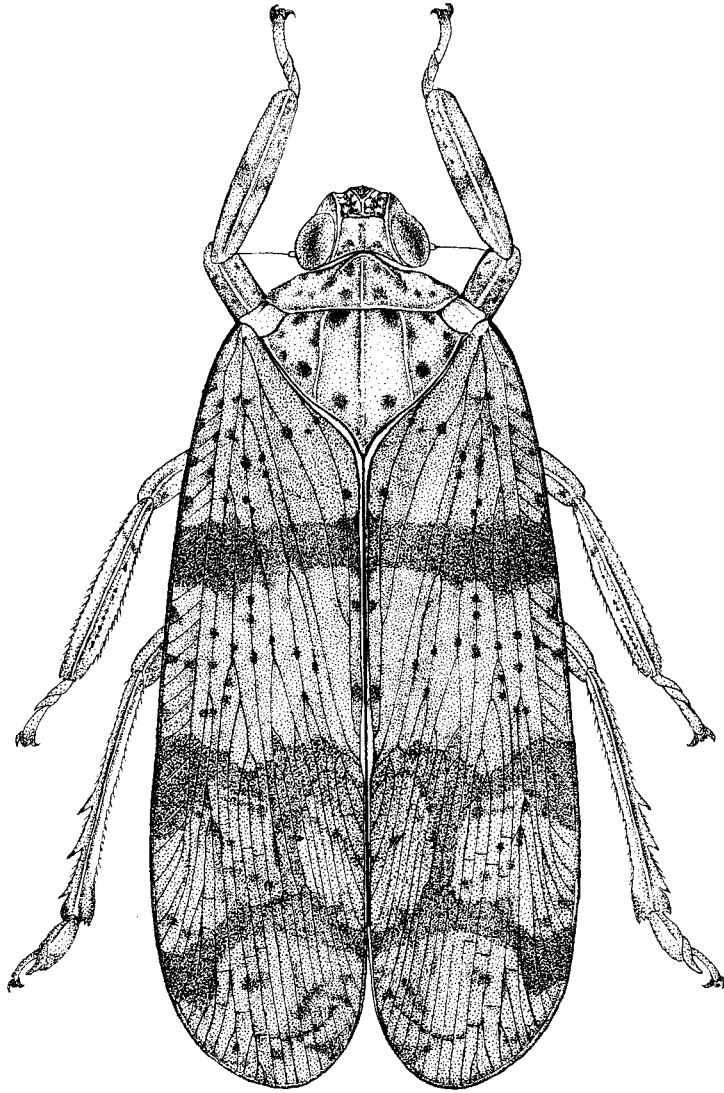
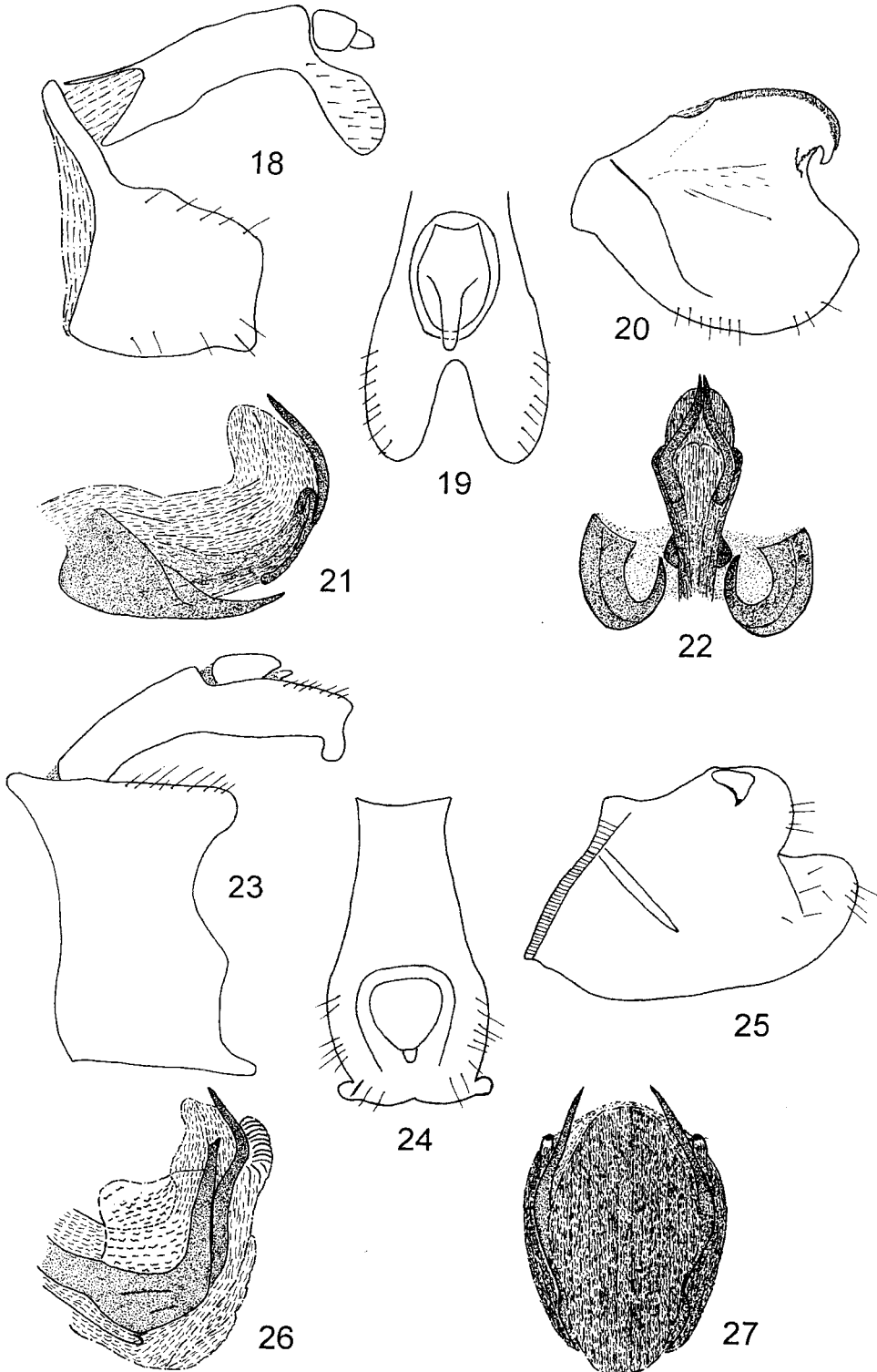


Fig. 17. *Lacusa orientalis* sp. n., male holotype (Laos: Vientiane, BPBM), dorsal view.

Lacusa orientalis sp. n. (Figs. 17, 23–27)

Description: Relatively large species, length: ♂, 12.5–13.0 mm. Head pale luteous, spotted with blackish brown; vertex pale luteous, with two spots near posterior margin blackish brown; frons pale luteous, with about 10 spots on lateral areas and four spots on central area (one apical, one subapical, and the other two basal) blackish brown; postclypeus with 2 longitudinal, subapically broken, fuscous brown fasciae along middle carina; sometimes postclypeus (excluding basal angles) pale brownish; genae, lora, anteclypeus and rostrum pale luteous; eyes greyish, spotted with black; ocelli reddish; antennae ochraceous, base of scape and pedicel blackish brown; pronotum ochraceous, lateral carinae and their surrounding areas, 4 spots to disk, 3 spots on



lateral areas, and the area behind eyes, fuscous brown; mesonotum ochraceous, 4 spots near anterior margin (the two largest on disk) and 6 spots near posterior lateral margins blackish brown; thorax beneath pale luteous; legs ochraceous to pale luteous, irregularly suffused with fuscous brown, outer and inner margins of fore and middle femora and tibiae and a series of spots on fore and middle femora and tibiae fuscous brown; sometimes fore femora and tibiae with reddish brown suffusion; all claws and tips of lateral and apical spines on hind tibiae and tarsi black; forewings ochraceous, subhyaline, veins and costal margins covered with fuscous brown spots, with 3 fuscous brown transverse fasciae, one before middle, another beyond middle, and the third subapical, the latter two curved and more or less connected near inner margin; hindwings hyaline, veins brown; abdomen ochraceous, segments with lateral and dorsal posterior margins brown, male genital styles and anal tube brown.

In paler specimens the transverse fasciae on forewings are very narrow and fine and the middle fascia is obliterate.

Structural characters as in generic diagnosis. Legs with fore femora and tibiae elongate, moderately, but not foliaceously dilated; frons with median carina.

Male genitalia: Pygofer (Fig. 23) short and high; anal tube (Figs. 23, 24) long and relatively large, posterior half expanded laterad and broad in dorsal view, apex slightly curved ventrad, weakly incised in caudal view; anal styles (Fig. 23) small and short; genital styles (Fig. 25) large and broad, posterior margins distinctly incised, dorsolateral hook relatively large, and somewhat triangular; aedeagus (Figs. 26, 27) with 4 strong, lateral, dorsally directed, spinose processes, two of which are relatively long and the other two shorter.

Female. Unknown.

Distribution: Laos, north Vietnam, southwest China (Yunnan).

Type specimens examined: Holotype ♂, **Laos:** Vientiane Prov., Ban Van Eue, light trap, 29.iv.1966 (native collector – RONDON) (BPBM). Paratypes. **Laos:** 1 ♂, Sayaboury Prov., Sayaboury, malaise trap, 15.i.1966 (native collector – RONDON); 1 ♂, Ban Van Heue, 20 km E of Phou-kow-kuei, 15–31.iv.1965 (native collector) (both in BPBM). [**Vietnam:**] 1 ♂, Tonkin, Hoa-Binh, vii.1940 (A. DE COOMAN) (IZCAS); 1 ♂, Central-Tonkin, Chiem-Hoa, viii-ix.[?] (H. FRUHSTORFER) (HU). **China, Yunnan:** 1 ♂, Damenglong, 700 m, 10.iv.1957 (Q.-Z. LIANG) (IZCAS); 1 ♂, Xishuangbanna, Banna, Menglong, Manbing, 650 m, 16.iv.1958 (H.-H. CHEN) (TMNH).

Remarks: This species is closely related to *L. celebris* (Distant) from Malay Peninsula, but can be distinguished from the latter by the minutiae of the colour pattern of head and forewings. It can be easily separated from *L. fuscofasciata* (Stål) by its larger size, fore femora and tibiae not foliaceously dilated, the colour pattern, and the shape of the male genitalia.

Genus *Pitambara* Distant

Pitambara Distant, 1906: 319; Melichar, 1915: 361; Baker, 1925: 280; Muir, 1930: 478; Metcalf, 1955: 44. Type species: *Elasmoscelis radians* Kirby, 1891: 149, pl. 6, fig. 2, by original designation.

◀ Figs. 18–27. *Lacusa fuscofasciata* (Stål) (India: Assam): 18, pygofer and anal segment, lateral view; 19, anal segment, caudal view; 20, left genital style, lateral view; 21, aedeagus, lateral view; 22, aedeagus, caudal view; *Lacusa orientalis* sp. n.: 23, pygofer and anal segment, lateral view; 24, anal segment, caudal view; 25, left genital style, lateral view; 26, aedeagus, lateral view; 27, aedeagus, caudal view.

Diagnosis: Relatively small species, length 7.0–7.5 mm. Head (including eyes) narrower than pronotum; vertex relatively long and narrow, longer than broad, much longer than pronotum, moderately produced in front of eyes, anterior margin \wedge -shaped in dorsal aspect, produced anteriorly beyond proximal margin of eyes, posterior margin arched anteriorly, lateral margins laminately elevated, with an obsolete median longitudinal carina; frons much longer than broad, strongly angularly amplified basally, lateral margins carinate, with distinct sublateral carinae, which are fused apically and then connected to median carina of vertex, with a median carina (apical part indistinct); postclypeus centrally and laterally carinate. Antennae with scape very small and short, pedicel subglobose, distinct. Rostrum very short, not reaching hind coxae, apical segment very short. Pronotum short, much shorter than vertex, disk small and narrow, truncate at base, tricarinate on disc, lateral areas curved down. Mesonotum tricarinate on disc. Forewings somewhat short and broad, somewhat round at apex, precostal area moderately broad with many oblique transverse parallel crossveins; hindwings narrower than forewings. Legs of moderate length, fore femora and tibiae moderately, but not foliaceously dilated, hind tibiae gradually slightly dilated towards apex, with 2 lateral spines (one apical, the other beyond middle) and 3–4 pecten rows with more than 30 small spines apically, hind tarsomere I incrassate, robust, with a dense vestiture of adhesive setae ventrally and a strong apical spine on each side and more than 5–6 small apical spines (more than 5 outside, 1 or more than 1 inside), hind tarsomere II very small.

Included species and distribution: Twelve species; Sri Lanka, northeast India, southwest China, Indochina, north Borneo, and Philippines (Luzon) (see METCALF, 1955).

Remarks: *Pitambara* DISTANT can be distinguished from other Oriental lophopid genera by the following combination of characters: body relatively small, 7.0–7.5 mm long; hind tibiae with 2 lateral spines and numerous apical spines; hind tarsomere I incrassate, with a dense vestiture of adhesive setae ventrally and 5–6 apical spines; vertex longer than broad, anterior margin acute and \wedge -shaped in dorsal aspect, produced anteriorly beyond proximal margin of eyes; and pronotum with disk relatively small. It differs from *Lacusa* STÅL in the vertex longer than broad, with its anterior margin acute and \wedge -shaped.

***Pitambara rubrofasciata* sp. n.** (Figs. 28–36)

Description: Length: ♂, 7.4 mm. General colour piceous brown; vertex, frons and genae pale luteous, middle carina on vertex, area between sublateral carinae on frons, and an oblique transverse fascia crossing ocellus on genae, rufescent; vertex with lateral carinae pale brownish; frons (Fig. 29) with lateral areas with a series of irregular, indistinct, very pale brownish spots; postclypeus, lora and anteclypeus (Figs. 29, 30) brown; pronotum brown, disk and lateral areas ochraceous; mesonotum brown; tegulae ochraceous; thorax beneath ochraceous; fore and middle legs ochraceous, fore femora and tibiae without piceous annulated rings, hind legs pale luteous with femora piceous; forewings piceous brown, costal membrane, a broad oblique transverse fascia near middle, inwardly almost reaching clavus, and apical marginal area greyish white and subhyaline, costal marginal areas with obliquely transverse piceous fasciae, apical marginal areas with a sinuate transverse linear piceous fascia; hindwings greyish white, subhyaline; abdomen ochraceous, with brownish suffusion.

Structural characters as in generic description. Hind tibiae with about 41–42 apical spines, hind tarsomere I with 18–19 small apical spines (12–13 outside, 6 inside).

Male genitalia: Pygofer (Fig. 31) relatively long ventrally and short dorsally in lateral aspect; anal tube (Figs. 32, 33) relatively short and small, expanded laterad, apex reaching well beyond apex of anal styles; anal styles (Fig. 32) short; genital styles (Fig. 34) short and small,

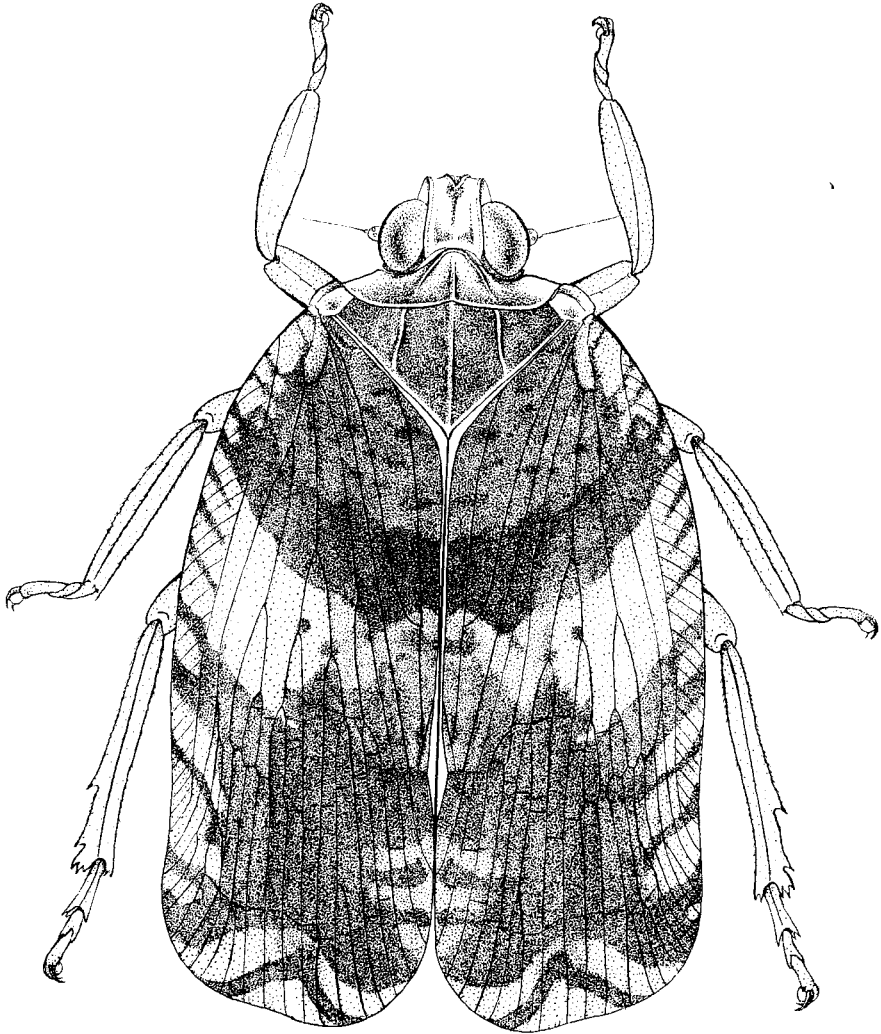


Fig. 28. *Pitambara rubrofasciata* sp. n., male holotype (India: Assam, CAS), dorsal view.

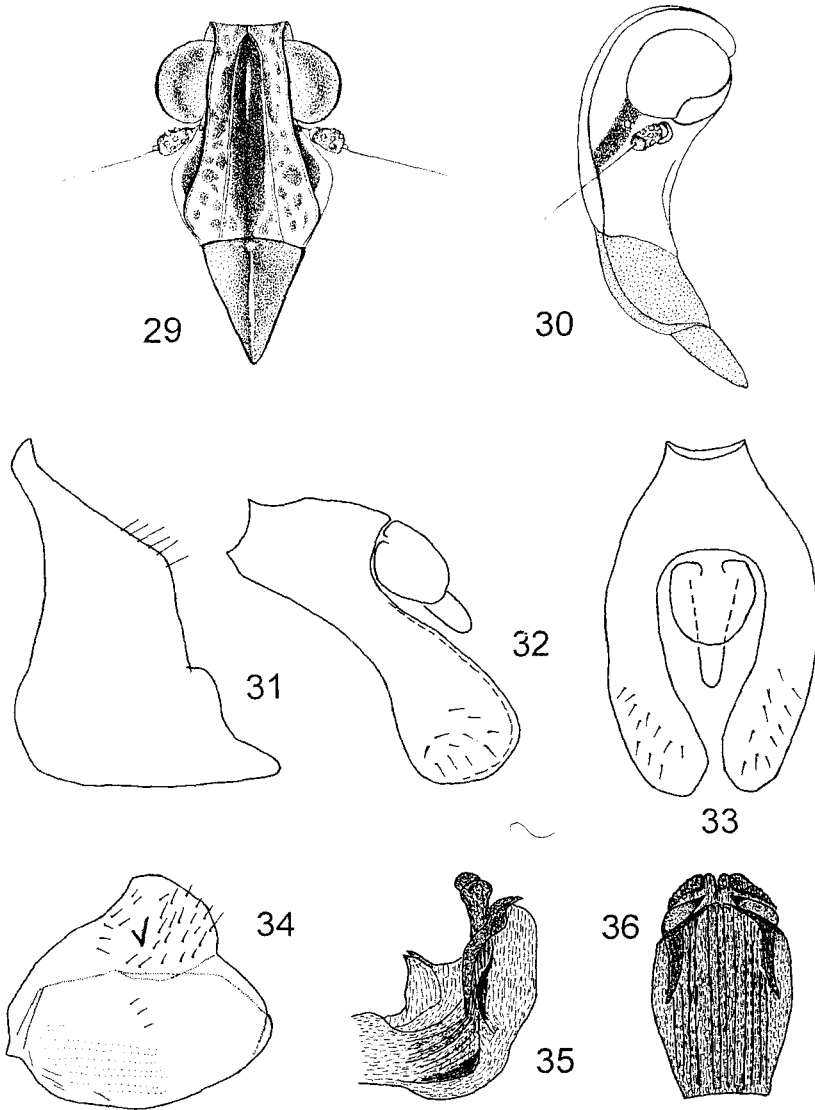
dorsolateral hook small; aedeagus (Figs. 35, 36) with two anterior, short, anterodorsally directed processes and two lateral, relatively strong, posterodorsally directed processes in lateral aspect.

Female. Unknown.

E t y m o l o g y : Named for the rufescent fasciae on frons, genae, and vertex.

D i s t r i b u t i o n : India (Assam).

T y p e s p e c i m e n e x a m i n e d : Holotype ♂, [India]: Assam, 8 mi. E. Ledo, 135 m, 13.X.[19]61 (E. S. ROSS & D. Q. CAVAGNARO) (CAS).



Figs. 29–36. *Pitambara rubrofasciata* sp. n.: 29, head, ventral view; 30, same, lateral view; 31, pygofer, lateral view; 32, anal segment, lateral view; 33, same, caudal view; 34, left genital style, lateral view; 35, aedeagus, lateral view; 36, aedeagus, caudal view.

Remarks: This species can be distinguished from all other known species in the genus by the rufescent fasciae on frons, genae and vertex as noted above; fore and middle femora and tibiae without piceous annulated rings; the broad oblique transverse greyish white and subhyaline fascia on forewings, and the shape of the male genitalia. It can be separated from another new species, *assamensis* sp. n. from Assam, by the colour patterns of the frons, pronotum, and forewings, and the structures of the male genitalia.

Pitambara assamensis sp. n. (Figs. 37–41)

Description: Length: ♂, 7.0 mm. General colour as in *rubrofasciata* sp. n. but much darker; frons and vertex without rufescent fasciae; postclypeus ochraceous with piceous brown suffusion, lora and anteclypeus pitchy black; pronotum ochraceous, two longitudinal fasciae on disk, and lateral areas adjacent to disk piceous brown; mesonotum pitchy black; thorax ochraceous, suffused with piceous brown; fore and middle femora and tibiae with piceous annulated rings; forewings pitchy brown, with a short transverse costal fascia near middle, inwardly reaching middle of corium, greyish white and subhyaline, the other markings as in *rubrofasciata* sp. n.; and abdomen fuscous brown, pleurae and hind segmental margins brownish ochraceous.

Structural characters as in generic description. Hind tibiae with about 33 apical spines, hind tarsomere I with 5–6 small apical spines (4–5 outside, 1 inside).

Male genitalia: Pygofer (Fig. 37) very short and high; anal tube (Figs. 37, 38) very short and relatively small, not extending beyond apex of anal styles in caudal view; anal styles (Fig. 37) relatively long; genital styles (Fig. 39) short and broad; aedeagus (Figs. 40, 41) with six strong, spinose process, two relatively long, evenly broad, and directed anterodorsally at basal half then posterodorsally at apical half in lateral aspect, two long, tapered from base to apex, and directed posterodorsally in lateral aspect, and the other two relatively short, directed anteriorly in lateral aspect.

Female. Unknown.

Etymology: Named for its occurrence in Assam, N.E. India.

Distribution: India (Assam).

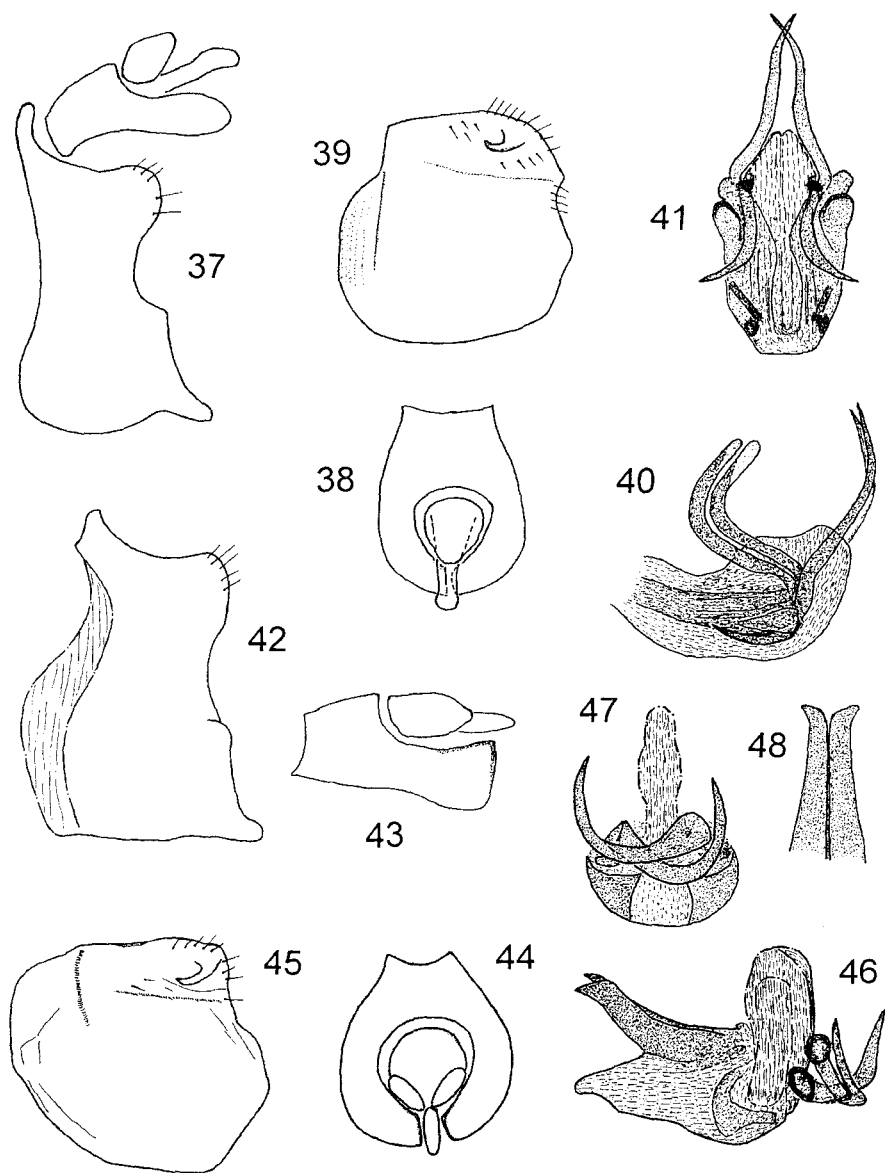
Type specimen examined: Holotype ♂, [India]: Assam, Kohara, Kaziranga, 110 m, 7.x.[19]61 (E. S. ROSS & D. Q. CAVAGNARO) (CAS).

Remarks: This species is closed to *rubrofasciata* sp. n. from Assam, N.E. India, but can be distinguished from the latter by the markings on head, legs and forewings and the shape of the male genitalia.

Pitambara nigrofuscata sp. n. (Figs. 42–48)

Description: Length: ♂, 7.0 mm. General colour piceous brown; head with vertex and frons pale luteous, vertex with posterior 0.5, median and lateral carinae piceous brown, a longitudinal fascia on posterior area of laminately elevated lateral carinae ochraceous, frons with sublateral carinae brown; genae pale luteous, an oblique transverse fascia crossing ocellus brown; postclypeus ochraceous with lateral areas piceous; lora and anteclypeus piceous brown; antennae with scape and pedicel ochraceous; rostrum ochraceous; pronotum piceous, with lateral areas and posterior margin ochraceous; mesonotum piceous; thorax beneath ochraceous, with piceous markings; legs ochraceous, fore and middle femora and tibiae annulated with piceous, tips of lateral and apical spines on hind tibiae and tarsi black; forewings piceous brown, costal and apical marginal areas greyish white, costal marginal areas with obliquely transverse piceous fasciae, apical marginal areas with a sinuated transverse linear piceous fascia; hindwings greyish white, subhyaline; abdomen piceous brown, posterior segmental margins greyish white.

Structural characters as in generic description. Hind tibiae with about 36–37 apical spines, hind tarsomere I with about 7 small apical spines (4 outside, 3 inside).



Figs. 37–48. *Pitambara assamensis* sp. n.: 37, pygofer and anal segment, lateral view; 38, anal segment, caudal view; 39, left genital style, lateral view; 40, aedeagus, lateral view; 41, aedeagus, caudal view; *Pitambara nigrofuscata* sp. n.: 42, pygofer, lateral view; 43, anal segment, lateral view; 44, same, caudal view; 45, left genital style, lateral view; 46, aedeagus, lateral view; 47, aedeagus, caudal view; 48, anterior processes of aedeagus, dorsal view.

Male genitalia: Pygofer (Fig. 42) short and high, long ventrally and short dorsally in lateral aspect; anal tube (Figs. 43, 44) short and broad, relatively small and somewhat rounded in caudal view, not extending beyond apex of anal styles in caudal view; genital styles (Fig. 45) short and broad, dorsolateral hook relatively long and slender; aedeagus (Figs. 46–48) with a pair of anterior, long, stout, anterodorsally directed processes and a pair of posterior, laterodorsally directed, spinose processes in lateral aspect.

Female. Unknown.

Etymology: Named for its uniformly piceous brown forewings (excluding costal area).

Distribution: Southwest China (Yunnan).

Type specimens examined: Holotype ♂, **China, Yunnan:** Jinping, Mengla, 500 m, 2.v.1956 (K.-R. HUANG *et al.*) (IZCAS). Paratypes. **China, Yunnan:** 2 ♂♂, same data as holotype except 400 m, 25.iv.1956 and 3.v.1956 (1 ♂ in IZCAS; 1 ♂ in BMNH).

Remarks: This species can be distinguished from all other known species in the genus by its forewings (excluding costal area) uniformly piceous brown and the shape of the male genitalia, especially the aedeagus. It is similar to *P. sinuata* DISTANT from Tenasserim, Burma, but can be distinguished from the latter by the vertex with base fuscous, frons with sublateral carinae fuscous, and the colour pattern in forewings.

Genus *Podoschtroumpfa* SOULIER-PERKINS

Podoschtroumpfa SOULIER-PERKINS, 1998: 609. Type species: *Podoschtroumpfa magna* SOULIER-PERKINS, 1998, by original designation.

Diagnosis: Medium-sized, relatively elongate and slender species, length 9.0–12.0 mm. Head long, distinctly longer than pronotum, a little narrower than pronotum; vertex long, much longer than broad, well or strongly produced in front of eyes, anterior margin very acute and ^-shaped in dorsal aspect, posterior margin arched anteriorly, lateral margins carinate, with a strong median longitudinal carina (obsolete in *rubrolineata* sp. n.); frons long and narrow, much longer than broad, weakly angularly amplified basally, lateral margins a little reflexed and carinate, lateral areas narrow and depressed, sublateral carinae rounded, nearly parallel and meeting anteriorly, without median longitudinal carina (with a very faint median carina apically in *magna*); postclypeus centrally and laterally carinate. Antennae with scape very small, short, pedicel short and subglobose. Rostrum very short, not reaching hind coxae, apical segment short. Pronotum distinctly shorter than vertex; disk somewhat broad, tricarinate, rounded anteriorly behind vertex; lateral areas curved down. Mesonotum broad, tricarinate on disc. Forewings relatively elongate and slender, a little amplified inwardly behind clavus, precostal area moderately broad with many oblique transverse parallel crossveins; hindwings slightly narrower than forewings. Legs of moderate length, fore femora and tibiae compressed laterally, not foliaceously dilated, hind tibiae gradually slightly dilated towards apex, with 3 lateral spines and 4–5 pecten rows with more than 80 small spines apically, hind tarsomere I incrassate, robust, with a dense vestiture of adhesive setae ventrally and a strong apical spine on each side and more than 30 small apical spines (more spines outside, few spines inside), hind tarsomere II very small.

Remarks: This genus was established recently by SOULIER-PERKINS (1998) for *Podoschtroumpfa magna* from Cambodia. I here describe in the genus the second species, *P. rubrolineata* sp. n. from Thailand and provide new locality data for *P. magna* from Vietnam and Thailand.

Included species and distribution: Two species; Cambodia, Vietnam (new record), and Thailand (new record).

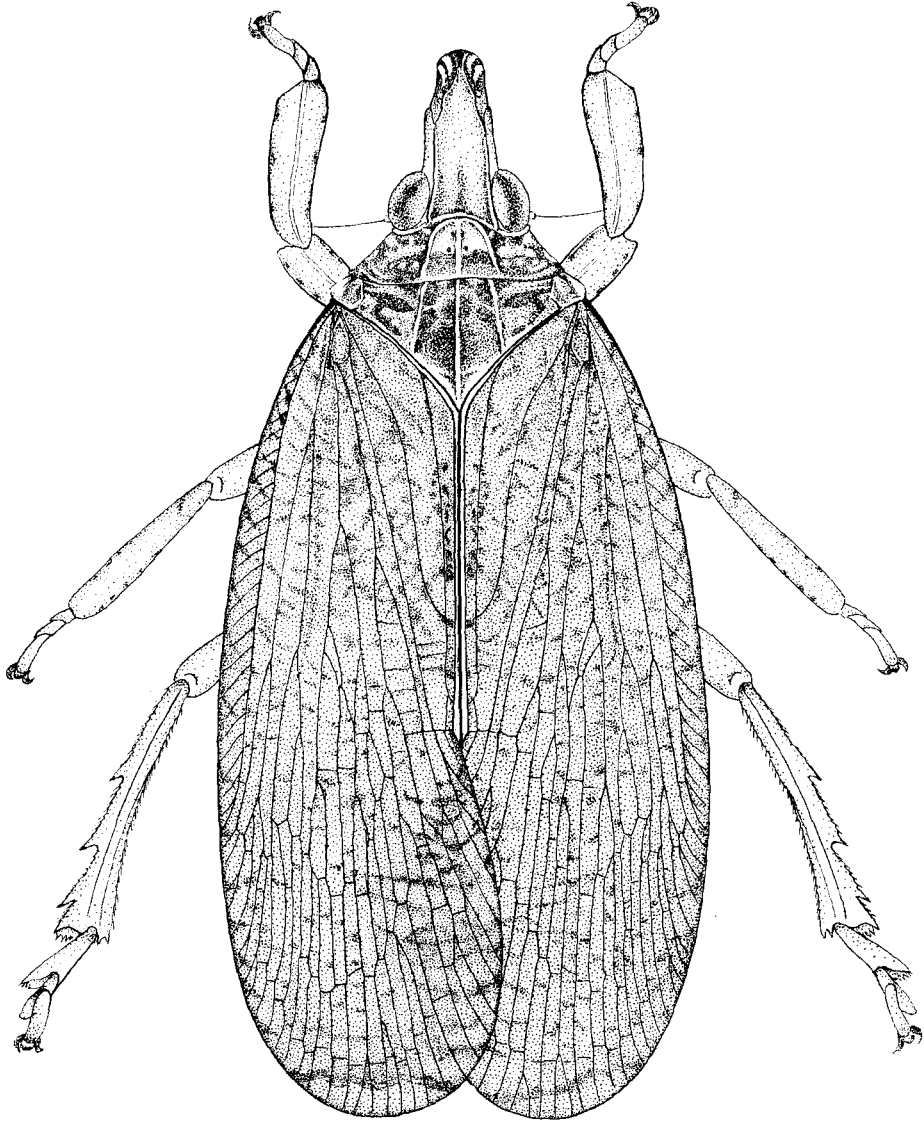


Fig. 49. *Podoschtroumpfa rubrolineata* sp. n., female holotype (Thailand: Doi Sutep, CAS), dorsal view.

Key to species of *Podoschtroumpfa*

1. Relatively smaller species, length ♀ 9.0–9.4 mm; vertex (Fig. 53) relatively shorter, medially about 1.34–1.46x longer than broad at base, with distinct median longitudinal carina; frons (Fig. 54) green with a median longitudinal band and lateral marginal areas reddish; Cambodia, Vietnam (new record) and Thailand (new record). *magna* SOULIER-PERKINS

- Larger species, length ♀ 12.0 mm; vertex (Fig. 51) long, medially about 2.29× longer than broad at base, without median longitudinal carina; frons (Fig. 52) yellowish, with a median longitudinal band reddish and lateral marginal areas pale reddish brown or brown; Thailand (Doi Sutep). *rubrolineata* sp. n.

Podoschtroumpfa rubrolineata sp. n. (Figs. 49, 51–52)

Description: Length: ♀, 12.0 mm. General colour brownish ochraceous; frons (Fig. 52) yellowish, with a median longitudinal band reddish and lateral marginal areas pale reddish brown or brown, apical lateral brown areas with several ochraceous oblique transverse stripes in lateral view; genae brownish ochraceous, an indistinct oblique transverse fascia crossing ocellus reddish; postclypeus yellowish, lora and anteclypeus brownish ochraceous; rostrum ochraceous; thorax beneath ochraceous; legs ochraceous, hind legs much paler, fore and middle femora and tibiae indistinctly annulated and spotted with piceous; forewings uniformly brownish ochraceous, apical marginal area with an indistinct fuscous transverse fascia; abdomen ochraceous, with fuscous brown suffusion.

Structural characters as in generic description. Head (Fig. 51) long, vertex long, medially about 2.29× longer than broad at base, about 2.67× length of pronotum, frons (Fig. 52) relatively long and narrow, distinctly prolonged, about 3.02× longer than broad at base, about 2.78× length of postclypeus, lateral areas very narrow, frons basally very weakly angulatedly expanded laterad on each side; hind tibiae with more than 80 small spines apically, hind tarsomere I with about 46 small apical spines.

Male. Unknown.

Etymology: Named for the distinct reddish median longitudinal band on the yellowish frons.

Distribution: Known only from the type locality in Thailand.

Type specimen examined: Holotype ♀, **Thailand:** E. slope, Doi Sutep, 1100–1275 m, 15.vii.1962 (E. S. ROSS & D. Q. CAVAGNARO) (CAS).

Remarks: This species, known only from a single specimen and a single locality in Thailand, can easily be distinguished from another known species in the genus, *magna* from Cambodia, Vietnam (new record) and Thailand (new record), by its relatively larger size, relatively long head, frons basally very weakly angulatedly expanded laterad on each side; and the distinct colour patterns on frons, as noted above.

Podoschtroumpfa magna SOULIER-PERKINS (Figs. 50, 53–54)

Podoschtroumpfa magna SOULIER-PERKINS, 1998: 612, figs. 13–16. Holotype ♂, Cambodia (BPBM) [examined].

Diagnosis: Length: ♀, 9.0–9.4 mm. General colour brownish ochraceous; vertex including lateral and median carinae brown, lateral margins and 2 apical linear spots ochraceous; frons (Fig. 54) green with a median longitudinal band and lateral marginal areas reddish; genae ochraceous; postclypeus, lora and anteclypeus brownish ochraceous; rostrum brownish ochraceous, apical segment fuscous; antennae with scape and pedicel ochraceous; pronotum and mesonotum brownish ochraceous, irregularly suffused with fuscous brown, carinae on disk pale ochraceous; thorax beneath brownish ochraceous; fore and middle legs brownish ochraceous, fore and middle femora and tibiae indistinctly annulated and spotted with piceous; hind legs ochraceous; forewings pale grey-

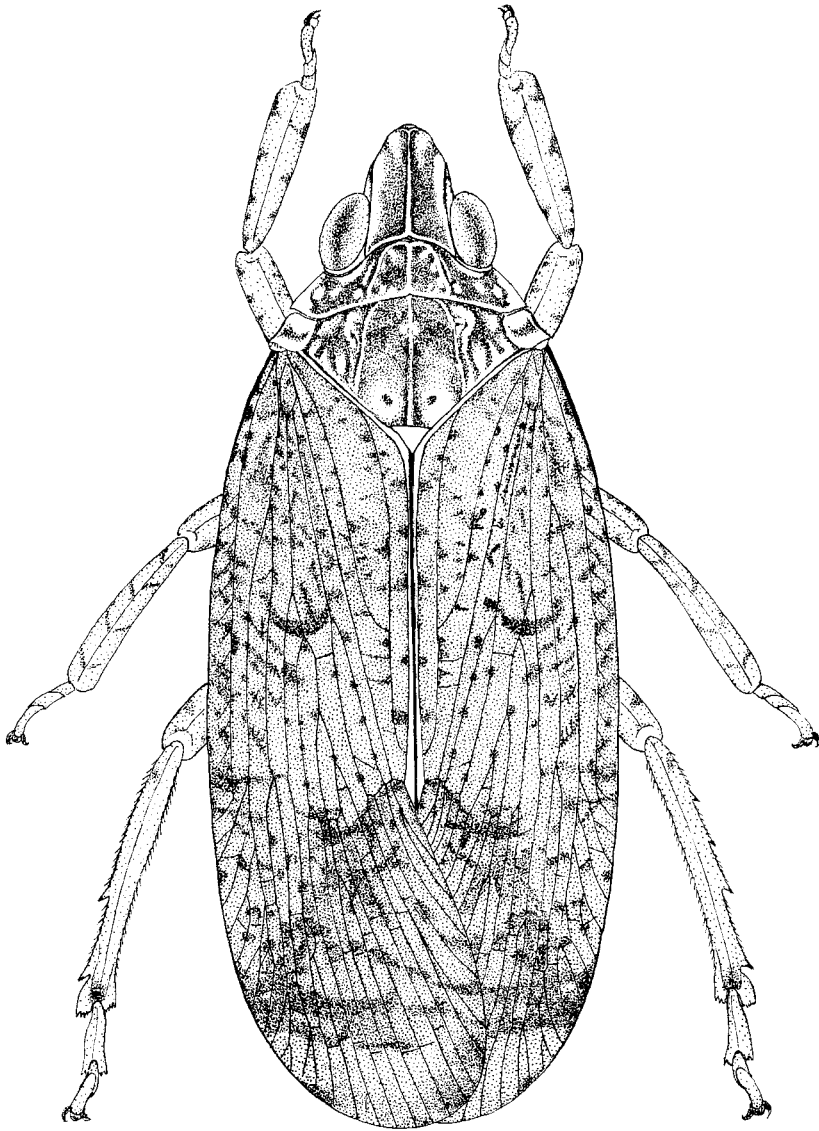
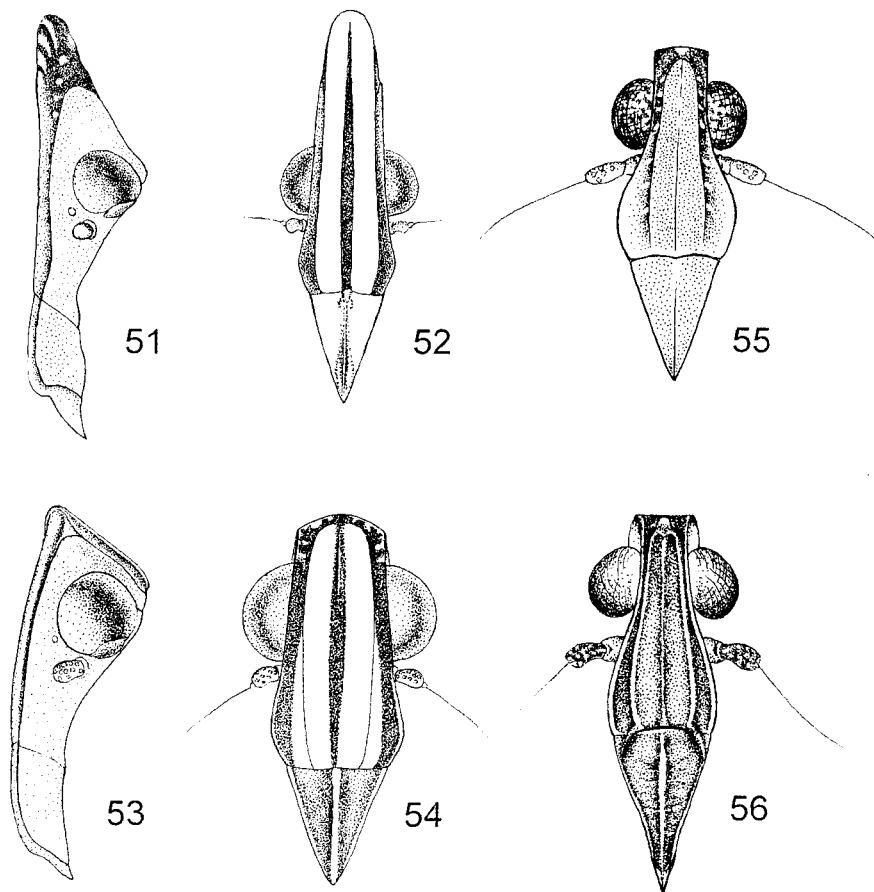


Fig. 50. *Podoschtroumpfa magna* SOULIER-PERKINS, female (Cambodia: Kirirom, BPBM), dorsal view.

ish, irregularly spotted with fuscous, with an indistinct, large triangular subhyaline area near middle, claval and apical areas dull ochraceous with many irregular pale fuscous spots or striae, apical area with several indistinct transverse piceous fasciae; hindwings hyaline, apical area brownish, veins brown; abdomen fuscous brown, pleurae and posterior segmental margins ochraceous.

Structural characters as in generic description. Vertex (Fig. 53) relatively short, medially about 1.34–1.46× longer than broad at base, about 1.92–2.07× length of pronotum, with strong median carina, lateral carinae distinct, not laminately elevated; frons (Fig. 54) broad, with faint median



Figs. 51–56. *Podoschtroumpfa rubrolineata* sp. n.: 51, head, lateral view; 52, same, ventral view; *Podoschtroumpfa magna* SOULIER-PERKINS: 53, head, lateral view; 54, same, ventral view; *Bisma indica* sp. n.: 55, head, ventral view; *Aluma sabahensis* sp. n.: 56, head, ventral view.

longitudinal carina apically, basally weakly angulatedly expanded laterad on each side; in one female specimen right and left hind tibiae with 2 and 4 lateral spurs respectively; hind tibiae with more than 80 small spines apically, hind tarsomere I with about 32 small apical spines.

This species was recently described by SOULIER-PERKINS (1998) from Cambodia (Kirirom). I here provide new locality records in Vietnam and Thailand.

Distribution: Cambodia, Vietnam (new record), and Thailand (new record).

Specimens examined: **Cambodia:** 1 ♀, Kirirom, 700 m, 1–6.iv.1961 (N. R. SPENCER) (BPBM). **Vietnam:** 1 ♀, 40 km SW of Pleiku, 300 m, 11.v.1960 (L. W. QUATE) (BPBM). **Thailand:** 1 ♀, Sakaerat, Khorat Prov., 3–400 m, in dry diplocot forest, 1–2.iii.1968 (D. ELMO HARDY) (IZCAS).

Remarks: This species can easily be distinguished from the new species *rubrolineata* sp. n. from Thailand by its relatively smaller size, shorter vertex and the distinct markings on frons, as noted above.

Genus *Bisma* DISTANT

Bisma DISTANT, 1906: 322; MELICHAR, 1915: 356, 364; MUIR, 1930: 478; METCALF, 1955: 47. Type species: *Bisma greeni* DISTANT, 1906: 323, fig. 158, by original designation.

Diagnosis: Medium-sized, relatively slender species, length 11.5–13.0 mm. Head (including eyes) narrower than pronotum; vertex relatively long and narrow, distinctly longer than broad, much longer than pronotum, moderately produced in front of eyes, anterior margin \wedge -shaped in dorsal aspect, produced anteriorly beyond proximal margin of eyes, posterior margin arched anteriorly, lateral margins laminately elevated, with an obsolete median longitudinal carina; frons much longer than broad, strongly angularly amplified basally, lateral margins carinate, with distinct sublateral carinae which are fused apically, with a median carina (apical part indistinct); postclypeus centrally and laterally carinate. Antennae with scape small and short, pedicel subglobose, distinct. Rostrum relatively long, extending a little beyond hind coxae, apical segment very short. Pronotum short, disk small and narrow, truncate at base, tricarinate with lateral carinae converging and uniting anteriorly and anterior 0.5 of medial carina indistinct, lateral areas curved down. Mesonotum tricarinate on disc, carinae continuous with those on pronotum. Forewings long, angularly rounded at apex, costal margins slightly sinuate beyond middle, basal longitudinal veins forked at their apices, where there are three short contiguous series of transverse veins, costal membrane with many oblique transverse parallel veins, and a number of transverse veins on apical area; hindwings broader than forewings. Fore and middle legs moderately long and robust, fore and middle femora and tibiae compressed and dilated on each side, hind legs relatively long, not dilated, hind tibiae with 3 strong lateral spines and 9 strong apical spines (4 outside, 5 inside, in ventral view), hind tarsomere I long, not incrassate, without a dense vestiture of adhesive setae ventrally, with 12 strong apical spines (6 on apical margin, 6 on inner surface, in ventral view), hind tarsomere II very small.

Included species and distribution: Three species; Sri Lanka, south India (new record), south China (Hainan Island) (new record), and Indochina (new record).

Remarks: This genus can be distinguished from other Oriental lophopid genera by the following combination of characters: relatively long vertex, forewings angularly rounded at apex, hind tibiae with few strong spines apically, hind tarsomere I long, not incrassate, without a dense vestiture of adhesive setae ventrally, with few strong apical spines.

JACOBI (1944) described *Bisma elasmoscelis* from Fujian, southeast China. LIANG (1996) transferred the species to *Serida*. It is here transferred to *Lophops* (see below).

***Bisma greeni* DISTANT**

Bisma greeni DISTANT, 1906: 323, fig. 158; MELICHAR, 1915: 365, fig. 13; METCALF, 1955: 48. Holotype ♀, Sri Lanka (BMNH) [examined].

Diagnosis: Length: ♀ 12.5 mm. General colour castaneous-brown; lateral carinae to vertex of head, disks of pro- and mesonota, and abdominal lateral and segmental margins ochraceous; face beneath dull castaneous, marginal areas spotted with ochraceous; body beneath and legs castaneous, legs more or less spotted and annulated with ochraceous, hind tibiae ochraceous with their apices and bases of spines piceous; forewings with about basal 0.5 brownish ochraceous mottled with fuscous, outer 0.5 paler and less mottled; a broad curved piceous fascia crossing near middle, and two broad oblique fasciae on posterior area, which are united on posterior margin, the outmost connected with apical margin by a short longitudinal fascia; hindwings pale fuliginous with apical and posterior margins fuscous.

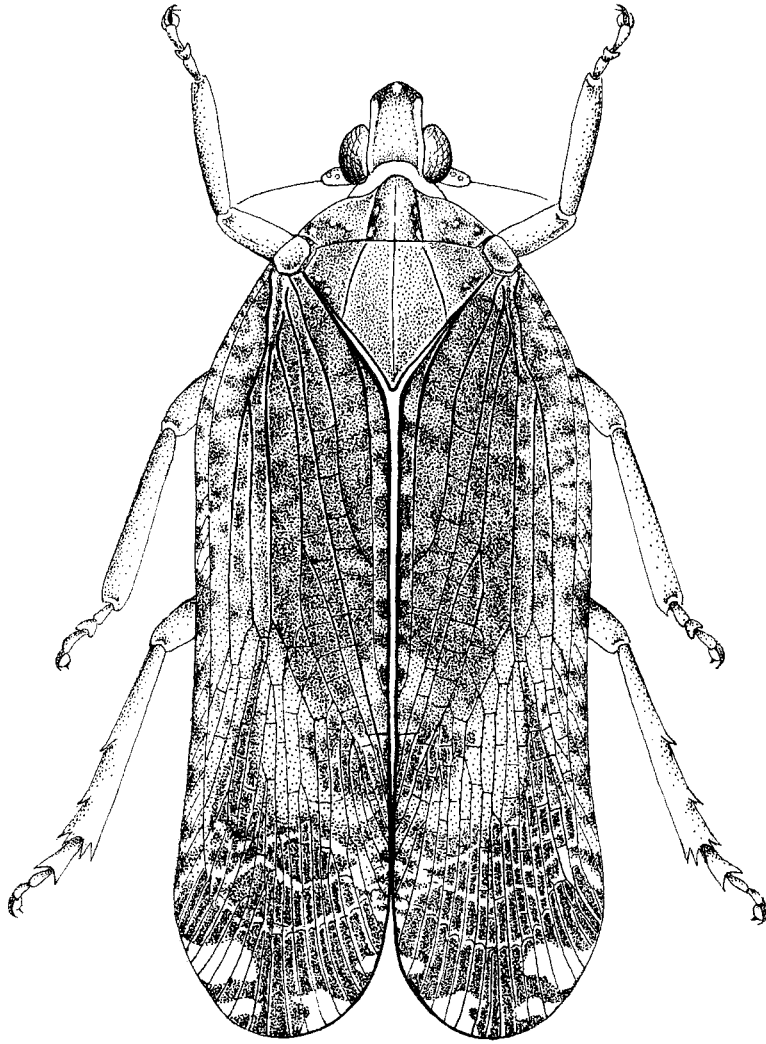


Fig. 57. *Bisma indica* sp. n., female holotype (South India: Trivandrum, AMNH), dorsal view.

This species was adequately described and illustrated by DISTANT (1906) and MELICHAIR (1915).

Type specimen examined: Holotype ♀, [small round white label with red margin] Type H.T.; [DISTANT's handwriting] *Bisma greeni* Dist. Type; Kandy, Ceylon, 6.02; 1147; [underside] Distant Coll. 1911-383 (BMNH).

Distribution: Sri Lanka.

***Bisma indica* sp. n. (Figs. 55, 57)**

Description: Length: ♀, 12.8 mm. Colour reddish castaneous to castaneous brown; vertex with lateral carinae blackish, suffused with ochraceous basally and apically, anterior margin

shining black with an ochraceous central spot in dorsal aspect; lateral carinae of frons and postclypeus blackish, marginal areas of frons (Fig. 55) with about 10 indistinct ochraceous spots, anteclypeus centrally blackish; rostrum with apical segment ochraceous; ocelli bright yellowish; genae with an ochraceous spot on posterior marginal area below eye; lateral carinae of mesonotum with 2 ochraceous spots (one in middle and the other near base), lateral areas of mesonotum with 3 ochraceous spots in a transverse series; mesonotum with lateral areas suffused with brown, two spots near posterior lateral margin ochraceous; forewings castaneous brown, suffused with piceous, apical $\frac{1}{3}$ pale piceous, veins castaneous, costal and subapical inner margins with several small ochraceous or whitish spots, 4 relatively large, irregular spots on apical marginal area hyaline (Fig. 57); hindwings fuliginous, veins darker; body beneath and legs castaneous, base of fore and middle tibiae suffused with black, fore and middle tarsi and hind tarsomeres II and III ochraceous, lateral and apical spines on hind tibiae ochraceous with tips and bases black, apical spines on hind tarsomere I ochraceous with tips black; abdomen beneath piceous, pleurae and segmental margins castaneous. Anal segment bearing dense white wax threads.

Vertex long, medially about 1.48× longer than broad at base, about 1.09× length of pronotum, lateral carinae distinctly elevated, disk concave; frons (Fig. 55) long, upper $\frac{1}{3}$ narrow and nearly parallel-sided, lower $\frac{2}{3}$ widened, widest slightly above frontoclypeal suture, sublateral and median carinae obsolete beyond middle; pronotum with disk elevated, lateral areas sloping laterad and then curved down, disk with lateral carinae distinct and a little elevated and median carina indistinct; mesonotum somewhat convex with lateral carinae obsolete and median carina indistinct; hind tibiae with 3 lateral spines and 9 apical spines (4 outside, 5 inside, in ventral view), hind tarsomere I with 12 apical spines (6 on apical margin, 6 on inner surface, in ventral view).

Male. Unknown.

E t y m o l o g y : This species is named for its occurrence in south India.

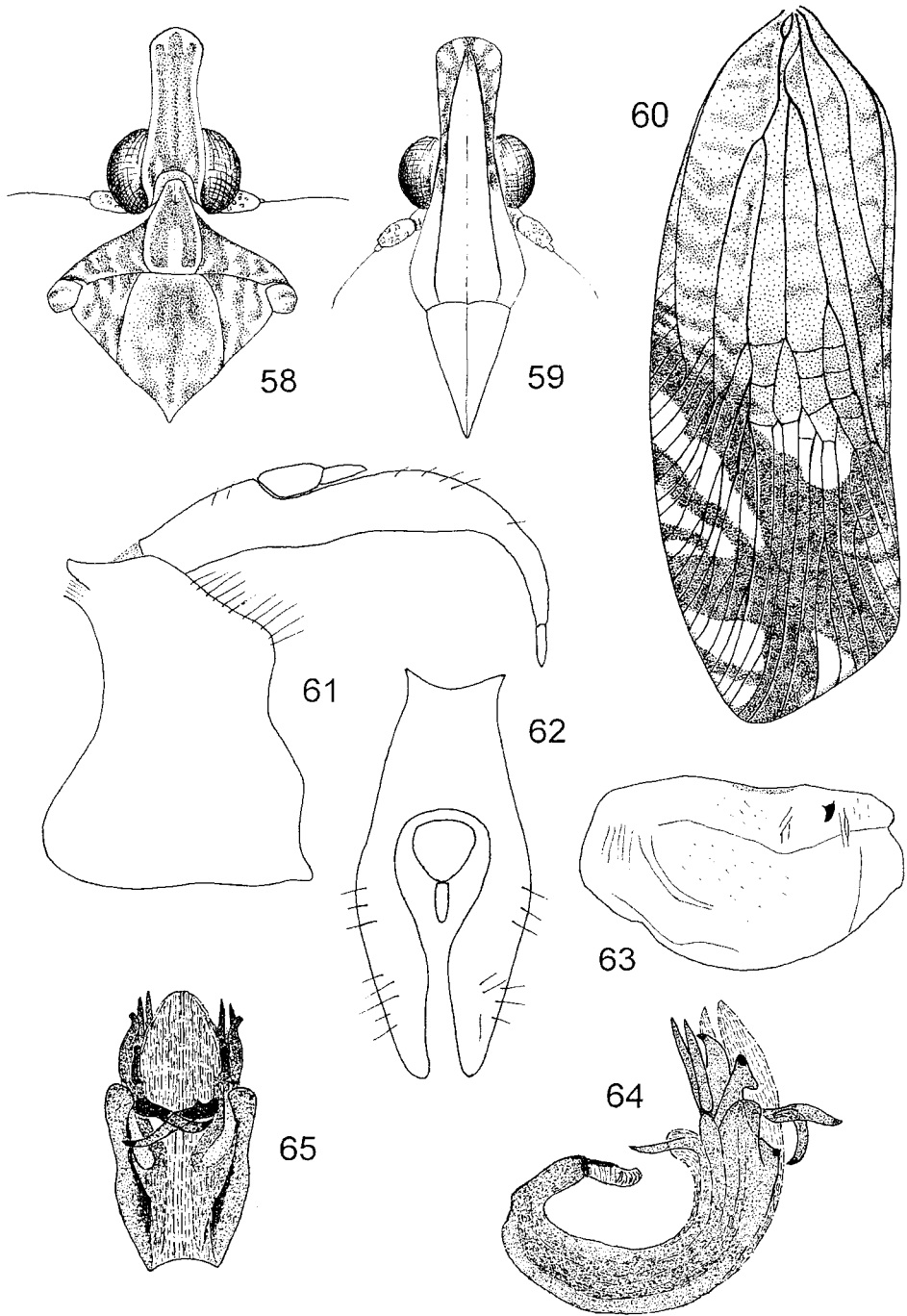
D i s t r i b u t i o n : South India.

T y p e s p e c i m e n e x a m i n e d : Holotype ♀, **South India:** Kerala, Trivandrum Dist., Poonandi Range, 3000 ft., ix.1971 (T. R. SUSAL NATHAN) (AMNH).

R e m a r k s : This species is almost identical externally to *B. greeni* from Sri Lanka, but can be distinguished from the latter by its hind tibiae castaneous and in the colour pattern of forewings.

***Bisma longicephala* sp. n.** (Figs. 5–6, 58–65)

D e s c r i p t i o n : Length: ♂, 11.5–12.0 mm; ♀, 11.5–13.0 mm. Head ochraceous brown; vertex (Fig. 58) blackish brown, lateral elevated carinal margins yellowish ochraceous, two apical spots yellow; frons (Fig. 59) with apical area suffused with black, sublateral carinae reddish brown, about 10 spots bordered with sublateral carinae and about 4 apical outer marginal spots yellowish ochraceous; genae with apical area suffused with black, the areas before and behind eyes ochraceous; postclypeus with median carina reddish brown; anteclypeus blackish brown, central area yellow; rostrum ochraceous, 2nd segment annulated with blackish fuscous apically; pronotum ochraceous brown or yellowish ochraceous, disk suffused with blackish brown with lateral carinal margins yellowish ochraceous; mesonotum ochraceous brown; thorax beneath brown; fore and middle femora brown, annulated with yellowish ochraceous; fore and middle tibiae blackish fuscous, annulated with yellowish ochraceous; fore and middle tarsi yellowish ochraceous; hind legs yellowish ochraceous or brownish ochraceous, hind tibiae annulated with blackish fuscous basally, subbasally and apically; forewings (Fig. 60) ochraceous brown, cross fasciae on costal and apical areas blackish brown, costal and apical areas with hyaline patches; hindwings brownish; abdomen brown with pleural areas reddish.



Figs. 58–65. *Bisma longicephala* sp. n., male holotype (South China: Hainan, IZCAS): 58, head, pronotum, and mesonotum, dorsal view; 59, head, ventral view; 60, left forewing; 61, pygofer and anal segment, lateral view; 62, anal segment, caudal view; 63, left genital style, lateral view; 64, aedeagus, lateral view; 65, aedeagus, caudal view.

Head (Fig. 58) long and slender, narrower than pronotum; vertex (Fig. 58) long, narrow, medially about 2.32–2.47× longer than broad at base, about 1.59–1.72× length of pronotum, distinctly extending in front of eyes, lateral margins strongly carinate and nearly parallel-sided, leaving the disk concave and somewhat flat; frons (Fig. 59) long, median carina very fine and obsolete; postclypeus with distinct median carina; rostrum reaching between hind trochanters; fore and middle femora and tibiae flattened and dilated, hind tibiae with 3 lateral spines and 9 strong apical spines (4 outside, 5 inside), and hind tarsomere I with 11 strong apical spines (6 on apical margin, 5 on inner surface).

Male genitalia: Pygofer (Fig. 61) high and broad, relatively long ventrally and short dorsally in lateral aspect; anal tube (Figs. 61, 62) with apical part greatly extended posteriorly and posteroventrally, very elongate in lateral aspect, extending greatly beyond apex of anal styles in caudal view; anal styles (Fig. 61) very small and short; genital styles (Fig. 63) longer than broad; aedeagus (Figs. 64, 65) with 12 relatively short, strong, apical spinose processes, two directed anteriorly, eight directed dorsally and the other two directed posteroventrally in lateral aspect.

Etymology: This species is named for its relatively long head.

Distribution: South China (Hainan Island), Indochina.

Type specimens examined: Holotype ♂, **China, Hainan Island:** Mt. Diaoluo, 26.iii.1964 (S.-L. LIU) (IZCAS). Paratypes. **China, Hainan Island:** 1 ♀, Ledong Co., Jian Feng Ling Nature Reserve, Mt. Tianchi, 30.vi.1993 (R. M. BROWN) (CAS); 1 ♂, 1 ♀, Jianfengling Nature Reserve, 18.iv.1985 (L.-Y. ZHENG) (NU); 1 ♂, Jianfengling, 14.xii.1974 (J.-K. YANG) (CAUIC); 1 ♀, Jianfeng, Tianchi, 900 m, 11.iv.1980, no collector (IZCAS); 1 ♂, Mt. Diaoluo, 2.iv.1980 (L.X. CHEN) (TMNH); 1 ♀, Qiongzong, Mt. Wuzhi, 800 m, 15.iv.1980 (S.-Y. WANG) (SMTD); 1 ♂, Mt. Wuzhi, 22.iv.1964 (TMNH); 1 ♀, Xinglong, 16.x.1957 (Z.-Z. CHEN) (SIE); 1 ♀, no definite locality, 1.iv.1934 (C. HO, Fan Inst. Biol. Peiping) (IZCAS). **Indo-China:** 1 ♀, without definite locality, 1913-222 (R. VITALIS) (BMNH).

Remarks: I here tentatively place *longicephala* in *Bisma* based mainly on the shape of the head and hind legs and the spine formula of the hind tibiae and hind tarsomere I. This species can be distinguished from the other two species, *greeni* and *indica*, from Sri Lanka and south India respectively, by its relatively long head, the general ochraceous brown colour and the shape of the male genitalia.

Genus *Aluma* DISTANT

Aluma DISTANT, 1909: 169; MELICHAR, 1915: 356, 366; MUIR, 1930: 478; METCALF, 1955: 56.
Type species: *Aluma ocellata* DISTANT, 1909: 169, pl. 11, figs. 3, 3a, by original designation.

Diagnosis: Head somewhat small and short, narrower than pronotum; vertex narrow and moderately long, longer than broad, produced anteriorly well beyond proximal margin of eyes; lateral margins strongly laminately elevated; frons much longer than broad, gradually widened towards postclypeus before which it is again curved inwardly, lateral margins carinate, with robust and elevated sublateral carinae and very faint median carina, lateral marginal areas and central area between sublateral carinae concave; postclypeus somewhat convex, centrally and laterally carinate, median carina robust. Antennae with scape short, pedicel subglobose, distinct. Rostrum long, extending beyond hind coxae, apical segment very short. Pronotum short, shorter than head, disk small, narrow, tricarinate, its apex moderately produced between eyes, its lateral angles subacute, lateral areas sloping laterad and then curving down; mesonotum broader than long, tricarinate, carinae continuous with those on pronotum. Forewings about three times as

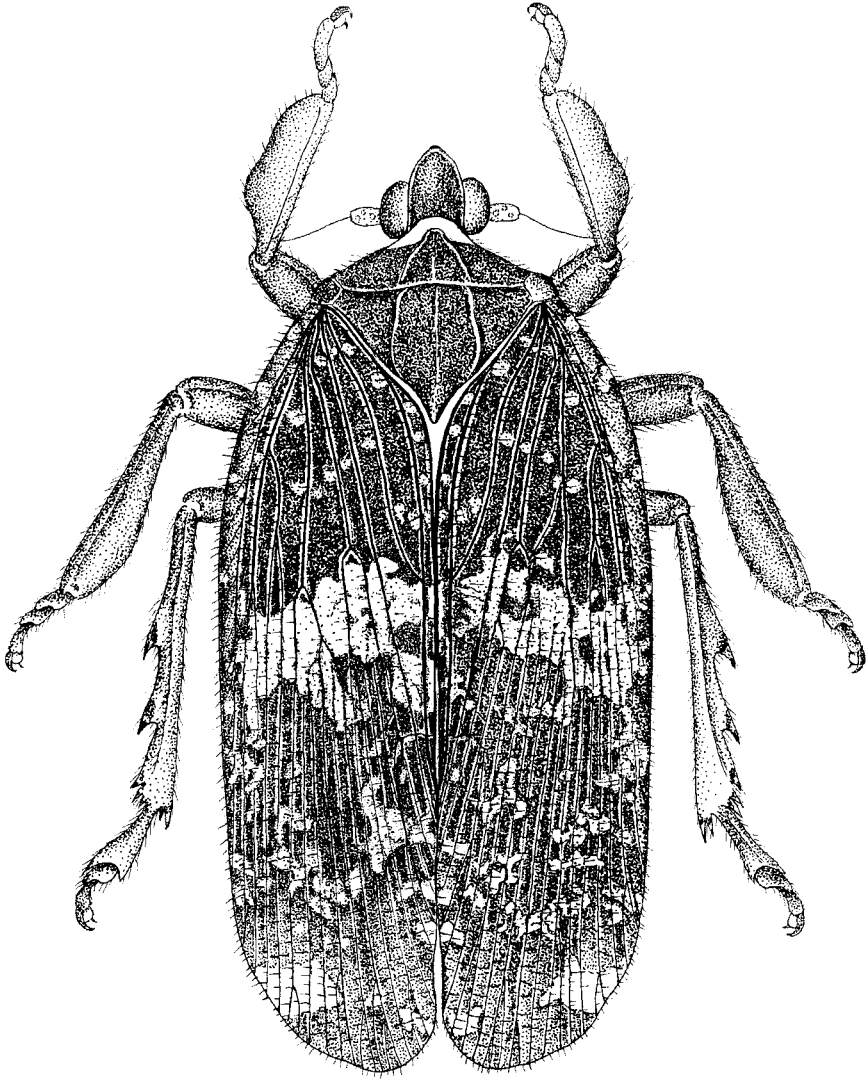


Fig. 66. *Aluma sabahensis* sp. n., female holotype (Malaysia: Sabah, USNM), dorsal view.

long as broad, costal area with oblique transverse veins, veins on remaining surface longitudinal, on apical area dense and numerous, with numerous short transverse veins, and a distinct subapical transverse series defining a short subapical area, costal margin moderately sinuate, apex slightly rounded, inner margin a little dilated beyond claval apex; hindwings narrower than forewings. Fore and middle legs of moderate length, fore and middle tibiae moderately dilated, hind legs relatively long, not dilated, hind tibiae with 2–3 lateral strong spines and about 9 apical strong spines; hind tarsomere I long, strongly thickened, not incrassate, without a dense vestiture of adhesive setae ventrally, with about 20 strong apical spines, hind tarsomere II very small.

Included species and distribution: Three species; Borneo, southern Burma.

Remarks: This genus is similar externally to *Marota*, but can be distinguished from it by the shape of head and the shape and venation of the forewings.

Aluma sabahensis sp. n. (Figs. 56, 66)

Description: Relatively large species, length: ♀, 16.5 mm. Colour almost uniformly black; eyes greyish; antennae brown; forewings black, ornamented with many white waxy spots (those on basal area are very small and more regular, those on apical area are larger and irregular) and an irregular, broad, transverse, white waxy band in middle, with several hyaline patches along inner and outer margins apically and subapically; hindwings brownish; abdomen with lateral and posterior segmental margins pale ochraceous.

Structural characters as in generic description. Vertex with lateral margin strongly laminately elevated, base broad, medially about 1.22× longer than broad at base, about 1.29× length of pronotum, somewhat triangular in dorsal aspect; frons (Fig. 56) with sublateral carinae strong; pronotum with median carina on disk indistinct; hind tibiae with 3 lateral spines and 9 strong apical spines, hind tarsomere I with about 20 apical spines. Wax-producing plates bearing distinct white wax threads.

Male. Unknown.

Etymology: Named for its occurrence in Sabah, Malaysia.

Distribution: Malaysia (Sabah).

Type specimen examined: Holotype ♀, **Malaysia:** Sabah, 1 km S. Kundasang, el. 1530 m, 27 Aug. 1983 (G. P. HEVEL & W. E. STEINER) (USNM).

Remarks: This species can be distinguished from *A. ocellata* DISTANT from Borneo (Sarawak) and *A. exigua* MELICHAR from Burma (Cari-Cheba) by its uniformly black colour and distinct markings on forewings.

New generic synonymies

Recent study of several lophopid genera has shown that *Lophops*, *Corethrura* and *Serida* are based only on minor morphological differences or on arbitrary combinations of character states. To improve nomenclatural and taxonomic stability, I therefore propose the following two new generic synonymies and eight new or reinstated combinations.

Genus *Lophops* SPINOLA

Lophops SPINOLA, 1839: 387. Type species: *Lophops servillei* SPINOLA, 1839: 388, pl. 10, figs. 3A–B, by monotypy.

Corethrura HOPE, 1843: 135; ATKINSON, 1886: 43; DISTANT, 1906: 317, 321; MELICHAR, 1915: 338, 346; MUIR, 1930: 478; METCALF, 1955: 18. Type species: *Corethrura fuscovaria* HOPE, 1843: 135, pl. 12, fig. 10, by monotypy. **New synonymy.**

Cystingocephala STÅL, 1853: 266. Type species: *Cystingocephala marginelineata* STÅL, 1855: 95, by subsequent designation of STÅL, 1855: 95. [Synonymised by STÅL, 1866: 201.]

Serida WALKER, 1857: 158; DISTANT, 1906: 317, 324; MELICHAR, 1915: 338, 343; BAKER, 1925: 273, 277; MUIR, 1930: 478; METCALF, 1956: 15; CHOU *et al.*, 1985: 125. Type species: *Serida latens* WALKER, 1857: 158, pl. 7, fig. 8 (under the name of *Lerida fervens*), by original designation [not by subsequent designation of DISTANT (1906: 324) as cited in METCALF (1955: 15)]. **New synonymy.**

Gozarta WALKER, 1870: 116. Type species: *Gozarta zebra* WALKER, 1870: 116, by monotypy. [Synonymised by DISTANT, 1909: 174.]

Brixioides KIRBY, 1891: 139; MELICHAR, 1903: 35; DISTANT, 1906: 327. Type species: *Brixioides carinatus* KIRBY, 1891: 139, by monotypy. [Synonymised by MELICHAR, 1915: 339.]

Astorga KIRKALDY, 1906: 395. Type species: *Astorga saccharicida* KIRKALDY, 1906: 395, by monotypy. [Synonymised by MELICHAR, 1915: 339.]

Discussion: The monotypic genus *Corethrura* was established by HOPE (1843) to contain *C. fuscovaria* HOPE from Silhet, India. BAKER (1925: 277) stated that *Corethrura* might be a synonym of *Serida*. I have examined the specimens of *Corethrura fuscovaria* HOPE and am unable to find characters to separate it from species of *Lophops*.

The genus *Serida* was established by WALKER (1857) for two new species, *S. latens* and *S. fervens*, from Sarawak, Borneo. *S. latens* was originally designated by WALKER (1857) as the type species of the genus. DISTANT (1906: 330) transferred *S. fervens* to *Varma* in Tropicuchidae. Several species were later added to *Serida* (DISTANT, 1909; MELICHAR, 1915; BAKER, 1925; FENNAH, 1978; LIANG, 1996). STÅL (1870: 751) was the first to comment on *Serida*. He pointed out that *Serida* was not to be distinguished from *Lophops*. I have examined several species from Oriental region which belong to *Serida* and am of the opinion that the minor differences between *Serida* and *Lophops* do not warrant the recognition of two separate genera.

Lophops is distributed in Africa, Asia and Australia. Its sister genus is probably *Pyrilla* WALKER.

New or reinstated combinations

The following new or reinstated combinations are proposed as a result of the generic synonymies discussed above:

***Lophops balteatus* (DISTANT) Reinstated combination**

Serida balteata DISTANT, 1909: 171; MELICHAR, 1915: 343, 345; METCALF, 1956: 17.
Lophops balteatus (DISTANT); JACOBI, 1944: 17.

***Lophops elasmoscelis* (JACOBI) New combination**

Bisma elasmoscelis JACOBI, 1944: 17; METCALF, 1955: 48.
Serida elasmoscelis (JACOBI); LIANG, 1996: 147.

***Lophops excisus* (MELICHAR) New combination**

Serida excisa MELICHAR, 1915: 345, fig. 3; BAKER, 1925: 278; METCALF, 1956: 17.

***Lophops fuscovarius* (HOPE) New combination**

Corethrura fuscovaria HOPE, 1843: 135, pl. 12, fig. 10; ATKINSON, 1886: 43; DISTANT, 1906: 322, fig. 157; MELICHAR, 1915: 346, fig. 4; METCALF, 1955: 19.

***Lophops gorgopis* (FENNAH) New combination**

Serida gorgopis FENNAH, 1978: 274, figs. 264–267.

***Lophops latens* (WALKER) New combination**

Serida latens WALKER, 1857: 158, pl. 7, fig. 8 (under the name of *Lerida fervens*); DISTANT, 1906: 325, fig. 160; BANKS, 1910: 40; MELICHAR, 1915: 344, fig. 2; BAKER, 1925: 278, pl. 2, figs. 4a-e; METCALF, 1956: 17; CHOU *et al.*, 1985: 126, fig. 117.

Lophops latens papuensis* (BAKER) New combinationSerida latens papuensis* BAKER, 1925: 278.*Serida latens* var. *papuensis* BAKER; METCALF, 1956: 18.***Lophops latens sherwilli* (DISTANT) New combination***Serida sherwilli* DISTANT, 1912: 189; 1916: 84; MELICHAR, 1915: 344, 345.*Serida latens sherwilli* DISTANT; BAKER, 1925: 278.*Serida latens* var. *scherwilli* DISTANT; METCALF, 1956: 18.**Acknowledgements**

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