

## The genus *Lobosciara* Steffan (Diptera, Sciaridae)

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*Lobosciara* Steffan, characterized by unusual modifications in the male genitalia, is the sister group of *Dolichosciara* Tuomikoski. The concept of the genus is redefined on the basis of the new material. *Lobosciara* includes the following species which are keyed and described: *L. spinipennis* (Sasakawa) (Thailand, Micronesia), *L. adebratti* sp. n. (Borneo), *L. bilobata* sp. n. (Malay Peninsula, Borneo, Sulawesi), *L. latiloba* sp. n. (Malay peninsula, Borneo) and *L. trilobata* sp. n. (Sulawesi). The phylogenetic interrelationship of the species is as follows: [*spinipennis* + *trilobata*] + [*latiloba* + (*adebratti* + *bilobata*)].

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Steffan (1969) found that *Bradysia spinipennis* Sasakawa, described from Thailand, was widespread in Micronesia. He noted that the species differed considerably from all other known Sciaridae by the male genitalia and established for it the genus *Lobosciara* which up till now has been monotypic.

While studying Oriental Sciaridae during the past few years we have recognized undescribed species that no doubt belong to *Lobosciara*. The new species are remarkable by having some of the unusual modifications noted by Steffan (1969) still more pronounced, while some other characters in these species approach the more common situation within the family.

We mounted the new alcohol-preserved material on microscope slides in "Euparal" whereas Steffan's (1969) material of *Lobosciara spini-*

*pennis* had been mounted in Hoyer's medium after treatment with KOH. The material is deposited in the following collections, later referred to by the name of the city only: Finnish Museum of Natural History, Helsinki; Swedish Museum of Natural History, Stockholm; The Natural History Museum, London; National Museum of Wales, Cardiff; and Bishop Museum, Honolulu.

The illustrations were made by the aid of a camera lucida attached to a microscope from specimens mounted on slides. The morphological terminology used is mostly generally known and needs no special explanation. Some terms are, however, indicated in Figs. 1 and 5. We base our concepts on the males only, although Steffan (1969) also described the female of *Lobosciara spinipennis*, and although we assume we have been able to identify the female of *L. trilobata*.

### Genus *Lobosciara*

*Lobosciara* Steffan, 1969:727. Type-species *Bradysia spinipennis* Sasakawa, 1962 (original designation and monotypy).

On the basis of the new material the characters of the genus given by Steffan (1969) need some definitions and additions: The comblike transverse row of bristly setae subapically on the prolateral side of the front tibia is not separated from other tibial vestiture by a wide bare area. Sometimes a small bare area is seen proximal to the row of setae. The setose lobes ventrally at the base of the gonocoxites vary from two to four in number: there may be only an intercoxal lobe which is medially divided more or less completely into a pair of submedial lobes (Figs. 1A and 1C, 2B), or there may be an undivided (Fig. 2D) or medially divided (Fig. 3B) intercoxal lobe plus a pair of more lateral lobes. All species have the base of the gonocoxal apodemes widened mesially; ventrally this widened part has a low tuberculated area with a patch of setae. Further, all species have the gonocoxal apodemes fused anteriorly, forming an U-shaped sclerite. The genital rod is long and whip-like in the type-species only; in other species it is short and varies greatly in the degree of sclerotization. The mesial surface of the gonostylus is impressed but inflattens easily, e. g. by treatment with KOH. The setae of the gonostylus are unmodified except for two stronger needle-like setae, one subapical and ventral, the other submedial and dorsal (Figs. 1B, 1D, 2A, 2E, 3A). The halves of tergite 10 vary from slightly apically bilobed (Figs. 2D, 3B) to deeply bipartite (Figs. 1A, 1C, 2B). Sternite 10 is extraordinarily enlarged and expanded and reaches more posteriad than the aedeagus. *Lobosciara* is exceptional in its species, having nearly identical gonostylus, while there are great differences between species in several other structures of the hypopygium.

#### Diagnostic characters

Steffan (1969) gave the following characters to distinguish the males of *Lobosciara* from all other Sciaridae: each of the lobes (halves) of tergite 10 has two lobes, the ventral mesial sur-

face of the gonocoxite has setose lobes and the genital rod is whip-like and elongated. Of these only the first applies to all of the species of *Lobosciara* now known, whereas the other characters may be similar to those in many other groups of Sciaridae. Other good diagnostic characters are the above-mentioned enlarged sternite 10 and the lobe-like widened mesial margin of the gonocoxal apodeme with the associated setigerous tubercle. The gonostylus of *Lobosciara* is fairly similar to that of *Dolichosciara*, but in the known species of *Dolichosciara* there is a group of megasetae dorsally on the mesial surface of the gonostylus, not just two widely separate needle-like setae on the mesial side of the gonostylus as in *Lobosciara*.

The diagnostic character for the female of the type-species given by Steffan (1969), viz. the swollen anterior part of the vaginal furca, applies also to the female of its sister species, *L. trilobata*, but whether it applies to the unknown females of the other species of the genus is not known.

#### Classification

Sasakawa (1962) included the type-species in *Bradysia*, and Steffan (1969) postulated without any further argumentation a close relationship between *Lobosciara* and *Bradysia*. It is obvious that the sister group of *Lobosciara* is to be sought among the group of genera formed by *Bradysia*, *Ctenosciara*, *Scatopsiara*, *Xenopygina*, *Prosciara*, *Dolichosciara* and *Phytosciara*. The species of these genera, like those of *Lobosciara*, have a comb-like row of setae subapically on the proximal side of the front tibia (apomorphy). In *Lobosciara*, *Dolichosciara*, *Prosciara* and *Phytosciara* this comb is more or less irregular and is proximally not accompanied by a wide triangular unsetose area as in the first four genera (apomorphy but not necessarily synapomorphy). Further, all species of *Lobosciara*, *Dolichosciara*, *Prosciara* and *Phytosciara* lack the apical tooth of the gonostylus and have claws with distinct teeth. *Lobosciara* and *Dolichosciara* are similar in having a long and slender gonostylus, and in having a group of long and strong setae ventrally on the apicomeral angle of the gonocoxite (apomorphy) instead of only one (plesiomorphy) as in other genera. We consider this apomorphic char-

acter state a synapomorphy of *Lobosciara* and *Dolichosciara*, and these two genera sister groups.

The interrelationship of the species of *Lobosciara* seems rather clear. *L. spinipennis* and *L. trilobata* differ from the other species of the genus and also from the common structural pattern of Sciaridae by having a pair of setigerous lobes laterad from the intercoxal lobe of the hypopygium (synapomorphy), and they are sister species. *L. latiloba*, *L. bilobata* and *L. adebratti* share very deeply bipartite halves of tergite 10 (synapomorphy) instead of having these lobes only apically bifid (plesiomorphy) as do *L. spinipennis* and *L. trilobata*. Accordingly, *L. latiloba*, *L. bilobata* and *L. adebratti* form a monophyletic group which is the sister group of *L. spinipennis* + *L. trilobata*. Further, *L. bilobata* and *L. adebratti* are probably sister species: they have the intercoxal lobe of the hypopygium completely divided into a pair of submedial lobes, separated by a nonsetose gap (synapomorphy), unlike *L. latiloba*, which has the lobe medially divided by a shallow setose depression only (plesiomorphy).

#### Key to the species of *Lobosciara*

1. Hypopygium with two setose lobes ventrally at the base of the gonocoxites (Figs. 1A, 1C, 2B, 2C) ..... 2
- Hypopygium with three or four setose lobes ventrally at the base of the gonocoxites (Figs. 2D, 3B) ..... 4
2. The lobes flat, broader than long (Fig. 1A) ..... *L. latiloba* sp. n.
- The lobes apically finger-like, longer than broad (Figs. 1C, 2B, 2C) ..... 3
3. The genital rod apically (at the tip of aedeagus) broad and well sclerotized (Fig. 1C, 1E) .... *L. bilobata* sp. n.
- The genital rod apically a narrow, weakly sclerotized stripe (Fig. 2B, 2C) ..... *L. adebratti* sp. n.
4. The genital rod long and whip-like, hypopygium ventrally at the base of gonocoxites with four setose lobes (Fig. 3B, 3C, 3D) ... *L. spinipennis* (Sasakawa)
- The genital rod short, not whip-like, hypopygium ventrally at the base of gonocoxites with three setose lobes (Fig. 2D) ..... *L. trilobata* sp. n.

#### *Lobosciara latiloba* sp. n.

Figs. 1A–B, 4D, 5A

Material studied: Holotype male: Brunei, Bukit Sulang nr. Lamuhin, fogging, 20.8.–10.9.1982, N.E. Stork (in London). Paratypes: the same data as in the holotype, 6♂♂ (in

London, in Helsinki and in Stockholm); Malaysia, Borneo, Sabah, mainline west, 56 km west of Silan, 100m, 25.9.–14.10.1987, A.H. Kirk-Spriggs (NMW Sabah (Borneo) Expedition, NMW.Z.1987.094), 1♂ (in Cardiff); the same data but 14.–19.10.1987, 1♂ (in Cardiff); Malaysia, Genting, 7.1981, R.I. Vane-Wright, 1♂ (in London) and Malaysia, Selangor, Mimaland nr. Kuala Lumpur, at light, 25.2.1991, H. & H. Hippa, B. Gustafsson & G. Sellerholm, 1♂ (in Stockholm).

**Description.** Head: Eye bridge with 2–3 rows of facets. Prefrons with 7–13 setae. Clypeus with 1–4 setae. Palpal segment 1 with 1 seta. Length/width of flagellar segment 4 of antenna 1.90–2.35. — Thorax: Pale brown. Episternum 1 with 5–11 setae. — Wing: Fig. 5A. Wing length: 1.8–2.0 mm. c/w 0.80–0.90. R1/R 0.65–0.80. — Legs: Fig. 4D. Tibia 1 with a comb of 5–8 setae. — Hypopygium: Fig. 1A, 1B. Sternite 10 with 1–2 setae on each half.

*L. latiloba* resembles *L. bilobata* and *L. adebratti* and differs from *L. spinipennis* by having deeply bipartite, not only apically bilobed, halves of tergite 10 and by lacking a pair of setigerous lobes laterad from the intercoxal lobe of the hypopygium. *L. latiloba* can be distinguished from *L. bilobata* and *L. adebratti* by having the halves of the medially divided intercoxal lobe broad and flat, not finger-like, and from all other species of the genus by having the lobe on the gonocoxal apodeme more pronounced (Fig. 1A).

#### *Lobosciara bilobata* sp. n.

Fig. 1C–E

Material studied: Holotype male: Malaysia, Borneo, Sabah, mainline west, 56 km west of Silan, 100m, 25.9.–14.10.1987, A.H. Kirk-Spriggs (NMW Sabah (Borneo) Expedition, NMW.Z.1987.094) (in Cardiff). Paratypes: the same data as in the holotype, 3♂♂ (in Helsinki and in Stockholm); the same data but 14.–19.10.1987, 2♂♂ (in Cardiff); Malaysia, Borneo, Sabah, Danum Valley, clearing by bridge, 8.7.–12.8.1986, P. Eggleton, 3♂♂ (in London and in Helsinki); the same data but primary forest canopy, 27.10.–5.11.1986, 1♂ (in London); Malaysia, Borneo, Sabah, Danum Valley, 5° 11'N, 117°47'E, 150m, 16.–24.9.1987, A.H. Kirk-Spriggs (NMW Sabah (Borneo) Expedition, NMW.Z.1987.094), 1♂ (in Cardiff); Malaysia, Borneo, Sabah, Bukit Monkobo, 5°48'N, 116°58'E, 1200m, 9.–17.8.1987, A.H. Kirk-Spriggs (NMW Sabah (Borneo) Expedition, NMW.Z.1987.094), 1♂ (in Cardiff); Malaysia, Borneo, Sabah, Sipitang, Mendolong Nersery,

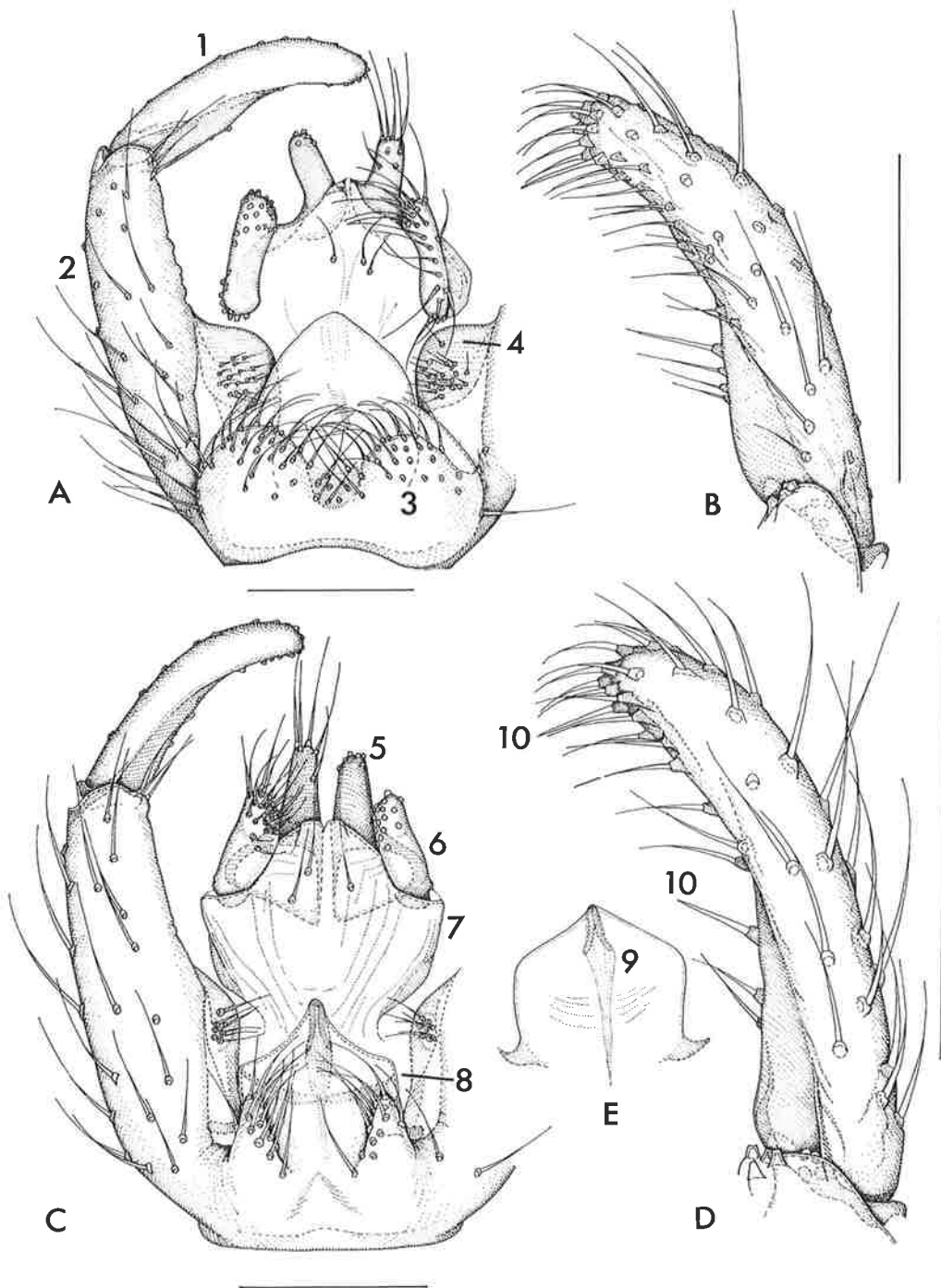


Fig. 1. Part of hypopygium (A and C), gonostylus (B and D) and aedeagus (E), ventral view. — A and B: *Lobosciara latiloba* sp. n. (A holotype, B paratype from Brunei). — C–E: *L. bilobata* sp. n. (C and D holotype, E paratype from Sabah). Scale 0.10 mm. 1: gonostylus, 2: gonocoxite, 3: intercoxal lobe of hypopygium, 4: gonocoxal apodeme, 5: dorsal lobe of the right half of tergite 10, 6: ventral lobe of the right half of tergite 10, 7: sternite 10, 8: aedeagus, 9: genital rod, 10: needle-like seta of gonostylus.

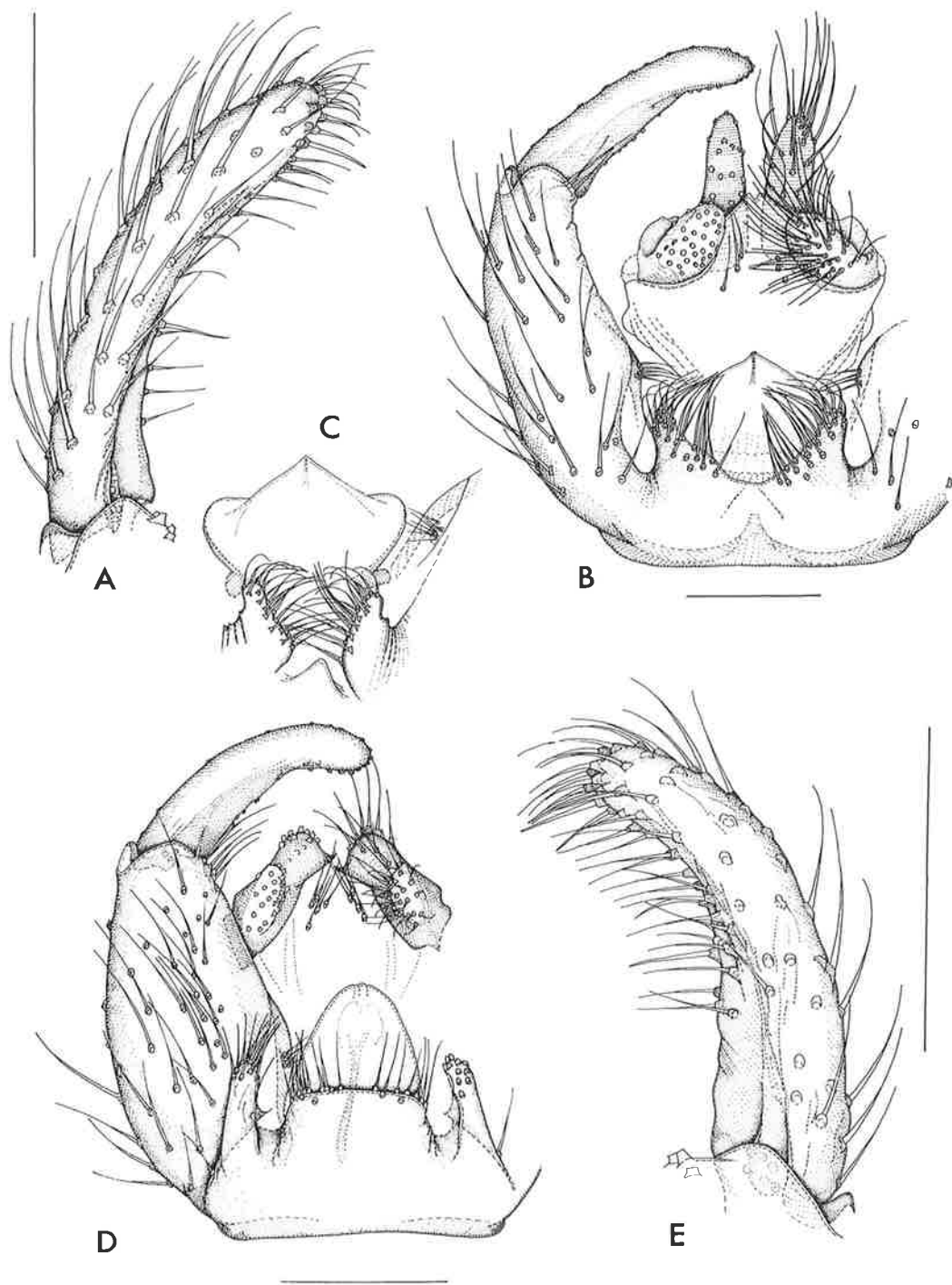


Fig. 2. Gonostylus (A and E), part of hypopygium (B and D) and aedeagus with associated structures (C), ventral view. — A–C: *Lobosciara adebratti* sp. n. (A and C paratypes from Sabah, B holotype). — D and E: *L. trilobata* sp. n. (holotype). Scale 0.10 mm.

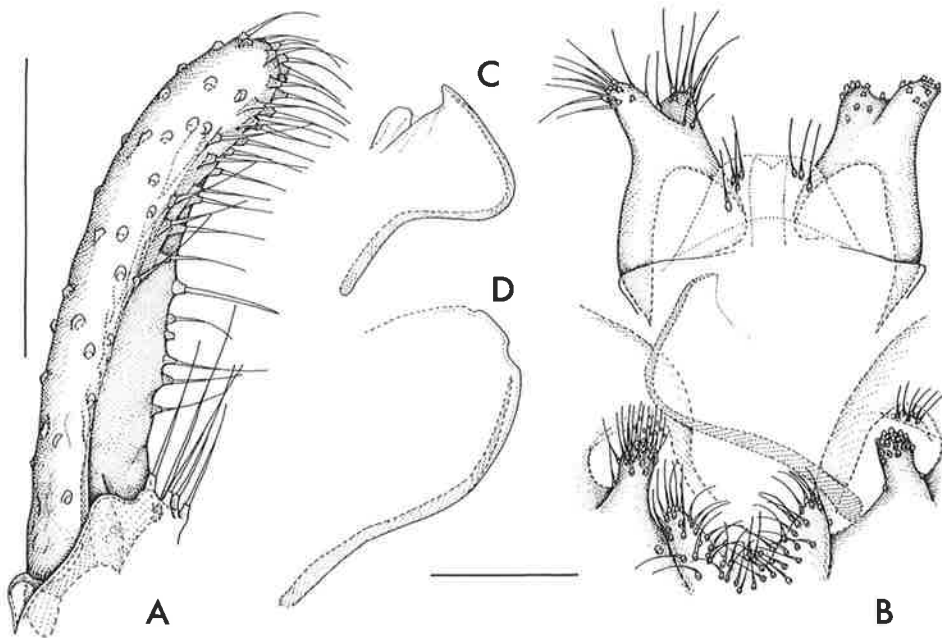


Fig. 3. *Lobosciara spinipennis* (Sasakawa) (A and C from Thailand, B from Guam and D from Palau): gonostylus (A), part of hypopygium (B) and part of aedeagus with the genital rod (C and D), ventral view. Scale 0.10 mm.

light trap, 11.4.1988, S. Adebratt, 1♂ (in Stockholm); Indonesia, Sulawesi Utara, Dumoga-Bone N.P., 0°34'N, 123°54'E, 232m, 3.–16.9.1985, A.H. Kirk-Spriggs (NMW Indonesia Expedition 1985 (Project Wallace), NMW.Z. 1985.078), 1♂ (in Cardiff) and Malaysia, Pahang, Bukit Frazer, light trap, 9.4.1992, H. Hippa, 1♂ (in Stockholm).

**Description.** Head: Eye bridge with 2–3 setae (at junction, sometimes 1). Prefrons with 5–13 setae. Clypeus with 1–4 setae. Palpal segment 1 with 1–2 setae. Length/width of flagellar segment 4 of antenna 1.75–2.10. — Thorax: Pale brown. Episternum 1 with 2–9 setae. — Wing: Wing length 1.6–2.3 mm. c/w 0.65–0.90. R1/R 0.60–0.80. — Legs: Fig. 4B. Tibia 1 with a comb of 5–7 setae. — Hypopygium: Fig. 1C, 1D, 1E. Sternite 10 with 1–4 setae on each half.

*L. bilobata* is similar to *L. adebratti*. For distinguishing characters, see under the latter.

#### *Lobosciara adebratti* sp. n.

Figs. 2A–C, 4C

Material studied: Holotype male: Malaysia, Borneo, Sabah, Sipitang, Mendolong Nersery, 31.3.1989, S. Adebratt (in Stockholm). Paratypes: the same data as in the

holotype, 14♂♂ (in Stockholm and in Helsinki); Malaysia, Sabah, Sipitang, 4.5.1988, S. Adebratt, 2♂♂ (in Stockholm); Malaysia, Borneo, Sabah, Sipitang, Mendolong Nersery, light trap, 11.4.1988, S. Adebratt, 2♂♂ (in Stockholm); Malaysia, Borneo, Sabah, mainline west, 56 km west of Silan, 100m, 25.9.–14.10.1987, A.H. Kirk-Spriggs (NMW Sabah (Borneo) Expedition, NMW.Z.1987.094), 1♂ (in Cardiff) and Malaysia, Sarawak, Lubok Jita, 1°12'N, 110°48'E, malaise in peat swamp forest, 6.–10.11.1976, P.S. Cranston, 4♂♂ (in London).

**Description.** Head: Eye bridge with 2–3 rows of facets. Prefrons with 6–14 setae. Clypeus with 2–5 setae. Palpal segment 1 with 1–3 setae. Length/width of flagellar segment 4 of antenna 1.60–2.00. — Thorax: Brown. Episternum 1 with 4–9 setae. — Wing: Wing length 1.7–2.3 mm. c/w 0.70–0.90. R1/R 0.55–0.90. — Legs: Fig. 4C. Tibia 1 with a comb of 5–9 setae. — Hypopygium: Fig. 2A, 2B, 2C. Sternite 10 with 1–5 setae on each half.

*L. adebratti* is similar to *L. bilobata* but can be distinguished as follows: the genital rod appears as a short, narrow, weakly sclerotized stripe at the apex of the aedeagus instead of being long, broad and apically strongly sclerotized; in ventral aspect the ventral lobes of tergite 10 are

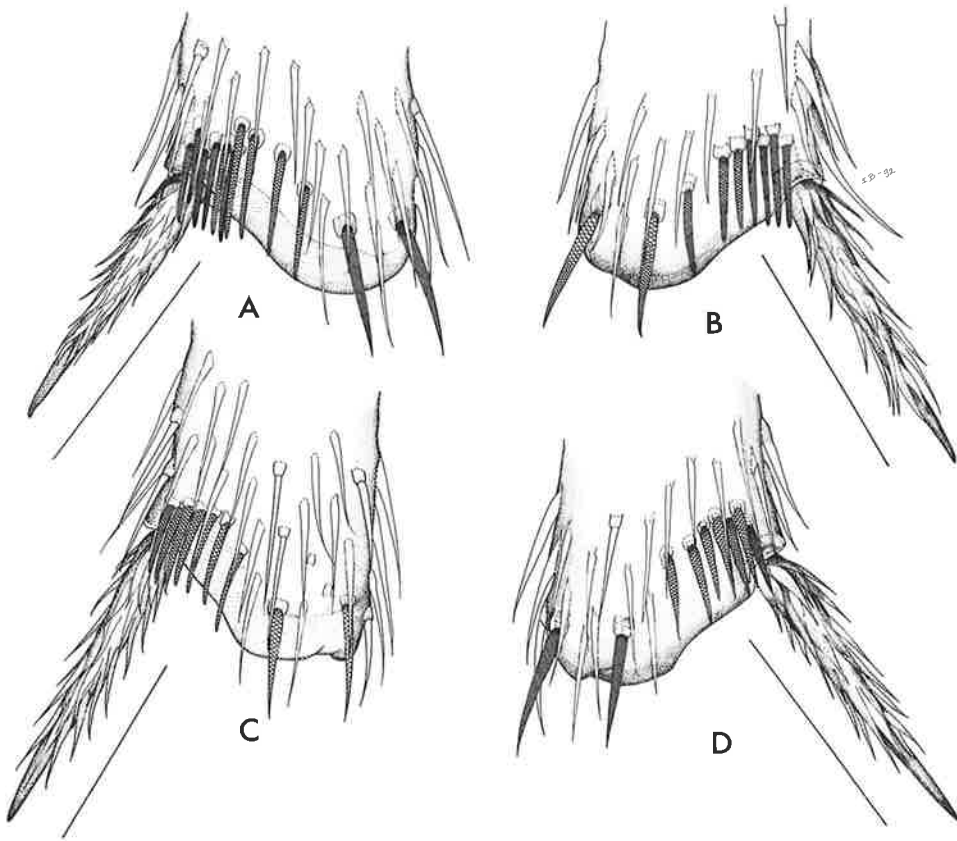


Fig. 4. Apex of front tibia, prolateral view. — A: *Lobosciara trilobata* sp. n. (paratype). — B: *L. bilobata* sp. n. (paratype from Sabah). — C: *L. adebratti* sp. n. (paratype from Sabah). — D: *L. latiloba* sp. n. (paratype from Malay Peninsula). Scale 0.05 mm.

more oval and oblique, and both the ventral and dorsal lobes are more extensively setose (Figs. 1C, 1E, 2B, 2C). For further discussion, see under *L. latiloba*.

***Lobosciara trilobata* sp. n.**

Figs. 2D–E, 4A

Material studied: Holotype male: Indonesia, Sulawesi Utara, Dumoga Irrigation Project, Toraut, malaise trap, irrigated rice vars Aceh & Citandul, 6.–10.8.1985, A.H. Kirk-Spriggs (NMW Indonesia Expedition 1985 (Project Wallace), NMW.Z.1985.078) (in Cardiff). Paratypes: the same data as in the holotype, 9♂♂ (in Cardiff, in Helsinki and in Stockholm) and the same data but 3.–6.8.1985, 7♂♂ (in Cardiff).

*Description.* Head: Eye bridge with 2–3 rows of facets. Prefrons with 5–14 setae. Clypeus with 1–4 setae. Palpal segment 1 with 1–2 setae. Length/width of flagellar segment 4 of antenna 2.00–2.50. — Thorax: Pale brown with darker brown areas. Episternum 1 with 4–8 setae. — Wing: Fig. 5B. Wing length 1.9–2.2 mm. c/w 0.75–0.90. R1/R 0.80–1.00. — Legs: Fig. 4A. Tibia 1 with a comb of 5–9 setae. — Hypopygium: Fig. 2D, 2E. Sternite 10 with 2–6 setae on each half.

*L. trilobata* is similar to *L. spinipennis*. They both differ from the other species of the genus by having only rather slightly bilobed halves of tergite 10, instead of deeply bipartite ones, and by having narrow finger-like setigerous lobes on

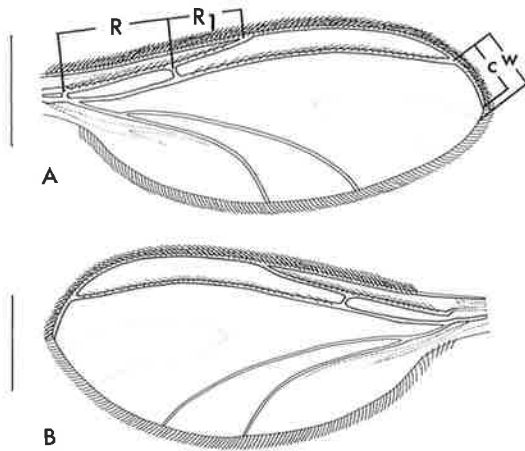


Fig. 5. Wing, dorsal view. — A: *Lobosciara latiloba* sp. n. (paratype from Brunei). — B: *L. trilobata* sp. n. (paratype). Scale 0.50 mm.

the sides of the intercoxal lobe of the hypopygium. The intercoxal lobe is broad and undivided in *L. trilobata* while it is medially deeply emarginated or almost divided into a pair of submedial lobes in *L. spinipennis* (Figs. 2D, 3B). *L. trilobata* is unique in the genus by having a pattern of paler and darker areas on the thorax instead of being practically unicolorous.

### *Lobosciara spinipennis* (Sasakawa)

Fig. 3

*Bradysia spinipennis* Sasakawa, 1962:130.

*Lobosciara spinipennis*, Steffan, 1969:728.

Material studied: Micronesia: S. Mariana Is., Guam, Pt. Oca, 22.6.1945, G.E. Bogart & J.L. Gressitt, 2♂♂ (in Honolulu); Palau Is., Koror, 4.1953, J.W. Beardsley, 1♂ (in Honolulu); Truk, Moen, light trap, 23.2.1949, R.W.L. Potts, 1♂ (in Honolulu); Truk, Moen, Civ. Ad. Area, 1.3.1949, R.W.L. Potts, 1♂ (in Honolulu); the same data but 22.3.1949, 1♂ (in Honolulu); Truk, Tol, Mt. Unibot, 200m, light trap, 30.12.1952, J.L. Gressitt, 1♂ (in Honolulu); Ponape, Colonia, Agric. Exper. Sta., light trap, 6.1.1953, J.L. Gressitt, 2♂♂ (in Honolulu); Kusaie, Matunlik, 22m, 8.2.1953, J.F.G. Clarke, 1♂ (in Honolulu); the same data but 22.3.1953, 1♂ (in Honolulu) and Thailand, Chiangmai Pr., Doi Suthap, jungle, 14.11.1976, P.T. Lehtinen, 1♂ (in Helsinki).

**Description.** Head: Eye bridge with 2–3(4) rows of facets. Prefrons with 10–22 setae. Clypeus with 1–4 setae. Palpal segment 1 with 1–2 setae. Antennae flattened in the specimens studied, no ratios measured. — Thorax: Pale brown. Episternum 1 with 6–12 setae. — Wing: Wing length 2.2–2.3 mm.  $c/w$  0.75–0.90.  $R1/R$  0.70–1.00. — Legs: Tibia 1 with a comb of 5–10 setae. — Hypopygium: Fig. 3. Sternite 10 with 1–5 setae on each half.

We have not seen the type material from Thailand, but Sasakawa's (1962) description with illustrated male genitalia leaves practically no doubts about the identity. The above description of *L. spinipennis* is based only on the material we studied.

The appearance of the aedeagus may vary greatly between the preparations: the long, curved genital rod may turn either to the right or to the left and may be more or less strongly bent in its apical part (Fig. 3). *L. spinipennis* differs from the other known species of the genus by having a very long whip-like genital rod instead of a short or nearly missing one. Otherwise it is similar to *L. trilobata*, the distinguishing characters being discussed under the latter.

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### References

- Sasakawa, M. 1962: Diptera from Southeast Asia (Part II). — Nature and life in Southeast Asia 2:125–133.  
Steffan, W. A. 1969: Insects of Micronesia, Diptera: Sciaridae. — In: Bernice P. Bishop Museum, Insects of Micronesia 12(7):669–732.

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