

Kontyû, Tokyo, 49 (2): 322-333. June 25, 1981

Records of the Strepsiptera from West Malaysia, with
Descriptions of a New Genus, *Malayaxenos*,
and Five New Species
(Notulae Strepsipterologicae-VII)

Teiji KIFUNE

Department of Parasitology, School of Medicine
Fukuoka University, Fukuoka 814-01, Japan

Synopsis Nine species of the Strepsiptera are recorded by male specimens from West Malaysia (Malay Peninsula). *Malayaxenos kitaokai* gen. et sp. nov., *Halictophagus longipenis*, *H. malayanus*, *Lychnocolax orientalis*, and *Stichotrema malayanum* spp. nov. are described. *Triozocera siamensis*, *Lychnocolax postorbis*, *Myrmecolax rossi*, and *Stichotrema retrorsum* are newly recorded from West Malaysia.

Little has been known on the strepsipterous fauna of the Malay Peninsula up to the present. Only DOVER (1927) reported the occurrence of a certain species attacking fulgorids and jassids. Recently, I was able to examine 13 male strepsipterans collected in West Malaysia through the courtesy of Dr. S. KITAOKA of the National Institute of Animal Health. These were attracted by light trap and separately mounted by the collector. Though unuse of cushion resulted in unfortunate damage or deformation of thoracic sclerites, specific identification was possible by the structures of antennae, appendages, hind wings, and aedeagi. They are classified into 9 species, all of which are the first records from the West Malaysia of Malay Peninsula. There are 5 new species, one of which represents a new genus as described in the followings.

Corioxenidae

Triozocera siamensis KIFUNE et HIRASHIMA, 1979

Esakia, (14): 62, figs. 1-7, ♂ (Thailand).

This species was described by several male specimens obtained in Thailand by light trap. The present specimen was also collected under the same circumstances.

Specimen examined. 1 ♂, Ipoh, Perak, West Malaysia, 27. Feb. 1980, S. KITAOKA leg., at light.

Remarks. This specimen agrees with the type of *Triozocera siamensis* in its size and morphological characters (Figs. 11-13). This is the first record of the species from Malaysia.

Malayaxenos gen. nov.

(Gender: masculine)

Diagnosis of the male. Medium-sized; antennae 6-segmented, 3rd and 4th segments each with long flabellum, 5th and 6th segments moderately long, surface structure closely allied to that of *Triozocera*; mandibles absent; maxillary palpi simple, long. Hind wing with almost similar venation to *Triozocera* or *Dundoxenos*. Tarsi 4-segmented, without claws. Aedeagus almost straight, slightly attenuate at median portion. Ninth abdominal segment dorso-ventrally elongated, elliptical in dorsal view; tenth tergite hemi-elliptical, tongue-shaped.

Female, triungulin, and host. Unknown.

Type species: *Malayaxenos kitaokai* sp. nov.

Malayaxenos kitaokai sp. nov.

Male (Figs. 1-7).

Size. Estimated total length of body 2.6 mm; head breadth 0.64 mm; length of antenna 0.78 mm; radial length of hind wing 1.7 mm; maximum breadth of abdomen 0.56 mm; length of ninth abdominal segment 0.65 mm; length of aedeagus 0.55 mm.

Structure. Allied in general structure to *Triozocera* as stated in the generic diagnosis. Head transversely elongated, elliptical; eyes hemispherical, each composed of about 21 facets, 14 of them visible from above; antennae 6-segmented, 3rd and 4th segments with long flabella, 5th and 6th moderately long, 5th slightly longer than 6th, 1st and basal portion of 3rd conical, 2nd globular, flabellum of 3rd segment shorter than that of 4th, 5th and 6th segments together longer than flabellum of 4th; maxillae about three times as long as broad, maxillary palpi straight, slightly attenuate at median portion; mandibles absent.

Pro- and mesothoraces about half as broad as head; metathorax deformed by pressure, metathoracic spiracles remarkable; legs slender, tarsi 4-segmented, without claws, 1st and 2nd tarsal segments of all legs with a roundly pointed projection at posterior tip and a small projection at the median portion of apical margin.

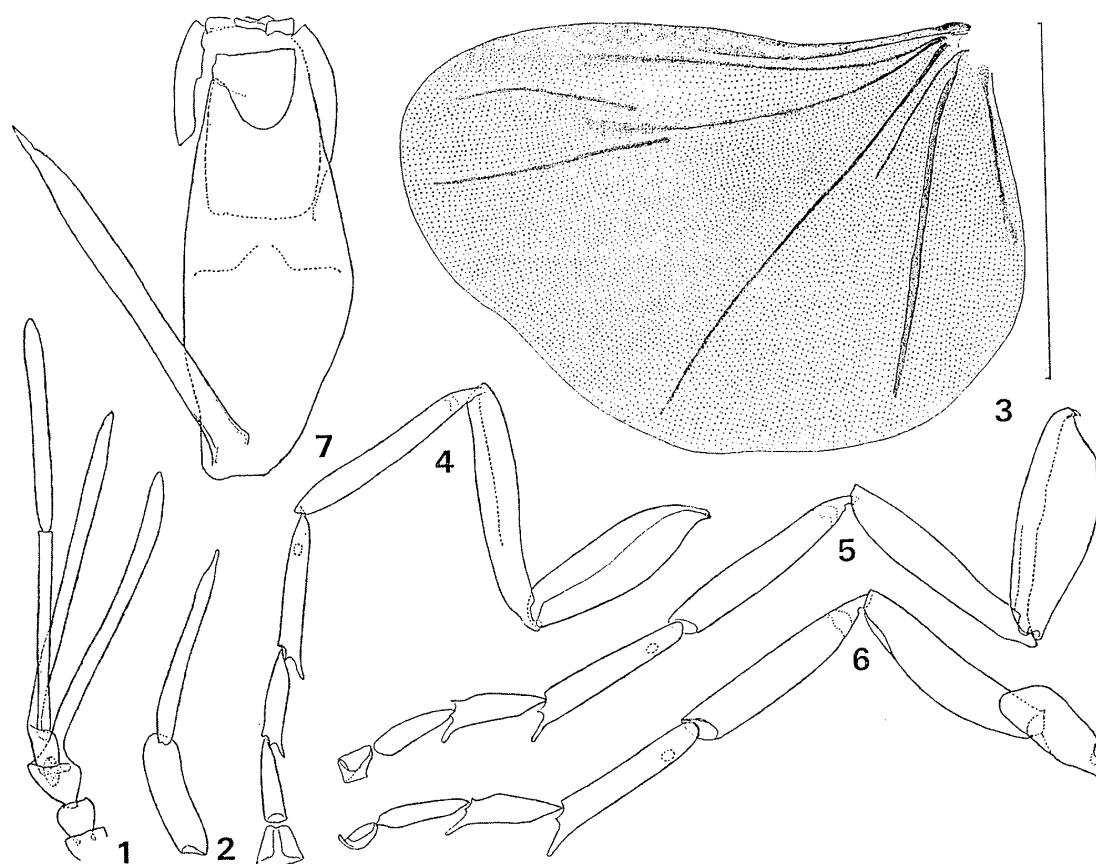
Hind wing with venation allied to that of *Triozocera*, but without detached vein near radius, detached vein near media situated a little anteriorly, 1A very short, shorter than one-half of 2A, jugal vein longer than 1A.

Abdomen well sclerotized; 9th segment very long, more than half of its posterior portion released from the preceding segment; aedeagus slender, long, broadest at about one-third of its length from apex, slightly attenuate at basal two-fifths.

Female, triungulin, and host. Unknown.

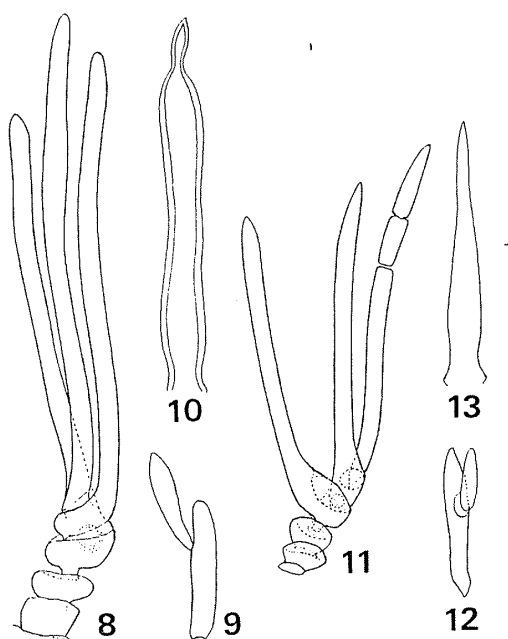
Type material. Holotype, ♂ (No. 2231, Kyushu Univ.), Ipoh, Perak, West Malaysia, 5. Mar. 1980, S. KITAOKA leg., at light.

Type depository. The holotype is preserved in the Entomological Laboratory, Faculty of Agriculture, Kyushu University.



Figs. 1-7. *Malayaxenos kitaokai* gen. et sp. nov., holotype, male, dorsal view. — 1, Right antenna; 2, right maxillary palpus; 3, left hind wing; 4, left fore leg; 5, left mid leg; 6, left hind leg; 7, genital capsule and aedeagus. Scale: 1 mm in Fig. 3, 0.5 mm in other figures.

Discussion. From the morphological characters, the present new genus shows a certain affinity to the genera *Triozocera* and *Dundoxenos* in venation of hind wing, but it also shows close relationships to *Corioxenos* in tarsal structure which is 4-segmented and clawless. Considering the combination of characters, I prefer to place this new genus in the subfamily Corioxeninae of KINZELBACH (1970). For the convenience of comparison, the antennae and aedeagi of the genera *Dundoxenos* and *Triozocera* are illustrated in Figs. 8-13. There is a slight possibility that the present new species may be the male of the genus *Callipharixenos* which is known from the female only. The latter is known from Thailand, a neighboring country to Malaysia. Conferring the primitive characters of the latter genus, however, I suppose that the former may not be the male of the latter.



Figs. 8–13. — 8–10. *Dundoxenos vilhenai*, male, dorsal view. — 11–13. *Triozocera siamensis*, male, ventral view. — 8 and 11, Antenna (8, left; 11, right); 9 and 12, maxilla and maxillary palpus (9, right; 12, left); 10 and 13, aedeagus. Scale: 0.5 mm.

Halictophagidae

Only two specimens of this family were found in the material. These represent two different new species.

Halictophagus malayanus sp. nov.

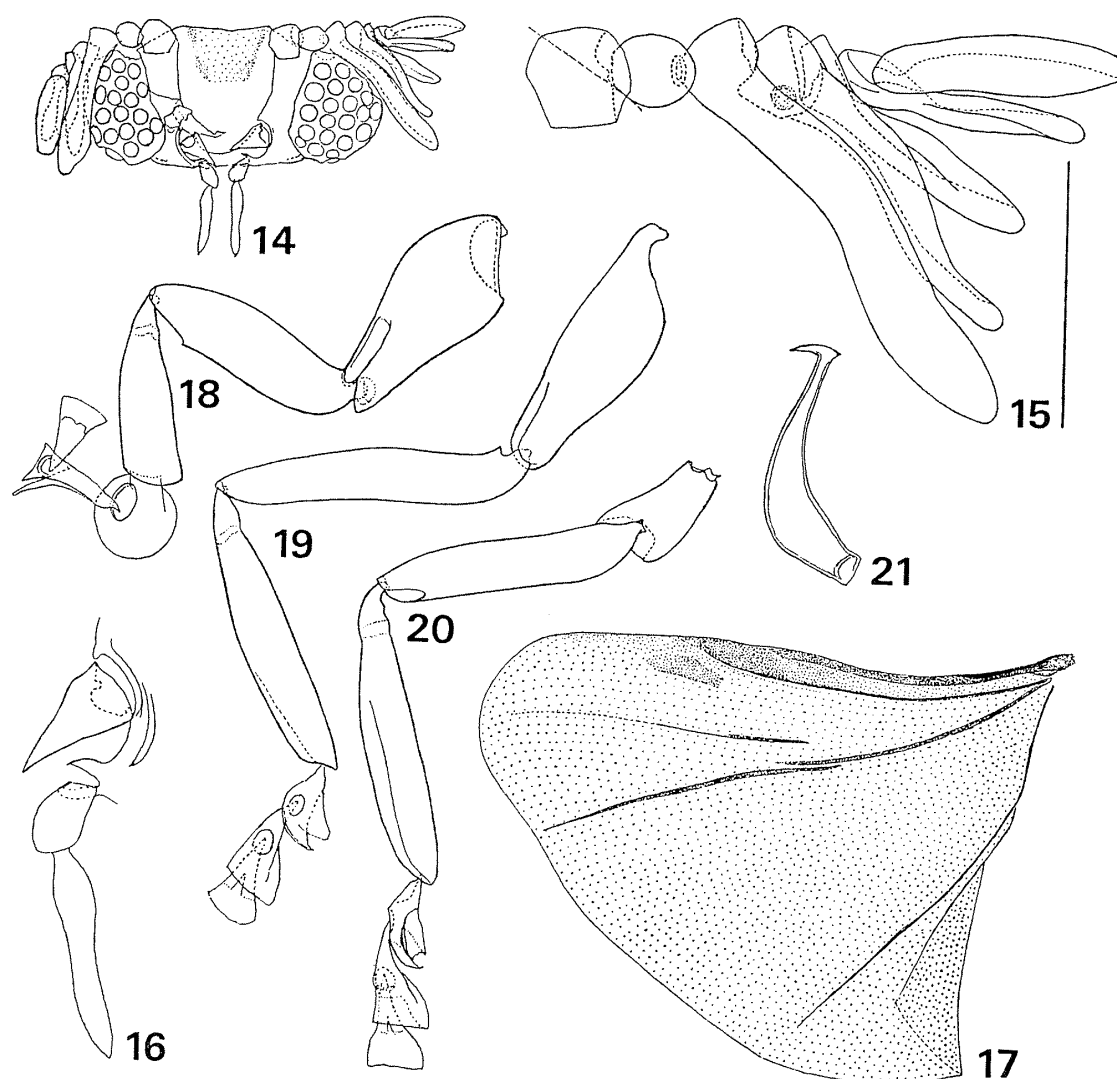
Male (Figs. 14–21)

Size. Estimated total length of body 2.4 mm; head breadth 0.7 mm; radial length of hind wing 1.5 mm; length of aedeagus 0.1 mm.

Structure. Head elliptical in frontal view; eyes hemispherical, each composed of about 23 facets; antennae compact, 3rd to 6th segments each with long flabellum, 7th segment long, flabellate, flabellum of 3rd segment longest and that of 5th shortest of these flabella, all flabella flattened, fusiform; mandibles short, subtriangular; maxillae short, club-like, maxillary palpi twice as long as maxillae.

Metathoracic sclerites deformed by pressure; femora slightly curved, 1st tarsal segments of fore legs circular, those of the other legs rather triangular.

Abdominal segments sclerotized, sternites more developed than tergites; 9th segment elliptical, 10th tergite semi-circular; aedeagus without dorsal process, its body slightly curved, basal half thickened, ventral projection rectangularly attached to the body.



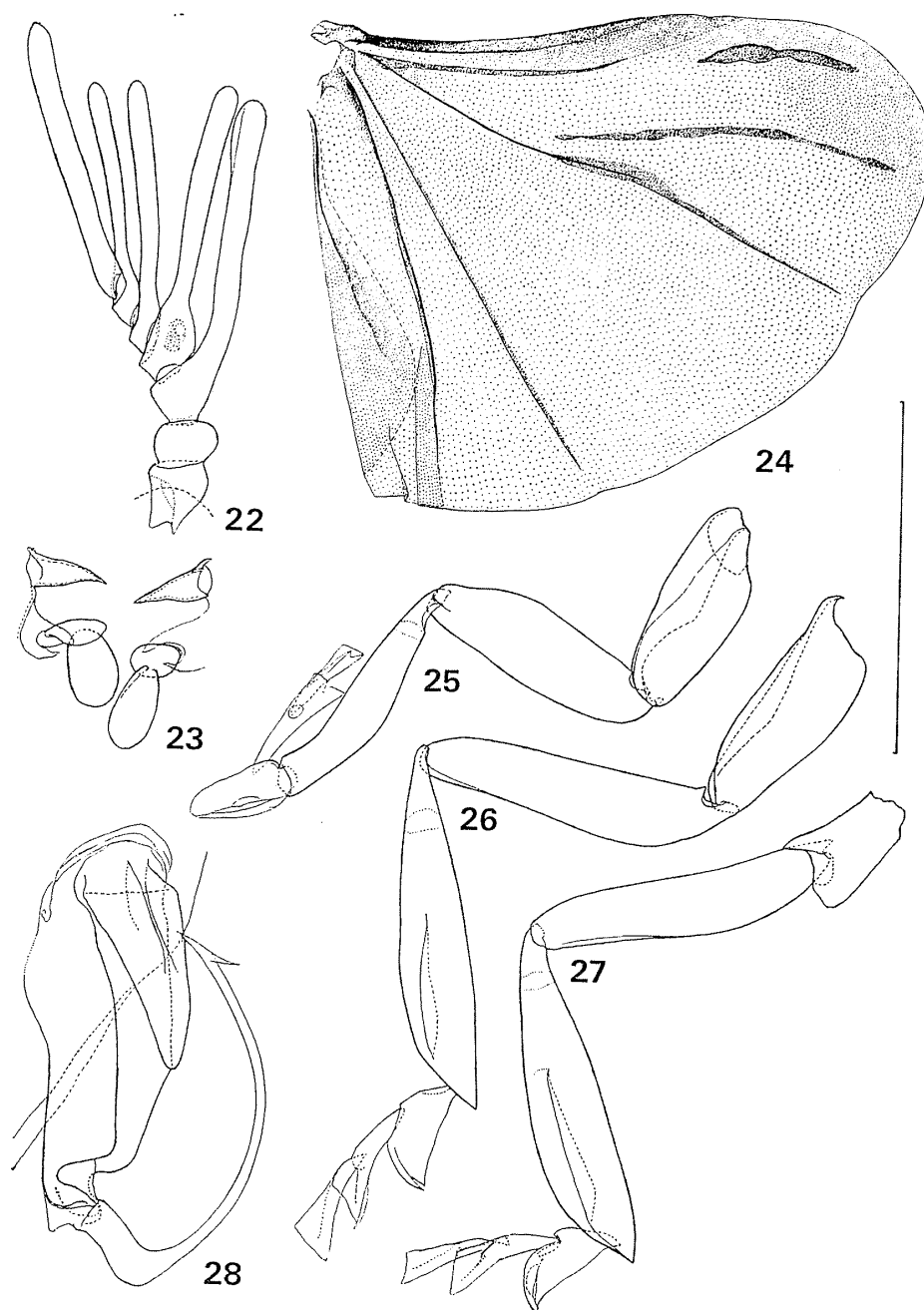
Figs. 14–21. *Halictophagus malayanus* sp. nov., holotype, male. — 14, Head; 15, left antenna; 16, left mandible and maxillary palpus; 17, left hind wing; 18, right fore leg; 19, right mid leg; 20, right hind leg; 21, aedeagus. 14–16, Frontal view; 17, dorsal view; 18–21, lateral view. Scale: 0.6 mm in Figs. 14 and 17, 0.12 mm in Fig. 21, 0.2 mm in other figures.

Female, triungulin, and host. Unknown.

Type material. Holotype, ♂ (No. 2232, Kyushu Univ.), Ipoh, Perak, West Malaysia, 8. Jan. 1980, S. KITAOKA leg., at light.

Type depository. The holotype is kept at the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

Discussion. The present new species is allied to *H. compactus* (PIERCE, 1918) from India, but differs from it in the shape of aedeagus, size of body, etc.



Figs. 22–28. *Halictophagus longipenis* sp. nov., holotype, male, dorsal view. — 22, Left antenna; 23, mandibles and maxillary palpi; 24, right hind wing; 25, left fore leg; 26, left mid leg; 27, left hind leg; 28, genital capsule and aedeagus. Scale: 1 mm in Fig. 24, 0.5 mm in other figures.

Halictophagus longipenis sp. nov.

Male (Figs. 22–28).

Size. Estimated total length of body 3.0 mm; head breadth 1.1 mm; length

of antenna 0.75 mm; radial length of hind wing 1.8 mm; maximum breadth of abdomen 0.47 mm; length of aedeagus 0.5 mm.

Structure. Head elliptical, transversely elongated; eyes spherical, each eye composed of about 27 facets; antennae 7-segmented, 3rd to 6th segments with long flabella, 7th segment as large as flabellum of 3rd, flabella of 5th and 6th segments slightly smaller than other flabella; mandibles short, triangular, not crossing each other; maxillae club-formed, maxillary palpi elliptical, as long as maxillae or mandibles. Hind wing with thick detached vein near radius, detached vein near media as long as proximal media.

Abdomen sclerotized, cylindrical; 9th segment dorso-ventrally elongated, sub-triangular, underside of posterior portion of 8th segment protruded posteriorly so as to sustain 9th segment; aedeagus very long, slender, strongly curved, dorsal process sharply pointed, short, ventral projection also sharply pointed with acute angle to the body of aedeagus; 10th tergite long, triangular, tongue-shaped.

Female, triungulin, and host. Unknown.

Type material. Holotype, ♂ (No. 2233, Kyushu Univ.), Ipoh, Perak, West Malaysia, 5. Mar. 1980, S. KITAOKA leg., at light.

Type depository. The holotype is preserved in the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

Discussion. The present new species is characterized by its unique, long, curved aedeagus, and in this character, this is allied to *H. javanensis* (PIERCE, 1918) from Java, but differs from it by much larger body, aedeagus, etc.

Myrmecolacidae

Lychnocolax postorbis BOHART, 1951

Wasmann J. Biol., 9: 100, figs. 41–46, ♂ (Philippines).

This species was described from the Philippines. In the present material the following 3 males were found. This is the first record of the species outside of the Philippines.

Specimens examined. 3 ♂♂, Ipoh, Perak, West Malaysia, 19. Jan. 1978, 8. Jan. 1980, & 12. Jan. 1980, S. KITAOKA leg., at light.

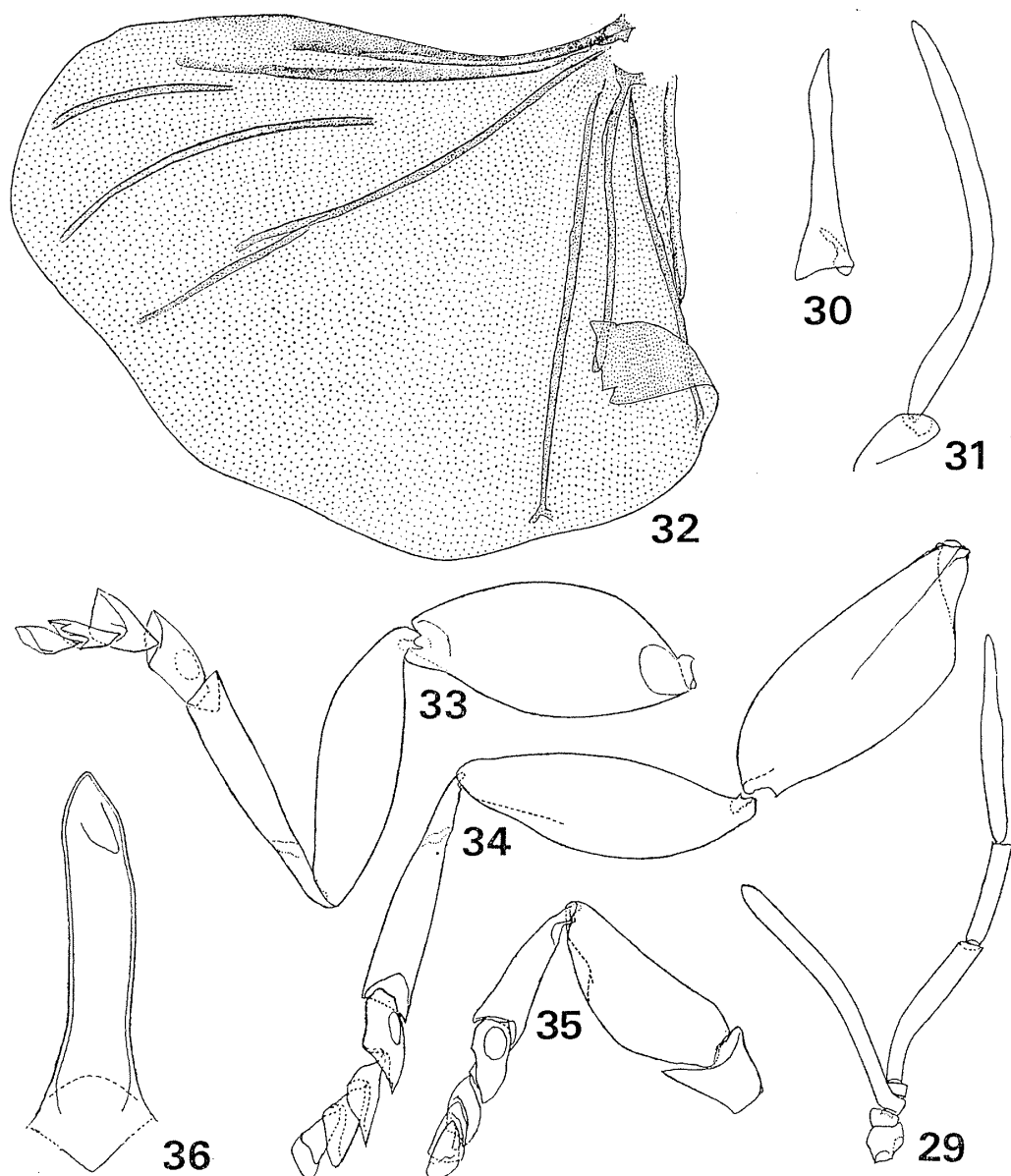
Depository of the specimens. Two males are donated to the Entomological Laboratory, Faculty of Agriculture, Kyushu University. One male is tentatively preserved in my collection for further study and will be finally donated to Kyushu University.

Lychnocolax orientalis sp. nov.

Only one male was discovered in the material.

Male (Figs. 29–36).

Size. Estimated total length of body 2 mm; head breadth 0.95 mm; radial



Figs. 29–36. *Lychnocolax orientalis* sp. nov., holotype, male. — 29, Right antenna; 30, right mandible; 31, left maxillary palpus; 32, left hind wing; 33, left fore leg; 34, left mid leg; 35, left hind leg; 36, aedeagus. 29–31, Frontal view; 32–36, dorsal view. Scale: 0.6 mm in Figs. 29 and 32, 0.3 mm in Figs. 33–35, 0.2 mm in Figs. 30 and 31, 0.12 mm in Fig. 36.

length of antenna 1.2 mm; length of maxillary palpus 0.35 mm; radial length of hind wing 1.5 mm; length of aedeagus 0.17 mm.

Structure. Head small against large eyes, anterior margin roundly curved; antennae 7-segmented, 1st segment twice as long as 2nd, flabellum of 3rd segment scarcely reaching base of 7th, 7th segment 1.5 times as long as 6th or more, 5th

segment longer than 6th but shorter than 7th; eyes almost globular, composed of about 21 facets each; maxillary palpi very long, sometimes curved.

Pro- and mesothoraces almost as broad as interocular distance; metathoracic sclerites deformed by pressure; hind wing with remarkable two detached veins between radius and media, proximal media about twice as long as distal media or more; detached vein near radius longer than one-half of detached vein near media, two anal veins remarkable; hind tarsi not so compact.

Abdomen moderately sclerotized; posterior portion of 9th segment protruded posteriorly, 10th tergite semicircular; aedeagus a half as long as 9th segment.

Female, triungulin, and host. Unknown.

Type material. Holotype, ♂ (No. 2234, Kyushu Univ.), Ipoh, Perak, West Malaysia, 5. Mar. 1980, S. KITAOKA leg., at light.

Type depository. The holotype is preserved in the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

Discussion. The present new species is generally allied to *L. postorbis*, but differs from it in the longer maxillary palpi, longer detached veins between radius and media of hind wing, and the shape of aedeagus and 10th tergite.

Myrmecolax rossi BOHART, 1951

Wasmann J. Biol., 9: 91, figs. 9–15, ♂ (Philippines).

This species is newly recorded from Malaysia and outside the Philippines for the first time.

Specimens examined. 3 ♂♂, Ipoh, Perak, West Malaysia, 19. Jan. 1978, 16. Jan. 1980, & 23. Jan. 1980, S. KITAOKA leg., at light.

Depository of the specimens. Two males are donated to the Entomological Laboratory, Faculty of Agriculture, Kyushu University. The rest is tentatively preserved in my collection for further study and will be finally transferred to Kyushu University.

Stichotrema retrorsum (BOHART, 1951)

Wasmann J. Biol., 9: 94, figs. 5–8, ♂ (*Rhipidocolax*) (Philippines).

This species was described as the type-species of the genus *Rhipidocolax* BOHART, 1951, which is characterized by the absence of detached veins between radius and media and the presence of one anal (=vannal) vein posterior to cubitus in the hind wing. The genus was, however, submerged into *Caenocholax* PIERCE, 1909, by reason of the discovery of certain species which shows an intermediate character in the presence of an obscure detached vein. Afterwards, almost all the species of the genus *Caenocholax* were transferred to *Stichotrema* HOFENEDER, 1910, mainly by the structure of the aedeagus. Only one male was discovered in the present material and this is also the first record of the species outside the Philippines.

Specimen examined. 1 ♂, Ipoh, Perak, West Malaysia, 5. Mar. 1980, S.

KITAOKA leg., at light.

Depository of the specimen. The specimen is tentatively deposited in my collection for the comparison with related species and will be finally donated to the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

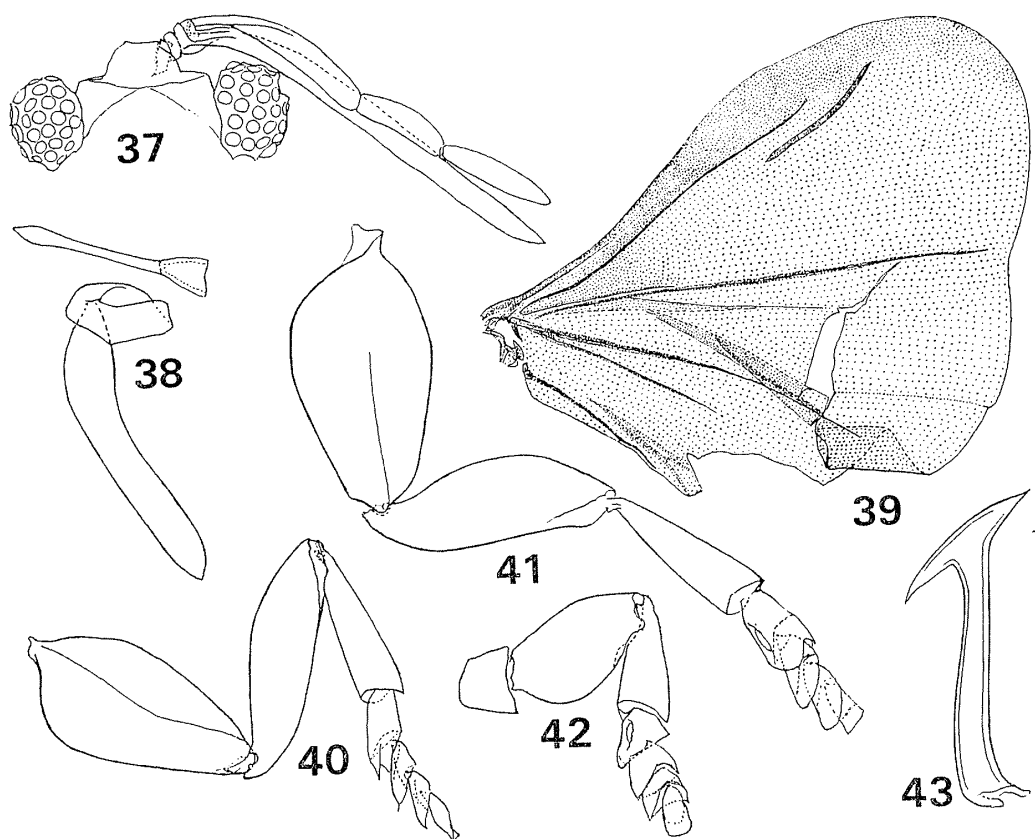
Stichotrema malayanum sp. nov.

This is described based on a single male specimen.

Male (Figs. 37–43).

Size. Estimated length of total body 2 mm; head breadth 0.6 mm; length of antenna 1 mm; radial length of hind wing 1.2 mm; length of aedeagus 0.12 mm.

Structure. Head broad, quadrilateral, anterior margin trapezoidally protruded; eyes globular, each eye composed of about 23 facets; antennae 7-segmented, 1st segment cylindrical, slightly longer than 2nd, 2nd segment short, disc-like, 3rd segment with long flabellum reaching tip of terminal end of 7th segment, 5th segment



Figs. 37–43. *Stichotrema malayanum* sp. nov., holotype, male. — 37, Head and right antenna; 38, right mandible and maxillary palpus; 39, right hind wing; 40, right fore leg; 41, right mid leg; 42, right hind leg; 43, aedeagus. 37–42, Dorsal view; 43, lateral view. Scale; 0.6 mm in Figs. 37 and 39, 0.3 mm in Figs. 40–42, 0.2 mm in Fig. 38, 0.12 mm in Fig. 43.

longest, a little shorter than 6th and 7th segments together, 7th slightly longer than 6th; mandibles very slender, subequal to head in length; maxillae elliptical, maxillary palpi about 6 times as long as broad.

Pro- and mesothoraces slightly narrower than interocular distance; hind wing with one detached vein near radius, proximal media a half as long as distal media, cubitus and anal vein terminating far from wing margin.

Abdominal sternites sclerotized, transversely oblong; aedeagus with dorsal process and ventral projection subequal in length.

Female, triungulin, and host. Unknown.

Type material. Holotype, ♂ (No. 2235, Kyushu Univ.), Ipoh, Perak, West Malaysia, 5. Mar. 1980, S. KITAOKA leg., at light.

Type depository. The holotype is deposited in the Entomological Laboratory, Faculty of Agriculture, Kyushu University.

Discussion. The present new species is allied to *S. krombeini* KIFUNE et HIRASHIMA, 1980, from Sri Lanka, but differs from it in the vertex narrower than prothorax, shorter proximal media, and larger size of body.

As the result of the present investigation, the following strepsipterans are known to occur in West Malaysia (Malay Peninsula).

List of the Strepsiptera from West Malaysia

(* New record)

Corioxenidae

Triozocerinae

- *1. *Triozocera siamensis* KIFUNE et HIRASHIMA, 1979 (♂)

Corioxeninae

- *2. *Malayaxenos kitaokai* gen. et sp. nov. (♂)

Halictophagidae

Halictophaginae

3. *Halictophagus peradeniya* (PIERCE, 1911) (L₁) (DOVER, 1927)
 *4. *H. longipenis* sp. nov. (♂)
 *5. *H. malayanus* sp. nov. (♂)

Myrmecolacidae

- *6. *Lychnocolax postorbis* BOHART, 1951 (♂)
 *7. *L. orientalis* sp. nov. (♂)
 8. *Myrmecolax nietneri* WESTWOOD, 1858 (L₁) (DOVER, 1927)
 *9. *M. rossi* BOHART, 1951 (♂)
 *10. *Stichotrema retrorsum* (BOHART, 1951) (♂)
 *11. *S. malayanum* sp. nov. (♂)

Acknowledgements I would like to express my cordial gratitude to Dr. S. KITAOKA, National Institute of Animal Health, Tsukuba, for the donation of the present

interesting material. I am also much indebted to Dr. Ed. LUNA DE CARVALHO, Portugal, for the gift of several specimens of *Dundoxenos vilhenai* for comparison with *Malayaxenos* and *Triozocera*. I am also grateful to Prof. Y. HIRASHIMA, Kyushu University, Fukuoka, for his kindness of critical reading of the manuscript and the acceptance of the type-specimens for preservation.

Postscript

After the completion of the manuscript of this paper, I received a copy of proof sheets of his recent paper from Dr. R. KINZELBACH, West Germany. In this paper, he is going to describe a new corioxenid genus, *Mufagaa*, from Saudi Arabia. My present new genus, *Malayaxenos*, is undoubtedly closely allied to his *Mufagaa*, but differs from it by the number of antennal segments (6 against 7), length of 1A (=his CuA₁) of hind wing (much longer than in *Mufagaa*), shape of aedeagus (almost straight in *Malayaxenos* but gently curved in *Mufagaa*), etc. Therefore, I consider *Malayaxenos* to be valid and place it near *Mufagaa* in Corioxeninae.

References

- BALIGA, H., 1967. A new species of *Corioxenos* (Stylopoidea) parasitizing *Antesiopsis cruciata* (F.) (Homoptera, Pentatomidae) in India. *Bull. ent. Res.*, **57**: 387-393, pl. 14.
- BLAIR, K. G., 1936. A new genus of Strepsiptera. *Proc. R. ent. Soc. Lond.*, (B), **5**: 113-117.
- BOHART, R. M., 1941. A revision of the Strepsiptera with special reference to the species of North America. *Univ. Calif. Publ. Ent.*, **7**: 91-159.
- 1951. The Myrmecolacidae of the Philippines (Strepsiptera). *Wasmann J. Biol.*, **9**: 83-103.
- ESAKI, T., & S. MIYAMOTO, 1958. The Strepsiptera parasitic on Heteroptera. *Proc. 10th Int. Congr. Ent.*, **1**: 373-381.
- KIFUNE, T., & Y. HIRASHIMA, 1979. Two new species of Strepsiptera from Thailand (Notulae Strepsipterologicae-V). *Esakia, Fukuoka*, (14): 61-71.
- & ——— 1980. Records of the Strepsiptera from Sri Lanka in the collection of the Smithsonian Institution with descriptions of seven new species (Notulae Strepsipterologicae-VI). *Ibid.*, (15): 143-159.
- KINZELBACH, R. K., 1970. *Loania canadensis* n. gen. n. sp. und die Untergliederung der Callipharixenidae. *Senck. biol.*, **51**: 99-107.
- 1971. Morphologische Befunde an Fächerflüglern und ihre phylogenetische Bedeutung (Insecta: Strepsiptera). *Zoologica, Stuttgart*, (119): I-XIII+1-256.
- LUNA DE CARVALHO, E., 1956. Primeira contribuição para o estudo dos Estrepsípteros angolenses (Insecta Strepsiptera). *Publ. cult. Co. Diam. Angola*, (29): 11-54.
- PIERCE, W. D., 1918. The comparative morphology of the order Strepsiptera together with records and descriptions of insects. *Proc. U. S. Natn. Mus.*, **54**: 391-501, pls. 64-78.