

FOUR NEW SPECIES OF *MICRONECTA*
(INSECTA: HETEROPTERA: MICRONECTIDAE)
FROM THE MALAY PENINSULA

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ABSTRACT. - *Micronecta dentifera*, new species, from Singapore, *M. charakta*, new species, from Perak and Trengganu, *M. leongi*, new species, from Trengganu and *M. maculata*, new species, from Johor and Trengganu are described and compared with related species.

KEY WORDS. - Malay Peninsula, Insecta, Heteroptera, Micronectidae, new species.

INTRODUCTION

Within the framework of preparing an identification guide to the Corixoidea of the Malay Peninsula I came across the new species of *Micronecta* described below. The specimens are deposited in the Zoological Reference Collection of the Raffles Museum of Biodiversity Research (ZRC), some duplicates have been placed in the Nieser Collection (NCTN). A key of the Micronectidae of the area will be published in the guide so in this paper the new species are compared to similar species only.

Micronectidae are small Corixoidea, all known species of which are less than five mm in length, which are characterized by having the scutellum exposed and having three segmented antennae. Other Malayan Corixoidea belong to the family Corixidae, they are longer than 4.5 mm and have the scutellum covered by the hemielytra, four segmented antennae and lack ocelli. Corixoidea can be separated from other Heteroptera by the rostrum which is broadly triangular and not segmented but usually provided with transverse grooves.

MATERIALS AND METHODS

Measurements are in mm and based on five specimens of each sex from the series containing the holotype if available. They are presented as the mean in some cases followed by the standard deviation (s) or the measurement of the holotype between brackets {}. The ocular index is calculated as two times the synthlipsis

(S) divided by the width of head across eyes (D) minus the synthlipsis: $2S/(D-S)$. In case of only two specimens available the range based on these specimens is given. For the hyaline mark at the base of the clavus long and short refer to the measurement along the anteroposterior axis. The stridulatory rib (the plectrum of Jansson, 1989) is not or hardly visible with normal optics and has not been considered in the descriptions.

Depositories: Zoological Reference Collection of the Raffles Museum of Biodiversity Research, Singapore (ZRC) and the Nieser Collection, Tiel, The Netherlands (NCTN).

TAXONOMY

Micronecta charakta, new species (Figs. 1-10)

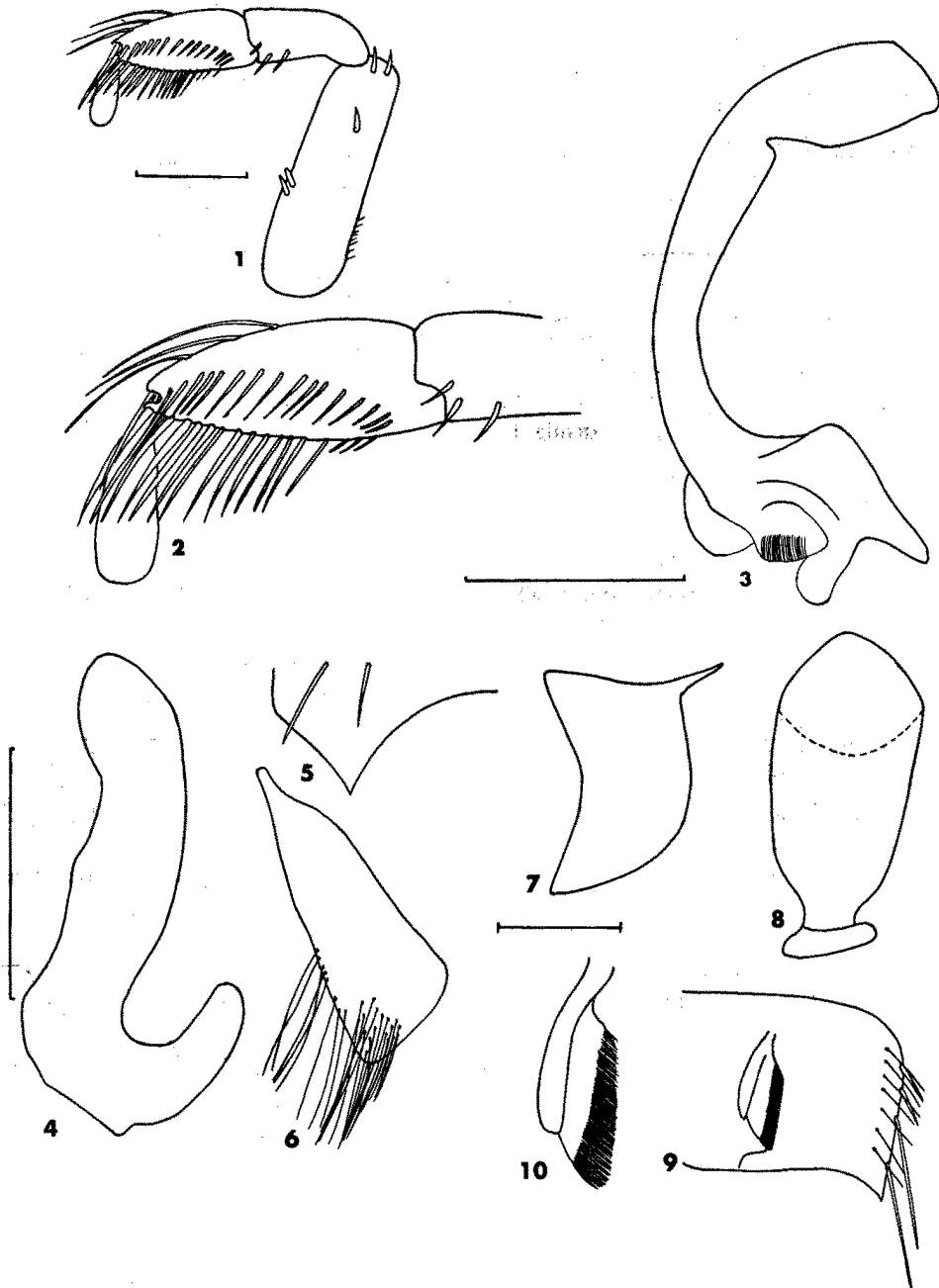
Material examined. - Holotype - macropterous male, West Malaysia: Perak, Sungai Korbu at Jalong, coll. H. K. Lua (ZRC-LKH319), 16 Feb.1997.

Paratypes - West Malaysia: same data as holotype 13 males, 25 females (ZRC, 3 males, 3 females NCTN). West Malaysia: Trengganu, tributary of Sungai Trengganu down river of Sekayu Waterfall Park, coll. H. K. Lua, 19 Mar.1992; 11 males, 14 females (ZRC-LKH179c, 2 males, 3 females NCTN); Trengganu, Sekayu, Sungai Brang, 21 Oct.1998, 17 males, 41 females (ZRC-LHK0401, 3 males, 3 females NCTN); Tributary of Sg. Trengganu, 18 Mar.1992, coll. H. K. Lua, 50 males, 102 females (ZRC-LHK179a, 7 males, 4 females NCTN); Sg. Trengganu, tributary, Sekayu, 16 May.1995, coll. B. Tan & G. Sumita, 32 males, 56 females (ZRC-TG06); Trengganu, Sg. Berang,

10 Oct.1997 (?coll. C. M. Yang), 101 males, 237 females (ZRC-Y719e, 12 males, 12 females NCTN). All macropterous.

Description. - Macropterous form, based on alcohol specimens. Generally a greyish, small, parallel sided species.

Dimensions. Length male 1.76, s 0.029 {1.75}; female 1.80, s 0.068; width male 0.84, s 0.006 {0.84}; female 0.86, s 0.042; width of head male 0.63, s 0.015 {0.63}; female 0.65, s 0.026; synthlipsis male 0.30 female 0.31; posterior width of an eye male 0.20 female 0.21; width of pronotum male 0.68 female 0.70.



Figs. 1-10. *Micronecta charakta*, new species, paratypes. Scales 0.1 mm except fig. 10 0.05 mm. 1-7. Male: 1 foreleg, 2 pala, 3 right paramere, 4 left paramere, 5 mediocaudal process of abdominal sternite VII, 6 free lobe of left part of abdominal tergite VIII, 7 prestrigilar flap. 8. Female: receptaculum seminis. 9-10. Male: 9 right part of abdominal tergite VI, 10 strigil.

Colour. Dorsally generally somewhat greyish light brown; pronotum unicolorous; hemielytra with indistinct slightly darker patches and two medium brown patches at lateral margins; hyaline mark at base of clavus short, not V-shaped. Abdomen brown to blackish, legs yellowish, scent glands black, hair fringe of hind tarsi brown.

Structural characteristics. Ratio length/width of body (both sexes) 2.1. Head slightly narrower than pronotum, synthlipsis 1.5 times as wide as the posterior margin of an eye, ocular index male 1.80, s 0.086, female 1.83, s 0.050. Pronotum well developed, dorsally convex with well developed lateral margins, two and a half times as wide as long (both sexes W/L 0.69/0.27). Spines laterally on abdominal segments: VI two short, two long; VII four short, one or two long; VIII five short two very long.

Male. Fore leg (Fig. 1), femur with two apical spines, one in apical third and two in basal half; in addition in the basal half there are dorsally some sparse hairs. Tibia with three spines in ventroapical angle. Pala (Fig. 2) with three dorsal bristles; upper row of palm with 15-18, ventral row with 14-16; the apical bristles of both upper and lower row are distinctly thicker than the remaining bristles in their row. Claw a simple clavate flap. Prestrigilar flap (Fig. 7) well differentiated; strigil (Figs. 9, 10) elongate oval, with a distinct stalk and one comb with about 90 teeth which are densely packed and difficult to count. Median lobe of seventh abdominal sternite (Fig. 5) short, with an acute apex and two rather weak bristles on its surface. Free lobe of left part of segment eight (Fig. 6) elongate, gradually broadening towards apex; with about 25 bristles in apical part. Right paramere (Fig. 3) with a notch in the ventral margin and about 25 stridulatory ridges. Left paramere rather broad (Fig. 4).

Female. Receptaculum seminis elongate urn shaped (Fig. 8).

Etymology. - Charaktos (Greek adjective: notched) refers to the characteristic notch in the right paramere.

Comparative notes. - With the key to SE Asian species (Nieser, 2000) this species runs to *M. pocsii* Wróblewski, which judging from the description (Wróblewski, 1967) looks similar. However, in *M. pocsii* the right paramere is of a different shape with a narrower shaft and apically ending in a slightly upward turned point moreover, the notch apically in the shaft is on the dorsal side whereas in *M. charakta* this notch is on the ventral side.

Micronecta dentifera, new species

(Figs. 11, 13-21)

Material examined. - Holotype - brachypterous male, Singapore: McRitchie Reservoir, near plot #4SICC, 28 May.1993 (ZRC-NS104).

Paratypes - Singapore: same data as holotype, 10 males, 24 females (ZRC, 2 males, 4 females NCTN); Island Country Club, near McRitchie reservoir, swampy pools, 28 May.1993, 2 males, 4 females (ZRC-NS106); Rifle Range Road, stream, 3 Jun.1993, 4 males, 6 females (ZRC-NS110, 1 male NCTN). All brachypterous.

Description. - Brachypterous form, based on alcohol specimens. Generally a lightly coloured, very small, ovate species.

Dimensions. Length male 1.22, s 0.019 {1.21}; female 1.26, s 0.01; width male 0.65, s 0.16 {0.66}; female 0.71, s 0.011; width of head male 0.45, s 0.011 {0.45}; female 0.47, s 0.011; synthlipsis male 0.17 female 0.18; posterior width of an eye male 0.15 female 0.14; width of pronotum male 0.43 female 0.47.

Colour. Dorsally generally yellowish to pale brown, eyes castaneous to grey; pronotum unicolorous yellowish; hemielytra with an irregular little contrasting light brown reticulate pattern and four dark patches at lateral margins of which the second is the largest; hyaline mark at base of clavus long, not V-shaped. Abdomen and legs yellowish, scent glands black, hair fringe of hind tarsi brown.

Structural characteristics. Ratio length/width of body male 1.9, female 1.8. head slightly wider than pronotum, caudolateral angles of eyes not reaching the anterolateral angles of the hemielytra but lateral margins of pronotum nearly entirely covered by eyes, synthlipsis 1.2 times as wide as the posterior margin of an eye, ocular index male 1.21, s 0.014, female 1.24, s 0.079. Pronotum reduced with short lateral margins, five times as wide as long (both sexes W/L 0.45/0.09). Spines laterally on abdominal segments: VI two short, two long; VII two or three short, one or two long; VIII five short two very long.

Male. Fore leg (Fig. 11), femur apparently without spines except for two to three apical ones. Tibia with two spines ventrally, two hair like bristles dorsally and a small peg in the distal dorsal edge. Pala with three dorsal bristles; upper row of palm with 12-16, ventral row with seven to nine bristles. Claw a simple elongate flap. Prestrigilar flap (Fig. 20) rather poorly differentiated; strigil (Figs. 18, 19) small, oval, one comb with about 40 teeth which are

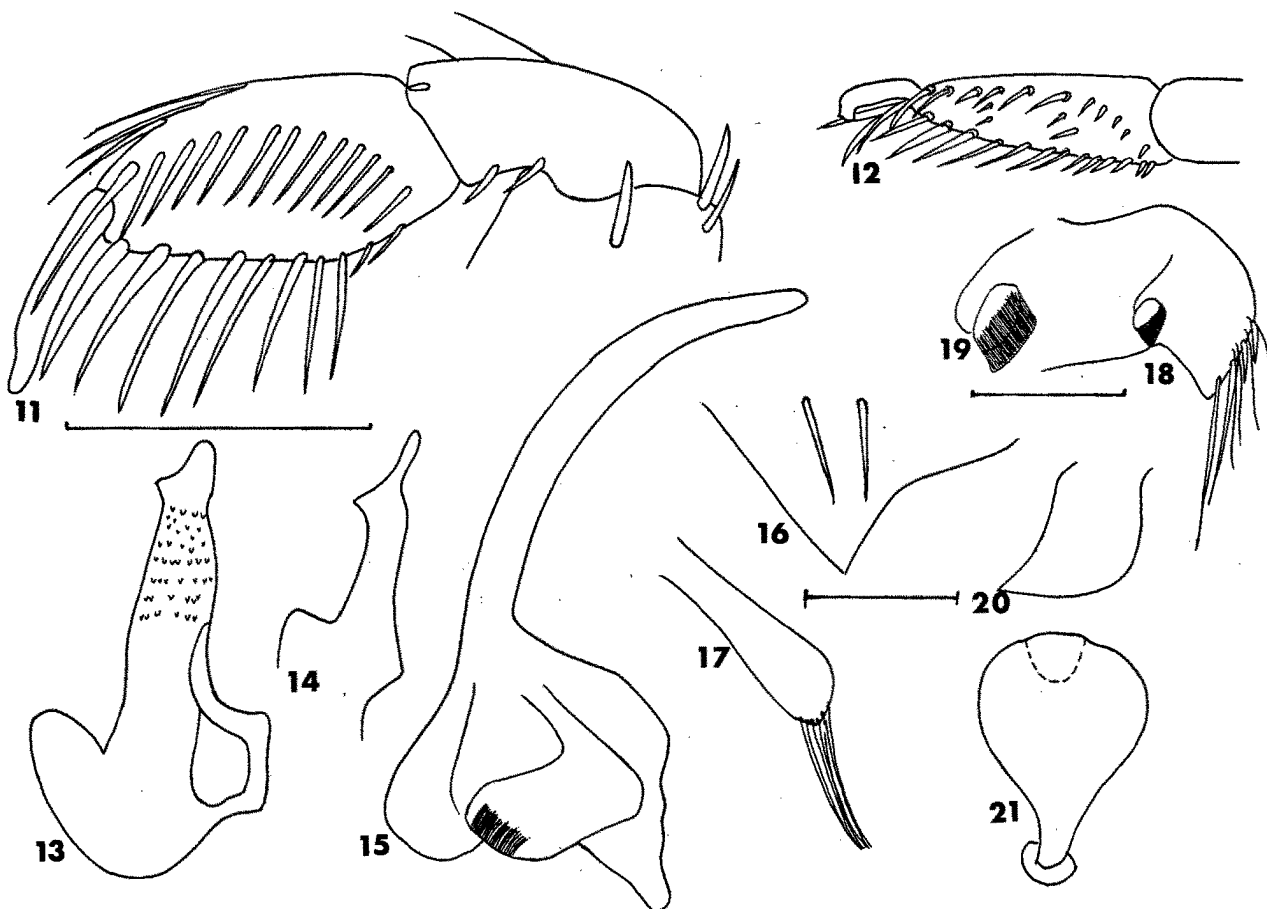


Fig. 11-21. 11. *Micronecta dentifera*, new species, male paratype, fore tibia and pala, scale 0.1 mm. 12. *Micronecta johorensis* Fernando, male pala (after Fernando, 1964). 13-21. *Micronecta dentifera*, new species, paratypes. Scales 0.1 mm except fig. 19 0.05 mm. 13-20. Male: 13, 14 different view of left paramere, 15 right paramere, 16 mediocaudal process of abdominal sternite VII, 17 free lobe of left part of abdominal tergite VIII, 18 right part of abdominal tergite VI, 19 strigil, 20 prestigilar flap. 21. Female: receptaculum seminis.

densely packed and difficult to count. Median lobe of seventh abdominal sternite (Fig. 16) short, with an acute apex and two rather weak bristles on its surface. Free lobe of left part of segment eight (Fig. 17) elongate and narrow, with a slightly clavate apex; apex with about eight bristles. Right paramere (Fig. 15) with about 20 stridulatory ridges. Left paramere (Figs. 13, 14), with a distinct subapical tooth.

Female. Receptaculum seminis broadly urn shaped (Fig. 21).

Etymology. - Dentiferus (Latin adjective: bearing a tooth or teeth) refers to the subapical tooth of the left paramere.

Comparative notes. - By the structure of the left paramere and the very short pronotum related to *M. eucosmeta* Hutchinson from India and *M.*

johorensis Fernando from West Malaysia. *M. eucosmeta* is distinctly larger (length 2.2-2.4 mm) and has three broad very striking longitudinal bands on each hemielytron. *M. johorensis* is also somewhat larger (length 1.6-1.8 mm) has the right paramere with a broader and relatively shorter shaft showing longitudinal striae (Fig. 22), which are not apparent in *M. dentifera* (Fig. 15). Moreover, *M. johorensis* has a smaller claw in the male (Fig. 12).

***Micronecta leongi*, new species**
(Figs. 23-31)

Material examined. - Holotype - macropterous male, West Malaysia: Trengganu, tributary of Sungai Trengganu, downstream of Sekayu Waterfall Park, 19 Mar.1992, coll. H. K. Lua (ZRC-LHK179c).

Paratypes - West Malaysia: same data as holotype, 3 males, 4 females macropterous (ZRC, 1 male, 1 female NCTN); tributary of Sg. Trengganu, 18 Mar. 1992, coll. H. K. Lua, 69 males, 96 females (ZRC-LHK179a, NCTN, 10 males, 10 females); Sg. Trengganu, tributary, Sekayu, 16 May.1995, coll. B. Tan & G. Sumita, 1 male, 1 female (ZRC-TG06); Trengganu, Sg. Berang, 10 Oct.1997 (?coll. C. M. Yang) 3 males, 13 females (ZRC-Y719e); Selangor, Sg. Benam, 17 Jun.1991, coll. H. K. Lua, 1 male macr. (ZRC-LHK153).

Description. - Macropterous form, based on alcohol specimens. Generally a pale somewhat brownish elongate species virtually without hemielytral marks.

Dimensions. Length male 1.93, s 0.059 {1.89}; female 2.01, s 0.015; width male 0.93, s 0.015 {0.92}; female 0.89, s 0.021; width of head male 0.63, s 0.010; female 0.69, s 0.010; synthlipsis male 0.27 female 0.28; posterior width of an eye male 0.23 female 0.24; width of pronotum male 0.69 female 0.69.

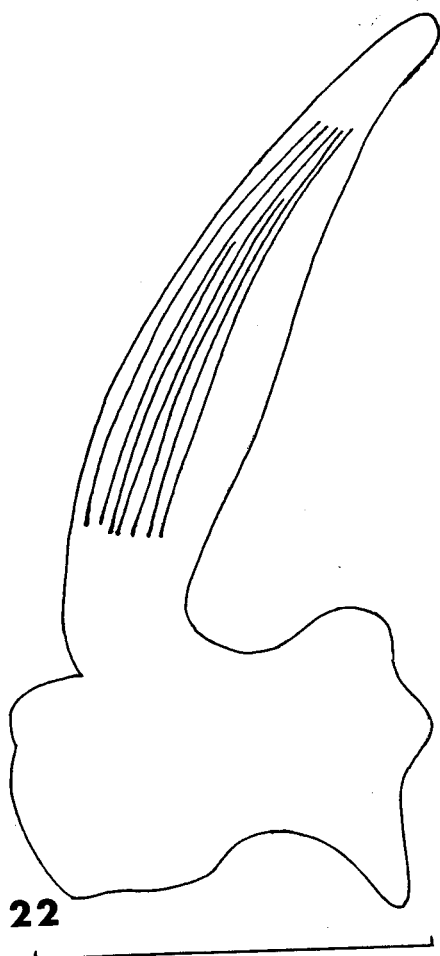


Fig. 22. *Micronecta johorensis* Fernando, right paramere, scale 0.1 mm.

Colour. Sordid, yellow to light brown, eyes castaneous to dark grey, rostrum medium brown, pronotum unicolorous, hemielytra with very faint broken darker longitudinal stripes, venter and legs sordid yellow.

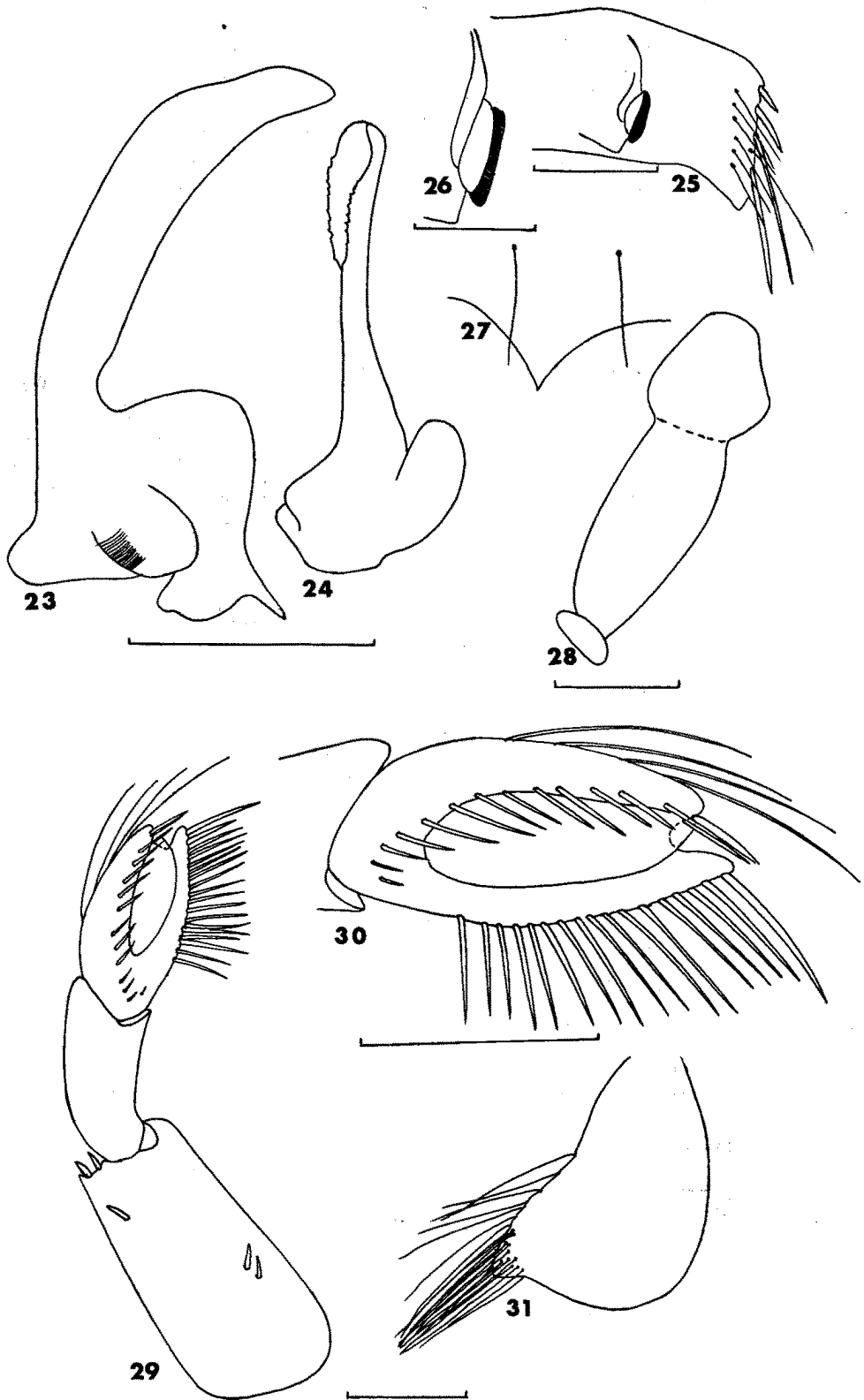
Structural characteristics. Ratio length/width of body male 2.1, female 2.3. Head slightly narrower than pronotum, synthlipsis 1.2 times as wide as the posterior margin of an eye, ocular index male 1.51, s 0.20, female 1.29, s 0.14. Pronotum developed, convex dorsally, lateral margins well visible behind the eyes, two and a half times as wide as long (both sexes W/L 0.69/0.28). Hemielytra with three shallow longitudinal grooves and beset with numerous small spines. Membranes fully developed, hind wings present. Spines laterally on abdominal segments: VI two short, two long; VII two short, one long; VIII five short one very long.

Male. Fore leg (Fig. 29), femur with two apical spines, one subapical and two in basal half. Tibia without apical spines. Pala (Fig. 30) with four dorsal bristles; upper row of palm with 14-17, ventral row with 15-19 bristles; the apical bristles of both upper and lower row are somewhat thicker than the remaining bristles in their row. Claw large, in the form of an elongately oval flap. Prestrigilar flap poorly differentiated; strigil (Figs. 25, 26) small, oval, with a distinct stalk and one comb with about 60 teeth which are densely packed and difficult to count. Median lobe of seventh abdominal sternite (Fig. 27) short, with an acute apex and rather poorly developed long bristles on its surface. Free lobe of left part of segment eight (Fig. 31) large with a broad apex; with about 25 bristles on outer margin. Right paramere (Fig. 23) with 16 stridulatory ridges; a broad, hardly curved shaft and tapering apex acuminate. Left paramere styliform, slightly expanded at tip, denticulate and grooved at the apex (Fig. 24).

Female. Receptaculum seminis elongate, apically widened, mushroom shaped (Fig. 28).

Etymology. - Named in honour of Dr. C. H. Leong for her pioneering work on the faunistics and taxonomy of Malayan Corixoidea.

Comparative notes. - The left paramere is somewhat similar to those of *M. scutellaris* Stål which occurs in West Malaysia and *M. desertana* Hutchinson which is distributed from Iran through India to Vietnam but not recorded from the Malay Peninsula. In both these species the shaft is relatively broader. In addition, *M. scutellaris* is distinctly larger, with a body length over



Figs. 23-31. *Micronecta leongi*, new species, paratypes, scales 0.1 mm except fig. 26 0.05 mm. 23-27. Male: 23 right paramere, 24 left paramere, 25 right part of abdominal tergite VI, 26 strigil, 27 mediocaudal process of abdominal sternite VII. 28. Female, receptaculum seminis. 29-31. Male: 29 foreleg, 30 pala, 31 free lobe of left part of abdominal tergite VIII.

3 mm. *M. desertana* is also larger, with a body length of about 2.5 mm, moreover males have distinctly more spines on anterior femur and the pala with a very narrow elongate claw. In addition the free lobe of the eighth tergite of the male is much narrower in *M. desertana*. The free lobe of tergite eight of males of *M. leongi* is characteristic, the only species with a somewhat similar lobe is *M. fieberi* Wróblewski from South India which has however the left paramere with a thick apically widened shaft and sternite VII with a very long thin "finger like" submedial projection.

***Micronecta maculata*, new species**

(Figs. 32-40)

Material examined. - Holotype - brachypterous male, West Malaysia: Trengganu, Sekayu, Sungai Brang., 21 Oct.1998, coll. H. K. Lua (ZRC-LHK0401).

Paratypes - West Malaysia: same data as holotype, 7 males - 11 females brachypterous, 2 males - 2 females macropterous. (ZRC-LHK0401; 2 males - 3 females brach., 1 male macr. NCTN); Sg. Trengganu, tributary, Sekayu, 16 May.1995, coll. B. Tan & G. Sumita, 1 female brach. (ZRC-TG06); Johor, Sg. Belumut, foothill, 3 Dec.1998, coll. H. K. Lua, 2 females brach. (ZRC-LHK424); Johor, Sungei Mersing, 9 May 1995, coll. S. L. Goh & G. T. Sumita, 1 male, 2 females brach. (ZRC-THH9510); Johor, Tg. Sedili, 27 Mar.1992, coll. K. L. Yeo, 2 males, 5 females brach., 1 female macr. (ZRC-Y787); Johor, Sg. Salangi, 22 Apr.1992, coll. K. L. Yeo & C. Yi, 9 males, 8 females brach. (ZRC-Y792b); Johor, Mersing, Sg. Ambat, 12 Oct. 1992, 7 males 10 females brach. (ZRC-Y810a, 2 males 2 females NCTN); Johor, Sg. Temetang, 13 Jan. 1993, coll. K.L. Yeo 5 males 7 females brach. (ZRC-Y818b)

Description. - Brachypterous form, based on alcohol specimens from sample LHK0401. Generally a yellowish, small, broadly ovate species with extensive dark marks on hemielytra.

Dimensions. Length male 1.25, s 0.015 {1.23}; female 1.25, s 0.025; width male 0.73, s 0.017 {0.72}; female 0.74, s 0.020; width of head male 0.54, s 0.015 {0.52}; female 0.53, s 0.012; synthlipsis male 0.24 female 0.24; posterior width of an eye male 0.18 female 0.19; width of pronotum male 0.51 female 0.52.

Colour. Dorsally generally yellowish; eyes castaneous to dark grey; pronotum with a pair of dark spots on hind margin at level of the inner angles of the eyes; hemielytra with variable distinct darker patches which usually become confluent and form a large patch on corium, basal hyaline marks with one or two weak dots each, lateral margins with four or five dark marks each; hyaline mark at base of clavus

long, not V-shaped. Venter and legs yellowish, abdominal venter often light greyish; scent glands blackish, hair fringe of hind tarsi brown.

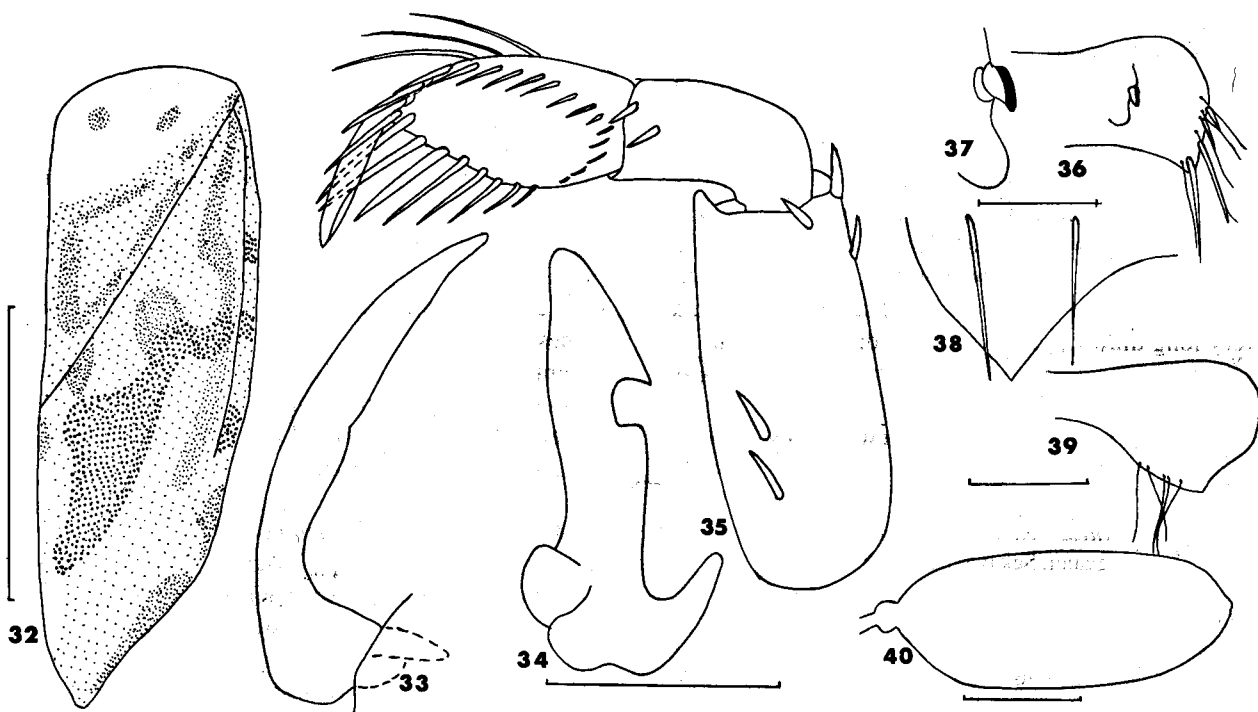
Structural characteristics. Ratio length/width of body both sexes 1.7. Head slightly wider than pronotum, synthlipsis 1.3 times as wide as the posterior margin of an eye, ocular index male 1.58, s 0.12, female 1.65, s 0.17. Pronotum reduced, lateral margins more or less covered by the posterior angles of the head, five times as wide as long (both sexes) W/L 0.51/0.11). Hemielytra with reduced membranes, apically pointed (Fig. 32); hind wings absent. Spines laterally on abdominal segments: VI two short, two long; VII four short, two long; VIII five short two very long.

Male. Fore leg (Fig. 35), femur with two apical spines, one subapical and two in basal half. Tibia with two apical spines. Pala with three dorsal bristles; upper row of palm with 12-14, ventral row with 9-11 bristles; the apical bristles of both upper and lower row are thicker than the remaining bristles in their row. Claw a narrowly elongate flap. Prestrigilar flap poorly differentiated; strigil (Figs. 36, 37) small, oval, with a distinct stalk and one comb with about 40 teeth which are densely packed and difficult to count. Median lobe of seventh abdominal sternite (Fig. 38) short, with an acute apex and two well developed long bristles on its surface. Free lobe of left part of segment eight (Fig. 39) very short with an acuminate apex; with about 5 bristles on outer margin. Right paramere (Fig. 33) with shaft hardly curved and apex acuminate, stridulatory ridges indistinct or absent, not observed. Left paramere with a hood-shaped apical part (Fig. 34).

Female. Receptaculum seminis comparatively large, elongate, egg shaped (Fig. 40).

Macropterous form. Essentially as brachypterous form except for larger size more elongate shape and modifications of pronotum and hemielytra. Length male 1.50-1.56, female 1.42-1.60; width male 0.76-0.77; female 0.72-0.73; width of head male 0.56-0.59; female 0.58-0.61; synthlipsis male 0.24-0.25 female 0.24-0.25; posterior width of an eye male 0.18-0.20 female 0.19-0.20; width of pronotum male 0.60-0.62 female 0.62-0.65. Ratio length/width of body male 1.95-2.05, female 1.97-2.19; pronotum three times as wide as long (0.62/0.20). Ocular index male 1.47-1.61, female 1.39-1.52. Hemielytra with fully developed membranes; hind wings present.

Etymology. - Maculatus (Latin adjective: spotted) refers to the spotted pattern on hemielytra.



Figs. 32-40. *Micronecta maculata*, new species, paratypes, scales 0.1 mm except fig.37 0.05 mm. 32. Right hemielytron of brachypterous specimen. 33-39. Male: 33 right paramere, 34 left paramere, 35 fore leg, 36 right part of abdominal tergite VI, 37 strigil, 38 mediocaudal process of abdominal sternite VII, 39 free lobe of left part of abdominal tergite VIII. 40. Female: receptaculum seminis.

Comparative notes. - The spotted pattern of the typical form and the shape of the left paramere are unlike any other *Micronecta*. However, the specimens from sample Y787 and Y792b have a much less contrasting to vague hemielytral pattern, leaving the left paramere as the best distinguishing characteristic. The very distinct dorsal pattern of *Micronecta lenticularis hungerfordi* Chen (1960) from Taiwan is arranged in regular transverse stripes and the parameres are totally different.

ACKNOWLEDGEMENTS

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