

Two new genera and a new subfamily of Micronectidae (Heteroptera, Nepomorpha) from Brazil¹

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Abstract: The new genus *Synaptogobia* with two new species, *S. xenocheir* nov.sp. (type species of genus) and *S. heissi* nov.sp., is described and placed in the new subfamily Synaptogobiinae. In addition, the monotypic genus *Monogobia* with the type species *M. elongata* nov.sp. is described and placed in the Micronectinae. All new taxa were collected in Brazil: Amazonas and Pará. A checklist and a key to subfamilies and genera of Micronectidae are provided.

Key words: Brazil, checklist, key to genera, Micronectidae, new genera, new subfamily, new species.

Introduction

The Micronectidae were first considered as a separate taxon by FIEBER (1851) as the “turma” Sigarae (based on *Sigara* LEACH 1817 nec FABRICIUS 1775). All the “turmae” of FIEBER (1851) are now separate families. DOUGLAS & SCOTT (1865) were the first to give them official family status as Sigaridae (ŠTYS & JANSSON 1988). Subsequent authors did not recognize the family or subfamily status of Micronectinae, e.g., PUTON (1880), OSHANIN (1912). JACZEWSKI (1924) introduced the modern name Micronectinae as a subfamily of Corixidae, and until recently this status was used by nearly every author. Some years ago the late Dr. Antti Jansson discussed with the first author (in litt.) that the taxon should be raised to family level, and he was going to work on it. However, due to his illness and untimely death he never finished this project. Recently NIESER (2002) raised the taxon to family status: Micronectidae.

Worldwide there are over 150 described species in the family Micronectidae, of which over 100 belong to the genus *Micronecta* which is distributed throughout the Eastern Hemisphere (with the exception of New Zealand, WISE 1965). However, the

status of a number of African species is doubtful. In the America's the Micronectidae were until recently represented only by the genus *Tenagobia* BERGROTH with 27 species, which is essentially restricted to South America with only two species reaching into Central America (BERGROTH 1899; DEAY 1935; NIESER 1977). Recently the Asian micronectid *Synaptonecta issa* (DISTANT) has been introduced in Florida and apparently established a reproducing population there (POLHEMUS & RUTTER 1997). In addition this species has turned up in an aquarium in New Zealand (JANSSON & MEYER-ROCHOW 1990). Probably the eggs of this species adhere to aquatic plants, which are traded for use in aquaria. The closely related family Corixidae is represented by three subfamilies in the America's. Two of those are represented by a single genus: the monotypic subfamily Heterocorixinae HUNGERFORD, its genus *Heterocorixa* WHITE is endemic in South America, and the Cy-matiinae HUNGERFORD, with one genus and one species, *Cymatia americana* HUSSEY restricted to North America (WHITE 1879; HUSSEY 1920; HUNGERFORD 1948). The subfamily Corixinae ENDERLEIN has 22 genera and many species distributed throughout the America's but is poorly represented in

¹ With great pleasure we dedicate this publication to our friend and fellow heteropterist Dr. Ernst Heiss, on occasion of his 70th birthday.

the tropical lowlands (HUNGERFORD 1948; NIESER & PADILLA 1992).

Corixoidea are inhabitants of shallow, stagnant or nearly stagnant waters. In temperate areas they occur mostly in ponds and lakes. In the tropics they are often found in streams but nearly always in potholes or marginal areas with little or no current. The majority of species spend most of their time near the bottom of the habitat, coming only to the surface for gas exchange. The fore tarsus is usually spoon shaped and is called a pala. Species staying near the bottom scoop up food from the bottom with their palae. Many species feed on small organic particles combined with sucking fluids from larger food items. The actual food of Heterocorixinae and Micronectidae is unknown. However, there are some indications that *Micronecta quadristrigata* BREDDIN, a very common species in tropical Asia, is carnivorous feeding on mosquito larvae (NAM et al. 2000). Cymatiinae are carnivorous (HUSSEY 1921; POPHAM et al. 1984). There is some controversy about feeding habits in Corixinae. HUNGERFORD (1920) states that “Corixids are largely herbivorous”, but other authors (e.g. JANSSON 1986) consider them to be mainly carnivorous. A thorough analysis of various British species by POPHAM et al. (1984) showed that various species have different feeding habits. They found carnivorous, detritivorous, herbivorous

and omnivorous species, and in one case, *Sigara falleni* (FIEBER 1848), the males feed virtually exclusively on algae whereas the females are mostly omnivorous.

Material and Methods

The new taxa described below are based on material which was obtained by the first author as a loan of *Tenagobia* species from the late Dr. H.H. Weber at the time he was taking care of the water bugs collected during investigations sponsored by the “Instituto Nacional de Pesquisas da Amazonia” at Manaus and Brazil and the “Max-Planck-Institut für Limnologie, Abt. Tropenökologie” at Plön (Germany). Part of the material consisted indeed of specimens of *Tenagobia* and has been studied in NIESER (1977). However, one box contained very aberrant material, obviously related to the Micronectidae but distinctly different from *Tenagobia*. The Amazonas material from the above-mentioned investigations is now deposited in the ZSMC, where the material studied in this paper will be deposited as well, unless indicated otherwise.

All measurements are in millimeters and are presented as the mean (\bar{x}) of five specimens of each sex. For some measurements the standard deviation (s.) and the measurement of the holotype between {} is given. The orientation of median, lateral and caudal in hemelytra refers to the situation with closed wings. The folding line is the imaginary line separating the vertex and the ventral part of the head (Fig. 13). Full references and discussion of the status of taxa above species level can be found in ŠTYS & JANSSON (1988).

Depositories (see ARNETT et al. 1993)

- NCTNNieser collection, Tiel, The Netherlands.
- RMNH. National Museum of Natural History Naturalis, Leiden, The Netherlands.
- ZMAN Department of Entomology, Zoological Museum of the University of Amsterdam, The Netherlands.
- ZSMC Zoological State Collection, München, Germany.

Table 1: Length of leg segments of Micronectidae in millimeters. In the fore leg, tibia represents the tibiotarsus.

	femur	tibia	tars 1	tars 2	claw
<i>Monogobia elongata</i> nov.sp. ♂					
fore leg	0.27	0.26			
middle leg	0.84	0.25	0.37	–	0.22
hind leg	0.48	0.30	0.38	0.21	0.15
<i>Monogobia elongata</i> nov.sp. ♀					
fore leg	0.27	0.27			
middle leg	0.78	0.25	0.31	–	0.24
hind leg	0.48	0.30	0.38	0.21	0.13
<i>Synaptogobia heissi</i> nov.sp. ♂					
fore leg	0.18	0.21			
middle leg	0.50	0.18	0.28	–	0.12
hind leg	0.39	0.21	0.33	0.19	0.09
<i>Synaptogobia heissi</i> nov.sp. ♀					
fore leg	0.18	0.18			
middle leg	0.44	0.16	0.25	–	0.12
hind leg	0.36	0.19	0.29	0.15	0.08
<i>Synaptogobia xenocheir</i> nov.sp. ♂					
fore leg	0.28	0.24			
middle leg	0.53	0.23	0.26	–	0.11
hind leg	0.53	0.32	0.42	0.25	0.13
<i>Synaptogobia xenocheir</i> nov.sp. ♀					
fore leg	0.28	0.24			
middle leg	0.54	0.24	0.28	–	0.13
hind leg	0.51	0.31	0.42	0.25	0.13

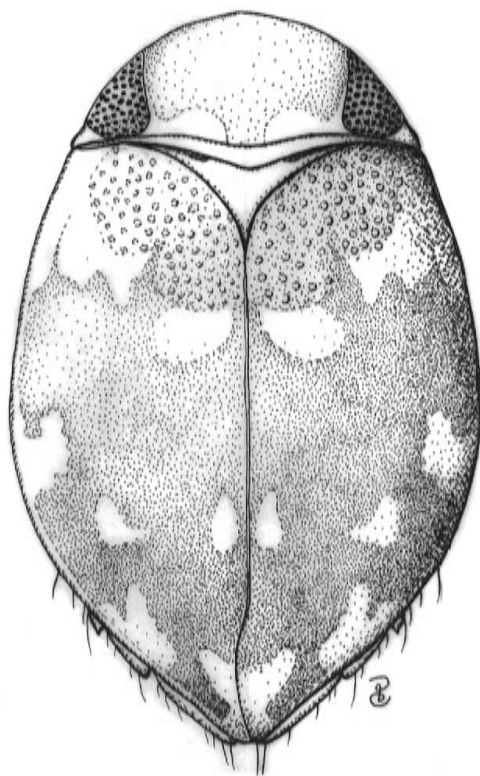


Fig. 1: *Synaptogobia xenocheir* nov.sp., holotype, male, dorsal view, body length 2.2 mm.

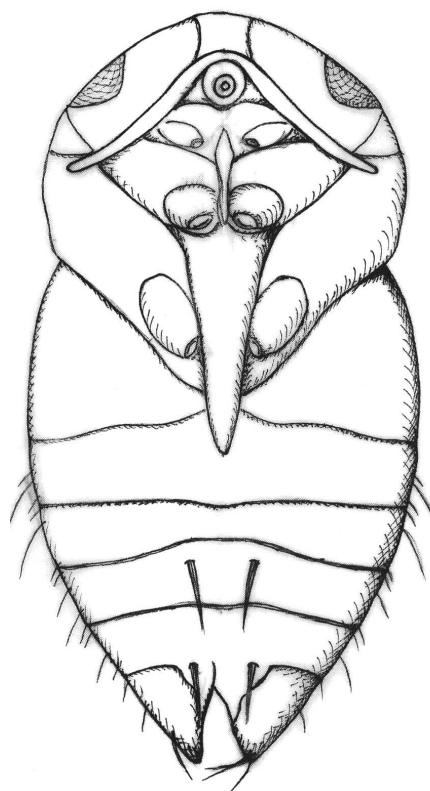


Fig. 2: *Synaptogobia xenocheir* nov.sp., paratype, male, ventral view.

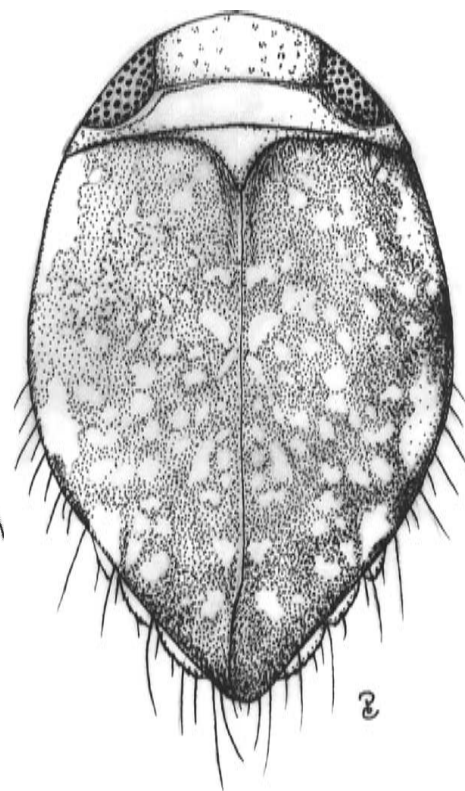


Fig. 3: *Synaptagobia heissi* nov.sp., holotype, male, dorsal view, body length 1.6 mm.

Systematics

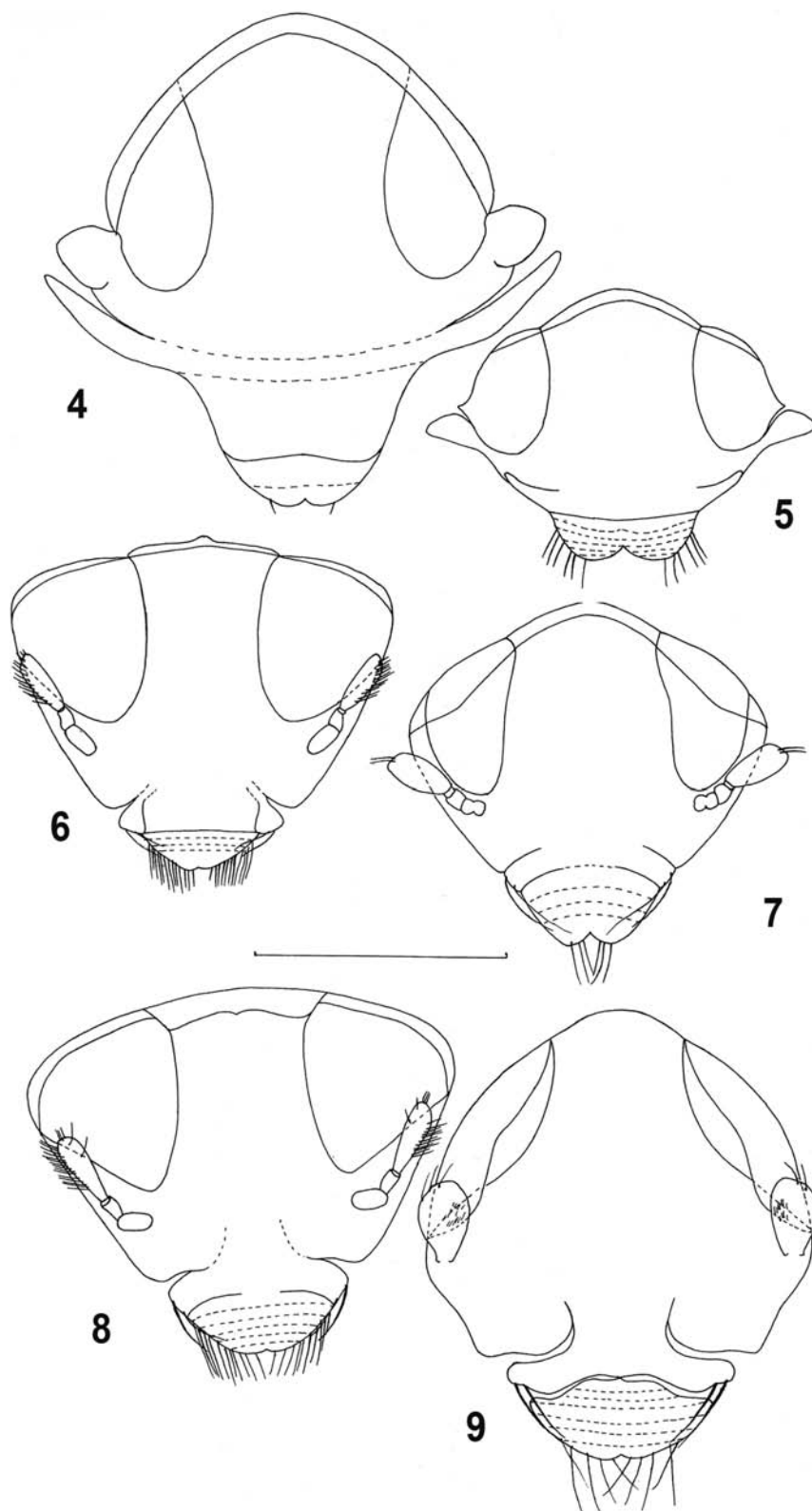
Subfamily Synaptogobiinae nov.subfam.

Type genus *Synaptogobia* nov.gen.

Description. Small to medium sized Micronectidae, length 1.4-2.2. Head dorsoventrally depressed, with a distinctly larger part of the eye dorsally of the folding line (Fig. 13); posterolateral angles behind eyes somewhat produced, covering sides of pronotum. Ocelli absent. Antennae fused with the head capsule, beset with very fine pilosity but lacking the longer bristles found in other genera (Figs 4-9). Anteclypeus laterally produced into elongate processes, which are separated from the head capsule by a suture; in microscopical preparations the head tends to split along these sutures (Fig. 4). Rostrum unsegmented with transverse grooves (Figs 15, 16). Pronotum very short; scutellum small but distinctly exposed (Figs 1, 3). Hemelytra without claval and membranal sutures or embolar groove; membrane in brachypterous form strongly reduced, hemelytra apically obtusely pointed. Hindwings vestigial. Mesosternum with a distinct cari-

na, metasternum with a very long xiphus (Fig. 2). Tibia and tarsus of fore leg fused in both sexes to form a tibiotarsus (or tibiopala). Claw of fore leg large, spine-like, not modified in male. Tarsus of middle leg one-segmented, longer than tibia with a pair of long claws (Table 1). Claw of hind leg placed apically on second tarsal segment. Abdominal sternites V and VII each with a pair of large bristles (Fig. 2). Male abdomen asymmetrical, without a strigil, and without free lobe on left part of tergite VIII. Right paramere at a magnification of 400x without visible ribs (pars stridens processus) on the basal lobe. Female abdomen symmetrical. So far only known in the brachypterous form.

Discussion. The unsegmented, transversely grooved rostrum, the structure of the fore tarsus with a row of well developed ventral bristles surrounding a palm, and the general structure of the legs place this taxon in the Corixoidea. The absence of ocelli, exposed scutellum, fused tibiopala, and the claws of the hind leg inserted apically on second tarsal segment place this taxon in the Micronectidae. Autapomorphies of Synaptogobiinae are: 1) the antenna fused



Figs 4-9: Head of Micronectidae in caudal view, squashed, scale 0.5 mm (4) *Synaptogobia xenocheir* nov.sp., paratype ♀ (5) *Synaptogobia heissi* nov.sp., paratype ♀ (6) *Micronecta jaczewskii* WRÓBLEWSKI 1962, ♀ (7) *Synaptonecta issa* (DISTANT 1911), ♀ (8) *Tenagobia incerta* LUNDBLAD 1928, ♀ (9) *Monogobia elongata* nov.sp., paratype ♀.

with the head capsule and lacking longer bristles; 2) head dorsoventrally depressed with large part of the eyes dorsally of the folding line; 3) anteclypeus strongly developed anterolaterally; 4) a distinct carina on mesosternum and 5) right paramere without pars stridens processus.

Due to the strongly reduced hemelytra with obtusely pointed apex, at first sight *Synaptogobiinae* looks similar to species of the micronectine genus *Synaptonecta* DISTANT. In addition, *Synaptogobiinae* shares the fused tibiopala in both sexes, and the unmodified palar claw of the male with *Synaptonecta*. However, the aberrant structure of the head, and apparent lack of ridges on the basal lobe of right paramere separate *Synaptogobiinae* from *Synaptonecta* and other Micronectinae. Further, *Synaptonecta* has microscutes on hemelytra and pronotum (WRÓBLEWSKI 1972) which is unique to this genus within Micronectidae. Finally, *Synaptogobiinae* have a long metasternal xiphus with an acute tip, and except for the genus *Monogobia* described below, all other Micronectidae have short metaxiphi with obtuse tips. PARSONS (1965) already noted that there is a tendency in Corixoidea for widening of the anteclypeus rostrally. However, no other species has a condition as in *Synaptogobiinae* where these anterolateral expansions of the anteclypeus are visible in ventral view as large moustache-like structures (Fig. 2).

Synaptogobia nov.gen. (Figs 1, 3)

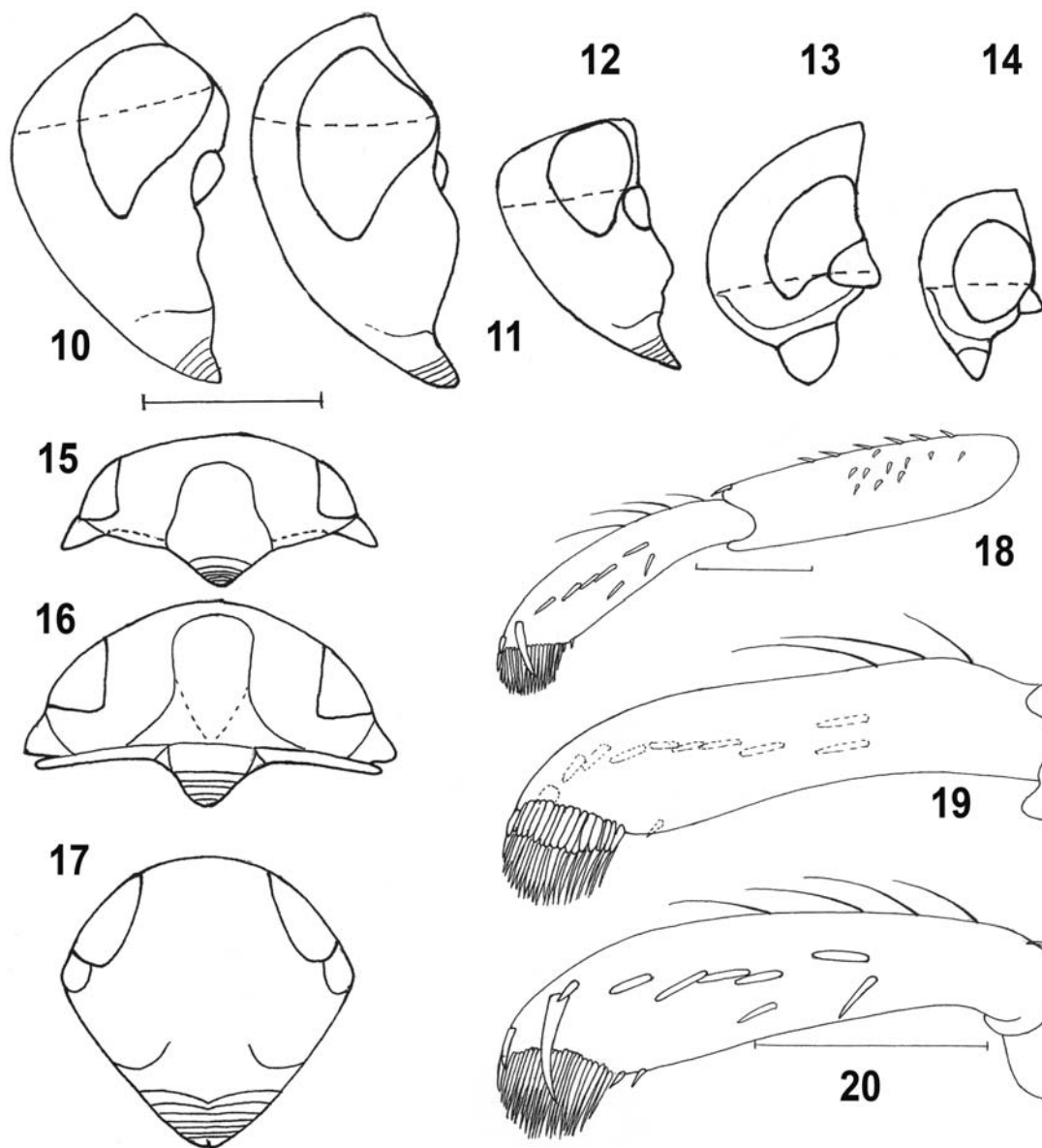
Type species: *Synaptogobia xenocheir* nov.sp.

Description: See description of subfamily *Synaptogobiinae*.

Etymology. Combination of "synapto" (Greek: to combine or to unite) referring to the fused tibiopala in both sexes and "gobia" last two syllables of *Tenagobia*, the American representative of the family Micronectidae.

Synaptogobia xenocheir nov.sp. (Figs 1, 2, 4, 13, 16, 18-23, 30)

Type material. Holotype, brachypterous ♂ (ZSMC), Brazil: Amazonas, Rio Cuieiras, Igarapé do Cachoeira, Cachoeira da Traira, 19 March 1961, at time of sampling the waterfall (= cachoeira) was about 2.5 m under water, sampled at edge, many leaves, some sand, leg. E.J. Fittkau, A161. Paratypes: same data as holotype, 22♂♂



Figs 10-14: Head of Micronectidae in lateral view, scale 0.5 mm (10) *Micronecta siva* (KIRKALDY 1897) (11) *Tenagobia shadei* LUNDBLAD 1928 (12) *Monogobia elongata* nov.sp. (13) *Synaptogobia xenocheir* nov.sp. (14) *Synaptogobia heissi* nov.sp.; Stippled line is the approximate border between the dorsal part of the head and the lateroventral part called "folding line" in this publication.

Figs 15-17: Head of Micronectidae in frontal view, scale 0.5 mm (15) *Synaptogobia heissi* nov.sp. (16) *Synaptogobia xenocheir* nov.sp. (17) *Monogobia elongata* nov.sp.

Figs 18-20: *Synaptogobia xenocheir* nov.sp., paratype male, fore leg, scale 0.1 mm (18) femur & tibiopala, latero-ventral view (19) tibiopala mediodorsal view (20) tibiopala, lateroventral view.

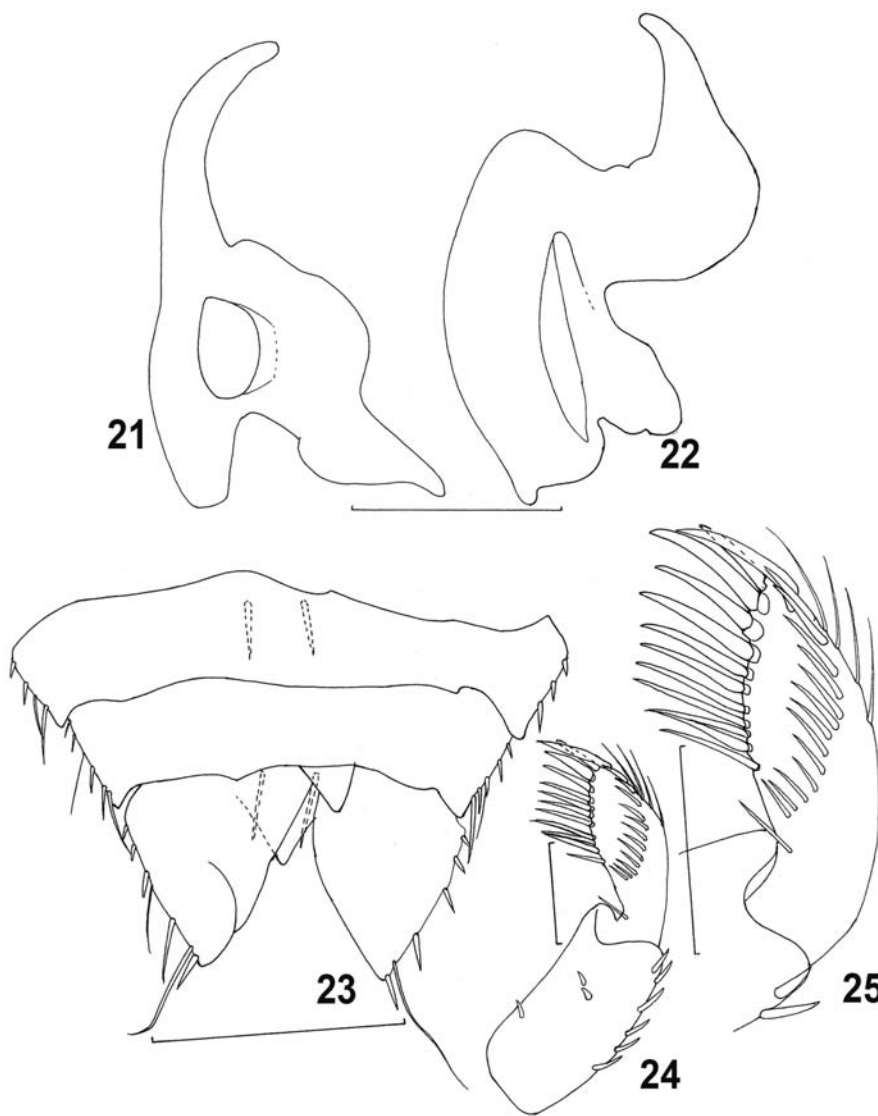
71 ♀♀ (6♂♂ 12 ♀♀ NCTN, 1♂ 2 ♀♀ RMNH, 1♂ 2 ♀♀ ZMAN); same data, downstream of waterfall at camping site, leaves without detritus on sand, 16.IV.1961, A156, 4♂♂ 7 ♀♀ (1♂ 1 ♀ NCTN, 1♂ 1 ♀ ZMAN); Cuieiras R., Igarapé do Cachoeirinha, 18.IV.1961, A157-1, 4♂♂ 4 ♀♀ (1♂ 1 ♀ NCTN); Rio Negro, Ponta Negra, Igarapé da Bica, quiet part of stream, sand with detritus at places with little or no current, 23.IV.1961, A185, 2♂♂ 4 ♀♀ (1♂ 1 ♀ NCTN); Cuieiras R., Igarapé Incarnada, small tributary of Ig. Cachoeira, stagnant water, many leaves, 24.XI.1962, 1 ♀; Igarapé Cachoeirinha, inflow downstream of Pedra dos Indios waterfall, stagnant water, leaves, and detritus, 26.XI.1962, A424, 7♂♂ 17 ♀♀ (1♂ 1 ♀ NCTN, 1♂ 2 ♀♀ RMNH); Igarapé Ca-

choeira, downstream of Pedra dos Indios waterfall, 27.XI.1962, 1 ♀; 15 km from Manaus, road to Rio Branco, Igarapé Aracu, 8.VI.1962, 1 ♀. All leg. E.J. Fittkau; all brachypterous.

Description. Brachypterous form. Body oval, dorsally light brown with pale yellow marks (Fig. 1).

Measurements. Length ♂ \bar{x} = 2.13 {2.21}, s = 0.083; ♀ \bar{x} = 2.11, s = 0.026; width ♂ 1.38, s = 0.034; ♀ \bar{x} = 1.07, s = 0.033; ocular index ♂ \bar{x} = 2.72 {2.49}, s = 0.34; ♀ \bar{x} = 2.57, s = 0.18.

Colour (Fig. 1). Head yellowish with a large light brown patch on vertex, eyes grey-



Figs 21-23: *Synaptogobia xenocheir* nov.sp., paratype male (21) right paramere (22) left paramere, scale 0.1 mm (23) apex of abdomen, dorsal view, scale 0.5 mm.

Figs 24-25: *Synaptogobia heissi* nov.sp., paratype male, fore leg, scale 0.1 mm (24) femur & tibiopala (25) tibiopala.

ish. Pronotum and scutellum yellowish. Hemelytra with a large, oval, basal hyaline mark; remainder light brown with yellowish markings, notably three along costal margin, one just behind the basal hyaline marking, one at apical third and one variable at caudal apex of hemelytron. In addition, two yellowish markings along median line of each hemelytron. Venter and legs yellowish.

Structural characteristics. Eyes small, width of an eye about one third the synthlipsis (0.19/0.61); anterior width of vertex only slightly wider than synthlipsis (0.66/0.61); frons strongly curved backwards (Fig. 13). Pronotum short, about one sixth the length of head (0.08/0.47), slightly narrower than head. Scutellum short and wide, lateral angles reaching behind eyes. Mesosternal carina well developed and long. Fore leg with a small apical palm, dor-

sal row of palar bristles peg-like, apically blunt (Figs 18-20). See Table 1 for leg segment lengths.

Male. Abdomen only slightly asymmetrical (Fig. 23); tergites V-VIII without submarginal rows of bristles (Fig. 23). Left paramere sigmoid, with a short and broad shaft (Fig. 22); right paramere with basal part and shaft of about equal length (Fig. 21).

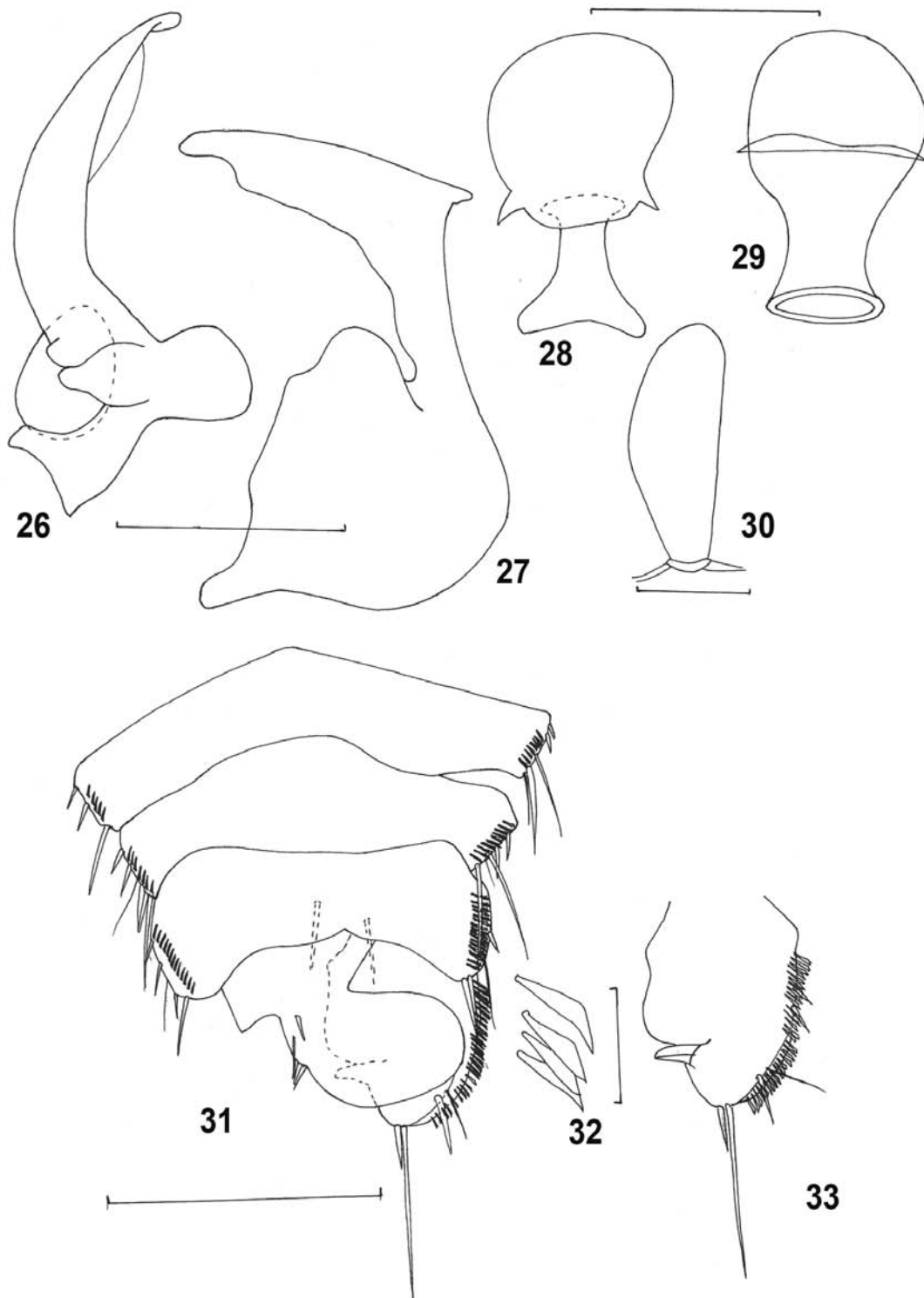
Female. Receptaculum seminis elongate (Fig. 30).

Etymology. "xenocheir" (Greek, a noun in apposition), meaning strange hand, referring to the aberrant tibiopala.

Comparative notes. *Synaptogobia xenocheir* nov.sp. differs from *S. heissi* nov.sp. by its larger size, different hemelytral pattern (Figs 1, 3) and different shape of tibiopala (Figs 18-20, 24, 25). The apex of abdomen in males (Figs 23, 31), parameres (Figs 21, 22, 26, 27) and receptaculi seminis (Figs 28, 30) are also distinctly different.

Synaptogobia heissi nov.sp. (Figs 3, 5, 14, 15, 25-28, 31-33)

Type material: Holotype, brachypterous ♂ (ZSMC), Brazil: Pará, Belterra, Lago Jurucui (lake on the right banks of Tapajós River), Igarapé Grande do Jurucui, quiet water at edge, 27.Nov.1947, leg. R. Braun, B10. Paratypes: Same data as holotype, 9♂♂ 9♀♀ (2♂♂ 2♀♀ NCTN, 1♂ 1♀ RMNH, 1♂, 1♀ ZMAN); same data, mouth of Igarapé Grande do Jurucui, 29.XI.1947, leg. R. Braun, B12, 3♂♂ 7♀♀ (1♂ 1♀ NCTN); Tapajós River, Lago Alter de Chao, South-Cabeceira, 10.XII.1947, leg. R. Braun, B15, 1♂ 1♀; Belterra, Jurucui River, 13.IV.1946, leg. H. Sioli, S110, 1♂; Belterra, Jurucui Lake, 24.IV.1946, leg. H. Sioli, S119, 1♂ 3♀♀; near Santarém, Mapiri, 28.VI.1946, leg. H. Sioli, S147, Tapajós R., Arapiuns River, Arua River, Mouth of Lago da Cachoeira, 1.VI.1952, leg. H. Sioli, S257, 1♂; Arapiuns R., Igarapé Mentai, 12.XI.1952, leg. H. Sioli, S273-274, 3♂♂ 8♀♀; Arapiuns R., Maró River near Mouth, 18.XI.1952, leg. H. Sioli, S277, 1♂ 1♀; same data, S278, 3♀♀; Arapiuns R., Igarapé Curi, 20.XI.1952, leg. H. Sioli, S279, 4♂♂ 8♀♀ (1♂ 1♀ NCTN); Ig. Curi, near mouth, 21.XI.1952, leg. H. Sioli, S282, 1♂ 1♀; Arapiuns R., Igarapé Caraná, deposit of dead leaves, 22.XI.1952, leg. H. Sioli, S283, 1♂ 2♀♀; Arapiuns R., Igarapé do Enseada do Urubú, pool at mouth, 24.XI.1952, leg. H. Sioli, S285, 1♂; Arapiuns R., Igarapé Axi-



Figs 26-27: *Synaptogobia heissi* nov.sp., paratype male, scale 0.1 mm (26) right paramere (27) left paramere.

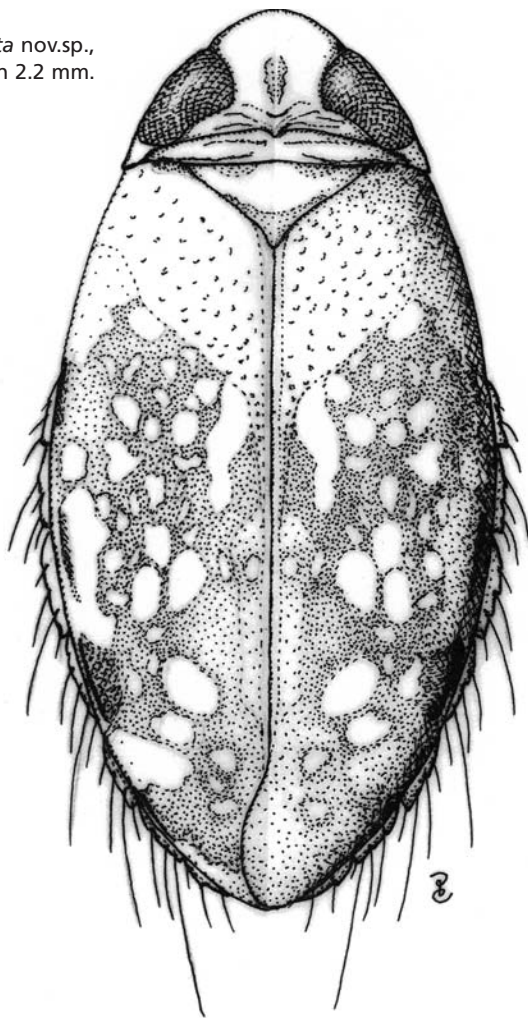
Figs 28-30: Receptaculum seminis of Micronectidae, female paratypes, scale 0.1 mm (28) *Synaptogobia heissi* nov.sp. (29) *Monogobia elongata* nov.sp. (30) *Synaptogobia xenocheir* nov.sp.

Figs 31-33: *Synaptogobia heissi* nov.sp., paratype male (31) apex of abdomen dorsal view, scale 0.5 mm (32) detail of submarginal fan-shaped bristles on tergites, scale 0.05 mm (33) right lobe of abdominal tergite VIII, dorsal view.

cará, near mouth, 9.XII.1956, leg. H. Sioli, S308, 1♂ 2♀♀; Amazonas, Upper Rio Negro, downstream of mouth of Uaupés River, at Icana, 15.IX.1952, leg. H. Sioli, S260, 2♂♂ 6♀♀; near Manaus, Larger Tarumá River, at waterfall, moderate current, 23.IX.1959, leg. H. Sioli, S315, 1♀; Lower Rio Negro, about 80 km upstream of Manaus, left bank near mouth of Arara River, 6.X.1960, leg. E.J. Fittkau, A31-6, 5♂♂ (2♂♂

NCTN) Cuieiras River, 50 km upstream of mouth, strong current, 15.XII.1960, leg. H.J. Fittkau, A62-1, 1♂ 7♀♀; Cuieiras R., Igarapé do Cachoeira da Traira, zone IV, between grass-like plants, 16.XII.1960, leg. E.J. Fittkau, A66-4, 3♂♂ 6♀♀ (1♂ 1♀ RMNH); Rio Negro, downstream of Barcelos, 7.II.1962, leg. E.J. Fittkau, A333, 3♂♂ 9♀♀ (1♂ 1♀ NCTN); Rio Negro, sandy beach downstream of mouth of Itu River,

Fig. 34: *Monogobia elongata* nov.sp., holotype, male, length 2.2 mm.



14.II.1962, leg. E.J. Fittkau, A 352, 1 ♀; Cuieiras R., Igarapé Cachoeira, upstream of waterfall, 25-26.XI. 1962, leg. E.J. Fittkau, A423-1, 2♂♂ 5 ♀♀. All brachypterous.

Description. Brachypterous form. Body oval, dorsally light brown with poorly contrasting yellowish mottling (Fig. 3).

Measurements. Length ♂ \bar{x} = 1.56 {1.56}, s = 0.062; ♀ \bar{x} = 1.44, s = 0.038; width ♂ \bar{x} = 0.97, s = 0.047; ♀ \bar{x} = 0.87, s = 0.026; width of head ♂ \bar{x} = 0.73 {0.72}, s = 0.013; ♀ \bar{x} = 0.70, s = 0.011; ocular index ♂ \bar{x} = 1.66 {1.69}, s = 0.094; ♀ \bar{x} = 1.75, s = 0.088.

Colour. Head, pronotum and scutellum yellowish, eyes greyish. Hemelytra without basal hyaline mark; light brown with yellowish mottling, and three yellow patches along costal margin. Venter and legs yellowish.

Structural characteristics. Eyes small, width of an eye slightly over half the synthlipsis (0.18/0.33); anterior width of vertex only slightly wider than synthlipsis

(0.39/0.33); in frontal view, head beneath eyes strongly folded inwards (Fig. 15). Pronotum short, about one third the length of head (0.08/0.22). Scutellum short and wide at base, lateral angles reaching well behind eyes (Fig. 3). Mesosternal carina distinct, triangular. Fore leg, palm of pala with 13-15 bristles in dorsal row and 10-12 in ventral row (Fig. 25). See Table 1 for leg segment lengths.

Male. Abdomen strongly asymmetrical, notably the lobes of segment VIII (Figs 31, 33). Tergites V-VIII with submarginal rows of apically widened "fan-shaped" bristles (Fig. 32). Right lobe of abdominal segment VIII dorsally with a pair of medially directed teeth (Fig. 33). Apex of left paramere widened with a small spur-like projection (Fig. 27); middle part of the shaft of right paramere widened (Fig. 26).

Female. Receptaculum seminis bulbous with a stalk (Fig. 28).

Etymology. This species is named in honour of our colleague and friend Dr. Ernst Heiss, for his excellent contribution to the knowledge of Hemiptera.

Comparative notes. See under *S. xenocheir* nov.sp.

***Monogobia* nov.gen. (Fig. 34)**

Type species: *Monogobia elongata* nov.sp.

Description. Medium-sized Microneктиdae, length 2.1-2.3. Head not dorsoventrally depressed, but with a distinctly larger part of the eye dorsally than ventrally of the folding line (Fig. 12); posterolateral angles behind eyes somewhat produced, covering sides of pronotum. Ocelli absent. Antennae one-segmented, not fused with the head capsule. Anteclypeus laterally produced but not into elongate processes (Fig. 9). Rostrum unsegmented with transverse grooves (Fig. 17). Pronotum very short; scutellum distinctly exposed (Fig. 34). Hemelytra without claval and membranous sutures or embolar groove; membrane in brachypterous form strongly reduced, hemelytra apically rounded. Hindwing reduced, varying from vestigial to reaching over halfway of abdomen. Mesosternum smooth, without carina, metasternum with a very long xiphus. Tibia and tarsus of fore leg fused in both sex-

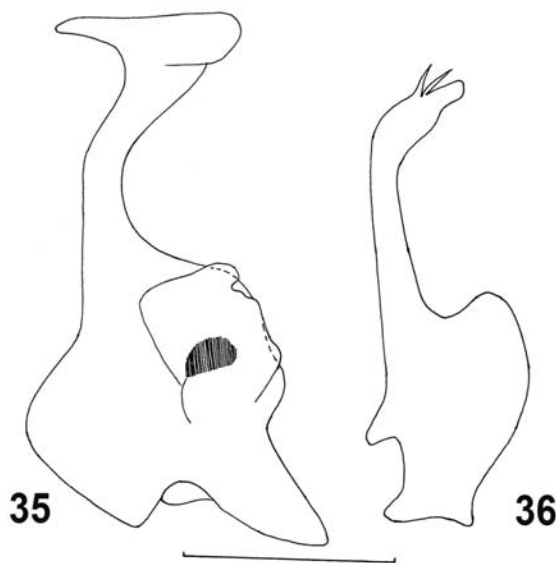
es to form a tibiopala. Claw of fore leg large, spine-like, not modified in male. Abdominal sternite V without a pair of large bristles. Abdominal sternite VII with a pair of large bristles (Fig. 38). Male abdomen asymmetrical, without a strigil, and without free lobe on left part of tergite VIII. Right paramere with ribs on the basal lobe (= pars stridens processus). Female abdomen symmetrical. So far only known in the brachypterous form.

Etymology. Combination of “monos” (Greek: single, only) referring to the one-segmented antennae and “gobia” last two syllables of *Tenagobia*, the American representative of the family Micronectidae.

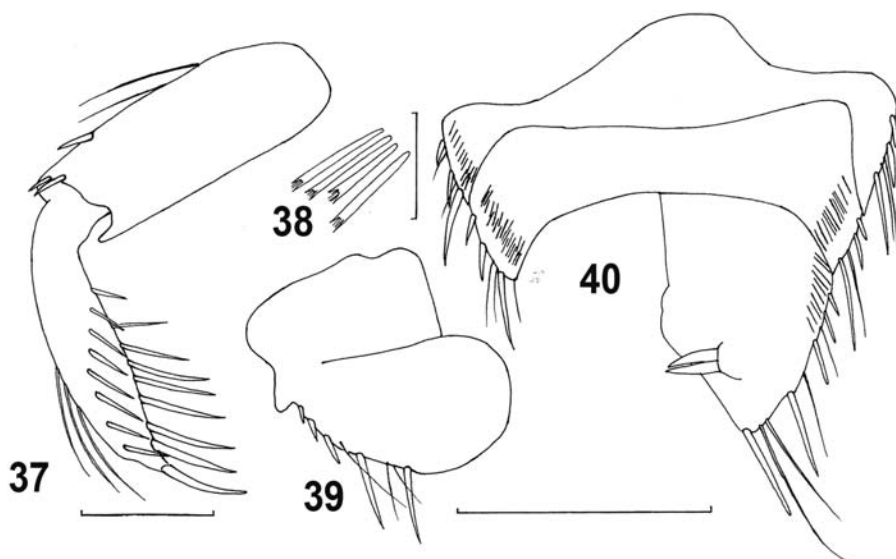
Discussion. The one-segmented antennae and the long metaxiphus suggest a close relationship with *Synaptogobia* nov.gen.. In addition the apex of abdomen in the male and the receptaculum seminis of the female are very similar to those of *Synaptogobia heissi* nov.sp.. However, the general shape of the head tapering gradually to the rostrum; the presence of longer bristles on the antennae, the absence of a carina on the mesosternum and the presence of ridges on the basal processus of the right paramere are shared with the remaining genera of the Micronectidae. Therefore, we consider that *Monogobia* nov.gen. belongs to the subfamily Micronectinae.

Monogobia elongata nov.sp. (Figs 12, 17, 29, 34-40)

Type material. Holotype, brachypterous ♂ (ZSMC), Brazil, Amazonas, Cuieiras River, Igarapé do Cachoeira, Cachoeira da Traira, 19 March 1961, at time of sampling was the waterfall (= cachoeira) was about 2.5 m under water, sampled at edge, many leaves, some sand, leg. E.J. Fittkau, A161. Paratypes: same data as holotype, 14♂♂ 27♀♀ (3♂♂ 6♀♀ NCTN, 1♂ 2♀♀ RMNH, 1♂ 2♀♀ ZMAN); Lower Rio Negro, about 80 km upstream of Manaus, left bank near mouth of Arara River, 6.X.1960, A31-6, 1♀; Cuieiras River, 50 km upstream of mouth, strong current, 15.XII.1960, A62-1, 1♀; Igarapé do Cachoeira, two hours upstream of A62, river 50 m wide, sand bottom, 15.XII.1960, A63-2, 2♂♂ 4♀♀ (1♂ 2♀♀ NCTN); Igarapé do Cachoeira, Cachoeira Pedras dos Indios, quiet areas near banks, 17.XII.1969, A72-4, 1♂; Igarapé do Cachoeira, upstream of waterfall, 25-26.XI.1962, A423-1, 1♀; Igarapé Cachoeira, water plants in current



Figs 35-36: *Monogobia elongata* nov.sp., paratype male, scale 0.1 mm (35) right paramere (36) left paramere.



Figs 37-40: *Monogobia elongata* nov.sp., paratype male, scale 0.5 mm unless otherwise specified (37) foreleg, femur and tibiopala (38) detail of submarginal brush-shaped bristles on abdominal tergites, scale 0.05 mm (39) left lobe of tergite VIII (40) apex of abdomen in dorsal view.

upstream of waterfall, 26.XI.1962, A425-1, 1♂ 2♀♀; Igarapé Cacoeira, downstream of Cachoeira Pedra dos Indios, stagnant part, 27.XI.1962, 2♂♂. All leg. E.J. Fittkau; all brachypterous.

Description (see description of genus). Brachypterous form. Body elongate oval, dorsally light brown with poorly contrasting yellowish mottling.

Measurements. Length ♂ \bar{x} = 2.21 {2.21}, s = 0.050; ♀ \bar{x} = 2.13, s = 0.028; width ♂ \bar{x} = 1.14, s = 0.065; ♀ \bar{x} = 1.11, s = 0.019; width of head ♂ \bar{x} = 0.82 {0.85}, s = 0.018; ♀ \bar{x} = 0.82, s = 0.024; ocular index ♂ \bar{x} = 1.03 {1.09}, s = 0.067; ♀ \bar{x} = 1.04, s = 0.040.

Colour (Fig. 34). Head, pronotum and scutellum yellowish, eyes greyish. Hemelytra with large, oval, hyaline mark, occupy-

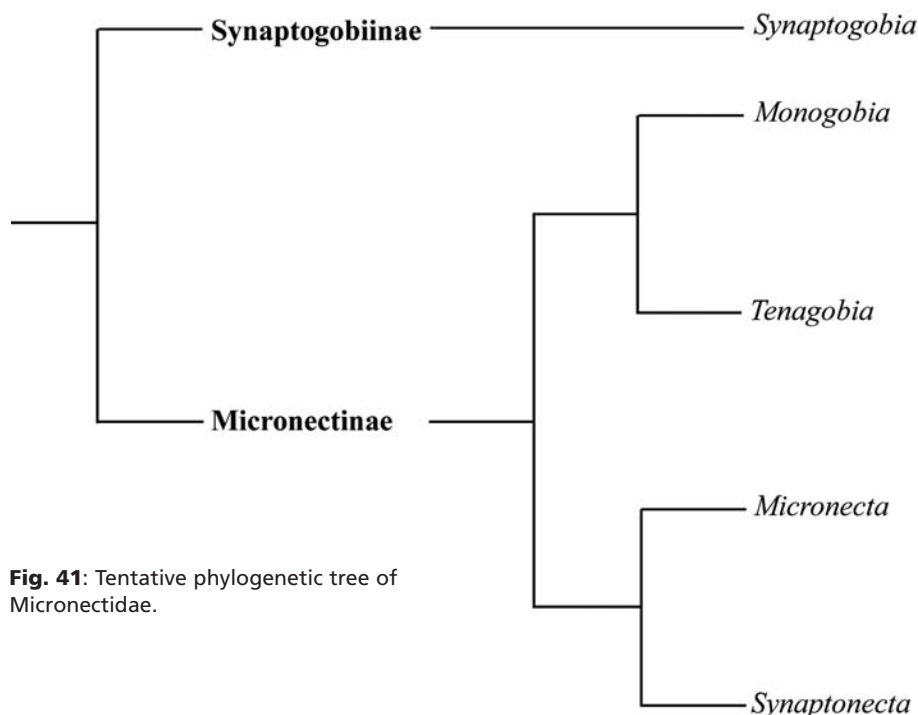


Fig. 41: Tentative phylogenetic tree of Micronectidae.

ing basal fifth of hemelytron; light brown with extensive yellowish mottling, venter and legs yellowish.

Structural characteristics. Width of an eye equal to synthlipsis (0.29/0.29); anterior width of vertex 1.5 times synthlipsis (0.45/0.29); head tapering gradually towards rostrum (Figs 12, 17). Pronotum short, about one third the length of head (0.10/0.29). Scutellum short and wide at base, lateral angles reaching well behind eyes (Fig. 34). Mesosternum smooth, without carina. Tibia and pala fused in both sexes (Fig. 37); dorsal row of palm with eight bristles, ventral row with seven bristles. See Table 1 for leg segment lengths.

Male. Abdomen strongly asymmetrical, notably the lobes of segment VIII (Figs 39, 40). Right lobe of abdominal segment VIII dorsally with a pair of medially directed teeth; Tergites V-VIII, except for left lobe of tergite VIII, with submarginal rows of rather small brush-like bristles (Fig. 38). Apex of left paramere bent with a pair of bristle-like projections (Fig. 36); right paramere apically widened with a spur-like projection, pars stridens processus with about 30 ribs (Fig. 35).

Female. Receptaculum seminis broadly mushroom-shaped (Fig. 29).

Etymology. “elongatus” (Latin: past participle of elongare, meaning to elongate), referring to the elongate oval body shape.

Comparative notes. There is a striking similarity between the structure of the apex of abdomen in males and the shape of the receptaculum seminis between *Monogobia elongata* nov.sp. and *Synaptogobia heissi* nov.sp.. However, the head structure and the lack of a mesosternal carina in *Monogobia* nov.gen. place this genus in the subfamily Micronectinae.

Conclusion

The genera of the family Micronectidae are summarized as follows:

Family Micronectidae JACZEWSKI 1924

Subfamily Micronectinae JACZEWSKI 1924

Genus *Micronecta* KIRKALDY 1897

Monogobia nov.gen.

Synaptonecta LUNDBLAD 1933

Tenagobia BERGROTH 1899

Subfamily Synaptogobiinae nov.subfam.

Genus *Synaptogobia* nov.gen.

Key to subfamilies and genera of the family Micronectidae

- 1 Head in frontal view, ventrally of eyes abruptly narrowed towards rostrum (Fig. 15); mesosternum with a distinct carina (Fig. 2) (Synaptogobiinae) Brazil *Synaptogobia*
- Head in frontal view, ventrally of eyes gradually narrowed towards rostrum (Fig. 17); mesosternum without carina (Micronectinae) 2
- 2 Metaxiphus long; antennae one-segmented; pala and tibia fused in both sexes. Brazil *Monogobia*
- Metaxiphus short; antennae three-segmented 3
- 3 Posterior margin of pronotum concave; hemelytra without nodal furrow; males without strigil. Tropical and subtropical America *Tenagobia*
- Posterior margin of pronotum convex; hemelytra with nodal furrow, males usually with a strigil 4

- 4 Head without a dorsal impression on vertex; pala and tibia of foreleg in males separate. Old World *Micronecta*
- Head with an impression of vertex; pala and tibia of foreleg fused in both sexes. India, SE Asia and Florida . . . *Synaptonecta*

As Mr. Paul Tinarella from the University of North Dakota is going to publish at least one new genus of Micronectidae in his forthcoming thesis, we refrain from a rigid cladistical analysis of the family on genus level until his paper is published. Within Corixoidea the species of Micronectidae known up to now have 3-segmented antennae whereas other taxa have 4-segmented antennae. The reduction of the antenna to one segment in *Monogobia* and the fusion of the antenna with the head in *Synaptogobia* are apomorphies. Other apomorphies of *Synaptogobia* are mentioned above. *Monogobia* shares the lack of a strigil in the male with *Tenagobia*. In addition the strongly reduced pronotum reminds of the brachypterous form of *Tenagobia incerta* LUNDBLAD (NIESER 1977). Based on these arguments a tentative phylogenetic tree of Micronectidae is proposed in Fig. 41.

Finally, it is a mystery why some of these species have not been reported elsewhere. Judging from the collections they are not rare in the Amazon basin. One possible clue is the Cachoeira da Traira, 19.III.1961 sample by Fittkau. He states that the waterfall was 2.5 m under water. As he collected chironomid larvae from the bottom of the habitats it is possible that these micronectid species are deep water species not usually collected by people looking for aquatic Heteroptera. The reduction of the antennae could then be connected with the deep water habitat. It would be worthwhile for local aquatic ecologists to look into this matter.

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Zusammenfassung

Eine neue Gattung *Synaptogobia* mit zwei neuen Arten, *S. xenocheir* nov.sp. (Typus-Art der Gattung) und *S. heissi* nov.sp. wird beschrieben und in die neue Unterfamilie Synaptogobiinae gestellt. Weiters wird die monotypische Gattung *Monogobia* mit der Typus-Art *M. elongata* nov.sp. beschrieben und in die Unterfamilie Micronectinae gestellt. Alle neuen Taxa wurden in Brasilien (Amazonas, Pará) gesammelt. Eine Checkliste und ein Schlüssel der Unterfamilien und Gattungen der Micronectidae wird zur Verfügung gestellt.

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