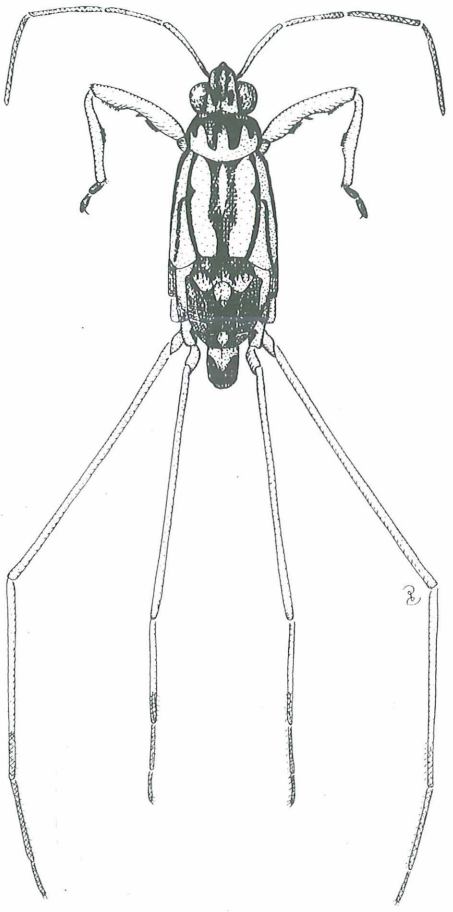
Amemboa 3

News and Results on Heteroptera of Thailand



ISBN 3-900 275-74-2

Amemboa

News and Results on Heteroptera of Thailand

Number 3 ISBN 3-900 275-74-2 September, 1999

A HoT preface

The project of "Heteroptera of Thailand" (HoT) is running slowly but well on its track through the cooperation among the collaborators. Looking at the launching point of the project, the original plan of working out the aquatic and semiaquatic bugs of Thailand, has been developed into a broader scheme, i.e. to include terrestrial bugs of Thailand, by the enthusiasm and support of many collaborators. We should objectively face the material we rely on for this task: there still is a huge demand for terrestrial bugs. The three main sources of acquiring material from Thailand remain the same: (1) to make field surveys to Thailand by collaborators; (2) to borrow it from known insect collections in Thailand; (3) to borrow it from known insect collections in Asia, Europe, and North America. We are still working on certain points regarding the above three points.

Again, as planned, the aquatic and semiaquatic Heteroptera of Thailand will be published as the first and second volumes due to the better understanding of their fauna; and although many new species have been found almost every year, the overview is reasonably clear. The following volumes of the handbook "Heteroptera of Thailand" will deal with terrestrial bugs, which is really challenging: A few bug groups can be expected to be worked out in a relatively short time; most groups will be a long-term task because of the lack of material and their poor background. Therefore, we suggest starting with presenting illustrated keys and reliable species lists in AMEMBOA. Such a solution would already be a big step toward filling in the nearly empty page of knowledge on Thai terrestrial bugs (see SCHAEFER & AHMAD in this volume.)

Through negotiation, some loan material of Thai bugs has been gradually sent to several collaborators. I would like to express my deep gratitude to those who have helped so much in this matter!

I would like to say I am happy to see that the health of Dr. Ivor Lansbury has been improved and he is now able to join this project (limnic Halovelinae) and has given much help with various suggestions to the project. Further, Dr. W. Ullrich (Lübeck, Germany) and Dr. D.A. Rider (Fargo, U.S.A.) are providing strong support with their work on Pentatomoidea, and Dr. A. Jannson (Helsinki) will contribute his experience in Corixidae.

For the convenience of final editing, using Wordperfect (DOS) or Corel Wordperfect Suit 7 as a word processor is required. A formula of writing each chapter is still under discussion; we hope to be able to present it soon. We hope to manage a distribution of guidelines (including model maps, etc.) to the cooperating authors in autumn.

To work on it, as a kind of side-work for all the collaborators, is definitely time-eating. Therefore, the slow progress is understandable. I sincerely thank all the collaborators for the effort and the donations. My specific thanks are due to Dr. Herbert Zettel for his excellent editing work on the project newsletter AMEMBOA, and to Prof. Dr. Carl W. Schaefer for his generous help to do the linguistic control for AMEMBOA!

Pingping Chen, chief editor of HoT

A key to the genera of Southeast Asian and Malesian Largidae (Hemiptera: Pyrrhocoroidea)

by Carl W. Schaefer & Imtiaz Ahmad

Abstract: Keys to the families of Pyrrhocoroidea, higher taxa of Largidae, and the genera occuring in Southeast Asia and Malesia are presented. A list with distribution data of these genera is added. So far there are no records of Largidae from Thailand.

As part of a larger study on the genera of Pyrrhocoroidea, we present here a key to the largid genera of southeast Asia and Malesia. Largidae consists of two subfamilies, Larginae and Physopeltinae; the former is entirely New World, and the latter entirely Old World. We emphasize that this key is provisional, and certain to be modified. In some cases it is based not on specimens but descriptions, and in other cases not all species of a given genus have been examined; the work is continuing. We welcome suggestions, corrections, and additions, and we welcome also information on specimens of these genera in public or private collections.

Unfortunately there are no published records of Largidae from Thailand so far, although the family is present in the whole area.

Key to families of Pyrrhocoroidea

1 Forefemora not or only slightly swollen, terete, distinctly sulcate (Physopeltinae) or not (Larginae); metathoracic scent gland complex auriculate (Physopeltinae) or not (Larginae); seventh abdominal sternite in female cleft medially, ovipositor laciniate; in male, aedeagus without thecal appendages, vesica always with distinct coils..... **Largidae**

Forefemora usually distinctly swollen, not terete, never sulcate; metathoracic scent gland complex never auriculate; seventh abdominal sternite in female entire, ovipositor plate-like; aedeagus with or without thecal appendages, vesica straight or slightly coiled. **Pyrrhocoridae**

Note: Pyrrhocoridae will be treated in a forthcoming publication.

Key to subfamilies of Largidae

1 Eyes pedunculate or sessile, occipital suture often present, head never sulcate behind bucculae; labium never reaching metacoxae, usually short of or just reaching mesocoxae; anterior disc of pronotum never continuous with anterior pronotal margin; forefemora never distinctly sulcate; metathoracic scent gland complex never auriculate; paramere never with lateral lobes; New World..... [Larginae]

Eyes sessile, occipital suture always present, head always sulcate behind bucculae; labium at least reaching metacoxae; anterior disc of pronotum usually continuous with anterior pronotal margin; forefemora always distinctly sulcate; metathoracic scent gland complex auriculate; paramere always with lateral or outer lobes; Old World..... **Physopeltinae**

Key to tribes of Physopeltinae

1 Sexually dimorphic (males elongate); antennae very long, first segment longer than head and pronotum together, in male about three times as long as head and pronotum together; first labial segment distinctly reaching posterior margin of head; pygophore with posterior margin slightly lobed.....
Lohitini: *Lohita grandis* (GRAY)

Not sexually dimorphic; antennae never as above; first labial segment usually short of, just reaching, or reaching beyond posterior margin of head; pygophore with posterior margin unlobed. **Physopeltini**

Key to Southeast Asian and Malesian genera of Physopeltini

1 Anterior disc of pronotum semicircular and swollen, globose, more prominent than posterior disc, rounded and not depressed laterally; first antennal segment a little longer than second, second and fourth equal, third half as long as second; labium short or reaching middle of mesosternum, first segment not reaching posterior margin of head..... ***Taeuberella* SCHMIDT**

Anterior disc of pronotum not as above; first antennal segment usually subequal to or a little shorter than second; labium usually long, reaching at least to metasternum, first segment not reaching or extending beyond posterior margin of head..... **2**

2 Pronotum behind anterior angles with distinctly forwardly directed projections, sometimes extending to posterior edge of eyes; bucculae elevated, forming distinct angles; labium long, reaching at least to just beyond posterior margin of third abdominal sternite; brachypterous. ***Pajanja* BLÖTE**

Pronotum not as above; bucculae not as above; labium not as above, never reaching beyond middle of third abdominal sternite; usually macropterous but sometimes brachypterous. **3**

3 Labium reaching about middle of third abdominal sternite, first segment surpassing posterior margin of head; anterior disc of pronotum not continuous with anterior pronotal margin, lateral margins of pronotum and corial margins markedly reflexed. ***Iphita* STÅL**

Labium not as above, reaching at most slightly beyond metasternum, first segment never reaching posterior margin of head; anterior disc of pronotum continuous with anterior margin..... **4**

4 First antennal segment shorter than second; underside of forefemora distinctly sulcate; labium just reaching posterior margin of metasternum.....
***Physopelta* AMYOT & SERVILLE**

First antennal segment equal or subequal to second; underside of forefemora not distinctly sulcate; labium extending at least slightly beyond metasternum..... **5**

5 Long (14.0 mm); anterior disc of pronotum markedly roundly convex, impunctate; posterior disc flat, densely punctate; forefemora with two conspicuous spines in addition to denticles; first antennal segment clavate..... ***Wachsiella*** SCHMIDT

Short (6.5 mm); anterior and posterior discs of pronotum not as above; forefemora with minute uniform denticles, without spines; first antennal segment not markedly thicker than second..... ***Delacampius*** DISTANT

Note. BLÖTE (1931) transferred this genus from Pyrrhocoridae (where it is listed by HUSSEY [1929]) to Largidae.

Distribution (by country) of genera of southeast Asian and Malesian Largidae

(from HUSSEY 1929, unless otherwise noted)

Lohita AMYOT & SERVILLE, 1843	Bangladesh (AHMAD & ABBAS 1985), Nepal (Schaefer, unpubl.), India, Philippines, Malaysia
Taeuberella SCHMIDT, 1932	Papua New Guinea (SCHMIDT 1932)
Pajanja BLÖTE, 1932	Indonesia (BLÖTE 1932)
Iphita STÅL, 1870	Papua New Guinea, Sri Lanka, India, Malaysia, Philippines
Physopelta AMYOT & SERVILLE, 1843	P.R. China, Taiwan, India, Malaysia, Philippines, Japan, Laos, Viet-Nam (also Africa, Australia)
Wachsiella SCHMIDT, 1931	Indonesia (SCHMIDT 1931)
Delacampius DISTANT, 1903	Papua New Guinea (AHMAD & ZAIDI 1987), Malaysia (also Africa [DISTANT 1919])

References

AHMAD, I. & ABBAS, N. 1985: Redescription of *Lohita grandis* (GRAY) (Hemiptera: Pyrrhocoroidea: Largidae) from Bangladesh with reference to its relationships. - Proceedings of the Entomological Society of Karachi 14-15: 13-20.

AHMAD, I. & ZAIDI, R.H. 1987: Redescription of a little known genus *Delacampius* DISTANT (Hemiptera: Largidae: Physopeltinae) from Oriental Region and its relationships. - Proceedings of the 7th Pakistan Congress of Zoology, pp. 161-165.

BLÖTE, H.C. 1931: Catalogue of the Pyrrhocoridae in sRijks Museum van Natuurlijke Historie. - Zoologische Mededeelingen (Leiden) 14: 94-136.

BLÖTE, H.C. 1932: Two new species of Pyrrhocoridae in sRijks Museum van Natuurlijke Historie. Zoologisches Mededeelingen (Leiden) 14: 263-264.

DISTANT, W.L. 1919: Some new species of the homopterous [sic] family Pyrrhocoridae. Annals and Magazine of Natural History (Series 9) 14: 218-222.

HUSSEY, R.F. 1929: Pyrrhocoridae. General Catalogue of the Hemiptera. Fascicle III. Pp. 144. Smith College, Northampton, Mass. (U.S.A.)

SCHMIDT, E. 1931: Zur Kenntnis der Familie Pyrrhocoridae FIEBER (Hemiptera-Heteroptera). Teil I. Stettiner Entomologische Zeitung 92: 1-51.

SCHMIDT, E. 1932: Zur Kenntnis der Familie Pyrrhocoridae FIEBER (Hemiptera-Heteroptera). Teil II. Wiener Entomologische Zeitung 49: 236-281.

Authors' addresses:
Prof.Dr. Carl W. Schaefer, Dept. of Ecology and Evolutionary Biology, University of Connecticut, 75 North Eagleville Road, Storrs CT 06269-3043, U.S.A. (e-mail: schaefer@uconnvm.uconn.edu)
Dr. Imtiaz Ahmad, Dept. of Zoology and Entomology, Karachi University, Karachi 75270, Pakistan

Short Notes:

Additions to the species lists of Thai Gerromorpha published by HECHER (1998) and CHEN & ZETTEL (1998) in Amemboa 2:

Veliidae:

***Microvelia leveillei* (LETHIERRY, 1877):** This species is listed for Thailand by HECHER (1998) under the name ***Microvelia diluta* DISTANT, 1909**. After type studies, the correct name is, however, *Microvelia leveillei*, a species described from the Philippine Islands (ZETTEL & GAPUD, in press).

***Pseudovelia pusilla* HECHER, 1997:** This species was recently described from Vietnam (HECHER 1997). A sampling of this species from Chiang Mai Province, Thailand, was brought to our attention by Dr. Wolfgang Ullrich (Lübeck, Germany).

Gerridae:

***Halobates proavus* WHITE, 1883:** The first record from Thailand was published in a small note by ANDERSEN (1991: 50): since *H. hayanus* and *proavus* often are found near the margin of coral reefs (personal observation in Phuket, Thailand), ...", which was overlooked by CHEN & ZETTEL (1998) in their check-list. Further material of this species (2 males, 2 females, Phuket, 17.2.1998, leg. E. Heiss, coll. Zettel) was recently sent to us for identification. *Halobates proavus* is a species widespread in the Pacific Ocean; the population from Phuket is the only one so far known from the Indian Ocean.

References:

ANDERSEN, N.M. 1991: Marine insects: genital morphology, phylogeny and evolution of sea skaters, genus *Halobates* (Hemiptera: Gerridae). - Zoological Journal of the Linnean Society, London 103: 21-60.

CHEN, P.P. & ZETTEL, H. 1998: Key to the genera and subgenera of Gerridae (Gerromorpha) of Thailand and adjacent countries, with a check-list of species known from Thailand. - Amemboa 2: 24-41.

HECHER, C. 1997: Two new species of *Pseudovelia* (Insecta: Heteroptera: Veliidae) from Vietnam. Annalen des Naturhistorischen Museums in Wien 99B: 41-49.

HECHER, C. 1998: Key to the genera of Veliidae (Gerromorpha) of Thailand and adjacent countries, with a check-list of genera and species known from Thailand. - Amemboa 2: 3-9.

ZETTEL, H. & GAPUD, V.P. in press: A new species group of Oriental *Microvelia* s.l. (Insecta: Heteroptera: Veliidae), with descriptions of three new species. - Annalen des Naturhistorischen Museums in Wien.

Herbert Zettel & Christine Sehnal (formerly Christine Hecher)
Entomological Department, Naturhistorisches Museum Wien
Burgring 7, A-1014 Vienna, Austria
e-mail: herbert.zettel@nhm-wien.ac.at
a8802713@unet.univie.ac.at

The genus *Merragata* BUCHANAN-WHITE, 1877 (Gerromorpha: Hebridae) in Thailand, with notes on the Oriental taxa

by Herbert Zettel

Abstract: The genus *Merragata* is recorded from Thailand for the first time. The species is provisionally named *Merragata pallescens* (DISTANT, 1909). Notes on the taxonomy of the Oriental forms and on the habitat of a Thai population are given.

Introduction

Merragata pallescens (DISTANT, 1909) from India is the only species of the genus, which is so far described from the Oriental Realm. LUNDBLAD (1933) added the variation *whitei* based on the different colouration of a single female from Java, Indonesia. Newly collected material from Thailand is externally similar to this variation and is discussed in the present study.

Merragata pallescens (DISTANT, 1909)

Material examined (all specimens macropterous): **holotype** (female, glued on card): "Type", "Type", "Merragata\ pallescens\ Dist.", "Distant Coll.\ 1911-383", "Tank, Museum\ compound\ Calcutta\ 7. IV.-[19?]10." [wrongly attachted label?] (The Natural History Museum, London); **further material:** 1 male (slide mounted by Lundblad; see LUNDBLAD 1933: fig. 82) "Paratype [no type!]\\ Merragata\ pallescens Dist.\ ♂\ Museum\ compound. Calcutta. 1910." (The Natural History Museum, London); 1 female "Thailand: Loei\ Wang Saphung, Mae Nam\ Loei, 8.III.1994\ leg.W.D.Shepard (1030)"; 1 male, 1 female "Thailand: Sakhon Nakhon\ 11km NE Ban Kham Poem\ Huai Ya, 5.III.1994\ leg. W.D. Shepard (1027)"; 42 ex. (males and females) "Thailand: Sakhon Nakhon Prov.\ Sakhon Nakhon, Constructed\ Wetland, 23.11.1995\ leg. H. Zettel" (in Natural History Museum Vienna, Coll. W.D. Shepard, and Khon Kaen University); 3 males, 1 female, same locality data, leg. N. Nieser (N 9526) (Coll. Nieser, Tiel).

Notes on the type material of *M. pallescens*: DISTANT (1909) described the species from a single specimen from "East Bengal; Rajshai (Annandale)" One year later the same author (DISTANT 1910) stated to "have only seen a single specimen" LUNDBLAD (1933) writes that the type is a female, and that there is a second specimen, a male, in the British Museum with the label "Tank, Museum compound, Calcutta, 8.[!; printing error?] IV.-10."; he has studied both specimens, and used the male for slide mounting and illustrations (LUNDBLAD 1933: fig. 82 A-I). Lundblad, as usual, did not use the original labels for the slide, but wrote the text (as cited above) in black ink on the slide.

The author agrees with LUNDBLAD (1933), that the female in the Natural History Museum, London, is the holotype of *M. pallescens*, although the labels now contradict this fact. It is assumed that the locality label of the male was later, after slide mounting, wrongly attached to the female type, either by Lundblad or by a curator after return of the material to the British Museum. This is confirmed by the facts that 1) in contrast to other specimens from the Distant collection, the locality label is pinned below the Distant Collection label; 2) there are two type labels on the pin on which the type is mounted.

Notes on *M. pallescens* var. *whitei* LUNDBLAD, 1933: LUNDBLAD (1933) described the variation from two females from eastern Java (not examined). LUNDBLAD (1933) mentions the blackish brown body colouration as the only difference to the type. One female is depicted by LUNDBLAD (1933: tab. X). LUNDBLAD (1933: p. 277) clearly expresses his intention not to describe a subspecific taxon, but merely a variation: "... trotzdem ziehe ich es vor, sie als bloße Varietät zu dieser [of *M. pallenscens*] zu stellen, da es nicht ratsam erscheint, in der Familie *Hebridae* neue Arten nach weiblichen Exemplaren aufzustellen." Therefore, according to the ICZN, the name *pallescens* LUNDBLAD, 1933, is not available as a taxon of the species group.

Description of the holotype of *M. pallescens*: size: length 1.68 mm; pronotal width 0.79 mm; head width 0.38 mm; length of second antennal segment 0.10 mm; length of metatibia 0.76 mm; body small and stout, densely pubescent.

Colour: pale yellowish brown; antenna and legs yellow, except antennal segment 4 brown; hemelytron whitish except veins yellow. The whole specimen gives a faded impression; the author is not sure if this is the original colour of the species.

Structures: head slightly elongate, 1.15 times longer than width across eyes; distance of eyes 0.68 times head width; buccula elongate, low, posteriorly forming a right angle; relative lengths of antennal segments 1 - 4: 1.15 1 0.9 1.3; segment 4 widest; pronotum about as long as head, 1.9 times wider than long, with lateral margin deeply concave; metanotal elevation short, subtriangular, with apex minutely incised; hemelytron with one closed cell; veins very thick, densely covered with long erect whitish hairs; abdomen distinctly widened in middle of length, and nearly as wide as the pronotum (0.95).

Male of *M. pallescens* from Calcutta, India: The specimen has been well illustrated by LUNDBLAD (1933: fig. 82 A-I). It apparently belongs to the same species as the holotype. In male genitalia no distinct differences were found between this specimen and males from Thailand. The abdomen is slightly wider than the pronotum, which may be artificial after slide preparation (but see the note below).

Specimens from Thailand: Material from Thailand agrees in colour with var. *whitei* from Java. No variation in colour of the numerous specimens was observed. Male genitalia are nearly identical with those of the male of *M. pallescens* from Calcutta.

Externally there are, except colour, two differences found between the *M. pallescens* type and specimens from Thailand. In the type the head is shorter, about 1.1 times longer than wide, but in Thai specimens more elongate, 1.25 times longer than wide. In the type (and in the male from Calcutta) the abdomen is very wide, nearly as wide as (or wider than) the pronotum, and its sides are distinctly convex in anterior half; but in Thai specimens (and in the female from Java; see LUNDBLAD 1933: tab. X) the sides of the abdomen are subparallel in the anterior half, and the abdomen is distinctly narrower than the pronotum (0.9 times as wide).

The specimens collected by the author occurred in large numbers at the edge of a constructed wetland, partly on and between water plants. *Merragata* differs strongly from other Thai Hebridae in its predominately pleustonic habit.

Conclusions

The genus *Merragata* consists of very small species, which are poor in external diagnostic characters. The phylogenetic position of the genus has been discussed by ANDERSEN (1981, 1982). Only a few species are described, mainly from the New World, and only one species and one variation from the Oriental Realm so far. Due to the life habit on open stagnant waters with water plants, dispersion by flight or phoresy (of eggs) by water birds or human activities is quite possible, and subsequently a wide distribution of *Merragata* species is likely.

The minute male genitalia, particularly the parameres, exhibit (by means of microscopic examination) no clear differences between the Indian male of *M. pallescens* and the studied material from Thailand. The stability of external characters (colour, proportions, etc.) should be tested in more material from the type area of *M. pallescens* in India. If more material from different areas becomes available, male genitalia should be studied by SEM-studies, which have proved to be successful in furnishing characters for species identification in small Hebridae, e.g. in *Hebrus* species. If the above mentioned differences (colour, proportions) prove to be stable, the Thai (and Indonesian) material should be provided with a new name (after check of the world species). Based on the present material and knowledge, no taxonomic changes are proposed, and the material from Thailand is provisionally identified as *M. pallescens*.

Acknowledgements: My sincere thanks are due to William D. Shepard (Sacramento) for providing me with specimens, to Tasanee Jamjanya and Narumon Sangpradub (both in Khon Kaen University) for bringing me to the site in Sakhon Nakhon, to Janet Margerison-Knight (The Natural History Museum, London) for the loan of type material, and to Carl W. Schaefer (University of Connecticut) for comments on the manuscript.

References

ANDERSEN, N.M. 1981: Semiaquatic bugs: phylogeny and classification of the Hebridae (Heteroptera: Gerromorpha) with a revision of *Timasius*, *Neotimasius* and *Hyrcanus*. Systematic Entomology 6: 377-412.

ANDERSEN, N.M. 1982: The Semiaquatic Bugs (Hemiptera, Gerromorpha). Phylogeny, Adaptations, Biogeography and Classification. - Entomonograph 3: 455 pp.

DISTANT, W.L. 1909: Oriental Rhynchota Heteroptera. Annals and Magazine of Natural History (8)3: 491-507.

DISTANT, W.L. 1910: The fauna of British India, including Ceylon and Burma. Rhynchota. Vol. V. Heteroptera: Appendix, Taylor & Francis, London, 362 pp.

LUNDBLAD, O. 1933: Zur Kenntnis der aquatilen und semiaquatilen Hemipteren von Sumatra, Java und Bali. - Archiv für Hydrobiologie, Supplement 12: 1-195, 263-489, 21 Tafeln.

Authors address: Dr. Herbert Zettel, Naturhistorisches Museum Wien, 2. Zoologische Abteilung, Burgring 7, A-1014 Vienna, Austria (e-mail: herbert.zettel@nhm-wien.ac.at)

Introduction to the Micronectidae (Nepomorpha) of Thailand

by Nico Nieser

Abstract: An introduction to the Micronectidae (formerly subfamily Micronectinae of the Corixidae) of Thailand and adjacent countries is given. A key to the two genera and some subgenera of *Micronecta* is presented. A preliminary list includes records of eleven species and one subspecies from Thailand, of which the following eight records (seven species and one subspecies) are new: *Micronecta grisea* (FIEBER), *M. guttatostriata* LUNDBLAD, *M. jaczewskii* WROBLEWSKI, *M. ludibunda langkana* WROBLEWSKI, *M. quadristrigata* BREDDIN, *M. scutellaris* (STÅL), *M. siva* (KIRKALDY), and *Synaptonecta issa* LUNDBLAD.

The Micronectidae were formerly usually included as subfamily Micronectinae in the family Corixidae. The cladistic analysis of MAHNER (1993) gives a base to regard them as a separate family. There are two genera in the area: *Micronecta* KIRKALDY (Fig. 1) and *Synaptonecta* LUNDBLAD. In his checklist of Oriental Micronectinae, WROBLEWSKI (1968) synonymized *Synaptonecta* with *Micronecta*, but later the same author treated them as separate genera (WROBLEWSKI 1972). Although there are quite a number of common and well known species in the area, most collections are from light catches; so the specific ecology of most species is poorly known. As a rule representatives of the family live along the shallow edges of stagnant or sluggish waters. Especially in warmer regions they tend to migrate to deeper parts of the habitat during the day when the water temperature rises (NIESER 1975). They can occur in high densities and thus constitute an important link in the food chain, but so far this has not been studied in more detail.

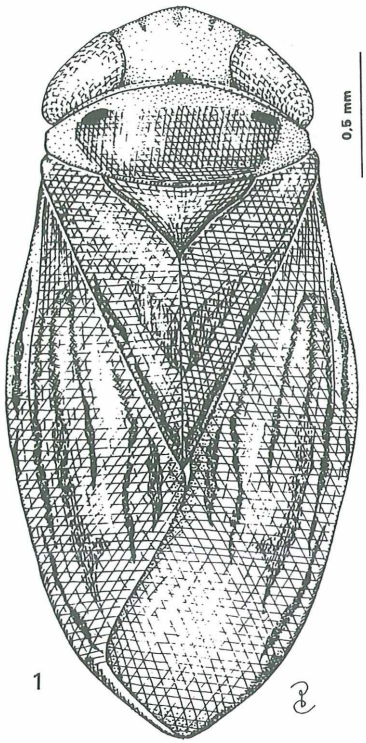
The genus *Micronecta* is divided into nine subgenera of which eight occur in Thailand and adjacent countries. Of these, two are quite easily recognized and each is represented by a single common and widespread species. The other subgenera are somewhat more difficult to separate. So a key to the genera and these two subgenera is presented for preliminary purposes.

Key to genera and some subgenera of Thai Micronectidae (based on males)

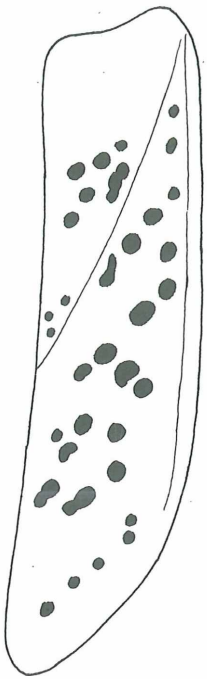
1 Vertex with an impression; hemielytra with a punctate pattern, the spots tend to fuse to larger blotches; tibia and tarsus of male foreleg fused; small species, body length 1.9 2.4 mm [new record from Thailand but occurring in India, Sri Lanka, Myanmar, Vietnam, W. Malaysia and Jawa]..... ***Synaptonecta issa* (DISTANT)**

Vertex convex (rarely flattened); tibia and tarsus of male foreleg separate; size variable **2**

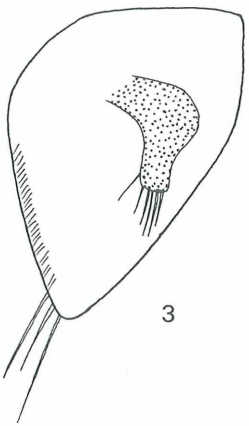
2 Dark pattern of hemelytra consisting of uniformly scattered distinct dark spots on a pale background (Fig. 2); body length 2.4 - 2.8 (females 2.6 - 3.3) [recorded from Thailand, distributed from India to Sumatera and Jawa]..... ***Micronecta* (*Pardanecta*) *haliploides* HORVATH**



1



2



3

Figs. 1 - 3: (1) Habitus of *Micronecta quadristrigata*; (2) right hemielytron of brachypterous *M. haliploides*; (3) left lobe of tergite 8 of *Micronecta quadristrigata*, stippled area is the free lobe.

- Dark pattern of hemelytra usually with more or less distinct longitudinal stripes or hemelytra without distinct pattern, not punctate..... **3**

3 Free lobe on left half of tergite 8 large and sigmoid (Fig. 3); left paramere with a sickle-shaped apex; hemelytra with four longitudinal stripes which, however, may be split into spots which can form reticulations; body length 2.2 - 2.9 mm [recorded from Thailand, widespread species: India through SE Asia, Indonesia, Philippines to North Australia]..... ***Micronecta* (*Sigmonecta*) *quadristrigata*** **BREDDIN**

- Free lobe of left half of tergite 8 of a different form, not sigmoid; apex of left paramere with a different apex ..... **other subgenera of *Micronecta***

Preliminary list of Micronectidae occurring in Thailand and adjacent areas

The list is mainly based on literature; in addition material from the Naturhistorisches Museum, Vienna (NHMW) and the Nieser collection, Tiel (NCTN) has been incorporated.

Abbreviations. - Countries: B = Myanmar; C = China (SW); I = India (especially Assam); L = Laos and Cambodia; M = West Malaysia (including Singapore); S = Sumatera; T = Thailand; V = Viêt-Nam; + = recorded; +! = first record, specimens in both NHMW and NCTN; !w = new record specimens in NHMW; +* = endemic.

	I	B	T	L	V	M	S	C
Micronecta								
albifrons (MOTSCHULSKY)	+							+
anatolica LINDBERG	+	+			+			
decorata LUNDBLAD						+	+	
desertana LUNDBLAD	+				+			
fugitans BREDDIN			+			+	+	
fulva PAIVA		+*						
grisea (FIEBER)	+		+!		+	+	+	+
guttatostriata LUNDBLAD			+!		+			
haliploides HORVATH	+		+		+	+	+	
hummeli LUNDBLAD								+
jaczewskii WROBLEWSKI			!w		+			
johorensis FERANDO						+*		
khasiensis HUTCHINSON	+				+			
ludibunda								
ssp. *ludibunda* BREDDIN	+		+		+	+		
ssp. *langkana* WROBLEWSKI			!w					
ssp. *malayana* LEONG						+*		
orientalis WROBLEWSKI								+
pocsi WROBLEWSKI						+*		
quadristrigata BREDDIN	+		+!		+	+	+	+
sahlbergi (JAKOVLEV)								+
scutellaris (STÅL)	+	+	+!		+	+		+
sedula HORVATH					+			+
siva (KIRKALDY)	+	+	!w		+		+	+
tarsalis L. CHEN					+			
waltoniana HUTCHINSON	+*							
Synaptonecta								
issa LUNDBLAD	+	+	!w		+	+		

Acknowledgement: Thanks are due to Dr. P.P. Chen for preparation of Figure 1.

References

MAHNER, M. 1993: Systema Cryptoceratorum Phylogeneticum (Insecta, Heteroptera). Zoologica 143: 1-302.

NIESER, N. 1975: The water bugs (Heteroptera: Nepomorpha) of the Guyana Region. Studies on the fauna of Suriname and other Guyanas 16: 1-308.

WROBLEWSKI, A. 1968: Notes on Oriental Micronectinae (Heteroptera, Corixidae). Polske Pismo Entomologiczne 38: 753-779.

WROBLEWSKI, A. 1972: Further notes on Micronectinae from Ceylon (Heteroptera, Corixidae). Polske Pismo Entomologiczne 42: 1-52, pls. 1-3.

Author's address: Dr. Nico Nieser, Htg. Eduardstr. 16, NL-4001 RG Tiel, The Netherlands
e-mail: iftang.01@net.HCC.nl

Communications:

Material requests (Miridae):

For my study on Cylapinae (Miridae) of Thailand I would like to borrow representatives of this subfamily from Oriental Region from any collections.

Jacek Gorczyca
Dept. Zoology, Silesian University
Bankowa 9, 40-007 Katovice, POLAND
(e-mail: gorczyca@us.edu.pl)

Short Notes:

Addition to the key to the genera of Helotrephidae (Nepomorpha) by ZETTEL (1999, Amemboa 2):

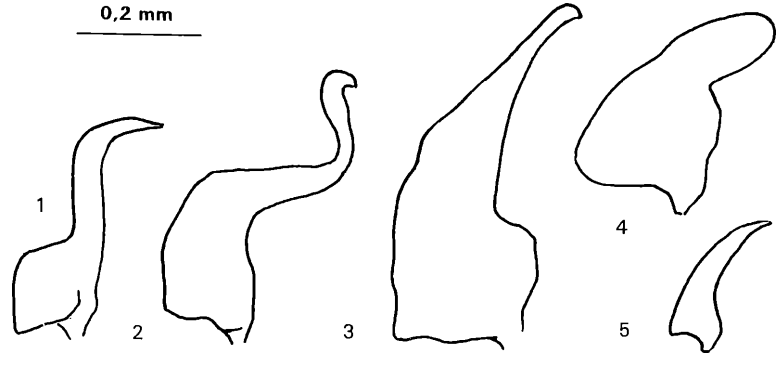
Very recently an undescribed species of the genus *Limnotrephes* ESAKI & CHINA, 1928, was discovered in North Thailand by Dr. Damir Kovac, Senckenberg Museum, Frankfurt am Main, Germany. *Limnotrephes* is externally very similar to *Idiotrephes* and *Tiphotrephes*, both widely distributed and abundant in Thailand. The relatively diverse (polyphyletic?) genus was formerly known only from South Africa and from the Indian subregion (Northwest and South India, Nepal). Its presence in Southeast Asia appeared unlikely, and therefore *Limnotrephes* was not treated in the key to genera by ZETTEL (1998). To include *Limnotrephes*, key couplet 6 has to be changed as follows:

6 Lateral margin of cephalonotum not extending onto eye surface, only indistinctly indenting the eye at posterior margin (ZETTEL 1998: fig. 11); male left paramere distally with distinct bent (Fig. 1); subgenital plate of female nearly symmetrical, with two narrow incisions laterally of a middle lobe (ZETTEL 1998: fig. 14); predominately hindwing-macropterous; body in both morphs highly domed ..... ***Tiphotrephes*** **ESAKI & CHINA**

Lateral margin of cephalonotum clearly extending onto eye surface, deeply indenting the eye (ZETTEL 1998: fig. 10); male left paramere (Figs. 2 - 5) and female subgenital plate different; brachypterous morph less domed..... **7**

7 Left paramere similar as in Figure 2; female subgenital plate (often very) asymmetrical, with more (ZETTEL 1998: fig. 13) or less deep dextrocaudal incision and usually with distinct dextrocaudal break..... ***Idiotrephes*** **LUNDBLAD**

Left paramere relatively simple, lobe-shaped, narrow triangular, or reduced (Figs. 3 - 5); female subgenital plate subsymmetrical, simple, without incision or break.....
Limnotrephes **ESAKI & CHINA**



Figs. 1 4: Left parameres of (1) *Tiphotrephes indicus* (DISTANT 1910), (2) *Idiotrephes* sp. (undescribed species from Thailand), (3) *Limnotrephes kumaonis* POLHEMUS, 1990 (male from Nepal), (4) *L. campbelli* ESAKI & CHINA, 1928 (from India), and (5) *L. minutissimus* ZETTEL, 1997 (from South India).

References:

ZETTEL, H. 1998: Introduction to the Helotrephidae (Nepomorpha) in Thailand and adjacent countries. - Amemboa 2: 15-18.

Herbert Zettel
Entomological Department
Naturhistorisches Museum Wien
Burgring 7, A-1014 Vienna, Austria
e-mail: herbert.zettel@nhm-wien.ac.at

Introduction to the Leptopodomorpha of Thailand and adjacent countries

by John T. Polhemus & Dan A. Polhemus

Abstract: Illustrated keys are provided for the three families and nine genera of Leptopodomorpha occurring in Thailand and adjacent countries. Notes on the genera and their habitat preferences are given, and a list of genera and species now known from the region. The following taxa are recorded from Thailand for the first time: *Leotichius* DISTANT, 1904 (probably undescribed species), *Valleriola javanica* DRAKE & HOTTES, 1951 (Leptopodidae), and *Saldoida armata* HORVATH, 1911 (Saldidae).

The infraorder Leptopodomorpha is comprised of four families of small insects that are mostly associated with the littoral habitat, although the habitat range is quite diverse, from intertidal rocks to strictly xeric. Three of these families and nine genera are known to occur in or near Thailand, but the shore bug fauna of the region is certainly much richer than now known. One genus of Saldidae of uncertain taxonomy, which was rarely collected in the mountains of North Thailand, is not considered in this study. Most species live in habitats that are cryptic or quite restricted, and others are difficult to catch, thus they are rarely collected except by specialists.

A world overview was given by POLHEMUS (1985). Catalogues are available for the world (SCHUH, GALIL & POLHEMUS 1987) and the Palearctic Region (LINDSKOG 1995), the latter with important nomenclatural information for the Asian fauna. A key to the genera of the Leptopodini may be found in POLHEMUS & POLHEMUS (1991). A detailed discussion of the species groups and morphology of the genus *Saldula* (Saldidae) is given in LINDSKOG & POLHEMUS (1992). Most Leptopodidae and some Saldidae possess stridulatory mechanisms (PERICART & POLHEMUS 1990, POLHEMUS 1985).

Notes on the genera and their habitat preferences are given, and a list of genera and species now known from the region, with their distribution.

Key to families and genera of Leptopodomorpha

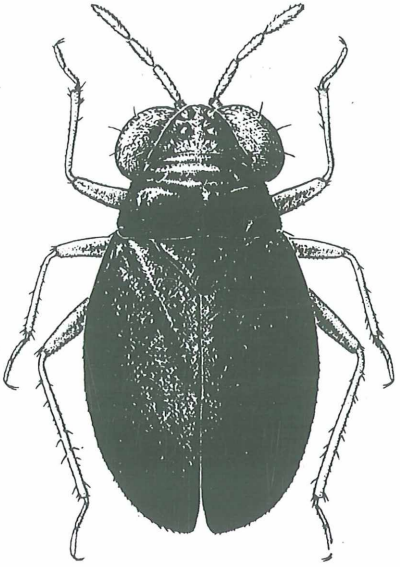
1 Small, body length less than 2 mm; hemelytra without membrane, coleopteroid; antennal segments short, of similar diameter (Fig. 1) (Family **Omaniidae**) ***Corallocoris***

Larger, body length at least 2.2 mm; ant-mimetic, with prominent horn-like structures on pronotum (Figs. 8a, b), or hemelytra with well developed membrane having 3, 4 or 5 cells, overlapping distally; antennae long, or distal segments much more slender than basal segments (Figs. 2, 5, 8a). **2**

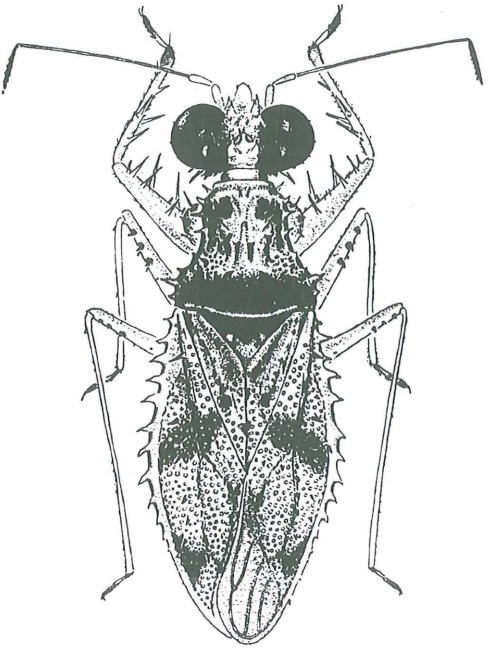
2 Eyes very large; antennal segment two thicker and shorter than distal segments (Figs. 2 - 4). (Family **Leptopodidae:** Subfamily **Leptopodinae**) **3**

Eyes exserted but smaller; second and distal antennal segments of roughly similar diameter (Figs. 5, 8a). (Family **Saldidae**) **5**

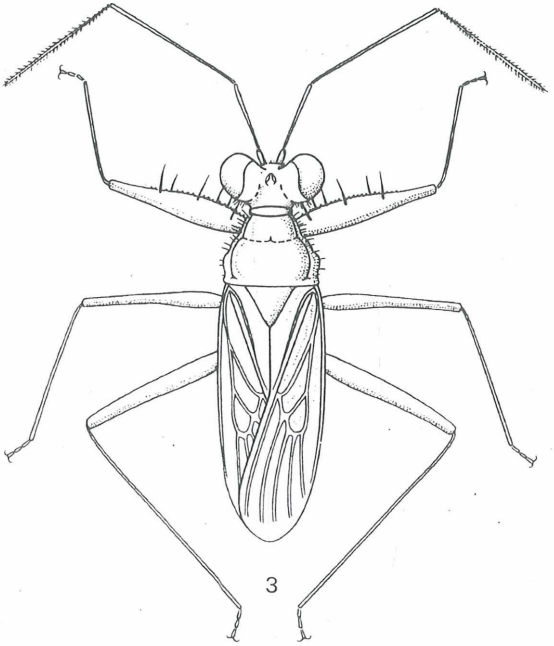
Figs. 1 - 4: Habitus of (1) *Corallocoris marksae*, (2) *Patapius* (*Pseudopatapius*) *thaiensis*, (3) *Valleriola* sp., and (4) *Leotichius* sp.



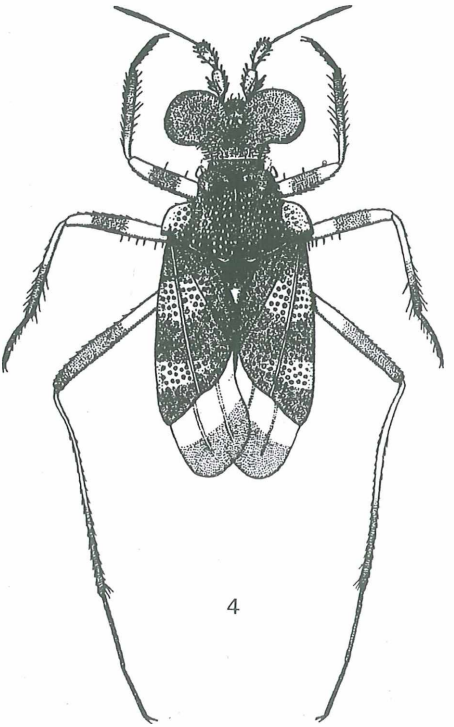
1



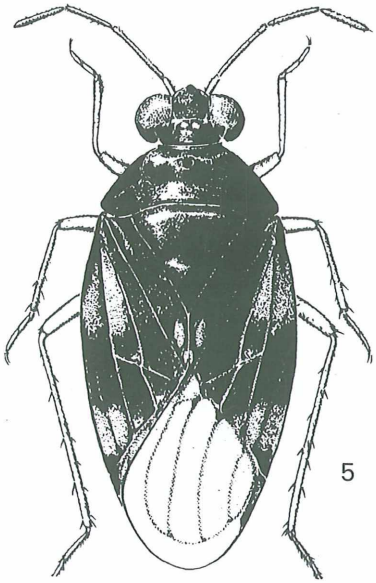
2



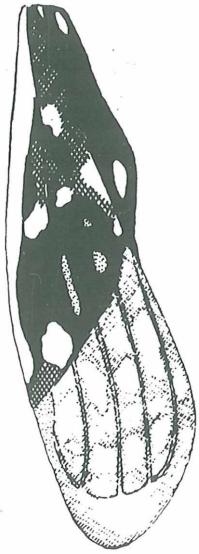
3



4



5

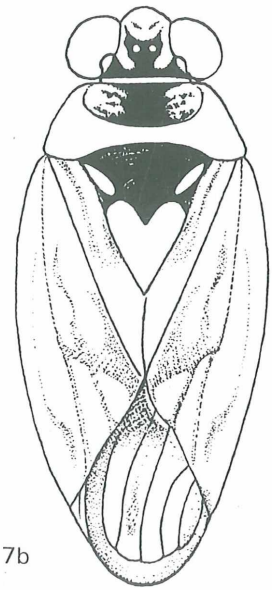


6

Figs. 5 - 6: (6) *Saldula* sp., habitus; (7) *Saldula thailandana*, left hemelytron.

Figs. 7a, b: *Pentacora* sp., habitus, legs not shown.

7a

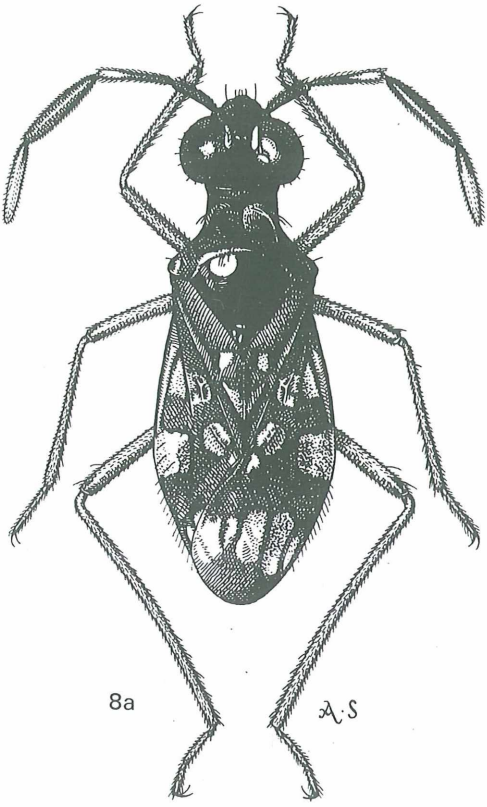


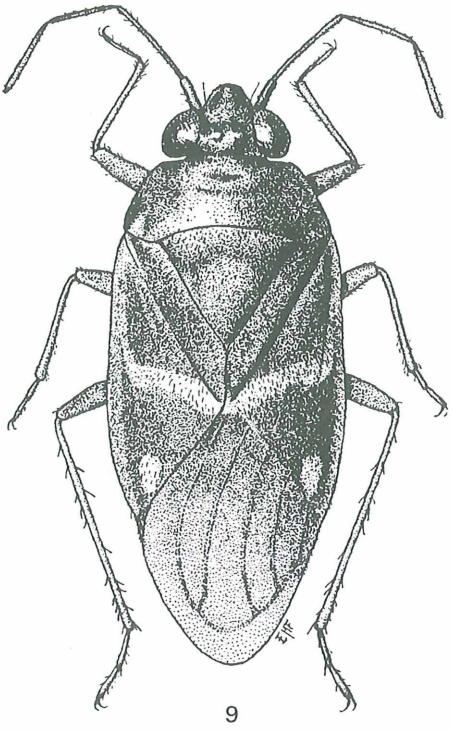
7b

3 Eyes dorsally chitinous, opaque and nonfunctional (Fig. 4). (Tribe Leotichiini).. ..... ***Leotichius***

\- Eyes dorsally normal, set with ommatidia, functional. (Tribe Leptopodini)..... 4

4 Hemelytral margins, pronotum, and head heavily spinose (Fig. 2)..... ..... ***Patapius* (*Pseudopatapius*)**





8b

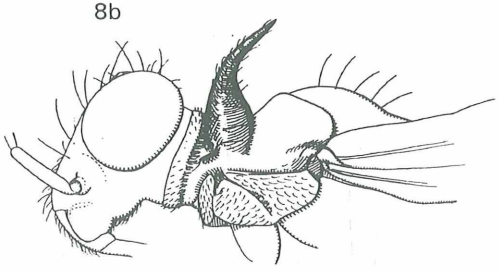


Fig. 8 - 9: (8) *Saldoida armata*, (a) habitus, (b) head and thorax, lateral view; (9) *Salduncula* sp., habitus.

- Hemelytral margin, pronotum, and head not heavily spinose. (Fig. 3)..... ***Valleriola***

5 Hemelytral membrane with five closed cells. (Fig. 7) (Subfamily **Chiloxantinae**)..... ***Pentacora***

- Hemelytral membrane with four closed cells. (Subfamily **Saldinae**)..... 6

6 Pronotum short, quadrate (Fig. 9). (Tribe Salduncullini)..... ***Salduncula***

- Pronotum longer, tapering anteriorly (Fig. 5). (Tribe Saldoidini)..... 7

7 Pronotum strongly narrowed anteriorly, with a pair of dorsal outgrowths (Figs. 8a, b). ***Saldoida***

Pronotum not strongly narrowed anteriorly, without outgrowths (Fig. 5)..... ***Saldula* + *Micracanthia***

Note: The genera *Saldula* and *Micracanthia* are separated by minute differences in the deep structures of the male genitalia, as described by P. Lindskog in LINDSKOG & POLHEMUS (1992); thus they are treated together here.

List of Leptopodomorpha of Southeast Asia, with distribution of species

New country or island records, marked with an asterisk (*), are based on material in the J. T. Polhemus Collection (if not marked) or Bishop Museum (BPBM).

LEPTOPODIDAE

***Leotichius* DISTANT, 1904**

Leotichius glaucopis DISTANT, 1904	Myanmar (Burma)
Leotichius speluncarum CHINA, 1941	West Malaysia
Leotichius sp.	Thailand (leg. Burckhardt, Geneva Museum)

***Patapius* (*Pseudopatapius*) DRAKE & HOBERLANDT, 1951**

Patapius (*Ps.*) *thaiensis* COBBEN, 1968	Thailand

***Valleriola* DISTANT, 1904**

Valleriola javanica DRAKE & HOTTES, 1951	Hong Kong*, Java, Myanmar (Burma)*, Thailand*, West Malaysia*
Valleriola sp.n.	Myanmar (Burma)*, Thailand*

OMANIIDAE

***Corallocoris* COBBEN, 1970**

Corallocoris marksae (WOODWARD, 1958)	Australia, Kwajelein*, New Caledonia, Philippines (Luzon), Samoa, Singapore

SALDIDAE

***Pentacora* REUTER, 1912**

Pentacora malayensis (DOVER, 1929)	Pakistan, West Malaysia

***Salduncula* BROWN, 1954**

Salduncula murphyi J. POLHEMUS, 1991	Singapore

***Saldoida* OSBORN, 1901**

Saldoida armata HORVATH, 1911	Australia, China, East Malaysia (Sabah*), India, Indonesia (Ambon*, Bali*, East Kalimantan*, Irian Jaya*, Java, Sulawesi*, Sumbawa*), Japan, Papua New Guinea*, Philippines (Luzon, Palawan*), Singapore*, Taiwan, Thailand*, West Malaysia*

***Saldula* VAN DUZEE, 1914 + *Micracanthia* REUTER, 1912**

Micracanthia ornatula (REUTER, 1881)	Africa, Australia, China, East Malaysia, India, Indonesia, Laos, Myanmar (Burma), Oman, Papua New Guinea*, Philippines, Saudi Arabia, Taiwan, Thailand*, Vietnam.
Saldula bengali COBBEN, 1986	India (Bengal), Nepal*, Vietnam*
Saldula niveolimbata (REUTER, 1900)	Africa, Laos*(BPBM), Seychelles, Vietnam, West Malaysia* (BPBM)
Saldula recticollis (HORVATH, 1899)	China, Japan, Russia (Far East), South Korea, Vietnam (south)*
Saldula sonneveldti BLÖTE, 1947	East Malaysia (Sarawak*), Indonesia (Sulawesi), West Malaysia*
Saldula thailandana COBBEN, 1986	Hong Kong*, Myanmar (Burma)*, Thailand, Vietnam*, West Malaysia*

Notes on the habits and habitats of the Southeast Asian genera

LEPTOPODIDAE

***Leotichius*:** Three described species are known, from Burma, West Malaysia and Bali (POLHEMUS & SCHUH 1995). One unnamed, probably undescribed, species is known from Thailand. These insects live on completely dry, sheltered earth in conjunction with ant lion larvae. The Malaysian species was found in a cave entrance, the Balinese species on dry powdery earth under multiple temple roofs.

***Patapius* (*Pseudopatapius*):** One species, *Patapius thaiensis*, is the only known Asian species of this subgenus, which has four additional species distributed across Africa (DRAKE & HOBERLANDT, 1951). As far as now known, all species are xerophilous on rocks or logs.

Valleriola: Of the many species known from Asia, two are known from Thailand, *Valleriola javanica* and one undescribed species. Members of this tropical genus, distributed from Africa and Madagascar to the southwestern Pacific islands, live on dry vertical or undercut rock surfaces, usually the shaded sides of large boulders in or near streams, but also concrete bridge pylons or dam faces.

OMANIIDAE

Corallocoris: Five species are widely distributed across the tropical western Pacific and Indian Oceans. One widespread species, *Corallocoris marksae*, is known from Singapore, where it lives on intertidal rocks in the upper tidal zone, secreting itself in crevices or small holes until low tide, then emerging to search for small prey. It can be expected along the rocky seashores of Thailand.

SALDIDAE

Micracanthia: One species of this cosmopolitan genus is found in Thailand, *Micracanthia ornatula*. This species is found on muddy shores of ponds and streams, and commonly comes to light. It is very common and widespread in the Old World tropics.

Pentacora: *Pentacora malayensis*, the only known Southeast Asian species of this genus, has been found just south of the Thai border in Kelantan, Malaysia. Most species of this cosmopolitan genus are salt tolerant, usually found in salt marshes, or muddy seashores.

Saldoida: One widely distributed Asian species, *Saldoida armata*, is known from Singapore and West Malaysia, and has recently been recognized from Thailand. Found on damp sandy soils, sparsely vegetated stream banks, steep rock surfaces near waterfalls, and occasionally saline habitats.

Saldula: Five species of this cosmopolitan genus are found in southeast Asia. Only *Saldula thailandana* has so far been found in Thailand, where it is restricted to steep rock surfaces near streams or waterfalls. *Saldula sonneveldti* is known from a tidal estuary just south of the Thai border in Kelantan, West Malaysia; this species seems restricted to mixohaline seashore habitats with sparse vegetation. The other species are found on shores of streams, lakes or ponds, seep springs, or hygropetric habitats.

Salduncula: One species, *Salduncula murphyi*, is known from Singapore, and should be found along the sea coasts of Thailand. All species of this genus are strictly intertidal, on large rocks in the high tide zone; during low tide they intermittently emerge, and move from crevice to crevice.

References and Bibliography

COBBEN, R.H. 1986: New shorebugs from the Solomon Islands, Thailand, India and South America (Heteroptera, Saldidae). - Annales de la Societe Entomologique de France 22: 223-233.

COBBEN, R.H. 1968b: A new species of Leptopodidae from Thailand (Hemiptera-Heteroptera). Pacific Insects 10: 529—533.

COBBEN, R.H. 1970: Morphology and taxonomy of intertidal dwarfbugs (Heteroptera: Omaniidae fam. nov.). - Tijdschrift voor Entomologie 113: 61-90.

DRAKE, C.J. & CHAPMAN, H.C. 1958: The subfamily Saldoidinae (Hemiptera: Saldidae). Annals of the Entomological Society of America 51: 480-485.

DRAKE, C.J. & HOBERLANDT, L. 1951: New Leptopodidae (Hemiptera-Heteroptera) from Angola, Portuguese West Africa. - Pubicáoes Culturais da Companhia de Diamantes de Angola 11: 7-16.

LINDSKOG, P. 1995: Infraorder Leptopodomorpha, pp. 115-141. In AUKEMA, B. & RIEGER, C., eds., Catalogue of the Heteroptera of the Palearctic Region. Netherlands Entomological Society, Amsterdam, xxvi + 222 pp.

LINDSKOG, P. & POLHEMUS, J.T. 1992. Taxonomy of *Saldula*: revised genus and species group definitions, and a new species of the *pallipes* group from Tunisia (Heteroptera: Saldidae). - Entomologica scandinavica 22: 63-88.

PERICART, J. & POLHEMUS, J.T. 1990: Un appareil stridulatoire chez les Leptopodidae de l'Ancein Monde (Heteroptera). - Annales de la Societe Entomologique de France 26: 9-17.

POLHEMUS, J.T. 1985: Shorebugs (Heteroptera: Hemiptera; Saldidae). A world overview and taxonomy of Middle American forms. - The Different Drummer, Englewood, Colorado, v +252 pp.

POLHEMUS, J.T. 1991: Three new species of *Salduncula* BROWN from the Malay Archipelago, with a key to the known species (Heteroptera: Saldidae). - Raffles Bulletin of Zoology 39: 153-160.

POLHEMUS, J.T. & POLHEMUS, D.A. 1991: A revision of the Leptopodomorpha (Heteroptera) of Madagascar and nearby Indian Ocean Islands. - Journal of the New York Entomological Society 99: 496-526.

POLHEMUS, J.T. & SCHUH, R.T. 1995: A new species of *Leotichius* from Bali, with notes on immature stages and habitat (Heteroptera, Leptopodidae). - Journal of the New York Entomological Society 102: 367-373.

SCHUH, R.T., GALIL, B. & POLHEMUS, J.T. 1987: Catalog and bibliography of Leptopodomorpha (Heteroptera). - Bulletin of the American Museum of Natural History 185 (3): 243-406.

Authors' adresses:

Dr. John T. Polhemus, Colorado Entomological Museum, 3115 S. York St., Englewood, Colorado, USA 80110 - e-mail: polhemus@stripe.colorado.edu

Dr. Dan A. Polhemus, Dept. of Entomology, MRC 105, National Museum of Natural History, Smithsonian Institution, Washington, D. C. USA 20560
e-mail: bugman@bishop.bishop.hawaii.org

An illustrated key to the genera of Hebridae (Gerromorpha) in Thailand

by Herbert Zettel

Abstract: Five genera of the family Hebridae are known from Thailand. An illustrated key is presented and notes on the habitat preferences are given.

Introduction

Hebrids (Velvet Water Bugs) are very small insects, which live predominantly or obligatorily predacious. Hebridae is a basic family of the suborder Gerromorpha ("Semiaquatic Bugs"), but most species inhabit terrestrial habitats or the extreme edge of the water. Only a few species live steadily at the water surface, and a few are even subaquatic.

The morphology and systematics of Hebridae have been excellently treated by ANDERSEN (1981, 1982). Since then, only one genus, *Nieserius* ZETTEL, 1999, has been added. In Thailand the family is represented by five genera in two subfamilies: *Hyrcanus* DISTANT, 1910, and *Nieserius* of the exclusively Oriental Hyrcaninae, which was recently revised by the author (ZETTEL 1998, 1999a); and *Hebrus* CURTIS, 1833, *Merragata* BUCHANAN-WHITE, 1877, and *Timasius* DISTANT, 1909, of the Hebrinae.

Hebridae can be easily distinguished from other Thai Gerromorpha by using the key by CHEN & ZETTEL (1996).

Key to the genera of Hebridae in Thailand

(modified after ANDERSEN 1981, 1982)

1 Antenna distinctly shorter than greatest width of pronotum; antennal segments stout, segment 4 without desclerotized zone, antenna therefore clearly 4-segmented (Figs. 1 - 3) **2**

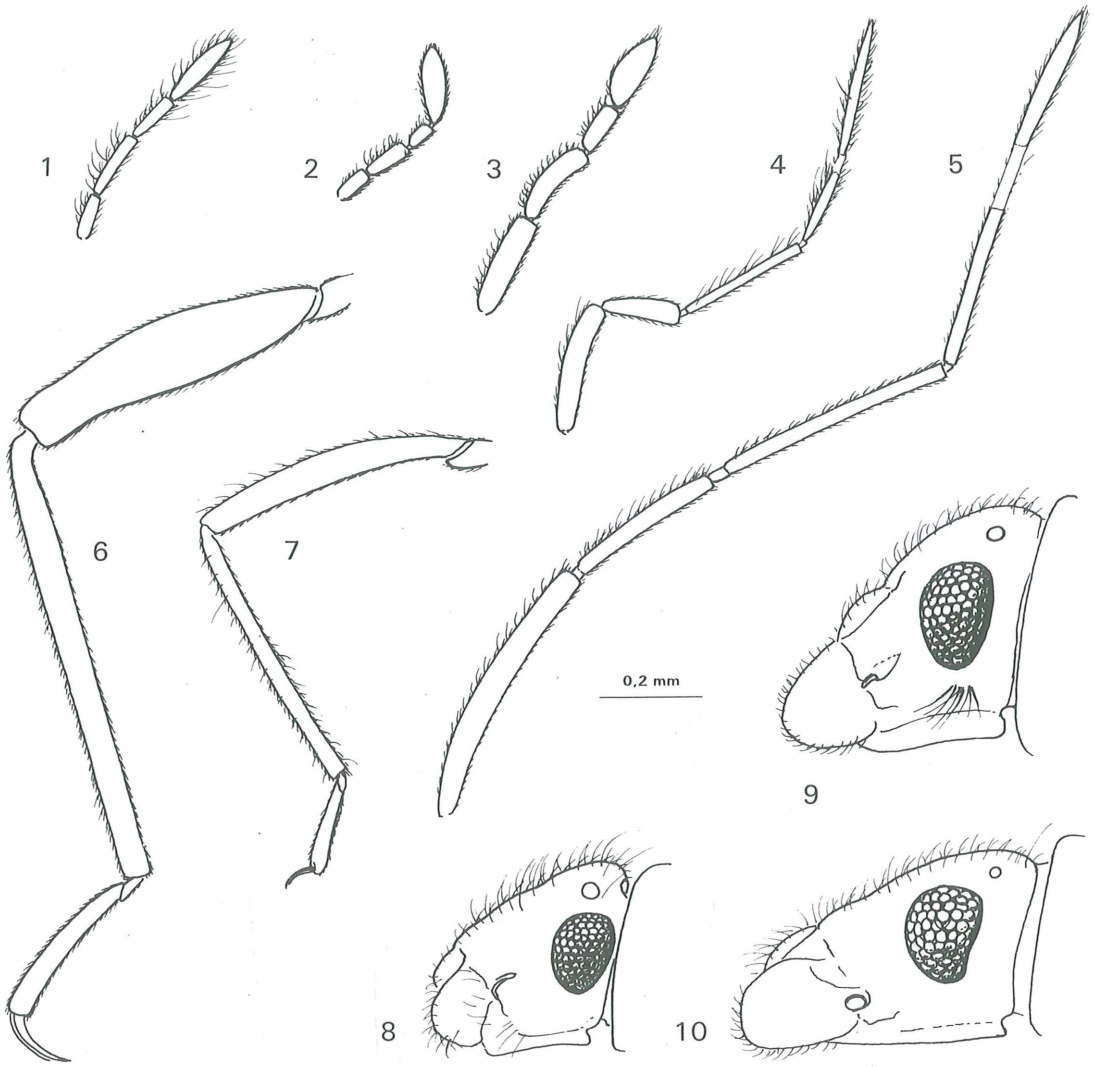
Antenna at least subequal in length to greatest width of pronotum; antennal segments slender; last segment (4th!) more or less clearly divided by a desclerotized zone, antenna therefore appearing 5-segmented (Figs. 4, 5) **4**

2 Middle sized to large species (body length more than 2.1 mm); head longer, narrow and pointed (Figs. 9, 10); eyes sessile; corium of forewing dark; antenna relatively stout (Figs. 2, 3); femora stout (Fig. 6) **3**

Very small species (body length less than 1.8 mm); head short and broad; eyes pedunculate, situated close to antero-lateral margin of pronotum (Fig. 8); antenna slender (Fig. 1); corium of forewing with white patch; femora slender (Fig. 7). ***Merragata***

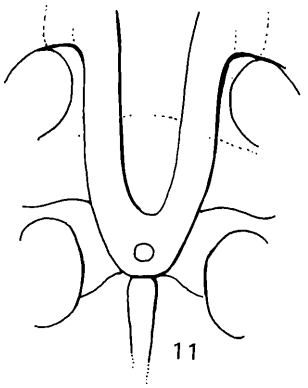
One species, *Merragata pallescens* DISTANT, 1909, is known from Thailand. It inhabits the edges of large stagnant waters (see ZETTEL 1999b).

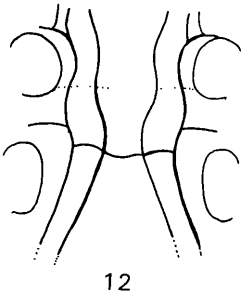
3 Antennal segment 1 shorter than segments 2 and 4 (Fig. 2); eye far removed from the pronotum, distance between eye and antero-lateral margin of the pronotum more than 0.4 times width of eye (Fig. 10); head below eyes with-



Figs. 1 - 10: (1 - 5) antenna of (1) *Merragata pallescens*, (2) *Nieserius subaquaticus*, (3) *Hyrcanus draculus*, (4) *Hebrus cruciatus*, (5) *Timasius miyamotoi*; (6, 7) hind leg of (6) *Nieserius subaquaticus* and (7) *Merragata pallescens*; (8 - 10) head, lateral view, of (8) *Merragata pallescens*, (9) *Hyrcanus draculus*, and (10) *Nieserius subaquaticus*.

out conspicious long bristles, only with some relatively short hairs; legs slender, mesofemur less than 3.7 times as long as broad (Fig. 6); brachypterous or macropterous ..... ***Nieserius***





Figs. 11 12: Meso- and metasternum and base of abdomen, schematically, in (11) *Timasius* and (12) *Hebrus*.

One species is known from North Thailand. The biology of *Nieserius* differs from that of all other Hebridae: *Nieserius* lives subaquatically on the fine sediments of smaller streams and brooks (ZETTEL 1999a).

Antennal segment 1 longer than segment 2 and subequal to segment 4 (Fig. 3); eye relatively close to pronotum, distance between eyes and antero-lateral margin of the pronotum clearly less than 0.4 times width of eye; Head below eyes with a tuft of conspicious long bristles (Fig. 9); legs stout, mesofemur more than 3.5 times as long as broad; always macropterous..... ***Hyrcanus***

Four species are so far known from Thailand, two of which seem to be endemic. *Hyrcanus* species inhabit places associated with brooks, streams, and rivers, either hygropetric (especially in mosses) or semiaquatic between leaf litter at the edge or even in the middle of streams. Probably some species go into the water, too (ZETTEL 1998).

4 Paired, longitudinal carinae of thoracic venter converging and meeting before hind margin of metasternum (Fig. 11) ***Timasius***

Only two species are reported from Thailand, but in fact the number of species is much higher. Two species groups, the *T. livens* group and the *T. chinai* group (see ANDERSEN 1981), form complexes of allopatric species with high radiation in the Indo-Chinese area. *Timasius* species are typically found hygropetric on wet, shaddy rock faces at the edge of running waters.

Paired, longitudinal carinae of thoracic venter parallel throughout and continuing separately onto the base of abdomen (Fig. 12)..... ***Hebrus***

The Oriental species of the genus *Hebrus* are unrevised. Many, mostly unnamed, species are known from Thailand. Nearly all Oriental *Hebrus* species are hygropetric (often on mosses) or ripicolous, but a few species are also found at the edge of the surface of stagnant waters. Specimens of *Hebrus cruciatus* DISTANT were found under large stones on a river bank in Mindanao, Philippines, where they found shelter from the heat at noon; this species occurs also in Thailand.

Check-list of Hebridae species known from Southeast Asia

NHMW = Natural History Museum Vienna

Subfamily Hyrcaninae

Hyrcanus chenae ZETTEL, 1998	China (Yunnan)
Hyrcanus draculus ZETTEL, 1998	Thailand (Chiang Mai, Mae Hong Son), North Laos, South China
Hyrcanus saxatilis ANDERSEN, 1981	Thailand (Chiang Mai)
Hyrcanus shepardi ZETTEL, 1998	Thailand (Phetchabun)
Hyrcanus varicolor ANDERSEN, 1981	Thailand (widespread), Viet Nam, Indonesia (Sumatra, Java)
Nieserius subaquaticus ZETTEL, 1999	Thailand (Chiang Mai, Mae Hong Son)
Nieserius brachypterus ZETTEL, 1999	North Laos

Subfamily Hebrinae

Merragata pallescens (DISTANT, 1909)	India, Thailand, Java (see ZETTEL 1999b)
Timasius livens ANDERSEN, 1981	Thailand (Chiang Mai)
Timasius miyamotoi ANDERSEN, 1981	Thailand (Chiang Mai)

Timasius spp. (several undescribed species from Thailand in NHMW)

Hebrus cruciatus (DISTANT, 1910)	Philippines, Thailand (Chiang Mai, NHMW)
Hebrus nereis POLHEMUS & POLHEMUS, 1989	Thailand (Andersen, unpubl. list), Singapore

Hebrus spp. (numerous undescribed species from Thailand in NHMW)

Acknowledgements: My thanks are due to all colleagues who supported this study by sending material for study, especially to N. Nieser (Tiel) and to W.D. Shepard (Sacramento); and to my friends in Thailand, who helped me so much during my field studies.

References

ANDERSEN, N.M. 1981: Semiaquatic bugs: phylogeny and classification of the Hebridae (Heteroptera: Gerromorpha) with a revision of *Timasius*, *Neotimasius* and *Hyrcanus*. Systematic Entomology 6: 377-412.

ANDERSEN, N.M. 1982: The Semiaquatic Bugs (Hemiptera, Gerromorpha). Phylogeny, adaptations, Biogeography and Classification - Entomonograph 3: 1-455.

CHEN, P.P. & ZETTEL, H. 1996: An illustrated key to the families of Gerromorpha in Thailand. Amemboa 1: 10-13.

ZETTEL, H. 1998: Eine taxonomische Revision der Gattung *Hyrcanus* DISTANT 1910 (Heteroptera: Hebridae) mit Neubeschreibungen von vier Arten aus Indien, Thailand, Laos und China. Stapfia 55: 585-606.

ZETTEL, H. 1999a: *Nieserius* gen.n., a new genus of the subfamily Hyrcaninae (Heteroptera: Hebridae) from Thailand, Laos, and Nepal, with the first known subaquatic species of Gerromorpha. - Aquatic Insects 21(1): 39-52.

ZETTEL, H. 1999b: The genus *Merragata* BUCHANAN-WHITE, 1877 (Gerromorpha: Hebridae) in Thailand. - Amemboa 3: 6-8.

Author's address: Dr. Herbert Zettel, Naturhistorisches Museum Wien, 2. Zoologische Abteilung, Burgring 7, A-1014 Vienna, Austria (e-mail: herbert.zettel@nhm-wien.ac.at)

Opinion:

Owners of the Bugs

Roam a meadow and enjoy nature. Observe the thousands of buzzing, creeping and swarming insects and think: Who is their owner?

This crazy thought has a real background. In our materialistic world everything (and everybody? see discussion on genetic "resources" of ethnic minorities) *has* to be owned. Since the agreement in the "Convention of Biodiversity" wild animals (including protozoes, worms, and insects), plants, and even microbes are owned by the states, who own the rights to self-controlled exploitation. The "common heritage principle" (in my opinion even this term is worth discussion) was replaced by the "common concern principle". Respect for nature is obviously not even considered.
It is not only a Christian attitude, than men subject Mother Earth. In most "civilizations" nature is owned by somebody; those creatures which are not owned by a person or a company are owned by the state. Ecological movements did not reduce this trend, but even enforced it involuntarily. Ecologists said, "be responsible for our nature", but politicians heard only "our nature": they made laws stating that wildlife (more modern: its genetic "resources") belongs to the country, which must be a little responsible for it ("... not too much, please, respect economic needs!"), but can use it as it likes. Biodiversity projects were (and still are) justified by (often not existing) follow-up research on usage of yet undiscovered species (in medical plants, etc.). Politicians heard "usage" and made laws to regulate this possible use in advance.
One of the disastrous consequences of the "Convention of Biodiversity" will be a quickly growing administration and regulation of biodiversity research (especially concerning export regulations), which may result even in a de facto end to international cooperation. Consequently, nature destruction may overtake biodiversity research, especially in those tropical countries where scientific cooperation is essential for well-founded nature protection.

Be sure: *It's good for the economy!*

Herbert Zettel
Entomological Department
Naturhistorisches Museum Wien
Burgring 7, A-1014 Vienna, Austria
e-mail: herbert.zettel@nhm-wien.ac.at

P.S.: Yesterday, at a newspaper kiosk, I read a headline in a popular journal: "Biodiversity: There are at least 13 million living creatures. - Who really needs them all?"

Imprint: "*Amemboa*" is a newsletter for taxonomical, systematical, and faunistical co-operative works on Thai Heteroptera. Editor: Dr. Herbert Zettel, Naturhistorisches Museum Wien, 2. Zoologische Abteilung, Burgring 7, A-1014 Vienna, Austria. Proof reading: Prof. Dr. C. W. Schaefer, Storrs, USA. Published by Naturhistorisches Museum Wien.

Contents

Scientific papers

Communications, Short Notes, Opinions