

## HEBRUS MURPHYI, NEW SPECIES (HETEROPTERA: HEBRIDAE) FROM AN INTERTIDAL MANGROVE HABITAT IN BURIAS ISLAND, PHILIPPINES

Herbert Zettel

Natural History Museum Vienna, International Research Institute of Entomology, Burgring 7, A-1014 Vienna, Austria  
Email: herbert.zettel@nhm-wien.ac.at

**ABSTRACT.** – *Hebrus murphyi*, new species, from Burias Island, Philippines, is described. It is closely related to *H. nereis* Polhemus & Polhemus, 1989, and *H. mangrovensis* Polhemus & Polhemus, 1989, and – like these species – inhabits the intertidal zone of mangroves. *Hebrus murphyi* is only known in the apterous morph, which is very rarely encountered in Hebridae. *Hebrus murphyi* is the first known species of Hebridae, which lacks a metanotal elevation (in this morph).

**KEY WORDS.** – *Hebrus*, new species, mangrove, aptery, metanotal elevation, Burias.

### INTRODUCTION

The genus *Hebrus* Curtis, 1833, has a world-wide distribution. Numerous species live in Southeast Asia, but most of them are still undescribed. Typical habitats of species of *Hebrus* are the transition zones of freshwaters, preferably of streams with stable water level. Two very peculiar species have been described from marine intertidal zones in mangroves from Singapore and southern Thailand earlier (Polhemus & Polhemus, 1989). In 2002, during a research visit to the Raffles Museum of Biodiversity Research, National University of Singapore, Prof. “Paddy” Murphy and Mrs. Yang Chang Man introduced the author to the method of finding these secretive species. One year later, the author discovered the first mangrove inhabiting *Hebrus* from the Philippines during an exploration of Burias Island.

### TAXONOMY

#### *Hebrus murphyi*, new species (Figs. 1-3)

**Material examined.** – Holotype (male, in Museum of Natural History, University of the Philippines, Los Baños, Philippines), labelled “Philippines: Burias, San\ Pasqual, Mabuhay, Taberna 19.2.2003, mangrove\ leg. H. Zettel (341d)”.

Paratypes – 2 males, 1 female, in Natural History Museum, Vienna, Austria, same data as holotype.

**Description.** – Length 1.50 – 1.54 mm (males), 1.52 mm (female); maximum width (at abdominal segment 4) 0.66 – 0.67 mm (males), 0.71 mm (female).

Colour: body black; legs brown, apices of tibiae and whole tarsi yellowish white; antenna brown, antennomere 1 yellowish brown; rostrum yellow, partly infuscated; dorsum of head, thorax, and tergites 1 – 3 with very sparsely set, simple, erect, black setae; following tergites, laterotergites 3 – 7, and sternites 3 – 7 with very dense, decumbent pilosity giving these parts greyish appearance (in male absent in medial part of tergite 7).

Structural characteristics: Head (inclusively ventral lobes) slightly longer (1.1 times) than length of protibia (Fig. 1); eye small, slightly distant from anterolateral margin of pronotum, smallest distance between eyes 3.2 times eye width; ocelli absent; buccula relatively low, with two small round impressions, posteriorly narrowly rounded or nearly acute (Fig. 2); relative lengths of antennomeres 1 – 4 as 1.2 : 1 : 1.9 : 2.5; absolute length of antennomere 2 in holotype: 0.15 mm; rostrum reaching posterior end of metacoxa.

Pronotum with short lobe, with reduced humeri; median length of pronotum 0.55 times head length; pronotum width 3.1 times pronotum length and 1.4 times head width; mesoscutellum inserted in pronotal lobe, small, and indistinctly separated; metanotum appearing as a transverse band, regularly tapering from sides to middle, without elevation, but with low median carina (Fig. 1); legs relatively short and stout; relative lengths of leg segments (male holotype; in relation to length of metatibia = 100 = 0.52 mm in holotype): profemur – 72, protibia – 75, protarsus – 27, mesofemur – 75, mesotibia – 77, mesotarsus – 29, metafemur – 95, metatarsus – 32; femora stout, metafemur slightly more slender than pro- and mesofemur; tarsi, especially on fore- and middle legs, conspicuously short and stout; hind leg of male not modified; wings absent.

Abdomen of ovate shape, maximum width in male 1.05 times, in female 1.15 times width of metathorax; tergites convex; tergites 1 – 3 completely fused, without sutures; sutures between sternites indistinct, partly absent; tergite 1 at base with pair of short carinae; ventral carinae posteriorly terminating in low, blunt elevation at base of abdomen.

Male terminalia: segment 8 small and simple, concealed by segment 7; pygophore small, roundish; proctiger small, distal part nearly circular; paramere small, curved, relatively slender, with long apical hook (Fig. 3).

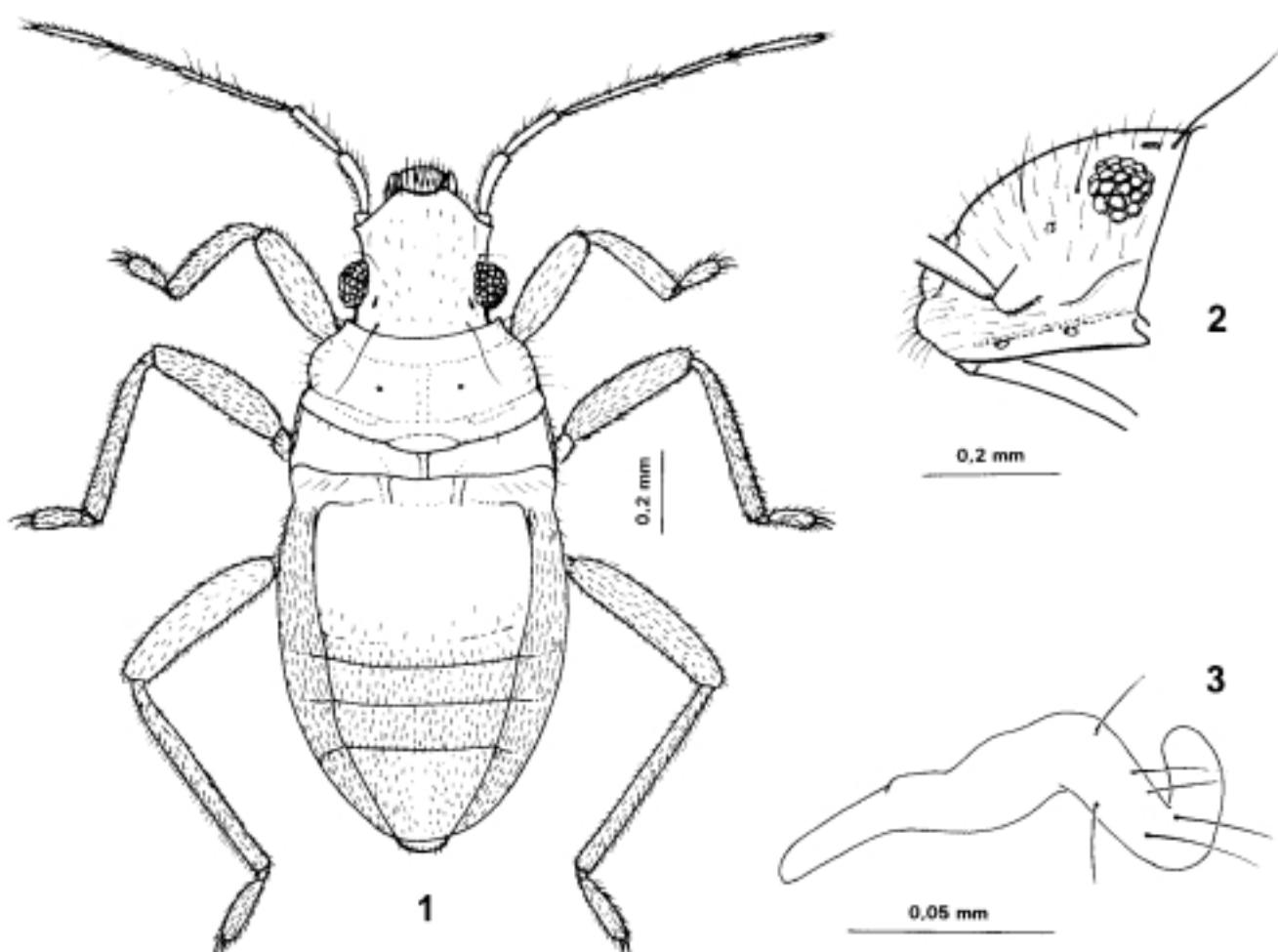
Female terminalia: gonocoxa very large and plate-like, without special modification; proctiger small, knob-like.

**Etymology.** – This species is dedicated to Prof. Dr. D. H. “Paddy” Murphy (National University of Singapore), who discovered the unique Gerromorpha fauna of southeast Asian mangrove swamps.

**Comparative notes and discussion.** – The mangrove inhabiting species *H. nereis*, *H. mangrovensis*, and *H. murphyi* are very similar to each other and seem to form a

monophyletic group. They have a stout, pitch-black body, the head relatively short and wide, the ocelli strongly reduced, no scale-like setae on the thorax, a major part of the abdomen densely set with decumbent black setae, and the tarsi conspicuously thick and short.

*Hebrus nereis* and *H. mangrovensis* live sympatric and syntopic in Singapore and can be mainly distinguished by the development of their forewings – submacropterous in *H. nereis*, micropterous in *H. mangrovensis* – and subsequently in the development of the metanotal elevation, which in *Hebrus* is correlated with wing development. The different shapes of the apices of the parameres prove that they are two distinct species and not only morphs of one species. *Hebrus murphyi* differs from both species in a set of important characteristics: Body length is 1.50 – 1.54 mm in *H. murphyi*, but 1.94 – 2.27 mm in *H. nereis* and 2.05 – 2.34 mm in *H. mangrovensis*. The buccula is posteriorly narrowly rounded or acute in *H. murphyi* (Fig. 2), but truncate or broadly rounded in *H. nereis* and *H. mangrovensis*. The second antennomere of *H. murphyi* is thick and short (Fig. 1) in comparison with antennomere 3, but relatively slender and



Figs. 1-3. *Hebrus murphyi*, new species. 1. Habitus of male, dorsal aspect. 2. Head, lateral aspect. 3. Left paramere of male, lateral aspect.

long in *H. nereis* and *H. mangrovensis*. The apical hook on the paramere of the male of *H. murphyi* (Fig. 3) is distinct from those of the other species.

Most conspicuously, *H. murphyi* is apterous and its metanotal elevation is absent. Andersen (1982: 88) writes that "Most species of the Hebridae are only known in the macropterous form." and "Apterous individuals are very rare in the Hebridae (e.g., found in *Hebrus tuckahoanus* Drake & Chapman) and even here the pronotal lobe is only slightly reduced in length and the metanotal elevation is still recognizable." In *H. murphyi* the pronotal lobe is strongly reduced, and after removing it in one paratype, no wing remnants have been detected on the mesothorax. The absence of the metanotal elevation in *H. murphyi* seems to be unique among Hebridae.

Another important characteristic of the mangrove inhabiting *Hebrus* species is the reduction of the ocelli. The presence of the ocelli is a plesiomorphic, but important distinguishing character of the family Hebridae. Polhemus & Polhemus (1989) state in the descriptions of both species, *H. nereis* and *H. mangrovensis*, that the "ocelli [are] reduced, very small, barely visible at 80 times." The author has examined specimens of *H. nereis*, *H. mangrovensis*, and *H. murphyi* at magnification of 128 times, and could not detect any ocelli-like structure. It can be suspected that in some way the presence of ocelli is related to the flight ability of species, because in Mesoveliidae ocelli are always absent in the apterous adults (Andersen 1982). However, small ocelli are present in some other species of Hebridae, which are usually brachypterous, e.g., in *Nieserius subaquaticus* Zettel, 1999, *N. brachypterus* Zettel, 1999, and *Hebrus hoberlandti* Porter, 1959.

It is likely that additional mangrove inhabiting species of *Hebrus* will be discovered in Southeast Asia, if more attention will be paid to these secretive insects. With more material available, it will be interesting to know whether this species group of *Hebrus* is obligatorily wingless as are all other species of Gerromorpha which live in marine habitats.

**Habitat notes.** – *Hebrus murphyi* has been collected during low tide in a mangrove area at the sitio Taberna in the barangay Mabuhay, municipality of San Pasqual on February 19, 2003. This mangrove still contains some old trees and pieces of dead branches and logs are lying on the ground of the intertidal zone. The first specimen had been detected running on the underside of a such a piece of wood, which was ca. 1 m long and 15 cm in diameter and densely set with holes (which, according to Prof. Murphy, might be important for finding air-filled shelter during high tide), just in the same way as the author was taught to collect *H. nereis* and *H. mangrovensis* in Singapore. After a long period of searching, no further specimen could be found on similar wood pieces.

Later, Allan B. Del Rosario and the author found three specimens on damp earth close to a small puddle; some dead wood was close to this site but did not yield more specimens.

**Distribution.** – Burias Island, Philippines. Although Burias represents a separate subregion of the Philippine fauna (see Ong et al., 2002), only intensive surveys in the mangroves of other islands can prove, that *H. murphyi* is endemic to Burias.

## ACKNOWLEDGEMENTS

The author thanks the following persons: Professors Lourdes B. Cardenas, Victor P. Gapud, Augusto C. Sumalde (all University of the Philippines, Los Baños) for general support to the author to carry out field work in the Philippines; Prof. Raul Ruiz (Camarines Sur State College of Agriculture, Pili) for help in organizing the field trip to Burias, and Allan B. Del Rosario and Santos Santa Ana (both Camarines Sur State College of Agriculture, Pili) for company during this trip and help in collecting; Prof. D. H. "Paddy" Murphy and Mrs. Yang Chang Man (both National University Singapore) for teaching how to collect *Hebrus* in intertidal mangrove habitats.

## LITERATURE CITED

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

Curtis, J., 1833. Characters of some undescribed genera and species, indicated in the "Guide to an Arrangement of British Insects". *Entomological Magazine* 1: 186-199.

Ong, P. S., L. E. Afuang, & R. G. Rosell-Ambal (eds.), 2002. *Philippine Biodiversity Conservation Priorities: A Second Iteration of the National Biodiversity Strategy and Action Plan*. Department of Environment and Natural Resources - Protected Areas and Wildlife Bureau, Conservation International Philippines, Biodiversity Conservation program - University of the Philippines Center for Integrative and Development Studies, and Foundation for the Philippine Environment, Quezon City, Philippines, 113 pp.

Polhemus, J. T. & D. A. Polhemus, 1989. A new mesoveliid genus and two new species of *Hebrus* (Heteroptera: Mesoveliidae, Hebridae) from intertidal habitats in Southeast Asian mangrove swamps. *Raffles Bulletin of Zoology*, 37(1): 73-82.

Porter, T. W., 1959. Three new species of *Hebrus* Curtis from the Philippine Islands (Hemiptera, Hebridae). *Journal of the Kansas Entomological Society*, 32: 31-35.

Zettel, H., 1999. *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.