

## A new species of *Hydrometra* (Insecta: Hemiptera: Heteroptera: Hydrometridae) from New Guinea

H. Zettel\*

### Abstract

*Hydrometra balkei* sp.n. is described from western New Guinea. The new species is known in the apterous morph and closely related with *H. strigosa* (SKUSE, 1893), a species with wide distribution from Australia eastwards till Tahiti.

**Key words:** Heteroptera, Hydrometridae, *Hydrometra*, new species, New Guinea, Indonesia

### Zusammenfassung

*Hydrometra balkei* sp.n. wird aus dem Westteil Neuguineas beschrieben. Die neue Art liegt in der apteren Morphe vor und ist mit *H. strigosa* (SKUSE, 1893) nahe verwandt, welche von Australien ostwärts bis Tahiti weit verbreitet ist.

### Introduction

In New Guinea, the Hydrometridae, or water measurers, are represented only by the genus *Hydrometra* LATREILLE, 1796 (CHEN & al. 2005). Species of *Hydrometra* are easily recognized by their peculiar elongated body including a very long head. They live in the transition zone between land and water surface and feed on dead animals or harmless prey.

The species of *Hydrometra* that occur in Australia, Melanesia and the Southwest Pacific were taxonomically revised by POLHEMUS & LANSBURY (1997); the Australian species were also treated by ANDERSEN & WEIR (2004). Fifteen *Hydrometra* species are known from this area, including seven from New Guinea (POLHEMUS & LANSBURY 1997), i.e., *H. eioana* POLHEMUS & LANSBURY, 1997, *H. horvathi* HUNGERFORD & EVANS, 1934, *H. kiunga* POLHEMUS & LANSBURY, 1997, *H. lineata* ESCHSCHOLTZ, 1822, *H. mindoroensis* POLHEMUS, 1976 (in POLHEMUS & REISEN 1976), *H. orientalis* LUNDBLAD, 1933, and *H. papuana* KIRKALDY, 1901. Only two species, *H. eioana* and *H. kiunga*, are reportedly endemic to New Guinea (POLHEMUS & LANSBURY 1997).

During a revision of the *Hydrometra* collection in the Natural History Museum Vienna, a new species from western New Guinea was recognized.

### Material and methods

The type material of the new species and the examined specimens of *H. strigosa* used for comparison are dry mounted and deposited in the Natural History Museum Vienna.

\* Dr. Herbert Zettel, Natural History Museum, Entomological Department, Burgring 7, 1010 Vienna, Austria (herbert.zettel@nhm-wien.ac.at)

Measurements: Anterior part of head is measured from apex of anteclypeus to anterior eye margin, posterior part from posterior eye margin to anterior margin of pronotum. Lengths of head, thoracic nota and tergites are measured along midline. The term "width" refers to the maximum width of the named structure. Measurements of antennomeres and leg segments are relative with length of antennomere 2 and mesotibia, respectively.

Illustrations: Stacked digital images (Figs. 1–6) were taken with a Leica DFC camera attached to a Leica MZ16 binocular microscope and processed with the help of Leica Application Suite. They were then stacked with ZereneStacker 64-bit and processed with Adobe Photoshop 7.0.

### *Hydrometra balkei* sp.n. (Figs. 1–6)

**Type material:** holotype (apterous male) and paratypes (two apterous females), labelled "INDONESIA, Irian Jaya\ swamp nr. Nabire, Kali\ Bobo, S 3°27' E 135°27' 5m, IV.1998, leg. M. Balke" (NHMW-Hemipt.-Inv.No. 000 012 736–738).

**Diagnosis:** Small species, known in apterous morph (Figs. 1, 2). Anteclypeus (Fig. 3) small, anteriorly acute. Abdomen moderately slender, mediotergites 4–6 distinctly wider than corresponding laterotergites. – Male (Figs. 4, 5): In lateral aspect sternite 7 with straight outline, distinct paired small tufts of black setae anteriorly and indistinct paired patches of pilosity posteriorly. Segment 8 without special modification, apical spine short. – Female (Figs. 2, 6): Abdomen strongly upcurved. Mediotergites 1–6 shiny. Mediotergite 7 matte, with small shiny spot medioanteriorly, posterior margin hardly wider than anterior one. Laterotergites 7 with long standing setae. Tergite 8 with small apical spine.

**Description of apterous male** (holotype): Size: body length: 8.5 mm; head width at eyes 0.40 mm; head length 2.7 mm; body width at metacetabula 0.53 mm; abdomen width 0.43 mm; length of second antennomere 0.9 mm; length of mesotibia 4.4 mm.

Colour (Fig. 1): Chiefly brown. Head blackish brown. Sides of thorax and abdomen with narrow light brown stripe ventrally bordered by dark brown stripe. Thorax dorsally with narrow whitish frosted stripe along midline. Antennae and legs pale brown, coxae and trochanters yellow. Rostrum yellowish.

Structural characteristics: Head (Fig. 1) moderately long, anteriorly thickened, at eyes as wide as at antennal tubercles (1.0 times); anterior part 2.1 times as long as posterior part. Anteclypeus (Fig. 3) small, as long as wide, sides weakly convex, apex pointed, surface smooth. Maxillary plate moderately large, subovate, slightly longer than high. Dorsal minimum distance of eyes 0.7 times eye width in dorsal aspect. Rostrum in resting position almost reaching posterior margin of head. Relative lengths of antennomeres ca. 0.5 : 1 : 2.8 : 2.1. Ventral surface of head with some standing hairs posteriorly, below eyes, and most abundant near apex.

Pronotum length 0.47 times head length; metanotum length 0.35 times head length; pronotum posteriorly with slightly impressed midline holding a few small pits; pits on acetabula large, but scarce (2–4 each). No wing rudiments present. Distance between mes- and metacetabula about twice the distance between pro- and mesacetabula. Relative lengths of leg segments (in relation with mesotibia = 100): profemur – 80, protibia



Fig. 1: Habitus of the holotype of *Hydrometra balkei* sp.n.

– 90, protarsus – 2+8+6, mesofemur – 84, mesotibia – 100, mesotarsus – 2+8+6, metafe-  
mur – 106, metatibia – 132; metatarsus – 2+7+6. Mesotibia length 5.9 times mesotarsus  
length. Second mesotarsomere 1.4 times as long as third.



Figs. 2–6: *Hydrometra balkei* sp.n., holotype (NHMW-Hemipt.-Inv.No. 000 012 736) and paratype female (NHMW-Hemipt.-Inv.No. 000 012 737): (2) Lateral aspect of female. Note absence of wings, pilosity of sternites 6–7, and upcurved abdomen. (3) Anterior portion of head. Note pointed anteclypeus. (4, 5) Abdominal segments 6–7 of male, (4) lateral and (5) ventral aspect. Note on sternite 7 the two groups of setae and the straight ventral outline, and short apical spine of segment 8. (6) Abdominal segments 7–8 of female, dorsal aspect. Note the shape and pilosity of tergite 7 and the short apical spine of tergite 8.

Abdomen (Fig. 1) relatively short and moderately slender; along dorsal midline 1.6 times as long as thorax. Abdomen chiefly matte, except mediotergites 1–6 shiny, almost smooth, with a faint transverse striation. Fifth mediotergite 2.8 times as long as wide and 1.4 times as wide as laterotergite 5. Mediotergite 7 posteriorly 1.25 times as wide as anteriorly, with most of surface convex and pilose, except most-anterior part; connexival corner rectangular, without prominent pilosity. Sternite 7 (Figs. 4, 5) ventrolaterally near anterior margin with one pair of pads of closely set, black setae situated on inconspicuous (very low) tubercles; pads ventrally separated by about eight times their width; medioposterior surface slightly elevated and bearing short, inconspicuous pilosity, no paired patches developed. Segment 8 (Fig. 4, 5) relatively stout, about as wide as posterior margin of mediotergite 7, in dorsal aspect, excluding the short apical spine, about 1.5 times as long as wide.

**Description of apterous females** (paratypes): Similar to male, slightly longer, body length 9.2–9.4 mm; head length 2.8–2.9 mm; head width at eyes 0.42–0.44 mm; body width at metacetabula 0.67–0.70 mm; abdomen width 0.65–0.66 mm; length of second antennomere 0.9 mm; length of mesotibia 4.6–4.7 mm.

Structural characteristics: Similar to male. Head at eyes slightly narrower than at antennal tubercles (0.95 times); anterior part of head 2.1–2.2 times as long as posterior part. Pronotum length 0.49–0.50 times head length; metanotum length 0.32–0.33 times head length. Relative lengths of leg segments (larger specimen measured; in relation with mesotibia = 100): profemur – 80, protibia – 91, protarsus – 2+8+6, mesofemur – 86, mesotibia – 100, mesotarsus – 2+8+6, metafemur – 110, metatibia – 138; metatarsus – 2+7+6. Mesotibia length 6.2–6.8 times mesotarsus length. Second mesotarsomere 1.4 times as long as third.

Abdomen (Fig. 2) relatively short and stout, clearly upcurved in lateral aspect; along dorsal midline 1.7–1.8 times as long as thorax. Sternites 5–7 ventrally with short, erect pilosity (slightly longer terminally); sternites 6 and 7 with rows of long setae located at connexival margin; sternite 7 ventromedially slightly produced. Mediotergites 1–6 shiny, almost smooth, with faint transverse striation. Fifth mediotergite 2.6 times as long as wide and 1.4 times as wide as laterotergite 5. Mediotergite 7 (Fig. 6) matte, pilose and convex, but anteriorly with small shiny, slightly depressed area; posterior margin 1.5 times as wide as anterior one. Mediotergite 8 (Fig. 6) with short, sharply pointed apical spine. Gonocoxa 1 with distinct, long pilosity.

**Macropterous morph:** Unknown.

**Comparative notes:** In both keys to species of the region (POLHEMUS & LANSBURY 1997, ANDERSEN & WEIR 2004) *Hydrometra balkei* sp.n. keys out with *H. strigosa* (SKUSE, 1893). Similarities are found, e.g., in size, general shape of anteclypeus, and paired pads of closely set, black setae near anterior margin of sternite 7 of the males. However, a good number of characteristics distinguish these two species: The anteclypeus is more pointed in *H. balkei* sp.n. than in *H. strigosa*. Mediotergites 4–6 are distinctly wider than the corresponding laterotergites in *H. balkei* sp.n., but hardly wider in *H. strigosa* (difference only visible in short-winged morph, and stronger in females). Laterally, the ventral outline of the abdominal segments 7 and 8 is straight in the male of *H. balkei* sp.n., but convex in the posterior half of segment 7 and the middle of segment 8 in males of *H. strigosa*. *Hydrometra strigosa* bears one pair of black stiff hair patches in posterior half of sternite 7; such structures are not present in *H. balkei* sp.n. The abdomen of the (apterous) female is strongly upcurved in *H. balkei* sp.n. (see Fig. 2), but almost straight in *H. strigosa*. The laterotergite 7 of the female bears numerous long standing hairs in *H. balkei* sp.n. (see Fig. 2), but no or a few short hairs in *H. strigosa*. *Hydrometra balkei* sp.n. is only known in the apterous morph, whereas *H. strigosa* has micropterous and macropterous morphs. Although fully winged specimens can be expected for *H. balkei* sp.n., too, the difference in the flightless morph is probably a stable character, as in general in *Hydrometra* an intraspecific polymorphism of the short-winged form is extremely rare.

There are also some similarities of *H. balkei* sp.n. with *Hydrometra mindoroensis*, a variable species distributed from the Philippines southwards and eastwards to northern Borneo, Sulawesi, the Moluccas, and also New Guinea (POLHEMUS & POLHEMUS 1995,



POLHEMUS & LANSBURY 1997, GAPUD et al. 2003). The "*H. mindoroensis* complex" consists of numerous isolated micro-populations; this is because of the fact that most specimens are micropterous, which inhibits gene flow between islands (GAPUD et al. 2003). *Hydrometra balkei* sp.n. shares the long pilosity of the female's laterotergites 7 with *H. mindoroensis*, but differs from it, e.g., by pointed anteclypeus, wide mediotergites, and upcurved abdomen of the female. *Hydrometra mindoroensis* clearly differs from both *Hydrometra balkei* sp.n. and *H. strigosa* by the structures of the male's abdominal segment 7: The paired anterior tufts of setae are located on tumescent elevations and the posterior elongated fields of pilosity are strongly developed.

**Distribution:** Indonesia, Papua, Nabire area, only known from the type locality.

**Etymology:** Cordially named for Dr. Michael Balke, now in the Bavarian State Collection of Zoology, Munich, who discovered this interesting species.

### *Hydrometra strigosa* (SKUSE, 1893)

**Material used for comparison:** 1 micropterous female "NEW CALEDONIA (NC 15)\ Grande Terre (S-Prov.)\ Riv. Dumbéa flood plain\ 28.XI.09, leg. M. A. Jäch", "pools and backwaters\ ca. 8 km NNW Nouméa\ ca. 10 m a.s.l.\ 22°09'20.7"S/166°27'23.7"E" (NHMW-Hemipt.-Inv.No. 000 011 465); 1 macropterous female "NEW CALEDONIA (NC 31)\ Grande Terre (S-Prov.)\ ca. 17 km NE Népoui\ 4.XII.09, leg. M. Madl", "River Népoui\ ca. 110 m a.s.l.\ 21°13'30"S/165°05'30"E\ and about 2 km upstream" (NHMW-Hemipt.-Inv.No. 000 011 466); 1 micropterous male, 1 micropterous female "NEW CALEDONIA: S-Prov.\ Riv. Dumbéa, 10m\ ca. 8 km NNW Nouméa\ 28.XI.09, leg. Schuh (15)\ 22°09'20.7"S/166°27'23.7"E" (NHMW-Hemipt.-Inv.No. 000 012 048-49).

### Acknowledgements

I am most grateful to Dr. Michael Balke for donating his specimens to the Natural History Museum Vienna; to Mag. Harald Bruckner for making the stacked images; to Prof. Dr. Carl Schaefer for a language review; and to Dr. Tran Anh Duc for useful comments to improve the manuscript.

### References

- ANDERSEN N.M. & WEIR T.A., 2004: Mesoveliidae, Hebridae, and Hydrometridae of Australia (Hemiptera: Heteroptera: Gerromorpha), with a reanalysis of the phylogeny of semi-aquatic bugs. – *Invertebrate Systematics* 18: 467–522.
- CHEN P.-P., NIESER N. & ZETTEL H., 2005: The aquatic and semi-aquatic bugs (Heteroptera: Nepomorpha & Gerromorpha) of Malesia. – *Fauna Malesiana Handbooks* 5, Brill, Leiden – Boston, 546 pp.
- ESCHSCHOLTZ J.F., 1822: *Entomographien* 1. – Reimer, Berlin, 128 pp.
- GAPUD V.P., ZETTEL H. & YANG C.M., 2003: The Hydrometridae (Insecta: Heteroptera) of the Philippine Islands. – *Annalen des Naturhistorischen Museums in Wien, Serie B*, 104 (2002): 143–162.
- HUNGERFORD H.B. & EVANS N.W., 1934: The Hydrometridae of the Hungarian National Museum and other studies on the family (Hemiptera). – *Annales Historico-Naturales Musei Nationalis Hungarici* 28: 31–112, 12 pls.
- KIRKALDY G.W., 1901: On some Rhynchota, principally from New Guinea (Amphibiocorisae and Notonectidae). – *Annali del Museo Civico di Storia Naturale Giacomo Doria* 20: 804–810.

- LUNDBLAD O., 1933: Zur Kenntnis der aquatilen und semiaquatilen Hemipteren von Sumatra, Java und Bali. – Archiv für Hydrobiologie, Suppl. 12: 1–195, 263–489, 21 pls.
- POLHEMUS J.T. & LANSBURY I., 1997: Revision of the genus *Hydrometra* LATREILLE in Australia, Melanesia, and the Southwest Pacific (Heteroptera: Hydrometridae). – Bishop Museum Occasional Papers 47: 1–67.
- POLHEMUS J.T. & POLHEMUS D.A., 1995: Revision of the genus *Hydrometra* LATREILLE in Indochina and the Western Malay Archipelago (Heteroptera: Hydrometridae). – Bishop Museum Occasional Papers 43: 9–72.
- POLHEMUS J.T. & REISEN W.K., 1976: Aquatic Hemiptera of the Philippines. – Kalikasan Philippine Journal of Biology 5(3): 259–294.
- SKUSE F.A.A., 1893: Notes on Australian aquatic Hemiptera No. 1. – Records of the Australian Museum 2: 42–45.

