

TWO NEW SPECIES OF WATER STRIDERS (HETEROPTERA: GERRIDAE) FROM THE PHILIPPINES

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Abstract.—Two new species of Gerridae are described from the Philippines: *Ptilomera palawanensis* from Palawan and *Metrocoris zetteli* from Mindanao. The descriptions are accompanied by a distribution map and figures of key characters.

Key Words: Gerridae, aquatic insects, Philippines, Palawan, Mindanao

Ongoing research into the systematics of Southeast Asian water striders continues to uncover new species from this region. To facilitate a forthcoming review of Philippine Gerridae by Dr. Herbert Zettel of the Vienna Museum, two new gerrid species from that archipelago, belonging to the genera *Ptilomera* Amyot and Serville and *Metrocoris* Mayr, are described below.

The last revision of *Metrocoris* in the Philippines was that of Polhemus (1990), who recognized three species: *M. tenuicornis* Esaki (Palawan), *M. luzonicus* Polhemus (Luzon), and *M. philippinensis* den Boer (Mindanao and Cebu). Based on recent collections by Herbert Zettel, additional material of *M. tenuicornis* is now at hand from Busuanga and Mindoro, and additional specimens of *M. philippinensis* have been taken on Negros and Panay, although the latter show slight variations in comparison to topotypic *M. philippinensis* from Mt. Apo on Mindanao.

The last comprehensive revision of *Ptilomera* was that of Hungerford and Matsuda (1965). Following their work, an additional species, *P. hungerfordi*, was described from the Philippines by Andersen (1967). Interestingly enough, the three known Philippine species of *Ptilomera*, in-

cluding the new taxon described below, are all confined to the island of Palawan.

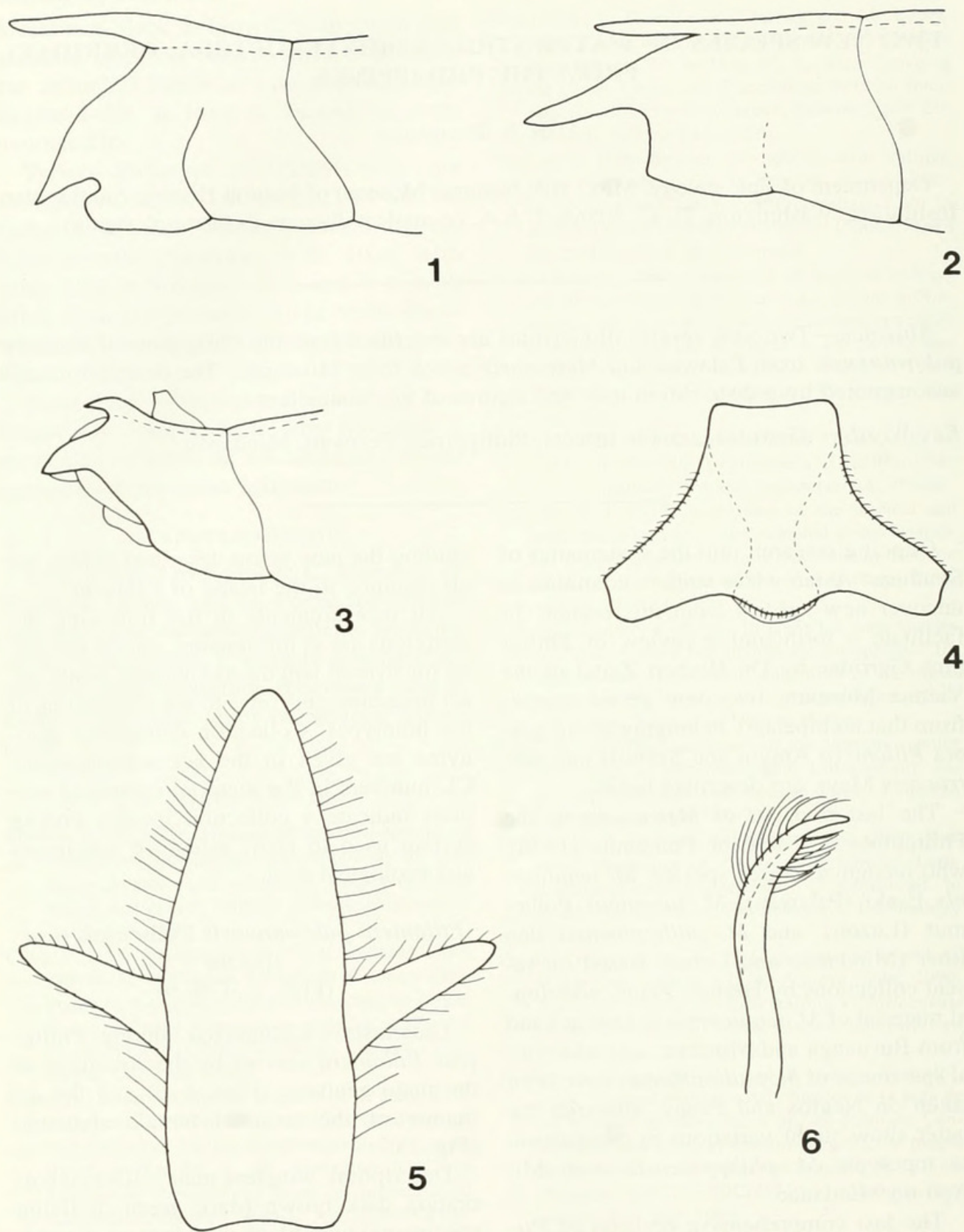
All measurements in the following descriptions are in millimeters; ranges are given for overall lengths and widths, while exact measurements refer to the dimensions of the holotypes. Collection depository acronyms are given in the acknowledgments. CL numbers in the material examined sections indicate a collection locality coding system used to cross reference specimens and ecological data.

Ptilomera palawanensis Polhemus, new species

(Figs. 1, 4–6, 9)

Diagnosis.—Recognized among Philippine *Ptilomera* species by the structures of the male genitalia (Figs. 4–6) and the armature of the terminal female abdomen (Fig. 1).

Description, wingless male.—Dorsal coloration dark brown (dark green in living specimens) with black markings on anterior portion of head, lateral portions of thorax, abdominal tergites, and foreleg; stripe of silvery hairs running longitudinally along each side of thorax, with smaller silvery patches on head and abdomen dorsally. Overall length 17.00–17.50 mm (mean =



Figs. 1-6. 1-3, Right lateral views of female terminal abdominal segments. 1, *Ptilomera palawanensis*. 2, *P. hungerfordi*. 3, *P. weneri*. 4-6, *P. palawanensis*, structural details of male genitalia. 4, Proctiger. 5, Pygophore. 6, Left paramere, dorsal view.

17.25, $n = 2$); maximum width (across mesoacetabulae) 3.90–4.10 mm (mean = 4.00, $n = 2$).

Head: dark brown, tip of clypeus and anterior portion of frons black, vertex with V-shaped dark spot centrally, patches of silvery setae present on either side of frons near bases of antennae; width across eyes 2.17; antenna black, lengths of segments I–IV = 8.54; 1.96; 2.24; 1.68; eyes brown, maximum width 0.55, length along inner margin 1.00, anterior width of interocular space 0.75, less than the length of an eye; rostrum yellowish brown, segment IV and midline of segment III glabrous black, basal 3 segments covered with very short recumbent pale setae, two long sensory setae present on posterior margin of segment III, overall length of rostrum 2.03, barely attaining posterior margin of prosternum.

Thorax: with pro-, meso- and metanota dark brown, broadly marked with black on anterolateral portion of pronotum behind eyes, laterally on meso- and metanota, and on pro-, meso- and metacetabula; side of thorax with longitudinal band of silvery hairs, beginning on mesopleuron and extending along metapleuron to metacetabula; silvery hair patches also present on pro- and mesoacetabulae, on pronotum behind eyes, and anterolaterally on anterior portions of meso- and metanota; pronotum gently raised medially at anterior margin, gently sulcate medially on posterior half; mesonotum evenly convex; metanotum with longitudinal medial suture.

Legs: brown, becoming blackish distally, forefemur with two parallel longitudinal black stripes centrally on dorsal face; ventral faces of forefemur and tibia, tip of foretibia, and entire foretarsus black; swimming fringe on posterior face of middle femur thick and well developed, occurring along entire length of segment; leg measurements as follows: foreleg, femur = 9.25, tibia = 8.25, tarsal I = 4.90, tarsal II = 1.90; middle leg, femur = 25.00, tibia = 16.00, tarsal I = 9.00, tarsal II = 0.75; hind

leg, femur = 35.00, tibia = 18.00, tarsal I + II (fused) = 0.35.

Abdomen: with tergites black, shining centrally, bearing sparse covering of short silvery setae on lateral portions of tergites II–VII; connexiva black, approximately half as wide as abdominal tergites, reflexed upward to near vertical orientation, covered with fine black setae; first genital segment black, mottled with brown, clothed with short recumbent black setae; lateral portions of abdomen with scattered patches of silvery setae; proctiger (= suranal plate) with median lobe distinctly produced, rounded, lateral wings relatively long and narrow (Fig. 4); pygophore slender with tip narrowed, bearing numerous long black setae, apical portion roughly conical, lateral projections clearly exceeding wings of suranal plate (Fig. 5); parameres stout basally, broadly curving, tips pointed (Fig. 6).

Ventral surface: pale yellowish white, thickly covered with short recumbent pale setae; numerous tiny black spinules present at tip of pygophore; length of metasternum less than combined lengths of abdominal ventrites I and II; first genital segment longer than abdominal ventrite VII; with low rounded longitudinal carina medially.

Wingless female.—Similar to male in general structure and coloration but slightly smaller, length 16.00–17.00 mm (mean = 16.25, $n = 10$); width of head across eyes 1.96 mm; width of thorax across mesoacetabulae 3.60–4.00 mm (mean = 3.41, $n = 10$). Ventrolateral lobe of abdomen weakly produced, apex pointed; dorsolateral lobe curving downward, acute apically; connexival spines of moderate length, relatively stout, orientation nearly horizontal; medial ventral lobe of moderate size, mostly hidden by converging ventral margins of ventrolateral lobes (Fig. 1); leg measurements as follows: foreleg, femur = 8.00, tibia = 7.00, tarsal I = 4.50, tarsal II = 1.80; middle leg, femur = 23.00, tibia = 15.00, tarsal I = 8.50, tarsal II = 0.80; hind leg, femur = 27.00, tibia = 15.00, tarsal I + II (fused) = 0.35.

Winged form.—Unknown.

Discussion.—The male parameres of *P. palawanensis* are similar to those of *P. hungerfordi* from Palawan, but the tip of the pygophore is more slender and the wings of the proctiger are narrower (Figs. 4–6). The female abdominal morphology is quite distinct from *P. hungerfordi*, with the ventrolateral lobe more produced, the dorsolateral lobe shorter and angled downward, and the connexival spines longer and stouter (compare Figs. 1 and 2). In *P. hungerfordi* there is a broad concavity between the ventrolateral and dorsolateral lobes, whereas in *P. palawanensis* these structures are separated by a relatively narrow slot (Figs. 1, 2). In addition, live specimens of *P. hungerfordi* are dark brown, whereas living specimens of *P. palawanensis* are dark green, changing to brown only after death.

None of the Philippine *Ptilomera* species shows close affinities to species on Borneo, despite evidence that north Borneo and Palawan have been linked historically by arc terranes along the eastern margin of the South China Sea (Polhemus 1996, Fig. 9). The Bornean *Ptilomera* species have males with sharply bent parameres, and females with the ventrolateral lobe of the terminal abdomen greatly reduced; neither of these character states are seen in the two Palawan species discussed above, or in *P. weneri* Hungerford and Matsuda, the third *Ptilomera* species known from Palawan. This latter is an odd, apparently primitive species (Hungerford and Matsuda 1958) that is different morphologically from any other congener in the region (Fig. 3), and its presence indicates that Palawan has had a long and complex faunal history independent from that of the remainder of the Philippines.

Ecological notes.—*Ptilomera palawanensis* was taken from swift, rocky streams in areas of disturbed primary rain forest. It frequently occurred in sympatry with *P. weneri* but was never taken in association with *P. hungerfordi*, even though the latter occurred on streams nearby, suggesting that *P. palawanensis* and *P. hungerfordi* may be

competitively exclusive on any given stream.

Etymology.—The name "*palawanensis*" refers to the island of Palawan to which this species is endemic.

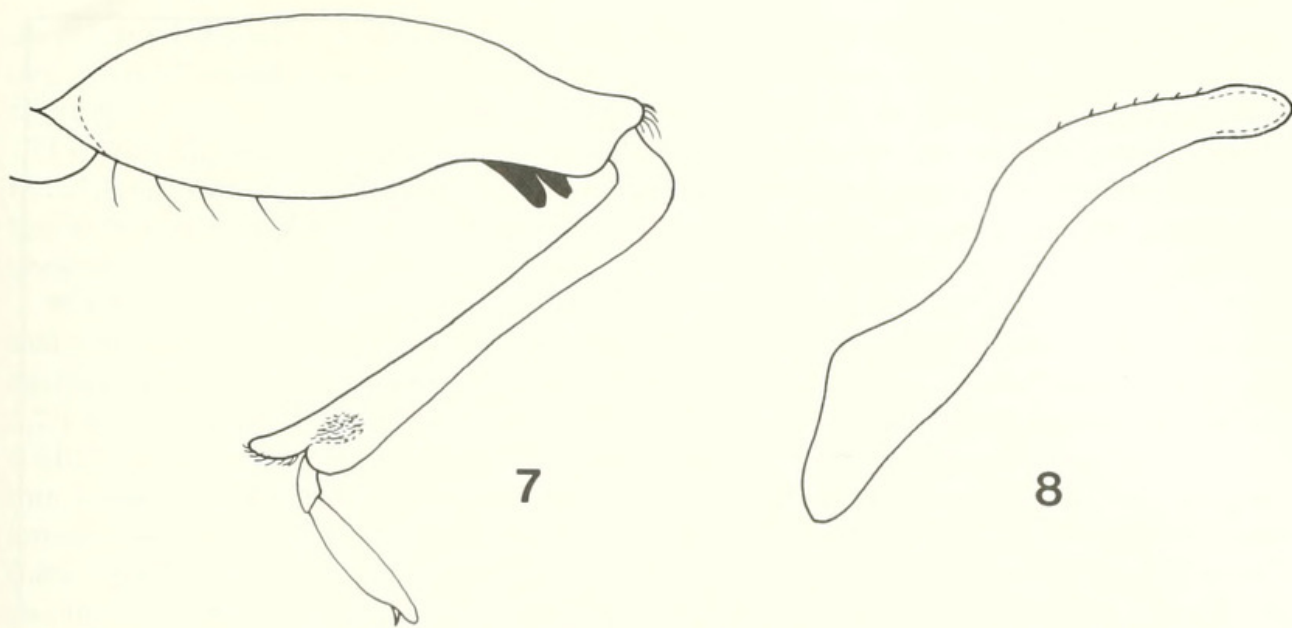
Material examined.—Holotype, wingless ♂: PHILIPPINES, Palawan, **Palawan Prov.**, Estrella Falls at Estrella, 17 km. SW of Narra, 26 July 1985, CL 2010, J. T. and D. A. Polhemus (USNM). Paratypes: PHILIPPINES, Palawan, **Palawan Prov.**: 1 wingless ♂, 14 wingless ♀, same data as holotype (JTPC); 5 wingless ♂, 12 wingless ♀, Taritien Riv. above Trident Mine, Lapu Lapu, 7 km. NW of Narra, 27 July 1985, CL 2011, J. T. and D. A. Polhemus (JTPC); 5 wingless ♂, 5 wingless ♀, Balsahan Riv., Iwahig Penal Colony, 20 km. SW of Puerto Princesa, 27 July 1985, CL 2014, J. T. and D. A. Polhemus (JTPC); 1 wingless ♀, Estrella Falls, 5 km. N. of Narra, 5 April 1994, H. Zettel (NHMW); 1 wingless ♂, 1 wingless ♀, Montible River, 20 km. WSW of Puerto Princesa, 26 March 1994, H. Zettel (NHMW); 1 wingless ♀, Balsahan River at Iwahig, 9 km. W. of Puerto Princesa, 7 April 1994, H. Zettel (NHMW).

Metrocoris zetteli Polhemus, new species
(Figs. 7–9)

Diagnosis.—A relatively large and robust *Metrocoris* species, easily recognizable by the structure of the male fore femur (Fig. 7) and the shape of the male paramere (Fig. 8).

Description, wingless male.—Dorsal coloration orange brown, overlain with black markings on head, thorax and abdomen. Overall length 6.00–6.20 mm (mean = 6.10, $n = 2$); maximum width (across metacetabulae) 3.30–3.40 mm (mean = 3.35, $n = 2$).

Head: orange brown, antennal sockets, tylus, and areas adjacent to inner margins of eyes black, a moderate sized but relatively indistinct dark patch also present centrally on interoculus, width/length = 1.80/0.90; antennae dark brown, segments I–III bearing thick fringes of erect, curling, pale



Figs. 7–8. *Metrocoris zetteli*, structural details. 7, Male foreleg, dorsal view. 8, Male right paramere, lateral view.

setae along ventral margins, lengths of segments I–IV = 3.60, 1.20, 1.25, 0.85; eyes reddish brown, maximum width 0.50, length along inner margin 0.60, width of interocular space 0.65, subequal to the length of an eye; rostrum yellowish brown, segment IV black, reaching onto mesosternum, overall length of rostrum 1.75.

Thorax: with pronotum orange brown, anterior margin with broad, black transverse band, this band extending posteriorly in trilobate fashion laterally and along midline, lateral markings not reaching posterior margin, central marking narrowly joining small, subtriangular black mark extending anterad from posterior margin; pronotal dorsum not swollen or bulbous, width 0.95, length along midline 0.57. Mesonotum orange brown, with partially developed lateral stripes, these stripes curving backward but not attaining transverse dark band along anterior margin of mesonotum; intermediate longitudinal stripes moderately broad, just touching anterior margin of meso/metanotal transverse dark band, this latter band curving anteriorly then laterally, becoming confluent with posterior transverse dark band of metanotum; medial dark stripe of mesonotum narrow, continuing onto metanotum and abdominal tergites I and II; overall tho-

racic color pattern similar to that illustrated for *M. sunda* in Polhemus (1990, Fig. 1).

Legs: with forefemur yellowish brown, becoming diffusely infuscated on distal $\frac{2}{3}$, distinctly inflated, length/width ratio 3.6/1.0, dorsal surface lacking short black spinules, ventral surface smooth and without small teeth or other modified setae, concave on distal $\frac{1}{3}$, this concavity flanked by two large, subequal sized teeth near tip of femur (Fig. 7); foretibia strongly curved basally, inner margin beyond curve lacking small black asperities, terminating in moderate-sized spur; middle and hind legs uniformly medium brown, slender and without unusual modifications; leg measurements as follows: foreleg, femur = 3.60, tibia = 3.00, tarsal I = 0.25, tarsal II = 2.10; middle leg, femur = 9.00, tibia = 6.50, tarsal I = missing, tarsal II = missing; hind leg, femur = 7.00, tibia = 5.00, tarsal I = 0.50, tarsal II = 0.30.

Abdomen: with tergites orange brown, marked with black; tergites I and II with dark medial stripe, tergites I–VII with dark bands along anterior margins, these bands becoming broader laterally, tergites I and II further margined with black laterally and posteriorly, leaving orange brown markings enclosed with black, tergite VIII entirely

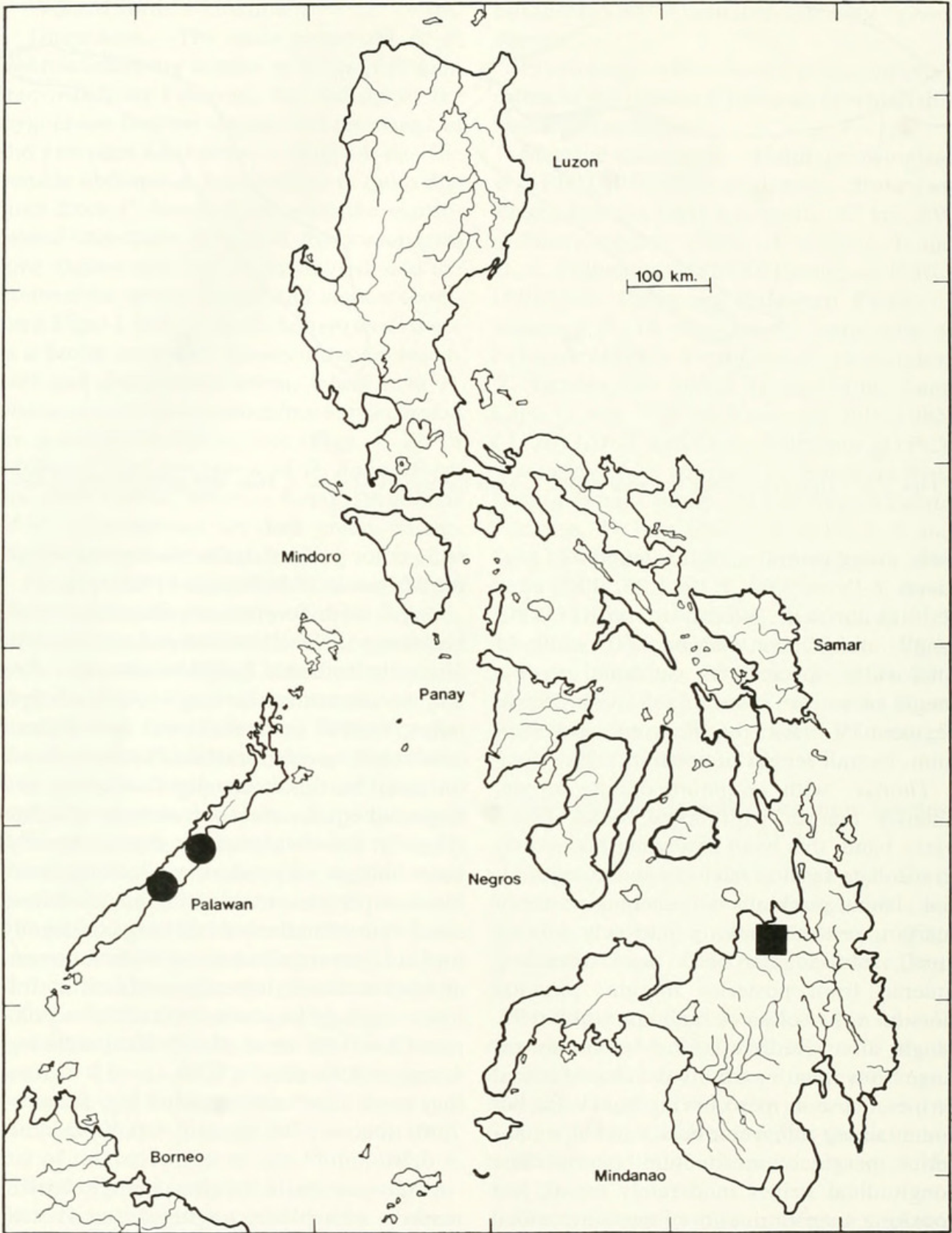


Fig. 9. Distribution of gerrid species in the Philippines. Square = *Metrocoris zetteli*. Circles = *Ptilomera palawanensis*.

dark brown dorsally; male paramere slender, weakly sinuate, tip slightly expanded (Fig. 8).

Ventral surface: orange brown, metasternal scent orifice moderately raised, ventral abdomen lacking depressions or tumescences.

Wingless female.—Similar to wingless male in general structure and coloration, but smaller in overall size; overall length 5.00–5.20 mm (mean = 5.12, $n = 4$); maximum width (across metacetabulae) 3.10–3.40 mm (mean = 3.23, $n = 4$); lengths of antennal segments I–IV = 2.10, 0.80, 1.00, 0.85; fore femur relatively slender, not swollen and armed as in male, leg measurements as follows: fore leg, femur = 2.45, tibia = 2.65, tarsal I = 0.12, tarsal II = 0.75; middle leg, femur = 6.50, tibia = 4.90, tarsal I = 2.00, tarsal II = 0.25; hind leg, femur = 5.80, tibia = 3.90, tarsal I = 0.40, tarsal II = 0.30.

Winged male.—Similar to wingless male in most structural characters, with following exceptions: overall length (including wings) 7.50 mm, maximum width (across pronotal humeri) 2.80 mm., pronotum expanded, anterior lobe yellowish brown with trilobate black markings similar to those of wingless male, posterior lobe orange brown, with broad transverse brown band extending across entire pronotum ahead of humeral angles, narrow, dark band extending posteriorly from this transverse band along longitudinal midline to apex of pronotum, flanked to either side by two (1 + 1) longitudinally ovate orange brown patches flanked laterally by diffuse brown patches extending posteriorly from transverse humeral band; fore femur not as swollen as in wingless male, apical teeth less developed.

Discussion.—*Metrocoris zetteli* may be recognized immediately among Philippine *Metrocoris* species by the male forefemur, which is highly swollen and has a distinctive armature consisting of a broad concavity ventrally on the distal $\frac{1}{3}$, flanked apically by two large, subequal sized teeth (Fig. 7). These foreleg structures are similar

in some degree to those seen in *M. stragulator* Breddin from the Greater Sunda Islands, but the latter species also has a large secondary tooth on the forefemur near the middle of the ventral face (Polhemus 1990, fig. 10), which is lacking in *M. zetteli*. The shape of the male paramere in *M. zetteli* is diagnostic as well (Fig. 8).

Etymology.—The name “*zetteli*” honors Dr. Herbert Zettel of the Vienna Museum, who has done much to advance our knowledge of Philippine water bugs.

Material examined.—Holotype, wingless ♂: PHILIPPINES, Mindanao, **Misamis Oriental Prov.**, Mt. Kibungol, 20 km. SE of Gingoog, 700–800 m., 9–18 April 1960, H. M. Torreallas (BPBM). Paratypes: PHILIPPINES, Mindanao, **Misamis Oriental Prov.**: 3 winged ♂, 4 wingless ♂, 10 wingless ♀, same data as holotype (BPBM, NHMW, USNM).

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