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Two new species of *Pseudovelia* HOBERLANDT, 1950 (Insecta: Heteroptera: Veliidae) from Palawan and Busuanga, Philippines

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Abstract

Two species of *Pseudovelia* HOBERLANDT, 1950, from the Philippines are described as new: *Pseudovelia tenuis* sp.n. from Busuanga and *P. lata* sp.n. from Palawan. They are closely related to *P. borneensis* ANDERSEN, 1983, from Sarawak and Sabah (Borneo).

Key words: *Pseudovelia*, Veliidae, Palawan, Busuanga, Philippines, new species.

Zusammenfassung

Zwei neue Arten der Gattung *Pseudovelia* HOBERLANDT, 1950, werden von den Philippinen beschrieben: *Pseudovelia tenuis* sp.n. von Busuanga und *P. lata* sp.n. von Palawan. Sie sind nahe verwandt mit *P. borneensis* ANDERSEN, 1983, von Sarawak und Sabah (Borneo).

Introduction

Until now three described species of *Pseudovelia* HOBERLANDT, 1950, are known to occur on the Philippine Islands: *Pseudovelia reiseni* POLHEMUS, 1976, endemic on Luzon, *P. argyropardala* NIESER, 1995, described from Karakelong (north of Sulawesi) and Mindanao, and *P. kalami* NIESER, 1995, endemic on Mindanao (Fig. 1). NIESER (1995) reports *P. reiseni* also from Mindanao, but after examination of the same material it turns out that it belongs to an undescribed species.

A fourth species, *P. feuerborni* LUNDBLAD, 1933, described from a single macropterous male from Java, was reported by ANDERSEN (1983) from Singapore, Malaysia, Thailand, and Luzon. The record from the Philippines was based on a single macropterous female from Mt. Makiling (province Laguna). Because of the difficulties in the distinction of females, the regional distribution of nearly all species of *Pseudovelia*, and the frequent occurence of an undescribed species from the same locality, the record of *P. feuerborni* is very improbable (Fig. 1).

This paper deals with the species of the Palawan Region (Palawan and Busuanga). Two species are described as new: *Pseudovelia tenuis* sp.n. from Busuanga and *P. lata* sp.n. from Palawan. They are endemic on these islands and closely related to *P. borneensis* ANDERSEN, 1983, described from Sarawak and Sabah (Borneo).

After a perfunctory study of further material collected by V.P. Gapud, N. Nieser, J.T. Polhemus, and H. Zettel in the last twenty years, at least 21 undescribed species of *Pseudovelia* are estimated to occur on Luzon, Mindoro, the Visayas, and Mindanao.

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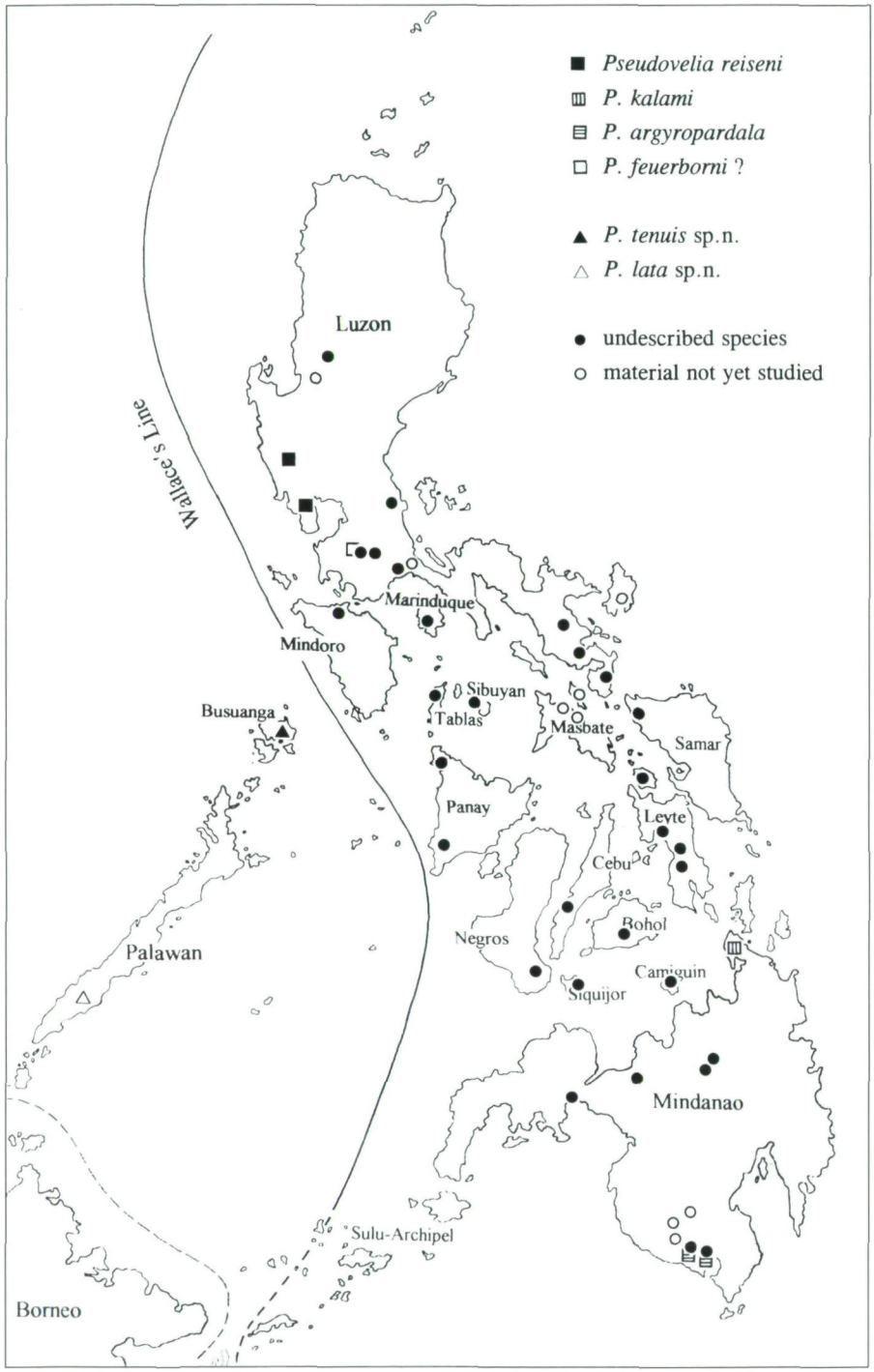

Fig. 1: Distribution of the described and undescribed species of *Pseudovelia* on the Philippines.

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Abbreviations

CZV = Collection H. Zettel, Vienna, Austria
JTPC = John T. Polhemus Collection, Englewood, Colorado, USA
NHMV = Natural History Museum, Vienna, Austria
UPLB = Museum of Natural History, University of the Philippines, Los Baños, Philippines
apt. = apterous
macr. = macropterous

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Pseudovelia tenuis sp.n.

Holotype: ♂ (apt.) [PHILIPPINEN: Palawan Pr.\ Busuanga Is., 5 km NW Coron\ Mabintangen Riv., 25.-29.2.\ 1996, leg. H. Zettel (82)] (UPLB). **Paratypes:** 1 ♀ (apt.) same data as holotype (CZV); 1 ♂, 1 ♀ (apt.) [PHILIPPINEN: Palawan Pr.\ Busuanga Is., 2 km W \ Coron, 23.2.1996\ leg. H. Zettel (80b)] (CZV); 1 ♂, 3 ♀♀ (apt.) [PHILIPPINEN: Palawan Pr.\ Busuanga Is., 13 rd. km WNW\ Coron, Balulu Falls, 24.2.\ 1996, leg. H. Zettel (81)] (CZV, NHMV, UPLB); 1 ♀ (apt.) [Philippinen: Palawan Pr.\ Busuanga Isl., 5 km NW Coron\ Mabentangen For. Res. 1.-7.2.\ 1999, leg. H. Zettel (170)] (CZV); 1 ♂ (apt.) [Philippinen: Palawan Pr.\ Busuanga Isl.\ 13 rd. km \ WNW Coron, Balulu Falls\ 2.2.1999, leg. Zettel (171)] (NHMV).

Apterous male

Size. Length 2.07 - 2.15 mm, maximum width (across suture between metanotum and laterotergite 1) 0.77 - 0.80 mm, width of pronotum 0.70 - 0.73 mm, width of head 0.52 - 0.55 mm.

Colour. Head dark brown to blackish; antennae brown, sometimes with base of segment 1 light brown. Pronotum dark brown, with horizontal stripe near anterior margin yellowish to light brown; black, irregularly distributed pores on pronotum except on stripe. Metanotum blackish to dark reddish-brown. Legs dark brown, with basal part of femora yellow. Tergites, laterotergite 1, and inner parts of laterotergites 2 - 7 dark brown to blackish, outer parts slightly lighter. Ventral surface of thorax and abdomen black, stripe on lateral margins of sternites and posterior margin of sternite 7 light brown.

Pilosity. Entire body surface covered with short, decumbent to suberect, silvery hairs. Long, erect hairs scattered on vertex along margin of eyes, antennae, and legs, hirsute on pronotum, metanotum, tergites, laterotergites, and sternites. Stout, silvery hairs forming stripes on vertex along margin of eyes, and patches laterally on tergite 1, postero-medially on tergite 6, and antero-medially on tergite 7, sometimes also at base of vertex, on horizontal stripe of pronotum, postero-medially on tergites 2 and 3, on posterior margin of laterotergite 1, and on posterior inner parts of laterotergites 3 and 4. Metatarsal segment 1 with row of short, erect hairs over entire length, about five hairs at base of segment stout and bristle-like (Fig. 10). Eyes naked except for two ocular setae.

Structural characters. Ventral lobe of head not produced backward. Antennae 0.64 - 0.69 times as long as body, relative lengths of segments 1 - 4 as 1.5 - 1.6 : 1 : 1.1 - 1.3 : 1.8 - 1.9 (Fig. 9). Pronotum 0.57 - 0.61 times as long as wide. Ratio of femur : tibia : tarsus

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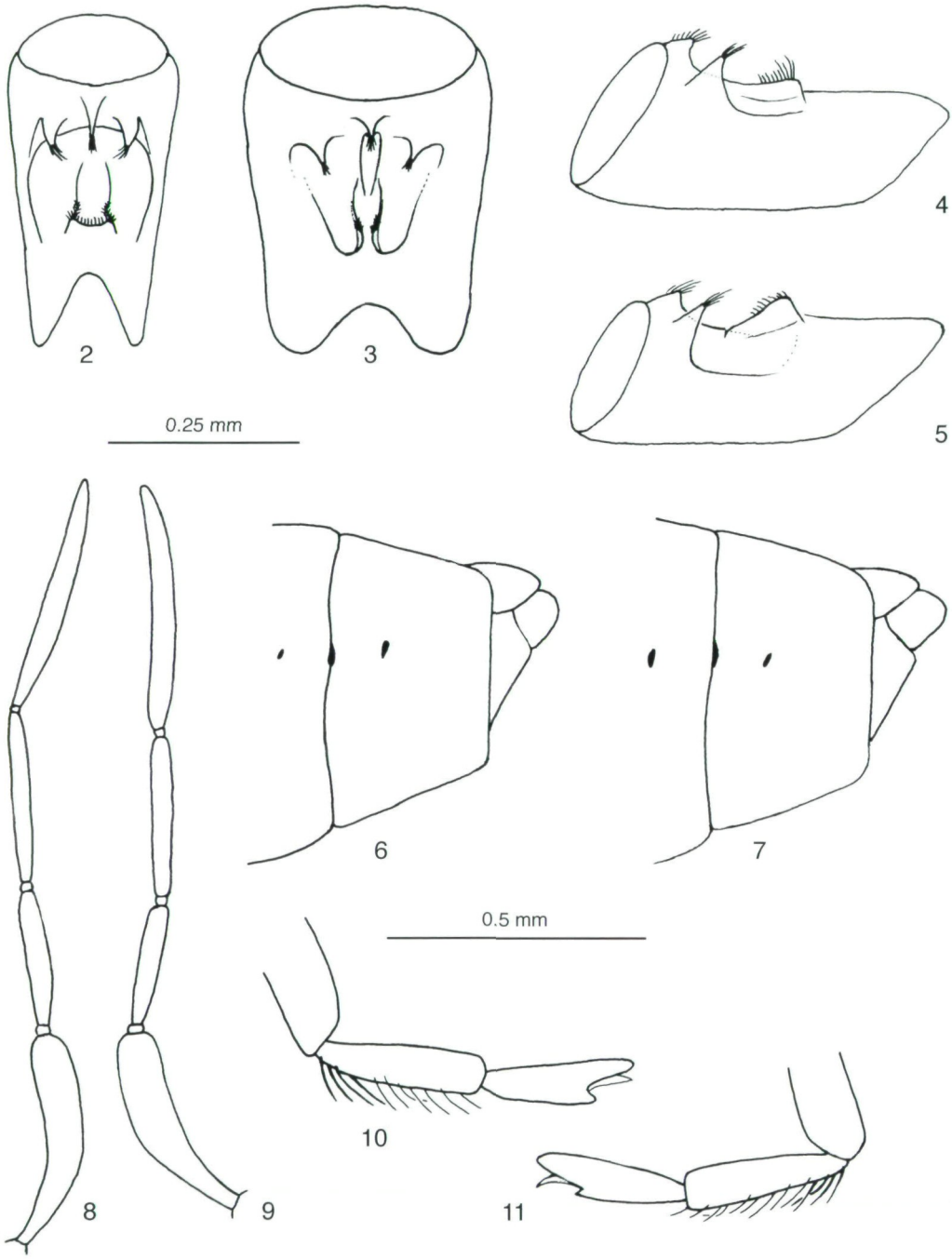

Figs. 2 - 11: (2 - 5) segment 8 of male in (2, 3) ventral view and (4, 5) lateral view of (2, 4) *P. tenuis* sp.n. and (3, 5) *P. lata* sp.n. (6 - 7) abdominal segments of female in lateral view of (6) *P. tenuis* sp.n. and (7) *P. lata* sp.n. (8 - 9) antenna of (8) *P. lata* sp.n. and (9) *P. tenuis* sp.n. (10 - 11) metatarsus of male of (10) *P. tenuis* sp.n. and (11) *P. lata* sp.n.

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(length of metatibia = 1): fore leg 0.69 : 0.63 : 0.34; middle leg 0.87 : 0.90 : 0.53 (0.19 + 0.34); hind leg 0.93 : 1 : 0.69 (0.36 + 0.33). Grasping comb on protibia 0.48 - 0.52 times as long as tibia. Metatarsus 0.64 - 0.69 times as long as metatibia, first metatarsal segment 1.09 - 1.18 times as long as segment 2 (Fig. 10). Tergites and sternites partly fused. Tergite 1 medially flattened, with postero-medial indentation. Second tergite 0.86 - 0.91 times as wide as head. Laterotergites raised.

Genital segments. Segment 8 ventrally with circular impression, antero-medially with table-like elevation, anterior and antero-lateral margin of elevation furnished with short hairs; posteriorly three spines, forming a triangle, consisting of compressed tubercles apically bearing tufts of hairs (Figs. 2, 4). Pygophore covered with dense, erect hairs, but carrying no tufts of hairs.

Apterous female

Size. Length 2.22 - 2.35 mm, maximum width (across suture between metanotum and laterotergite 1) 0.80 - 0.88 mm, width of pronotum 0.70 - 0.75 mm, width of head 0.54 - 0.58 mm.

Colour as in apterous male, but horizontal stripe on pronotum not extending onto lateral portions.

Pilosity as in male, but patch of stout, silvery hairs on tergite 7 postero-medially instead of antero-medially. Metatarsal segment 1 without row of short, erect hairs.

Structural characters. Ventral lobe of head and fusion of tergites and sternites as in male. Antennae shorter than in male, 0.59 - 0.60 times as long as body, relative lengths of segments 1 - 4 as in male. Pronotum 0.47 - 0.54 times as long as wide. Protibia without grasping comb. Metatarsus 0.51 - 0.56 times as long as metatibia, first metatarsal segment 0.64 - 0.73 times as long as segment 2. Tergite 1 medially flattened. Second tergite 0.91 - 1.00 times as wide as head. Laterotergites 2 - 7 wider and more strongly raised than in male.

Genital segments. Proctiger with very dense, short, erect hairs, lateral areas of gonocoxa 1 with long, erect hairs; genital structure as in Figure 6.

Macropterous male and female unknown.

Comparative notes

Pseudovelia tenuis sp.n. is closely related to *P. lata* sp.n. and *P. borneensis* ANDERSEN, 1983. Males of these species can be easily distinguished by the ventral structure of segment 8 (Figs. 2 - 5; ANDERSEN 1983: figs. 35, 36). The grasping comb on the protibia is of similar length in *P. tenuis* sp.n. and *P. lata* sp.n. (about half length of protibia), but slightly longer in *P. borneensis* (grasping comb : protibia as 30 : 51, from ANDERSEN 1983). In *P. borneensis* the metatarsus of males is only half as long as the metatibia (ANDERSEN 1983), whereas in *P. lata* sp.n. it is 0.61 - 0.64 times and in *P. tenuis* sp.n. 0.64 - 0.69 times as long as the metatibia.

Females of *P. borneensis* can be separated from both of the newly described species by the structure of tergite 8, which is produced backward and overlying the genital segments (ANDERSEN 1983: fig. 37 [erroneously referred as tergum 7]). In *P. tenuis* sp.n. and *P. lata* sp.n. tergite 8 is not produced backward that much (Figs. 6, 7).

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Apterous specimens of *P. tenuis* sp.n. and *P. lata* sp.n. can be distinguished by the maximum body width. In *P. lata* sp.n. it is larger and measured across tergite 4, in *P. tenuis* sp.n. it runs across the suture between metanotum and laterotergite 1. The relative lengths of the antennal segments 1 - 4 can also be used as diagnostic characters. In *P. tenuis* sp.n. the antennal segment 4 is distincly longest (1.5 - 1.6 : 1 : 1.1 - 1.3 : 1.8 - 1.9; Fig. 9), in *P. lata* sp.n. it is also longest, but shorter in relation to segment 2 (1.3 - 1.5 : 1 : 1.2 - 1.3 : 1.5 - 1.6; Fig. 8), and in *P. borneensis* segments 1 and 4 are of similar length (37 : 23 : 26 : 38, from ANDERSEN 1983).

Etymology: "tenuis" (Latin, meaning "slender") refers to the maximum body width, which is smaller than in *P. lata* sp.n. and measured across the suture between metanotum and the laterotergite 1.

Distribution: Busuanga Island (Fig. 1).

Habitat notes (Zettel, pers. comm.): Site 82 (= 170) is a small, shallow stream in a degraded forest, which is in the dry season an average 3 - 4 metres wide and only in a few places deeper than 0.5 metres. The collecting sites were shaded by trees. *Pseudovelia tenuis* sp.n. was collected in quiet small bays, one specimen was found between roots hanging into the water. Site 81 (= 171) is a small streamlet, an average 1 - 2 metres wide, flowing through pastures, bordered with trees. In 1995 the water was reduced to some remnant pools. Site 80b is a very shallow stream of varying width, running through agricultural land, partly bordered by trees. All three sites are in the lowland (altitude less than 100 m a.s.l.), close to the sea. *Pseudovelia tenuis* sp.n. is a rare species and does not live in aggregations like some other species of this genus do.

Pseudovelia lata sp.n.

Holotype: ♂ (apt.) [PHILIPPINES, Palawan\ Mainit Falls, 18 km. NW\ of Brooks Point, 50m.\ CL 2006 VII-26-85\ J.T. & D.A.Polhemus] (JTPC). **Paratypes:** 8 ♂♂, 9 ♀♀ (apt.) same data as holotype (JTPC, NHMV); 4 ♂♂ (apt.), 2 ♂♂ (macr.) [PHILIPPINES, Palawan\ Sabsaban Falls, Aribongas\ 16 km. NE of Brooks Point\ CL 2007 VII-26-85\ J.T. & D.A.Polhemus] (JTPC, NHMV).

Apterous male

Size. Length 2.10 - 2.20 mm, maximum width (across tergite 4) 0.87 - 0.90 mm, width of pronotum 0.75 - 0.78 mm, width of head 0.52 - 0.56 mm.

Colour. Head light to dark brown; antennae brown, sometimes with base of segment 1 light brown to yellow. Pronotum light to dark brown, with horizontal stripe near anterior margin lighter brown to yellow; black, irregularly distributed, small punctures on pronotum except on stripe. Metanotum blackish to dark reddish-brown, sometimes lighter brown with suture between metanotum and laterotergite 1 blackish. Legs brown, with basal part of femora yellow. Tergites, laterotergite 1, and inner parts of laterotergites 2 - 7 dark brown to blackish, outer parts lighter brown. Ventral surface of thorax and abdomen black, stripe on lateral margins of sternites and posterior margin of sternite 7 light brown to dark reddish-brown.

Pilosity. Entire body surface covered with short, decumbent, silvery hairs. Long, erect hairs scattered on vertex along margin of eyes, antennae, and legs, hirsute on pronotum,

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metanotum, tergites, laterotergites, and sternites. Stout, silvery hairs forming stripes on vertex along margin of eyes, and patches at base of vertex, laterally on tergite 1, postero-medially on tergite 6, and on posterior inner parts of laterotergites 3 and 4, sometimes also medially on tergite 7. Metatarsal segment 1 with row of short, erect hairs over entire length, about five hairs at base of segment stout and bristle-like (Fig. 11). Eyes naked except for two ocular setae.

Structural characters. Ventral lobe of head not produced backward. Antennae 0.69 - 0.72 times as long as body, relative lengths of segments 1 - 4 as 1.3 - 1.5 : 1 : 1.2 - 1.3 : 1.5 - 1.6 (Fig. 8). Pronotum 0.60 - 0.66 times as long as wide. Ratio of femur : tibia : tarsus (length of metatibia = 1): fore leg 0.67 : 0.64 : 0.33; middle leg 0.81 : 0.84 : 0.47 (0.16 + 0.31); hind leg 0.80 : 1 : 0.63 (0.32 + 0.31). Grasping comb on protibia 0.49 - 0.52 times as long as tibia. Metatarsus 0.61 - 0.64 times as long as metatibia, first metatarsal segment 0.96 - 1.04 times as long as segment 2 (Fig. 11). Tergites and sternites partly fused. Tergite 1 medially flattened, with postero-medial indentation. Second tergite 0.98 - 1.07 times as wide as head. Laterotergites raised only a little. Sternites 4 - 7 with median notch.

Genital segments. Segment 8 ventrally with posteriad widened impression, with three spines on apical portion, forming a triangle, consisting of compressed tubercles apically bearing tufts of hairs; antero-medially two converging, elevated lobes, carrying a few, very short hairs (Figs. 3, 5). Pygophore covered with dense, erect hairs, but carrying no tufts of hairs.

Macropterous male

Size. Length 2.27 - 2.30 mm, maximum width (across pronotum) 1.02 - 1.05 mm, width of head 0.56 - 0.58 mm, forewing slightly surpassing end of abdomen.

Colour. Head, antennae, pronotum, and legs of same colour as in apterous male. Tergites and inner parts of laterotergites covered by wings; outer parts of laterotergites brown, sutures between laterotergites darker brown. Fore wings light brown, with elongate white patch at base of corium. Ventral surface of thorax dark brown to blackish, sternites light to dark brown, laterally with blackish stripe, and on lateral margin with light brown stripe.

Pilosity as in apterous male except for body parts covered by wings. Corium with long, erect hairs on anterior margin.

Structural characters. Ventral lobe of head, structure of laterotergites, legs, and sternites as in apterous male. Antennae 0.66 - 0.68 times as long as body, relative lengths of segments 1 - 4 as in apterous male. Pronotum 0.85 - 0.86 times as long as wide. Grasping comb on protibia 0.51 - 0.53 times as long as tibia.

Genital segments as in apterous male.

Apterous female

Size. Length 2.40 - 2.45 mm, maximum width (across tergite 4) 0.92 - 1.00 mm, width of pronotum 0.77 - 0.78 mm, width of head 0.56 - 0.58 mm.

Colour as in apterous male.

Pilosity as in apterous male; metatarsal segment 1 without row of short, erect hairs.

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Structural characters. Ventral lobe of head and structure of tergites and sternites as in apterous male. Antennae shorter than in male, 0.59 - 0.60 times as long as body, relative lengths of segments 1 - 4 as in male. Pronotum 0.52 - 0.55 times as long as wide. Protibia without grasping comb. Metatarsus 0.54 - 0.57 times as long as metatibia, first metatarsal segment 0.67 - 0.71 times as long as segment 2. Second tergite 1.07 - 1.14 times as wide as head. Laterotergites 2 - 7 wider and more strongly raised than in male.

Genital segments. Proctiger and gonocoxa with dense, short, erect hairs; genital structure as in Figure 7.

Macropterous female unknown.

Comparative notes see: *Pseudovelia tenuis* sp.n.

Etymology: "lata" (Latin, meaning "broad") refers to the maximum body width in apterous specimens, which is larger than in *P. tenuis* sp.n. and measured across the tergite 4.

Distribution: Palawan Island (Fig. 1).

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