

## New species, subspecies, and records of *Strongylovelia* ESAKI, 1924 (Insecta: Heteroptera: Veliidae) from the Philippines

H. Zettel\*

### Abstract

Two Philippine species and one subspecies of the haloveliine freshwater genus *Strongylovelia* ESAKI, 1924, are described as new: *Strongylovelia marinduquensis* sp.n. from Marinduque, *S. samarensis* sp.n. from Northern Samar, and *S. philippinensis surigaoensis* ssp.n. from Surigao del Norte, Mindanao. The following taxonomical changes are proposed: *Strongylovelia sibuyana* stat.n. for *S. philippinensis sibuyana* LANSBURY & ZETTEL, 1997 and *S. bukidnonica* stat.n. for *S. philippinensis bukidnonica* LANSBURY & ZETTEL, 1997. For the first time, *S. philippinensis philippinensis* LANSBURY & ZETTEL, 1997, is recorded from the islands Marinduque, Ticao, Masbate, Samar, and Leyte. A revised identification key to the apterous females of Philippine species and subspecies is presented.

**Key words:** Veliidae, Haloveliinae, *Strongylovelia*, new species, new subspecies, new records, Philippines, key.

### Zusammenfassung

Aus der Gattung *Strongylovelia* ESAKI, 1924, welche zu den süßwasserbewohnenden Haloveliinae gehört, werden zwei Arten und eine Unterart von den Philippinen neu beschrieben: *Strongylovelia marinduquensis* sp.n. von Marinduque, *S. samarensis* sp.n. von Nord-Samar und *S. philippinensis surigaoensis* ssp.n. von Surigao del Norte, Mindanao. Die folgenden taxonomischen Änderungen werden vorgeschlagen: *Strongylovelia sibuyana* stat.n. für *S. philippinensis sibuyana* LANSBURY & ZETTEL, 1997 und *S. bukidnonica* stat.n. für *S. philippinensis bukidnonica* LANSBURY & ZETTEL, 1997. *Strongylovelia philippinensis philippinensis* LANSBURY & ZETTEL, 1997 wird erstmals für die Inseln Marinduque, Ticao, Masbate, Samar und Leyte gemeldet. Ein revidierter Bestimmungsschlüssel zu den apteren Weibchen der philippinischen Arten und Unterarten wird präsentiert.

### Introduction

The subfamily Haloveliinae is primarily known for its marine genera, which have been or will be taxonomically revised by ANDERSEN (1989a, b, 1992; and in prep.). Only two genera are limnic, which are distributed exclusively in the Oriental and Papuan Regions. *Entomovelina* ESAKI, 1930 presently contains one West Malaysian species only; this and undescribed taxa from China and Borneo are under revision (P.P. Chen & al., in prep.). *Strongylovelia* ESAKI, 1924, is a genus containing small limnic Haloveliinae distributed mainly in the Oriental Realm and reaching New Britain in the east. It can be easily distinguished from other haloveliine genera by the large yellow marks on the thorax. Some notes on the morphology and ecology of *Strongylovelia* have been provided by LANSBURY & ZETTEL (1997). Only eleven species are so far described from Taiwan, the Philippines, Borneo, New Guinea, and New Britain; the genus is further known from Sri

\* Dr. Herbert Zettel, Natural History Museum, International Research Institute of Entomology, Burgring 7, A-1014 Vienna, Austria

Lanka, India, Southeast Asia (Thailand, Vietnam, Singapore), Sumatra, and Sulawesi (ESAKI 1924, 1926, LANSBURY 1993, LANSBURY & ZETTEL 1997, LUNDBLAD 1933, POLHEMUS 1979, Thirumalai, in prep.; and unpublished data). This paper contains the descriptions of some additional species and subspecies recently collected from the Philippines by the author, proposes two taxonomical changes based on newly recognized relationships and distribution patterns, and provides new records of three formerly described species and a modified identification key for apterous females.

Specific epithets of all new taxa are derived from their geographic origin and are used as Latinized adjectives.

### Material and methods

Adult specimens have been killed with ethyl-acetate and then dry mounted on paper cards. Immatures collected with some of the series have not been considered in this study. Some specimens of larger series have been preserved secondarily, after softening, in 70 % ethanol. A Leica WILD M10 binocular microscope with magnifications up to 128 x was used for most of the studies; drawings were made by using a camera lucida. Drawings of parameres of males have been made by using a OLYMPUS BX 40 microscope with a camera lucida.

Material is referred by citing the original labels. Each single label is marked with """; the backslash sign \ indicates a break of a line.

Terminology follows LANSBURY & ZETTEL (1997). Measurements of antennomeres and leg segments are omitted, because they do not yield specific differences for separation of species of the *S. philippinensis* group.

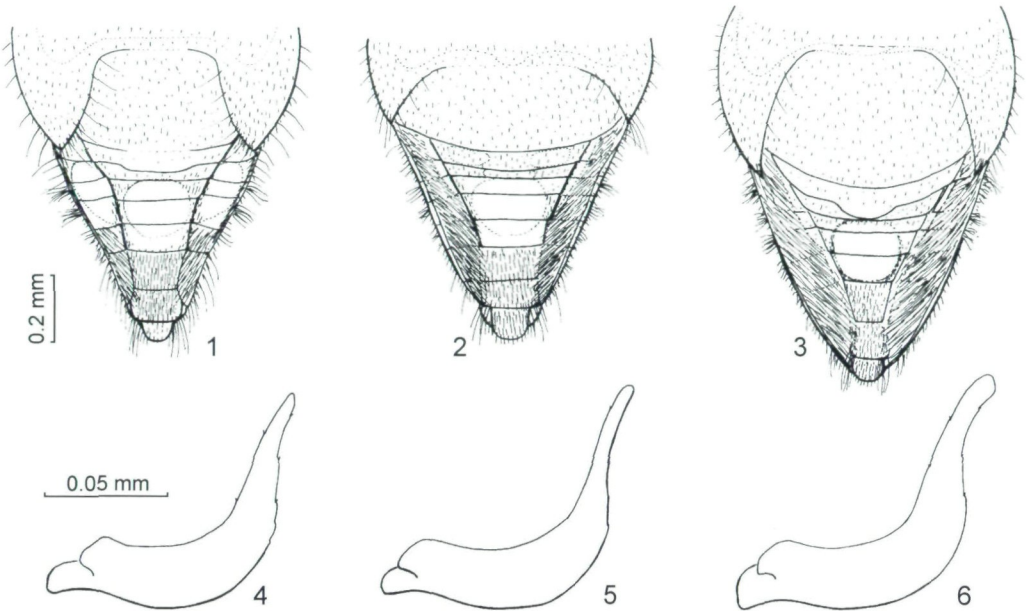
### Abbreviations of repositories:

CSSAC	Camarines Sur State Agricultural College, Pili, Camarines Sur, The Philippines
CNTN	Coll. N. Nieser, Tiel, The Netherlands
CZW	Coll. H. & S.V. Zettel, Vienna, Austria
NHMW	Naturhistorisches Museum, Vienna, Austria
OXUM	Oxford University Museum, England
PPCC	Coll. P.P. Chen, Beijing, China
UPLB	Museum of Natural History, University of the Philippines, Los Baños, The Philippines
ViSCA	Natural History Museum, Department of Plant Protection, Visayas State College of Agriculture, Baybay, Leyte, The Philippines

### Descriptions of new taxa

#### *Strongylovelia samarensis* sp.n. (Figs. 1, 4)

**Holotype** (apterous ♀): "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 16.3.\ 1998, leg.Zettel (162)" (UPLB); **paratypes**: 6 ♀♀, 9 ♂♂ (apterous), 1 ♀, 1 ♂ (macropterous), same label data (CZW, UPLB); 9 ♀♀, 15 ♂♂ (apterous) same label data except "... 25.1.2000\ leg. H. Zettel (217)" (NHMW, UPLB); 11 ♀♀, 2 ♂♂ (apterous) "Philippinen: N. Samar\ San Joaquin, Lologayan\ Falls, 27.1.2000\ leg. H. Zettel (219a)" (NHMW, UPLB); 2 ♀♀, 2 ♂♂ (apterous) same label data except "... (219b)" (NHMW).



Figs. 1 - 6: (1 - 3) Posterior corners of meso-metanotum and abdomen of apterous female, dorsal view (pilosity half-schematic): (1) *S. samarensis* sp.n.; (2) *S. marinduquensis* sp.n.; (3) *S. philippinensis surigaoensis* ssp.n.; (4 - 6) left paramere, lateral view: (4) *S. samarensis* sp.n.; (5) *S. marinduquensis* sp.n.; (6) *S. philippinensis surigaoensis* ssp.n.

### Description:

**Apterous female:** body length 1.43 - 1.58 mm; body width 0.82 - 0.89 mm; body tear-shaped, relatively broad; colour variable; holotype black except head along dorsal eye margin with obscure orange marks, mesonotum (except anterior and posterior corners), tergite 2, prosternum, mesosternum, mesopleura except brown mark on mesacetabula, metapleura in dorsal half, and lateral parts of sternites 2 - 3 pale yellow, median part of sternite 7, gonocoxae, and proctiger yellowish brown; between mesopleura and mesonotum with black band which very broad posteriorly and strongly narrowed anteriorly; antennomere 1 yellowish, 2 - 4 blackish; legs basally yellowish, distal parts of femora brownish, tibiae (except yellowish base of protibia) and tarsi dark brown to blackish; in most light paratypes head along dorsal eye margin with broad orange marks, mesonotum completely, tergite 1 medially, tergite 3 completely, lateral parts of sternites 2 - 5, and base of antennomere 2 yellow, sides of thorax completely yellow except small dark spot on metacetabula and dark band between mesopleura and mesosternum, which broadly interrupted anteriorly; in most dark paratypes tergite 2 with black midline; extent of dark colouration of legs also variable.

Median pronotal length 0.4 times eye length; mesothorax laterally with dense row of long black hairs; posterior corners of meso-metanotum relatively broad, with acute apex, with numerous long hairs (Fig. 1); sternite 2 laterally with few long black hairs; sternites 3 - 5 laterally with tufts of long curved black hairs; connexiva without erect hairs, only on sternite 7 with long semierect black hairs; tergite 8 with few long black

hairs at hind corners; tergites with very thin pubescence except on tergites 4 - 6; protibia with long black bristles; ventral pilosity on mesofemur and metafemur semierect, in distal half longer.

In dorsal aspect shape of abdomen (except inserted part of tergite 1) nearly equilateral-triangular (slightly longer) and sternites not clearly visible (Fig. 1); connexiva straightly converging; laterotergites directed laterodorsad, not covering tergites; laterotergites 3 - 5 with large, nearly bare (only medially and on laterotergite 5 with very few hairs), shiny impression reaching connexivum (Fig. 1); laterotergites 6 - 7 and tergites 7 and 8 with dense, brownish hair layer; connexivum of segment 7 apically angular; tergites anteriorly broad, posteriorly strongly narrowed; tergite 1 fused with metanotum and more or less fused with tergite 2, with straight hind margin; sutures between tergites 2 - 4 visible; tergite 2 with broad, shallow middle lobe on hind margin; tergite 3 with nearly straight hind margin; tergites 4 - 6 with deep impression; tergite 5 about 2.0 times as broad as long; tergite 8 without median impression; sternites 3 - 5 laterally close to connexivum with shiny areas.

**Apterous male:** body length 1.05 - 1.16 mm; body width 0.61 - 0.68 mm; body relatively broad; colour similar as in female except black stripe between yellow areas on mesonotum and mesopleura anteriorly rarely interrupted and often only weakly narrowed, all tergites and sternites black or only sternites 2 - 3 with small yellow mark, and yellow mark on metapleura often reduced to small spot; metanotum rarely with yellow mark laterally; terminalia yellowish.

Median pronotal length 0.4 times eye length; black hairs laterally on mesothorax as in female; hairs along connexiva long, more than twice as long as length of tergite 6; protibia externally and mesofemur and metafemur internally with thin black bristles, metafemur additionally with several long, spiny bristles; abdomen short, anterior tergites (1 - 4) slightly convex, the following nearly flat; tergite 1 fused with metanotum, sutures between tergites 1, 2, and 3 developed, but laterally inconspicuous in some specimens; tergite 5 about 8 times as wide as long; paramere evenly curved, distally strongly tapered, hardly twisted, weakly bent posteriorly, and with scanty indentation (Fig. 4).

**Macropterous female:** body length 1.48 mm; body width 0.85 mm; length of forewing 1.3 mm; similar to apterous female, but pronotum much larger, with obtuse humeral corners, with half-ovate yellow mark; sternites 2 - 5 with yellow marks and tergites 2 - 5 yellowish; wings clearly surpassing tip of abdomen, blackish, with some indications of longitudinal veins in basal third, without distinct closed cells; connexiva convex, with long erect bristles; tergites without basal longitudinal keels and without shining areas; all sutures between tergites well developed; structures on tergites and laterotergites more weakly developed than in apterous morph.

**Macropterous male:** body length 1.16 mm; body width 0.69 mm; length of forewing (from base to apex) 1.2 mm; similar to apterous male, pronotum and wings as in macropterous female; abdomen without longitudinal keels on basal tergites; all sutures between tergites well developed.

**Comparative notes:** *Strongylovelia samarensis* sp.n. belongs to the *S. philippinensis* group as defined by LANSBURY & ZETTEL (1997). All species of this group are very similar. *Strongylovelia samarensis* sp.n. shares the tufts of bristles on the lateral areas of ab-

dominal sternites of the female with *S. philippinensis* and *S. marinduquensis* sp.n., but differs from both species clearly in the broadly impressed, bare, and shining laterotergites 3 - 5 of the apterous female (Fig. 1). In all other species and subspecies of the group these laterotergites are laterally covered with dense pilosity (e.g., Figs. 2, 3), and only their medial parts are furrow-like impressed in some species. The presence of *S. p. philippinensis* on Samar (see below) supports the specific status of *S. samarensis* sp.n.

**Distribution:** Philippines: Northern Samar.

### *Strongylovelia marinduquensis* sp.n. (Figs. 2, 5)

**Holotype** (apterous ♀): "Philippinen: Marinduque\ 8 rd.km SW Boac\ (S Laylay), 13.2.1998\ leg. H. Zettel (135)" (UPLB); **paratypes:** 15 ♀♀, 7 ♂♂ (apterous), same label data (NHMW, UPLB).

#### **Description:**

**Apterous female:** body length 1.29 - 1.40 mm; body width 0.81 - 0.89 mm; body tear-shaped, relatively broad; colour slightly variable; black except head along dorsal eye margin with obscure orange marks, and pale yellow colour on mesonotum (except anterior and posterior corners), paired marks on tergites 2 and 3 (often obscure and tergite with broad dark midline, rarely completely yellow), prosternum, mesosternum, broad band dorsally on mesopleura and metapleura, and large mark dorsolaterally on sternite 2; median part of sternite 7, gonocoxae, and proctiger dark brownish; broad black band between mesopleura and mesonotum anteriorly narrowed but not interrupted; tergite 1 black, with small yellowish mark anteromedianly, or with stripe along midline nearly reaching hind margin; antennomere 1 yellowish, 2 - 4 dark brown; legs basally yellowish, but procoxa brownish, apex of mesotrochanter, mesofemur, distal half of metafemur, and all tibiae and tarsi blackish; in most light specimens base of mesofemur yellowish brown.

Median pronotal length 0.45 times eye length; mesothorax laterally with dense row of long black hairs; posterior corners of meso-metanotum acute, but relatively short, at apex with long hairs (Fig. 2); sternite 2 laterally with few black hairs; sternites 3 - 5 laterally with tufts of long curved black hairs, usually rather indistinct on sternite 5; connexiva without erect hairs, only on sternite 7 with long semierect black hairs; tergite 8 with few long black hairs at hind corners; tergites with very thin pubescence except medially on tergites 4 - 6; protibia with long black bristles; ventral pilosity on mesofemur and metafemur semierect, longer in distal half.

In dorsal aspect shape of abdomen (except inserted part of tergite 1) nearly equilateral-triangular (slightly shorter) and sternites hardly visible (Fig. 2); connexiva straightly converging; laterotergites directed (latero-)dorsad, not covering tergites; laterotergites 3 - 5 with narrow, bare, shiny impression in medial half, laterally hirsute; connexiva and tergites 7 and 8 with dense, brownish hair layer; connexivum of segment 7 apically angular; tergites anteriorly broad, posteriorly narrowed; tergite 1 fused with metanotum and medially weakly fused with tergite 2; all sutures between tergites visible; all tergites with straight hind margin; anterior tergites without middle lobe; tergites 4 - 6 with moderately deep, broad impression; tergite 5 about 2.8 times as broad as long; tergite 8 with indistinct median impression; sternites 2 - 5 laterally close to connexivum with shiny areas.

**Apterous male:** body length 0.97 - 1.04 mm; body width 0.59 - 0.64 mm; body relatively broad; colour similar as in female except black stripe between yellow areas on mesonotum and mesopleura anteriorly rarely interrupted, and all tergites and sternites black; terminalia dark brown.

Median pronotal length 0.4 times eye length; black hairs laterally on mesothorax as in female; hairs along connexiva long, more than twice as long as length of tergite 6; protibia externally and mesofemur and metafemur internally with thin black bristles, metafemur additionally with several long, spiny bristles; abdomen short, anterior tergites (1 - 4) slightly convex, the following nearly flat; tergite 1 medially more or less fused with metanotum, sutures between tergites well developed; tergite 5 about 6 times as wide as long; paramere evenly curved, distally strongly tapered and very narrow, slightly twisted, weakly bent posteriorly, and with scanty indentation (Fig. 5).

**Macropterous morphs:** unknown.

**Comparative notes:** *Strongylovelia marinduquensis* sp.n. belongs to the *S. philippinensis* group (LANSBURY & ZETTEL 1997), although it differs from all other species by the straight hind margins of tergites of the apterous female (Fig. 2). Further, the hind corners of the meso-metanotum are less acute (Fig. 2), and the impression on tergites 4 - 6 of the apterous female is less prominent than in other species of the group. The species group definition by LANSBURY & ZETTEL (1997) must be adjusted to these facts. However, *S. marinduquensis* sp.n. shares the tufts of setae on sternites 3 - 4 of the female with *S. philippinensis* and is in general similar to its nominotypical subspecies, from which the female of *S. marinduquensis* sp.n. usually can be distinguished by a darker colouration of the tergite 1 (but see exceptions in *S. p. philippinensis* below), dark apex of the abdomen, and a completely brown mesofemur. The occurrence of *S. p. philippinensis* on Marinduque is a strong support for the specific status of *S. marinduquensis* sp.n.

**Distribution:** Philippines: Marinduque.

### *Strongylovelia philippinensis surigaoensis* ssp.n. (Figs. 3, 6)

**Holotype** (apterous ♀): "Philippinen: Mindanao\ Surigao d.N., Bacuag\ Dugsangon, 9.2.2000\ leg. H. Zettel (234)" (UPLB); **paratypes:** 19 ♀♀, 26 ♂♂ (apterous), 1 ♂ (macropterous), same label data (NHMW, UPLB).

#### **Description:**

**Apterous female:** body length 1.55 - 1.64 mm; body width 0.82 - 0.89 mm; body tear-shaped, relatively broad; colour variable, but tergite 1 constantly black; holotype black except head along dorsal eye margin with obscure orange marks, mesonotum (except anterior and posterior corners), tergites 2 and 3, prosternum anteriorly, mesosternum, mesopleura except brown mark on mesacetabula, metapleura dorsally, and sternites 2 - 3 laterally pale yellow, median part of sternite 7, gonocoxae, and proctiger yellowish, between mesopleura and mesonotum with black band which very broad posteriorly, strongly narrowed and weakly interrupted anteriorly; antennomere 1 yellowish, 2 - 4 blackish; legs basally yellowish, apices of profemur and mesotrochanter, mesofemur, distal half of metafemur, all tibiae and tarsi dark brown to blackish; in most light para-

types anterior corners of mesonotum and lateral parts of sternites 2 - 4; in most dark paratypes tergite 2 with black midline, tergite 3 black, only sternite 2 laterally with small yellowish mark, and terminalia orange; extent of dark colouration of legs also variable, e.g., base of protibia rarely yellowish.

Median pronotal length 0.4 times eye length; mesothorax laterally with dense row of long black hairs; posterior corners of meso-metanotum long and very acute, at apex with long hairs (Fig. 3); sternite 2 laterally with few long black hairs; sternites 3 - 4 laterally with tufts of long curved black hairs; connexiva without erect hairs, only on sternite 7 with long semierect black hairs; tergite 8 with few long black hairs at hind corners; tergites with very thin pubescence except medially on tergites 4 - 6; protibia with long black bristles; ventral pilosity on mesofemur and metafemur semierect, in distal half longer.

In dorsal aspect shape of abdomen (except inserted part of tergite 1) nearly equilateral-triangular (slightly shorter) and sternites not clearly visible (Fig. 3); connexiva straightly converging; laterotergites directed laterodorsad, not covering tergites; laterotergites 3 - 5 with narrow, bare, shiny impression in medial half, laterally hirsute; connexiva and tergites 7 and 8 with dense, brownish hair layer; connexivum of segment 7 apically angular; tergites anteriorly broad, posteriorly narrowed; tergite 1 fused with metanotum and more or less fused with tergite 2, with straight hind margin; sutures between tergites 2 - 4 visible; tergite 2 with broad middle lobe on hind margin; tergite 3 with medially slightly convex hind margin; tergites 4 - 6 with deep impression; tergite 5 about 2.9 times as broad as long; tergite 8 with shallow median impression; sternites 3 - 5 laterally close to connexivum with shiny areas.

**Apterous male:** body length 1.17 - 1.21 mm; body width 0.66 - 0.69 mm; body relatively broad; colour similar as in dark females, yellow colour even more reduced, with black stripe between yellow areas on mesonotum and mesopleura anteriorly not interrupted and often broad until anterior margin, with yellow mark on metapleura reduced to small spot in some specimens, with all tergites and sternites black; terminalia orange brown.

Median pronotal length 0.45 times eye length; black hairs laterally on mesothorax as in female; hairs along connexiva long, more than twice as long as length of tergite 6; protibia externally and mesofemur and metafemur internally with thin black bristles, metafemur additionally with several long, spiny bristles; abdomen short, tergites 1 - 4 weakly convex, tergites 5 - 7 nearly flat; tergite 1 medially fused with metanotum, sutures between tergites 1, 2, and 3 developed; tergite 5 about 7 times as wide as long; paramere evenly curved, distally evenly tapered, hardly twisted, distinctly bent posteriorly, and with scanty indentation (Fig. 6).

**Macropterous male:** body length 1.28 mm; body width 0.77 mm; length of forewing 1.4 mm; similar to apterous male, but pronotum much larger, with obtuse humeral corners, with half-ovate yellow mark; wings clearly surpassing tip of abdomen, blackish, with pale costal margin, with some indications of longitudinal veins in basal third, without distinct closed cells; connexiva with long erect bristles; tergites without basal longitudinal keels; all sutures between tergites well developed.

**Macropterous female:** unknown.

**Comparative notes:** *Strongylovelia philippinensis surigaoensis* ssp.n. is very closely related with the nominate form of this species, but is larger than all other species and subspecies of the *S. philippinensis* group except *S. samarensis* sp.n., which has very aberrant connexiva of the female, and exceptionally large specimens of *S. philippinensis philippinensis*. The constantly black coloration of the tergite 1 of the apterous female distinguish *surigaoensis* ssp.n. from the two other most similar subspecies *philippinensis* and *boholensis*. For identification of subspecies see also the key.

**Distribution:** Philippines: Mindanao: Surigao del Norte.

### New records and taxonomical changes

#### *Strongylovelia philippinensis philippinensis* LANSBURY & ZETTEL, 1997

*Strongylovelia philippinensis philippinensis* LANSBURY & ZETTEL, 1997: 66.

**Additional material examined:** 1 ♀, 1 ♂ (apterous), 2 ♂♂ (macropterous) "ILOCOS NORTE: PIDDIG.\ Tangaoan C. Nursery\ Paraiso Refor. Project\ 21 OCT. 1976\ A.A.BARROSO" (UPLB); 1 ♀ (apterous) "ZAMBALES\ SBF\ Triboa Mangrove\ 13 Apr 97/VPG/MS" (UPLB); 6 ♀♀ (apterous) "Philippinen: Luzon,\ Zambales, Subic Bay\ Triboa Mangrove, 7.12.\ 2000, leg.H.Zettel (260)" (NHMW, UPLB); 5 ♀♀, 5 ♂♂ (apterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Himaao Creek, 1.2.2002/ leg. H. Zettel (302)" (CZW, UPLB, CSSAC); 2 ♀♀ (apterous) "Philippinen: Marinduque\ NE Buenavista, Sihi\ source, 15.2.1998\ leg. H. Zettel (138)" (NHMW); 8 ♀♀, 4 ♂♂ (apterous) "Philippinen: Marinduque\ 1 km N Sihi, Malinao\ Spring, 16.2.1998\ leg. H. Zettel (139)" (NHMW, UPLB); 4 ♀♀, 10 ♂♂ (apterous) "Philippinen: Ticao Isl.\ W San Fernando, Mag-Kaipit\ Spring, 27.2.1998\ leg. H. Zettel (148)" (NHMW, UPLB); 20 ♀♀, 20 ♂♂ (apterous), 2 ♂♂ (macropterous, dealate) "Philippinen: Masbate Isl.\ 3.5 km SE Masbate, Tugbo\ Tugbo River, 2.3.1998\ leg. H. Zettel (152)" (NHMW, UPLB); 19 ♀♀, 17 ♂♂ (apterous), 2 ♀♀, 3 ♂♂ (macropterous, dealate) "Philippinen: Masbate Isl.\ 2 km S Baleno\ stream, 4.3.1998\ leg. H. Zettel (154)" (NHMW, UPLB, PPCC); 1 ♂ (apterous) "Philippinen: W. Samar\ E Basey, Sohoton NP,\ Sohoton River, 29.1.2000\ leg. H. Zettel (221a)" (NHMW); 20 ♀♀, 20 ♂♂ (apterous) "Philippinen: W. Samar\ E Basey, Sohoton NP,\ creek, 29.1.2000\ leg. H. Zettel (221b)" (NHMW, UPLB); 5 ♀♀, 2 ♂♂ (apterous) "Philippinen: Leyte\ Baybay, VISCA, stream\ 50m, 31.1.2000\ leg. H. Zettel (222a)" (NHMW, VISCA).

**Notes:** The nominotypical subspecies has been described from Central Luzon. As now more material from a large area of the Philippines is available, some variability of the populations is noteworthy: Only one of the four females from Ticao shows a large triangular yellow mark on tergite 1 which has been regarded diagnostic for the subspecies; two have a reduced mark and the fourth is lacking any yellowish dot. Mesofemora of males from Ticao vary from yellow to brown. Also females from Marinduque exhibit considerable variability in the size of the triangular yellow mark on tergite 1. Most of the females (except one) from Masbate and Leyte have a distinct (although sometimes rather small) yellow mark on tergite 1 and correspond well with the typical light specimens from Luzon. Females from Samar have this mark variable in size, but always present; they are in average larger than females of other populations. Females from Camarines Sur have the tergite 1 black or with a small yellow mark. Structural characteristics of all females studied are similar as in the populations from Central Luzon. Colour variations have hardly been recognized in any other subspecies so far, except in one melanistic female of *S. p. boholensis* (LANSBURY & ZETTEL 1997), but is here described for *S. samarensis* sp.n.

**Distribution:** Philippines: described from Central Luzon (Laguna and Quezon) (LANSBURY & ZETTEL 1997). Here newly recorded from northern Luzon (Ilocos Norte, Zambales), southern Luzon (Camarines Sur), Marinduque, Masbate, Ticao, Western Samar, and Leyte.



***Strongylovelia bukidnonica* LANSBURY & ZETTEL, 1997, stat.n.***Strongylovelia philippinensis bukidnonica* LANSBURY & ZETTEL, 1997: 71.**Additional material examined:** 1 ♀, 2 ♂♂ (apterous) "Philippinen: Mindanao\ Bukidnon, Malaybalay\ Kaamulan, 650 m, 15.-20.\ 3.2000, leg. Zettel (247)" (CZW).**Notes:** This species is so far only known from the province of Bukidnon. For change of status see *S. sibuyana*.***Strongylovelia sibuyana* LANSBURY & ZETTEL, 1997, stat.n.***Strongylovelia philippinensis sibuyana* LANSBURY & ZETTEL, 1997: 68.**Notes:** The subspecies *philippinensis*, *boholensis*, and *surigaoensis* ssp.n. are very similar to each other in the abdominal structures of the female and mainly distinguishable by size and colour. In contrast, females of the "subspecies" *sibuyana* and *bukidnonica* show distinct structural differences with *S. philippinensis* (see key); therefore, in a morphological species concept, both deserve specific rank. Moreover, the species status of *S. bukidnonica* is supported by the occurrence of *S. philippinensis surigaoensis* ssp.n. in Mindanao.***Strongylovelia palawanensis* LANSBURY & ZETTEL, 1997***Strongylovelia palawanensis* LANSBURY & ZETTEL, 1997: 62.**Additional material examined:** 27 ♀♀, 25 ♂♂ (apterous), 8 ♀♀, 6 ♂♂ (macropterous, 7 ♀♀, 4 ♂♂ dealate) "Philippinen: Palawan Pr.\ Busuanga Isl., 13 rd.km\ WNW Coron, Balulu Falls\ 2.2.1999, leg. Zettel (171)" (CZW, UPLB); 1 ♂ (apterous), Puerto Princesa, Cabayugan, Cabayugan River, stream in secondary forest, CR2, 16.XI.-11.XII.2000, leg. H. Freitag (UPLB).**Notes:** This species is so far recorded from the islands Palawan and Busuanga. The possible conspecific status of populations from Sabah (North Borneo) needs a more detailed analysis of the *S. esakii* species group.**Key to the apterous females of the Philippine species and subspecies of *Strongylovelia***  
(modified from LANSBURY & ZETTEL 1997)

- 1 All tergites wide, black, flat and with straight hind margin; tergite 5 about 6 times wider than long; posterior corner of meso-metanotum forming an obtuse angle (*S. esakii* group) (Palawan, Busuanga). .... ***S. palawanensis* LANSBURY & ZETTEL, 1997**
- Posterior tergites relatively narrow (Figs. 1 - 3); tergite 5 about 2 - 3 times wider than long; at least tergite 2 partly yellowish; tergites 1, 2, or 3, often with medio-caudal lobe; at least tergites 4 - 5 with deep medial impression; posterior corner of meso-metanotum usually forming a sharp angle (*S. philippinensis* group). ..... **2**
- 2 Sternites 3 - 4 (- 5) with distinct tufts of erect black hairs laterally, clearly visible in dorsal aspect of the specimen (Figs. 1 - 3). ..... **3**
- Sternites 3 - 5 without tufts of erect black hairs. .... **7**
- 3 Laterotergites 3 - 5 with deep groove reaching lateral margin, shining and bare on most of the surface, only medially with some short pubescence; posterior corner of meso-metanotum broad, with medial margin convex (Fig. 1) (Samar). ..... ***S. samarensis* sp.n.**

- Laterotergites 3 - 5 at most in medial half with furrow-like impression, at least in lateral half with dense pilosity similar to that on laterotergites 6 - 7; posterior corner of meso-metanotum narrow (Figs. 2, 3). ..... 4
  - 4 Hind margin of all tergites straight; posterior corner of meso-metanotum relatively short (Fig. 2) (Marinduque). ..... *S. marinduquensis* sp.n.
  - At least one of the tergites 1 - 3 (usually tergite 2) with distinct mediocaudal lobe; posterior corner of meso-metanotum relatively long (Fig. 3). ..... 5
  - 5 Connexiva strongly convergent, tergites therefore very narrow, tergite 5 about 2.0 - 2.5 times wider than long; tergite 8 without median impression; tergite 1 black or at most with yellowish hind margin; protibia and mesofemur blackish. .... 6
  - Connexiva less convergent (Fig. 3), tergites therefore broader, tergite 5 about 2.8 - 3.0 times wider than long; tergite 8 with shallow median impression; tergite 1 often with yellowish mark in anterio-medial part; legs often lighter coloured. ....  
..... *S. philippinensis* LANSBURY & ZETTEL, 1997
- With three geographical subspecies:
- a Body length 1.55 - 1.64 mm; tergite 1 completely black and with straight posterior margin (Fig. 3) (Mindanao: Surigao del Norte). ..... *S. p. surigaoensis* ssp.n.
  - Body length usually 1.32 - 1.50 mm, if exceptionally larger, then tergite 1 with medial lobe on posterior margin; tergite 1 usually with yellowish mark anterio-medially. .... **b**
  - b Tergite 1 usually with medial triangular yellowish mark, which more or less confluent with yellowish meso-metanotal mark; protibia and mesofemur often yellowish, apically brownish; suture between tergites 1 and 2 usually distinct and medially convex (Luzon, Marinduque, Ticao, Masbate, Samar, Leyte). .....  
..... *S. p. philippinensis*
  - Tergite 1 with narrow medial yellowish mark (very rarely lacking) not confluent with yellowish mark of meso-metanotum; suture between tergites 1 and 2 medially obsolete, if traceable, then straight (Bohol). .....  
..... *S. p. boholensis* LANSBURY & ZETTEL, 1997
  - 6 Tergite 1 completely black; postero-medial lobe of tergite 2 narrow and prominent; tergites 2 and 3 not fused (Sibuyan). ..... *S. sibuyana* LANSBURY & ZETTEL, 1997
  - Tergite 1 with yellowish hind margin; postero-medial lobe of tergite 2 broad and shallow, or indistinct if tergites 2 and 3 fused; laterotergite 2 with few very long, medially directed hairs, which lacking in all other species (Mindanao: Bukidnon). .....  
..... *S. bukidnonica* LANSBURY & ZETTEL, 1997
  - 7 Sternites 2 - 3 with yellow marks near to connexiva; tip of abdomen yellowish; abdomen slender, all sternites partially visible from dorsal aspect; tergites 1 - 3 with large middle lobes at hind margin (Cebu). ..... *S. cebuana* LANSBURY & ZETTEL, 1997
  - All sternites and tip of abdomen completely black; abdomen broad, only connexiva visible from dorsal aspect; tergites 1 - 3 with small middle lobes at hind margin (Mindoro). ..... *S. mindoroensis* LANSBURY & ZETTEL, 1997

### Acknowledgements

The author is very much obliged to Prof. Dr. Victor P. Gapud and Prof. Dr. Augusto C. Sumalde (both University of the Philippines, Los Baños), who enable his field work in the Philippines, and to Prof. Dr. Ma. Juliet Ceniza and Prof. Dr. Paciencia Milan (both Visayas State College of Agriculture) for their help and hospitality in ViSCA, Baybay, Leyte. Two field trips, during which material for this study has been collected, have been financially supported by the Austrian Ministry of Education and Cultural Affairs. Thanks are also due to Dr. Stefan Schödl (Natural History Museum Vienna) and to the authors wife, Sally V. Zettel, who helpfully accompanied him during one of these field trips; and to Dr. Ivor Lansbury (Oxford University Museum) and Dr. Yang Chang Man (Raffles Museum of Biodiversity Research, Singapore) for linguistic corrections to the manuscript.

### References

- ANDERSEN N.M., 1989a: The coral bugs, genus *Halovelie* BERGROTH (Hemiptera, Veliidae). I. History, classification, and taxonomy of species except the *H. malaya*-group. – *Entomologica scandinavica* 20: 75-120.
- ANDERSEN N.M., 1989b: The coral bugs, genus *Halovelie* BERGROTH (Hemiptera, Veliidae). II. Taxonomy of the *H. malaya*-group, cladistics, ecology, biology, and biogeography. – *Entomologica scandinavica* 20: 179-227.
- ANDERSEN N.M., 1992: A new genus of marine water striders (Hemiptera, Veliidae) with five new species from Malesia. – *Entomologica scandinavica* 22: 389-404.
- ESAKI T., 1924: On a new genus and species of the Gerridae from Formosa. – *Annales of the Entomological Society of America* 17(2): 228-230.
- ESAKI T., 1926: The water-striders of the subfamily Halobatinae in the Hungarian National Museum. – *Annales Musei Nationalis Hungarici* 23: 117-164.
- LANSBURY I., 1993: *Strongylovelia* (Veliidae) and *Metrobatopsis* (Gerridae) and associated pleustron Hemiptera of West New Britain. – *Tijdschrift voor Entomologie* 136: 15-22.
- LANSBURY I. & ZETTEL H., 1997: New species and subspecies of the genus *Strongylovelia* ESAKI (Insecta: Heteroptera: Veliidae) from Borneo and the Philippines. – *Annalen des Naturhistorischen Museums in Wien* 99B: 51-77.
- LUNDBLAD O., 1933: Zur Kenntnis der aquatilen und semiaquatilen Hemipteren von Sumatra, Java und Bali. – *Archiv für Hydrobiologie, Supplement-Band* 12: 1-195, 263-489, 21 pls.
- POLHEMUS J.T., 1979: Results of the Austrian-Ceylonese Hydrobiological Mission 1970, of the Institute of Zoology of the University of Vienna (Austria) and the Department of Zoology of the University of Sri Lanka, Vidyalankara Campus, Kelaniya. Part XIX: Aquatic and Semiaquatic Hemiptera of Sri Lanka from the Austrian Indo-Pacific Expedition, 1970-71. – *Bulletin of Fisheries Research Station, Sri Lanka* 29: 89-113.

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Annalen des Naturhistorischen Museums in Wien](#)

Jahr/Year: 2003

Band/Volume: [104B](#)

Autor(en)/Author(s): Zettel Herbert

Artikel/Article: [New species, subspecies, and records of \*Strongylovelia\* ESAKI, 1924 \(Insecta: Heteroptera: Veliidae\) from the Philippines. 183-193](#)