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Two new species of the genus *Pseudeucinetus* HELLER from Indonesia and the Solomon Islands (Coleoptera: Limnichidae: Thaumastodinae)

H. YOSHITOMI & N.S. PUTRA

Abstract

Two new species of the genus *Pseudeucinetus* HELLER (Coleoptera: Limnichidae: Thaumastodinae) are described: *Pseudeucinetus javanicus* sp.n. from Java (Indonesia) and *P. solomonicus* sp.n. from the Solomon Islands. A key to species and a check list of the genus are provided.

Key words: Coleoptera, Limnichidae, *Pseudeucinetus*, taxonomy, new species, Indonesia, Solomon Islands, habitat.

Introduction

The genus *Pseudeucinetus* HELLER, 1921 is represented by four described species occurring in the Oriental and Pacific Regions (SPANGLER 1995), but some undescribed species are known to exist (HERNANDO & RIBERA 2005). Many specimens previously collected were captured with light traps, therefore the true habitats of the species of this genus are unknown.

In the present paper, we describe two new species of the genus, and report the true habitat of *Pseudeucinetus javanicus*.

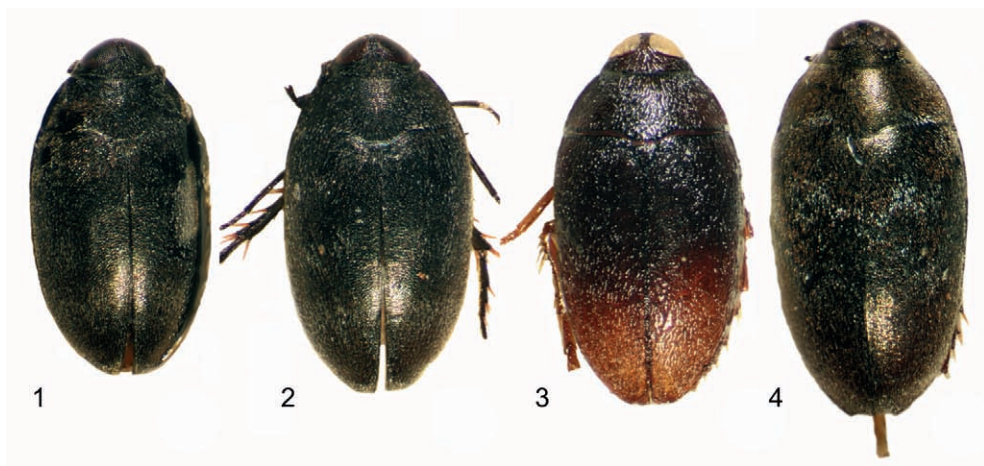
Material and methods

General dissection methods follow YOSHITOMI (2005). Some male and female genitalia were mounted on separate slides with Canada balsam.

Photographs were taken under a Leica MZ95 (Figs. 1–4) and an Olympus BH-2 (Figs. 16–19) with the Canon EOS Kiss X2 super system (© Microscope Network), and produced by automontage software Helicon® Focus ver. 4.70.5 Pro (Helicon Soft® Limited). In addition, Figs. 16–19 were arranged by Adobe Photoshop® CS4 ver. 11.0 using the tools of “invert” and “monochrome” (method following HAYASHI 2009). The distribution map was based on data from the Shuttle Radar Topography Mission (SRTM30) read by Kashmir 3D 8.8.2 (© Sugimoto Tomohiko).

Abbreviations:

EUM	Ehime University Museum, Matsuyama, Japan
NMW	Naturhistorisches Museum Wien, Austria
EL	length of elytra at suture
EW	maximum width of elytra
HL	head length in dorsal view
PL	mesal length of pronotum
PW	maximum width of pronotum
TL	total length (HL+PL+EL)



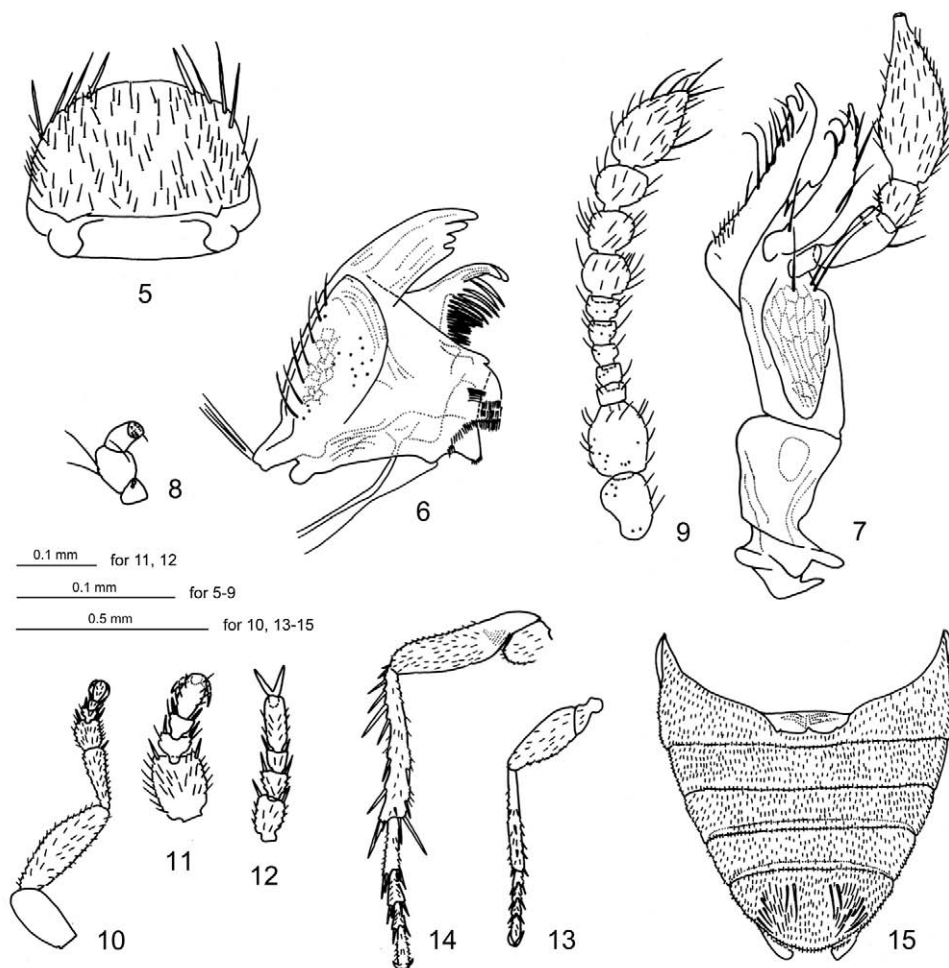
Figs. 1–4: Habitus, 1) *Pseudeucinetus javanicus*, male, holotype; 2) same, female, paratype; 3) *P. solomonicus*, male, holotype; 4) same, female, paratype.

***Pseudeucinetus javanicus* sp.n.**
(Figs. 1–2, 5–17, 20–24, 30–31)

TYPE MATERIAL: Holotype (EUM, type no. 1172): ♂, “Progo Riv., Sleman Yogyakarta, Java INDONESIA 11. VIII. 2009 H. Yoshitomi leg.”. Paratypes (EUM, NMW): 1 ♂, 1 ♀, same data as for the holotype, ♂ mounted on slide no. HY 1120 and ♀ genitalia on slide no. HY 1122; 11 ♂♂, 2 ♀♀, “Dondong river, Pengkol, Yogyakarta special Region, 7°53'8.63"S 110°36'0.37"E Java, INDONESIA 3. III. 2010 H. Yoshitomi leg.”; 51 ♂♂, 31 ♀♀, “Prambunan river, Banyusoco, 7°58'40.55"S 110°27'41.00"E, Jogjakarta, Java, Indonesia, 19. VIII. 2010 H. Yoshitomi lgt.”.

DESCRIPTION: Male (Fig. 1): Body elongate, moderately convex dorsally, slightly shining, densely covered with suberect setae throughout. Coloration of body black; elytra with obscure silver spots consisting of erect setae.

Head large, hypognathus; clypeus with straight anterior margin. Anterior margin of labrum (Fig. 5) arcuate, bearing long setae. Mandibles (Fig. 6) with four terminal teeth. Segment IV of maxillary palpi (Fig. 7) nipple-like. Labial palpi (Fig. 8) short. Eyes large, semicircular. Antennae (Fig. 9) short, reaching proximal 1/2 of pronotum; sockets situated near base of clypeus; relative length (width) of each antennal segment (n = 1, paratype) 17 (12) : 19 (15) : 7 (7) : 7 (7) : 7 (7) : 7 (7) : 7 (8) : 12 (12) : 12 (12) : 12 (12) : 25 (14). Pronotum transverse, broadest at the base; anterior margin straight; lateral margins evenly and gently arcuate; basal margin gently bisinuate; PW/PL 2.50. Scutellum small, equilateral triangular. Elytra oblong, broadest at the base, gently tapered apically; apices subtriangular, projecting ventrally; EL/EW 1.45; EL/PL 4.10; EW/PW 1.13; TL/EW 2.04. Fore legs (Fig. 10) short; tibiae short, expanded apically; tarsi (Fig. 11) densely covered with short normal setae on ventral surface, with stout setae in anterior angles of segments I–III; segment I enlarged, as long as tarsal segments II–IV combined; segments II–III widened. Middle tibiae (Fig. 13) with two pairs of stout setae on ventral surface. Hind tibiae (Fig. 14) bearing long setae on lateral margin, with two pairs of long tibial spurs. Sternites III–VI (Fig. 15) densely covered with short setae. Sternite VII (Fig. 16) with a pair of subtriangular projections rounded at apices, densely covered with short (anterior and mesal parts) and long (lateral parts) setae; two pairs of anterior extra setae (a) and five pairs of lateral extra setae (b) present.



Figs. 5–15: *Pseudeucinetus javanicus*, male (except for Fig. 12); 5) labrum; 6) left mandible; 7) left maxilla; 8) labial palpus; 9) left antenna; 10) fore leg; 11) fore tarsus of male; 12) fore tarsus of female; 13) middle leg; 14) hind leg; 15) sternites III–VII.

Sternite VIII slightly sclerotized; sternite IX (Fig. 20) moderately sclerotized, asymmetrical, with two long apical plates. Aedeagus (Figs. 21–22) long, well sclerotized; basal piece elongate, tapered basally, distinctly curved basally; lateral lobes long and slender, as long as basal piece, obtuse at apices, punctate sparsely, gently curved dorsally; median lobe long, as long as lateral lobes, evenly tapered apically, gently curved dorsally.

Female (Fig. 2): Sexual dimorphism of external features distinct in the following characteristics: fore tibiae long, not expanded apically; fore tarsi (Fig. 12) normal, tarsal segment I a little longer than segment II; PW/PL 2.60; EL/EW 1.47; EL/PL 4.40; EW/PW 1.15; TL/EW 2.02. Extra setae on sternite VII (Fig. 17) same as male. Urosternite (Fig. 23) moderately sclerotized, semicircular, protruding laterally, with long and slender apodeme. Ovipositor (Fig. 24) long, about 1.1 times as long as urosternite; coxite pointed at apices, densely covered with fine punctures, bearing short apical setae; approximate ratio of coxite and baculus as ($n = 1$) 1.0 : 4.5.

MEASUREMENTS: Male (n = 1): TL 1.73 mm; PW 0.75 mm; PL 0.30 mm; EL 1.23 mm; EW 0.85 mm. Female (n = 1): TL 1.82 mm; PW 0.78 mm; PL 0.30 mm; EL 1.32 mm; EW 0.90 mm.

TAXONOMIC REMARKS: Judging from the shapes of male genitalia, this species is related to *P. uenoi* SPANGLER known from Malaysia, and differs from it by the characters described in the key below.

BIOLOGICAL NOTES: The type series was collected (together with *Limnichus* sp. and *Acontoseles* sp.) from the splash zone of rocks in small rivers (Fig. 30). The specimens were active in the morning and evening (Fig. 31), but they hid in cracks or under the rocks during daytime. One specimen was also captured at light.

ETYMOLOGY: Named after the type locality.

***Pseudeucinetus solomonicus* sp.n.**

(Figs. 3–4, 18–19, 25–29)

Pseudeucinetus zygops: SATÔ 1994: 173 [in part].

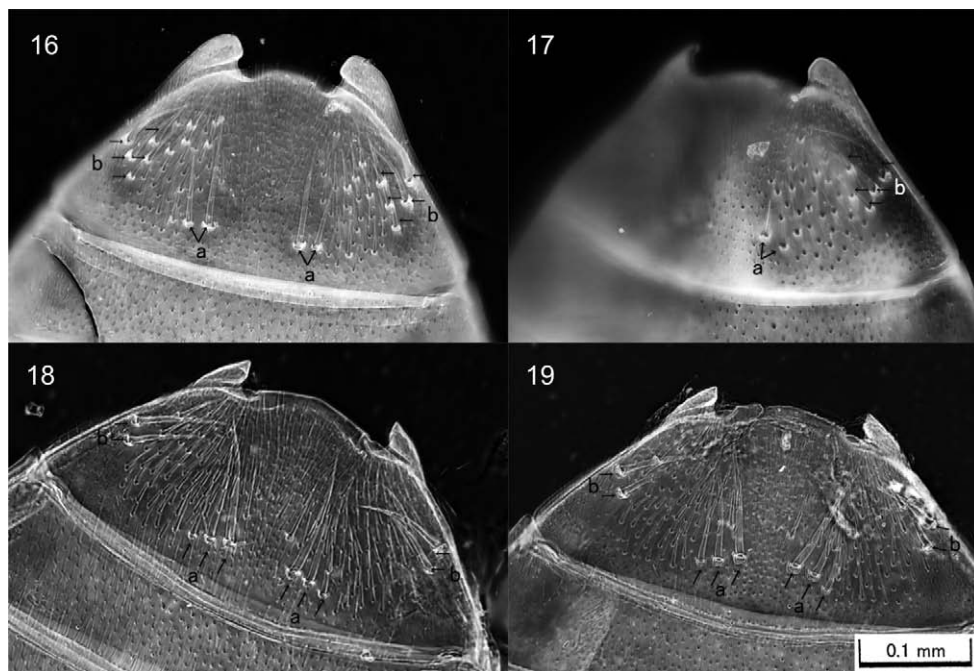
TYPE MATERIAL: Holotype (EUM, type no. 1173): ♂, “Santa Catalina Island VII-2-33”, “Solomon Islands”, “M Willows Jr. Collector”, “Templeton Crocker Exped. 1933”, genitalia on slide no. HY 1121. Paratypes (EUM, NMW): 1 ♀, same data as for the holotype; 2 ♀♀, “Santa Anna Island VII-3-33”, “Solomon Islands”, “M Willows Jr. Collector”, “Templeton Crocker Exped. 1933”, 1 ♀ genitalia on slide no. HY 1123.

DESCRIPTION: Male (Fig. 3): Body elongate, moderately convex above, shining, densely covered with suberect setae throughout. Coloration of body black, but elytra somewhat brownish in holotype.

Head large, hypognathus; clypeus with straight anterior margin. Eyes large, semicircular. Antennae short, reaching proximal 1/2 of pronotum; sockets situated near base of clypeus. Pronotum transverse, broadest at the base; anterior margin straight; lateral margins gently arcuate; basal margin weakly bisinuate; PW/PL 2.60. Scutellum small, equilaterally triangular. Elytra oblong, broadest at the base, gently tapered apically; apices broadly quadrate, projecting ventrally; EL/EW 1.48; EL/PL 4.43; EW/PW 1.15; TL/EW 2.03. Legs as in *P. javanicus*. Sternites III–VI densely covered with short setae. Sternite VII (Fig. 18) with a pair of subtriangular projections pointed at apices, densely covered with short (anterior and mesal parts) and long (lateral parts) setae; three pairs of anterior extra setae (a) and two pairs of lateral extra setae (b) present.

Sternite VIII slightly sclerotized, with densely set short spines; sternite IX (Fig. 25) moderately sclerotized, asymmetrical, with two long apical plates with pointed apices. Aedeagus (Figs. 26–27) long, well sclerotized; basal piece oblong, widest at the middle, weakly curved dorsally; lateral lobes long, about 1.2 times as long as basal piece, subparallel-sided near base to apices, obtuse at apices, punctate sparsely, with a pair of inner projections on apical 1/5; median lobe short, about 0.8 times as long as lateral lobes, tapered apically, nipple-like in apical part, slightly curved dorsally.

Female (Fig. 4): Sexual dimorphism of external feature as in *P. javanicus*; PW/PL 2.67–2.87 (2.77); EL/EW 1.49–1.54 (1.52); EL/PL 4.63–4.73 (4.68); EW/PW 1.10–1.13 (1.11); TL/EW 2.02–2.10 (2.06). Extra setae on sternite VII (Fig. 19) same as male. Urosternite (Fig. 28) moderately sclerotized, somewhat semicircular, with narrow lateral arms, with long and slender apodeme. Ovipositor (Fig. 29) long, about 1.1 times as long as urosternite; coxite pointed at apex, densely covered with fine punctures; approximate ratio of coxite and baculus as (n = 1) 1.0 : 5.4.



Figs. 16–19: Sternite VII in male (16, 18) and female (17, 19); 16–17) *Pseudeucinetus javanicus*; 18–19) *P. solomonicus*.

MEASUREMENTS: Male ($n = 1$): TL 1.83 mm; PW 0.78 mm; PL 0.30 mm; EL 1.33 mm; EW 0.90 mm. Female ($n = 2$): TL 1.89–1.92 (1.91) mm; PW 0.80–0.86 (0.83) mm; PL 0.30 mm; EL 1.39–1.42 (1.41) mm; EW 0.90–0.95 (0.93) mm.

TAXONOMIC REMARKS: This species is related to *P. novabritannica* DELÈVE known from the Bismarck Archipelago, and differs from it by the characters listed in the key below.

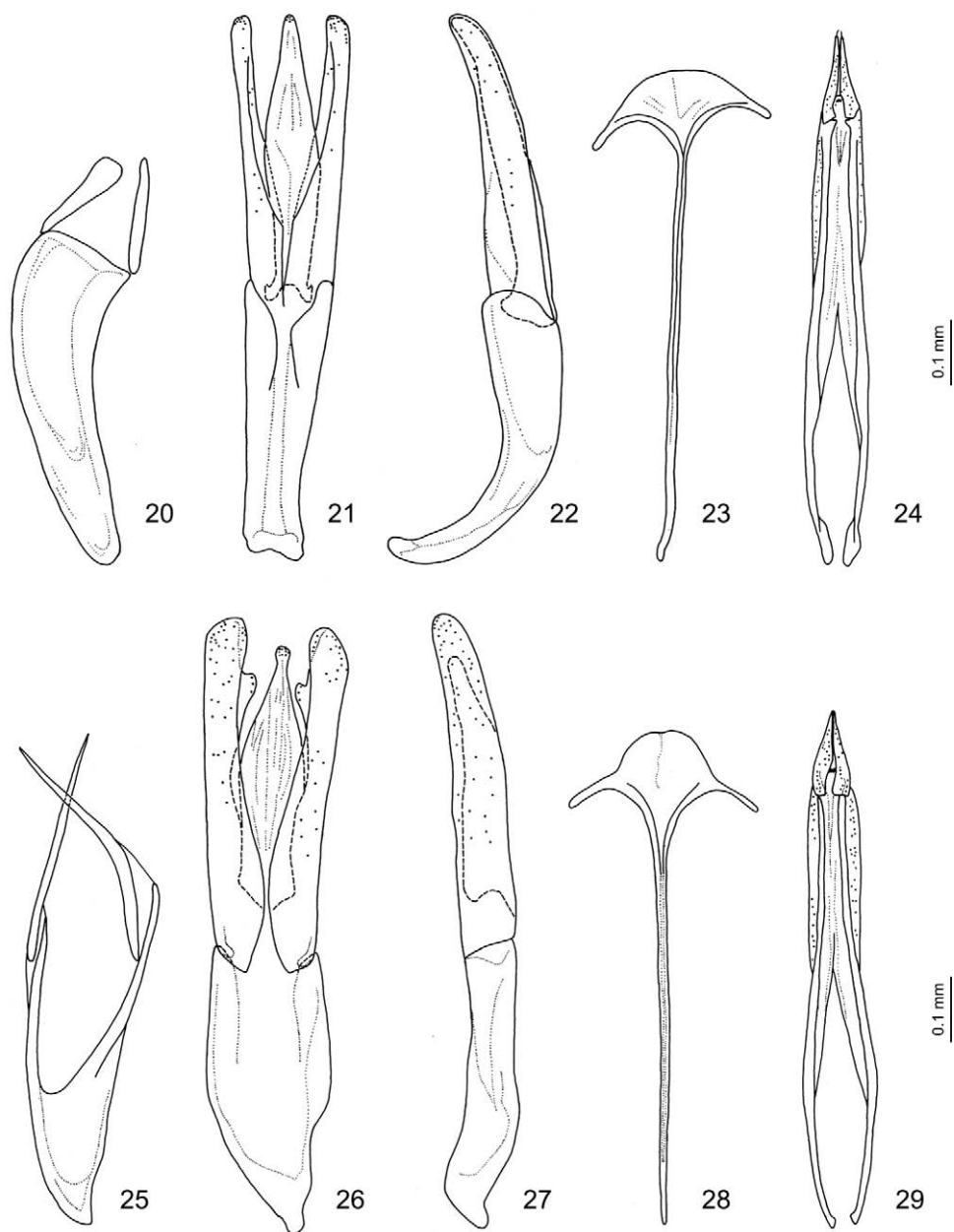
Pseudeucinetus solomonicus was recorded incorrectly from the Solomon Islands as *P. zygops* by SATÔ (1994). Therefore the record of *P. zygops* from the Solomon Islands is deleted.

ETYMOLOGY: Named after the type locality.

Discussion

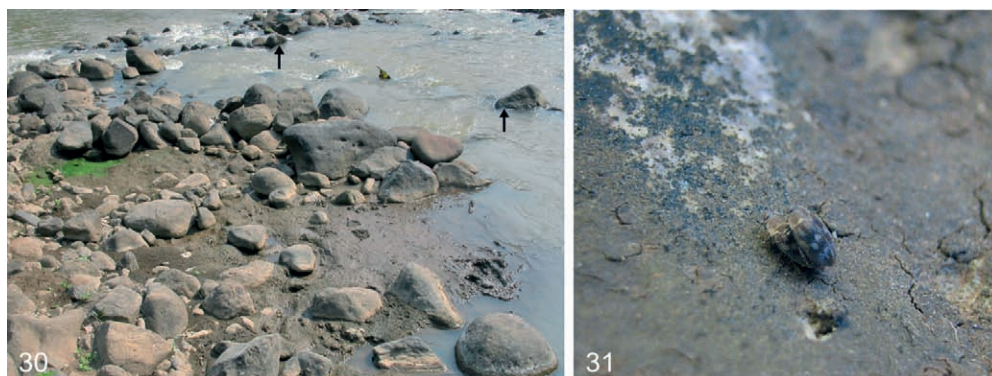
The distribution of the species of *Pseudeucinetus* is shown in Fig. 32. *Pseudeucinetus zygops* HELLER, 1921 is widely distributed from India to Bismarck Archipelago, but the other species obviously have limited distributions.

The subfamily Taumastodinae is represented by five genera. Of these, three genera (*Mexico* SPILMAN, 1972, *Babalimnichus* SATÔ, 1994 and *Martinius* SPILMAN, 1959) live on rocky seashores, while the remaining genera (*Acontosceles* CHAMPION, 1924 and *Pseudeucinetus*) occur in fresh water environments, e.g. around water falls, small rivers, or hygropetric habitats. It is interesting in an evolutionary view point that the genus *Pseudeucinetus* appears closely related to seashore genera *Martinius* and *Babalimnichus* based on external structures.



Figs. 20–24: *Pseudeucinetus javanicus*; 20) male sternite IX; 21) aedeagus in ventral view; 22) same, lateral view; 23) urosternite; 24) ovipositor.

Figs. 25–29: *P. solomonicus*; 25) male sternite IX; 26) aedeagus in ventral view; 27) same, lateral view; 28) urosternite; 29) ovipositor.



Figs. 30–31: *Pseudeucinetus javanicus*; 30) collecting site, Progo River, arrows indicate where specimens were collected; 31) adults in Prambupan River.

Check list of the species of *Pseudeucinetus*

<i>Pseudeucinetus javanicus</i> sp.n.	Indonesia (Java)
<i>Pseudeucinetus novabritannica</i> DELÈVE, 1973	Bismarck Archipelago (New Britain), Papua New Guinea
<i>Pseudeucinetus solomonicus</i> sp.n.	Solomon Islands (Santa Catalina, Santa Anna)
<i>Pseudeucinetus spilmani</i> SPANGLER, 1995	Indonesia (Bacan)
<i>Pseudeucinetus uenoi</i> SPANGLER, 1995	Borneo
<i>Pseudeucinetus zygops</i> HELLER, 1921	India, Malay Peninsula, Philippines (Balabac, Palawan, Mindanao, Negros), Indonesia (Sulawesi), Bismarck Archipelago (New Ireland)

Key to the species of *Pseudeucinetus*, based on male genitalia

- 1 Lateral lobes with a pair of small projections on inner margins 2
- Lateral lobes without any projections on inner margin 3
- 2 Subapical inner projections of lateral lobes small; subbasal inner projections of lateral lobes distinct and acute; basal piece short, about 0.5 times as long as lateral lobe ***novabritannica***
- Subapical inner projections of lateral lobes large and distinct; subbasal inner projections of lateral lobes absent; basal piece long, about 0.8 times as long as lateral lobe ***solomonicus***
- 3 Apex of median lobe of aedeagus acuminate in dorsal or ventral view 4
- Apex of median lobe of aedeagus nipple-like in dorsal or ventral view ***spilmani***
- 4 Median lobe strongly pointed at apex, straight in lateral margins; basal piece gently curved dorsally ***zygops***
- Median lobe weakly pointed at apex, arcuate in lateral margins; basal piece strongly curved dorsally 5
- 5 Apices of lateral lobes straightly acute; median lobe widest at the middle ***uenoi***
- Apices of lateral lobes obtuse; median lobe widest at basal part ***javanicus***

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Museum of Entomology, University of California) and Dr. Paul E. Skelley (Florida State Collection of Arthropods, Florida Department of Agriculture) for reading the draft of this paper, and Mr. Ahmad Taufiq Arminudin, Mr. Albertus Priyadi, and Miss Nugrahenny Setya Prabandari (Gadjah Mada University) and Mr. Keizo Takasuka (EUM) for their help in field investigations. Part of this work was supported by JSPS Exchange Program for East Asian Young Researchers in Kochi University.

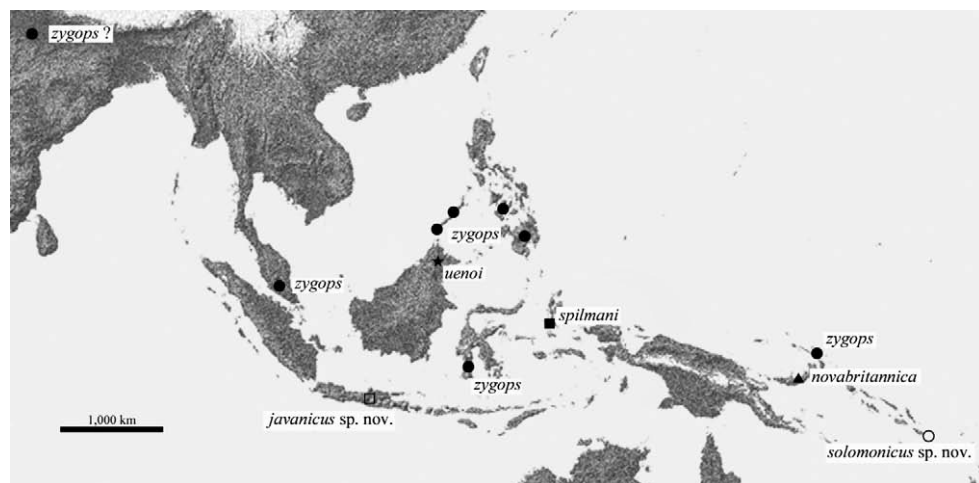


Fig. 32: Geographical distribution of the species of *Pseudeucinetus*.

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Dr. Hiroyuki YOSHITOMI

Ehime University Museum, Bunkyo-chô 3, Matsuyama, 790-8577 Japan (hymushi@agr.ehime-u.ac.jp)

Dr. Nugroho Susetya PUTRA

Laboratory of Basic Entomology, Faculty of Agriculture, Gadjah Mada University, Jl. Flora 1, Bulaksumur, Jogjakarta, 55281 Indonesia

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Autor(en)/Author(s): Yoshitomi Hiroyuki

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