

SHORT COMMUNICATION

## Four new Australo-Oriental species of *Paraneseuthia* (Coleoptera: Staphylinidae: Scydmaeninae)

Paweł JAŁOSZYŃSKI

Museum of Natural History, University of Wrocław, Sienkiewicza 21, 50-335 Wrocław, Poland; e-mail: scydmaenus@yahoo.com

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**Abstract.** Four new species of the eutheine genus *Paraneseuthia* Franz, 1986 are described: *P. luzonica* sp. nov. (the Philippines), *P. kaibesariana* sp. nov. (Indonesia: Kai Besar Is.), *P. tanimbariana* sp. nov. (Indonesia: Yamdena Is.), and *P. morobensis* sp. nov. (Papua New Guinea). Externally, these species share many characters with members of the SE Asian, Sundaland group within the genus. However, male genitalic structures of some of them resemble aedeagi of Australian *Paraneseuthia*, supporting previous phylogeographic hypotheses that assumed the origins of both north-eastern (Far Russian and Japanese) and south-eastern (Australian and Melanesian) *Paraneseuthia* from a Sundaland ancestor. The aedeagus of *P. morobensis* sp. nov. shows intermediary shape and structures between those of *P. quadrifoveata* Jałoszyński, 2010 of Borneo, Sabah, and that of *P. levigata* Jałoszyński, 2010 of eastern Papua New Guinea. The aedeagus of *P. tanimbariana* sp. nov., in turn, shows a striking similarity to that of the northern Australian *P. angustifurculata* Jałoszyński, 2013 and other species known to occur in Australia. The male genitalia of *P. luzonica* sp. nov. (the first species discovered in the Philippines), and especially of *P. kaibesariana* sp. nov., add unique features to the already known, great morphological diversity of the SE Asian members of *Paraneseuthia* that occupy the presumable evolutionary cradle of this genus.

**Key words.** Coleoptera, Scydmaeninae, Cephenniitae, Eutheini, *Paraneseuthia*, taxonomy, Australian Region, Oriental Region

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### Introduction

Among six extant genera of Eutheini (JAŁOSZYŃSKI 2014a), *Paraneseuthia* Franz, 1986 is most diverse in terms of the body shape and genitalic structures. This genus is unique among Scydmaeninae in having not 4-, but 3-segmented maxillary palps, with a large, fusiform terminal palpomere. It remains unknown whether the palpomere 4 has been completely reduced, or indistinguishably fused with the penultimate one. Morphological diversity, diagnostic characters and phylogenetic relationships of *Paraneseuthia* were subjects of a series of recent papers (JAŁOSZYŃSKI 2006, 2008, 2009, 2010, 2011, 2013, 2014a,b, 2015, 2018; JAŁOSZYŃSKI & HOSHINA 2004; KURBATOV 1990, 1991) that also remarkably expanded the known distribution of this genus. *Paraneseuthia* was originally proposed for a species found in Fiji (FRANZ 1986), and subsequently (at that time surprisingly) discovered

in the Russian Far East (KURBATOV 1990, 1991). FRANZ (1986) did not explicitly place his new genus in any tribe, but NEWTON & FRANZ (1998) listed it as a member of Cephenniini. The current placement within Eutheini was established by JAŁOSZYŃSKI & HOSHINA (2004), based on morphological study. *Paraneseuthia* currently comprises 24 nominal species distributed in Asia (India: Uttarakhand, Indonesia: Sumatra, Japan: Honshu, Kyushu, Malaysia: Perak, Pahang/Selangor, Sabah, Russian Far East: Kuril Is., Primorie, Turkey) and Australia-Pacific (Australia, Fiji, New Guinea). The greatest morphological diversity and species-richness can be found in SE Asia. Species that occur there show affinities to north-east Asian and Australian-Pacific groups that both seem to be derived from the Sundaland center (JAŁOSZYŃSKI 2011). The most surprising recent discoveries, a new sub-Himalayan (Indian), and even more unusual, a Mediterranean



(Turkish) species (JAŁOSZYŃSKI 2015), put in doubt the hypothesis of a strictly western Pacific dispersal proposed by JAŁOSZYŃSKI (2011). They await inclusion in a formal analysis to propose phylogeographic hypotheses better reflecting the current knowledge of this enigmatic genus. Meanwhile, new specimens from previously poorly studied areas became available, and their characters require documenting, before the aforementioned hypotheses can be revisited.

Four new species of *Paraneseuthia* are described below, from the area believed to be a center of diversity, and possibly also an evolutionary cradle of this genus.

### Material and methods

Dry-mounted specimens were relaxed in warm water and dissected. Aedeagi were dehydrated in isopropanol and xylene and mounted in Canada balsam. Habitus images were taken using a Nikon Coolpix 4500 digital camera mounted on a Nikon SMZ1500 stereoscopic microscope. Image stacks were processed using COMBINE ZP (HADLEY 2010).

Morphological terms follow JAŁOSZYŃSKI (2010). The measurements and abbreviations applied here are as follows (mean values are given when at least three specimens were available for measurements):

AeL	length of aedeagus (including apical projections of median lobe, if present);
AnL	length of antennae, measured in dorsal view;
BL	body length, a sum of lengths of head, pronotum and elytra measured separately;
EI	elytral index, length of elytra divided by their combined width;
EL	length of elytra measured along suture, from base to apex;
EW	maximum width of elytra, combined;
HL	length of anterior part of head capsule measured from anterior margin of clypeus to a hypothetical line joining posterior margins of eyes;
HW	width of head, including eyes;
PL	length of pronotum measured along midline;
PW	width of pronotum.

Studied specimens are deposited in the following collections:

cPJ	Paweł Jałoszyński collection, Wrocław, Poland;
EUMJ	Ehime University Museum, Matsuyama, Japan;
MHNG	Muséum d'Histoire naturelle de la Ville de Genève, Geneva, Switzerland.

The label data are quoted verbatim, with a slash (/) used to separate lines of text; comments on the appearance of the labels (e.g., the color) are given in square brackets.

### Taxonomy

#### *Paraneseuthia luzonica* sp. nov.

(Figs 1, 5–6)

**Type material.** HOLOTYPE: ♂, PHILIPPINES: three labels: '(PHILIPPINES) / Mt. Maquiling / alt. 400 m / Laguna Prov. / Luzon, 12. IX. / 1985, K. Ishikawa' [white, printed], 'Tullgren sample / of leaf litter' [white, printed], '*PARANESEUTHIA luzonica* / det. P. Jałoszyński, 2019 / HOLOTYPUS' [red, printed] (EUMJ). PARATYPES: 3 ♂♂ 3 ♀♀, same data as for holotype, except for yellow 'PARATYPUS' label (EUMJ, cPJ).

**Diagnosis.** Body strongly convex; frons and vertex in both sexes with median, slightly elongate, impunctate and glossy area demarcated by lateral rows of 2–3 small but distinct punctures, several similar punctures demarcate this area also anteriorly, forming an arcuate row or transverse group of punctures between antennal insertions; pronotum lacking transverse antebasal groove; punctures on elytra much more distinct than those on pronotum; aedeagus with median lobe broadest in submedian region, with strongly asymmetrical, subtriangular apex, lacking lateral projections, with a pair of asymmetrical, elongate sclerites partly protruding from ostium, one weakly curved, the other nearly U-shaped; parameres slender, each with one apical seta.

**Description. Male.** Body (Fig. 1) suboval, strongly convex; BL 0.94–0.99 mm (mean 0.96 mm); cuticle glossy, moderately dark reddish-brown, appendages indistinctly lighter, setae light brown.

Head broadest at eyes, HL 0.11–0.13 mm (mean 0.12 mm), HW 0.20 mm; vertex and frons confluent, their elongate, suboval median portions demarcated anteriorly and laterally by several deep punctures (2–4 on each side and 3 or more anteriorly, anterior punctures form arcuate transverse row, irregular oval or nearly triangle). Supraantennal tubercles weakly elevated. Median area of frons and vertex virtually impunctate and glossy; punctures on sides fine and inconspicuous; setae very short, suberect, sparse. Eyes large, bean-shaped, strongly convex. Antennae short, AnL 0.38–0.39 mm (mean 0.38 mm); antennomeres 1–2 each elongate, 3–8 each about as long as broad, 9 weakly transverse, 10 distinctly, but not strongly transverse, 11 distinctly broader than 10, about 1.7× as long as broad.

Pronotum in dorsal view subtrapezoidal, rounded, broadest slightly behind middle or near posterior third, PL 0.26–0.30 mm (mean 0.28 mm), PW 0.33–0.35 mm (mean 0.33 mm); anterior margin broadly rounded, lateral margins rounded, more strongly so in anterior third, weakly in posterior fourth; posterior pronotal corners obtuse-angled and blunt; posterior margin nearly straight; lateral antebasal impressions distinct, subtriangular, each accompanied by small and shallow but distinct pit closer to lateral margin than to middle, pits not connected by groove. Punctures on pronotal disc very shallow and small but dense, those at middle separated by distances shorter than diameters of punctures; setae short, sparse, suberect.

Elytra together oval, broadest near anterior third, EL 0.55–0.58 mm (mean 0.56 mm), EW 0.45–0.46 mm (mean 0.45 mm), EI 1.22–1.28; humeral calli small, elongate, elytral apices separately, broadly rounded. Punctures much larger and deeper than those on pronotum, those in anterior half separated by spaces subequal to diameters of punctures, punctures reduce in diameter and depth toward sides and apex; setae sparse, suberect, slightly longer than those on pronotum.

Legs moderately long and slender; unmodified, protibiae straight.

Aedeagus (Figs 5–6) bottle-shaped, moderately stout, AeL 0.23 mm, median lobe in ventral view broadest



Figs 1–4. Dorsal habitus of male holotypes. 1 – *Paranesouthia luzonica* sp. nov.; 2 – *P. kaibesariana* sp. nov.; 3 – *P. tanimbariana* sp. nov.; 4 – *P. morobensis* sp. nov.

in submedian region, with rapidly narrowed, strongly asymmetrical apical portion, which is trapezoidal with oblique distal margin; endophallus with pair of dark, asymmetrical elongate sclerites, one slender and only weakly curved, other nearly U-shaped; parameres slender, in lateral view weakly curved, each with one apical seta.

**Female** similar to male, with on average slightly higher EI. BL 0.89–0.93 mm (mean 0.91 mm); HL 0.10 mm, HW 0.19–0.20 mm (mean 0.20 mm), AnL 0.38 mm; PL 0.26–0.28 mm (mean 0.27 mm), PW 0.33 mm; EL 0.53–0.56 mm (mean 0.54 mm), EW 0.40–0.43 mm (mean 0.42 mm), EI 1.29–1.31.

**Etymology.** After the island of Luzon; adjective.

**Distribution.** The Philippines, southern Luzon, western part of Laguna Province.

**Remarks.** The aedeagus of *P. luzonica* does not show close similarities to male copulatory organs of any other known congener. The general bottle-like shape of the median lobe, with a rapidly tapered apical region, remotely resembles the aedeagus of *P. peckorum* Franz, 1986 (Fiji). However, in the latter species the apex of the median lobe is symmetrical, in contrast to the strong asymmetry visible in the same region in *P. luzonica*. Otherwise, the Philippine species resembles other SE Asian congeners in having a strongly convex, relatively stout body and a slightly modified frons. Consequently, examination of the unique aedeagus is necessary for unambiguous identification.

#### *Paranesouthia kaibesariana* sp. nov.

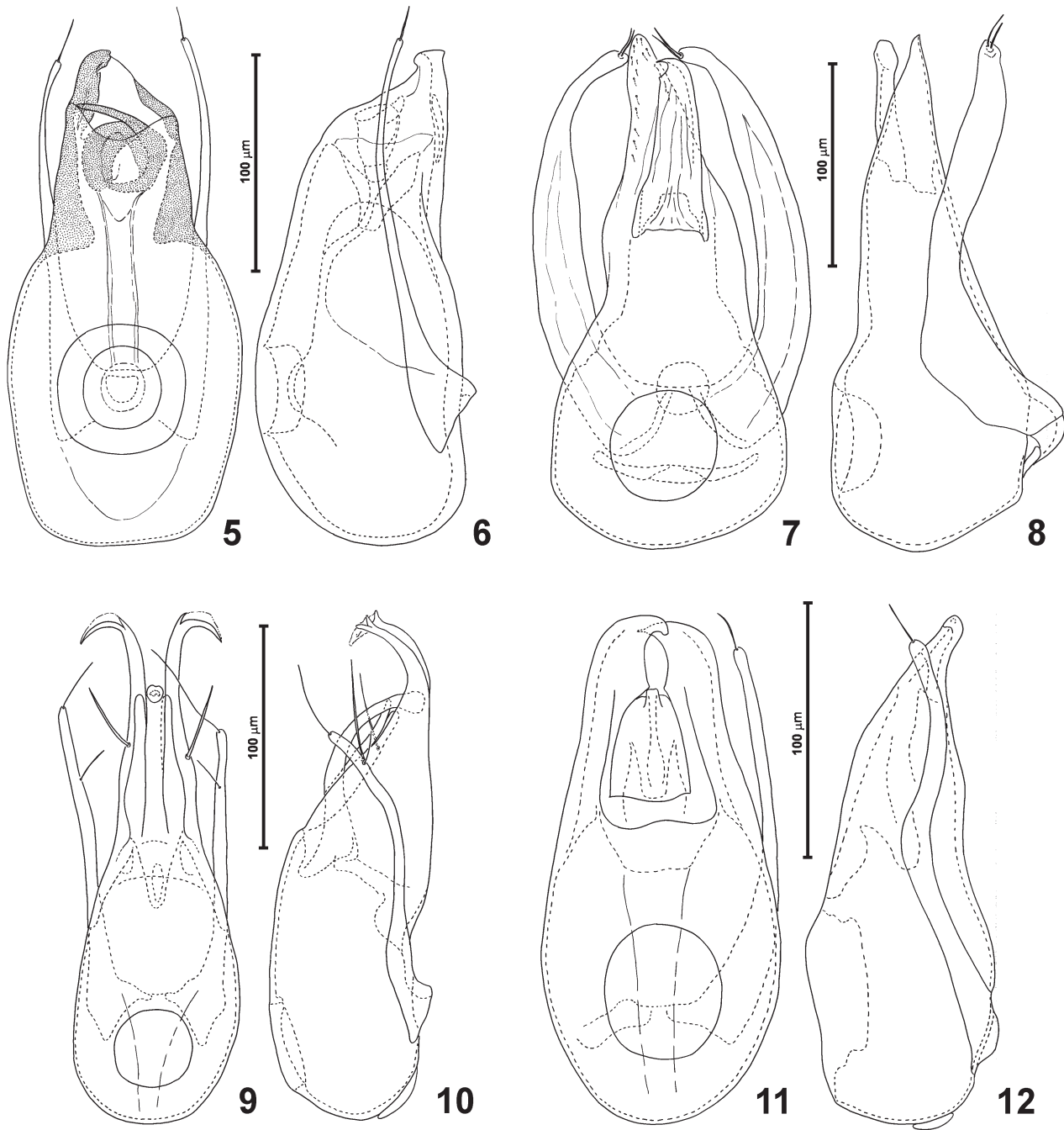
(Figs 2, 7–8)

**Type material.** HOLOTYPE: ♂, INDONESIA: MALUKU: KAI ISLANDS: two labels: ‘INDO: MALUC / Kai Bosar [sic!], Bombay / Agosti, leaf litter / 3.9.91 (4) F911018’ [white, printed], ‘*PARANESEUTHIA kaibesariana* / det. P. Jąłoszyński, 2019 / HOLOTYPE’ [red, printed] (MHNG).

**Diagnosis.** Body strongly convex; frons and vertex with median, strongly elongate, impunctate and glossy area demarcated by lateral impressed and irregular rows of several tiny punctures, several similar punctures indistinctly demarcate this area also anteriorly, forming irregular group between antennal insertions; pronotum lacking transverse antebasal groove; punctures on elytra much more distinct than those on pronotum; aedeagus with median lobe broadest in sub-basal region, with strongly elongate, subtriangular and asymmetrical apical region, subapical sclerites absent; parameres conspicuously broad from base to subapical region, where they are strongly narrowed and each bears two apical setae.

**Description. Male.** Body (Fig. 2) suboval, strongly convex; BL 1.25 mm; cuticle glossy, brown, appendages indistinctly lighter, setae light brown.

Head broadest at eyes, HL 0.18 mm, HW 0.26 mm; vertex and frons confluent, their strongly elongate, subrectangular median portion slightly convex and demarcated at each side by shallowly impressed row of several very small, irregularly distributed punctures; frons between antennal insertions with several similar punctures forming irregular



Figs 5–12. Aedeagus in ventral (5, 7, 9, 11) and lateral (6, 8, 10, 12) views. 5–6 – *Paraneseuthia luzonica* sp. nov.; 7–8 – *P. kaibesariana* sp. nov.; 9–10 – *P. tanimbariana* sp. nov.; 11–12 – *P. morobensis* sp. nov.

group demarcating median area anteriorly. Supraantennal tubercles weakly elevated. Median area of frons and vertex virtually impunctate, glossy; punctures on sides fine and inconspicuous; setae short, suberect, sparse. Eyes conspicuously large, only slightly bean-shaped, strongly convex. Antennae short, AnL 0.50 mm; antennomeres 1–2 each elongate, 3–6 each slightly elongate, 7 as long as broad, 8 indistinctly transverse, 9 and 10 each weakly transverse, 11 much broader than 10, about 1.7× as long as broad.

Pronotum in dorsal view inversely subtrapezoidal, rounded, broadest slightly in front of middle, PL 0.38 mm,

PW 0.44 mm; anterior margin broadly rounded, lateral margins rounded in anterior third, nearly straight and weakly convergent posterad in posterior third; posterior pronotal corners obtuse-angled and blunt; posterior margin weakly arcuate; lateral antebasal impressions distinct, subtriangular, each accompanied by small and shallow but distinct pit closer to lateral margin than to middle, pits not connected by groove. Punctures on pronotal disc very fine, inconspicuous; setae moderately long, sparse, suberect.

Elytra together oval, broadest near anterior third, EL 0.70 mm, EW 0.55 mm, EI 1.27; humeral calli small, elongate, elytral apices separately, broadly rounded.

Punctures much larger and deeper than those on pronotum, those in anterior half separated by spaces subequal to diameters of punctures, punctures reduce in diameter and depth toward sides and apex; setae sparse, suberect, slightly longer than those on pronotum.

Legs moderately long and slender; unmodified, protibiae slightly recurved, with median portion slightly thickened.

Aedeagus (Figs 7–9) subtriangular in ventral view, moderately stout, AeL 0.25 mm, median lobe in ventral view broadest near base, strongly narrowing distad, with a distinct broad constriction near middle followed by broad thickening and again strongly tapered in apical third, apex subtriangular and rounded, asymmetrical, bent to one side; ostium covered by ventral subapical plate, which is subtriangular, strongly elongate and with asymmetrical, hook-like apex; endophallus lacking darkly sclerotized components; parameres conspicuously modified, conspicuously broad from base to subapical region, apices narrowed, each with two apical setae, each paramere in lateral view bent at an obtuse angle near proximal third.

**Female.** Unknown.

**Etymology.** After the island of Kai Besar; adjective.

**Distribution.** Indonesia, Maluku Province, Kai (or Kei) Besar (not “Bosar”, as written on the label) island (= Great Kai Island, also Nuhu Yuut or Nusteen). The locality “Bombay” is a village NE of Eilat.

**Remarks.** *Paraneseuthia kaibesariana* is externally unremarkable and the only certain method to unambiguously identify this species is to examine the aedeagus. The male genitalia of *P. kaibesariana* are unique; no other known congener has such an elongate, subtriangular and undivided apical portion of the median lobe, nor such monstrously broadened parameres.

***Paraneseuthia tanimbariana* sp. nov.**

(Figs 3, 9–10)

**Type material.** HOLOTYPE: ♂, INDONESIA: MALUKU: TANIMBAR ISLANDS: two labels: ‘INDO:MALUC / Tanimbar: Yamdena Isls. / 22 km N Saumlaki, litter / Agosti 11.9.91 (9)’ [white, printed], ‘*PARANESEUTHIA / tanimbariana* / det. P. Jałoszyński, 2019 / HOLOTYPUS’ [red, printed] (MHNG). PARATYPE: ♀, same data as for holotype (MHNG).

**Diagnosis.** Body moderately convex; in both sexes frons between eyes with pair of distinct pits with diffuse margins separated by space subequal to their diameters; pronotum with narrow transverse groove connecting lateral antebasal pits; punctures on elytra superficial, inconspicuous; aedeagus with median lobe conspicuously slender, broadest in sub-basal region, with pair of long and slender lateral apical projections, each with its apical portion strongly curved laterad and with hyaline, sharply delimited area; distomedian portion of median lobe narrow and strongly elongate, in lateral view visible as curved projection with broadened apex; endophallus lacking dark sclerites; parameres slender, each with one apical and one subapical seta, one long seta is also inserted near middle of each lateral apical projection.

**Description. Male.** Body (Fig. 3) suboval, moderately convex; BL 0.78 mm; cuticle glossy, brown, appendages indistinctly lighter, setae light brown.

Head broadest at eyes, HL 0.10 mm, HW 0.18 mm; vertex and frons confluent; frons between eyes with pair of distinct pits with diffuse margins, each pit closer to the other one than to eye, distance between pits subequal to their diameters; vertex transverse, flattened. Supraantennal tubercles weakly elevated. Punctures on frons and vertex fine, inconspicuous, cuticle glossy; setae very short, suberect, sparse. Eyes large, only slightly bean-shaped, strongly convex. Antennae short, AnL 0.30 mm; antennomeres 1–2 each elongate, 3–5 each about as long as broad, 6–7 each slightly transverse, 8 strongly transverse, almost ring-like, 9 and 10 each distinctly, but not strongly transverse, 11 much broader than 10, indistinctly longer than broad.

Pronotum in dorsal view inversely subtrapezoidal, rounded, broadest slightly behind middle, PL 0.23 mm, PW 0.28 mm; anterior margin broadly rounded and demarcated from lateral margins by blunt and obtuse-angled but well-marked anterior corners; lateral margins weakly and almost evenly rounded, in posterior third weakly convergent posterad; posterior pronotal corners obtuse-angled and blunt; posterior margin in front of scutellar base straight, at each side indistinctly concave and slightly bent anterad; lateral antebasal impressions distinct, subtriangular, each accompanied by small and shallow but distinct pit closer to lateral margin than to middle, pits connected by narrow but distinct transverse groove. Punctures on pronotal disc very fine, inconspicuous; setae moderately long, sparse, suberect.

Elytra together oval, broadest slightly in front of middle, EL 0.45 mm, EW 0.33 mm, EI 1.38; humeral calli small, elongate, elytral apices separately, broadly rounded. Punctures much larger than those on pronotum but superficial and with diffuse margins, inconspicuous; setae sparse, suberect, slightly longer than those on pronotum.

Legs moderately long and slender; unmodified, protibiae nearly straight.

Aedeagus (Figs 9–10) slender, approximately drop-shaped, AeL 0.23 mm, median lobe in ventral view broadest in sub-basal region, strongly narrowing distad, with pair of long and slender lateral apical projections, each with distal region strongly curved laterad and with well-defined hyaline apical portion, each projection with long seta near middle of external margin; median apical portion of median lobe forms elongate, dorso-ventrally curved projection with thickened apex; endophallus lacking darkly sclerotized components; parameres slender, in lateral view each bent ventrad at an obtuse angle, each with one apical and one subapical seta, the latter far from apex.

**Female** externally very similar to male, slightly larger and with stouter elytra. BL 0.84 mm; HL 0.11 mm, HW 0.18 mm, AnL 0.30 mm; PL 0.25 mm, PW 0.30 mm; EL 0.48 mm, PW 0.38 mm, EI 1.27.

**Etymology.** After the Tanimbar Islands; adjective.

**Distribution.** Indonesia, Maluku Province, Tanimbar Islands (= Timur Laut), southern region of Yamdena Island.

**Remarks.** Adults of this species are unremarkable and identification is possible only by the conspicuously slender and complicated aedeagus with a bifurcate apex and a pair of thick lateral setae in the subapical region. No other Asian

species has a similar aedeagus. Similarities in the male genitalic structures can be found only in some congeners that occur in Australia. However, the Australian species have much more slender and more flattened body than the only known male of *P. tanimbariana*.

***Paraneseuthia morobensis* sp. nov.**

(Figs 4, 11–12)

**Type material.** HOLOTYPE: ♂, PAPUA NEW GUINEA: MOROBE PROVINCE: two labels: 'PAPUA NG:Morobe / Mt.Mission, Bitoi Rd / 1350m, 2.V.1992 / G. Cuccodoro #6A' [white, printed], '*PARANESEUTHIA / morobensis* / det. P. Jałoszyński, 2019 / HOLOTYPUS' [red, printed] (MHNG). PARATYPES: 3 ♀♀, same data as for holotype (MHNG, cPJ).

**Diagnosis.** Body strongly convex; in male frons between eyes with pair of indistinct, tiny and shallow punctures with diffuse margins separated by space much wider than their diameters; pronotum lacking transverse antebasal groove; punctures on elytra superficial, inconspicuous; aedeagus with median lobe broadest between base and middle, with pair of broad and relatively short lateral apical projections, each with its apical portion strongly curved mesad, so that apices overlap at middle; endophallus lacking elongate sclerites; parameres slender, each bent near middle at an obtuse angle and with one apical seta.

**Description. Male.** Body (Fig. 4) suboval, strongly convex; BL 1.09 mm; cuticle glossy, brown, appendages indistinctly lighter, setae light brown.

Head broadest at eyes, HL 0.14 mm, HW 0.25 mm; vertex and frons confluent; frons between eyes with pair of indistinct, shallow and barely noticeable punctures with diffuse margins, each puncture slightly closer to the other one than to eye, distance between pits much wider than their diameters; elongate median area between pits indistinctly more convex than sides of frons; vertex transverse, weakly convex. Supraantennal tubercles weakly elevated. Punctures on frons and vertex fine, inconspicuous, cuticle glossy; setae short, suberect, sparse. Eyes large, only slightly bean-shaped, strongly convex. Antennae short, AnL 0.48 mm; antennomeres 1–2 each elongate, 3 slightly elongate, 4–8 each about as long as broad, 9 and 10 indistinctly transverse, 11 much broader than 10, about 1.7× as long as broad.

Pronotum in dorsal view semi-oval, broadest near middle, PL 0.30 mm, PW 0.41 mm; anterior margin broadly rounded and confluent with lateral margins; sides strongly rounded in posterior third, weakly so in posterior half, weakly convergent posterad in posterior third; posterior pronotal corners obtuse-angled and blunt; posterior margin in front of scutellar base straight, at each side indistinctly concave and slightly bent anterad; lateral antebasal impressions developed as well-defined, deep and weakly elongate pits, each accompanied by tiny distinct pit closer to lateral margin than to middle, pits not connected by transverse groove. Punctures on pronotal disc very fine, inconspicuous, cuticle glossy; setae short, sparse, nearly recumbent or only slightly suberect.

Elytra together oval, broadest near anterior third, EL 0.65 mm, EW 0.50 mm, EI 1.30; humeral calli small, elongate, elytral apices separately, broadly rounded. Punctures much larger than those on pronotum but superficial and

with diffuse margins, inconspicuous; setae sparse, short, nearly recumbent or only slightly suberect.

Legs moderately long and slender; unmodified, protibiae nearly straight.

Aedeagus (Figs 11–12) drop-shaped, moderately stout, AeL 0.20 mm, median lobe in ventral view broadest between base and middle, strongly narrowing distad, with pair of short and broad lateral apical projections, each with distal region strongly curved mesad, their apices overlap at middle; endophallus lacking darkly sclerotized components; parameres slender, in lateral view each recurved, each with one apical seta.

**Female.** Externally very similar to male, lacking pair of punctures on frons and with slightly stouter elytra. BL 0.99–1.06 mm (mean 1.03 mm); HL 0.11–0.14 mm (mean 0.13 mm), HW 0.23 mm, AnL 0.45 mm; PL 0.28–0.33 mm (mean 0.30 mm), PW 0.38–0.41 mm (mean 0.40 mm); EL 0.60 mm, EW 0.48–0.50 mm (mean 0.49 mm), EI 1.20–1.26.

**Etymology.** After the Morobe Province; adjective.

**Distribution.** Papua New Guinea, east-central area of Morobe Province.

**Remarks.** *Paraneseuthia morobensis* is another unremarkable species that can be unambiguously identified only by examination of the male genitalia. The aedeagus, which is remotely similar to those of the sympatric *P. levigata* Jałoszyński, 2010 and the geographically distant *P. quadrifoveata* Jałoszyński, 2010 of Borneo, Sabah, has a pair of broad apical lobes curved mesad and with slightly overlapping apices; this character is not known in any other species of *Paraneseuthia*. The remaining known New Guinean species, *P. devia* Jałoszyński, 2008 and *P. guineana* Jałoszyński, 2009, have conspicuously slender and asymmetrical aedeagi, strongly differing from the stout and symmetrical copulatory organ of *P. morobensis*.

## Discussion

Four new species fill rather minor, but important gaps in the known distribution of *Paraneseuthia*. *Paraneseuthia luzonica* is the first species of the genus recorded from the Philippines. It clearly differs from the north-eastern group that inhabits Japan (including the Ryukyus) and the Russian Far East, which is characterized by a particularly small, relatively slender body form and unusually complicated aedeagi with an asymmetrical base and symmetrical apical structures of the median lobe. The aedeagus of *P. luzonica* is uniquely shaped and not similar to any male genitalia known previously in this genus. However, external characters (body form, modified frons) show close similarities with structures known in other SE Asian species of *Paraneseuthia*.

Specimens from the Moluccas have been already reported, but only females of undescribed species were known and remained undescribed (JAŁOSZYŃSKI 2011). *Paraneseuthia kaibesariana* and *P. tanimbariana*, even though occurring in a geographical proximity, differ considerably from each other. The aedeagus of *P. kaibesariana* is unique with no similar male genitalia previously known in this genus; the monstrously broadened parameres are espe-

cially highly unusual. Affinities of this species cannot be inferred without a formal analysis, but it seems certain that it strongly differs from the north-eastern, as well as from the Australian group of species. It adds another puzzling element to the unparalleled morphological diversity of SE Asian species of *Paraneseuthia*.

In contrast, possible affinities of *P. tanimbariana* seem evident. The aedeagus of this species strikingly resembles copulatory organs typical of Australian species; it has a symmetrical pair of long, slender and curved lateral apical projections, each bearing a long and thick lateral seta near middle, described previously for *P. angustifurculata* Jałoszyński, 2013 (Australia, Far North Queensland). Another northern Australian species, *P. dilatifurculata* Jałoszyński, 2013, has very similar projections, but the setae are inserted at their bases, on additional short subapical lateral lobes. Similar setae, but shorter and inserted on sides of apical region of the median lobe, have SE Asian species *P. joeparkeri* Jałoszyński, 2014b, and *P. titiwangsana* Jałoszyński, 2014b (both from Malay Peninsula). The two latter species do not bear long lateroapical projections, but have the apex of median lobe emarginate, with a short, subtriangular lateral lobe at each side. This may represent an ancestral condition, in relation to derived, strongly elongated lateral lobes transformed into long, slender projections, with the originally basal seta moved more distally, to reach the median site as in *P. tanimbariana* and its Australian relatives. A strong tendency of the median lobe to become emarginate, notched at middle or strongly bifurcate can be seen in most species, within all areas of occurrence; an extremely deep bifurcation that has led to a development of slender lateroapical projections is unique for species that occur in Australia, and for the newly described *P. tanimbariana*.

New Guinea was known to host the most unusual species of *Paraneseuthia*. *Paraneseuthia devia* and *P. guineana* of western New Guinea (Indonesia) have strongly asymmetrical, slender aedeagi, with the apical margin of median lobe slightly emarginate and oblique in relation to the long axis. Interestingly, the direction of the asymmetry (in ventral view the most distal site is the left apical corner of the median lobe) was previously found in *P. carltoni* Jałoszyński, 2011 and *P. booloumba* Jałoszyński, 2011 of NE Australia (JAŁOSZYŃSKI 2011), and now also in the newly described *P. kaibesariana* of the Moluccas. But the Australian species do not have a shallow emargination, instead they possess median lobes with deeply bifurcate apices, and an asymmetrical pair of lateroapical lobes of different lengths. *Paraneseuthia levigata* of eastern New Guinea (Papua New Guinea) also has a slender, but symmetrical aedeagus with a bifurcate apex, although the lateroapical projections are much shorter than those in most Australian species. The newly described *P. morobensis* has an intriguing aedeagus that appears as an intermediary form between that of its sympatric *P. levigata* (strongly elongate, slender, with lateral apical projections directed distomesad) and the geographically distant *P. quadrifoveata* of Borneo, Sabah (stout, with lateral apical projections broad and short and very strongly curved mesad, so that their apical portions overlap at middle). The aedeagus of *P. morobensis* is moderately slender, with broad lateral apical

projections that are curved mesad, but not as strongly as those in *P. quadrifoveata*. This species represents an interesting morphological link between central and far eastern Sundaland species.

The male genitalic structures, extremely diverse within *Paraneseuthia*, are not only the most reliable identification features, but proved to be crucial for reconstructing phylogenetic relationships between species (JAŁOSZYŃSKI 2011). Therefore, the newly described species, representing some interesting, possibly transitional character states in the male genitalia, may also be important for understanding relationships and historical dispersal events.

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