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Research article

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Two new species of *Engertia* Dalla Torre, 1913 and *Philacelota* Heller, 1900 from Indonesia and the Philippines with a revised identification key (Coleoptera: Scarabaeidae: Melolonthinae)

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Abstract. Two new species of the leucopholine genera *Engertia* Dalla Torre, 1913 and *Philacelota* Heller, 1900 are described. *Engertia allolepis* sp. nov. from Ambon Island in the Moluccas, Indonesia, can be distinguished from the other species of the genus by the heterogeneous setosity on the elytra as well as by a very robust and arcuate aedeagus. *Philacelota leucothea* sp. nov. from Luzon Island, Philippines, differs from the other species of *Philacelota* in the scaled whitish vestiture of the pronotum and elytra, as well as in the unidentate protibiae and in the shape of parameres. The length of the 3rd antennomere is the only reliable character for the separation of the genera *Engertia* and *Philacelota*. A revised dichotomous key for identification of males and females of all species of *Engertia* and *Philacelota* is given. The genus *Philacelota* is reported from the Philippines for the first time.

Keywords. Scarab beetles, *Engertia allolepis*, *Philacelota leucothea*, determination key, Indo-Australian Archipelago.

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Introduction

The genus *Engertia* Dalla Torre, 1913 (*Phila* Brenske, 1897, preoccupied name) includes moderately sized to small chafers characterized by the presence of an antennal club with five or six lamellae in the males and four or five lamellae in the females (Brenske 1897; Keith 2006). Six species have previously been described from Sri Lanka, the Philippines and eastern Indonesia to Papua New Guinea (Brenske 1897; Moser 1913; Keith 2006; Prokofiev 2016a). A historical overview and analysis of the systematic position of *Engertia* were provided by Keith (2006), and some additional data on the morphology and distribution were reported by Prokofiev (2015, 2016b).

The genus *Philacelota* Heller, 1900 was proposed for two species inhabiting northern Sulawesi and Sula Mangoli, Indonesia (Heller 1900). A third species from Flores Island was recently described by Zidek (2018). Members of *Philacelota* are very similar to those of *Engertia* in overall size, shape and vittae

elytra, and in the general shape of the aedeagi, but differ in the presence of seven lamellae in the male antennal club and in the long 3rd antennomere in both sexes (vs short in the members of *Engertia*).

The present contribution is devoted to the description of two new species of *Engertia* and *Philacelota* from the islands of Ambon and Luzon, respectively. The latter record considerably extends the known distribution range of the genus *Philacelota*.

Material and methods

All the measurements of the entire specimens are based on the combined length of the head, pronotum and elytra measured individually. Both the dorsal and ventral surfaces of the beetles are covered with modified (thin, flat, expanded to different degrees) setae here referred to as ‘scales’. Sometimes, the specimens appear to be more or less worn, with their scales lost to varying extents. However, the scaled areas can easily be distinguished from the glabrous ones by the presence of punctures, which are always setigerous in *Engertia* spp. The label data are cited verbatim. Separate labels are separated by ‘/’. The following collections were studied (their curators are listed in parentheses):

- cAP = the author’s working collection, Moscow, Russia
MNHN = Muséum national d’Histoire naturelle, Paris, France (O. Montreuil, A. Mantilleri)
NHM = Natural History Museum, London, United Kingdom (M. Barclay, M. Geiser)
ZMB = Museum für Naturkunde der Leibniz Gemeinschaft, Berlin, Germany (J. Frisch, J. Willers)

Comparative material examined

Engertia amboinae (Brenske, 1897): INDONESIA • 1 ♂, 2 ♀♀: “Molucc. Ambon / Ex Musaeo Van Lansberge”; MNHN • 2 ♂♂, 1 ♀; Ambon; MNHN • 1 ♀; “Ambon / Has / Ex Musaeo van Lansberge”; MNHN • 2 ♀♀; Ambon; NHM • 1 ♀; W. Irian, Yapen I., northern coast, Yapen Barat, Rosbori vill.; 14 Nov. 2012; A.M. Prokofiev leg.; cAP; • 1 isolated elytron; W. Irian, Miosidi islet between Biak & Yapen Is., sea coast; 15 Nov. 2012; A.M. Prokofiev leg.; cAP.

Engertia germanica Prokofiev, 2016: NEW GUINEA • 2 ♂♂ (holotype and paratype); D.N. Guinea, Berlinhafen; H. Schoede S.G.; ZMB • 1 ♂; “Nouv.-Guinee Duivenbode”; MNHN.

Engertia papuana (Moser, 1913): NEW GUINEA • 1 ♂; “Depapre area/Cyclops mts., Sentani”; 02°31–34’ S, 140°31’ E; 19–31 Feb. 2009; Zamesov, Sinyaev and Romanenko leg.; cAP.

Engertia setifera (Moser, 1913): INDONESIA • 1 ♂; “Has / Ambon / Ex Musaeo van Lansberge”; MNHN • 1 ♂; Seram I., Elpa Putih, ~ 40 km N of Sahulau vill., Waipia distr., on light; 17–20 Nov. 2011; A.M. Prokofiev leg.; cAP.

Philacelota submaculata Heller, 1900: INDONESIA • 1 ♂; “Celebes / Kema / Ex Musaeo van Lansberge”; MNHN • 3 ♀♀; “W. Celebes G. Tompoe Paloe J.P. Ch. Kalis 2700’”; 1937; MNHN.

A drawer containing Brenske’s and Moser’s types of *Engertia* in ZMB (type specimens of *E. maculosa* (Brenske, 1896), *E. papuana* and *E. setifera* according to the data provided in the museum catalogue) has not been available since 2014 when I requested these types for study (J. Willers, personal communications, 2014–2016). Thus, these type specimens were not included in the present study and their whereabouts is unclear at present. The data for *E. lii* Keith, 2006, *E. maculosa* and for females of *E. setifera* were taken from Brenske (1896), Moser (1913) and Keith (2006). The data for *P. jakli* Zidek, 2018 and *P. sulana* Heller, 1900 were taken from Heller (1900) and Zidek (2018).

Results

Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Family Scarabaeidae Latreille, 1802
Subfamily Melolonthinae Samouelle, 1819
Genus *Engertia* Dalla Torre, 1913

Engertia allolepis sp. nov.

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Figs 1, 2A–G

Diagnosis

Engertia, with five lamellae in antennal club of males. Disc of pronotum with irregular callose areas. Elytra with glabrous costae and scale pattern forming longitudinal bands on interstices; scales on elytra lanceolate in 1st to 3rd interstices, but intermixed with setiform scales on 4th and 5th interstices and along apical margin of elytra. Propygidium with dense long setae; pygidium fully scaled. Abdominal ventrites 2 to 4 with isolated round patches of scales along midline. Aedeagus strongly arcuate, robust.

Etymology

The species epithet is based on the Greek words ‘*allos*’, meaning ‘different’, and ‘*lepis*’, meaning ‘scale’, due to the heterogeneous scales covering the elytra.

Type material

Holotype

INDONESIA • ♂; “Molucc. Ambon / Has / Ex Musaeo van Lansberge”; MNHN.

Description (holotype)

Male

BODY (Fig. 1). Length 18.5 mm, greatest width 7.5 mm. Integument dark reddish-brown; vertex, pronotum and tarsal claws more infuscated; scales and pilosity yellowish to whitish.

HEAD. Clypeus pentagonal, with anterior margin weakly bisinuate in frontal view, slightly produced in middle and conspicuously reflexed; surface rugo-punctate; punctures moderately deep, bearing narrowly lanceolate to spiniform scales becoming much shorter and thinner along midline in posterior half of clypeus. Fronto-clypeal suture conspicuous, weakly concave. Frons rugo-punctate; punctures much denser along inner margins of eyes, bearing lanceolate scales replaced by moderately long erect setae on lateral thirds of anterior half-length of frons; vertex glabrous. Antennae consist of ten antennomeres, with five antennomeres in club (Fig. 2A); all antennomeres of club of equal length; 5th antennomere half as long as 4th, 3rd and 4th antennomeres of equal length; antennomeres of club strongly shagreened, antennomeres of funicle glabrous. Last maxillary palpomere elongate fusiform, with narrow, but deep impression on its outer side. Labrum weakly bilobed, covered by moderately long setae intermixed at sides with narrowly lanceolate scales; mentum deeply concave, bearing long setae along its lateral and posterior margins.

THORAX AND ABDOMEN. Pronotum narrower at base than base of elytra, 1.5 times as broad as long, broadest just before middle, strongly and almost equally convergent anteriorly and posteriorly; sides straight anteriorly, weakly concave posteriorly; anterior and posterior angles obtuse; anterior margin bisinuate; posterior margin strongly convex before scutellar shield; all sides of pronotum unbeaded. Pronotum roughly, but

not deeply and very unevenly punctured, punctures slightly rugose with interspaces between punctures on disc somewhat callose; glabrous and callose medial longitudinal stripe present; scales on pronotum mostly lanceolate, but intermixed on disc with few setiform scales; moderately long setae present along anterior margin and near anterior angles of pronotum only. Propleura setose, with dense patch of lanceolate scales in their anterior halves. Scutellar shield broadly rounded apically, only punctured along lateral sides; punctures bearing narrowly lanceolate scales. Elytra with five conspicuous glabrous costae; base of elytron somewhat swollen; humeral and apical umbones rather weakly expressed. Interstices shallowly, but densely punctured; punctures of 1st to 3rd interstices bearing lanceolate scales, partially replaced by setiform scales in 4th and 5th interstices and along apical margin of elytra (Fig. 2B–C). Propygidium finely and densely punctured; punctures setigerous, bearing long setae; distal margin of propygidium with few isolated lanceolate scales (Fig. 2C). Pygidium densely covered by lanceolate scales (Fig. 2D), setose along lateral and apical margins. Prosternum, mesoventrite and metaventrite densely and finely rugo-punctate, densely covered with long setae; disc of metaventrite, metepimeron and metepisternum bearing some scales. First abdominal ventrite flat in middle; 1st and 2nd ventrites setose, remaining ventrites with isolated setae in their lateral thirds only, except last visible ventrite bearing rather dense setae of moderate length along its distal margin; all abdominal ventrites covered by ovate (lanceolate in uppermost parts) scales, more densely aggregated in uppermost reaches of each ventrite, forming small round patches of scales on 2nd to 4th ventrites along midline of abdomen (Fig. 2E); sutures between 2nd and 5th abdominal ventrites obliterated in middle.

LEGS. Protibiae unidentate, with spur short and thick; middle and hind tibiae gracile; apex of hind tibiae with 12 separated bristles. Femora setose; lanceolate scales present on hind femora only; tibiae with sparse narrow scales and spiniform setae; tarsi with setae only. Tarsomeres 1–4 shortened, especially of fore tarsi; 1st tarsomere of hind tarsi equal to 2nd in length. Claws bifurcate, with lower lobe situated slightly closer to base of claw, parallel to upper one, distinctly shorter, but as broad as the latter.

GENITALIA. Aedeagus (Fig. 2E, G) strongly arcuate, robust; phallobase remarkably deepened distally; parameres considerably narrowed toward apex, their ventral contour very weakly arcuate and dorsal contour almost straight; apical extensions of parameres small, oval, not upturned.



Fig. 1. *Engertia allolepis* sp. nov., habitus, holotype, ♂ (MNHN). Scale bar = 2.5 mm.

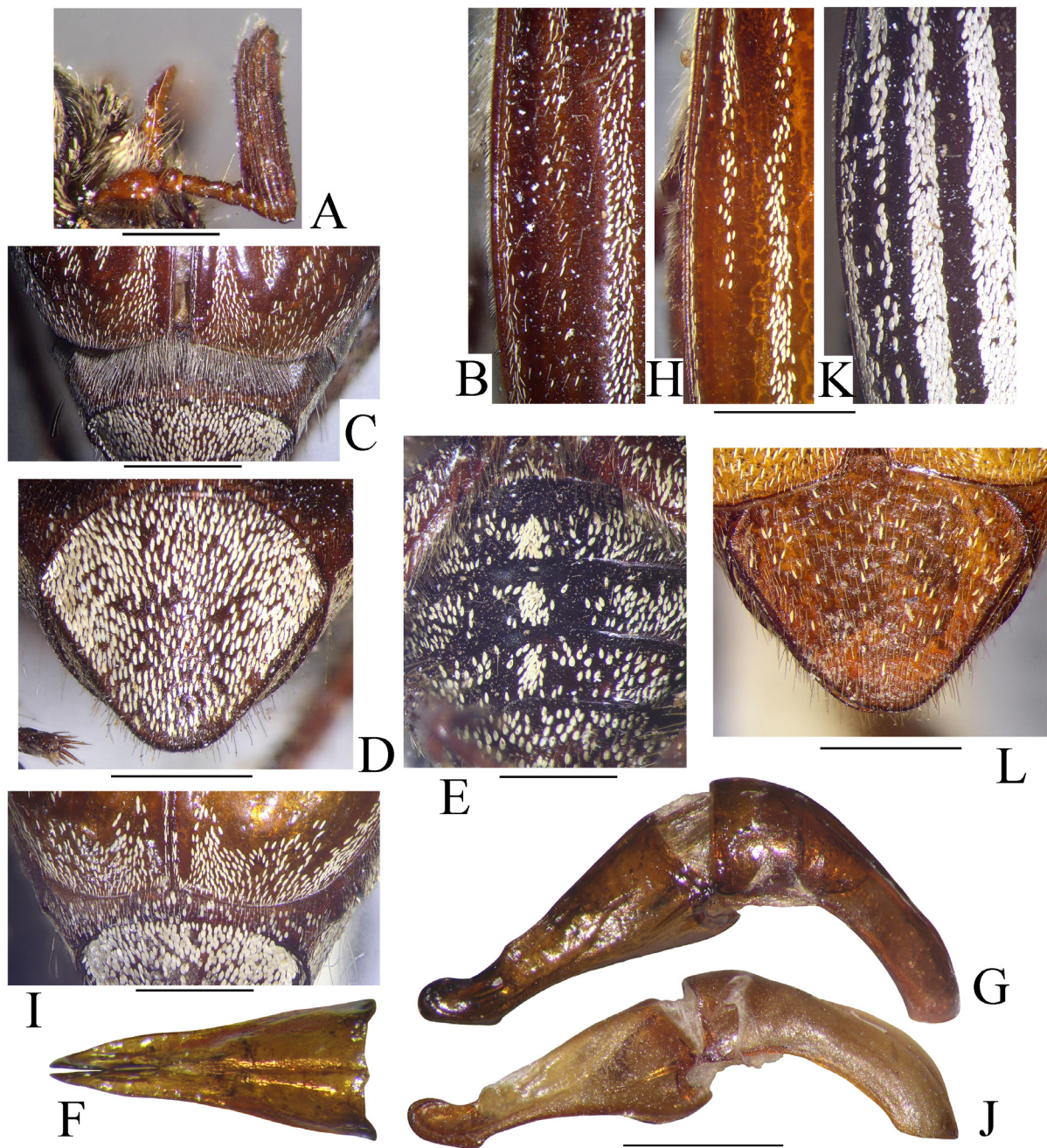


Fig. 2. A–G. *Engertia allosepis* sp. nov., holotype, ♂ (MNHN). A. Antenna. B. Lateral part of the elytron. C. Apical margin of elytra and propygidium. D. Pygidium. E. Abdominal ventrites 2–4. F. Parameres, dorsal view. G. Aedeagus, lateral view. — H–J. *E. papuana* (Moser, 1913), ♂, from Sentani (cAP). H. Lateral part of elytron. I. Apical margin of elytra and propygidium. J. Aedeagus, lateral view. — K. *E. amboinae* (Brenske, 1897), ♂, from Ambon (MNHN), lateral part of elytron. — L. *E. setifera* (Moser, 1913), ♂, from Seram, pygidium (cAP). Scale bars are in common for B, H and K, and for F–G and J. Scale bars: A–B, H, K = 1.5 mm, C–G, I–J, L = 2.5 mm.

Female

Unknown.

Differential diagnosis

Engertia allolepis sp. nov. is unique within the genus in the possession of both lanceolate and setiform scales in the outer elytral interstices (vs elytral scales more or less homogeneous in shape in all interstices in the other *Engertia* spp.; see Fig. 2H for representation). In other respects this new species is most similar to *E. papuana* (Moser, 1913), but differs from the latter in the much longer and denser pilosity of the propygidium (compare Fig. 2C and 2I) and in the somewhat callose disc of the pronotum. The aedeagi of *E. allolepis* sp. nov., *E. amboinae* (Brenske, 1897), *E. germanica* Prokofiev, 2016, *E. papuana* and *E. setifera* (Moser, 1913) are very similar to each other, but the aedeagus of *E. allolepis* sp. nov. is more arched in lateral view than that of the aforementioned species except *E. germanica*, and it can be further distinguished from the aedeagi of all the other species mentioned above in the deeper and broader apical portion of the phallobase and in the more robust and massive parameres (compare Fig. 2G with 2J as an example).

Engertia allolepis sp. nov. is known from Ambon Island, where two other members of the genus are distributed: *E. amboinae* and *E. setifera*. Besides the heterogeneous vestiture of the elytra and the more robust aedeagus, the new species can be distinguished from *E. amboinae* by the scales in the elytral interstices being much narrower (lanceolate to setiform vs ovoid: Fig. 2K), scales along midline of the abdominal ventrites aggregated into spots (vs not aggregated), propygidium with long (vs short) setae, and from *E. setifera* by the pygidium being densely covered with scales (vs mainly setose: Fig. 2L), scales along midline of the abdominal ventrites aggregated into spots (vs not aggregated), and scales present on labrum and metaventrite (vs absent).

Genus *Philacelota* Heller, 1900

Philacelota leucothea sp. nov.

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Figs 3–4, 5A–B

Diagnosis

Philacelota with squamose vestiture. Disc of pronotum with narrow, longitudinal callose stripe. Elytra evenly scaled in males, while in females the scaled areas are intermixed with glabrous ones to form a variegated pattern. Propygidium of males with short acicular setae and sparse long setae, of females with short setae only; pygidium fully scaled in males, but with glabrous medial longitudinal stripe in females. Scales along midline of abdominal ventrites 2 to 4 evenly distributed. Aedeagus of characteristic shape.

Etymology

The name of this new species reflects the white scale covering of the beetles. *Leucothea* ('white goddess') is a poetic epithet of a Greek goddess. The species epithet is treated as a noun in apposition.

Type material

Holotype

PHILIPPINES • ♂; "N O Luzon / Philippines Ch. Semper"; MNHN.

Paratypes

PHILIPPINES • 1 ♂, 2 ♀♀; same collection data as for holotype; MNHN.

Description (holotype)

Male

BODY (Fig. 3A). Length 15.0 mm, greatest width 6.5 mm. Integument reddish-brown; scales and pilosity whitish.

HEAD. Clypeus nearly crescent-shaped, with anterior margin arcuate in frontal view and weakly reflexed; surface roughly rugo-punctate, with long spiniform (slightly broadened at base, pointed at tip) scales. Fronto-clypeal suture conspicuous, almost straight. Frons and vertex roughly rugo-punctate; punctures denser on anterior half of frons; posterior half of frons and vertex with a narrow longitudinal callosity along midlength. Frons and vertex covered by elongate spiniform scales, denser toward inner margins of eyes, intermixed with sparse, moderately long setae. Antennae consist of 10 antennomeres, with seven antennomeres in club (Fig. 4A); all antennomeres of club of equal length; 3rd antennomere with a strong anteromedial process; antennomeres of club strongly shagreened, antennomeres of funicle glabrous. Last maxillary palpomere elongately fusiform, with outer side impressed. Labrum weakly bilobed, covered by spiniform scales and sparse long setae; mentum deeply concave, bearing long setae along its lateral and posterior margins.

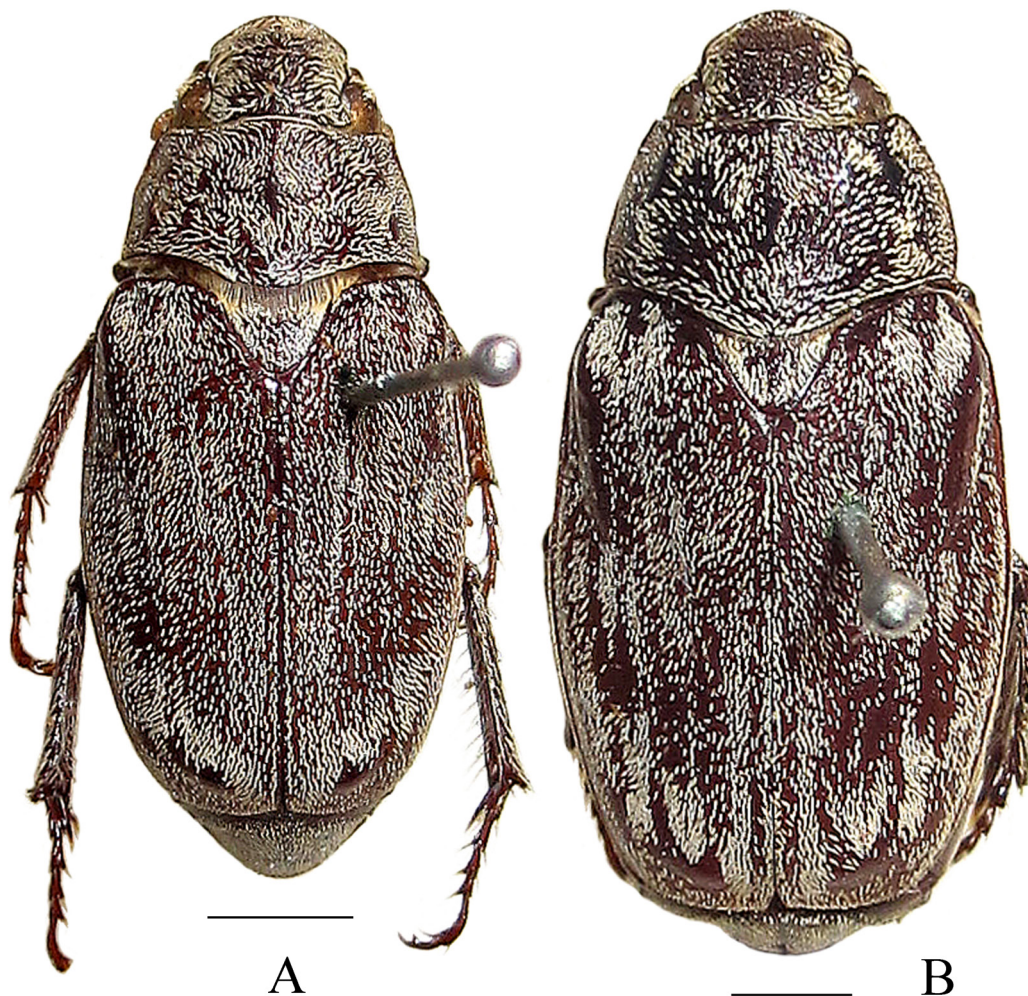


Fig. 3. *Philacelota leucothea* sp. nov., habitus. **A.** ♂, holotype (MNHN). **B.** ♀, paratype (MNHN). Scale bars: 2.5 mm.

THORAX AND ABDOMEN. Pronotum narrower at base than base of elytra, 1.5 times as broad as long, broadest in middle, distinctly more convergent anteriorly than posteriorly; sides straight anteriorly, but very weakly concave posteriorly; anterior and posterior angles obtuse; anterior margin strongly concave, slightly bisinuate in middle; posterior margin strongly convex before scutellar shield; all sides of pronotum unbeaded. Pronotum not roughly rugo-punctate, with a narrow longitudinal medial callosity along its anterior half, covered by acicular to narrowly lanceolate scales being much smaller in size on sides than on disc, with setae along its anterior and lateral margins only. Propleura setose, with few small acicular scales along lateral margins only. Scutellar shield broadly rounded apically, not roughly rugo-punctate, covered with narrowly lanceolate scales becoming acicular and much denser along lateral margins. Elytra with three indistinct costae bearing scales; base of elytron with a swollen margin; humeral and apical umbones somewhat callose, glabrous; surface of elytra somewhat impressed behind humeral umbones.

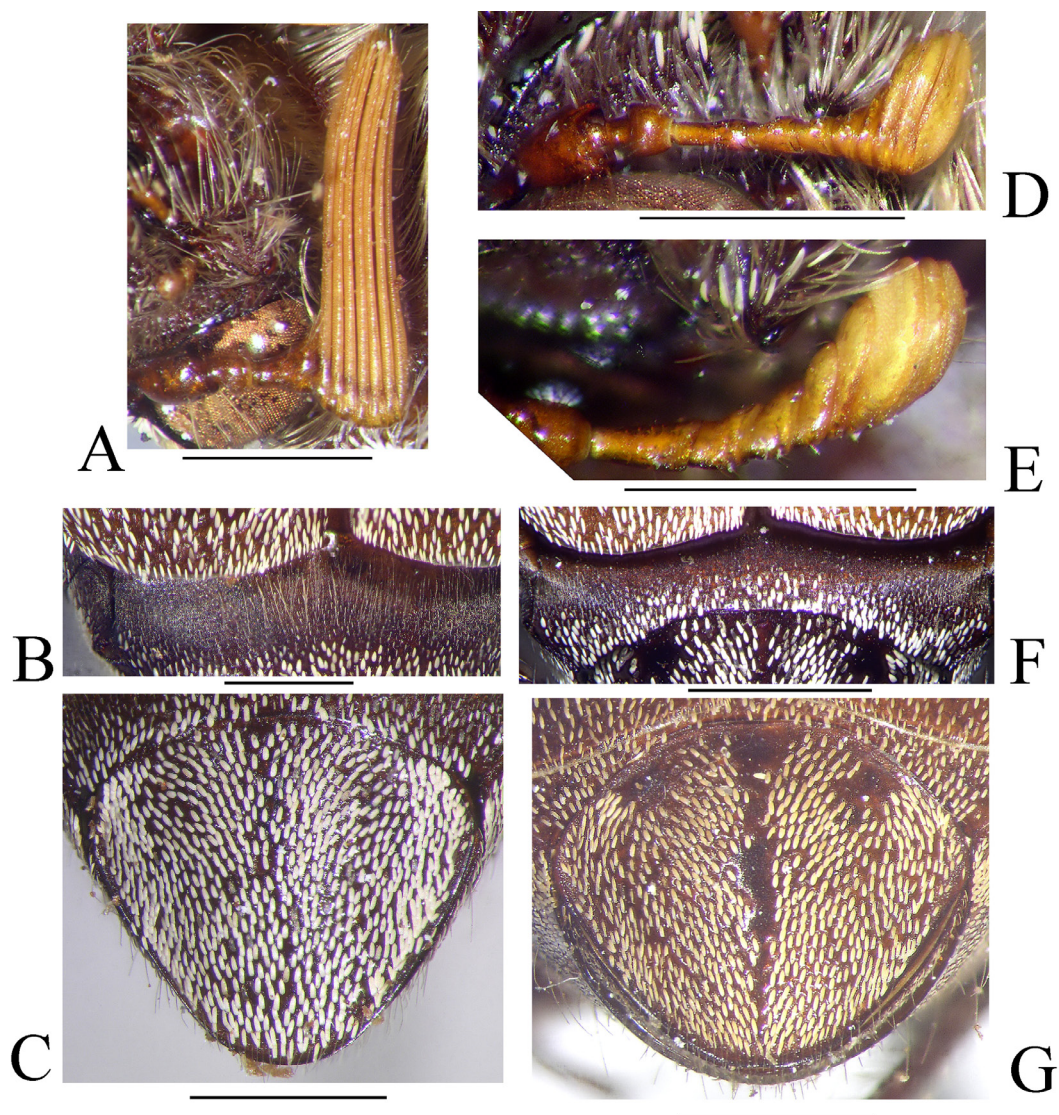


Fig. 4. *Philacelota leucothea* sp. nov., holotype, ♂ (MNHN) (A–C) and paratype, ♀ (MNHN) (D–G). A. Antenna, lateral view. B. Propygidium. C. Pygidium. D. Antenna, lateral view. E. Antenna, dorsolateral view showing relative size of club antennomeres. F. Propygidium. G. Pygidium. Scale bars: A, C–E = 1.5 mm; B = 2 mm; F–G = 2.5 mm.

Interstices shallowly, unevenly and irregularly punctured; punctures somewhat rugose; scales small, rather evenly covering entire surface of elytra, lanceolate to narrowly lanceolate, becoming acicular close to margins. Propygidium (Fig. 4B) finely and densely punctured; its basal half covered with small acicular setae intermixed with sparse long setae along basal margin; setae replaced on distal half by small ovoid scales. Pygidium (Fig. 4C) fully covered by small ovoid scales, setose at apical margin only. Prosternum, mesoventrite and metaventrite densely and finely rugo-punctate, densely covered with long adpressed setae; metepimeron and metepisternum possessing scales; metaventrite lacking scales. First abdominal ventrite carinate in middle, covered with short, adpressed, hair-like setae replaced by densely setting, scale-like setae along posterior margin; 2nd abdominal ventrite covered by small lanceolate scales intermixed with adpressed setae on its anterior half; remaining abdominal ventrites covered by small lanceolate and ovoid scales evenly distributed, but concentrated into dense patches on uppermost parts of ventrites; 3rd to 5th abdominal ventrites with few isolated long setae on lateral thirds only; last visible ventrite with several rows of moderately short, adpressed setae along its apical margin; sutures between 2nd to 5th abdominal ventrites obliterated in middle.

LEGS. Protibiae unidentate, with spur short and thick; middle and hind tibiae gracile; apex of hind tibiae with 13 separated bristles. Femora setose and moderately densely covered with lanceolate scales; tibiae with sparse lanceolate scales and spiniform setae; tarsi with setae only. Tarsomeres 1–4 shortened, especially of the fore tarsi; 1st tarsomere of hind tarsi only slightly longer than 2nd. Claws bifurcate, with lower lobe slightly closer to upper one than to base and almost parallel to upper one, distinctly shorter, but as broad as the latter.

GENITALIA. Aedeagus (Fig. 5A–B) strongly arcuate; phallobase conspicuously humped dorsally at its distal extremity; parameres almost uniformly deep along their length in lateral view, with apical extensions large, boot-shaped.

VARIATION. Length 14.0 mm, greatest width 5.5 mm. Margins of clypeus less angular than in holotype. Fronto-clypeal suture somewhat carinate in middle. Scales on dorsal surface of head, pronotum and elytra smaller and sparser than in holotype. Elytra with four costae more pronounced than in holotype. Abdominal ventrites more setose than in holotype.

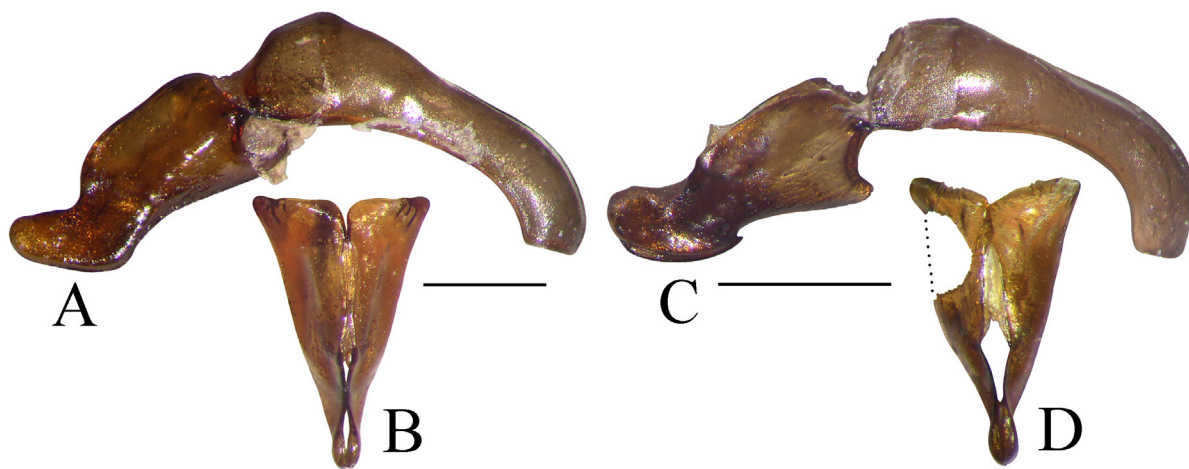


Fig. 5. A–B. *Philacelota leucothea* sp. nov., holotype, ♂ (MNHN). A. Aedeagus, lateral view. B. Parameres, dorsal view. — C–D. *P. submaculata* Heller, 1900, from Kema, Sulawesi, ♂ (MNHN). C. Aedeagus, lateral view. D. Parameres, dorsal view. Scale bars: A–B = 1.5 mm; C–D = 2 mm.

Female

Habitus: see Fig. 3B. Length 16.0–17.0 mm, greatest width 6.5–7.0 mm. Fronto-clypeal suture concave in middle. Antennal club (Fig. 4D–E) consists of five antennomeres: 2nd antennomere 1.4–1.7 times as long as 1st (1st antennomere sometimes only slightly exceeding anteromedial process of last antennomere of funicle in length), 2nd antennomere one-third to two-thirds as long as 3rd, 3rd antennomere equal to or slightly shorter than 4th; 4th and 5th antennomeres of equal length. Funicle: 4th and 5th antennomeres with conspicuous anteromedial process, 3rd antennomere as long as 4th and 5th combined. Last maxillary palpomere more attenuated than in male. Scales on pronotum and especially on elytra unevenly distributed, intermixed with glabrous spaces forming a variegated pattern. Elytra with three–four more or less developed costae; humeral umbones conspicuously produced backward, with surface of elytra distinctly impressed behind them. Propygidium lacking long setae (Fig. 4F). Pygidium with glabrous medial stripe, sometimes callose on its basal half (Fig. 4G). Abdominal ventrites more inflated than in male. Protibial spur longer than in male. Apex of hind tibiae with 16 short, separated bristles. Tarsi shorter than in males; 1st and 2nd tarsomeres of hind tarsi equal in length.

Differential diagnosis

This new species is most similar to *P. submaculata* Heller, 1900 from northern Sulawesi in the possession of squamose vestiture (vs setose in *P. jakli* Zidek, 2018 and *P. sulana* Heller, 1900). *Philacelota leucothea* sp. nov. differs from *P. submaculata* in the following respects: long hair-like setae on the basal half of the propygidium very sparse in males and absent in females (vs dense in both sexes), much less callose pronotum and upper surface of the head, less costate elytra, and finer and sparser puncturation of their interstices. Furthermore, the males of *P. leucothea* sp. nov. differ from the males of *P. submaculata* in the elytra uniformly covered with scales (vs elytral costae glabrous), in the absence of the bare longitudinal stripe on the pygidium (vs present), and in the shape of the aedeagus (Fig. 5).

Identification key for the species of *Engertia* and *Philacelota*

1. Antennal club with 5–7 lamellae in males and 4 or 5 lamellae in females, those of males conspicuously elongated; scales on elytral interstices aggregated into spots or stripes 2
 - Antennal club with 3–5 lamellae in both sexes (rarely more than 3); when more than 3 in number, club lamellae not conspicuously elongated in males, and scales of elytral interstices never aggregated into spots or stripes other Indo-Australian leucopholine genera
2. Antennal club of males with 7 lamellae; 3rd antennomere elongated in both sexes (Fig. 6B–D) (*Philacelota*) 3
 - Antennal club of males with 5 or 6 lamellae; 3rd antennomere short in both sexes (Fig. 6A–C) (*Engertia*) 6
3. Body vestiture squamose; parameres compressed laterally, with irregular outlines 4
 - Body vestiture setose; parameres tube-like with expanded tips (unknown in *P. sulana*) 5
4. Upper surface of head and disc of pronotum with irregular callose areas of variable expression in both sexes. Males: basal half of propygidium with dense long setae; elytral costae glabrous; aedeagus as on Fig. 5C–D. Females: basal half of propygidium with long setae; puncturation of the elytral interstices dense and coarse (Indonesia: Sulawesi) *P. submaculata* Heller, 1900
 - Upper surface of head and disc of pronotum with longitudinal callose stripe in both sexes. Males: basal half of propygidium with minute acicular and sparse long setae; elytral costae scaled; aedeagus as on Fig. 5A–B. Females: basal half of propygidium with minute acicular setae; puncturation of the elytral interstices sparse and fine (Philippines: Luzon) *P. leucothea* sp. nov.

5. Protibiae unidentate in male; pronotum widest at base; setae of body vestiture very short and sparse (Indonesia: Sula Mangoli) *P. sulana* Heller, 1900
 – Protibiae weakly bidentate in male; pronotum widest at midlength; setae of body vestiture long and dense (Indonesia: Flores)..... *P. jakli* Zidek, 2018
6. Antennal club with conspicuously elongated antennomeres. Males (unknown for *E. maculosa*) 7
 – Antennal club with short antennomeres. Females (unknown for *E. allolepis* sp. nov., *E. germanica* and *E. papuana*)..... 12
7. Antennal club with 6 lamellae (Philippines: Leyte, Palawan)..... *E. lii* Keith, 2006
 – Antennal club with 5 lamellae 8
8. Scales heterogeneous in shape in two outermost interstices and along apical margin of elytra. Aedeagus more arcuate in profile and more robust in shape (as on Fig. 2G) (Indonesia: Ambon).....
 *E. allolepis* sp. nov.
 – Scales homogeneous in shape in all interstices and along apical margin of elytra. Aedeagus less arcuate in profile (except *E. germanica*) and always more gracile in shape (as on Fig. 2J)..... 9
9. Elytra covered with ovoid to lanceolate scales; scales present on labrum and metaventrite..... 10
 – Elytra covered with setiform scales; labrum and metaventrite with setae only..... 11
10. Elytra covered with ovoid scales; scales along midline of abdominal ventrites not aggregated into spots (Indonesia: islands of Ambon, Yapen and Miosidi) *E. amboinae* (Brenske, 1897)
 – Elytra covered with lanceolate scales; scales along midline of abdominal ventrites aggregated into small spots (New Guinea)..... *E. papuana* (Moser, 1913)
11. Setiform scales on elytra thick; pygidium mainly setigerous; scales along midline of abdominal ventrites not aggregated into spots (Indonesia: islands of Seram, Ambon and Saparua)
 *E. setifera* (Moser, 1913)
 – Setiform scales on elytra thin; pygidium mainly scaly; scales along midline of abdominal ventrites aggregated into spots (New Guinea)..... *E. germanica* Prokofiev, 2016

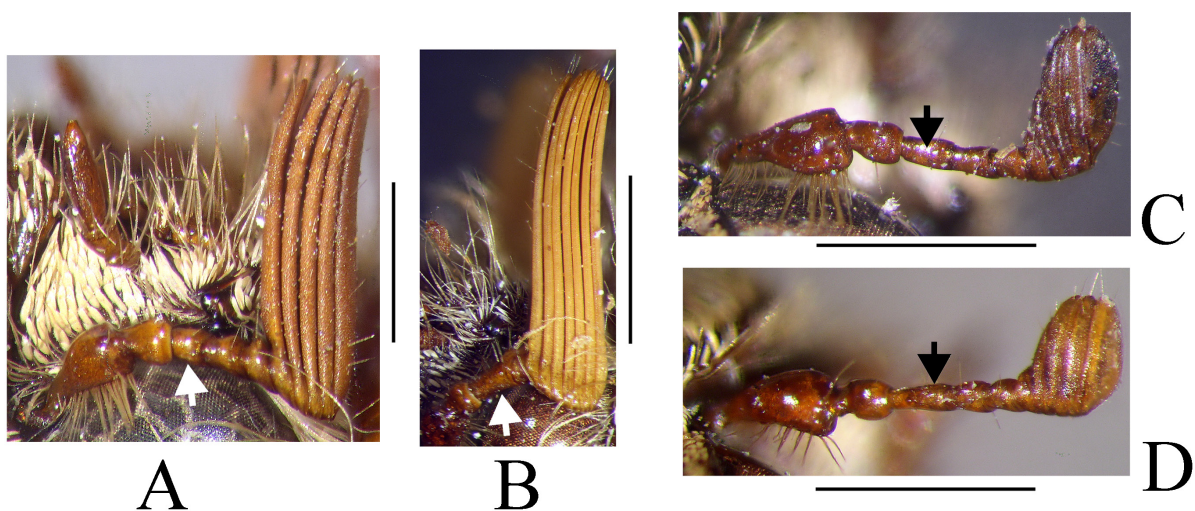


Fig. 6. Shape of 3rd antennomere (arrowed) in males (A–B) and females (C–D) of the type species of the genera *Engertia* Dalla Torre, 1913 and *Philacelota* Heller, 1900. A, C. *Engertia amboinae* (Brenske, 1897). B, D. *Philacelota submaculata* Heller, 1900. Scale bars = 1.5 mm.

12. Antennal club with 5 lamellae, first two abbreviated (Philippines: Leyte, Palawan)
..... *E. lii* Keith, 2006
– Antennal club with 4 lamellae, only first one abbreviated 13
13. Scales on elytra aggregated into spots; clypeus semicircular (Sri Lanka).....
..... *E. maculosa* (Brenske, 1896)
– Scales on elytra aggregated into longitudinal stripes; clypeus polygonal 14
14. Scales on elytra ovoid (Indonesia: islands of Ambon, Yapen and Miosidi)
..... *E. amboinae* (Brenske, 1897)
– Scales on elytra setiform (Indonesia: islands of Seram, Ambon and Saparua)
..... *E. setifera* (Moser, 1913)

Discussion

The genus *Engertia* currently comprises seven species distributed in Sri Lanka and the Indo-Australian islands of Philippines, the Moluccas and New Guinea, including small islands in Cenderawasih Bay. The genus *Philacelota* includes four species known from the Philippines and Indonesia (islands of Luzon, Sulawesi, Sula and Flores). The two genera are very similar to one another and the recently described *E. lii* fills the gap between of *Engertia* and *Philacelota* in the number of club antennomeres. Moreover, the aedeagus of *E. lii* is more similar to that of *P. submaculata* than of *E. amboinae* in having laterally compressed parameres with irregular outlines, triangular in dorsal view (Keith 2006: figs 9–10), while the parameres of *P. jakli* are elongated (tube-like) with expanded tips like in most species of *Engertia* (Zidek 2018: figs 4–5). Nevertheless, *Engertia* is retained here as a genus distinct from *Philacelota* on the basis of the constant differences between the members of these genera in the length of the 3rd antennomere in both sexes (Fig. 6). The relationships between *Engertia* and *Philacelota* and the other leucopholine genera remain unclear at the present state of knowledge.

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References

- Brenske E. 1896. Neue Melolonthiden aus Africa und Asien. *Stettiner entomologische Zeitschrift* 57: 178–205.
- Brenske E. 1897. Neue Gattungen und Arten der Melolonthiden aus Afrika und Asien. *Stettiner entomologische Zeitung* 58: 96–120.
- Heller K.M. 1900. Neue Käfer von Celebes IV. *Abhandlungen und Berichte des königlichen zoologischen und anthropologisch-ethnographischen Museums zu Dresden* 9: 1–46. Available from <https://biodiversitylibrary.org/page/46189178> [accessed 10 Sep. 2019].
- Keith D. 2006. Reflexions sur le genre *Engertia* et description d’une nouvelle espèce des Philippines. *Lambillionea* 106: 90–94.
- Moser J. 1913. Beitrag zur Kenntnis der Melolonthiden I. *Deutsche entomologische Zeitschrift* 3: 271–297. Available from <https://archive.org/details/biostor-101429> [accessed 10 Sep. 2019].
- Prokofiev A.M. 2015. A male of *Engertia setifera* (Coleoptera: Scarabaeidae: Melolonthinae) from Seram Island, Indonesia. *Baltic Journal of Coleopterology* 15: 25–28.

Prokofiev A.M. 2016a. New genera and species of the Papuan Leucopholini and Melolonthini (Coleoptera, Scarabaeidae: Melolonthinae). *Euroasian Entomological Journal* 15: 68–74. [In Russian.]

Prokofiev A.M. 2016b. On the phytophagous scarabs of the subfamilies Dynastinae, Rutelinae, and Melolonthinae from the Schouten Islands (= Kepulauan Biak), Indonesian Papua (Coleoptera: Scarabaeidae). *Species Diversity* 21: 71–77. <https://doi.org/10.12782/sd.21.1.071>

Zidek J. 2018. A new species of *Philacelota* Heller (Scarabaeidae: Melolonthinae: Melolonthini) from Flores Island, Indonesia. *Insecta Mundi* 0679: 1–6.

Available from <http://digitalcommons.unl.edu/insectamundi/1176> [accessed 19 Sep. 2019].

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