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### Two new genera of Epilachnini Mulsant from New Guinea and Aru Islands (Coleoptera: Coccinellidae)

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## Two new genera of *Epilachnini* Mulsant from New Guinea and Aru Islands (Coleoptera: Coccinellidae)

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The species formerly classified in the genus *Afidentula* Kapur from New Guinea and Aru Islands are revised. As a result of detailed analysis of mouth parts and genital structures of the species, two new genera are proposed: monotypic *Lalokia* gen. nov. from Aru Islands and New Guinea, with *Lalokia aruensis* (Crotch) (comb. nov.), and *Papuaepilachna* gen. nov. from New Guinea including *Papuaepilachna bivacana* (Bielawski) (comb. nov.), *P. kapuri* (Bielawski) (comb. nov.), *P. nasti* (Bielawski) (comb. nov.), *P. tenmana* (Bielawski) (comb. nov.), *P. watalai* (Jadwiszczak) (comb. nov.) and *P. wiebesi* (Bielawski) (comb. nov.). All species are illustrated and an identification key to the species of *Papuaepilachna* is provided. A key to the genera of *Epilachnini* from New Guinea and Aru Islands is also provided.

<http://www.zoobank.org/urn:lsid:zoobank.org:pub:F721B07F-CBF0-4516-853D-1FD434FE06F1>

**Keywords:** Cucujoidea; entomology; *Epilachnini*; *Lalokia*; *Papuaepilachna*; new genera; taxonomy

### Introduction

*Epilachnini* was recognized as a distinctive group by Mulsant (1946). In traditional classification of ladybirds (Sasaji 1968, 1971; Gordon 1975) it was treated as a separate subfamily within Coccinellidae but recently Ślipiński (2007) and Seago et al. (2011) recognized it as a tribe within the broadly defined subfamily Coccinellinae. *Epilachnini* is a large group of herbivorous ladybird beetles that includes 23 genera (Jadwiszczak and Węgrzynowicz 2003) with worldwide distribution. Because of a very uniform morphology current classification and taxonomy of *Epilachnini* is far from being resolved and needs critical study of most genera.

About 350 species of *Epilachnini* were recorded from the Australasian region with only 38 species from New Guinea. Most of them (28) belong to *Henosepilachna* Li, three to *Subaffisa* Bielawski and seven to *Afidentula* Kapur (Jadwiszczak and Węgrzynowicz 2003).

Kapur (1958) established the genus *Afidentula* for two Oriental species of *Epilachna*, *E. manderstjernae* Mulsant (type species) and *E. minima* Gorham. He recognized two key characters separating *Afidentula* from other *Epilachnini*: the well-developed basal tooth on tarsal claw and abdominal sternite VIII of female not divided longitudinally. Following this interpretation Bielawski (1963) transferred *Epilachna aruensis* Crotch to *Afidentula* and described *A. nasti* from New Guinea. Subsequently

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Bielawski (1965) described four more species of *Afidentula* and Jadwiszczak (1986) one species of *Afidentula* from New Guinea. Jadwiszczak (1987) mentioned that the Papuan species of *Afidentula* are more closely related to *Epilachna* (*Henosepilachna*) *fulvimana* and *E. (H.) guttatopustulata* species groups than they are related to the Asian species of *Afidentula*.

Recent revision of the Asian species of the *Afidentula* (Tomaszewska and Szawaryn 2013) revealed that the mainland species form a uniform group characterized by: (a) comparatively small body; (b) brown colour with black markings on elytra; (c) compact and short mandibles provided with three apical teeth of which only middle one is sometimes weakly serrated; (d) maxilla with basistipes and mediastipes separated entirely or almost so; (e) terminal labial palpomere shorter than subterminal one; (f) tibial spurs absent; (g) basal tooth on tarsal claw present, and (h) sternite VIII in females undivided.

Seven species from New Guinea and Aru Islands differ considerably from the type species of *Afidentula*. In general appearance and size they resemble black species of *Henosepilachna* from New Guinea (Szawaryn 2011). The basal tooth on tarsal claw and undivided sternite VIII in females are similar to Asian *Afidentula* but the Papuan species can be distinguished by: body much larger and entirely black or black with orange spots on elytra, the prementum with a group of long apical setae/hairs (in *Afidentula ligula* has a small field with shorter, strong setae), large thin laterally mandibles with apical and subapical teeth, often additionally serrated, elytral epipleura complete (incomplete in *Afidentula*), the distance between antennal sockets about three or four times greater than a distance between antennal socket and inner margin of eye (in *Afidentula* this distance is about twice as great). Additionally the Papuan species have coxites with styli and the tegmen with stout parameres.

Due to the differences listed above, these seven species are here removed from *Afidentula*. They however do not constitute a uniform group. Considerable differences found in mouthpart structures (described in detail in generic diagnoses and descriptions) led us to establish two new genera: *Lalokia* gen. nov. for accommodation of *A. aruensis*, and *Papuepilachna* gen. nov. for accommodation of *A. bivacana*, *A. kapuri*, *A. nasti*, *A. tenmana*, *A. watalai* and *A. wiebesi*.

## Material and methods

Specimens used in this study are deposited in the following collections:

BMNH Natural History Museum, London, UK

BPBM Bernice P. Bishop Museum, Honolulu, USA

CUMZ University Museum of Zoology, Cambridge, UK

HNHM Hungarian Natural History Museum, Budapest, Hungary

MIZ Museum and Institute of Zoology PAS, Warszawa, Poland.

Entire beetles, where available, or at least genitalia and mouth parts were dissected, cleared in 10% solution of KOH and rinsed with distilled water then transferred to glycerol and examined on slides. Illustrations were made from slide preparations using a camera lucida attached to the Leica or Carl Zeiss Jenamed microscopes. Mouth parts were cleaned in ethyl alcohol and transferred to adhesive tape for scanning electron microscopy. After examination the genitalia and mouth parts were transferred

to microvials and pinned beneath the specimen. Measurements were made using an ocular micrometer attached to a dissecting microscope. The following terms are used: TL, total length, from apical margin of clypeus to apex of elytra; PL, pronotal length, from the middle of anterior margin to margin of basal foramen; PW, pronotal width at widest part; EL, elytral length across sutural line including scutellum; EW, elytral width across both elytra at the widest part. Scanning electron micrographs were made using a HITACHI S-3400N machine. Photographic images were produced using a digital camera, and enhanced using AUTO MONTAGE software in the Electron Microscopy Laboratory of the MIZ. The final plates were prepared using ADOBE PHOTOSHOP CS<sup>®</sup>.

The beetle morphology follows Lawrence et al. (2011) including use of Roman numerals for the body segments; specific terminology used in Coccinellidae follows Ślipiński and Tomaszewska (2010).

## Systematics

### Key to the genera of Epilachnini from New Guinea and Aru Islands

1. Tibial spurs absent ..... *Lalokia* gen. nov.  
Tibial spurs present with formula 1-2-2 ..... 2
2. Tarsal claw bifid without basal tooth or angulation .... *Subafissa* (Bielawski)  
Tarsal claw bifid with large basal tooth or angulation ..... 3
3. Abdominal sternite VIII in female divided longitudinally . *Henosepilachna* Li  
Abdominal sternite VIII in female entire ..... *Papuaepilachna* gen. nov.

## Descriptions of new genera

### *Lalokia* gen. nov.

**Type species.** *Epilachna aruensis* Crotch, 1874.

### *Etymology*

The generic name stems from the Laloki River, located in eastern Papua New Guinea, from which nearest neighbourhood one of the examined specimens of this species was collected.

### *Diagnosis*

*Lalokia* is very similar to *Papuaepilachna* and *Afidentula* sharing with both genera the basal angulation of tarsal claw and non-divided female abdominal sternite VIII. It also shares with *Afidentula* the lack of tibial spurs and presence of almost complete epipleural, submarginal carina. With *Papuaepilachna* it additionally shares mandibles large, thin laterally with apical and subapical teeth, most often additionally serrated, terminal labial palpomere longer than subterminal one, maxilla with basistipes and mediastipes with at most only trace of suture visible between them, distance between

antennal sockets three to four times greater than a distance between antennal socket and inner margin of eye, elytral epipleura complete, coxites with distinct styli and tegmen with stout parameres. *Lalokia*, however, is distinguished from both discussed genera by prementum provided on dorsal surface with short, scale-like appendages, ligula without apical setae, labial palpi placed subapically on prementum and mentum strongly transverse (more than twice as wide as long). Additionally transverse prementum, long submarginal epipleural carina, reaching at least anterior margin of mesocoxa, sperm duct very short and a lack of tibial spurs will distinguish *Lalokia* from *Papuaepilachna*.

Externally *Lalokia aruensis* is very distinctive by having two orange-red maculae on each elytron and among Australasian Epilachnini resembles only members of the genus *Subafissa* but can be easily separated by having tarsal claws with a basal angulation that is absent in *Subafissa*.

### Description

Body (Figures 2A, 15C) oval, convex; dorsum pubescent. Pronotum with dark disc and yellow lateral margins; elytra dark brown with four large, orange maculae. Ventral side yellow or brownish-yellow.

Head exposed, transverse; ventral antennal grooves absent. Eyes finely faceted; barely emarginate. Antennal insertions (Figure 1I) exposed in front of eyes, close to inner eye margins, with distance between antennal sockets about 3.8 times greater than distance between antennal socket and inner margin of eye. Antenna (Figure 1A) shorter than width of head; 11-segmented; scape large, swollen, about twice as long as pedicel; pedicel longer than wide, swollen; antennomere 3 elongate, longer than antennomeres 4–6 combined; antennal club relatively compact, three-segmented, asymmetrical on inner surface. Clypeus transverse; labrum transverse (Figure 1B), covered with dense, long setae, anterior margin emarginate. Mandible (Figure 1F, G) provided with two apical and two subapical long teeth; upper apical tooth with additional shallow incision; subapical teeth large; all teeth without apparent additional denticles; prosthema large, long, densely setose; near base of mandible at outer margin on dorsal surface there are several long setae; dorsal and ventral surfaces basally with areas of small dense pores (sensillae?). Submentum transverse, fused with gula with suture well visible; labium (Figure 1C–E) with mentum strongly transverse; prementum short, transverse, sclerotized; dorsal surface covered with scale-like appendages bearing short setae in mid line; labial palp placed subapically on prementum, three-segmented; basal palpomere short, transverse; second palpomere about as long as wide, weakly widening anteriorly; terminal palpomere elongate, narrowing anteriorly. Maxilla (Figure 1H) with cardo subtriangular, covered with several long setae; basistipes and mediastipes not separated, with suture rather visible; galea large suboval, weakly concave on inner margin, densely setose apically; lacinia small, suboval, transverse, covered with long, dense setae; maxillary palp four-segmented, palpomeres 2–4 widened apically, pubescent; palpomere 2 short, slightly longer than palpomere 3; terminal palpomere 1.5 times wider along apical margin than on base. Gula (Figure 1J) transverse; gular sutures long and deep, convergent anteriorly.

Pronotum transverse, widest at base and gradually narrowing anteriorly; anterior and hind margins not bordered; disc convex, finely punctate. Prothoracic hypomeron

smooth; notosternal suture distinct; prosternum (Figure 2B) in front of coxa about 0.5 times as long as coxal longitudinal diameter, anterior edge raised with distinct groove behind it; hind margin of prosternum in front of coxae with groove; prosternal process about 0.3 times as wide as longest coxal diameter, with weak concavities along its lateral margins; procoxal cavity strongly transverse with small triangular slit laterally.

Mesoventrite (Figure 2C) with anterior edge with complete raised border and with weak groove behind it; mesal surface with cavity receiving apex of prosternal process; mesoventral process narrower than coxal diameter; meso-metaventral articulation with suture visible; junction straight, without internal knob. Scutellum small, triangular. Elytra at base distinctly broader than pronotum; dually punctate; humeral angles well developed; lateral margins widely flattened, visible from above throughout; elytral epipleuron complete (Figure 2A), flat without foveae, with submarginal carina almost complete; metaventrite with intercoxal process broadly bordered and raised; metaventral postcoxal lines connected medially and complete laterally, straight with distinct groove behind (Figure 2C); metaventrite with discrimen incomplete; metanepimeron distinct.

Legs moderately long and stout with hind femora protruding from outer margin of elytral epipleuron (Figure 2A). Trochanters simple, on inner margin with weak cavity for receiving tip of tibia (Figure 2B). Femora cylindrical with weak grooves throughout for receiving tibiae. Tibiae cylindrical without apical spurs; tarsi pseudotrimerous; tarsal claw bifid, with additional large, subquadrate basal tooth.

Abdomen (Figure 2P, Q) with six ventrites in males and five ventrites in females with sternite VIII partly visible. Ventrite 1 in mid line more than twice as long as ventrite 2. Abdominal postcoxal lines separate medially, recurved and incomplete, reaching half length of ventrite 1; apical margin of male ventrite 5 truncate, ventrite 6 emarginate (Figure 2G), abdominal tergite VIII rounded (Figure 2F); apical margin of female ventrite 5 weakly rounded, sternite VIII arcuate, entire (Figure 2E), tergite VIII subtruncate (Figure 2D).

*Male terminalia and genitalia* (Figure 2K–M). Apodeme of male sternum IX rod-like. Tergite X with anterior margin weakly emarginate and posterior margin truncate. Tegmen with penis guide subtriangular in lateral view, narrowing towards apex with apical part curved outwardly; with lateral sides symmetrical; parameres slightly shorter than penis guide, broad, separated, articulated with phallobase, with apices shortly setose; tegmen strut broadened apically. Penis base with arms poorly developed; penis thin, curved basally, then straight, rod-like towards apex.

*Female genitalia* (Figure 2H–J). Proctiger (TX) sclerotized, short, rounded apically; coxites oval with styli terminal, and with small protuberances on inner margin; infundibulum absent. Bursa copulatrix large, non-divided, ending with outlet of sperm duct, outlet of common oviduct placed dorsally protruding above half length of bursa copulatrix. Sperm duct very short and narrow, simple, uniform in diameter; spermatheca small, membranous, long-oval, without clear nodulus and ramus; accessory gland long, widening apically.

#### *Distribution*

Aru Islands, New Guinea.

***Lalokia aruensis*** (Crotch) comb. nov.  
(Figures 1A–J, 2A–Q, 15C)

*Epilachna aruensis* Crotch, 1874: 79; Gemminger and Harold 1876: 3808; Korschefsky 1931: 32

*Solanophila aruensis*: Weise 1908: 305.

*Afidentula aruensis*: Bielawski 1963: 431.

*Material*

*Holotype*. Indonesia: Aru Islands: “TYPE/ TYPE *aruensis* Aru/ *Epilachna aruensis* (Crotch) A.P. Kapur det./ HOLOTYPE *Epilachna aruensis* Crotch 1874” (CUMZ).

*Other material*. Papua New Guinea: N. Guinea Papua, *Afidentula aruensis* (Crotch) det. A. Jadwiszczak 1987 (1 male: HNHM); Laloki Papua, F. Muir, 2–3.1910 (1 female: BPBM), same but 4.1910, KOEBELE coll. (1 male: BPBM); Bisianumu E. of Port Moresby 500 m June 8 1955, J.L. Gressitt Collector, Primary forest, *Afidentula aruensis* (Crotch) det, R. Bielawski 1961 (1 female: BPBM); 58., 48., *aruensis*, named by Crotch, *Epilachna aruensis* Crotch det. R. Bielawski 1957, Syn-type? (1: BMNH); Papua New Guinea, Mt Hagen Area, 1220 m (4000') Baiyer Riv. Sanct. 6–11 July 1974, H. Howden, British Museum 1987–171 (1 male, BMNH).

*Description*

Length 6.7–7.0 mm; TL/EW = 1.20–1.29; PL/PW = 0.36–0.38; EL/EW = 1.00–1.11; EW/PW = 1.62–1.77.

Body (Figures 2A, 15C) round-oval, convex; surfaces covered with moderately long, sparse, appressed, yellow pubescence. Head, mouthparts, antennae, hypomeron, prosternum and fore legs yellow. Pronotum with central part dark brown to black with lateral margins yellow. Ventral side, scutellum, mid and hind legs dark brown. Elytron dark brown to black with two large, oval reddish maculae, one post basal and second pre-apical, not reaching elytral margins or suture.

Antenna (Figure 1A) with antennomere 3 about 1.3 times longer than pedicel and almost as long as antennomeres 4–6 combined; antennomeres 4 and 5 at most as long as wide; antennomeres 6–8 transverse. Mandibles with dorsal apical and two subapical teeth large, pointed, sharp (sometimes blunt), dorsal apical tooth broad, shallowly excised, shorter than ventral apical one; all teeth without additional serration (Figure 1F, G). Labrum broadly emarginate (Figure 1B). Labium (Figure 1C–E) with palpomere 1 transverse; palpomere 2 widening anteriorly, about twice as long as first one; terminal palpomere long, narrowing anteriorly, about 3 times as long as palpomere 1 and 1.4 times longer than palpomere 2. Maxillary palpomere 2 slightly longer than palpomere 3; palpomere 3 subquadrate; terminal palpomere large, somewhat securiform about twice as long as third one (Figure 1H).

Prosternal process (Figure 2B) rounded apically, parallel-sided; width of prosternal process about 1.7 times greater than length of prosternum in front of procoxae.

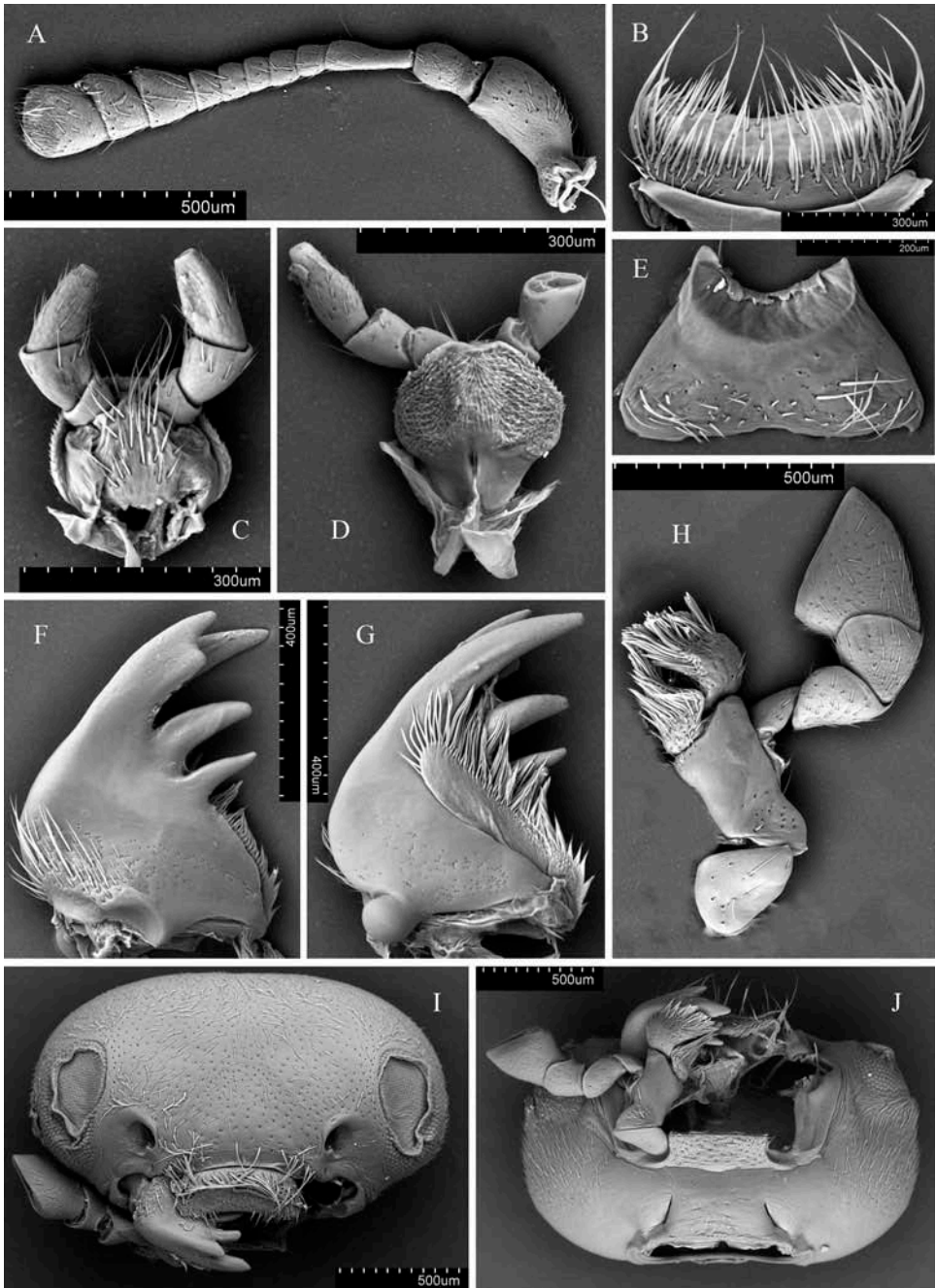


Figure 1. (A–J) *Lalokia aruensis* (Crotch). (A) Antenna; (B) labrum; (C) prementum, ventral; (D) prementum, dorsal; (E) mentum; (F) mandible, dorsal; (G) mandible, ventral; (H) maxilla; (I) head, anterodorsal; (J) head, ventral.



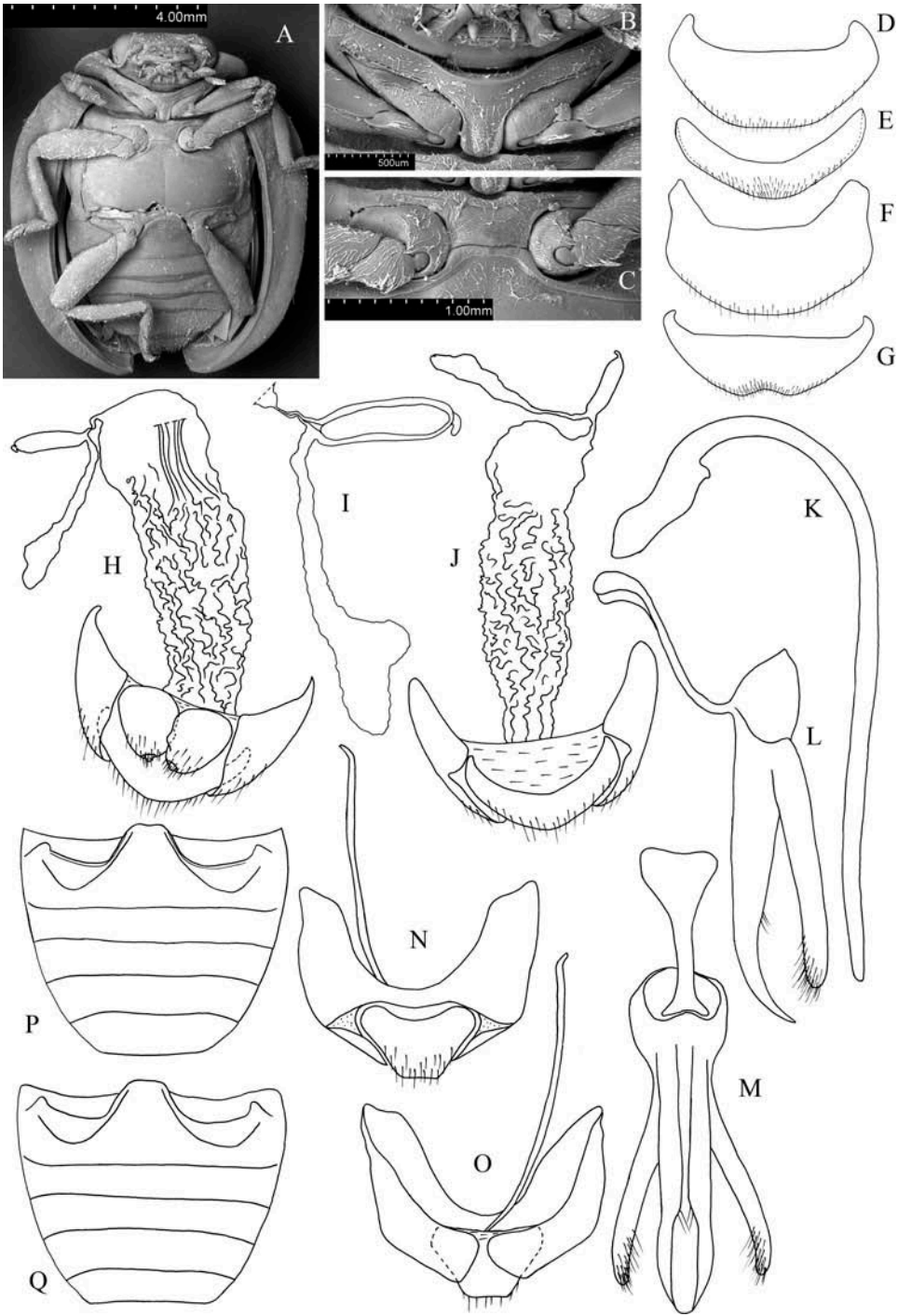


Figure 2. (A–Q) *Lalokia aruensis* (Crotch). (A) Habitus, ventral; (B) prosternal process; (C) mesoventral process; (D) tergite VIII, female; (E) sternite VIII, female; (F) tergite VIII, male; (G) ventrite 6, male; (H) female genitalia, ventral; (I) spermatheca and accessory gland;

Mesoventral process about 0.8 times as wide as mesocoxal diameter at the same position (Figure 2C).

Male terminalia and genitalia as in Figure 2K–M.

Female genitalia as in Figure 2H–J.

*Papuaepilachna* gen. nov.

**Type species.** *Afidentula nasti* Bielawski, 1963.

*Etymology*

Generic name stems from *Papua* (referring to Papua New Guinea and both New Guinean provinces of Indonesia: Papua and West Papua) and *Epilachna*, the type genus of the tribe Epilachnini.

*Diagnosis*

Among Papuan Epilachnini *Papuaepilachna* is most similar to *Henosepilachna*, especially to the species related to *H. guttatopustulata* (Fabricius) with which *Papuaepilachna* shares, except for external similarity, elongate-oval prementum provided with a bunch of long apical setae and incomplete epipleural submarginal carina, reaching to only about mid length of metaventricle. *Papuaepilachna*, however, is distinguished from all *Henosepilachna* species by having female sternite VIII entire, non-divided longitudinally. Moreover, it is separated from species of *H. guttatopustulata* group by male ventrite 6 emarginate (with deep notch in *H. guttatopustulata* group), labrum entirely sclerotized (in *H. guttatopustulata* group anterior half of labrum is membranous) and additional gland of spermatheca large, at least twice as long as spermatheca (about as long as spermatheca in species related to *H. guttatopustulata*).

*Description*

Length 5.8–9.0 mm. Body elongate oval, sometimes distinctly heart-shaped, strongly convex; dorsum densely pubescent. Pronotum usually black, sometimes with yellow lateral margins, rarely whole pronotum yellow; elytra black. Ventral surfaces mostly black.

Head exposed, transverse; ventral antennal grooves weak, straight, along inner margin of mouthparts, reaching at most hind margin of eye. Eyes finely faceted; not emarginate. Antennal insertions (Figures 3H, 5I, 7F, 11E, 13H) exposed in front of eyes, close to anterior inner margin of eye, with distance between antennal sockets more than three times greater than distance between antennal socket and inner margin of eye. Antenna (Figures 3A, 5A, 7A, 13A) usually shorter than width of head; 11-segmented; scape large, swollen, at least twice as long as pedicel; pedicel longer than

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Figure 2. (J) female genitalia, dorsal; (K) penis, lateral; (L) tegmen, lateral; (M) tegmen, inner; (N) male genital segment, dorsal; (O) male genital segment, ventral; (P) abdomen, female; (Q) abdomen, male.

wide, slightly swollen; antennomere 3 elongate, about as long as antennomeres 4 and 5 combined; antennal club relatively compact, three-segmented, asymmetrical on inner surface. Clypeus transverse. Labrum (Figures 5B, 7B, 11B, 13B), transverse, covered with dense, long setae, anterior margin emarginate medially. Mandibles (Figures 3E, 5F, 7C, 9C, 11C, 13F) provided with more or less distinctly developed, two apical teeth and usually two subapical teeth; upper apical tooth shorter than tooth below; all teeth often with additional serration; prostheca large, long, densely hairy; outer margin of mandible near base provided with several long setae; dorsal and ventral surfaces near mandibular base with small areas of dense punctation/pores. Submentum rectangular, fused with gula with suture well visible (Figure 7G); labium (Figures 3B, 5C–E, 7E, 11G, 13C, D) with mentum trapezoidal with lateral margins more or less convergent anteriorly, less than twice as wide as long; prementum oval, sclerotized, at least as long as wide; ligula setose with bunch of long, apical setae medially; labial palps placed in about mid length of prementum, three-segmented, basal palpomere shortest; second palpomere elongate, weakly widening anteriorly; terminal palpomere elongate, longer than second one, narrowing anteriorly. Gula transverse; gular sutures deep, strongly convergent anteriorly (Figure 7G). Maxilla (Figures 3C, 5H, 7H, 11F) with cardo suboval, covered with several long setae; basistipes and mediastipes with only trace of suture visible; galea large oval, setose with dense and long setae at apex; lacinia small, triangular, covered with long, dense setae; maxillary palp 4-segmented, palpomere 2 elongate, about 1.5 times longer than palpomere 3; terminal palpomere large, widening apically, at least as long as wide measured along apical and lateral, outer margins.

Pronotum transverse, widest at base and gradually narrowing anteriorly; anterior and hind margins not bordered; disc convex, finely punctate. Prothoracic hypomeron smooth; notosternal suture distinct; prosternum (Figures 3I, 6B, 8B, 9H, 11I, 13I) in front of coxa 0.45–0.50 times as long as coxal longitudinal diameter, anterior edge raised without distinct groove behind it; prosternal process at most 0.4 times as wide as longest coxal diameter, subparallel sided, without lateral carinae; procoxal cavity transverse with triangular slit laterally and usually with bordering line anterolaterally.

Mesoventrite (Figures 3J, 6C, 8C, 9H, 11I, 13J) with anterior edge with complete raised border and without distinct groove behind it; mesal surface with cavity for receiving apex of prosternal process; mesoventral process about 0.7–1.0 times as wide as coxal diameter; meso-metaventral articulation with suture visible; junction straight, without internal knob. Scutellum small, triangular. Elytra dually punctate; at base distinctly broader than pronotum; lateral margins widely flattened, visible from above; elytral epipleuron (Figures 3G, 6A, 8A, 9G, 11H, 13E) strongly narrowing just before apex but it is complete or almost so, flat without foveae, with submarginal carina incomplete, reaching about middle length of metaventrite; metaventrite (Figures 3J, 6C, 8C, 9H, 11I, 13J) with intercoxal process broadly bordered and raised without distinct groove behind; metaventral postcoxal lines connected medially and complete laterally, straight; metaventrite with discrimen incomplete; metanepimeron distinct.

Legs (Figures 3G, 6A, 8A, 9G, 11H, 13E) slender; trochanters simple, with weak cavity on inner margin for receiving tip of tibia. Femora cylindrical with shallow groove throughout for receiving tibia. Tibiae with apical spurs (Figure 5K) of formula 1-2-2; tarsi pseudotrimerous; tarsal claw bifid with additional large, subquadrate basal tooth (Figures 5J, 7I).

Abdomen with six ventrites in males and five ventrites in females with sternite VIII partly visible. Ventrite 1 in mid line more than twice as long as ventrite 2. Abdominal postcoxal lines separate medially, recurved and incomplete; moderately deep, slightly exceeding half length of ventrite 1; posterior margin of male ventrite 5 usually truncate, ventrite 6 usually shallowly emarginate, abdominal tergite VIII rounded; apical margin of female ventrite 5 subtruncate, sternite VIII rounded, entire, tergite VIII rounded.

Male terminalia and genitalia. Apodeme of male sternum IX rod-like. Tergite X with anterior margin emarginate and posterior margin arcuate. Penis guide of tegmen apically bent outwardly, its lateral sides symmetrical; parameres about the same length as penis guide, broad, separated, articulated with phallobase, with apex densely hairy; tegmen strut somewhat widened apically. Penis thin, usually straight along most of its length, rod-like; penis base with arms poorly developed.

Female genitalia. Proctiger (TX) sclerotized laterally and apically, submembranous medially and anteriorly with apical margin arcuate; coxites transverse, broadly oval or almond-like with styli terminal. Bursa copulatrix large, non-divided, ending with outlet of common oviduct and with narrowing part of bursa leading to short sperm duct; infundibulum absent; spermatheca small, membranous, vermiform, without clear nodulus and ramus; accessory gland large, about twice as long as spermatheca (Figures 6I, 8K).

#### Distribution

New Guinea.

#### Key to the species of *Papuaepilachna*

1. Antenna longer than width of head, antennomeres 6–8 longer than wide (Figure 11A), ventrite 5 in male deeply and broadly emarginate (Figure 12I); body 8.1–9.0 mm long ..... *P. watalai* (Jadwiszczak)  
 Antenna shorter than width of head, antennomeres 6–8 at most as long as wide (Figures 3A, 13A); ventrite 5 in male truncate (Figures 6L, 8I, 10A, 14D); body 5.8–8.3 mm long ..... 2
2. Labrum with anterior margin shallowly emarginate, to subtruncate (Figures 3H, 13B); sides of pronotum widely yellow with median area black or only infuscate ..... 3  
 Labrum with anterior margin deeply emarginate (Figures 5B, 7B, 9B); pronotum almost entirely, deeply black ..... 4
3. Body heart-shaped, antennomere 5 longer than wide (Figure 13A), prosternal process weakly widening towards apex (Figure 13I); mentum about 1.5 wider than long (Figure 13D); elytral epipleuron four times wider than metanepisternum (Figure 13E) ..... *P. wiebesi* (Bielawski)  
 Body oval, antennomere 5 weakly transverse (Figure 3A), prosternal process with sides parallel (Figure 3I); mentum about 1.9 times wider than long (Figure 3B); elytral epipleuron three times wider than metanepisternum (Figure 3G) ..... *P. bivakana* (Bielawski)

4. Body more than 8 mm long, distinctly heart-shaped, widest near basal third of elytra (Figures 9G, 15B); mandibular teeth with additional serration (Figure 9C, D) ..... *P. tenmana* (Bielawski)  
Body 5.8–7.3 mm long, elongate oval, widest near middle length of elytra (Figures 6A, 8A, 15E, F); mandibular teeth without additional serration ... 5
5. Antennomeres 4 and 5 shorter than wide (Figure 7A); mandible with large tooth in molar area (Figure 7C, D); labial basal palpomere longer than wide (Figure 7E); abdominal postcoxal lines rounded (Figure 8H, I); elytral pubescence appressed ..... *P. nasti* (Bielawski)  
Antennomeres 4 and 5 scarcely longer than wide (Figure 5A); mandible without tooth in molar area (Figure 5F, G); labial basal palpomere subquadrate (Figure 5D); abdominal postcoxal lines v-shaped (Figure 6K, L); elytral pubescence suberect ..... *P. kapuri* (Bielawski)

### Species redescription

*Papuaepilachna bivakana* (Bielawski)  
(Figures 3A–J, 4A–E, 15G)

*Afidentula bivakana* Bielawski, 1965: 50.

#### Material

*Paratype*. New Guinea, Indonesia: “Museum Leiden Nieuw Guinea Exp. K.N.A.G. 1939 Araboebivak 14 October 1939/ *Afidentula bivakana* det. R. Bielawski 1964/ Paratypus” (1 female: MIZ).

#### Diagnosis

This species is most similar to *P. wiebesi* because of dorsal body colouration but *P. bivakana* can be easily separated from *P. wiebesi* by elongate oval body (distinctly heart-shaped in *P. wiebesi*), antennomere 5 subquadrate, more transverse mentum and the prosternal process with sides parallel.

#### Description

Length 8.3 mm; TL/EW = 1.26; PL/PW = 0.44; EL/EW = 1.14; EW/PW = 1.81.

Body (Figures 3G, 15G) elongate-oval, convex; surfaces covered with short white, appressed setae. Mouthparts yellow with last two maxillary palpomeres brown. Antennomeres 1–7 yellow, antennomeres 8–11 dark brown to black. Head black with yellow triangular fronto-clypeal macula. Pronotum along middle black, lateral parts yellow; hypomera yellow, prosternum black; dorsal surfaces and legs black.

Antenna (Figure 3A) with antennomere 4 elongate, longer than antennomere 5; antennomeres 5 and 6 subquadrate; antennomere 7 and 8 transverse; antennomere

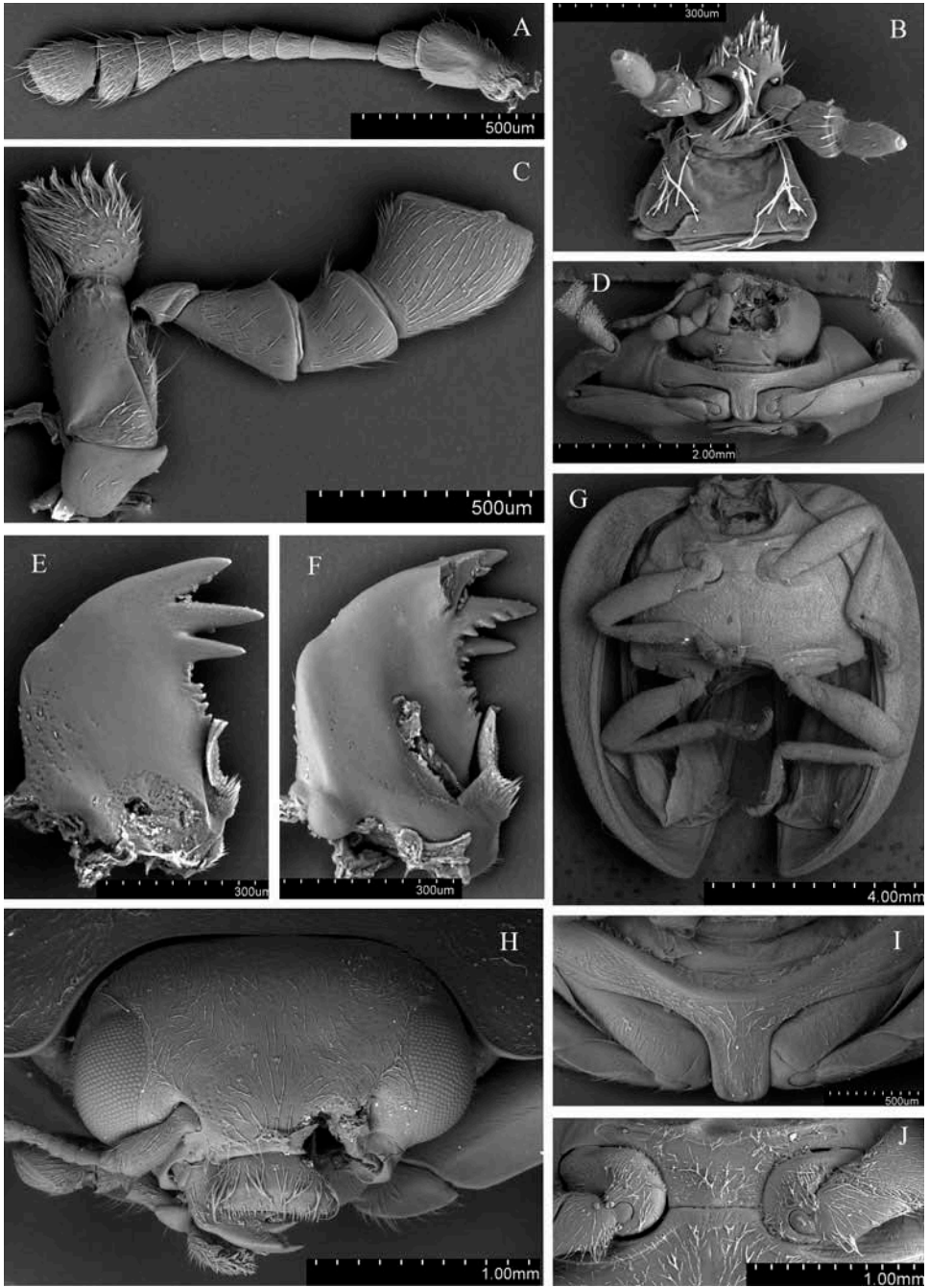


Figure 3. *Papuaepilachna bivakana* (Bielawski). (A) Antenna; (B) labium; (C) maxilla; (D) head and prosteronum, ventral; (E) mandible, dorsal; (F) mandible, ventral; (G) habitus, ventral; (H) head, anterodorsal; (I) prosternal process; (J) mesoventral process.

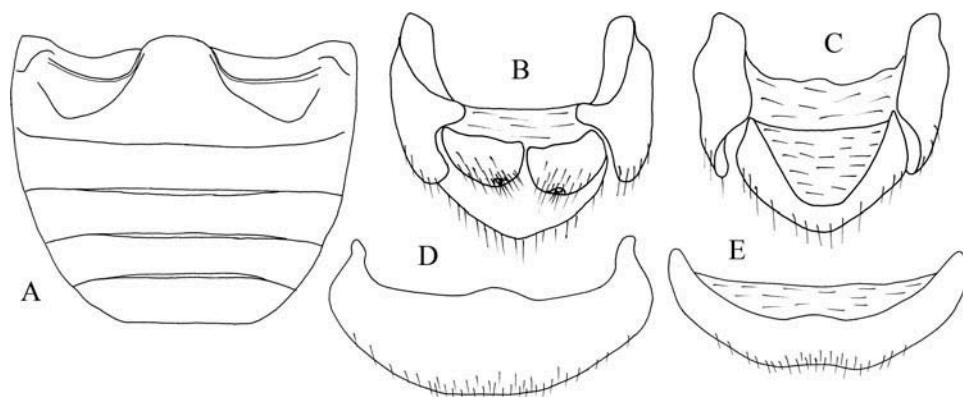


Figure 4. *Papuaepilachna bivakana* (Bielawski). (A) Abdomen, female; (B) female genitalia, ventral; (C) female genitalia, dorsal; (D) tergite VIII, female; (E) sternite VIII, female.

8 widened anteriorly. Mandibles (Figure 3E, F) with two apical and first subapical teeth large, sharp, triangular in shape with numerous denticles on inner margin; second subapical tooth large, sharp without denticles; additional serration below teeth. Labrum feebly emarginate (Figure 3H). Labium (Figure 3B) with palpomere 1 transverse, about half length of palpomere 2, which is scarcely longer than wide; apical palpomere about 1.2 times longer than palpomere 2. Maxillary terminal palpomere (Figure 3C) about 1.15 times longer than wide.

Prosternal process (Figure 3D, I) subtruncate at apex with sides parallel; width of prosternal process about 1.3 times greater than length of prosternum in front of procoxae. Mesoventral process (Figure 3J) about as wide as coxal diameter at the same position.

Legs with hind femora protruding from outer margin of elytral epipleuron (Figure 3G).

Abdominal postcoxal lines somewhat angulately curved (Figure 4A); apical margin of female ventrite 5 truncate (Figure 4A), sternite VIII weakly emarginate and tergite VIII rounded (Figure 4D, E).

Male terminalia and genitalia not studied (see Bielawski 1965: 51).

Female genitalia as in Figure 4B, C with transverse, almond-like coxites.

***Papuaepilachna kapuri*** (Bielawski)  
(Figures 5A–K, 6A–Q, 15E)

*Afidentula kapuri* Bielawski, 1965: 45.

*Material*

*Paratypes*. New Guinea, Indonesia: “Museum Leiden Nieuw Guinea Exp. K.N.A.G. 1939 Araboebivak 5 October 1939/ Paratypus/ *Afidentula kapuri* sp. nov. det. R. Bielawski 1964” (1 male: MIZ); same but 12 October 1939 (2 females: MIZ); same but 17 October 1939 (2 males, 1 female: MIZ); same but 25 October 1939 (1 male, 1 female:

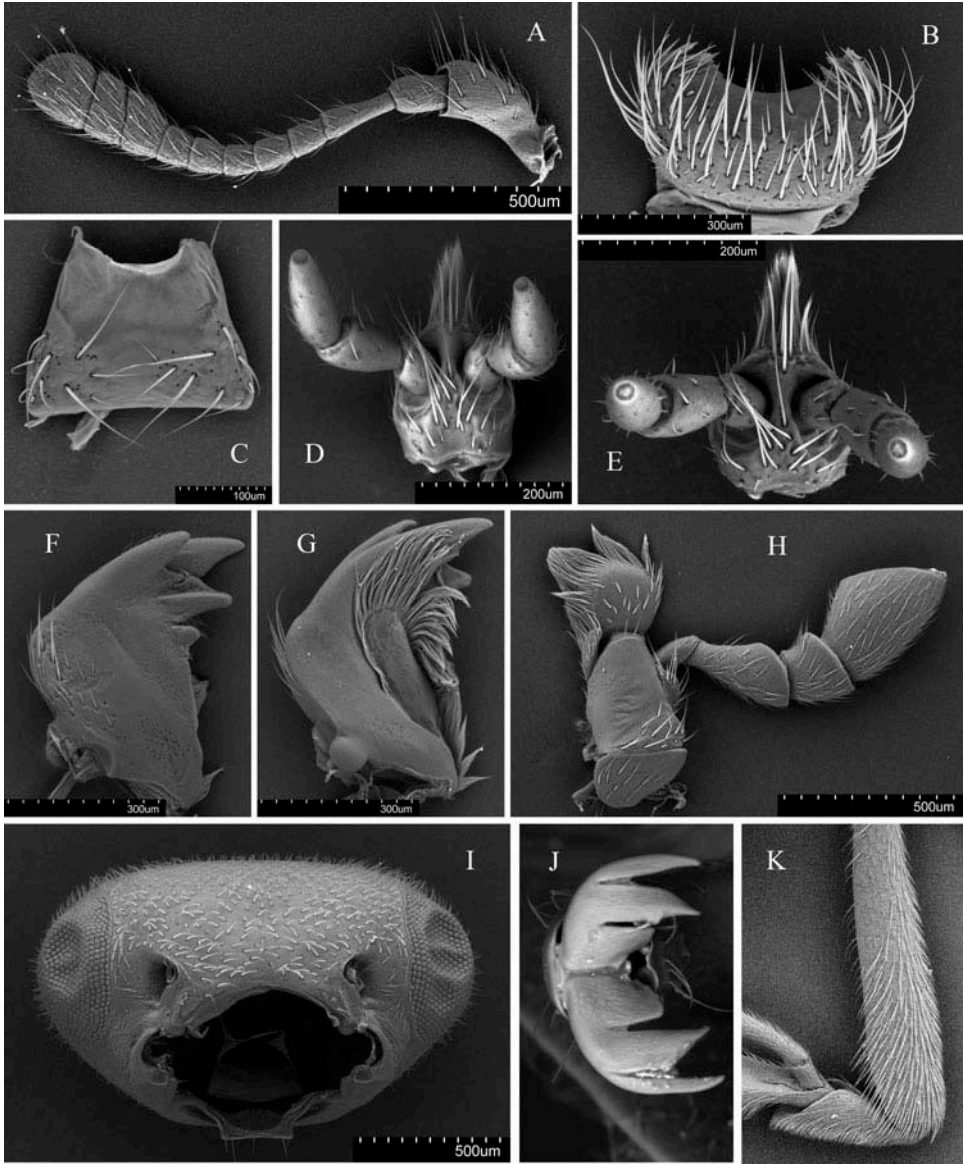


Figure 5. *Papuaepilachna kapuri* (Bielawski). (A) Antenna; (B) labrum; (C) mentum; (D) prementum, ventral; (E) prementum, anteroventral; (F) mandible, dorsal; (G) mandible, ventral; (H) maxilla; (I) head; (J) tarsal claw; (K) tibia.

MIZ); same but 30 October 1939 (2 males: MIZ); same but 2 November 1939 (1 male, 1 female: MIZ); same but 6 November 1939 (2 males, 3 females: MIZ); "New Guinea (Neth.) Wisselmaren: 1530 m Urapura Kamo V. August 10. 1955/ J.L. Gressitt Coll./ Paratypus *Afidentula kapuri* sp. nov. det. R. Bielawski 1964" (1 male: MIZ).



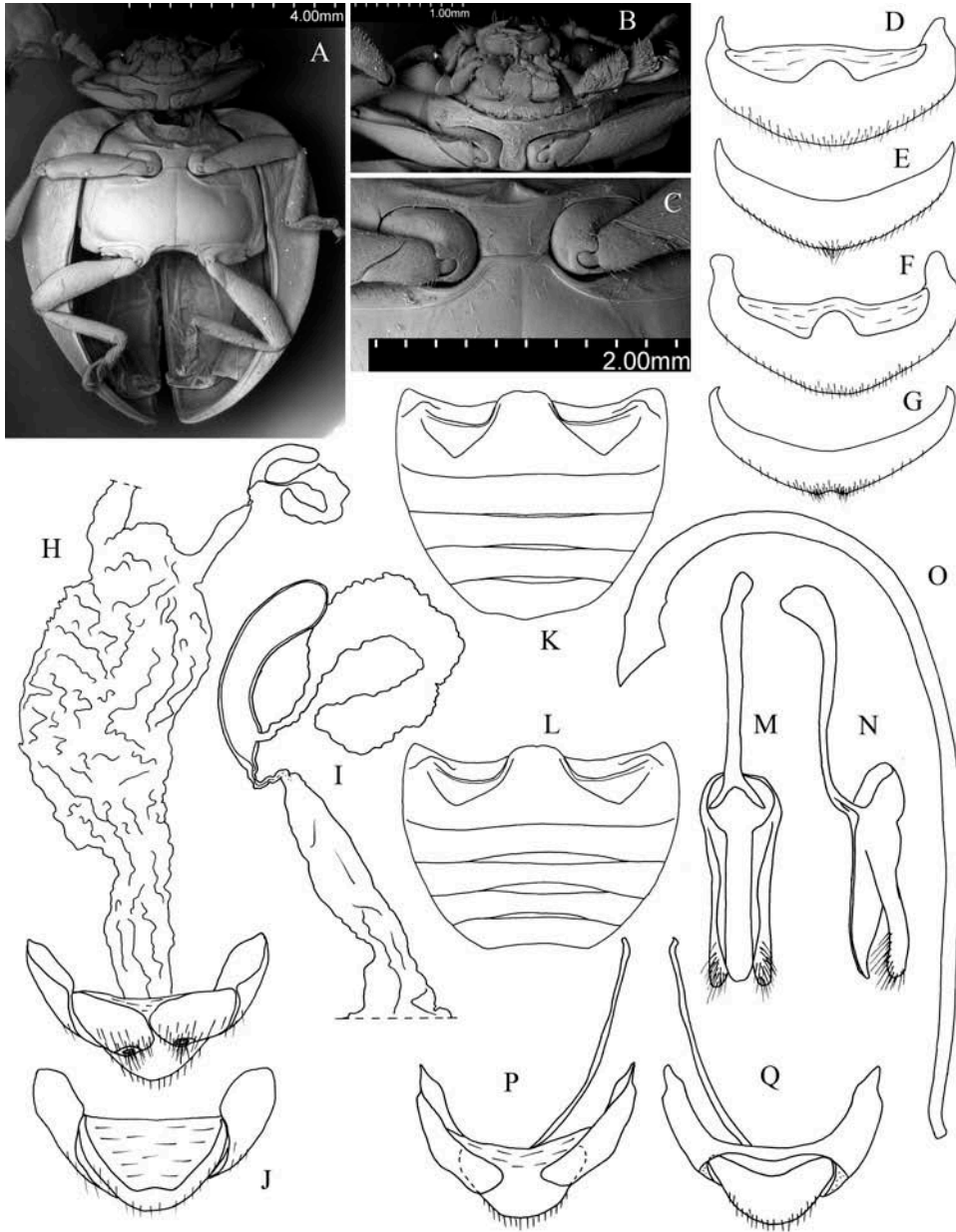


Figure 6. *Papuaepilachna kapuri* (Bielawski). (A) Habitus, ventral; (B) prosternal process; (C) mesoventral process; (D) tergite VIII, female; (E) sternite VIII, female; (F) tergite VIII, male; (G) ventrite 6, male; (H) female genitalia, ventral; (I) spermatheca and accessory gland; (J) female genitalia, dorsal; (K) abdomen, female; (L) abdomen, male; (M) tegmen, inner; (N) tegmen, lateral; (O) penis, lateral; (P) male genital segment, ventral; (Q) male genital segment, dorsal.

*Diagnosis*

This species resembles *P. nasti* in body size, shape and colouration but is distinguished by suberect elytral pubescence, antennomeres 4 and 5 slightly elongate, molar area of mandible without tooth and postcoxal lines on abdomen v-shaped.

*Description*

Length 6.3–7.3 mm; TL/EW = 1.19–1.25; PL/PW = 0.40–0.44; EL/EW = 1.05–1.08; EW/PW = 1.84–1.93.

Body (Figures 6A, 15E) elongate-oval, convex; surfaces covered setose with short, white, suberect setae. Dorsum black with only anterior angles of pronotum very narrowly yellow; ventral surfaces and legs black; only maxillae and labium chestnut brown; antennomere 1 black, antennomeres 2–7 yellow or yellowish-brown, antennomeres 8–11 dark brown to blackish.

Antenna (Figure 5A) with antennomeres 4–7 weakly elongate, subequal in length; antennomere 8 transverse. Mandibles (Figure 5F, G) with two apical and first subapical teeth large, triangular in shape; second subapical tooth small, subtriangular; all teeth without additional serration. Labrum deeply emarginate medially at apex (Figure 5B). Labium (Figure 5C–E) with palpomere 1 subquadrate, about half length of palpomere 2; terminal palpomere about 1.3–1.4 times longer than palpomere 2. Terminal maxillary palpomere about 1.35 times longer than wide (Figure 5H).

Prosternal process (Figure 6B) weakly widening near apex, truncate apically; width of prosternal process about 1.65 times greater than length of prosternum in front of procoxae. Mesoventral process (Figure 6C) about 0.7 times as wide as mesocoxal diameter at the same position.

Legs with hind femora protruding from outer margin of elytral epipleuron (Figure 6A).

Abdominal postcoxal lines V-shaped (Figure 6K, L); male ventrite 5 as long as ventrite 4, apical margin of ventrite 5 truncate (Figure 6L), ventrite 6 scarcely emarginate, tergite VIII rounded (Figure 6F, G); apical margin of female ventrite 5 somewhat sinuate (Figure 6K), sternite and tergite VIII rounded (Figure 6D, E).

Male terminalia and genitalia (Figure 6M–Q). Tergite IX not divided dorsally. Penis guide as long as parameres; apex slightly bent, rounded in outer view. Parameres slightly widening apically. Tegmen strut longer than penis guide and basal piece combined. Penis with apex slightly curved outwardly.

Female genitalia as in Figure 6H–J with coxites transverse, almond-like.

***Papuaepilachna nasti*** (Bielawski)  
(Figures 7A–I, 8A–Q, 15F)

*Afidentula nasti* Bielawski, 1963: 433.

*Material*

*Holotype male*. Papua New Guinea: “Melambi. R. Lae, N. G., Mirilunga Vill. 1370 m (4500’), 16/6/57, Native Gardens, Coll. J. H. Ardley, 680, C. L. E. Coll. No./5521, Holotypus, Pres by Com Inst. Ent. BM 1958-1, *Epilachna nasti* sp. n., det. R. Bielawski 1958, Type” (BMNH).

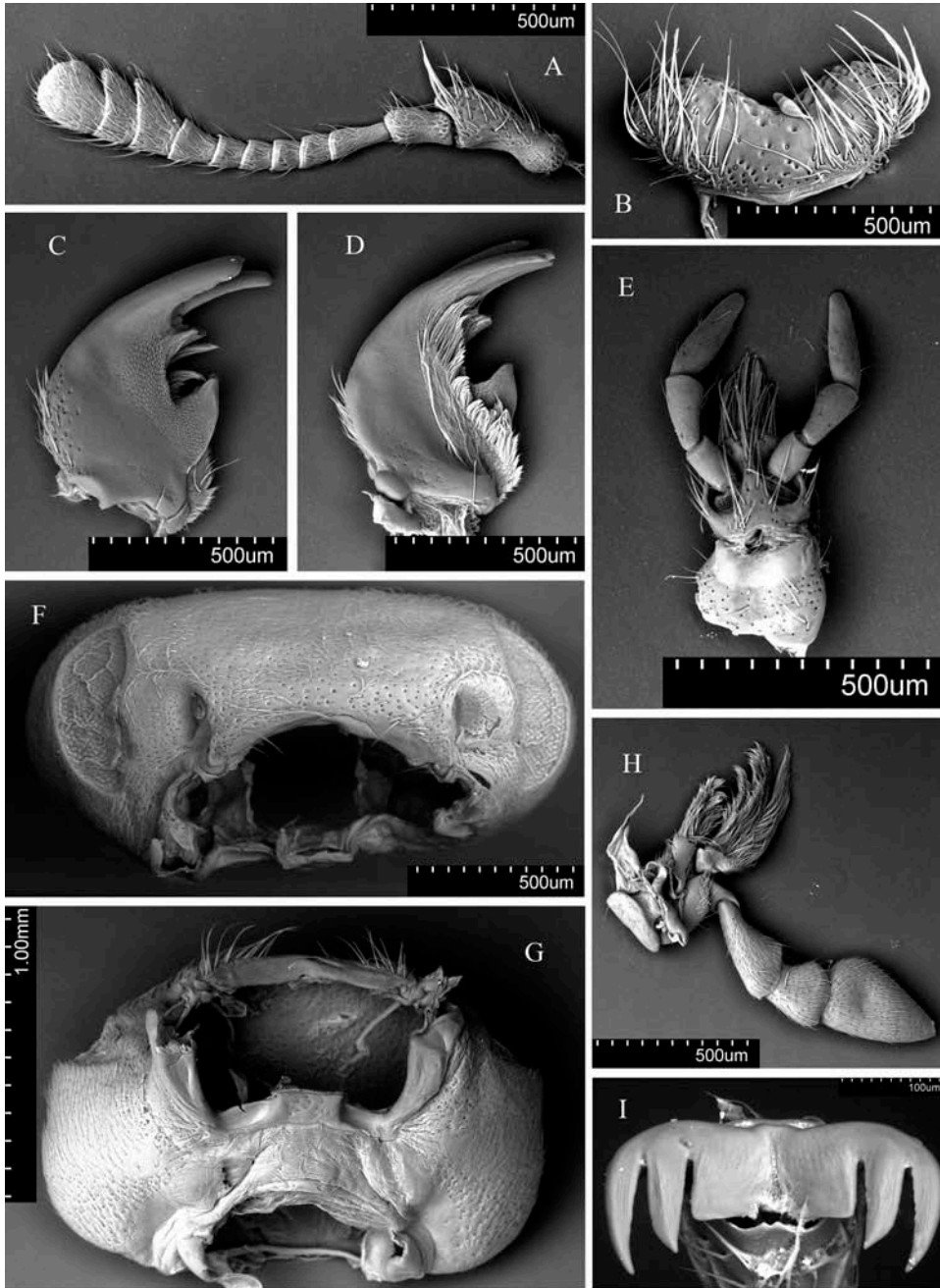


Figure 7. *Papuaepilachna nasti* (Bielawski). (A) Antenna; (B) labrum; (C) mandible, dorsal; (D) mandible, ventral; (E) labium; (F) head; (G) head, ventral; (H) maxilla; (I) tarsal claw.

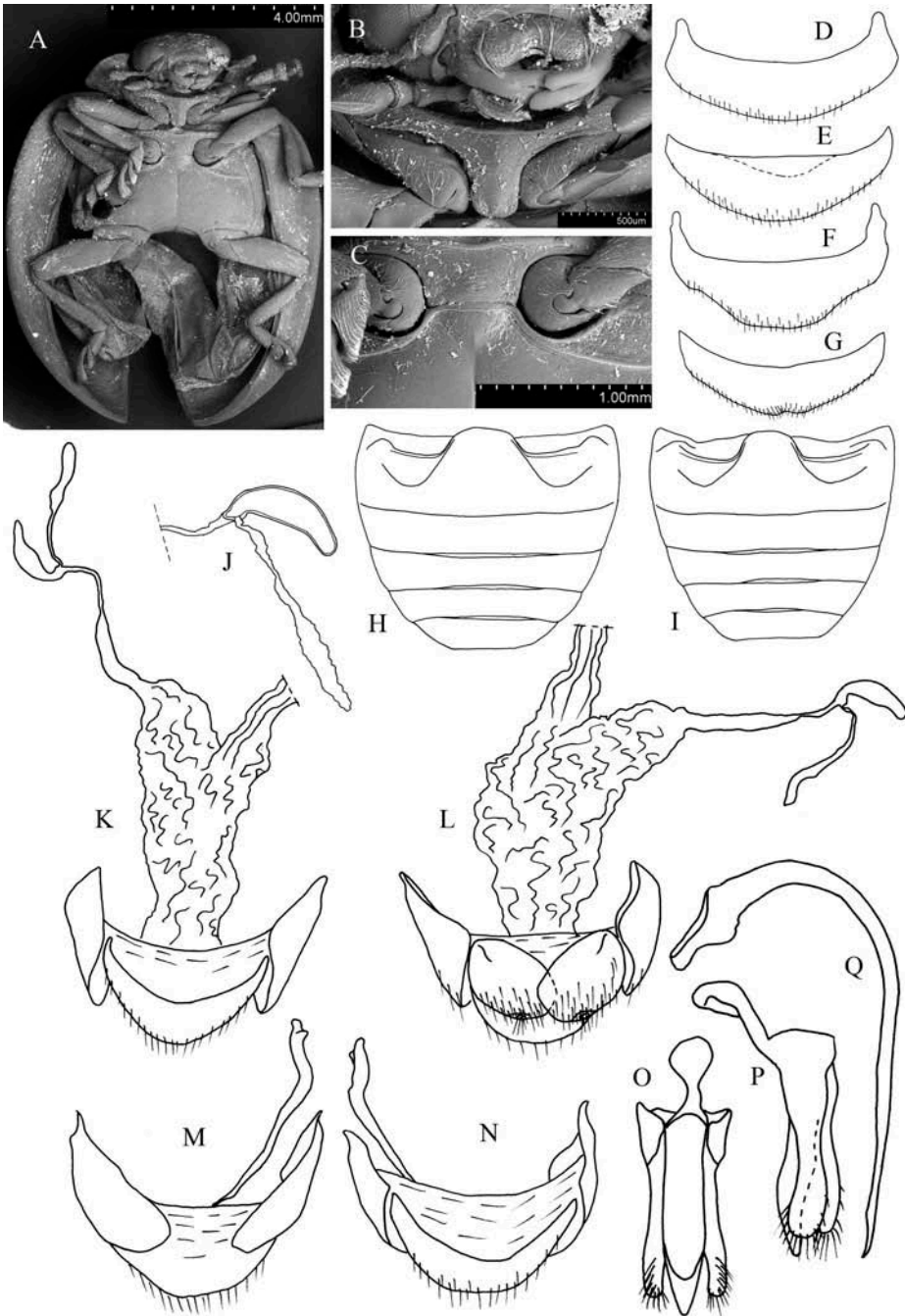


Figure 8. *Papuaepilachna nasti* (Bielawski). (A) Habitus, ventral; (B) prosternal process; (C) mesoventral process; (D) tergite VIII, female; (E) sternite VIII, female; (F) tergite VIII, male; (G) ventrite 6, male; (H) abdomen, female; (I) abdomen, male; (J) female genitalia, dorsal; (K) spermatheca and accessory gland; (L) female genitalia, ventral; (M) male genital segment, ventral; (N) male genital segment, dorsal; (O) penis, lateral; (P) tegmen, lateral; (Q) tegmen, inner.

*Paratypes.* Papua New Guinea: “Neu-Guinea Cromwelgebrige/ ex coll. F. Kessel Mus. Zool Polonicum Warszawa 19/45/ Inst. Zool. P.A.N. Warszawa Allotypus/ *Epilachna nasti* sp. nov. det. R. Bielawski 1958/ prep. genit. N: 1424 R. Bielawski 1956” (1 female: MIZ); “Htid. v. Finsohafen 1.30 L. Wagner S./ Paratypus/ *Afidentula nasti* sp. nov. det R. Bielawski 1961” (1 female: MIZ); “New Guinea (Neth.), Wisselmeren, 1500 m, Itouda Kamo V. Aug. 14. 1955/ J.L Gressitt collector/ Paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski 1962” (1: BPBM); New Guinea, (NE), Bulolo 1020 m. 20 August 1956/ E.J. Ford, Jr. collector/ Paratypus/ *Afidentula nasti* sp. n., Paratypus, det. R. Bielawski 1962” (2: BPBM); same but 24 August 1956 (1: BPBM); “New Guinea (NE), Nonduglo 1600 m, 8 July 1956/ Light trap, J.L. Gressitt/ Paratypus/ *Afidentula nasti* sp. n. paratypus, det. R. Bielawski” (1: BPBM); same but “July 9 1955/ Inst. Zool. P.A.N. Warszawa 56/62” (1 male: MIZ); “New Guinea (NE), Baindoang Salawaket Range, 1800 m, 15 September 1956/ E.J. Ford Jr. collector/ paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski 1962” (2: BPBM); same but Inst. Zool P.A.N. Warszawa 56/62 (2 females: MIZ); “New Guinea: Papua, Owen Stanley Range, Goilala: Tororo 1560 m, 21–24 February 1958/ W.W. Brandt collector, Bishop/ Paratypus/ *Afidentula nasti* sp. n. paratypus, det. R. Bielawski” (1: BPBM; 2 males: MIZ); “New Guinea: NE W. Highlands: Hagen SE of Kornfarm, 15 October 1958/ J.L. Gressitt collector, Paratypus/ *Afidentula nasti* sp. n. paratypus det. R. Bielawski 1962/ Inst. Zool. P.A.N. Warszawa 56/62” (1 female: MIZ); “New Guinea: NE, W. Highlands: Korn Farm, 1560 m, 19 October 1958/ J.L. Gressitt collector/ Paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski 1962” (1: BPBM); “New Guinea: NE, Finisterre Range, Saidor: Funyende, 1200 m, 24–30 September 1958/ W.W. Brandt collector, Bishop/ Paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski 1962” (1: BPBM); same but “Inst. Zool. P.A.N. Warszawa 56/62” (1 female: MIZ); “New Guinea: NE, Kassam, 1350 m, 48 km E. of Kainantu, 30 October 1959/ T.C. Maa collector, Bishop/ paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski” (2: BPBM); “New Guinea: NE, Mòife 2100 m., 15 km NW of Okapa, 7–14 October 1959/ T.C. Maa collector, Bishop/ Paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski, 1962” (1: BPBM); “New Guinea: NE, Kliptami Valley, 1200–1350 m. 1–15 August 1959/ W.W. Brandt collector, Bishop/ Paratypus/ *Afidentula nasti* sp. n., paratypus, det. R. Bielawski 1962” (1: BPBM).

*Other material.* Papua New Guinea: north-east Western Highlands: Goiburing; east of Korn Farm 1560–1650 m, 16 October 1958, J.L. Gressitt Coll., *Afidentula nasti* (Biel.) (1 male: MIZ); north-east, Baindoang Salawaket Range 1800 m. 15 September 1956, E.J. Ford Jr. Coll., *Afidentula nasti* (Biel.) (1 male: MIZ); north-east Kilolo Creek near Wau, 900–1000 m, August 1968, N. I. H. Krauss Collector (1 male: BPBM); Morobe Distr. Wau, 2 July 1974, 1150 m, Gewise Otaweto coll’r. Wau Ecology Inst., Bishop Museum Acc. No. 1976.186, *Pipturus* (1 male: BPBM).

### Diagnosis

This species can be distinguished from all its congeners by its characteristic mandible provided with large tooth in molar area and by basal labial palpomere longer than wide. By overall size, shape and colouration *Papuaepilachna nasti* is most similar to *P. kapuri* but can be distinguished from it by having (apart from above-mentioned

characters) appressed pubescence, parallel sided prosternal process and regularly curved abdominal postcoxal lines.

### Description

Length 5.8–7.4 mm; TL/EW = 1.14–1.23; PL/PW = 0.38–0.44; EL/EW = 1.02–1.06; EW/PW = 1.77–2.00.

Body (Figures 8A, 15F) elongate-oval, convex; surfaces covered with short, appressed pubescence. Body black with only mouthparts (except for terminal maxillary palpomere) and antennomeres 2–8 yellowish-brown; anterior angles of pronotum may be very narrowly yellow.

Antenna (Figure 7A) with antennomeres 4–7 weakly transverse, subequal in length; antennomere 8 longer and wider than antennomeres 4–7, as long as wide, widening anteriorly. Mandibles with two large apical and one small subapical, wide, chisel-like tooth; molar area provided with large triangular tooth (Figure 7C, D). Labrum deeply emarginate medially at apex (Figure 7B). Labial palp with all palpomeres elongate (Figure 7E); palpomere 1 about 0.75 times length of palpomere 2; terminal palpomere about 1.25 times as long as subterminal one. Terminal maxillary palpomere about as long as wide (Figure 7H). Galea and lacinia covered with very long setae.

Prosternal process (Figure 8B) subtruncate at apex, parallel sided; width of prosternal process about 1.5 times greater than length of prosternum in front of procoxae. Mesoventral process about as wide as coxal diameter at the same position (Figure 8C).

Legs with hind femora not protruding from outer margin of elytral epipleuron (Figure 8A).

Abdominal postcoxal lines regularly curved (Figure 8H, I); male ventrite 5 as long as ventrite 4, apical margin of ventrite 5 truncate (Figure 8I), ventrite 6 scarcely emarginate, tergite VIII rounded (Figure 8F, G); apical margin of female ventrite 5 subtruncate (Figure 8H), sternite and tergite VIII rounded (Figure 8D, E).

Male terminalia and genitalia (Figure 8M–Q). Tergite IX divided dorsally. Penis guide longer than parameres; apex pointed from outer view. Parameres slightly widening apically. Tegminal strut about 0.5 times shorter than penis guide and basal piece combined. Penis straight, narrowing anteriorly; apex pointed.

Female genitalia as in Figure 8J–L with coxites transversely oval.

### Remarks

One of the examined specimens bears a label “Pipturus”. It is not clear whether plant of this genus of the family Urticaceae is a host plant for *P. nasti* or just this specimen was caught on it. Information about host plants of Epilachnini is so limited that it is worth noting this fact.

### *Papuaepilachna tenmana* (Bielawski) (Figures 9A–G, 10A–H, 15B)

*Afidentula tenmana* Bielawski, 1965: 47.

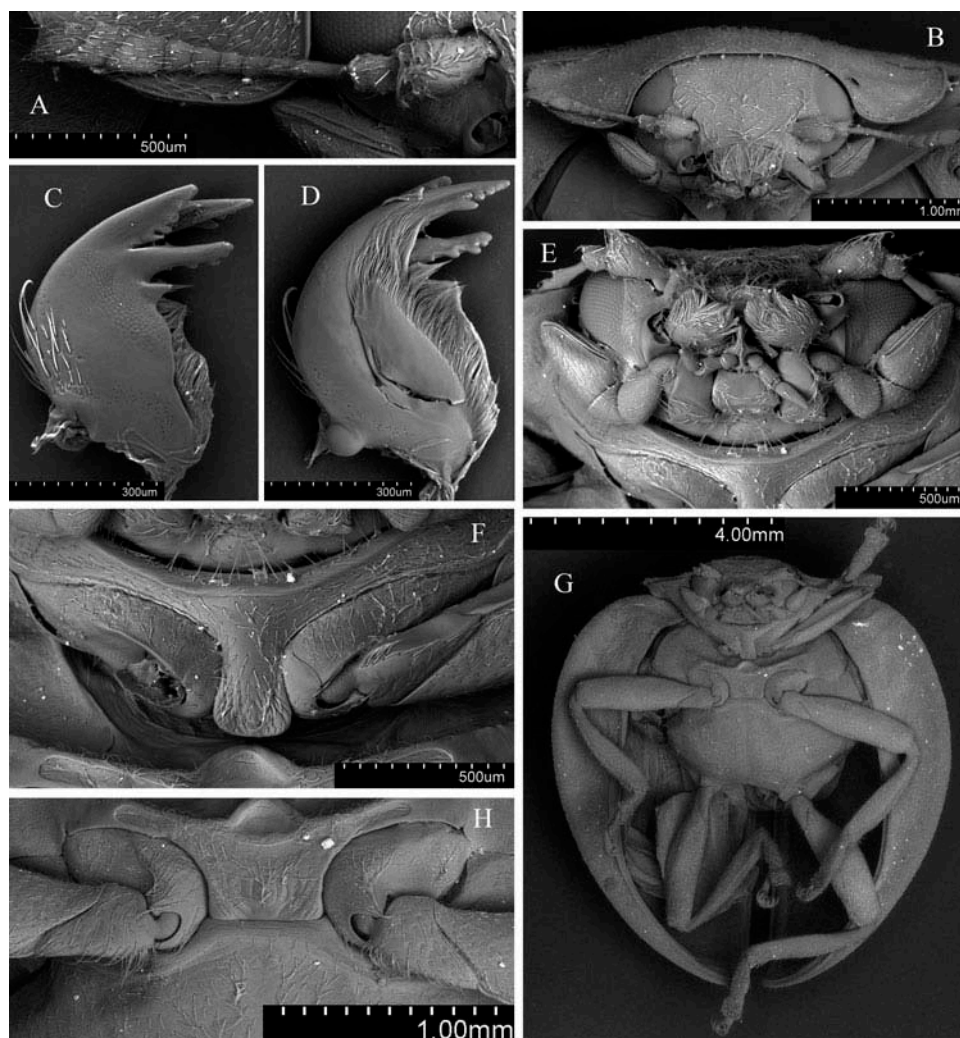


Figure 9. *Papuaepilachna tenmana* (Bielawski). (A) Antenna; (B) head, dorsal; (C) mandible, dorsal; (D) mandible, ventral; (E) head and mouth parts, ventral; (F) prosternal process; (G) habitus, ventral; (H) mesoventral process.

#### Material

Papua New Guinea: North-east Telefomin August 1973, Abid Beg Mirza collector, Bishop Museum (1 male: BPBM).

#### Diagnosis

The body distinctly heart-shaped makes *Papuaepilachna tenmana* most similar to *P. wiebesi* and *P. watalai*. It is distinguished from both these species by mandibular teeth provided with additional denticles and labrum with anterior margin more deeply

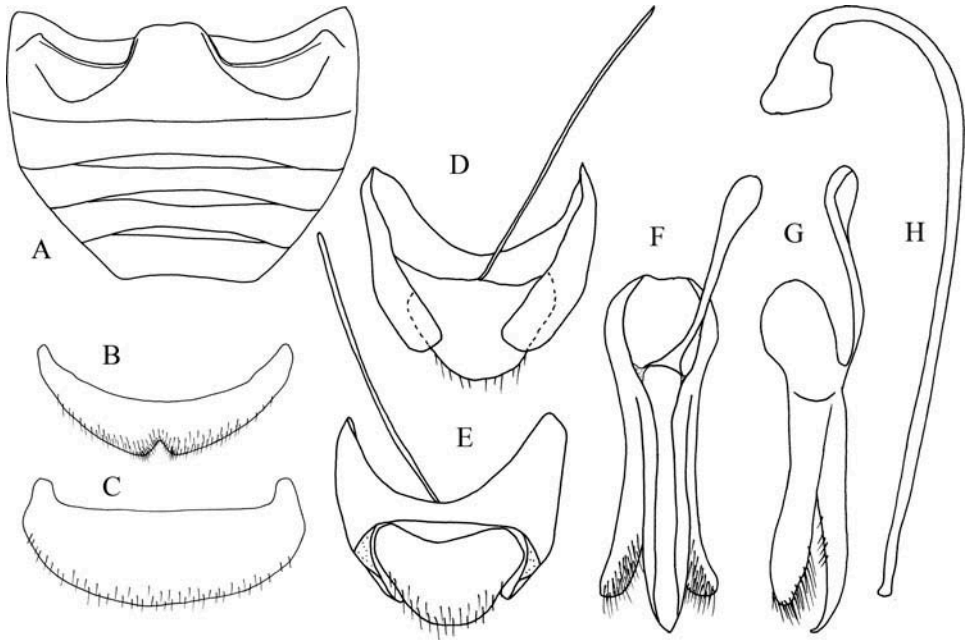


Figure 10. *Papuaepilachna tenmana* (Bielawski). (A) Abdomen, male; (B) ventrite 6, male; (C) tergite VIII, male; (D) male genital segment, ventral; (E) male genital segment, dorsal; (F) tegmen, inner; (G) tegmen, lateral; (H) penis, lateral.

emarginate medially. Additionally *P. tenmana* can be separated from *P. wiebesi* by having whole prothorax black while from *P. watalai* by antennomeres 6–8 at most as long as wide or transverse and male ventrite 5 truncate apically.

#### Description

Length 8.3 mm; TL/EW = 1.28; PL/PW = 0.45; EL/EW = 0.98; EW/PW = 1.97.

Body (Figures 9G, 15B) heart-shaped, convex; surfaces covered with short, white, appressed pubescence; black with mouthparts, antennomeres 2–8 and anterior angles of pronotum yellowish-brown.

Antenna (Figure 9A) with antennomeres 4 and 5 elongate, longer than antennomere 6; antennomere 6 subquadrate; antennomere 7 and 8 weakly transverse; antennomere 8 widened anteriorly. Mandibles (Figure 9C, D) with two apical and first subapical teeth large, sharp, triangular in shape with numerous additional denticles; second subapical tooth small and sharp. Labrum emarginate (Figure 9B). Labium (Figure 9E) with palpomere 1 short, subquadrate, longer than half length of palpomere 2; terminal palpomere about 1.5 times longer than palpomere 2. Terminal maxillary palpomere large, securiform about as long as wide (Figure 9E).

Prosternal process (Figure 9F) subtruncate at apex, weakly expanded apically; width of prosternal process about 1.8 times greater than length of prosternum in front of procoxae. Mesoventral process about 0.85 times as wide as coxal diameter at the same position (Figure 9H).



Legs with hind femora protruding from outer margin of elytral epipleuron (Figure 9G).

Abdominal postcoxal lines regularly curved (Figure 10A); male ventrite 5 as long as ventrite 4, apical margin of ventrite 5 truncate (Figure 10A), ventrite 6 narrowly, deeply emarginate, tergite VIII rounded (Figure 10B, C).

Male terminalia and genitalia (Figure 10D–H). Tergite IX not divided dorsally. Tergite X rounded at apex. Penis guide slightly longer than parameres; apex bent, subacute from outer view; penis guide with several setae at outer surface. Parameres weakly widening anteriorly. Tegminal strut shorter than penis guide and basal piece combined. Penis long, straight throughout most of its length, with sides parallel and apex rounded.

Female not known.

***Papuaepilachna watalai*** (Jadwiszczak)  
(Figures 11A–J, 12A–N, 15D)

*Afidentula watali* Jadwiszczak, 1986: 257;

*Afidentula watalai*: Jadwiszczak and Węgrzynowicz 2003: 25. Emendation.

*Material*

*Paratypes*. Papua New Guinea: “N. Guinea: NE Ialibu 2100 m Gressitt-Maa/ Paratypus/ *Afidentula watali* sp. nov. det. A. Jadwiszczak” (1 male: MIZ); “N. Guinea: NE Mt Ialibu 2300–2560 m/ Paratypus/ J.L. Gressitt collector, 8–14 April 1968/ Inst. Zool. P.A.N. Warszawa/ *Afidentula watali* sp. nov. det. A. Jadwiszczak” (1 female: MIZ).

*Diagnosis*

This species is the largest member of the genus. Moreover it can be distinguished by its antenna length exceeding width of the head with antennomeres 4–8 elongate.

*Description*

Length 8.1–9.0 mm; TL/EW = 1.21–1.25; PL/PW = 0.42–0.48; EL/EW = 1.08; EW/PW = 1.91–2.03.

Body (Figures 11H, 15D) heart-shaped, convex; surfaces distinctly setose with white, short, appressed pubescence; black with only mouthparts brown (except for two last maxillary palpomeres) and antennomeres 2–8 yellowish.

Antenna (Figure 11A) longer than width of the head; antennomere 3 longer than pedicel and slightly shorter than antennomeres 4 and 5 combined; antennomeres 4–8 elongate, twice as long as wide, subequal in length to each other. Mandibles with lower apical tooth large, subtriangular, upper one reduced, both subapical teeth large, subtriangular; all teeth without additional serration (Figure 11C, D); ventral surface of subapical teeth distinctly tuberculate. Labrum weakly emarginate medially at apex (Figure 11B). Labium (Figure 11G) with palpomere 1 small, subquadrate, about half

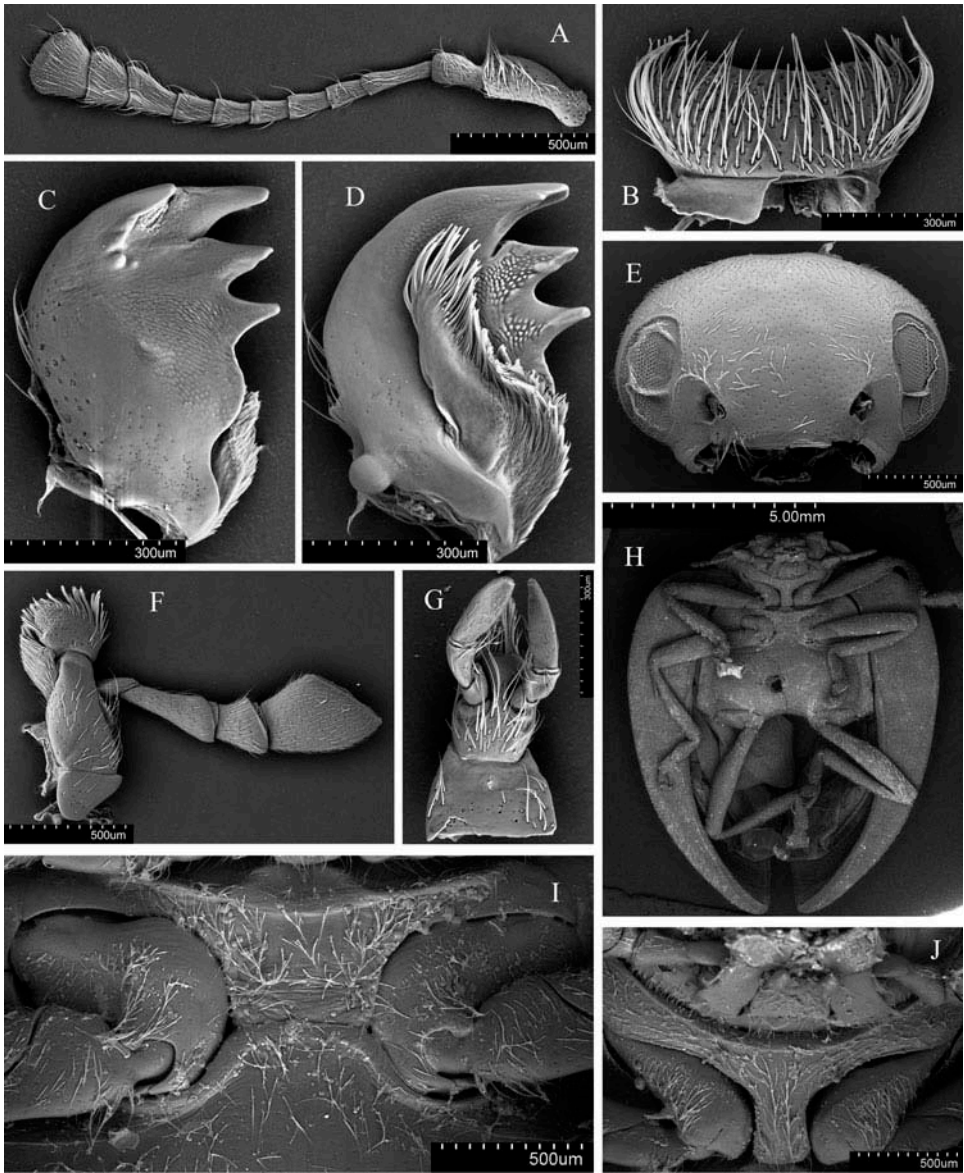


Figure 11. *Papuaepilachna watalai* (Jadwiszczak). (A) Antenna; (B) labrum; (C) mandible, dorsal; (D) mandible, ventral; (E) head, dorsal; (F) maxilla; (G) labium; (H) habitus, ventral; (I) mesovenal process; (J) prosternal process.

the length of second palpomere; terminal palpomere long, about 1.8 times longer than palpomere 2. Terminal maxillary palpomere somewhat securiform about 1.2 times longer than wide (Figure 11F).

Prosternal process (Figure 11J) truncate at apex, with sides subparallel; width of prosternal process about 1.35 times greater than length of prosternum in front of

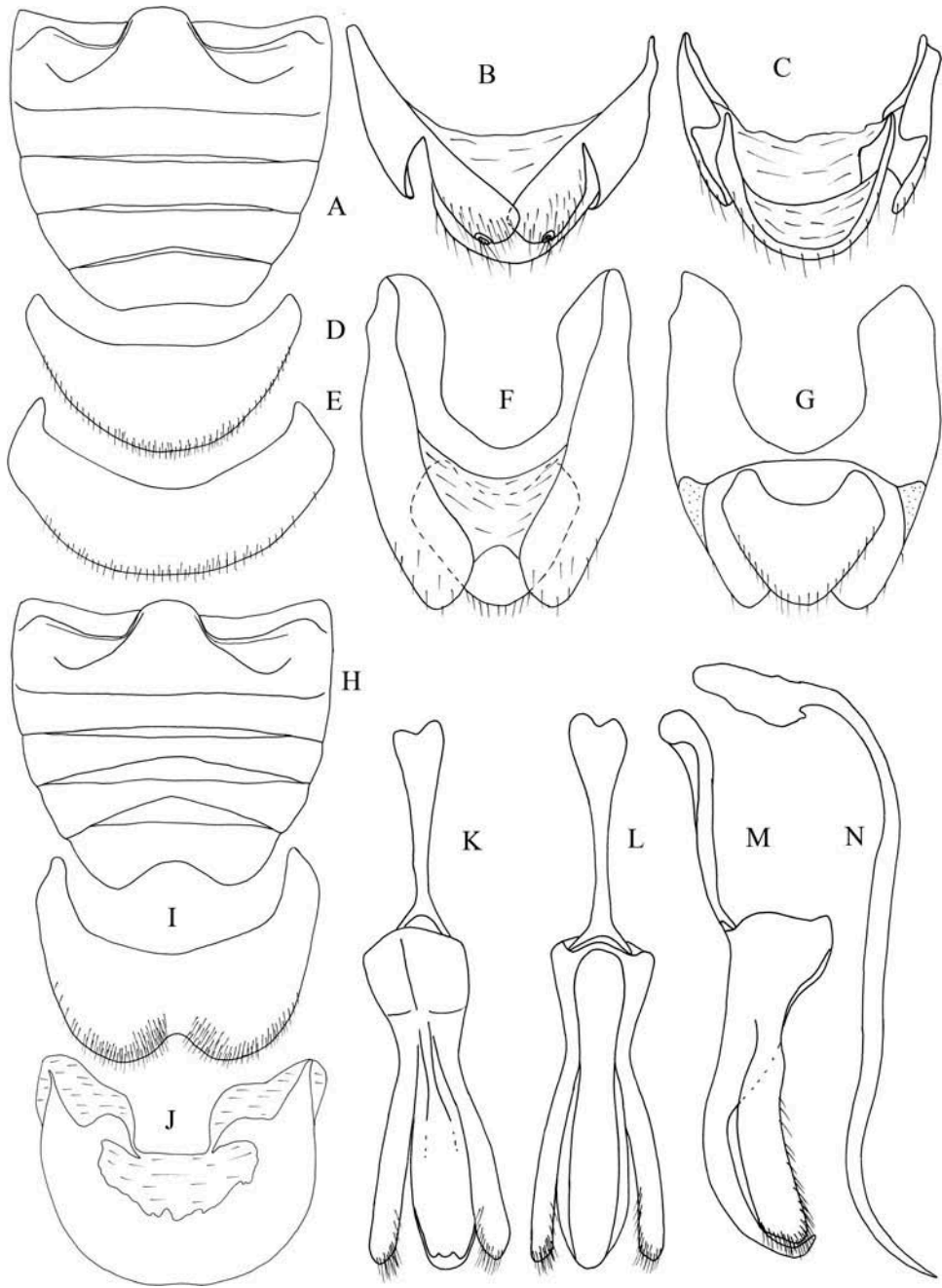


Figure 12. *Papuaepilachna watalai* (Jadwiszczak). (A) Abdomen, female; (B) female genitalia, ventral; (C) female genitalia, dorsal; (D) sternite VIII, female; (E) tergite VIII, female; (F) male genital segment, ventral; (G) male genital segment, dorsal; (H) abdomen, male; (I) ventrite 6, male; (J) tergite VIII, male; (K) tegmen, outer; (L) tegmen, inner; (M) tegmen, lateral; (N) penis, lateral.

procoxae. Mesoventral process about 0.7 times as wide as coxal diameter at the same position (Figure 11I).

Legs with hind femora protruding from outer margin of elytral epipleuron (Figure 11H).

Abdominal postcoxal lines regularly curved, distinctly incomplete (Figure 12A, H); male ventrite 5 apically broadly and deeply emarginate (Figure 12H), ventrite 6 narrowly and deeply emarginate (Figure 12I), tergite VIII large, highly sclerotized, rounded (Figure 12J); apical margin of female ventrite 5 truncate (Figure 12A), sternite and tergite VIII rounded (Figure 12D, E).

Male terminalia and genitalia (Figure 12F, G, K–N). Tergite IX not divided dorsally. Tergite X deeply emarginate at anterior margin. Penis guide as long as parameres, strongly curved outwardly towards apex. Parameres weakly widening apically. Penis long, S-shape; apex pointed.

Female genitalia as in Figure 12B, C with coxites transverse, almond-like; their outer lateral margins fused with paraprocts.

***Papuaepilachna wiebesi*** (Bielawski)  
(Figures 13A–J, 14A–K, 15A)

*Afidentula wiebesi* Bielawski, 1965: 52.

*Material*

Paratypes. Papua New Guinea: “Museum Leiden Nieuw Guinea Exp. K.N.A.G. 1939 Araboebivak 13 October 1939/ *Afidentula wiebesi* sp. nov. det. R. Bielawski 1964/ Paratypus” (1 male: MIZ); same but 16 October 1939 (1 male: MIZ); same but 5 November 1939 (1 male, 1 female: MIZ).

*Diagnosis*

This species is most similar to *P. tenmana* and *P. watalai* sharing distinctly heart-shaped body. *Papuaepilachna wiebesi* however can be separated from both these species in having the prothorax most often yellowish brown with only prosternal process between coxae black. Moreover, mandibular teeth without denticles and shallowly emarginate anterior margin of labrum distinguish it from *P. tenmana* while antenna length shorter than width of head with antennomeres 6–8 at most as long as wide, and male ventrite 5 truncate apically separate *P. wiebesi* from *P. watalai*.

*Description*

Length 7.0–7.8 mm; TL/EW = 1.22–1.30; PL/PW = 0.42–0.44; EL/EW = 1.07–1.26; EW/PW = 1.71–1.87.

Body (Figures 13E, 15A) heart-shaped, convex; surfaces covered with white, short, appressed pubescence; body mostly black with mouthparts brown (except for terminal maxillary palpomere black); antennomere 1 dark brown and antennomeres 2–8, hypomeron and prosternum yellow with apex of prosternal process black. Pronotum often with infusate disc and yellow lateral sides, sometimes entire pronotum yellow or black with only lateral and anterior margins yellow.

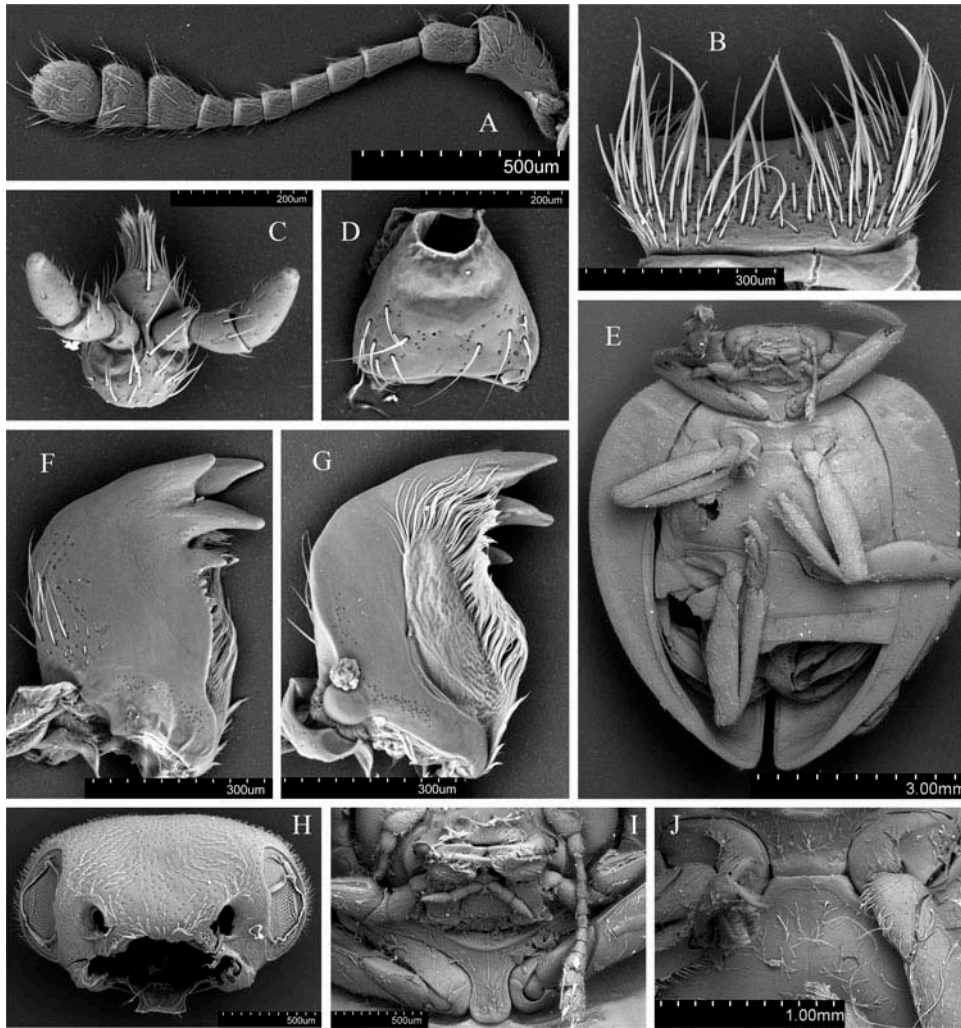


Figure 13. *Papuaepilachna wiebesi* (Bielawski). (A) Antenna; (B) labrum; (C) prementum, anteroventral; (D) mentum; (E) habitus, ventral; (F) mandible, dorsal; (G) mandible, ventral; (H) head; (I) prosternal process; (J) mesoventral process.

Antenna (Figure 13A) with antennomere 3 shorter than antennomeres 4 and 5 combined; antennomeres 4 and 5 elongate, antennomeres 6–8 subquadrate; antennomere 8 widening anteriorly. Mandibles with two apical and first subapical teeth large, subtriangular; second subapical teeth smaller, subtriangular; all teeth without additional denticles; outer surface below teeth serrate (Figure 13F, G). Labrum shallowly emarginate medially at apex (Figure 13B). Labium (Figure 13C, D) with palpomere 1 small, subquadrate, about 0.6 of the length of palpomere 2; terminal palpomere about twice as long as first palpomere. Terminal maxillary palpomere somewhat securiform, about as long as wide (Figure 13I).

Prosternal process (Figure 13I) rounded at apex; width of prosternal process about 1.6 times greater than length of prosternum in front of procoxae.

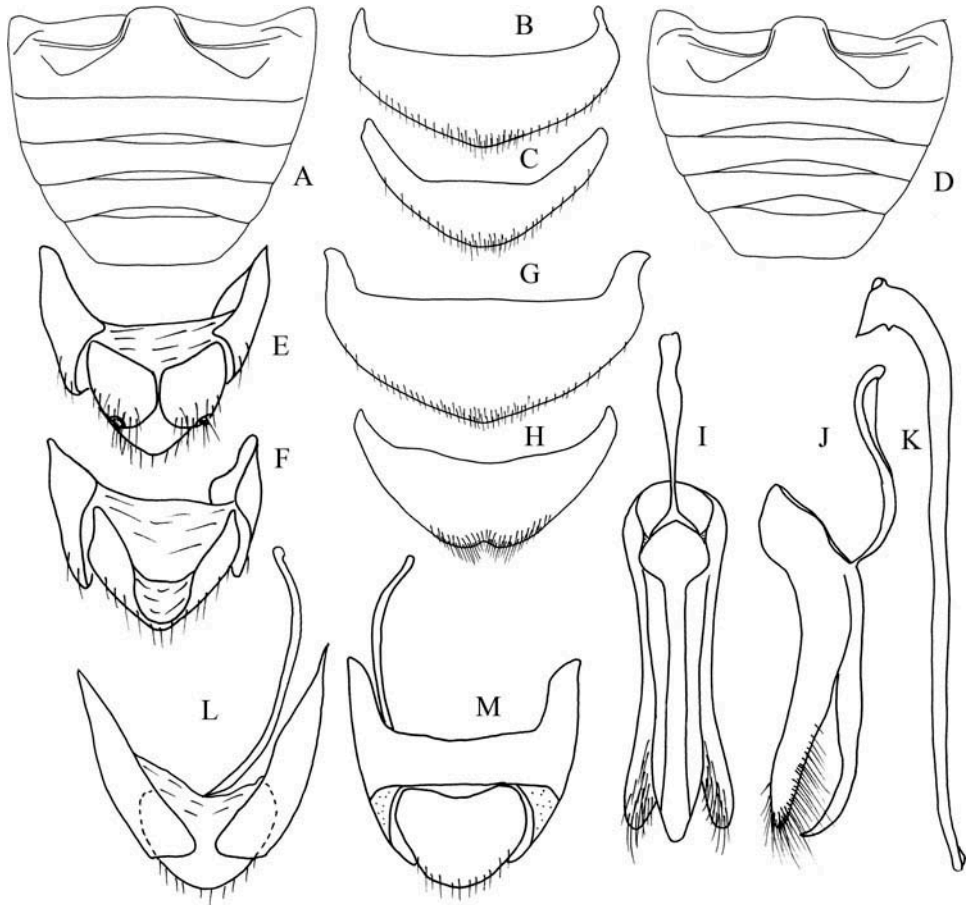


Figure 14. *Papuaepilachna wiebesi* (Bielawski). (A) Abdomen, female; (B) tergite VIII, female; (C) sternite VIII, female; (D) abdomen, male; (E) female genitalia, ventral; (F) female genitalia, dorsal; (G) tergite VIII, male; (H) ventrite 6, male; (I) tegmen, inner; (J) tegmen, lateral; (K) penis, lateral; (L) male genital segment, ventral; (M) male genital segment, dorsal.

Mesoventral process about 0.75 times as wide as coxal diameter at the same position (Figure 13J).

Legs with hind femora protruding from outer margin of elytral epipleuron (Figure 13E).

Abdominal postcoxal lines somewhat angulately curved (Figure 14A, D); male ventrite 5 about 1.5 times longer than ventrite 4; apical margin of ventrite 5 truncate (Figure 14D), ventrite 6 very shallowly emarginate (Figure 14H), tergite VIII arcuate (Figure 14G); apical margin of female ventrite 5 truncate (Figure 14A), sternite and tergite VIII arcuate (Figure 14B, C).

Male terminalia and genitalia (Figure 14I–M). Tergite IX not divided dorsally. Penis guide scarcely longer than parameres, curved outwardly at apex. Parameres narrowing towards apex in lateral view. Penis long and straight almost throughout its length; with sides parallel.

Female genitalia as in Figure 14E, F with coxites transversely oval.

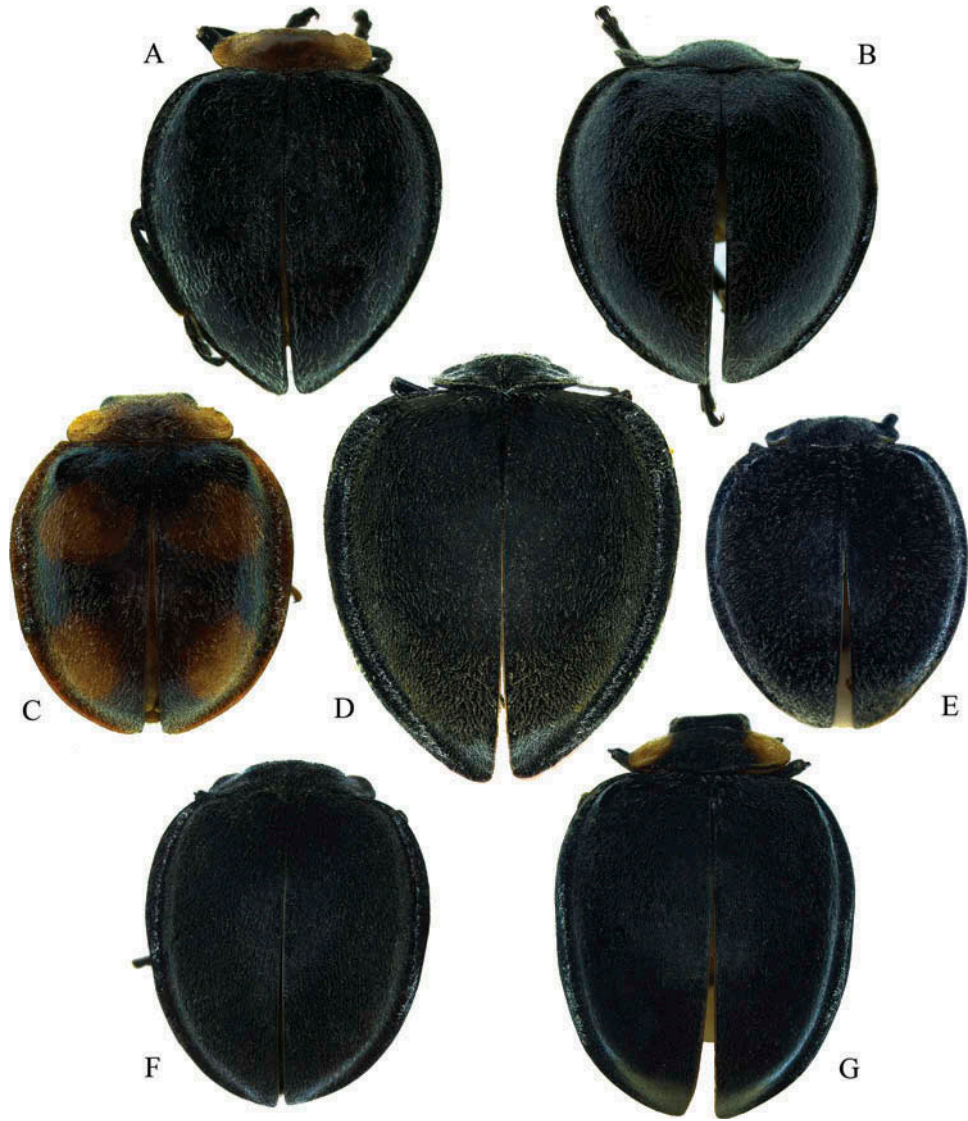


Figure 15. Habitus: (A) *Papuaepilachna wiebesi* (Bielawski); (B) *Papuaepilachna tenmana* (Bielawski); (C) *Lalokia aruensis* (Crotch); (D) *Papuaepilachna watalai* (Jadwiszczak); (E) *Papuaepilachna kapuri* (Bielawski); (F) *Papuaepilachna nasti* (Bielawski); (G) *Papuaepilachna bivakana* (Bielawski).

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## References

- Bielawski R. 1963. Monographie der Epilachninae (Coleoptera: Coccinellidae) der Australischen Region. *Ann Zool.* 21;17:295–461.
- Bielawski R. 1965. Four new species of the genus *Afidentula* Kapur (Coleoptera, Coccinellidae) from New Guinea. *Ann Zool.* 23;4[1965–1966]:45–55.
- Crotch GR. 1874. A revision of the Coleopterous Family Coccinellidae. London (UK): E.W. Janson. 311 pp.
- Gemminger M, Harold E von. 1876. *Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus*. Tom. XII. Chrysomelidae (Pars II.), Languridae, Erotylidae, Endomychidae, Coccinellidae, Corylophidae, Platypyllidae. *Accedit. Index Generum universalis*. Theodor Ackermann, Monachii. pp. 3479–3822.
- Gordon RD. 1975. A revision of the Epilachninae of the Western Hemisphere (Coleoptera: Coccinellidae). Technical Bulletin No 1493. Washington (DC): United States Department of Agriculture; 409 pp.
- Jadwiszczak A. 1986. Materials to the knowledge of the Epilachninae (Coleoptera, Coccinellidae) of New Guinea and Solomon Islands with the description of two new species. *Polskie Pismo Entomolog.* 56:249–261.
- Jadwiszczak A. 1987. Materials to the knowledge of the Epilachninae (Coleoptera, Coccinellidae) of Australian Region, with a description of a new species. *Polskie Pismo Entomolog.* 57:617–629.
- Jadwiszczak A, Węgrzynowicz P. 2003. World catalogue of Coccinellidae. Part I – Epilachninae. Olsztyn (Poland): Mantis; 264 pp.
- Kapur AP. 1958. Coccinellidae of Nepal. *Records of the Indian Museum, Calcutta.* 53:309–338.
- Korschefsky R. 1931. Coccinellidae I. In: Junk W, Schenkling S, editors. *Coleopterorum Catalogus*. Part 118. Berlin: W. Junk; 224 pp.
- Lawrence JF, Ślipiński SA, Seago AE, Thayer MK, Newton AF, Marvaldi AE. 2011. Phylogeny of the Coleoptera based on morphological characters of adults and larvae. *Ann Zool.* 61: 1–217.
- Sasaji H. 1968. Phylogeny of the family Coccinellidae (Coleoptera). *Etizenia.* 35:1–37.
- Sasaji H. 1971. Phylogenetic positions of some remarkable genera of the Coccinellidae (Coleoptera) with an attempt of the numerical method. *Memoir Faculty Educ Fukui Univ, Series II (Nat Sci).* 21:55–73.
- Seago AE, Giorgi JA, Li J, Ślipiński A. 2011. Phylogeny, classification and evolution of ladybird beetles (Coleoptera: Coccinellidae) based on simultaneous analysis of molecular and morphological data. *Mol Phylogenet and Evol.* 60;1:137–151.
- Ślipiński SA. 2007. Australian ladybird beetles (Coleoptera: Coccinellidae). Their biology and classification. Canberra (Australia): Australian Biological Resources Study; 286 pp.
- Ślipiński A, Tomaszewska W. 2010. Coccinellidae Latreille, 1802. In: Leschen RAB, Beutel RG, Lawrence JF, editors. *Handbook of zoology*. Vol. 2, Coleoptera. Berlin (Germany): Walter de Gruyter GmbH & Co. KG; XIII + 786 pp.
- Szawaryn K. 2011. A new species of *Henosepilachna* Li (Coleoptera: Coccinellidae: Epilachnini) from New Guinea. *Ann Zool.* 61(4):685–689.
- Tomaszewska W, Szawaryn K. 2013. Revision of the Asian species of *Afidentula* Kapur, 1958 (Coleoptera: Coccinellidae: Epilachnini). *Zootaxa* 3608;1:26–50.
- Weise J. 1908. Coccinellidae. In: *Nova Guinea. Résultats de l'Expédition Scientifique Néerlandaise à la Nouvelle-Guinée en 1903 sous les auspices de Arthur Wichmann*. Vol. V. Zoologie. Livraison II. Leiden: J. Brill. pp. 305–310.