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Three new species of *Euops* SCHOENHERR from the forest canopy in Papua New Guinea (Coleoptera, Curculionoidea, Attelabidae)

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Abstract

Specimens of *Euops* SCHOENHERR, 1839 collected during surveys of the canopy fauna at Baiteta forest, Papua New Guinea, are studied. This material contains five species: *Euops* (*Euopsidius*) *testaceus* VOSS, 1929, *E. (Metaeuops) ruficornis* VOSS, 1956, *E. (Lijudmilinius) prismae* **sp. n.**, *E. (Guineoeuops) cacuminis* **sp. n.**, and *E. (Guineoeuops) missai* **sp. n.**. The new species are described, important characters are illustrated, and their phylogenetic position is discussed.

Introduction

The attelabid genus *Euops* SCHOENHERR, 1839 is highly diverse in New Guinea (RIEDEL, 2002). Most of the described species of this genus were collected from lower vegetation by using a beating sheet. A small collection of *Euops* made during surveys of the canopy fauna in Papua New Guinea resulted in the discovery of three new species. Two of them form the bulk of this material. It is likely that they are confined to canopy habitats, since they have never been found in other conventional collections.

Material and methods

This study is based on examination of 141 specimens collected by Olivier MISSA in Madang province, Papua New Guinea between 1993 and 1996. Collecting methods employed were canopy fogging ("FOG") and sticky traps ("GLU") set in the canopy. The collecting site was located in the centre of Baiteta forest (S 5° 01', E 145° 45'), 4 km inland from the North Coast and 50 meters above sea level. Baiteta forest is a remnant patch of lowland mixed tropical rainforest with a relatively high canopy of 35-40 m (MISSA, 2000). The abbreviation "WK" stands for "week" of collecting, but the dates could not be deciphered. Some of the material, especially the specimens of sticky traps, are in relatively poor condition. During the time the trapped specimens were exposed to tropical weather, many of them became moldy and suffered additional damage when they were removed from the glue. However, since good series are available, this circumstance is not too problematic.

Type depositories are cited using the following codens:

IRSNB	Institut Royal des Sciences Naturelles de Belgique, Rue Vautier 29 B-1000 Brussels, Belgium
SMNK	Staatliches Museum für Naturkunde Karlsruhe, Erbprinzenstr. 13, D-76133 Karlsruhe Germany

Methods are the same as outlined in RIEDEL (2002). Habitus illustrations were made using Automontage© software (Syncroscopy) with a JVC KY70 digital camera adapted to a Leica Z6 Zoom-system. Photographic illustrations of genitalia and proventriculi were made with the same software/camera combination adapted to a Leica Diaplan. For this purpose the genitalia were embedded in glycerol gelatine. All photographs were improved using Adobe Photoshop CS2. The complex structures of the transfer apparatus (TA) of the male

aedeagus can not be adequately illustrated by this photographic technique because there are too many layers of sclerites, membranes and spiculae involved. Under these circumstances, traditional ink drawing is more useful to illustrate the characters.

***Euops (Guineoeuops)* LEGALOV, 2003: 370, formerly *E. simulans*-group of RIEDEL 2001**

Diagnosis. Male, genitalia: Tegminal plate wide, with sides towards setose apical edge subparallel or diverging; apical edge densely setose, medially with short setae, becoming longer laterad. Tectum of aedeagus usually with distinct sclerotized frame. TA usually with fold-out struts. Female: Apex of pro-, meso- and metatibia with uncus and premucro. Setose patch of venter consisting of three double rows of modified setae, plus one simple row of modified or nonmodified setae. Ovipositor without coxites.

***Euops (Guineoeuops) cacuminis* sp. n.**

(Figs. 1, 2, 7, 8, 13, 14, 19, 20, 22, 23, 26, 31, 34, 37, 38, 45)

Diagnosis. Length, pronotum + elytron: 2.69-3.92 mm. Coloration black with distinct blue lustre. Pronotum microreticulate; disc densely punctate with minute punctures; sides with dense deep punctures. Male: Prepectus short, at most 1.8 x as long as postpectus. Profemur ventrally simple, without knob. Apex of protibia strongly angularly protruding ventrad of uncus. TA as in Fig. 31. Female: Abdominal sternite VI with row of nonmodified setae. Spermathecal gland normal, not elongate.

Type material.

Holotype: PAPUA NEW GUINEA: Madang Prov., Baiteta, GLU XB-12, 13.VI.1994, CCL-5804, leg. O. Missa, "Canopy Mission PNG" (type deposit: IRSNB).

Paratypes (IRSNB, SMNK): PAPUA NEW GUINEA, Madang Prov., Baiteta, leg. O. Missa, "Canopy Mission PNG": 1 female (marked as "allotype"), GLU 22, WK1; 1 female, GLU 529, WK6; 1 male, GLU 399, WK6, CCL-12073; 1 female, GLU 622, WK 7; 1 male, GLU 283, WK1; 1 female, GLU523, WK6; 1 female, GLU148, WK6, CCL-12041; 1 female, GLUT2-23, CCL-5452, 7.IV.1994; 1 male, GLU81, 5.VII.1995; 1 female, GLU XB-9, CCL-5739, 6.VI.1994; 1 female, GLU 609, WK5; 1 female, GLU 563, WK3, CCL-11404; 1 male, GLU 659, WK10; 1 male, GLU XB-21, CCL-5897, 30.V.1994; 1 female, GLU 647, WK5; 1 female, GLU 659, WK 10; 1 male, GLU 81, 5.VII.1995; 1 male, GLU 636, WK5; 1 female, GLU 81, 5.VII.1995; 1 female, GLU 10, 5.VII.1995; 1 male, GLU 646, WK7; 1 male, GLU 495, WK5; 1 female, GLU 663, WK7; 1 female, GLU 486, WK7; 1 female, GLU 625, WK7; 1 female, GLU 528, WK7; 1 female, GLU 641, WK7; 1 female, GLU 651, WK7; 1 male, GLU 623, WK7; 1 male, GLU74, CCL-10846, 02.VIII.1995; 1 female, GLU 618, WK8, CCL-12634; 1 female, GLU 452, WK8; 1 male, GLU 586, WK1; 1 male, GLU522, WK5; 1 male, GLU 658, WK9; 1 male, GLU 659, WK9; 1 female, GLU 658, WK9; 1 female, GLU 597, WK 8; 1 female, GLU586, WK8; 1 female, GLU623, WK9; 1 female, GLU 43, WK9; 1 female, GLU 2, WK9; 1 female, GLU 659, WK10; 1 male, GLU 120, WK 10; 1 male, GLU 315, CCL-11791, WK5; 1 female, GLU 659, WK 10; 1 female, GLU 621, WK 6; 1 male, GLU 525, WK5; 1 male, GLU 639, CCL-11926, WK6; 1 female, GLU 659, WK10; 1 female, GLU 642, WK1; 1 female, GLUXB-26, CCL-5994, 19.V.1994; 1 male, GLU 658, WK9; 1 female, GLU T2-15, CCL-5342, 28.III.1994; 1 male, GLU XB-9, CCL-5725, 5.IV.1994; 1 female, GLU 659, WK10; 1 female, GLU 659, WK 10; 1 male, GLU 78, CCL-10471, 21.VI.1995; 1 male, 1 female, 21.III.1994.

Description.

Male (holotype). Length, pronotum + elytron: 3.88 mm. Coloration black with distinct blue lustre; metasternum and anterior face of procoxa with greenish-bronze lustre.

Head. As in Fig. 13. Gena 1.09 x as long as width of head immediately behind eyes. Vertex weakly microreticulate, behind eyes with dense shallow punctures; posteriorly weakly coriaceous with shallow wrinkles and sparse minute punctures. Eyes dorsally subcontiguous at middle of length of eye. Frons flat,

without median costa, anteriorly at junction with rostrum with weak median impression. Head ventrally in front of gular region dull, microreticulate-coriaceous, bordering eyes scrobiculate-punctate; median furrow indistinct. Rostrum $2.47 \times$ as long as mouthparts; at widest point $1.40 \times$ wider than at base; in cross section dorsally weakly rounded. Clypeus with median notch. Profile of rostrum with dorsal contour of interantennal area rounded, weakly projecting; anteriorly in weakly convex, almost straight line to apex; ventral contour at base weakly concave, at middle with incision, weakly convex to base of prementum, posterior part of maxillary cavity slightly, roundly projecting; dorsal and ventral contour of rostrum weakly converging towards apex. Ventral surface of rostrum poorly delimited against venter of head, basally with submental median carina terminating abruptly at middle; suture between prementum and submentum simple, without knobs; submentum glabrous, anterior to hind level of maxillary cavities flat. Antenna as in Fig. 34, terminal article of club $1.8 \times$ as long as wide.

Mouthparts. Prementum at base $1.8 \times$ wider than long, $2.6 \times$ wider than at apex; surface flat; with lateral margins converging apicad in weakly sinuate line, basally weakly convex, apically concave; with three moderately long, acute apical processes subequal in length; median apical process on same level as lateral processes. Proventriculus (Fig. 22) distinctly bilateral-symmetric; primary gnathal ridges 2a, 1, 2b posteriorly shortened, 3a and 3b projecting, and 4a, 5, 4b slightly shortened; behind each primary gnathal ridge with pulvillus supported by cone shaped structure loosely attached to gnathal ridge; pulvillus provided with long setae; primary gnathal ridges thin, blade-like.

Thorax. Prothorax $0.89 \times$ as long as wide; sides in front of subbasal constriction evenly, strongly rounded; with distinct preapical constriction; disc evenly convex, moderately microreticulate, densely punctate with minute shallow punctures, towards sides weakly rugose; in lateral aspect, side moderately microreticulate, densely punctate with deep punctures, except smooth and impunctate along pleurosternal suture. Metanotum with long sutural spines; with one pair of large lateral lobes.

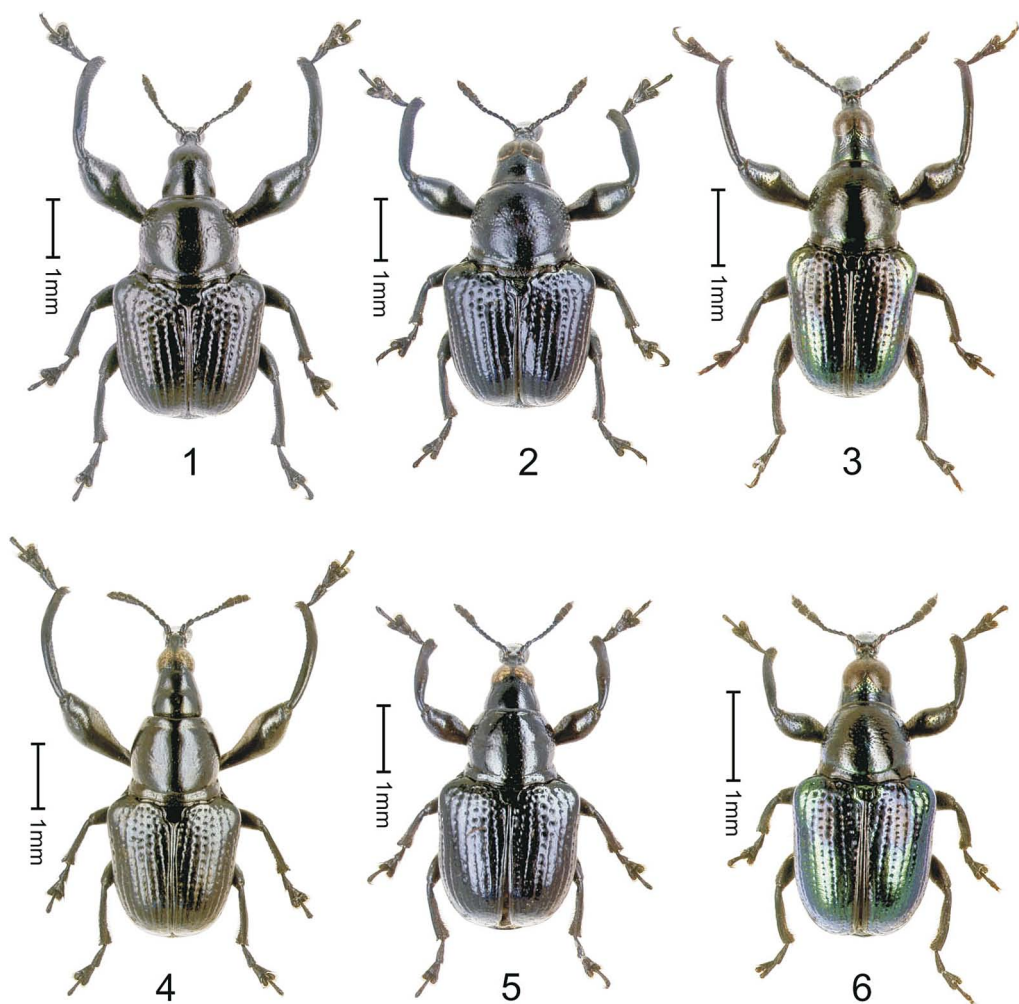
Elytron short, $1.81 \times$ longer than wide, humerus simple; striae deeply impressed, basally near scutellum punctures connected by obliquely transverse wrinkles; each interval moderately elevated laterally, evenly sloping mesad. Thoracic venter. Prepectus ca. $1.4 \times$ as long as postpectus. Height of pterothorax $0.95 \times$ length of elytron.

Legs. Procoxa in anterior aspect $0.98 \times$ as long as wide; without protuberance. Trochanter of foreleg ventrally not markedly projecting. Profemur with longitudinal axis straight; strongly swollen; ventral contour subangulate, dorsal and anterior contour sinuate; posterior contour convex; anterior surface coriaceous, sparsely granulate; ventrally smooth, without knob. Protibia moderately long; ventral surface scabrous, sparsely setose; tibial apex strongly angularly protruding ventrad of uncus; anterior distal comb from dorsal edge along base of uncus, posterior distal comb for short distance at tarsal articulation. Mesotibia subapically simple, without extension. Uncus of metatibia about at middle of tibial apex.

Abdomen. Venter sparsely setose; sternite III subglabrous; sternites IV-V each bearing one transverse row of suberect, relatively long setae; sternite VI with scattered suberect setae. Tergite VII evenly rounded, medially not subcarinate. Pygidium ca. $1.28 \times$ wider than long, densely deeply punctate, without microreticulation except at extreme base, sparsely setose with short recumbent setae, but apically with long suberect setae. Genitalia. Sternite VIII as in Fig. 26; base markedly bisinuate; apex bilobate. Tegminal plate (Fig. 23) with sides before apical edge weakly diverging; apical edge subangulate, laterally weakly concave and with pointed tuft of long setae. Aedeagus as in Fig. 20. Apical scoop of pedon (Fig. 37) ca. $0.70 \times$ as long as wide, with lateral margins curving to evenly rounded apex. Tectum (Fig. 38) with arms of sclerotized frame curving obliquely mesad from junctions with apodemes, continuing with straight subparallel sides to rounded apex. TA (Fig. 31) without dorsal plate; without basal sclerite; without fold-out struts; with pair of "irregular, sclerotized areas" (marked * in Fig. 31) possibly connected to indistinct transfer processes; these structures probably homologous to the ones present in *E. wei* RIEDEL, 2001 and *E. kutubu* RIEDEL, 2001; lateral support structures markedly asymmetrical; left [apex directed backwards] with massive J-shaped sclerite, right with narrow brace and small sclerite, area between membranous. Endophallus within body of aedeagus without sclerite.

Female (allotype). Same as holotype except: length, pronotum + elytron: 3.65 mm. Head as in Fig. 14. Gena as long as width of head immediately behind eyes ($0.98 \times$). Rostrum shorter, $2.21 \times$ as long as mouthparts. Elytron $1.73 \times$ longer than wide.

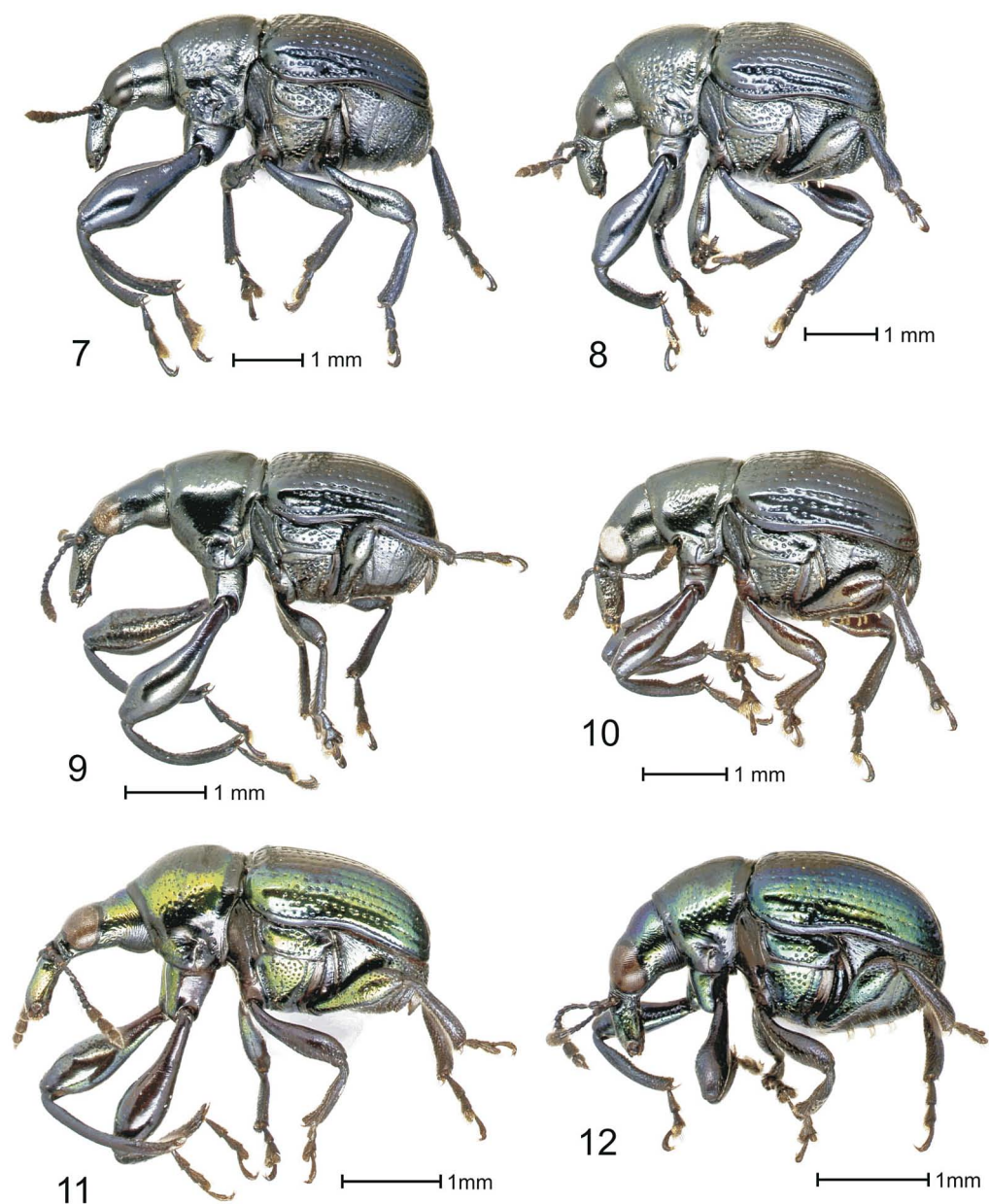
Thoracic venter. Prepectus ca. $0.5 \times$ as long as postpectus. Height of pterothorax $1.01 \times$ length of elytron.



Figs 1-9. Habitus of *Euops* spp., dorsal aspect: **1.** *E. cacuminis* sp. n., holotype; **2.** *E. cacuminis* sp. n., allotype; **3.** *E. prismae* sp. n., holotype; **4.** *E. missai* sp. n., holotype; **5.** *E. missai* sp. n., allotype; **6.** *E. prismae* sp. n., allotype.

Legs. Procoxa in anterior aspect 0.89 x as long as wide. Profemur moderately swollen; subsymmetrically clavate; ventral contour evenly sinuate. Protibia with dorsal contour weakly convex; ventral contour sinuate, convex in basal two thirds, concave in apical third; ventral surface of protibia setose with suberect setae, but most of them abraded; in convex portion crenulate on anterior edge, more posteriorly (*not* more basally) with row of ca. 10 denticles. Tibial apex with uncus and premucro; premucro in subventral position.

Abdomen. Setose patch consisting of three double rows of modified setae on sternite III-V plus one simple row of sparse nonmodified setae on sternite VI; setose patch ca. 0.99 x as long as wide. Pygidium ca. 1.25 x wider than long. Genitalia as in Fig. 19. Ovipositor without coxites. Sternite VIII as in Fig. 19, without apodeme. Spermatheca as in Fig. 45; subisodiametric from base to shortly before apex.



Figs 7-12. Habitus of *Euops* spp., dorsal aspect: **7.** *E. cacuminis* sp. n., holotype; **8.** *E. cacuminis* sp. n., allotype; **9.** *E. missai* sp. n., holotype; **10.** *E. missai* sp. n., allotype; **11.** *E. prismae* sp. n., holotype; **12.** *E. prismae* sp. n., allotype.

Intraspecific variation. Length, pronotum + elytron: 2.69-3.92 mm ($n=23$, $\bar{x}=3.56 \pm 0.30$). Prothorax 0.87-0.92 x as long as wide ($n=23$, $\bar{x}=0.90 \pm 0.02$). Elytron 1.72-1.84 x longer than wide ($n=23$, $\bar{x}=1.78 \pm 0.03$). Thoracic venter. Male prepectus ca. 1.4-1.8 x as long as postpectus. Height of pterothorax 0.95-1.02 x length of elytron in males ($n=11$, $\bar{x}=0.98 \pm 0.02$), 0.95-1.02 x length of elytron in females ($n=12$, $\bar{x}=0.98 \pm 0.03$). Legs. Profemur allometric; with decreasing size of specimens profemur becoming shorter and less

markedly clavate. Abdomen. Female patch of modified setae 1.04-1.30 x longer than wide ($n=10$, $\bar{x}=1.17 \pm 0.08$). Male venter with rows of suberect setae on sternites IV-V more or less distinct. Pygidium 1.12-1.28 x wider than long in males ($n=11$, $\bar{x}=1.20 \pm 0.04$), 1.16-1.34 x wider than long in females ($n=11$, $\bar{x}=1.26 \pm 0.06$).

Etymological note. This epithet is based on the Latin noun *cacumen* (treetop) and refers to the circumstances of the species' capture. This species may be confined to the forest canopy.

Biological note. This species was mainly collected using sticky traps set in the canopy.

***Euops (Guineoeuops) missai* sp. n.**

(Figs 4, 5, 9, 10, 15, 16, 21, 24, 27, 29, 32, 35, 39, 40, 44)

Diagnosis. Coloration black with blue lustre. Disc of pronotum evenly convex, shining, densely punctate with minute punctures. Male: Suture between prementum and submentum elevated laterally, at middle depressed, in dorsoapical aspect contour bilobate. Prepectus ca. 6 x as long as postpectus. Profemur ventrally simple, without knob. Apex of protibia strongly angularly protruding ventrad of uncus. TA as in Fig. 32. Female: Abdominal sternite VI with row of nonmodified setae.

Type material.

Holotype: PAPUA NEW GUINEA: Madang Prov., Baiteta, FOG AR-3-11, [date missing], leg. O. Missa, "Canopy Mission PNG" (type deposit: IRSNB).

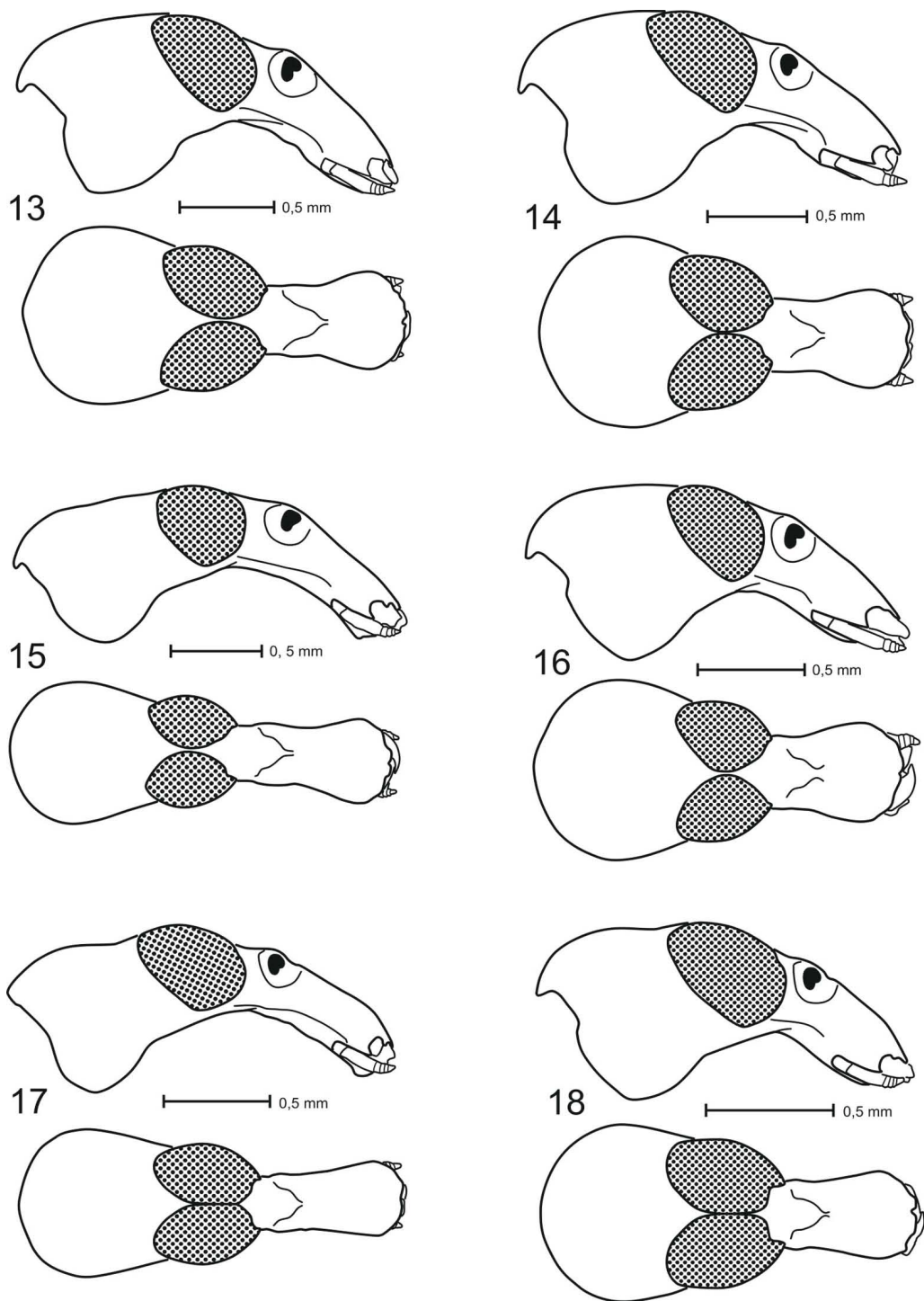
Paratypes (IRSNB, SMNK): PAPUA NEW GUINEA, Madang Prov., Baiteta, leg. O. Missa, "Canopy Mission PNG": 1 female (marked as "allotype") FOG AR8-12, CCL-6926; 1 female, FOG AR 8-5; 1 female FOG AR8-9; 1 female, FOG AR 8-3, CCL-6842, [date missing].

Description.

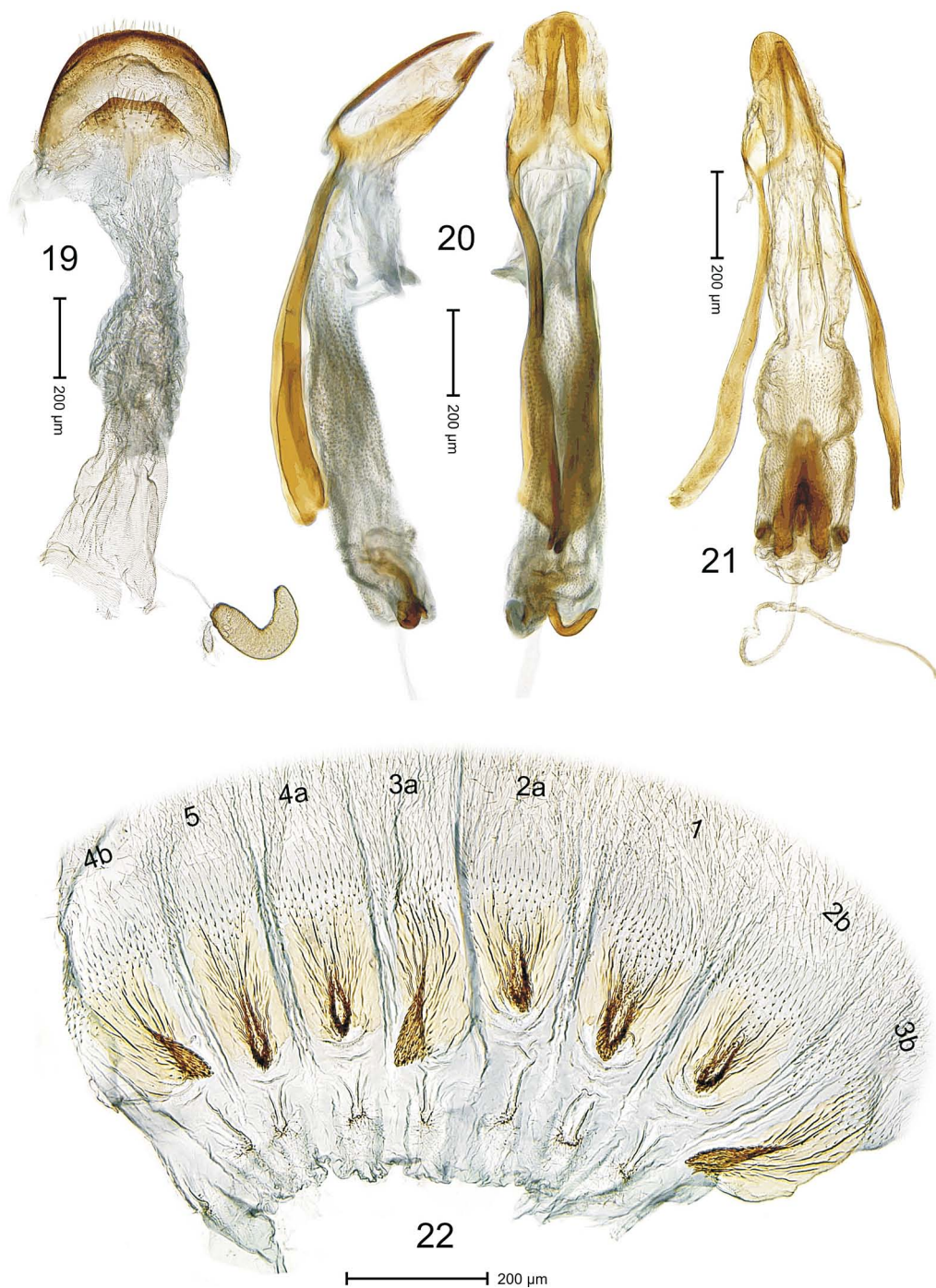
Male (holotype). Length, pronotum + elytron: 3.47 mm. Coloration black with distinct metallic blue lustre; anterior face of procoxa with greenish-bronze lustre.

Head. As in Fig. 15. Gena 1.61 x as long as width of head immediately behind eyes. Vertex shining, along hind margin of eye punctate, posteriorly almost impunctate, laterally in posterior half with shallow transverse wrinkles curving dorsad. Eyes dorsally subcontiguous at middle of length of eye. Frons flat, without median costa, anteriorly at junction with rostrum with weak median impression. Head ventrally in front of gular region shining, weakly rugose, with scattered punctures, especially bordering eyes; anteriorly with median carina of rostrum passing mid-level of eye, terminating at center of a broad shallow concavity between eyes; with weak swelling at hind corner of eye; median furrow indistinct. Rostrum 2.63 x as long as mouthparts; at widest point 1.38 x wider than at base; in cross section dorsally weakly rounded. Clypeus with median notch. Antennal insertion shifted anteriad, at basal quarter of rostrum. Profile of rostrum with dorsal contour of interantennal area rounded, weakly projecting; anteriorly in straight line to apex; ventral contour evenly concave to projecting base of prementum; dorsal and ventral contour of rostrum subparallel. Ventral surface of rostrum poorly delimited against venter of head, basally with submental median carina; suture between prementum and submentum elevated laterally, at middle depressed, in dorsoapical aspect contour bilobate; submentum subglabrous, sparsely setose with short suberect setae, anteriorly with semi-rotund shallow concavity. Antenna as in Fig. 35, terminal article of club 1.7 x as long as wide.

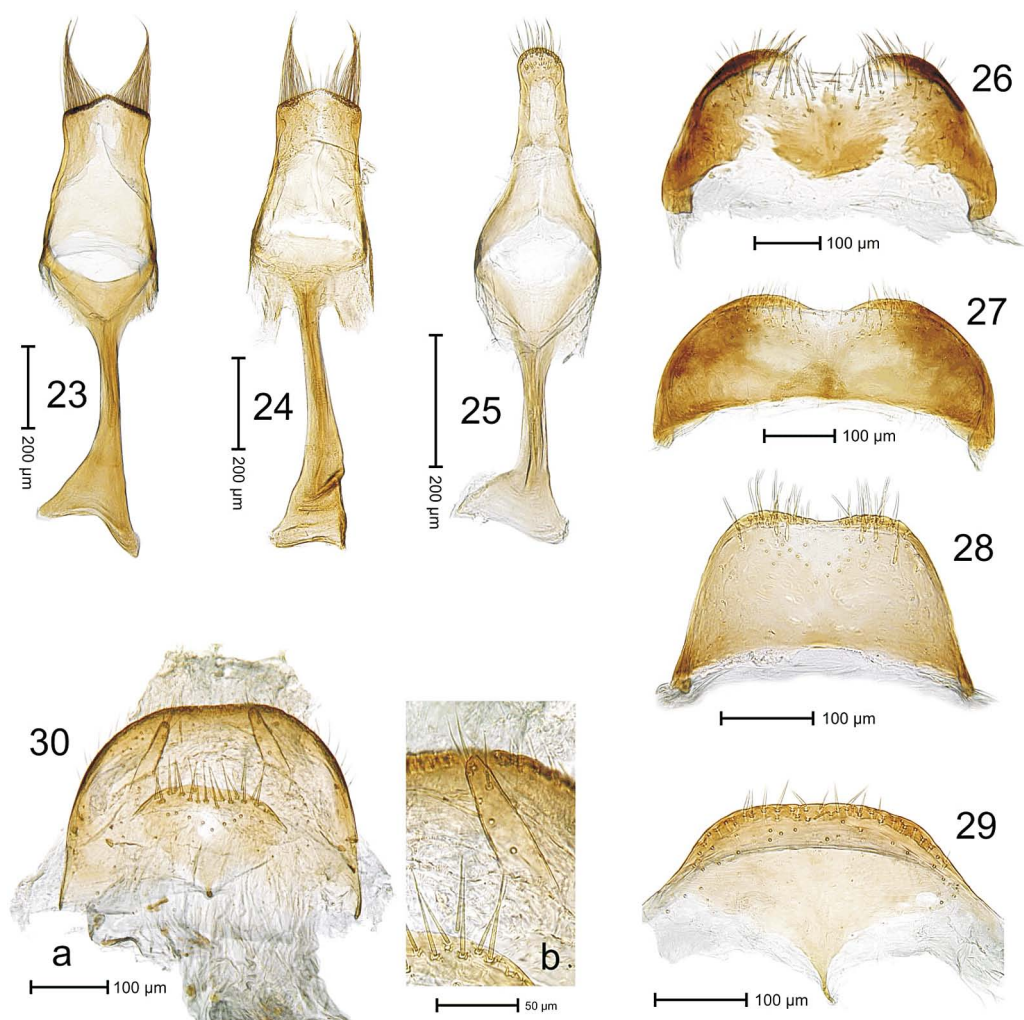
Mouthparts. Prementum at base 2.2 x wider than long, 3.7 x wider than at apex; surface flat; with lateral margins converging apicad in straight line, before apex weakly concave; with three moderately long, acute apical processes subequal in length; median apical process projecting slightly more ventrad than lateral processes. Proventriculus bilateral-symmetric; primary gnathal ridges 2a, 1, 2b posteriorly shortened, 3a and 3b slightly projecting, and 4a, 5, 4b slightly shortened; behind each primary gnathal ridge with elongate cluster of long setae, those following the shortened gnathal ridges supported by extension of gnathal ridge; primary gnathal ridges thin, blade-like.



Figs 13-18. Head of *Euops* spp., above in lateral aspect, below in dorsal aspect: **13.** *E. cacuminis* sp. n., holotype; **14.** *E. cacuminis* sp. n., allotype; **15.** *E. missai* sp. n., holotype; **16.** *E. missai* sp. n., allotype; **17.** *E. prismae* sp. n., holotype; **18.** *E. prismae* sp. n., allotype.



Figs 19-21. Genitalia of *Euops* spp.: **19.** *E. cacuminis* sp. n., allotype; **20.** *E. cacuminis* sp. n., holotype; aedeagus in lateral aspect (left) and dorsal aspect (right); **21.** *E. missai* sp. n., holotype; aedeagus in dorsal aspect. **Fig. 22.** Proventriculus of *E. cacuminis* sp. n., paratype. Homologous gnathal ridges with same numbers; median ventral ridge (1) and median dorsal ridge (5); ventral ridges (2a, 1, 2b) shortened.



Figs 23-25. Tegmen of *Euops* spp.: **23.** *E. cacuminis* sp. n., holotype; **24.** *E. missai* sp. n., holotype; **25.** *E. prismae* sp. n., holotype. **Figs 26-29.** Sternite VIII of *Euops* spp.: **26.** *E. cacuminis* sp. n., holotype; **27.** *E. missai* sp. n., holotype; **28.** *E. prismae* sp. n., holotype; **29.** *E. missai* sp. n., allotype. **Fig. 30.** Female genital of *E. prismae* sp. n., allotype; (a) segment VIII with coxites, (b) left coxite.

Thorax. Prothorax 0.93 x as long as wide; widest slightly behind middle; sides in front of subbasal constriction strongly rounded, then weakly convex to apex; dorsally with weak preapical constriction; disc evenly convex, shining, densely punctate with minute punctures becoming larger towards sides; in lateral aspect, side in ventral half deeply punctate anteriorly above coxa, remainder almost smooth, coriaceous; dorsal half densely punctate with moderately large, somewhat rugose punctures. Metanotum with long sutural spines; with one pair of large lateral lobes; edge of metanotum between lateral lobe and sutural spine sinuate. Elytron 2.08 x longer than wide, humerus simple; striae deeply impressed; intervals evenly convex. Thoracic venter. Prepectus ca. 6 x as long as postpectus, leading in straight line dorsad to apex. Height of pterothorax 0.90 x length of elytron.

Legs. Procoxa in anterior aspect 1.32 x as long as wide; without protuberance. Trochanter of foreleg ventrally not markedly projecting. Profemur with longitudinal axis curved with convex posterior side;

moderately swollen; ventral, anterior and dorsal contour sinuate; posterior contour convex; anterior surface ventrally weakly granulate, coriaceous; ventrally smooth, without knob. Protibia long, evenly curved ventrad; ventral surface scabrous, sparsely setose; tibial apex strongly angularly protruding ventrad of uncus; anterior distal comb from dorsal edge along base of uncus, posterior distal comb for short distance at tarsal articulation. Mesotibia subapically simple, without extension. Uncus of metatibia ca. at middle of tibial apex.

Abdomen. Venter subglabrous, sternites IV-VI with inconspicuous transverse rows of short subrecumbent setae. Tergite VII evenly rounded, medially not subcarinate. Pygidium ca. 1.31 x wider than long, densely deeply punctate, at base microreticulate, sparsely setose with short recumbent setae, except apically with longer suberect setae. Genitalia. Sternite VIII as in Fig. 27; base concave; apex bilobate. Tegminal plate (Fig. 24) with sides towards apical edge subparallel; apical edge subangulate, weakly rounded, with short setae medially, with pointed tuft of much longer setae laterally. Aedeagus (Fig. 21). Apical scoop of pedon (Fig. 39) ca. 0.92 x as long as wide, with lateral margins subparallel, apex evenly rounded. Tectum (Fig. 40) with arms of sclerotized frame curving obliquely mesad from junctions with apodemes, converging with straight sides to narrow apex. TA (Fig. 32) with small dorsal plate; without basal sclerite; with fold-out struts ca. 0.6 x as long as TA, laterally not cleft. Endophallus within body of aedeagus without sclerites.

Female (allotype). Same as holotype except: length, pronotum + elytron: 3.34 mm. Head as in Fig. 16. Gena 1.16 x as long as width of head immediately behind eyes. Rostrum shorter, 1.83 x as long as mouthparts; antennal insertion more basad, at basal fifth of rostrum. Profile of rostrum with ventral contour sinuate, concave at base, convex to apex; dorsal and ventral contour of rostrum converging from base to apex; suture between prementum and submentum simple, without knobs; submentum flat, without median impression.

Prothorax 0.87 x as long as wide. Elytron 2.02 x longer than wide. Thoracic venter. Prepectus ca. 1.9 x as long as postpectus. Height of pterothorax 0.97 x length of elytron.

Legs. Procoxa in anterior aspect 0.98 x as long as wide. Profemur with longitudinal axis straight; moderately swollen; subsymmetrically clavate; contours sinuate with slight concavity at base and marked convexity at apex. Protibia with dorsal contour weakly convex; ventral contour sinuate, convex in basal two thirds, concave in apical third; ventral surface of protibia sparsely setose with short suberect setae; in convex portion with indistinct crenation on anterior edge, more posteriorly (*not* more basally) with row of ca. 5 low denticles. Tibial apex with uncus and premucro; premucro in subventral position.

Abdomen. Setose patch consisting of three double rows of modified setae on sternite III-V plus one simple row of sparse nonmodified setae on sternite VI; setose patch about as long as wide (0.98 x). Pygidium ca. 1.28 x wider than long. Genitalia. Ovipositor without coxites. Sternite VIII as in Fig. 29, apex subtruncate, base with short apodeme. Spermatheca as in Fig. 44; tapering apicad.

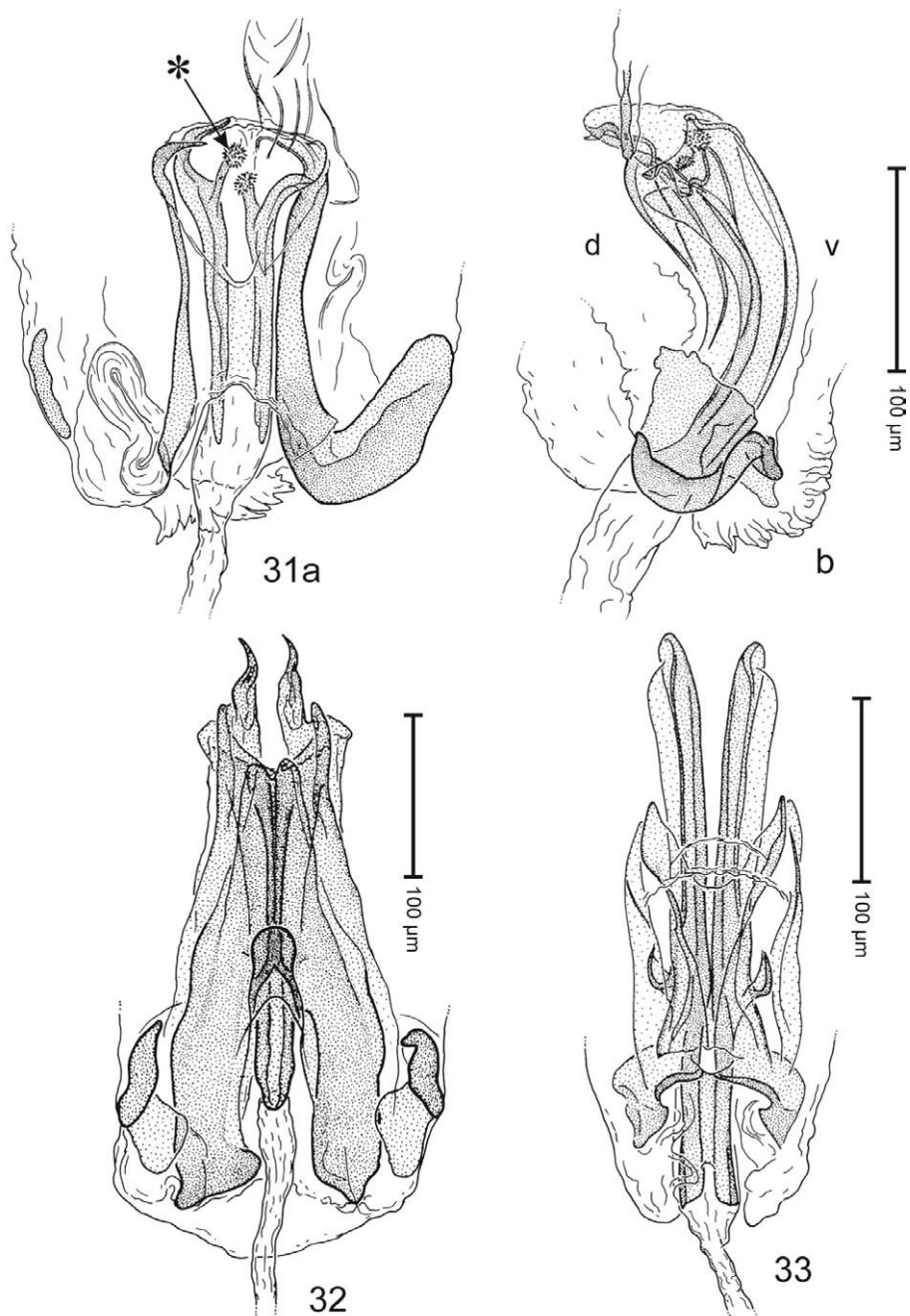
Intraspecific variation. Length, pronotum + elytron: 2.80-3.47 mm ($n=5$, $\bar{x}=3.23 \pm 0.25$). Prothorax 0.87-0.88 x as long as wide in females ($n=4$, $\bar{x}=0.88 \pm 0.01$). Elytron 1.92-2.04 x longer than wide ($n=4$, $\bar{x}=2.00 \pm 0.05$). Height of pterothorax 0.93-0.97 x length of elytron in females ($n=4$, $\bar{x}=0.95 \pm 0.02$). Abdomen. Female patch of modified setae 0.98-1.08 x as long as wide ($n=4$, $\bar{x}=1.04 \pm 0.05$). Pygidium 1.28-1.37 x wider than long in females ($n=4$, $\bar{x}=1.33 \pm 0.04$).

Etymological note. This species is named in honor of the collector, Olivier MISSA (University of York, United Kingdom).

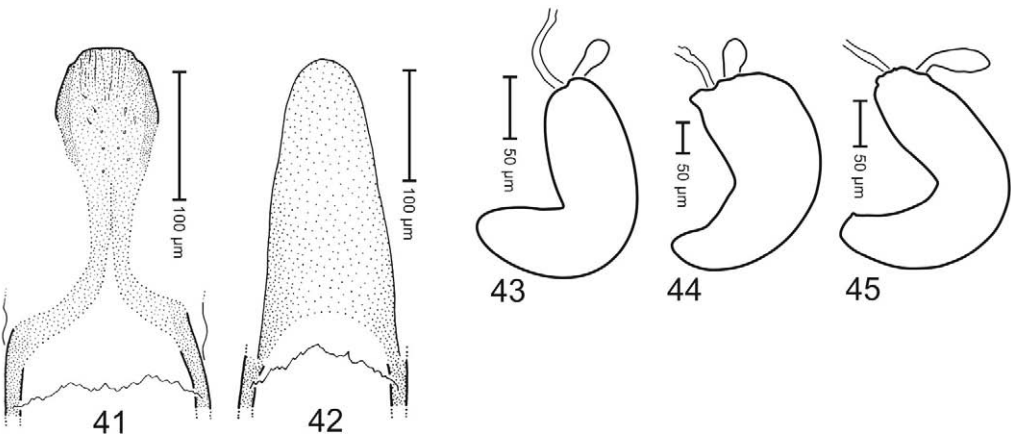
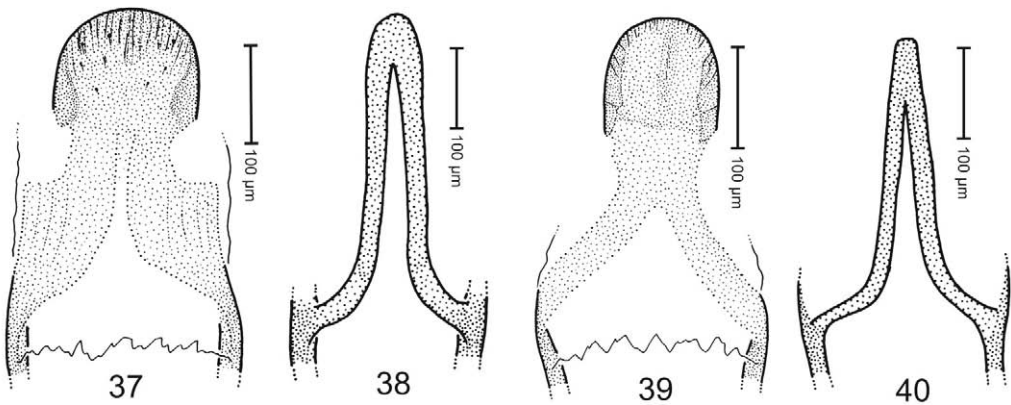
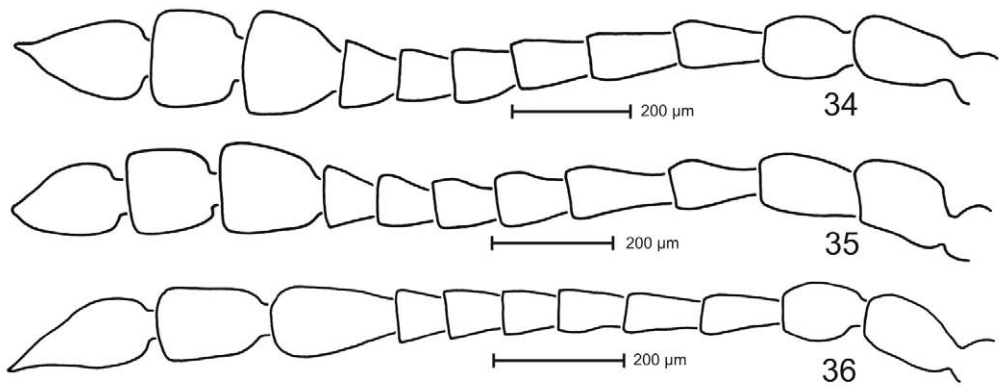
Biological note. This species was collected by canopy fogging.

Euops (Lijudmilinius) LEGALOV, 2003: 362, formerly *E. femoralis*-group of RIEDEL 2002

Diagnosis. Proventriculus with gnathal ridges and denticulate pulvilli. Male sternite III of abdominal venter subglabrous. Tegminal plate of male genitalia narrow; apical edge rounded and with dense long setae. Apex of male protibia with flattened protrusion ventrad of uncus. Female tibiae apically without premucro. Setose patch of female venter consisting of three double rows of modified setae. Ovipositor with coxites (Fig. 30).



Figs 31-33. Male genitalia of *Euops* spp.; transfer apparatus (TA) of aedeagus; **31.** *E. cacuminis* **sp. n.**, holotype; left in dorsal aspect, right in lateral aspect; d = dorsal side, v = ventral side; * = irregular, sclerotized area at the apex of transfer process. **32.** *E. missai* **sp. n.**, holotype, in dorsal aspect; **33.** *E. prismae* **sp. n.**, holotype, in dorsal aspect.



Figs 34-36. Antenna of *Euops* spp.: **34.** *E. cacuminis* sp. n., holotype; **35.** *E. missai* sp. n., holotype; **36.** *E. prismae* sp. n., holotype. **Figs 37-42.** Details of male genitalia, *Euops* spp.: **37.** pedon of *E. cacuminis* sp. n., holotype; **38.** tectum of *E. cacuminis* sp. n., holotype; **39.** pedon of *E. missai* sp. n., holotype; **40.** tectum of *E. missai* sp. n., holotype; **41.** pedon of *E. prismae* sp. n., holotype; **42.** tectum of *E. prismae* sp. n., holotype. **Figs 43-45.** Spermatheca of *Euops* spp.: **43.** *E. prismae* sp. n., allotype; **44.** *E. missai* sp. n., allotype; **45.** *E. cacuminis* sp. n., allotype.

***Euops (Lijudmilinius) prismae* sp. n.**
(Figs. 3, 6, 11, 12, 17, 18, 25, 28, 30, 33, 36, 41, 42, 43)

Diagnosis. Prothorax subglobose with deep subbasal constriction; disc weakly rugose, at side punctate. Male: Profemur asymmetrically clavate; anterior surface in apical 0.25 with protuberance. TA as in Fig. 33.

Type material.

Holotype: PAPUA NEW GUINEA: Madang Prov., Baiteta, GLU 377, WK1, leg. O. Missa, "Canopy Mission PNG" (type deposit: IRSNB).

Paratypes (IRSNB, SMNK): PAPUA NEW GUINEA, Madang Prov., Baiteta, leg. O. Missa, "Canopy Mission PNG": 1 female (marked as "allotype"), GLU 520, WK2; 1 female, GLU 447, CCL-12963, WK10; 1 female, GLU396, CCL-11928, WK6; 1 female, GLU 63, WK5; 1 female, GLU630, WK2; 1 female, GLU 47, CCL-10608, 12.VII.1995; 1 female, GLU 327, CCL-11837, WK5; 1 male, GLU331, CCL-11165, WK2; 1 male, GLU596, WK2; 1 female, GLUXB-2, CCL-5642, 16.V.1994; 1 female, GLU 545, CCL-11231, WK2; 1 male, GLU 42, CCL-10746, 26.VII.1995; 1 female, GLU2, WK8; 1 male, GLU14, CCL-10736, 26.VII.1995; 1 male, GLU48, 5.VII.1995; 1 male, GLU33, CCL-10439, 21.VI.1995; 1 male, GLU480, WK9; 1 female, GLU2-28, CCL-5517, 9.VI.1994; 1 female, GLU 47, WK 4; 1 male, GLU 517, WK3; 1 female, GLU 168, WK8; 1 female, GLU 459, WK10; 1 female, GLU 103, WK2; 1 female, GLU574, CCL-12483, WK8; 1 female, GLU342, CCL-12525, WK8; 1 male, GLU 22, WK9; 1 male, GLU 361, WK3; 1 male, GLU262, WK1; 1 male, GLU260, CCL-12906, WK10; 1 female, FOG XA-15, CCL-2417, 9.IV.1993; 1 male, GLUXB-2, CCL-5640, 21.IV.1994; 1 male, GLU47, CCL-10694, 19.VIII.1995; 1 male, GLU9, CCL-10655, 19.VIII.1995; 1 male, GLU262, WK1; 1 male, GLU 341, WK9; 1 male, GLU543, CCL-12902, WK10; 1 female, GLU5, 7.VI.1995; 1 male, GLU46, CCL-10607, 12.VIII.1995; 1 female, GLU 447, CCL-12850, WK9; 1 male, GLU335, WK9; 1 female, GLU, CCL-10167, 17.V.1995; 1 male, GLU38, CCL-10681, 19.VII.1995; 1 female, GLU 252, WK9; 1 female, GLU 168, WK9; 1 male, GLU467, CCL-13161, WK10; 1 female, GLU529, CCL-12969, WK10; 1 female, GLU202, WK7; 1 female, CCL-10621, GLU55 bis, 12.VIII.1995; 1 male, GLU9, CCL-10800, 02.VIII.1995; 1 female, GLU 459, WK10; 1 female, GLU52, WK8; 1 female, GLU31, CCL-12683, WK9; 1 female, GLU, CCL-10172, 17.V.1995; 1 female, GLU3, 5.VIII.1995; 1 female, GLU50, CCL-10317, 7.VI.1995; 1 female, GLU489, WK2; 1 male, GLU148, CCL-11807, WK5; 1 male, GLU618, WK3; 1 female, GLU517, WK2; 1 female, GLUXB-26, CCL-6002, 7.VI.1994; 1 female, GLU2-32, CCL-5567, 28.III.1994; 1 female, GLU 467, WK8; 1 female, GLU2-27, CCL-5492, 25.IV.1994; 1 female, GLU 390, WK1; 1 male, GLU 357, WK1; 1 male, FOG AR 68, 22.VII.1996; 1 female, GLU200, WK9.

Description.

Male (holotype). Length, pronotum + elytron: 3.06 mm. Coloration (Figs. 3, 6, 11, 12) largely metallic green, partly with bluish lustre; basal half of elytron dorsally from middle to stria 5 black except for area bordering coppery scutellum; pronotum with bright green midline, remainder of dorsum black with weak bronze lustre; sides of prothorax with black, L-shaped mark leading from procoxa to anterior margin; anterior face of procoxa metallic golden-green, posterior face dark ferruginous; mesothorax black; legs deeply reddish brown with more or less distinct metallic green lustre; metafemur metallic green; antenna black.

Head. As in Fig. 17. Gena 1.32 x as long as width of head immediately behind eyes. Vertex shining; behind eyes moderately deeply punctate, posteriorly with sparse minute punctures; laterally in posterior half with transverse wrinkles. Eyes in dorsal view moderately prominent from lateral contour of head, medially contiguous for ca. 0.5 x their length. Frons anteriorly at junction with rostrum with median ridge. Ventral surface of head in front of gular region shining, posteriorly with transverse wrinkles; anteriorly microreticulate bordering eyes, weakly rugose, median furrow distinct. Rostrum 2.82 x as long as mouthparts; at widest point 1.33 x wider than at base; in cross section dorsally moderately rounded. Clypeus with median notch. Interantennal area converging with sinuate lateral margins; anteriorly of antennal insertion scrobes approximate, medially separated by sharp median carina. Profile of rostrum with dorsal contour of interantennal area weakly projecting, rounded; anteriorly straight and finally in weakly convex line to apex; ventral contour weakly concave to projecting base of prementum; dorsal and ventral contour of rostrum basally subparallel. Venter of rostrum poorly delimited against venter of head, basally with indistinct submental median carina and with pair of shallow lateral impressions. Antenna as in Fig. 36.

Mouthparts. Prementum at base 1.7 x wider than long, ca. 2.3 x wider than at apex; surface markedly concave, especially along midline impressed; subbasally obliquely folded, apical portion bent dorsad, pair of subtriangular basal portions swollen, roundly projecting ventrad; with sinuate lateral margins converging apicad; with three moderately long, acute apical processes, subequal in length; apically concave, median apical process retracted into more dorsal position. Proventriculus with eight primary gnathal ridges; cutting edge of gnathal ridge in profile of subtriangular shape, acute; posteriad of each gnathal ridge with moderately large, densely setose pulvillus.

Thorax. Prothorax as long as wide (1.03 x), subglobose, sides evenly strongly rounded; with deep subbasal constriction, with shallow preapical constriction; disc shining, weakly microreticulate, weakly rugose, at side punctate. Metanotum without sutural spines, but with pair of bluntly angular projections; laterally projecting angularly without forming distinct lateral lobe. Elytron at humerus simple; 2.20 x longer than wide; striae moderately impressed throughout. Thoracic venter. Prepectus ca. 1.5 x as long as postpectus. Height of pterothorax 0.88 x length of elytron.

Legs. Procoxa in anterior aspect 1.19 x as long as wide; simple at articulation with trochanter; apicomeresally with swelling. Profemur strongly swollen; asymmetrically clavate; ventral contour and dorsal contour sinuate; posterior contour convex; anterior surface granulate, in apical quarter with rounded protuberance. Protibia long, but shorter than in *E. femoralis*; ventral surface with one low costa and three irregular rows of low protruding granulae; sparsely setose with moderately long, suberect setae; tibial apex strongly angularly protruding ventrad of uncus; anterior distal comb complete; posterior distal comb strongly oblique, behind tarsal articulation, dorsally and ventrally shortened, indistinct with thin setae. Mesotibia subapically simple, without extension.

Abdomen. Venter subglabrous except sternites IV-V with sparse suberect setae. Pygidium 1.04 x wider than long; microreticulate; densely, moderately deeply punctate; setose with long recumbent setae. Genitalia. Sternite VIII as in Fig. 28; apex weakly bilobed, with long setae; base weakly concave. Tegminal plate (Fig. 25) with sides subparallel towards apex; apical edge broadly rounded, with dense long setae. Aedeagus. Apical scoop of pedon (Fig. 41) basally poorly delimited, ca. 0.70 x as long as wide, with lateral margins converging, apex subtruncate, shape subtrapezoid. Tectum (Fig. 42) without well-sclerotized lateral frame; weakly sclerotized. TA as in Fig. 33; without dorsal plate; transfer process long, markedly extending beyond apex of body. Endophallus in apical portion without sclerite.

Female (allotype). Same as described male except: length, pronotum + elytron: 2.63 mm. Coloration. Dorsal black patch of elytron smaller, with bronze lustre; scutellum metallic green. Head. As in Fig. 18. Gena as long as width of head immediately behind eyes (1.01 x). Eyes in dorsal view weakly prominent from lateral contour of head. Rostrum 2.13 x as long as mouthparts; at widest point 1.24 x wider than at base. Profile of rostrum with dorsal and ventral contour weakly convex, in apical half converging. Mouthparts. Prementum flat, not concave, at base simple, without folded and swollen basal portion. Prothorax 0.95 x as long as wide. Elytron 2.10 x longer than wide. Height of pterothorax 0.93 x length of elytron. Legs. Procoxa in anterior aspect 1.09 x as long as wide. Profemur moderately swollen; asymmetrically clavate; dorsal contour sinuate, markedly convex before apex; anterior contour more bulging than evenly convex posterior contour, but without distinct protuberance; anterior surface at base with longitudinal row of setiferous denticles. Protibia with dorsal contour weakly convex; ventral contour sinuate, convex in basal half, concave in apical half; ventral surface crenulate, especially basally; apically without crenulation but with suberect setae. Tibial apex without premucro; uncus in dorsal position. Abdomen. Setose patch of venter 1.04 x as long as wide, consisting of three double rows of modified setae on sternite III-V; sternite VI without row of setae. Pygidium 1.14 x wider than long. Genitalia. Ovipositor with coxites (Fig. 30). Sternite VIII as in Fig. 30; apex subtruncate, laterally rounded; with short apodeme. Spermatheca as in Fig. 43; subisodiametric from base to shortly before apex.

Intraspecific variation. Length, pronotum + elytron: 2.24-3.06 mm (n=21, \bar{x} =2.66 \pm 0.20). Coloration. Elytra metallic green or metallic blue; either of more or less complete metallic coloration with or without black patch at elytral base, or largely bronze-ferruginous with only humeri and elytral apex greenish-blue; in general coloration most intense on humeri, near scutellum and on elytral apex. Green midline of pronotum in some specimens limited to basal half; in few specimens indistinct because entire pronotum of metallic green coloration. Head. Gena and rostrum more elongate in larger males, shorter in smaller males. Prothorax 0.95-1.04 x as long as wide in males (n=11, \bar{x} =1.00 \pm 0.03), 0.94-0.98 x as long as wide in females (n=10, \bar{x} =0.96 \pm 0.01); sides markedly rounded in larger males, less rounded in smaller males. Elytron 2.13-2.26 x longer than

wide in males ($n=11$, $\bar{x}=2.21 \pm 0.04$), 2.06-2.21 x longer than wide in females ($n=10$, $\bar{x}=2.13 \pm 0.05$). Thoracic venter. Height of pterothorax 0.84-0.90 x length of elytron in males ($n=11$, $\bar{x}=0.87 \pm 0.02$), 0.89-0.99 x length of elytron in females ($n=10$, $\bar{x}=0.93 \pm 0.03$). Legs. Profemur allometric; with decreasing size of specimens profemur becoming shorter and less markedly clavate; knob on anterior surface becoming indistinct in medium-sized specimens, missing in small specimens. Abdomen. Female patch of modified setae 1.11-1.43 x as long as wide ($n=10$, $\bar{x}=1.29 \pm 0.13$). Pygidium 0.96-1.12 x wider than long in males ($n=10$, $\bar{x}=1.04 \pm 0.04$), 1.04-1.23 x wider than long in females ($n=9$, $\bar{x}=1.14 \pm 0.06$).

Etymological note. This species is named in honor of my dear wife Prisma for her patience and understanding of my work.

Biological note. This species was mainly collected using sticky traps set in the canopy.

Euops (Euopsidius) testaceus VOSS, 1929

Material examined: PAPUA NEW GUINEA: Madang Prov., Baiteta, GLU 207 WK6, CCL – 12169, [no date given], leg. O. Missa, “Canopy Mission PNG” (1 male, IRSNB); GLU 210, WK3 (1 female, IRSNB).

Euops (Metaeuops) ruficornis VOSS, 1956

Material examined: PAPUA NEW GUINEA: Madang Prov., Baiteta, GLU 570, WK1, leg. O. Missa, “Canopy Mission PNG” (1 female, IRSNB);

Discussion

The *Euops* fauna of New Guinea was summarized by RIEDEL (2002) and species-groups were defined. LEGALOV (2003) proposed independent genera for each of these species groups based on a more limited set of characters than given in the original diagnosis and without having examined any specimens himself. Additionally, he proposed new, often monotypic genera for species with conspicuous apomorphies. Many of these names are available under the current rules of the ICZN. Some of LEGALOV's genera can be sunk as synonyms, others need to be used on a lower rank as subgenera (SETLIFF, 2007). Two of the new species (*E. cacuminis* sp.n. and *E. missai* sp.n.) belong to the subgenus *Guineoeuops* LEGALOV, revised by RIEDEL (2001) as the *simulans*-group of *Euops*. The third one (*E. prismae* sp.n.) belongs to the subgenus *Lijudmilinius* LEGALOV, formerly a monotypic taxon for *E. femoralis* VOSS, 1924.

Euops cacuminis sp.n. is closely related to *E. wei* RIEDEL, 2001 and *E. kutubu* RIEDEL, 2001. This assumption rests on the general distribution of characters (short prepectus of male; mesotibia of male subapically without dorsal expansion; profemur of male ventrally simple; apex of male protibia strongly angularly protruding ventrad of uncus; structure of proventriculus) and on the apomorphic structure of the reduced male transfer apparatus (TA). In the character matrix of RIEDEL (2001) it codes identical with *E. wei*. In the key of RIEDEL (2001) it runs to couplet 8 that includes the two above mentioned species. It can be easily distinguished from both by the specific structure of the TA (Fig. 31) that includes asymmetrical lateral support structures with a massive J-shaped sclerite on the left (apex of aedeagus directed backwards) and a narrow or partly vestigial sclerite on the right. It may be the more basal of the three species, while *E. wei* and *E. kutubu* are sister species, because the transfer processes of the TA are in a more retracted and possibly more apomorphic position in *E. wei* and *E. kutubu*.

Euops missai sp.n. is regarded as a sister species of *E. japensis* RIEDEL, 2001 based upon the following characters of the male: the peculiar protrusions at the suture between prementum and submentum, the close general similarity of the TA, the elongated head, and the long forelegs. In the character matrix of RIEDEL (2001) it codes identical with *E. japensis*. In the key for males of RIEDEL (2001) it runs to couplet 9. Here it should be modified as follows:

9 (6') Head and rostrum elongate (Fig. 121; fig 15 of present paper). Suture between prementum and submentum elevated laterally, at middle depressed, in dorsoapical aspect contour bilobate. Forelegs long. 9A

- 9' Head and rostrum shorter (Figs. 119, 122). Suture between prementum and submentum simple, in dorsoapical aspect contour not bilobate. Forelegs shorter. 10
- 9A (9) Pronotum coarsely sculptured, rugose-punctate, wrinkles leading to blunt knob in front of scutellum. Metanotum with two pairs of lateral lobes. TA with pair of basal sclerites.
. *E. japensis* RIEDEL, 2001
- 9A' Pronotum medially subglabrous with minute punctures; towards sides with some shallow wrinkles; without distinct knob in front of scutellum. Metanotum with one pair of lateral lobes. TA without basal sclerite. *E. missai* **sp.n.**

Euops prismae **sp.n.** is closely related to *E. femoralis* VOSS, 1924 based on the diagnostic characters for *Lijudmilinius* LEGALOV as given above. The new species can be distinguished from *E. femoralis* by its extensive metallic green coloration, its subglobose prothorax, the different shape of the profemur and a TA with longer transfer processes.

Zusammenfassung

Das Material der Gattung *Euops* SCHONHERR, 1839 aus einer Untersuchung der Kronenfauna im Baiteta Forst in Papua Neu Guinea wurde bearbeitet. Es wurden fünf Arten nachgewiesen: *Euops* (*Euopsidius*) *testaceus* VOSS, 1929, *E. (Metaeuops) ruficornis* VOSS, 1956, *E. (Lijudmilinius) prismae* **sp. n.**, *E. (Guineoeuops) cacuminis* **sp. n.**, und *E. (Guineoeuops) missai* **sp. n.**. Die neuen Arten werden beschrieben und ihre kennzeichnenden Merkmale abgebildet; die phylogenetische Stellung der Arten wird diskutiert.

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