

Sixteen new species of *Agrilus* Curtis, 1825 from East Africa (Coleoptera, Buprestidae)

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Academic editor: Charles Bellamy | Received 29 March 2009 | Accepted 2 September 2009 | Published 9 October 2009

[urn:lsid:zoobank.org:pub:9B33B40C-2B9C-40C8-A931-F9F1428A6AB2](https://zoobank.org/pub/9B33B40C-2B9C-40C8-A931-F9F1428A6AB2)

Citation: Curletti G, Sakalian V (2009) Sixteen new species of *Agrilus* Curtis, 1825 from East Africa (Coleoptera, Buprestidae). ZooKeys 24: 1–29. doi: 10.3897/zookeys.24.191

Abstract

Sixteen new species of *Agrilus* Curtis, 1825 from East Africa: *A. (Agrilus) cteniasiformis*, **sp. n.**, *A. (Agrilus) gueorguievi*, **sp. n.**, *A. (Agrilus) kinuthiae*, **sp. n.**, *A. (Agrilus) ljubomirovi*, **sp. n.**, *A. (Agrilus) njugunai*, **sp. n.**, *A. (Agrilus) polinae*, **sp. n.**, *A. (Duttus) delchevi*, **sp. n.**, *A. (Paralophotus) gordonii*, **sp. n.**, *A. (Paralophotus) jiloi*, **sp. n.**, *A. (Paralophotus) pavlinae*, **sp. n.**, *A. (Paralophotus) penevi*, **sp. n.**, *A. (Paralophotus) popovi*, **sp. n.**, *A. (Paralophotus) semerdjievi*, **sp. n.**, *A. (Paralophotus) tsavoensis*, **sp. n.** from Kenya; *A. (Agrilus) novaki*, **sp. n.** from Tanzania; *A. (Robertius) mungaii*, **sp. n.** from Uganda are described, illustrated and compared with related species.

Keywords

Coleoptera, Buprestidae, *Agrilus*, Kenya, Tanzania, Uganda, new species

Introduction

This paper is a second joint contribution on the *Agrilus* fauna of East Africa following Curletti and Sakalian (2007). The majority of the new species were collected in 2005 and 2006 during implementation of a project by “International Center of Insect Physiology and Ecology” (Nairobi, Kenya) titled “Promotion of natural-based, sustain-

able businesses for forest-adjacent communities in the East-Usambara - Tanga, Taita Hills and Lower Tana River Forests“, sponsored by “Critical Ecosystem Partnership Fund”(Washington,USA). The remaining specimens were collected during expeditions by the second author in Kenya from 2004 to 2006, except *Agrilus* (*Agrilus*) *novaki*, sp. n., which was collected by K. Novák in Tanzania and *Agrilus* (*Robertius*) *mungaii*, sp. n. from Uganda, which was found by the authors while studying the collection of the National Museum of Kenya.

Abbreviations

NMK National Museum of Kenya (Nairobi, Kenya)

GCCI Collection of Gianfranco Curletti (Carmagnola, Italy)

IZBAS Collection of the Institute of Zoology BASc Scientific Found (Sofia, Bulgaria)

Agrilus (*Agrilus*) *cteniasiformis*, sp. n.

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Figs 1, 2

Type specimens. Holotype ♂: “C Kenya, Simba (02°08’S – 37°34’E), 1050 m, 31.10.2005, G. Curletti & V. Sakalian leg.”. Paratypes: 1 ♂ and 1 ♀ with same locality and date as holotype. The holotype is deposited in IZBAS and the paratypes in GCCI.

Description of holotype. Body slender, subparallel, bronze colored dorsally; ventral side metallic black, frons dark green, elytra with very sparse and short white pubescence.

Head with medial sulcus and longitudinal striae on vertex and upper portion of frons; width of vertex between eyes 0.37 mm; frons protruding at upper portion; medial and lower portions of frons dark green, rugose; lower portion of frons, clypeus and genae with short, dense, white pubescence; eyes feebly convex; antennae short, barely reaching upper portion of eyes; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin bisinuate, carinate; anterior pronotal lobe distinct; lateral margins slightly curved before latero-posterior angles; latero-posterior angles rectangular; prehumeral pronotal carinae arched, extending from latero-posterior angles to just before lateral margin at middle of pronotum; marginal and submarginal carinae subparallel, not coalescent; discal sculpture consisting of very distinct transverse striae.

Scutellum small, anterior margin rounded; transverse carina present; apical projection short.

Elytra subparallel, width across humeri almost as wide as pronotal base; elytra widest at posterior third; humeral depressions deep and wide; apices narrowly separately arcuate, serrated; elytra with short, uniform, white pubescence; discal elytral sculpture consisting of transverse wrinkles.



Figure 1. *Agrilus (Agrilus) cteniasiformis*, sp. n. (dorsal view).



Figure 2. Aedeagus *Agrilus (Agrilus) cteniasiformis*, sp. n. (dorsal view). Scale: 1 mm.

Underside. Prosternal lobe robust, regularly arcuate. Prosternal process narrowed between procoxae, apical projection long and acutely pointed. Ventriles with uniform, short, golden pubescence; apex of last ventrite truncate. Aedeagus (Fig. 2).

Description of paratypes. Females differ from males in the rounded and bordered apex of the last ventrite and the bronze-colored frons.

Size. Length 3.00–3.40 mm (holotype 3.30 mm); width 0.85–0.95 mm (holotype 0.90 mm).

Differential diagnosis. The new species is closely related to *Agrilus (Agrilus) ctenias* Théry, 1934 from Mozambique. It differs from this species by its bronze rather than emerald green color and smaller size.

Etymology. The specific epithet denotes the similarity of the new species and *A. ctenias*.

Remarks. Collected from yellow sticky traps placed on branches of *Acacia* sp.

***Agrilus (Agrilus) gueorguievi*, sp. n.**

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Figs 3, 4

Type specimens. Holotype ♂: “Kenya, Tsavo West National Park (03°30’S – 38°16’E), 7.11.2005, G. Curletti & V. Sakalian leg.”. Paratypes 14 exs: 2 ♂♂ and 4 ♀♀ with

same locality and date as holotype; 3 ♂♂ and 5 ♀♀: “Kenya, western of Voi City (03°26’S – 38°30’E), 4.11.2005, G. Curletti & V. Sakalian leg.”. The holotype is deposited in IZBAS and the paratypes in GCCI, IZBAS and NMK.

Description of holotype. Body short, subcylindrical, dark copper with blackish tinge, vertex and frons of male black; elytra with uniform, dense and short white pubescence.

Head with very narrow medial sulcus and very fine longitudinal striae on vertex; vertex and frons black; width of vertex between eyes 0.55 mm; frons convex, protruding in dorsal view; upper portion of frons densely punctuate; lower portions of frons rugose; clypeus separated from frons by sharp carina; clypeus and genae with short, dense, white pubescence; eyes convex, very small; antennae short, barely reaching anterior portion of pronotum; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin straight, carinate; anterior pronotal lobe absent; lateral margins slightly curved before latero-posterior angles; latero-posterior angles slightly obtuse; pronotum with two medial and two lateral shallow depressions; prehumeral pronotal carinae absent; marginal and submarginal carinae subparallel, not coalescent; discal sculpture consisting of transverse striae and sparse punctuation; pubescence on disc very sparse and white.

Scutellum small, anterior margin rounded; transverse carina present; apical projection long and acutely pointed.

Elytral width across humeri slightly wider than pronotal base, widest at posterior third; humeral depressions deep and wide; apices narrowly jointly arcuate, not serrulate; elytra with short, uniform, white pubescence; discal elytral sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe with anterior margin truncate. Prosternal process parallel between procoxae, acuminate apically; prosternal process with dense, white, pubescence. Ventriles with uniform, short, white, sparse pubescence, denser on laterosternites; apex of last ventrite truncate with long apical setae. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together. Aedeagus (Fig. 4).

Description of paratypes. Sexual dimorphism occurs in the color of vertex and frons, which is black in males and dark copper in females.

Size. Length 2.60–3.60 mm (holotype 3.00 mm); width 0.75–1.15 mm (holotype 0.85 mm).

Differential diagnosis. This new species is very similar to *Agrilus* (*Agrilus*) *kinuthiae*, sp. n., from which it differs by the blackish tinged body, black vertex and frons of males and very different shape of the aedeagus (Fig. 4 and Fig. 6).

Etymology. The name was chosen to honor the Bulgarian entomologist, the late Dr. Vassil Guéorguiev, for his great body of works on different families of Coleoptera.

Remarks. Most of the specimens were collected from yellow sticky traps placed on branches of *Acacia* sp.



Figure 3. *Agrilus (Agrilus) gueorguievi*, sp. n. (dorsal view).



Figure 4. Aedeagus of *Agrilus (Agrilus) gueorguievi*, sp. n. (dorsal view). Scale: 1 mm.

***Agrilus (Agrilus) kinuthiae*, sp. n.**

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Figs 5, 6

Type specimens. Holotype ♂: “NE Kenya, Lower Tana River (02°16’S – 40°10’E), 30 m, 25–28.10.2005, G. Curletti & V. Sakalian leg.”. Paratypes 6 exs: 4 ♀ ♀ with same locality and date as holotype; 2 ♀ ♀ “NE Kenya, Lower Tana River (02°13’S – 40°10’E), 10 m, 25–28.10.2005, G. Curletti & V. Sakalian leg.”. The holotype is deposited in IZBAS and the paratypes in GCCI, IZBAS and NMK.

Description of holotype. Body robust, subcylindrical, bright copper in color with a greenish tinge and the frons green.

Head with dense punctuation on vertex and upper portion of frons; width of vertex between eyes 0.62 mm; frons protruding in upper portion; lower portion of frons, clypeus and genae with short, dense, white pubescence; clypeus separated from frons by sharp carina; eyes convex and large; antennae short, barely reaching anterior margin of pronotum; antennomeres 4–11 markedly wider than long, triangular.

Pronotum widest at anterior third; anterior margin straight, carinate; anterior pronotal lobe absent; lateral margins slightly curved in posterior third; latero-posterior angles subrectangular; pronotum with weak depressions (two medial and two lateral);

posterior medial depression deeper and oval; prehumeral pronotal carinae absent; marginal and submarginal carinae subparallel, not coalescent; discal sculpture consisting of transverse striae and sparse punctuation.

Scutellum robust, anterior portion triangular; transverse carina present; hind projection short and acutely pointed.

Elytra subparallel width humeri almost as wide as pronotal base; widest at posterior third; humeral depressions deep and wide; apices narrowly jointly rounded, not serrulate; elytra with short, uniform, white pubescence; discal elytral sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe robust, anterior margin truncate. Prosternal process parallel between procoxae than narrowed apically; prosternal process with dense, white, pubescence. Abdomen with suture between ventrites 1 and 2 not visible. Ventrites with uniform, short, golden pubescence; apex of last ventrite shallowly arcuately emarginate, with long pubescence. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together. Aedeagus (Fig. 6)

Description of paratypes. Sexual dimorphism occurs in the following characters: upper portion of frons, which is green in males and cupper in females, pubescence of

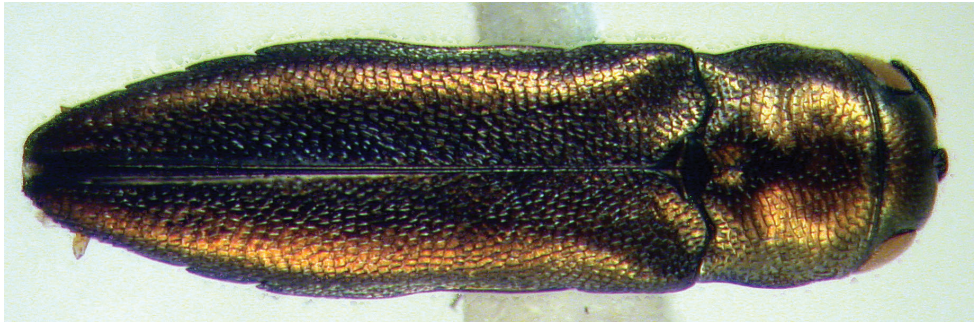


Figure 5. *Agrilus (Agrilus) kinuthiae*, sp. n. (dorsal view).

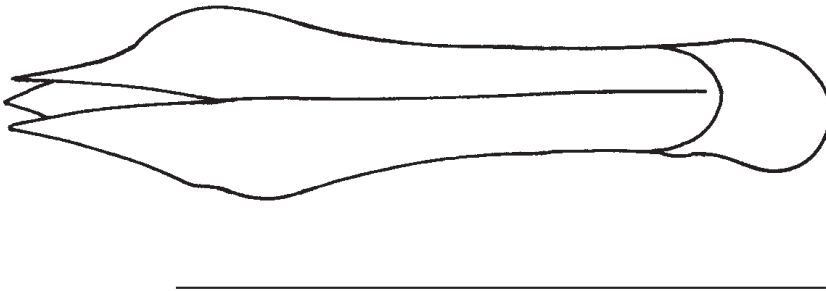


Figure 6. Aedeagus of *Agrilus (Agrilus) kinuthiae*, sp. n. (dorsal view). Scale: 1 mm.

prosternal process, which is longer in males and apex of last ventrite, which is shallowly arcuately emarginate in males, while in females is subtruncate.

Size. Length 3.90–4.45 mm (holotype 4.00 mm); width 0.95–1.25 mm (holotype 1.05 mm).

Differential diagnosis. *Agrilus* (*Agrilus*) *kinuthiae*, sp. n. is very similar to *A. (Agrilus) chembae* Théry, 1934, which synonym is *A. (Agrilus) othello* Obenberger, 1935. *A. chembae* is distributed in Kenya, Mozambique and Tanzania. The new species has frons less prominent in dorsal view and the sculpture of pronotum is less strong. The aedeagus has the paramers more expanded and rounded laterally and more anteriorly advanced.

Etymology. Dedicated to Dr. Vanja Kinuthia, from the National Museum of Kenya, for her kindness to give us the possibility to study the Buprestidae collection at the Museum.

Remark. Collected from yellow sticky traps placed on branches of *Acacia* sp.

***Agrilus* (*Agrilus*) *ljubomirovi*, sp. n.**

urn:lsid:zoobank.org:act:8AFF7317-3067-4E3F-8766-99EA18499971

Figs 7, 8

Type specimens. Holotype ♂: “Kenya, N Oltepesi (01°33′S – 36°37′E), 22.11.2005, G. Curletti & V. Sakalian leg.”. Paratypes 2 ♂♂: with the same locality and date as holotype. The holotype is deposited in IZBAS and the paratypes in GCCI and IZBAS.

Description of holotype. Body robust, subcylindrical, dark copper colored dorsally, underside with blackish tinge. Elytra with blackish lustre and uniform semierect pubescence.

Head with very narrow, indistinct medial sulcus and very fine longitudinal striae on vertex; width of vertex between eyes 0.52 mm; frons protruding at upper portion, hemispheric in dorsal view with sculpture of concentric wrinkles and deep punctation; lower portion of frons, clypeus and genae with short, dense, white pubescence; clypeus separated from frons by sharp carina; eyes convex; antennae short, extending anterior margin of pronotum; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin carinate; anterior pronotal lobe absent; lateral margins slightly curved before latero-posterior angles; latero-posterior angles subrectangular; pronotum with anterior medial and two lateral very shallow depressions; only postero-medial depression deeper, longitudinally long-oval; prehumeral pronotal carinae more visible from lateral view, broadly arched, extending from posterior margin and reaching middle portion of pronotum just before lateral margin; marginal and submarginal carinae not conjoined; discal sculpture consisting of diagonal and transverse striae and sparse punctation; pubescence on disc sparse and white.

Scutellum well developed, anterior portion arched; transverse carina present; hind projection long and acutely pointed.

Elytra width across humeri, slightly wider than pronotal base, widest at posterior third; humeral depressions deep and wide, without pubescence; apices widely separately arcuate, serrated; elytra with uniform, semierect pubescence; discal elytral sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe with anterior margin broadly arcuate. Prosternal process subparallel between procoxae than widened and triangular apically. Abdomen with suture between ventrites 1 and 2 not visible. Ventrites with uniform, short, sparse pubescence, denser on laterosternites; apex of last ventrite truncate, with long erect setae apically. Metatarsus shorter than metatibia; basal metatarsomere very distinctly shorter than following metatarsomeres together. Aedeagus (Fig. 8)

Description of paratypes. Paratypes without substantial differences.

Size. Length 3.35–3.70 mm (holotype 3.35 mm); width 0.95–1.10 mm (holotype 0.95 mm).

Differential diagnosis. The aedeagus of *Agrilus* (*Agrilus*) *ljubomirovi*, sp. n. is similar to that of *A. (Agrilus) gueorguievi*, sp. n. The main characters that distinguish these two species are as follow: vertex and frons black in *A. gueorguievi*, sp. n., dark copper in



Figure 7. *Agrilus* (*Agrilus*) *ljubomirovi*, sp. n. (dorsal view).

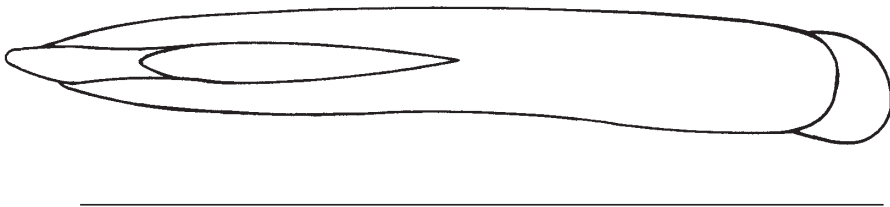


Figure 8. Aedeagus of *Agrilus* (*Agrilus*) *ljubomirovi*, sp. n. (dorsal view). Scale: 1 mm.

A. ljubomirovi, sp. n.; prehumeral carina present in *A. ljubomirovi*, sp. n. and lacking in *A. gueorguievi*, sp. n.; elytral pubescence sparser and longer in *A. ljubomirovi*, sp. n.; anterior margin of prosternal lobe truncate in *A. gueorguievi*, sp. n. and rounded in *A. ljubomirovi*, sp. n.

Etymology. The name is chosen to honor the friend of the second author, Toshko Ljubomirov, specialist on Sphecidae and Crabronidae (Hymenoptera) and a very good collector of buprestid beetles.

Remark. Collected from yellow sticky traps placed on branches of *Acacia* sp.

***Agrilus* (*Agrilus*) *njugunai*, sp. n.**

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Figs 9, 10

Type specimens. Holotype ♂: “NE Kenya, North of Malindi, Sabaki River (03°08’S – 40°07’E), 25–28.10.2005, G. Curletti & V. Sakalian leg.”. Paratype ♀: with same locality and date as holotype. The holotype is deposited in IZBAS and the paratype in GCCI.

Description of holotype. Body slender, elongate dark copper dorsally and bright copper ventrally, with blackish tinge on vertex and frons. Elytra with uniform golden pubescence.

Head with medial sulcus and dense punctation on vertex and upper portion of frons (more distinct on upper portion of frons); width of vertex between eyes 0.50 mm; frons protruding in medial and upper portions; lower portion of frons, clypeus and genae with short, dense, white pubescence; clypeus separated from frons by transverse carina; eyes convex and large; antennae short, extending anterior margin of pronotum; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin straight, carinate; anterior pronotal lobe absent; lateral margins distinctly curved before latero-posterior angles; latero-posterior angles rectangular; pronotum with two shallow lateral depressions; prehumeral pronotal carinae sharp rib-like, extending from lateroposterior angles to medial portion of pronotum, diverging from lateral margin; marginal and submarginal carinae coalescent at medial portion of pronotum; discal sculpture consisting of diagonal and transverse striae and sparse punctation.

Scutellum relatively small, anterior portion triangular; transverse carina present; apex very short and acutely pointed.

Elytra elongate, subparallel, width across humeri almost as wide as pronotal base; elytra widest at posterior third; humeral depressions deep and without pubescence; apices very narrowly separately arcuate, distinctly serrate; elytra with short, uniform, golden pubescence; discal elytral sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe robust, arcuate apically. Prosternal process parallel between procoxae, then narrowed and elongate apically; pro -, meso - and metasternum and prosternal process with white, dense pubescence. Suture between ventrites 1 and

2 not visible; ventrites with uniform, short, sparse, white pubescence; laterosternites with very dense, short, white pubescence; apex of last ventrite with distinct medial incision. Metatarsus shorter than metatibia; basal metatarsomere slightly shorter than following metatarsomeres together. Aedeagus (Fig. 10).

Description of paratype. Sexual dimorphism occurs in the last ventrite of the female, the apex of which lacks an incision and has a fascicle of long hairs.

Size. Length 3.95–4.30 mm (holotype 3.95 mm); width 0.95–1.05 mm (holotype 0.95 mm).

Differential diagnosis. *Agrilus (Agrilus) njugunai*, sp. n. and *A. (Agrilus) polinae*, sp. n. are similar to *A. (Agrilus) addagallensis* Obenberger, 1935 from Ethiopia. They differ from that species mainly by the ventrites with uniform pubescence, without white spots on the sides. *Agrilus (Agrilus) polinae*, sp. n. can be separated from *A. (Agrilus) njugunai*, sp. n. by the different structure of the pronotum, which is more depressed at the sides; by the marginal and submarginal pronotal carinae not conjoined, the presence of two longitudinal, sutural stripes of pubescence on the elytra and the medially emarginate prosternal lobe of *A. polinae*, sp. n.

Etymology. Dedicated to the expedition car driver Mr. Joseph N'juguna for his assistance during the expeditions in different regions of Kenya.

Remark. Collected from yellow sticky traps placed on branches of *Acacia* sp.



Figure 9. *Agrilus (Agrilus) njugunai*, sp. n. (dorsal view).

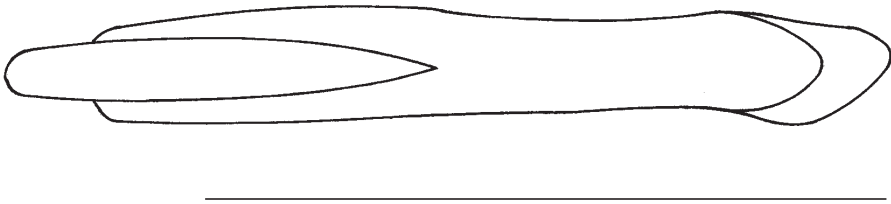


Figure 10. Aedeagus of *Agrilus (Agrilus) njugunai*, sp. n. (dorsal view). Scale: 1 mm.

***Agrilus (Agrilus) novaki*, sp. n.**

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Figs 11, 12

Type specimens. Holotype ♂: “Tanzania, Mikumi 18–21.07.2001, K. Novák leg.”. Paratype ♀: with same locality and date as holotype. The holotype is deposited in IZ-BAS and the paratype in GCCI.

Description of holotype. Body slender, elongate, black colored; elytra with uniform, dense, white pubescence.

Head with deep longitudinal striae on vertex and upper portion of frons; width of vertex between eyes 0.42 mm; frons protruding, rugose with sparse, white pubescence; clypeus separated from frons by sharp, transverse carina; clypeus glabrous; eyes large and convex; antennae short, extending anterior portion of pronotum; antennomeres 4–11 wider than long, rhomboidal.

Pronotum widest at anterior third; anterior margin slightly bisinuate, carinate; anterior pronotal lobe wide, weakly developed; lateral margins subparallel, slightly curved before latero-posterior angles; latero-posterior angles slightly obtuse; pronotum with two deeper lateral depressions and two shallow medial depressions; prehumeral pronotal carinae distinct, arched, extending from latero-posterior angles to posterior third of pronotum, not reaching lateral margins; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of diagonal and transverse striae; pronotum sparsely pubescent.

Scutellum with anterior margin rounded; transverse carina present.

Elytra elongate, width across humeri almost as wide as pronotal base; elytra widest at posterior third; humeral depressions deep; apices narrowly, separately arcuate, feebly serrated; surface with uniform, dense, white pubescence; discal sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe slightly arcuate. Prosternal process slightly narrowed between procoxae, apical projection long and acutely pointed; prosternum and prosternal process with dense, semierect, white pubescence. Suture between ventrites 1 and 2 not visible; apex of last ventrite truncate, with long, erect setae. Metatarsus shorter than metatibia; basal metatarsomere slightly shorter than following metatarsomeres together. Aedeagus (Fig. 12).

Description of paratype. Female with apex of the last ventrite less rounded, more truncate, with short pubescence, dispersed over entire surface not concentrated in apical portion, without long, erect apical setae, prosternal process, with shorter pubescence.

Size. Length 4.00–4.55 mm (holotype 4.00 mm); width 1.00–1.20 mm (holotype 1.00 mm).

Differential diagnosis. *Agrilus (Agrilus) roscidellinus* Obenberger, 1935 from Tanzania resembles this species in size, black color, uniform white pubescence on elytra and prehumeral carinae not reaching the lateral margin of the pronotum. *Agrilus (Agrilus) novaki*, sp. n. differs mainly by the glabrous pronotum and frons, broader vertex, rounded head and feebly serrate elytral apex.

Etymology. Dedicated to honor the collector of the specimens K. Novák.

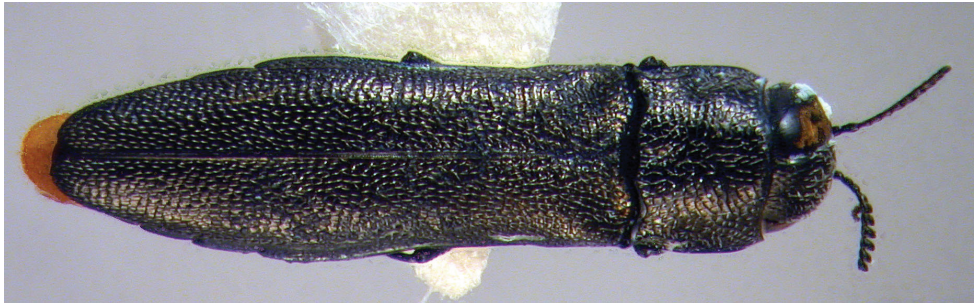


Figure 11. *Agrilus (Agrilus) novaki*, sp. n. (dorsal view).

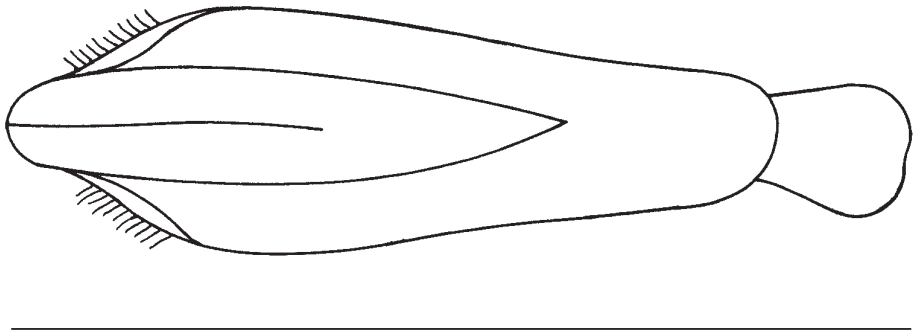


Figure 12. Aedeagus of *Agrilus (Agrilus) novaki*, sp. n. (dorsal view). Scale: 1 mm.

***Agrilus (Agrilus) polinae*, sp. n.**

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Figs 13, 14

Type specimens. Holotype ♂: “Kenya, Tsavo West National Park (03°30’S – 38°16’E), 7.11.2005, G. Curletti & V. Sakalian leg.”. Paratypes 2 exs: 1 ♀ with same locality and date as holotype; 1 ♀: “western of Voi Town (03°26’S – 38°16’E), 4.11.2005, G. Curletti & V. Sakalian leg.”. The holotype is deposited in IZBAS and the paratypes in GCCI and IZBAS.

Description of holotype. Body elongate, dark copper dorsally, underside and frons with blackish tinge. Elytra with two longitudinal, sutural stripes of short golden pubescence.

Head with medial sulcus on vertex and upper and middle portions of frons; vertex rugose with fine punctation; width of vertex between eyes 0.52 mm; frons very strongly protruding at middle portion; upper and middle portions of frons with deep and dense punctation; lower portion of frons and genae with short, dense, golden pubescence; clypeus without pubescence, separated from frons by deep transverse

sulcus, extending between lower portions of eyes; eyes convex and very large; antennae short, extending anterior margin of pronotum; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin slightly bisinuate, carinate; anterior pronotal lobe distinct; lateral margins distinctly curved before latero-posterior angles; latero-posterior angles slightly obtuse; pronotum with four depressions (two lateral and two medial) lateral depressions deep and wide; medial depressions separated at central portion of disc; posterior depression deep, triangular; anterior depression shallow; prehumeral pronotal carinae very short, arched, extending from latero-posterior angles to posterior third of pronotum, widely separated from lateral margins; marginal and submarginal carinae not coalescent; disc rugose, discal sculpture consisting of dense punctation and diagonal and transverse striae.

Scutellum robust, anterior portion triangular; transverse carina present; hind projection short and acutely pointed.

Elytra elongate, subparallel, width across humeri slightly wider than pronotal base, widest at posterior third; humeral depressions deep and large without pubescence; apices very narrowly separately arcuate, not serrulate; elytra with two longitudinal, sutural stripes of short golden pubescence, extended from humeral depressions to apices; remaining elytral pubescence uniform and sparser; elytra not covering laterosternites, visible from dorsal view; discal elytral sculpture consisting of transverse wrinkles.



Figure 13. *Agrilus* (*Agrilus*) *polinae*, sp. n. (dorsal view).

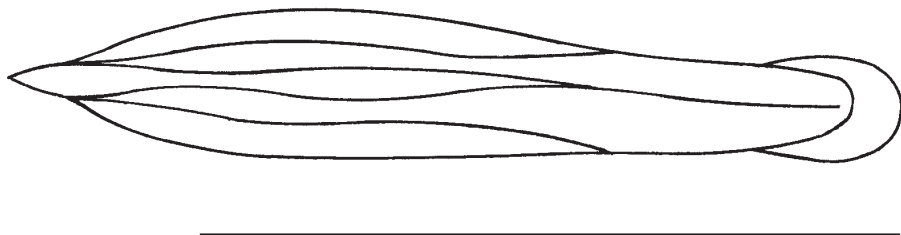


Figure 14. Aedeagus of *Agrilus* (*Agrilus*) *polinae*, sp. n. (dorsal view). Scale: 1 mm.

Underside. Prosternal lobe robust, emarginate medially. Prosternal process slightly narrowed between procoxae; elongate apically; prosternum and prosternal process with white, short dense pubescence. Suture between ventrites 1 and 2 not visible; ventrites with uniform, short, sparse, white pubescence; laterosternites with very dense, short, white pubescence; apex of last ventrite truncate with very slightly presented medial incision. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together. Tarsal claws bifid. Aedeagus (Fig. 14).

Description of paratypes. Females more robust with dark copper frons and bright copper underside, apex of last ventrite without incision; prosternal process more densely pubescent.

Size. Length 4.20–4.85 mm (holotype 4.20 mm); width 1.05–1.35 mm (holotype 1.05 mm).

Differential diagnosis. See *Agrilus* (*Agrilus*) *njugunai*, sp. n.

Etymology. Dedicated to Polina Sakalian, the daughter of the second author.

***Agrilus* (*Duttus*) *delchevi*, sp. n.**

urn:lsid:zoobank.org:act:63FCB200-1EFA-4955-9435-EEC9FC4B14C1

Figs 15, 16

Type specimens. Holotype ♂: “Kenya, Ngong Hills, Kiserian distr. (01°26′56″S – 36°38′19″E), 1940 m, 28.04.2004, V. Sakalian leg.”. The holotype is deposited in IZBAS.

Description. Body robust, subcylindrical, dark copper colored, with reddish tinge on frons and pronotum and blackish tinge on elytra; underside and legs bright copper; elytra with two longitudinal impressions and short lateral pubescence from posterior third to apex.

Head with medial depression on vertex and upper portion of frons; with longitudinal striae and dense punctation on sides of vertex portion of depression; width of vertex between eyes 0.75 mm; frons protruding at middle portion, with two depressions, one deeper and wider, situated in upper portion of frons, with sculpture of transverse wrinkles; another situated in lower portion of frons, with sculpture of concentric wrinkles; frons and clypeus with short, dense, red pubescence; genae with white pubescence; eyes convex and large; antennae very short, barely reaching to posterior third of eyes; antennomeres 4–11 much wider than long, triangular.

Pronotum widest at anterior third; anterior margin carinate; lateral margins distinctly curved in posterior third; latero-posterior angles acute; pronotum with two medial and two lateral depressions; posterior medial depression larger, longitudinal, long oval, separated in middle portion of pronotum from oval, smaller anterior depression; prehumeral pronotal carinae rib-formed, extending from latero-posterior angles to middle portion of pronotum, widely separated from lateral margins; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of transverse striae; lateral depressions with dense red pubescence.

Scutellum large, anterior portion triangular; transverse carina present; hind projection acutely pointed.

Elytra slightly wider across humeri than pronotal base, widest at posterior third; humeral depressions deep and wide; apices widely jointly rounded, distinctly serrulate; disk with two longitudinal impressions extending from humeral depressions to apical portion; elytra with short, sparse, lateral pubescence on posterior third; discal elytral sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe robust, evenly arcuate. Prosternal process narrowed between procoxae; medial portion of prosternum and prosternal process with long, white, sparse pubescence; medial portion of meso and metasternum with short, sparse, white pubescence. Ventrites with regular, short, sparse, golden pubescence; apex of last ventrite subtruncate, with long pubescence. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together; tarsal claws bifid with long inner tooth. Aedeagus (Fig. 16).

Size. Length of the holotype 8.75 mm; width of the holotype 2.50 mm.

Differential diagnosis. This new species was found at the same locality as *Agrilus* (*Duttus*) *marietae* Curletti & Sakalian, 2007. It is similar to *A. marietae* but differs by its larger size; narrower vertex, red pubescence of frons, clypeus and pronotum, sides of pronotum sinuate before posterior angles, lack of bidentate ventral apical portion and aedeagus thinner and more elongate.

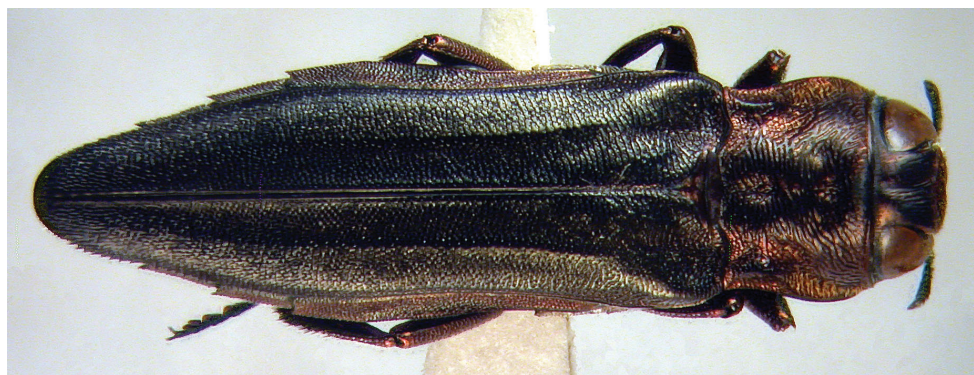


Figure 15. *Agrilus* (*Duttus*) *delchevi*, sp. n. (dorsal view).



Figure 16. Aedeagus of *Agrilus* (*Duttus*) *delchevi*, sp. n. (dorsal view). Scale: 2 mm.

Etymology. The name is chosen to honor the Bulgarian arachnologist Dr. Hristo Delchev Head of Department of “Taxonomy, Faunistic and Zoogeography” of the Institute of Zoology, Bulgarian Academy of Sciences, for his great body of work on different families of spiders of the world.

***Agrilus (Paralophotus) gordonii*, sp. n.**

urn:lsid:zoobank.org:act:ADC22987-F0A0-4325-B2C0-EF0530C5F244

Figs 17, 18

Type specimens. Holotype ♂: “NE Kenya, Lower Tana River (02°16’S – 40°10’E), 30 m, 25–28.10.2005, G. Curletti & V. Sakalian leg.”. Paratypes 6 exs: 1 ♂ and 2 ♀ ♀: with same locality and date as holotype; 1 ♀: “Lower Tana River (02 13’ S - 40 10’ E), 10 m, 25–28.10.2005, G. Curletti & V. Sakalian leg.”; 1 ♂: “Lower Tana River, Nyangoro, 24.04.2006, V. Sakalian leg.”; 1 ♂: “Lower Tana River, 2006, V. Sakalian leg., ex larva *Acacia* sp.”. The holotype is deposited in IZBAS and the paratypes in GCCI, IZBAS and NMK.

Description of holotype. Body short, slender, subcylindrical, dark copper, with reddish tinge on frons, disc of elytra with three spots of short white pubescence in middle, posterior third and apical portions.

Head with medial depression on vertex and upper part of frons and two carinae, bordering the eyes; width of vertex between eyes 0.25 mm; frons rounded in dorsal view; frons, clypeus and genae with very dense, red/orange pubescence; clypeus separated from frons by sharp carina; eyes convex very small; antennae very short, barely reaching upper portion of eyes; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin bisinuate; anterior pronotal lobe distinct; lateral margins curved before latero-posterior angles; latero-posterior angles rectangular; pronotum with two wider and deeper lateral and two very shallow medial depressions; prehumeral pronotal carinae broadly arcuate, extending from posterior margin to lateral margins at middle of pronotum; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of transverse striae and sparse punctation.

Scutellum robust, anterior margin rounded; transverse carina distinct; hind projection short and acutely pointed.

Elytra subparallel, widest at posterior third, humeri distinctly wider than pronotal base; humeral depressions deep and wide, with dense white pubescence; apices widely separately arcuate, not serrulate; disc of elytra with three spots of white pubescence in middle and posterior third (arched) and apical portions (reduced to sutural area); discal elytral sculpture consisting of transverse wrinkles.

Underside. Prosternal lobe robust, arcuate. Prosternal process slightly narrowed between procoxae; prosternum, prosternal process, meso- and metasternum with short, white pubescence. Suture between ventrites 1 and 2 not visible; ventrites with uniform, sparse, golden pubescence; apex of last ventrite truncate, arcuately emargin-



Figure 17. *Agrilus (Paralophotus) gordonii*, sp. n. (dorsal view).

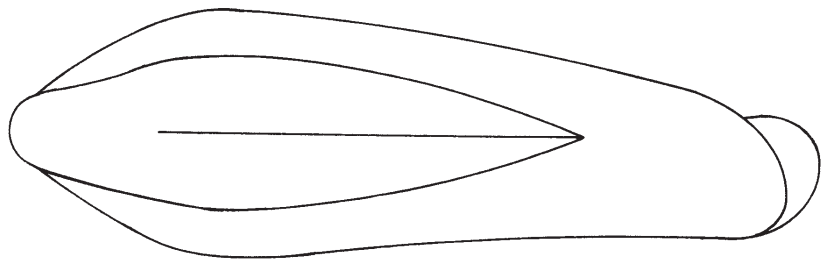


Figure 18. Aedeagus of *Agrilus (Paralophotus) gordonii*, sp. n. (dorsal view). Scale: 1 mm.

ate. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together. Aedeagus (Fig. 18)

Description of paratypes. Sexual dimorphism occurs in pubescence of frons, clypeus and genae: males have red/orange pubescence, while females have white. Paratypes also exhibit minor differences in size and density of elytral pubescent spots.

Size. Length 3.40–3.95 mm (holotype 3.45 mm); width 0.90–2.50 mm (holotype 0.95 mm).

Differential diagnosis. *Agrilus (Paralophotus) gordonii*, sp. n., *A. (Paralophotus) jiloi*, sp. n., *A. (Paralophotus) penevi*, sp. n. and *A. (Paralophotus) semerdjievi*, sp. n. are unique among the representatives of this subgenus because of their small size. These species may be separated as follows:

- 1. Body robust. Frons flat in dorsal view *A. semerdjievi*, sp. n.
- Body slender . Frons rounded, convex in dorsal view 2

2. Vertex between the eyes wider: width 0.25 times the width of the anterior margin of pronotum *A. penevi*, sp. n.
- Vertex between the eyes narrower: width less than 0.20 times the width of the anterior pronotal margin **3**
3. Frons and genae of male with red/orange pubescence. Prehumeral carinae reaching lateral margin of pronotum *A. gordonii*, sp. n.
- Frons and genae of male with white pubescence. Prehumeral carinae not reaching lateral margin of pronotum *A. jiloi*, sp. n.

Etymology. The name of the species was chosen to honor Dr. Ian Gordon from the International Center of Insects Physiology and Ecology (Nairobi, Kenya) for his considerable efforts to conserve the unique Kenyan nature.

Remarks. Most specimens were collected from yellow sticky traps placed on branches of *Acacia* sp.

***Agrilus (Paralophotus) jiloi*, sp. n.**

urn:lsid:zoobank.org:act:47DAA742-BF85-4845-96D4-2D721E4E881B

Figs 19, 20

Type specimens. Holotype ♂: “NE Kenya, Lower Tana River, Hewani Village, 20–23.04.2006, V. Sakalian leg.”. Paratypes: 2 ♀♀ with same locality and date as holotype. The holotype is deposited in IZBAS and the paratypes in GCCI and IZBAS.

Description of holotype. Body short, slender, subcylindrical, dark copper, elytra with nearly uniform golden pubescence, denser at middle, posterior third and apical portions.

Head with medial depression on vertex and upper part of frons and two very distinct, sharp carinae, bordering the eyes; width of vertex between eyes 0.12 mm; frons rounded, hemispheric in dorsal view; frons and genae with very dense, white pubescence; clypeus separated from frons by sharp carina, without pubescence; eyes convex very small; antennae very short, barely reaching upper portion of eyes; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin bisinuate, carinate; anterior pronotal lobe distinct; lateral margins subparallel, slightly curved before latero-posterior angles; latero-posterior angles almost rectangular; pronotum with two wider lateral and two weak medial depressions; prehumeral pronotal carinae rib-formed, extending from posterior margin to middle portion of pronotum, not approaching lateral margins; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of transverse striae and sparse punctuation.

Scutellum with anterior margin rounded; transverse carina distinct; hind projection short and acutely pointed.



Figure 19. *Agrilus* (*Paralophotus*) *jiloi*, sp. n. (dorsal view).

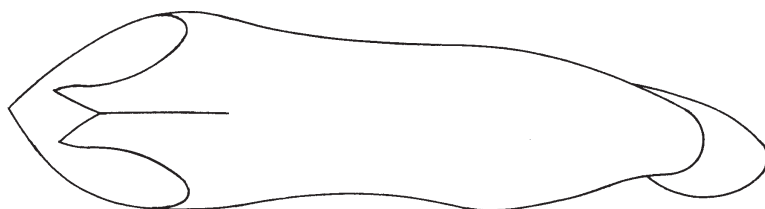


Figure 20. Aedeagus of *Agrilus* (*Paralophotus*) *jiloi*, sp. n. (dorsal view). Scale: 1 mm.

Elytra subparallel, widest at posterior third, width at humeri slightly wider than pronotal base; humeral depressions wide, without pubescence; apices narrowly, separately arcuate, distinctly serrulate; disc of elytra with nearly uniform golden pubescence denser at middle, posterior third and apical portions; discal elytral sculpture consisting of polygonal cells and transverse wrinkles.

Underside. Prosternal lobe robust, very distinctly arcuate. Prosternal process slightly narrowed between procoxae; prosternal process pubescent. Ventrites with uniform, sparse, golden pubescence; apex of last ventrite truncate with long pubescence. Aedeagus (Fig. 20).

Description of paratypes. The paratypes differ slightly in size and density of elytral pubescence.

Size. Length 3.25–4.00 mm (holotype 3.50 mm); width 0.95–1.20 mm (holotype 1.00 mm).

Differential diagnosis. See *Agrilus* (*Paralophotus*) *gordoni*, sp. n.

Etymology. Dedicated to Levi Jilo from Hewani Village (Lower Tana River district) for his assistance during the expeditions of the authors in this region of Kenya.

Remarks. Most specimens were collected from yellow sticky traps placed on branches of *Acacia* sp.

***Agrilus (Paralophotus) pavlinae*, sp. n.**

urn:lsid:zoobank.org:act:743AF137-0713-469F-A6DF-93474F736C2F

Fig. 21

Type specimens. Holotype ♀: “NE Lower Tana River (02°16′54″S – 40°10′35″E), 30 m, 25–26.10.2005, G. Curletti & V. Sakalian leg.”. Paratype ♀: with same locality and date as holotype. The holotype is deposited in IZBAS and the paratype in GCCI.

Description of holotype. Body robust, dark copper colored, with two tubercles on pronotum and three spots of short golden pubescence on elytra.

Head with medial depression on vertex and upper part of frons and two carinae bordering the eyes on the vertex and upper portion of frons; width of vertex between eyes 0.42 mm; depression of vertex with sparse punctation; frons, clypeus and genae with dense golden pubescence; eyes feebly convex, small; antennae short, barely reaching upper portion of eyes; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; lateral margins curved in posterior third; latero-posterior angles acute; pronotum with two wide lateral depressions; disc with two central tubercles with concentric pubescence; prehumeral pronotal carinae very distinct, sharp, arched near posterior margin then parallel, extending to just before middle portion of pronotum, not approaching lateral margins; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of longitudinal, transverse and concentric (at tubercles) striae, pubescent.

Scutellum robust, arched in anterior portion; transverse carina present; hind projection acutely pointed.

Elytra subparallel, widest at posterior third, width across humeri wider than pronotal base; humeral depressions deep and wide, golden pubescent; apices very narrowly separately arcuate, distinctly serrulate; disk with three spots of short, golden, pubescence just before middle and posterior third and apical portion, antemedial and postmedial spots arched, apical spot adsutural; discal elytral sculpture consisting of polygonal cells.

Underside. Prosternal lobe robust, distinctly arcuate. Prosternal process with sides parallel between procoxae; apical portion very long and acutely pointed; prosternum,

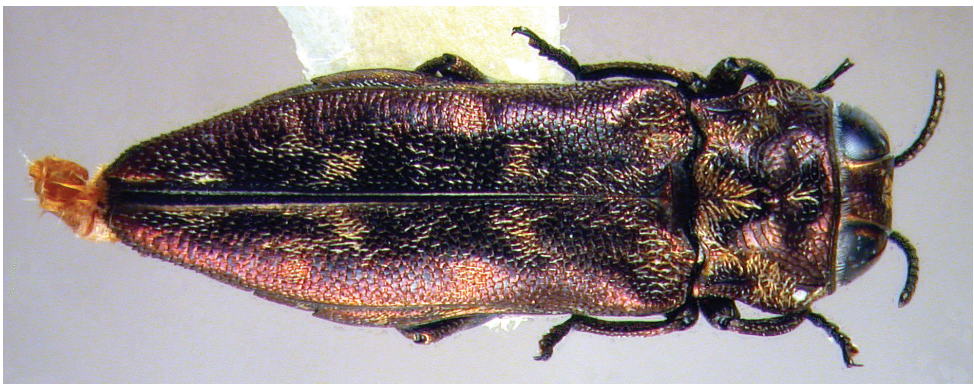


Figure 21. *Agrilus (Paralophotus) pavlinae*, sp. n. (dorsal view).

prosternal process, and meso- and metasternum with white pubescence. Abdomen without suture between ventrites 1 and 2. Lateral portions of ventrites 3 with spots of white pubescence; apex of last ventrite truncate without medial emargination. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together; tarsal claws bifid with short inner tooth.

Description of paratype. The paratype differs slightly in size and density of pronotal and elytral pubescent spots.

Size. Length 5.75–6.50 mm (holotype 5.75 mm); width 1.70–1.95 mm (holotype 1.70 mm).

Differential diagnosis. Among the *Paralophotus* species which have two tubercles of concentric sculpture on the centre of the pronotum only *Agrilus* (*Paralophotus*) *pavlinae*, sp. n. has white pubescent spots on the sides of the third ventrite.

Etymology. Dedicated to Pavlina Pesheva, the mother of the second author.

***Agrilus* (*Paralophotus*) *penevi*, sp. n.**

urn:lsid:zoobank.org:act:10E5FA1F-3097-41B9-BBE4-723F45763E40

Figs 22, 23

Type specimens. Holotype ♂: “Kenya, Ngong Hills, Kiserian district (01°26′56″S – 36°38′19″E), 1940 m, 17.04.2006, V. Sakalian leg.”.; Paratype ♂: with same locality and date as holotype. The holotype is deposited in IZBAS and the paratype in GCCI.

Description of holotype. Body short, slender, subcylindrical, dark copper, elytra with three spots of short white pubescence.

Head with one medial and two lateral sulci bordering the eyes on the vertex and upper part of frons; width of vertex between eyes 0.42 mm; vertex between sulci sparsely punctate; frons rounded, hemispheric in dorsal view; sculpture of frons consisting of transverse wrinkles; pubescence very sparse; clypeus separated from frons by sharp carina; eyes convex very small; antennae short, extending to anterior margin of pronotum; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin bisinuate, bordered with distinct carinae; anterior pronotal lobe distinct; lateral margins subparallel; latero-posterior angles slightly obtuse; pronotum with two wider and deeper lateral and two weak medial depressions; prehumeral pronotal carinae rib-formed, extending from posterior margin to middle portion of pronotum; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of transverse striae.

Scutellum relatively small; anterior margin rounded; transverse carina weak; hind projection short and acutely pointed.

Elytra subparallel, widest at posterior third, width across humeri almost as wide as pronotal base; humeral depressions weak, pubescent; apices jointly arcuate, not serrulate; disc of elytra with three spots of short, white, arched pubescence in middle, posterior third and apical portions; discal elytral sculpture consisting of polygonal cells and transverse wrinkles.

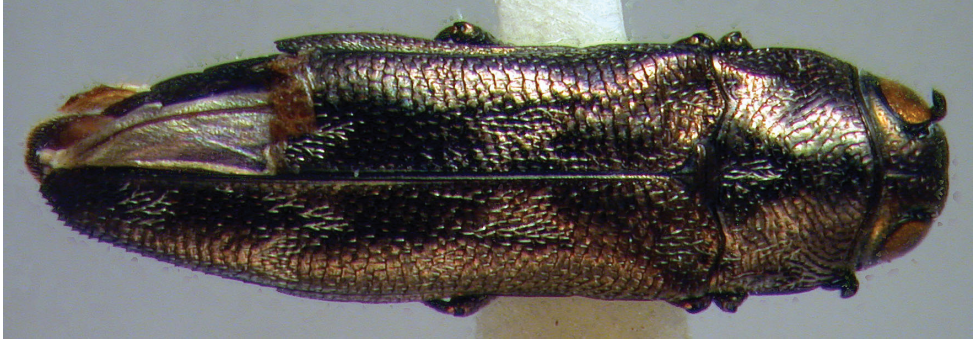


Figure 22. *Agrilus (Paralophotus) penevi*, sp. n. (dorsal view).

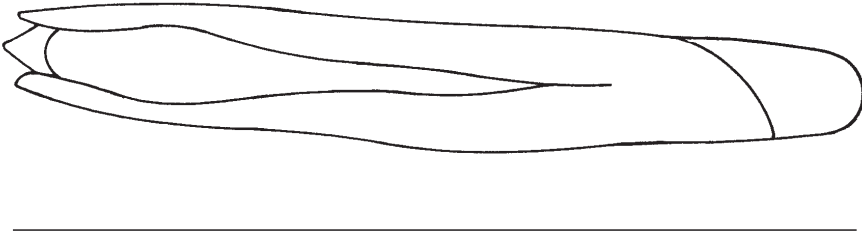


Figure 23. Aedeagus of *Agrilus (Paralophotus) penevi*, sp. n. (dorsal view). Scale: 1 mm.

Underside. Anterior border of prosternal lobe slightly emarginate medially. Abdomen with suture between ventrites 1 and 2 not visible. Ventrites with uniform golden pubescence; apex of last ventrite subtruncate with long pubescence. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together. Aedeagus (Fig. 23).

Description of paratype. The paratype differs slightly in size and density of elytral pubescent spots.

Size. Length 4.00–4.30 mm (holotype 4.00 mm); width 1.20–1.25 mm (holotype 1.20 mm).

Differential diagnosis. See *Agrilus (Paralophotus) gordonii*, sp. n.

Etymology. The name was chosen to honor the famous Bulgarian entomologist and publisher, founder of Pensoft Publishers, Dr. Lyubomir Penev.

***Agrilus (Paralophotus) popovi*, sp. n.**

urn:lsid:zoobank.org:act:C9DDAB89-4322-4014-A563-9E98FE36B273

Figs 24, 25

Type specimens. Holotype ♂: “NE Kenya, Lower Tana River (02°16’S – 40°10’E), 30 m, 25–28.10.2005, G. Curletti & V. Sakalian leg.”. Paratypes 3 exs: 2 ♂♂, with same locality and date as holotype; ♀: “Lower Tana River, Hewani Village, 20–

23.04.2006, V. Sakalian leg.”. The holotype is deposited in IZBAS and the paratypes in GCCI and IZBAS.

Description of holotype. Body robust, subcylindrical, dark copper colored, with reddish tinge on frons, with two tubercles on pronotum and three spots of short golden pubescence on elytra.

Head with medial depression on vertex and two distinct carinae bordering upper portion of eyes; width of vertex between eyes 0.45 mm; frons, clypeus and genae with dense red pubescence; eyes feebly convex, very small; antennae very short, barely reaching posterior third of eyes; antennomeres 4–11 distinctly wider than long, triangular.

Pronotum widest at anterior third; anterior margin arcuate medially; lateral margins curved in posterior third; latero-posterior angles rectangular; pronotum with two wide lateral depressions; disc with two central, finely microsculptured nonpubescent tubercles; prehumeral pronotal carinae arched basally near latero-posterior angles then parallel to lateral margins and ending near middle portion of pronotum; marginal and submarginal carinae coalescent at middle portion of pronotum; discal sculpture consisting of transverse striae, pubescent.

Scutellum large, anterior margin rounded; transverse carina present; hind projection short and acutely pointed.

Elytra subparallel, widest at posterior third, slightly wider across humeri than width of pronotal base; humeral depressions deep, wide, with golden pubescence; apices very narrowly separately arcuate, not serrulate; disk with three spots of short, golden, arched pubescence just before middle of elytra and on posterior third and apical portions; discal elytral sculpture consisting of polygonal cells.

Underside. Prosternal lobe robust, distinctly arcuate. Prosternal process with sides parallel between procoxae then widened apically, apex triangular; prosternum, prosternal process and medial part of meso- and metasternum with long, white pubescence. Lateral portions of ventrites 3–5 with spots of golden pubescence; apex of last ventrite truncate with distinct medial emargination and long pubescence. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together; tarsal claws bifid with short inner tooth. Aedeagus (Fig. 25).

Description of paratypes. Sexual dimorphism occurs in pubescence of frons, clypeus and genae: males have red pubescence, while females have golden. The paratypes also differ slightly in size and density of elytral pubescent spots.

Size. Length 5.25–5.95 mm (holotype 5.95 mm); width 1.50–1.75 mm (holotype 1.75 mm).

Differential diagnosis. Among the *Paralophotus* species similar in size to *Agrilus* (*Paralophotus*) *popovi*, sp. n. and with two central tubercles on the pronotum only this new species has the male frons, clypeus and genae with red pubescence.

Etymology. Dedicated to honor the zoology teacher of the second author Prof. Tsvetan Popov, for his considerable contributions as a university lecturer in Bulgaria and Nigeria.

Remarks. The holotype was collected from yellow sticky traps placed on branches of *Acacia* sp. The paratypes were collected by beating branches of *Acacia* sp.



Figure 24. *Agrilus (Paralophotus) popovi*, sp. n. (dorsal view).

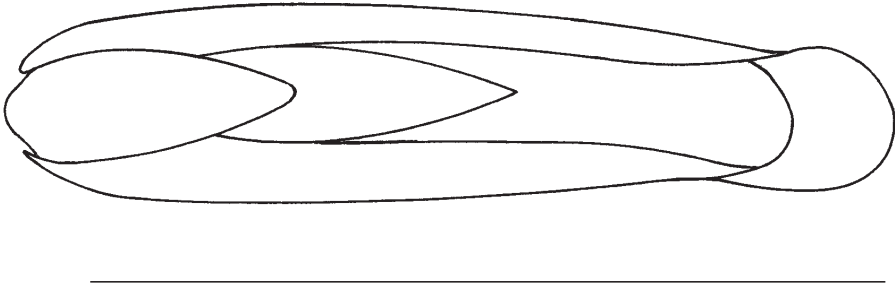


Figure 25. Aedeagus of *Agrilus (Paralophotus) popovi*, sp. n. (dorsal view). Scale: 1.5 mm.

***Agrilus (Paralophotus) semerdjievi*, sp. n.**

urn:lsid:zoobank.org:act:154A9368-FFA8-4795-A947-D98063E400A9

Figs 26, 27

Type specimens. “Holotype ♂: Kenya, S Oltepesi (01°39’S – 36°29’E), 954 m, 22.11.2005, G. Curletti & V. Sakalian leg.”. Paratypes 3 exs: 2 ♂♂ and 1 ♀, with same locality and date as holotype. The holotype is deposited in IZBAS and the paratypes in GCCI and IZBAS.

Description of holotype. Body short, cylindrical, robust, dark copper, elytra with three spots of short white pubescence.

Head with medial depression on vertex and upper part of frons and two carinae bordering the eyes on vertex and upper portion of frons; width of vertex between eyes 0.37 mm; depression of vertex with dense punctation; frons flat in dorsal view; frons, clypeus and genae with dense white pubescence; eyes convex, slightly protruding, small; antennae short, barely reaching upper portion of eyes; antennomeres 4–11 wider than long, triangular.

Pronotum widest at anterior third; anterior margin arcuate medially, bordering with distinct carinae; lateral margins curved in posterior third; latero-posterior angles slightly obtuse; pronotum with two lateral and one anterior-medial weak depressions; prehumeral pronotal carinae rib-formed, extending from posterior margin to before middle of pronotum; marginal and submarginal carinae coalescent at posterior third of pronotum; discal sculpture consisting of transverse striae; pronotal depressions pubescent.

Scutellum large, prominent; anterior margin rounded; transverse carina present; hind projection short and acutely pointed.

Elytra subparallel, widest at posterior third, width across humeri wider than pronotal base; humeral depressions deep and wide, pubescent; apices jointly arcuate, serrulate; elytra with four spots of short, white, arched pubescence (one humeral, two discal and one apical); discal elytral sculpture consisting of polygonal cells.

Underside. Prosternal lobe slightly arcuate. Prosternal process with sides parallel between procoxae, then narrowed apically; prosternum, prosternal process and meso- and metasternum with long, white pubescence. Abdomen with suture between ventrites 1 and 2 not visible; ventrites 3–5 with long, white pubescence, denser in lat-



Figure 26. *Agrilus* (*Paralophotus*) *semerdjievii*, sp. n. (dorsal view).

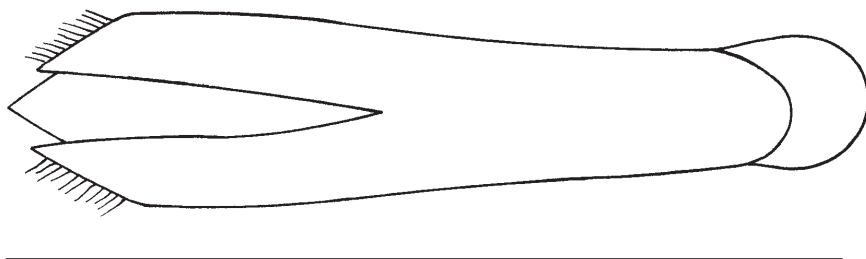


Figure 27. Aedeagus of *Agrilus* (*Paralophotus*) *semerdjievii*, sp. n. (dorsal view). Scale: 1 mm.

eral portions; apex of last ventrite truncate, without medial emargination, pubescent. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together. Aedeagus (Fig. 27).

Description of paratypes. The paratypes differ slightly in size and density of elytral pubescent spots.

Size. Length 4.40–4.80 mm (holotype 4.40 mm); width 1.40–1.55 mm (holotype 1.40 mm).

Differential diagnosis. See *Agrilus* (*Paralophotus*) *gordoni*, sp. n.

Etymology. The name was chosen to honor the very good friend of the second author, Ing. Hristo Semerdjiev, CEO and Chairman of the Board of the Directors of Technecon Group who partly sponsored the expeditions of the authors in Kenya.

Remarks. Collected from yellow sticky traps placed on branches of *Acacia* sp.

***Agrilus* (*Paralophotus*) *tsavoensis*, sp. n.**

urn:lsid:zoobank.org:act:143D96AF-D5A7-4EF8-AF1B-507EDA70B723

Fig. 28

Type specimens. Holotype ♀: “Kenya, Tsavo West National Park (03°30′S – 38°16′E), 4.11.2005, G. Curletti & V. Sakalian leg. “. The holotype is deposited in IZBAS.

Description. Body robust, subcylindrical, dark copper dorsally, underside bright copper, elytra with three spots of short golden pubescence.

Head with medial depression on vertex and upper portion of frons; depression with dense punctation; width of vertex between eyes 0.37 mm; frons flattened; frons, clypeus and genae with dense white pubescence; eyes narrow, long and flat, situated frontally; antennae very short, barely reaching posterior third of eyes; antennomeres 4–11 markedly wider than long, triangular.

Pronotum widest at anterior third; anterior margin straight, carinate; lateral margins strongly curved in posterior third; latero-posterior angles acute; pronotum with two wide and deep lateral depressions; disc with transverse central impression; pre-humeral pronotal carinae straight, extending from posterior margin to posterior third of pronotum; marginal and submarginal carinae subparallel, not coalescent; discal sculpture consisting of transverse striae, pubescent.

Scutellum large and robust, anterior margin rounded; transverse carina present; hind projection short and acutely pointed.

Elytra distinctly widest at posterior third, width across humeri wider than pronotal base; humeral depressions deep, without pubescence; apices distinctly separately, arcuately acuminate, not serrulate; elytral disk with three spots of short, golden, pubescence in middle (not very distinct), posterior third and apical portions near suture; medial and postmedial spots arched; discal elytral sculpture consisting of polygonal cells.

Underside. Prosternal lobe robust, evenly arcuate. Prosternal process protruding in basal portion, sides parallel between procoxae, then narrowed apically; prosternum, prosternal process, meso- and metasternum with dense, white pubescence. Ventrites

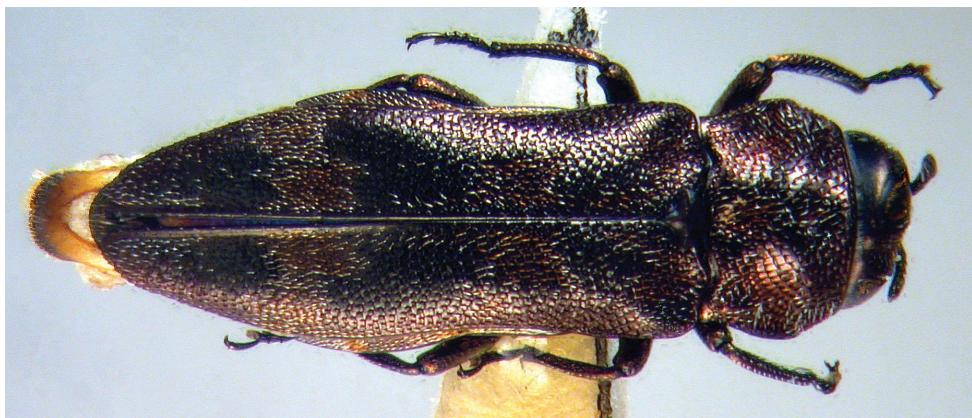


Figure 28. *Agrilus* (*Paralaphotus*) *tsavoensis*, sp. n. (dorsal view).

with uniform dense white pubescence; apex of last ventrite distinctly emarginate, with long setae. Metatarsus shorter than metatibia; basal metatarsomere shorter than following metatarsomeres together; tarsal claws bifid with short inner tooth.

Size. Length of the holotype 5.50 mm; width of the holotype 1.80 mm.

Differential diagnosis. There are no other *Paralaphotus* spp. known from Kenya with the eyes situated frontally as in this species. Curletti and Dutto (1999) described two species from Tanzania, *Agrilus* (*Paralaphotus*) *investus* and *A.* (*Paralaphotus*) *kenge* with such character, but both of these species have mucronate elytral apices. *Agrilus* (*Paralaphotus*) *myops* Curletti, 1998 from Somalia has strongly denticulate elytral apices while those of *A. tsavoensis*, sp. n. is smooth.

Etymology. Named for the type locality: Tsavo West National Park.

***Agrilus* (*Robertius*) *mungaii*, sp. n.**

urn:lsid:zoobank.org:act:0FEA0350-5791-46A8-9639-5B77136C21AC

Figs 29, 30

Type specimens. Holotype ♂: “Uganda, Bwamba Forest, Fort Portal, 2100' (around 640 m), 04. 1951, E. Pinho leg.”. The holotype is deposited in NMK.

Description. Body elongate, flattened, dark copper, dorsum with blackish tinge, frons with greenish lustre; elytra with two spots of white pubescence.

Head. Vertex with wide medial sulcus sparsely punctate; width of vertex between eyes 0.90 mm; frons protruding, rhomboidal, wider in upper portion, densely granulate; clypeus with dense yellow pubescence, separated from frons by sharp carina; eyes large, protruding; antennae extending to anterior third of pronotum; antennomeres 4–10 very much wider than long, triangular; last antennomere rhomboidal.

Pronotum. Subparallel, slightly wider in anterior third; with two lateral and two medial depressions; anterior pronotal lobe only weakly developed; lateral margins slightly curved before acute lateroposterior angles; weak longitudinal basal depression

in posterior portion of disc; anterior discal depression weak subtriangular; lateral depressions large, oblique; prehumeral pronotal carinae rib-formed, extending from latero-posterior angles to just before lateral margins at middle of pronotum; marginal and submarginal carinae subparallel, separate; discal sculpture consisting of weak transverse striae, which become denser and more oblique in lateral portions of pronotum.

Scutellum large, robust; transverse carina present; hind projection very short and acutely pointed.

Elytra. Distinctly elongate; only slightly wider across humeri than posterior pronotal margin; humeral depressions distinct, deep and large; elytra parallel to posterior third, widest at posterior third and subparallel to apical portion; apices very widely, separately arcuate, strongly serrulate; disc with short, sparse, fine pubescence and two spots of condensed white pubescence at the middle and posterior portions; discal sculpture consisting of fine, dense granulations and transverse wrinkles.

Underside. Prosternal lobe deeply, arcuately emarginate. Prosternal process wide, sides parallel between coxae, carinate laterally. Ventrites with golden short pubescence more condensed on lateral portions of ventrites and laterosternites; apex of last ventrite rounded apically without medial emargination. Metatarsus shorter than metatibia; basal metatarsomere longer than following metatarsomeres together; tarsal claws bifid with acutely pointed teeth. Aedeagus (Fig. 30).

Size. Length of the holotype 7.12 mm; width of the holotype 1.65 mm.



Figure 29. *Agrilus (Robertius) mungaii*, sp. n. (dorsal view).

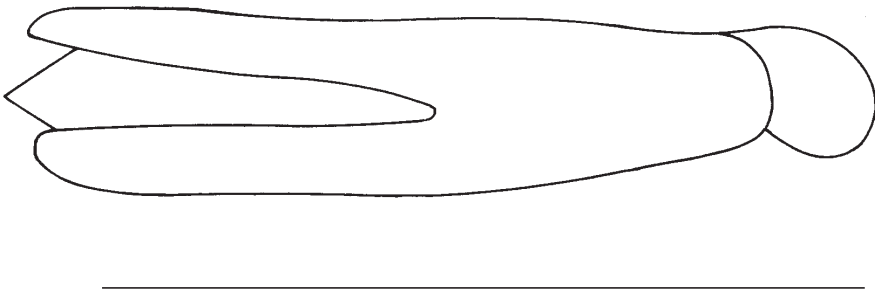


Figure 30. Aedeagus of *Agrilus (Robertius) mungaii*, sp. n. (dorsal view). Scale: 1.5 mm.

Differential diagnosis. This new species is closely related to *Agrilus delenitor* Obenberger, 1935, described from Cameroon. It differs by its green color (*A. delenitor* is bronze), flat vertex, more superficial sculpture of the pronotum, and sterna with denser lateral pubescence (uniform in *A. delenitor*). The aedeagus of *A. mungaii*, sp. n. is broader with a broader penis (Fig. 30).

Etymology. Dedicated to the curator of insects in the National Museum of Kenya, Mr. Michael Mungai, for his kindness to let us study the buprestid specimens in his care.

Acknowledgements

Our sincerely thanks are due to Ted C. MacRae (Monsanto Company, Chesterfield, Missouri, USA) for comments and linguistic revision of the text.

References

- Curletti G, Dutto A (1999) New *Agrilus* species from Tanzania (Coleoptera, Buprestidae). Part I. Lambillionea 99 (3): 162–170.
- Curletti G, Sakalian V (2007) Two new species of the genus *Agrilus* Curtis, 1825 from Kenya (Coleoptera: Buprestidae). Deutsche Entomologische Zeitschrift 54 (1): 75–78.

Seven new species of *Cephennium* Müller & Kunze (Coleoptera, Staphylinidae, Scydmaeninae, Cephenniini) from California with a key to native North American species

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Academic editor: Jan Klimaszewski | Received 14 August 2009 | Accepted 17 September 2009 | Published 9 October 2009

[urn:lsid:zoobank.org:pub:BB883B1E-E58F-4074-92EB-7E814E78F678](https://zoobank.org/urn:lsid:zoobank.org:pub:BB883B1E-E58F-4074-92EB-7E814E78F678)

Citation: Hopp KJ, Caterino MS (2009) Seven new species of *Cephennium* Müller & Kunze (Coleoptera, Staphylinidae, Scydmaeninae, Cephenniini) from California with a key to native North American species. ZooKeys 24: 31–54. doi: 10.3897/zookeys.24.247

Abstract

Seven new species of *Cephennium* from California are described and illustrated - *C. celsifrons*, **sp. n.**, *C. mariposae*, **sp. n.**, *C. grandarboreum*, **sp. n.**, *C. canestroii*, **sp. n.**, *C. gilberti*, **sp. n.**, *C. urbanum*, **sp. n.** and *C. aridum*, **sp. n.** The single known native Nearctic species, *C. anophthalmicum* Brendel, was known only from moist coastal forests around the San Francisco Bay area. The new species greatly expand the distribution of the genus, through central and southern California, occurring in the central Sierra Nevada, south through the coast ranges and Sierra Nevada to the Santa Monica Mountains and desert foothills of the San Bernardino and San Jacinto Mountains. A key to all eight species (the entire native Nearctic fauna) of *Cephennium* occurring in California is provided.

Keywords

Systematics, Staphylinidae, Scydmaeninae, Cephenniini, *Cephennium*, California Floristic Province

Introduction

Members of the tribe Cephenniini (Coleoptera: Staphylinidae: Scydmaeninae) are primarily known to occur in the western Palearctic region, and most of the known spe-

cies belong to the genus *Cephennium*. Newton and Franz (1998) report 124 species of *Cephennium*, only one of which is known to occur in the Nearctic (O’Keefe 2001). This species, *Cephennium anophthalmicum*, was described by Brendel in 1889 from Alameda County in coastal, central California, and until this time remains the only species of this genus described from the Nearctic region (O’Keefe 2001). A second species of *Cephennium*, *C. gallicum* Ganglbauer, has been reported from maritime north-eastern North America, but this represents a recent introduction from Europe (Majka and Klimaszewski 2004).

The California Floristic Province is a biodiversity hotspot, recognized for its unique, diverse, and threatened biota (Myers et al. 2000). The California Beetle Project, begun in 2005, was launched to compile a complete inventory of the region’s Coleoptera. This effort has documented over 8000 species, and uncovered numerous new ones, both undetected and undescribed (Caterino 2006; Caterino and Chatzimanolis 2007; Caterino et al. 2008). Through these efforts the inadequacy of current documentation of the region’s leaf litter fauna has become ever clearer. Intensive collecting in this microhabitat by members of the CBP has yielded several new species of *Cephennium* since 2004, three of which were discovered in the past two years. Along with the newly collected material, four species were discovered in the collections of the California State Collection of Arthropods (CSCA) and the Field Museum of Natural History (FMNH), whose collectors, Fred Andrews and Art Gilbert (by association, CSCA), and Al Newton and Margaret Thayer (FMNH) are avid litter sifters. Only one of the species from our newly collected material and the material we borrowed from other collections overlap, leaving us with seven new species. These seven new species represent a considerable increase in the known Nearctic fauna of this tribe and genus, and significantly expand its known geographic range.

Materials and methods

Specimens examined for this study are deposited in the following institutions and collections (all collection codens follow Evenhuis (2008) and the curators responsible for borrowed specimens are listed in parentheses):

CASC California Academy of Sciences, San Francisco, CA (David Kavanaugh, Jere Schweikert).

CSCA California State Collection of Arthropods, Sacramento, CA (Chuck Bellamy).

FMNH Field Museum of Natural History, Chicago, IL (Margaret Thayer, Alfred Newton).

LACM Los Angeles County Museum of Natural History, Los Angeles, CA (Brian Brown).

MCZC Museum of Comparative Zoology, Harvard University, Cambridge, MA (Philip Perkins).

SBMN Santa Barbara Museum of Natural History, Santa Barbara, CA.

Label data from the material examined are verbatim and transcribed following Ivie (1985): the end of each line on a label is indicated by a “;” (semicolon); the individual labels are separated by a “/” (backslash).

Specimens were studied with a Leica® MZ9.5 stereomicroscope equipped with a 150w Nikon MKII fiber optic light. SEMs were taken with a Zeiss® EVO 40 XVP Scanning Electron Microscope. Specimen measurements were taken using an eyepiece micrometer in a Leica® MZ9.5 stereomicroscope at 3.2× magnification. Length was measured medially from the base of the pronotum to the apex of the elytra; pronotal and elytral widths were measured at their widest points.

Male genitalia were extracted by first relaxing the specimen in hot water and then the entire specimen was placed in a warm solution of 10% KOH. Once the specimen was cleared, it was removed from the KOH solution and rinsed with distilled water, and then placed in 100% EtOH for dissection. The specimen was placed on its dorsal surface and then the abdomen was “pumped” by compressing the abdomen repeatedly just basad of the medial lobe. This gentle pumping pushed the genitalia out through the apical abdominal opening. After examination, the genitalia were then placed in a vial of glycerin that was placed on the pin under the specimen labels. Males can sometimes be recognized when the outline of the genital capsule can be observed through the translucent cuticle. Otherwise, except in the case of *C. celsifrons*, where there is a distinct sexual dimorphism, the sexes are not usually distinguishable.

Key to Nearctic genera of Scydmaeninae

The most recent key to Nearctic genera of Scydmaenidae (=Scydmaeninae, Grebennikov and Newton 2009) (O’Keefe 2001) must be modified in order to accommodate the new species of *Cephennium* described herein. We also revise this to reflect Jałoszyński’s (2007) recent synonymization of *Chelonoidum* Strand with *Cephennodes* Reitter. All other native Nearctic Cephenniini are now assigned to *Cephennodes*. Couplet 4(3) should exclude the presence/absence of eyes because several of our new species possess reduced eyes. The couplet should read:

- 4(3) Foveae present in basal pronotal angles (Fig. 27.20); procoxae separated by prosternal process (Fig. 10.20) ***Cephennodes* (Fig. 27.20)**
- Foveae absent from basal pronotal angles; procoxae not separated by prosternal process (Fig. 11.20) ***Cephennium* (Fig. 28.20)**

Morphological characters of significance

There are a few diagnostic characters among the California *Cephennium* species that may aid in identifying species collected in the future, and in determining their status

as described or new. Among the species we examined, characters that were useful in delimiting species included the presence of eyes and number of ommatidia, the shape of the humeral angle of the elytron, the number of scutellar setae, the vestiture and apical shape of the mesosternal keel, and the male genitalia. Within the aedeagus, structures that were morphologically useful to delimit species were the shape of the median dorsal projection and the arrangement of setae arising from the apical collar.

Species descriptions of California *Cephennium* Müller & Kunze

Cephennium anophthalmicum Brendel, 1889

Figs 1A, 2A, 3A, 5A, 6

Type Material. Not seen. A holotype was not designated for this species. However, it was described from a single specimen from Alameda County that was sifted from vegetable debris together with a large number of *Pinodytes cryptophagoides* (currently *Catopocerus cryptophagoides*) by Marie Fuchs (Brendel 1889). We attempted to track down this specimen but were not able to locate it at either the Academy of Natural Sciences in Philadelphia, the original repository of the Brendel collection, or the Museum of Comparative Zoology at Harvard University, the current repository for the Brendel collection. However, we did see a specimen from the MCZC that was determined as *C. anophthalmicum* from Alameda County. Because the label data do not exactly match the information presented by Brendel (1889) we believe this is only a topotype, and not a primary type. We choose not to designate a neotype here as it is possible that the original type specimen is still in existence somewhere.

Material Examined. “Alameda; Co. CAL.”/ “Laundry; Farm”/ “H. C. FALL; COLLECTION”/ “*Cephennium; anophthalmicum*; Brend.” (1 MCZC); “Mill Valley; Marin Co. Cal.; 30.V.1952”/ “By sifting; forest duff”/ “H.B. Leech; Collector”/ red square label/ “*Cephennium*; sp. ♀; Cl. Besuchet; det. V 1961”/ “Collection of the; CALIFORNIA ACADEMY; of SCIENCES, San; Francisco, Calif.” (1 CASC); “Loma Mar; SanMateo Co.Calif; IV-29-1970”/ “ex. Redwood; Litter”/ “Collector; T.R.Haig” (1 FMNH [female, disarticulated]).

Diagnosis. This species can be distinguished from its California congeners by the character combination of the absence of eyes, humeral angle of elytron bluntly angulate (Fig. 1A), and the absence of a basal elytral sutural ridge. *Cephennium anophthalmicum* most closely resembles *C. urbanum*, but can be separated from it by the presence of a basal elytral sutural ridge (Fig. 1G), and the apex of the mesosternal keel divergent and crescent-shaped in *C. urbanum* (Fig. 2G). It can be easily distinguished from *C. aridum*, *C. celsifrons*, and *C. mariposae* by the presence of eyes in these species (Fig. 4A, C-D), and can be separated from *C. grandarboreum*, *C. canestroi* and *C. gilberti* by the humeral angle of the elytron, which is raised, dorsally flattened and apically rounded in these three species (Fig. 3D-F).

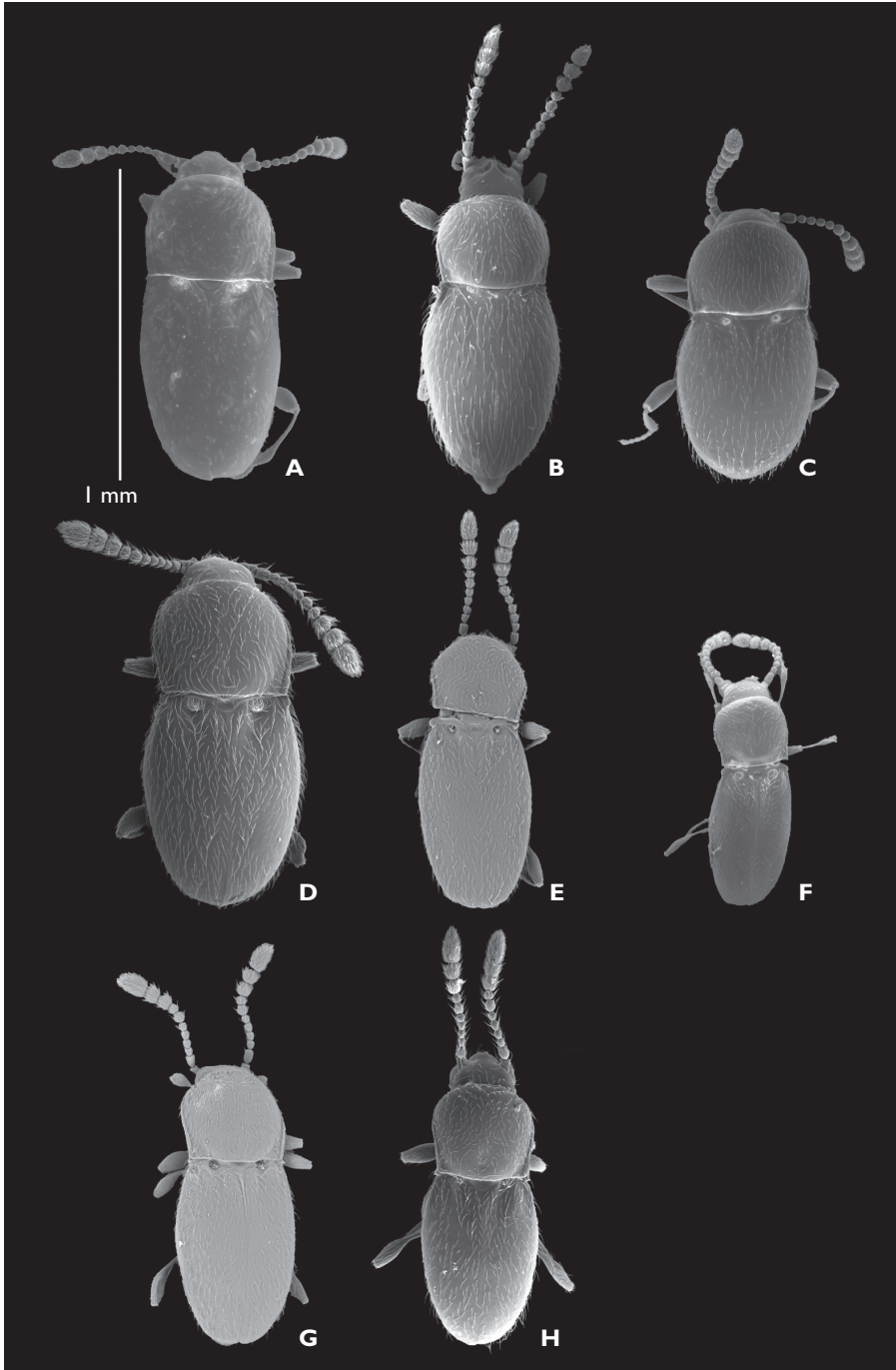


Figure 1. **A–H** Dorsal habitus SEMs, all to same scale **A** *Cephennium anophthalmicum* Brendel **B** *Cephennium celsifrons* Hopp & Caterino **C** *Cephennium mariposae* Hopp & Caterino **D** *Cephennium grandarboreum* Hopp & Caterino **E** *Cephennium canestroii* Hopp & Caterino **F** *Cephennium gilberti* Hopp & Caterino **G** *Cephennium urbanum* Hopp & Caterino **H** *Cephennium aridum* Hopp & Caterino.

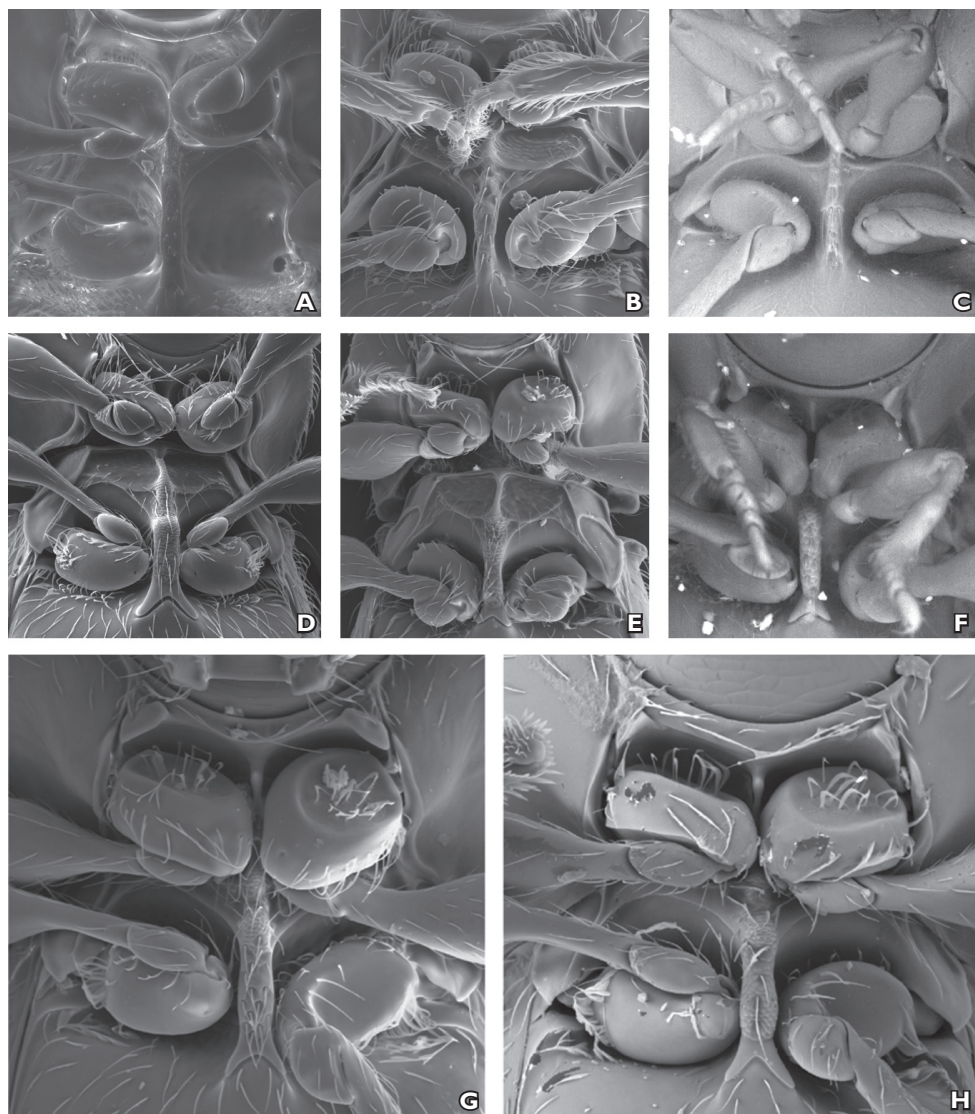


Figure 2. A–H Mesosternal keel SEMs **A** *Cephennium anophthalmicum* Brendel **B** *Cephennium cel-sifrons* Hopp & Caterino **C** *Cephennium mariposae* Hopp & Caterino **D** *Cephennium grandarboreum* Hopp & Caterino **E** *Cephennium canestroii* Hopp & Caterino **F** *Cephennium gilberti* Hopp & Caterino **G** *Cephennium urbanum* Hopp & Caterino **H** *Cephennium aridum* Hopp & Caterino.

Redescription. Male. Length: 0.874 mm; pronotal width: 0.418 mm; elytral width: 0.475 mm. Body elongate, slender, weakly convex; testaceous; evenly and moderately pubescent; pubescence golden, slender, moderately long, weakly decumbent (Fig. 1A). Dorsal surface of head smooth, weakly pubescent, narrowing anteriorly from antennal insertions. Eyes absent. Antenna setose, antennomere I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, an-

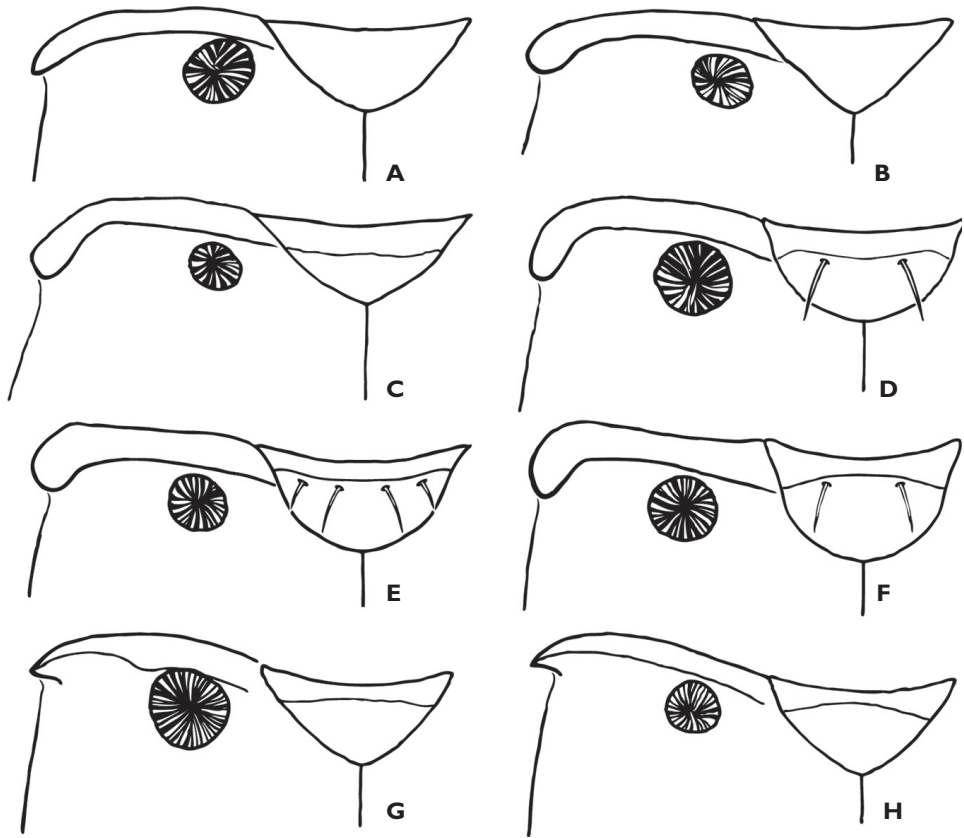


Figure 3. A–H Base of left elytron **A** *Cephennium anophthalmicum* Brendel **B** *Cephennium celsifrons* Hopp & Caterino **C** *Cephennium mariposae* Hopp & Caterino **D** *Cephennium grandarboreum* Hopp & Caterino **E** *Cephennium canestroi* Hopp & Caterino **F** *Cephennium gilberti* Hopp & Caterino **G** *Cephennium urbanum* Hopp & Caterino **H** *Cephennium aridum* Hopp & Caterino.

tennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming a loose club. Pronotum moderately pubescent, broadest between middle and anterior third, very convex in disc and moderately flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; lateral marginal bead complete, gradually widening towards base; lateral edge broadly rounded to posterior third, then weakly sinuate to base (Fig. 1A). Hypomeron smooth, sparsely setose towards anterior quarter and along outside (lateral) edge. Prosternum lacking protuberant nodules anterolaterad procoxal cavities (Fig. 2A). Elytra smooth, as pubescent as pronotum, covering all abdominal segments; elytral suture flat; basomedial fovea present on each elytron; fovea moderate in size, moderately pubescent (Figs. 1A, 3A). Humeral angle of elytron projecting laterally to blunt point, dorsally raised and flattened (Fig. 3A). Scutellum weakly triangular, lacking setae (Fig. 3A). Mesosternal keel sparsely setose, lacking scale-like microsculp-

ture, posterior quarter impunctate, apex weakly bifid (divergent), divergent projections short, triangulate (Fig. 2A). Metathoracic wings vestigial. Femora strongly clavate in distal half, tibiae expanded and becoming more densely setose towards distal half. Five visible abdominal sternites, ventrites V and VI partially fused. Aedeagus strongly sclerotized, with median lobe basally rounded, pill-shaped; parameres thin, sinuate, bisetose apically, extending to apex of rather narrow, bluntly triangular median dorsal process; apical digiform process curving ventrad at apex, extending just beyond apical collar; membranous apical collar with sclerotized clasper-like processes extending from apex; membranous lateral flaps present at base of apical collar (Fig. 5A).

Female. Identical to male.

Biology. This species was first described from a single specimen that was sifted from vegetable debris. An additional specimen was sifted from forest duff. Beyond this, there is little known about the biology of this species.

Distribution. This species has been collected around the San Francisco Bay Area in central coastal California (Fig. 6).

***Cephennium celsifrons* Hopp & Caterino, sp. n.**

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Figs 1B, 2B, 3B, 4A-B, 5B, 6

Type Material. Holotype. Male. “CALIF: Calaveras Co.; 3.0 mi NW West Point [-38.4160°N, 120.5515°W]; 2250 ft., v.20.1976; berl.; litter, mixed hdwd.- *Pinus* -; *Libocedrus* – *Abies*; for.; A. Newton, M. Thayer”/ “*Cephennium* sp. ♀; A. Newton det. 1978” (FMNH).

Paratypes (8): 1 specimen with same data as holotype (SBMN [gold coated for SEM]); “CALIF: Calaveras; Co., 3mi NW West; Point 2250’; v.20.1976”/ “A. Newton; M. Thayer; collectors”/ “A. Newton; M. Thayer; collectors” (1 MCZC); “CAL.: Calaveras Co.; 3 mi NE Glencoe 2000’; VI.25.1975 berl. litter; oak – conifer forest away; from stream; A. Newton”/ “*Cephennium*; A. Newton det. 1975” (2 FMNH, females); “3 miW Michigan Bar; Amador Co., Cal.; III-3-1971”/ “ex Berlese-; oak duff”/ “Fred G.; Andrews; collector” (1 FMNH, male [disarticulated]); “CALIF: Amador Co.; Pine Grove; IV-15-1972; Fred G Andrews”/ “Berlesed; Oak; Litter” (1 CSCA); “CALIF: Amador Co.; 1 mi. W Pine Grove; II-14-1971; R. F. Wilkey; Ex. Rotten wood” (1 CSCA); “Pine Grove; Amador Co., Cal.; IV.15.1972”/ “Berlesed; from; Oak duff” (1 CSCA [disarticulated]).

Etymology. This species name is derived from the latin *celsus* (elevated or lofty) in combination with *frons*, in reference to the unique, prominent sexual dimorphism exhibited by the male.

Diagnosis. This species can be distinguished from all California congeners by the character combination of the presence of two ommatidia on each side of the head (Fig. 4A), the mesosternal process truncate at the apex (Fig. 2B), and the frons of the male with a median longitudinal ridge (Fig. 4B). The male frons structure is unique to this

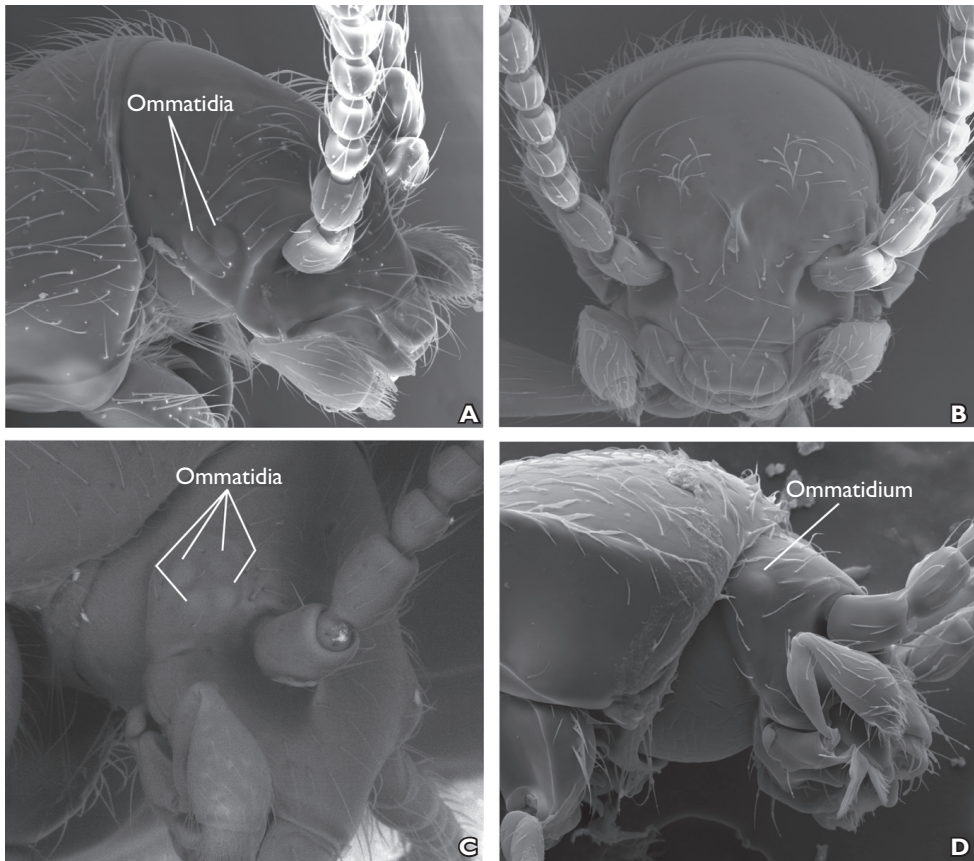


Figure 4. **A–D** Characters on the head, including number of ommatidia and male frons **A–B** *Cephennium celsifrons* Hopp & Caterino **C** *Cephennium mariposae* Hopp & Caterino **D** *Cephennium aridum* Hopp & Caterino.

species. *Cephennium celsifrons* and *C. mariposae* are otherwise very similar but can be distinguished by the number of ommatidia present (2 vs. 4, respectively, Figs. 4A, C). *Cephennium aridum* has a single ommatidium on each side of the head (Fig. 4D), and no other species exhibit any traces of eyes.

Description. Male. Length: 0.817–0.893 mm; pronotal width: 0.323–0.380 mm; elytral width: 0.380–0.418 mm. Body broad, ovate, slightly convex, rufo-testaceous to amber yellow, evenly densely pubescent, pubescence golden, slender, long, moderately decumbent (Fig. 1B). Head small, deflexed, sparsely pubescent, not narrowing anteriorly from antennal insertions; frons pinched medially forming a medial ridge (Fig. 4B); two ommatidia present on each side of the head (Fig. 4A). Antenna setose, antennomere I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming loose club. Pronotum densely pubescent, broadest between middle and anterior third, disc very convex medially and

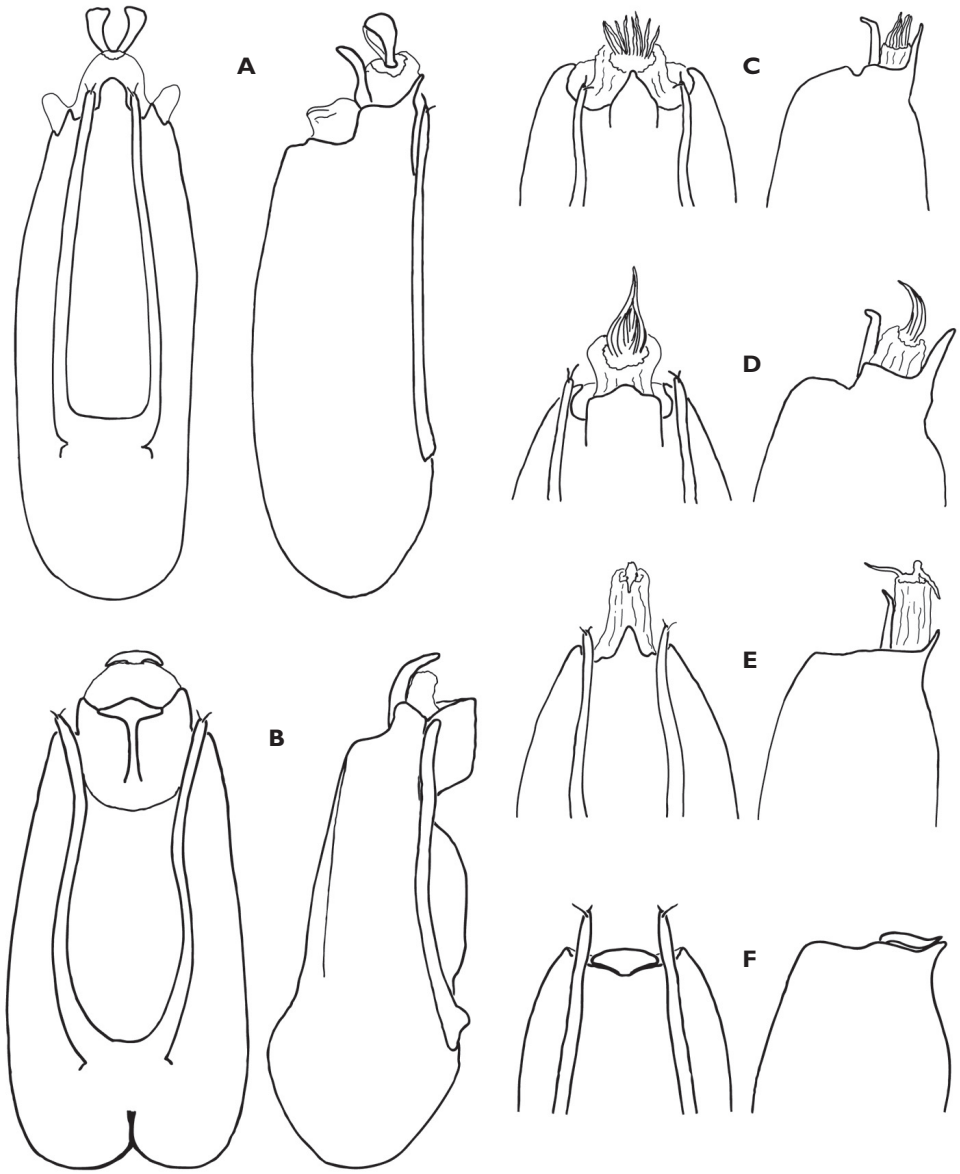


Figure 5. **A–F** Dorsal and lateral view of the aedeagus **A** *Cephennium anophthalmicum* Brendel **B** *Cephennium celsifrons* Hopp & Caterino **C** *Cephennium grandarboreum* Hopp & Caterino **D** *Cephennium canestroii* Hopp & Caterino **E** *Cephennium urbanum* Hopp & Caterino **F** *Cephennium aridum* Hopp & Caterino.

weakly flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; marginal bead complete laterally, gradually widening towards base; lateral edge broadly rounded to posterior third,

then evenly curved to base (Fig. 1B). Hypomeron smooth, sparsely setose towards upper quarter and along outside (lateral) edge, hypomerol bead anterolaterad procoxae sinuate. Prosternum without nodules anterolaterad procoxal cavities (Fig. 2B). Elytra impunctate, pubescent as pronotum, covering all abdominal segments, weakly truncate at apex; elytral suture flat; elytral striae absent; basomedial fovea present on each elytron, fovea small, with dense inwardly directed setae (Figs. 1B, 3B). Humeral angles of elytron raised, dorsally flattened (plateau-like), laterally rounded; weakly curved posterad around anterolateral angle (Fig. 3B). Scutellum roundly triangular, without setae (Fig. 3B). Mesosternal keel setose with indentation around each seta; smooth in the posterior quarter portion, apex straight (Fig. 2B). Metathoracic wings vestigial. Femora strongly clavate in distal half, tibiae expanded and becoming more densely setose towards distal half. Six visible abdominal sternites (fusion between ventrites V and VI incomplete). Aedeagus with median lobe rather lightly sclerotized, bulbous and deeply emarginate at base; apex with keel-like median dorsal process and dorsally curved, apically convex digiform process extending over part of apical collar (Fig. 5B).

Female. Identical to male except frons flat.

Biology. This species has been collected from berlesed litters of oak, rotten wood, mixed oak/conifer, and mixed hardwood. This species apparently favors moist habitats.

Distribution. This species has been collected in the mid-elevations of the central Sierra Nevada, from localities in Amador and Calaveras Counties (Fig. 6).

***Cephennium mariposae* Hopp & Caterino, sp. n.**

urn:lsid:zoobank.org:act:2E36C8F3-E54C-4CD3-AAF4-A5D366014F5E

Figs 1C, 2C, 3C, 4C, 6

Type Material. Holotype (sex not determined): “CALIF: Mariposa Co.; Mariposa [-37.4766°N, 119.9584°W] XI-15-1984; Berlese rotten log; A. J. Gilbert” (CSCA).

Etymology. This species is named for the county and town from which it was collected, Mariposa.

Diagnosis. This species can be distinguished from its California congeners by the character combination of the presence of four ommatidia on each side of the head (Fig. 4C), the mesosternal process truncate at the apex (Fig. 2C), and the humeral angle of the elytron weakly raised and dorsally flattened (Fig. 3C). *Cephennium mariposae* is most similar to *C. celsifrons* but can be distinguished from it by the latter having only two ommatidia on each side of the head (Fig. 2A) and a more elongate and slender body form (Fig. 1B). This species can be easily separated from *C. urbanum*, *C. anophthalmicum*, *C. canestroii*, *C. grandarboreum* and *C. gilberti* by the absence of ommatidia and the apex of the mesosternal keel being divergent in these species. It can be further distinguished from *C. anophthalmicum*, *C. urbanum* and *C. aridum* by the humeral angle of the elytron projecting laterally to a point in these three species (Fig. 3A, G-H).

Description. Length: 0.836 mm; pronotal width: 0.380 mm; elytral width: 0.437 mm. Body broad, ovate, slightly convex, testaceous, evenly densely pubescent, pubescence golden, slender, moderate in length (Fig. 1C). Head small, deflexed, sparsely pubescent, not narrowing anteriorly from antennal insertions; frons flat; four ommatidia present on each side of head. Antenna setose, antennomere I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming a loose club. Pronotum densely pubescent, broadest between middle and anterior third, disc convex medially and weakly flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; marginal bead complete laterally, gradually widening towards base; lateral edge broadly rounded to posterior third, then evenly to base (Fig. 1C). Hypomeron smooth, sparsely setose towards upper quarter and along outside (lateral) edge; hypomeral bead anterolaterad procoxae sinuate. Prosternum without nodules anterolaterad procoxal cavities (Fig. 2C). Elytra impunctate, as pubescent as pronotum, covering all abdominal segments, weakly truncate at apex; elytral suture flat; elytral striae absent; basomedial fovea present on each elytron, fovea small, with moderately dense inwardly directed setae (Figs. 1C, 3C). Humeral angles of elytron raised, dorsally flattened (plateau-like), apically rounded, slender, moderately curving posterad around anterolateral angles (Fig. 3C). Scutellum roundly triangular, without setae (Fig. 3C). Mesosternal keel setose with indentation around each seta, apex not divergent (Fig. 2B). Metathoracic wings vestigial. Femora strongly clavate in distal half, tibiae expanded and becoming more densely setose towards distal half. Six visible abdominal sternites (fusion between ventrites V and VI). Aedeagus not studied.

Female. Identical to male.

Biology. The lone specimen of this species was collected from a rotten log.

Distribution. This species is only known from Mariposa in Mariposa County, CA (Fig. 6).

***Cephennium grandarboreum* Hopp & Caterino, sp. n.**

urn:lsid:zoobank.org:act:8CD00FEF-266D-42A1-8C2F-0031C5EAAF06

Figs 1D, 2D, 3D, 5C, 6

Type Material. Holotype. Male. “CA: Monterey Co.; 36.2403°N, 121.7781°W; LPNF: Sycamore Cyn.; II.14.2006; Caterino&Chatzimanolis; maple/redwood litter”/ “CA BEETLE PROJ; CBP0041534” (SBMN).

Paratypes (7): 3 specimens with same data as holotype (1 SBMN, CBP0041525 [disarticulated]; 1 FMNH, CBP0041544; 1 CASC, CBP0041516); “CA: Monterey Co.; 36.0772°N, 121.5923°W; UC Big Creek Reserve; Redwood Camp, iii.28.2004. M. Caterino, redwood litter” (1 CSCA, CBP0018437; 1 LACM, CBP0018450; 1 SBMN [in freezer for DNA]); “CA: Monterey Co.; 36.0812°N, 121.5974°W; UC Big

Creek Reserve; BigCk/BrunetteCk.confl.; ii.7.2003, M. Caterino; redwood litter" (1 SBMN, CBP0006070 [gold coated for SEM]).

Etymology. This species name is the combination of the Latin words *grandis* and *arboreus*, meaning very large tree, as this species is associated with coast redwoods (*Sequoia sempervirens*).

Diagnosis. This species is most similar to *Cephennium gilberti* but can be distinguished from it by its body size and shape. *Cephennium grandarboreum* is represented by the largest specimens (0.988–1.121 mm long) of this genus currently known to occur in California, and is very robust. *C. gilberti* is known from the smallest specimen (0.646 mm long) of this genus known to occur in California and is much more slender and elongate. These two species can also be separated by the mesosternal keel, which is strongly divergent in *C. grandarboreum*, which has the apex $\sim 2.4\times$ as wide as the widest anterior point (Fig. 2D). The mesosternal keel of *C. gilberti* is weakly divergent and $\sim 2\times$ as wide as the widest anterior point (Fig. 2F). *Cephennium grandarboreum* can be separated from all other species by having two scutellar setae (Fig. 3D) instead of four (Fig. 3E) or zero (Figs 3A–C, G–H). Apart from the scutellar setae, *C. grandarboreum* and *C. canestroi* are quite similar, with rounded elytral humeral angles, but the elytral foveae are large and densely setose in *C. grandarboreum* (Figs. 1D, 2D), whereas they are smaller and moderately setose in *C. canestroi* (Fig. 1E, 2E). The humeral angle of the elytron is also more slender and posteriorly curved in *C. grandarboreum* (Fig. 3D) than in *C. canestroi* (Fig. 3E), and has a more strongly divergent mesosternal keel (Fig. 2D) than *C. canestroi* (Fig. 2E).

Description. Male. Length: 0.988–1.121 mm; pronotal width: 0.418–0.437 mm; elytral width: 0.456–0.475 mm. Body broad, ovate, slightly convex, rufo-testaceous to amber yellow, evenly densely pubescent, pubescence golden, slender, long (Fig. 1D). Head small, deflexed moderately pubescent, weakly narrowing anteriorly from antennal insertions; eyes absent. Antenna setose, antennomere I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming a loose club. Pronotum densely pubescent, broadest between middle and anterior third, disc very convex medially and weakly flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; marginal bead complete laterally, gradually widening towards base; lateral edge broadly rounded to posterior third, then weakly sinuate at base (Fig. 1D). Hypomer on smooth, sparsely setose towards upper quarter and along outside (lateral) edge, hypomer al bead anterolaterad procoxae with small knob at apex. Prosternum with small, weakly produced egg-shaped nodules anterolaterad procoxal cavities (Fig. 2D). Elytra impunctate, as pubescent as pronotum, covering all abdominal segments, weakly truncate at apex; elytral suture flat; elytral striae absent; basomedial fovea present on each elytron, fovea large, deep, with dense inwardly directed setae (Fig. 1D, 3D). Humeral angle of elytron raised laterad scutellum to humeral angle, humeral plateau slender, dorsally flattened, apically rounded; apex reaching posterad past midline of elytral fovea (Fig. 3D). Scutellum roundly triangular, with two setae (Fig. 3D). Mesosternal keel setose, texture ap-

pearing as fish scales anteriorly, abruptly smooth and impunctate near mesometasternal suture, apex strongly bifid and divergent, posterior projections long (Fig. 2D). Metathoracic wings vestigial. Femora strongly clavate in distal half, tibiae expanded and becoming more densely setose towards distal half. Five visible abdominal sternites (sometimes appearing as six due to weak fusion between ventrites V and VI). Aedeagus with median lobe bulbous, heavily sclerotized, median dorsal projection coming to point at apex (triangular), reaching past apical collar; apical collar with dense setae surrounding opening; dorsal parameres slender, longer than median lobe but not extending past apical collar, with lateral subapical setae on each side; apical digiform process extending past apical collar, bent ventrad near apex (Fig. 5C).

Female. Identical to male.

Biology. Specimens were extracted from redwood litter and a combination of maple and redwood litter with the use of Berlese funnels.

Distribution. This species is known from a few localities near Big Sur, Monterey County, CA (Fig. 6).

***Cephennium canestroi* Hopp & Caterino, sp. n.**

urn:lsid:zoobank.org:act:55F6B353-76A2-4826-8D8E-6FD28BE5671C

Figs 1E, 2E, 3E, 5D, 6

Type Material. Holotype. Male. “CA: San Luis Obispo Co.; 35.5249°N, 121.0719°W; UC Rancho Marino Res.; II.26.2009, *Salix* litter; M.S. Caterino”/ “CA BEETLE PROJ; CBP0087147” (SBMN).

Paratypes (5): “CA: San Luis Obispo Co.; 35.5361°N, 121.0723°W; UC Rancho Marino Res.; III.10.2009, M.S. Caterino; *Heteromeles* litter” (2 SBMN, CBP0087853 [gold coated for SEM], CBP0087825 [disarticulated]; 1 CASC, CBP0087841; 1 CSCA, CBP0087830; 1 FMNH, CBP0087815 [male genitalia dissected out and gold coated for SEM]).

Etymology. We are pleased to name this species for Don Canestro, director of the Rancho Marino Reserve, in appreciation of his generous assistance with our fieldwork.

Diagnosis. This species can be separated from its California congeners by the character combination of the absence of eyes, humeral plateau of the elytra raised, dorsally flattened and apically rounded, and scutellum with four setae (Fig. 3E). *Cephennium canestroi* most closely resembles *C. grandarboreum* and *C. gilberti*, all having a generally rounded humeral angle (Figs. 3D–F), but *C. canestroi* can be distinguished from them by having four scutellar setae (Fig. 3E) instead of two (Fig. 3D, F). *Cephennium canestroi* can be separated from *C. anophthalmicum* and *C. urbanum* by the shape of the elytral humeral angle, which projects laterally to a point in the latter two species (Fig. 3G–H).

Description Male. Length: 0.836–0.922 mm; pronotal width: 0.314–0.323 mm; elytral width: 0.361–0.380 mm. Body elongate, slender, weakly convex; amber-yellow, transparent under light, evenly and moderately pubescent, pubescence golden, slender, moderately long, weakly recumbent (Fig. 1E). Dorsal surface of head impunctate, weakly

pubescent, weakly narrowing anteriorly from antennal insertions. Eyes absent. Antenna setose, antennomeres I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming a loose club. Pronotum pubescent, broadest between middle and anterior third, very convex in disc and weakly flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; marginal bead complete laterally, gradually widening towards base; lateral edge broadly rounded to posterior third, then sinuate to base (Fig. 1E). Hypomeron impunctate, sparsely setose towards anterior quarter and along outside (lateral) edge (Fig. 2E). Prosternum with prominent egg-shaped nodules anterolaterad procoxal cavities (Fig. 2E). Elytra smooth, as pubescent as pronotum, covering all abdominal segments; elytral suture flat; elytral striae absent, basomedial fovea present on each elytron, fovea small, moderately pubescent (Figs. 1E, 2E). Humeral angle of elytron raised from laterad scutellum along anterior margin to humeral angle, humeral plateau broad, dorsally flattened, apically rounded, not reaching past midline of elytral fovea (Fig. 3E). Scutellum nearly semicircular, with four setae present (two on each side of the midline) (Fig. 3E). Mesosternal keel setose, texture appearing like fish scales in its entirety until abruptly smooth in the posterior quarter, weakly bifid at mesometasternal suture, divergent projections short (Fig. 2E). Metathoracic wings vestigial. Femora strongly clavate in distal half; tibiae expanded and becoming more densely setose towards distal half. Five visible abdominal sternites, with partial fusion between the apical two (ventrites V and VI). Aedeagus with median lobe bulbous, strongly sclerotized, median dorsal projection parallel-sided at base, convergent and bisinuate at apex, not reaching past apical collar; apical collar with dense setae meeting medially and forming wick-like setal extension, curving ventrad; dorsal parameres slender, extending beyond apex of median lobe but not past apical collar, each with two subapical setae; apical digiform process present, bent ventrad near apex (Fig. 5D).

Female. Identical to male.

Biology. This species has been collected from *Heteromeles* (Toyon) and *Salix* (Willow) litter. The collecting sites occur near a native stand of Monterey Pine (*Pinus radiata*), and is along the coast near the town of Cambria. Collecting sites were in a rocky drainage, with sparse shrubby willow cover, facing and only a few hundred meters from the ocean, and on a shaded northeast facing slope under a very large toyon tree, with a dense understory of *Rubus* and *Toxicodendron*.

Distribution. This species has been only collected from San Luis Obispo County, CA, in the University of California Rancho Marino Reserve (Fig. 6).

***Cephennium gilberti* Hopp & Caterino, sp. n.**

urn:lsid:zoobank.org:act:307DD4D1-D511-447D-AFF4-2258EE6DFC10

Figs 1F, 2F, 3F, 6

Type Material. Holotype (unknown sex): “CALIF: Kern Co.; 5 mi. E Glenville [sic] [– 35.7486°N, 118.5805°W]; Alta Sierra Camp; III-12-1979; A.J. Gilbert”/ “Berlesed;

Oak; Litter” (CSCA). We did not risk dissecting the type to determine sex due to its uniqueness and minute size.

Etymology. We name this species in honor of Dr. Art Gilbert, collector of the unique specimens of two of the species described herein, including this one.

Diagnosis. This species can be distinguished from its California congeners by the character combination of the eyes absent, humeral angle of the elytron raised, dorsally flattened and apically rounded (Fig. 3F), scutellum with two setae (Fig. 3F), and the mesosternal keel weakly divergent at the apex (Fig. 2F). This species most closely resembles *C. grandarboreum*, but can be distinguished from it by its smaller size (0.646 mm long), more elongate and slender body (Fig. 1F), the posterior angles of the pronotum being sharper in *C. gilberti* (Fig. 1F), and the mesosternal keel more weakly divergent at the apex with the apex approximately only 2× as wide as the widest point anterior to the apex (Fig. 2F), as opposed to the apex strongly divergent and nearly 2.4× as wide as the widest point anterior to the apex as in *C. grandarboreum* (Fig. 2D). *C. gilberti* can be separated from *C. anophthalmicum*, *C. urbanum* and *C. aridum* by the humeral angle of the elytron, which projects laterally to a point in these species (Fig. 3A, G-H). Finally, it can be distinguished from *C. celsifrons*, *C. mariposae* and *C. aridum* by the presence of ommatidia in these species (Fig. 4A, C-D).

Description (sex unknown). Length: 0.646 mm; pronotal width: 0.228 mm; elytral width: 0.266 mm. Body elongate, slender, weakly convex, amber yellow, evenly moderately pubescent, pubescence golden, slender, moderate in length (Fig. 1F). Head small, deflexed, sparsely pubescent; frons flat; eyes absent. Antenna setose, antennomeres I and II longer than broad, antennomeres III-VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX-XI gradually clavate forming a loose club. Pronotum moderately pubescent, broadest between middle and anterior third, disc very convex medially and weakly flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; marginal bead complete laterally, gradually widening towards base; lateral edge broadly rounded to posterior third, then slightly sinuate to base (Fig. 1F). Hypomer on smooth, sparsely setose towards upper quarter and along outside (lateral) edge, hypomer al bead anterolaterad procoxae sinuate. Prosternum with prominent, bluntly triangular nodules anterolaterad procoxal cavities (Fig. 2F). Elytra impunctate, as pubescent as pronotum, covering all abdominal segments, weakly truncate at apex; elytral suture flat; elytral striae absent; basomedial fovea present on each elytron, fovea large, with moderately dense inwardly directed setae (Figs. 1F, 3F). Humeral angles of elytron raised, dorsal plateau apically rounded, slender, barely reaching beyond anterior portion of the elytral foveae (Fig. 3F). Scutellum roundly triangular, with two short setae, one on each side of the midline (Fig. 3F). Mesosternal keel setose with scale-like microsculpture over most of length, abruptly smooth near meso-metasternal junction, apex weakly divergent, angulate (Fig. 2F). Metathoracic wings vestigial. Femora strongly clavate in distal half, tibiae expanded and becoming more densely setose towards distal half. Six visible abdominal sternites (fusion between ventrites V and VI not evident).

Biology. This species has been collected only from berlesed oak litter.

Distribution. This species is known from a single locality five miles east of Glenville, at about 1800m in the southern Sierra Nevada of Kern County, CA (Fig. 6).

***Cephennium urbanum* Hopp & Caterino, sp. n.**

urn:lsid:zoobank.org:act:5640D121-C792-4274-B02B-01EA234F177E

Figs 1G, 2G, 3G, 5E, 6

Type Material. Holotype. Male. “CA: Los Angeles Co.; 34.0824°N, 118.5660°W; Topanga SP, Santa Ynez; Cyn, III.30.2009; K.J. Hopp; *Quercus/Platanus* litter”/ “CA BEETLE PROJ; CBP0088983” (SBMN).

Paratypes (20): 9 specimens with same data as holotype (8 SBMN, CBP0088984 [male genitalia dissected], CBP0088982, CBP0088981, CBP0088989, CBP0088986, CBP0088990, CBP0088988 [male genitalia gold coated for SEM], CBP0088987 [disarticulated]; 1 LACM, CBP0088985); “CA: Los Angeles Co.; 34.0768°N, 118.8163°W; Santa Monica Mts.; Zuma Cyn, IV.14.2009; M.S. Caterino & K.J. Hopp; *Heteromeles* litter” (2 SBMN, CBP0089582, CBP0089583 [gold coated for SEM]); “CA: Los Angeles Co.; 34.0760°N, 118.8170°W; Santa Monica Mts.; Zuma Cyn, IV.14.2009; M.S. Caterino & K.J. Hopp; *Heteromeles/Ceanothus* litter” (1 SBMN, CBP0089561); “CA: Los Angeles Co.; 34.1258°N, 118.6567°W; SAMO, Calabasas Cold; Creek Trail, IV.22.2009; K.J. Hopp & M. Polihronakis; *Quercus/Neotoma* litter” (2 SBMN, CBP0090114, CBP0090115); “CA: Los Angeles Co.; 34.0561°N, 118.8800°W; Charmlee Park, IV.14.2009; M.S. Caterino & K.J. Hopp; *Quercus* litter” (1 SBMN, CBP0089831); “CA: Los Angeles Co.; 34.0723°N, 118.6846°W; Santa Monica Mts NRA; Piuma Rd, III.30.2009; K.J. Hopp, *Quercus/Ceanothus/Heteromeles* litter” (1 SBMN, CBP0089190; 1 CSCA, CBP0089191); “CA: Los Angeles Co.; 34.0948°N, 118.7242°W; Santa Monica Mts.; Malibu Ck SP; *Quercus/Rhus* litter, II.8.2009; M.S. Caterino & K.J. Hopp” (1 FMNH, CBP0086147); “CA: Los Angeles Co.; 34.0969°N, 118.7276°W; Santa Monica Mts.; Malibu Ck SP; *Quercus* litter, II.8.2009; M.S. Caterino & K.J. Hopp” (1 CASC, CBP0086092); “Pasadena; Cal.”/ “H. C. FALL; COLLECTION” (1 MCZC).

Etymology. The species name *urbanum* signifies the proximity of the Santa Monica Mountains to the urban development of greater Los Angeles. These mountains represent an extremely important island of native biodiversity surrounded by development.

Diagnosis. This species can be distinguished from its California congeners by the character combination of the absence of eyes, humeral angles of elytral project laterally to a sharp point (Fig. 3G), presence of a basal elytral sutural ridge (Fig. 1G), and the apex of the mesosternal keel crescent-shaped (Fig. 2G). This species most closely resembles *C. anophthalmicum* but they can be separated by the basal sutural ridge, absent from *C. anophthalmicum*, and the apex of the mesosternal keel, which is divergent and crescent-shaped in *C. urbanum* (Fig. 2G) and very weakly divergent and angulate in *C. anophthalmicum* (Fig. 2A). It can be easily distinguished from *C. celsifrons*, *C. mariposae* and *C. aridum* by the presence of eyes in these species (Fig. 4A, C-D). Finally, it can be distinguished from *C. grandarboreum*, *C. canestroi* and *C. gilberti* by the humeral angle of the elytron, which is raised and rounded in these three species (Fig. 3D-F).

Description. Male. Length: 0.760–0.874 mm; pronotal width: 0.304–0.342 mm; elytral width: 0.352–0.399 mm. Body elongate, slender, weakly convex; amber-yellow,

translucent; evenly and moderately pubescent; pubescence golden, slender, moderately long, weakly decumbent (Fig. 1G). Dorsal surface of head smooth, weakly pubescent, narrowing anteriorly from antennal insertions. Eyes absent. Antennae setose, antennomeres I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming a loose club. Pronotum moderately pubescent, broadest between middle and anterior third, very convex in disc and moderately flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; lateral marginal bead complete, gradually widening towards base; lateral edge broadly rounded to posterior third, then weakly sinuate to base (Fig. 1G). Hypomeron smooth, sparsely setose towards anterior quarter and along outside (lateral) edge. Prosternum with large, protruding, obliquely oriented, ovate nodules anterolaterad procoxal cavities (Fig. 2G). Elytra smooth, as pubescent as pronotum, covering all abdominal segments; elytral sutural margin raised from base of scutellum to $< 1/3$ the length of elytra; basomedial fovea present on each elytron; fovea small, moderately pubescent (Figs. 1G, 3G). Humeral angle of elytron projecting laterally to a sharp point (Fig. 3G). Scutellum weakly triangular, lacking setae (Fig. 3G). Mesosternal keel setose, anterior quarter with scale-like microsculpture, between coxae with large, round setose punctures, lacking scale-like microsculpture, and with posterior quarter impunctate, apex weakly bifid (divergent), divergent projections short, posterior margin crescent-shaped (Fig. 2G). Metathoracic wings vestigial. Femora strongly clavate in distal half, tibiae expanded and becoming more densely setose towards distal half. Five visible abdominal sternites, ventrites VI and VII partially fused. Aedeagus with median lobe bulbous, heavily sclerotized, median dorsal process triangular lacking parallel-sided base, not reaching past apical collar; apical collar membranous, long, with thin dorsally and ventrally articulated projections; dorsal parameres slender, extending just beyond end of median lobe but not past apical collar, each with two subapical seta; apical digiform process bent weakly ventrad near apex (Fig. 5E).

Female. Identical to male.

Biology. This species has been sifted and extracted by Berlese funnels from *Quercus* (oak) and *Heteromeles* (Toyon) litter as well as mixed litters of *Quercus* and *Rhus* (sumac), *Quercus* and *Salix* (willow), *Quercus* and *Platanus* (sycamore), *Quercus*, *Ceanothus* (California lilac), and *Heteromeles*, and from a *Neotoma* (woodrat) nest pile under *Quercus*.

Distribution. This species has mainly been collected in the Santa Monica Mountains in Los Angeles County, CA, with a single record from ‘Pasadena’ in the western foothills of the San Gabriel Mountains (Fig. 6).

***Cephennium aridum* Hopp & Caterino, sp. n.**

urn:lsid:zoobank.org:act:859E5725-2579-406B-8E7A-7AB07AE6739B

Figs 1H, 2H, 3H, 4D, 5F, 6

Type Material. Holotype. Male. “CA: San Bernardino Co.; 34.1405°N, 116.4541°W; UC Burns Reserve; Railroad Cyn, IV.1.2008; sifted from grass & flood debris; M. Ca-

terino & R. Leschen"/ "CA BEETLE PROJ; CBP0072926" (SBMN [gold coated for SEM])).

Paratypes (9): "CALIF: Riverside Co; 4mi SE Valle Vista; II-1978 K.Cooper; Oak litter 78-57"/ "CEPHENNIUM; spp.; S. O'KEEFE DET '90" (1 SBMN); "CALIF: Riverside Co; Palm Canyon Aqua [sic]; Caliente Reservation; IV-27-1978 78-67; K.W.Cooper"/ "berlese litter; at base of *Washingtonia filifera*" (1 CSCA); "CALIF: Riverside Co.; Whitewater cyn. Palm Oasis; V-4-1987 to XI-27-1988; Rolf L. Aalbu coll."/ "Ethylene-glycol pitfall; trap at base of *Washingtonia filifera*" (2 CSCA); "CALIF: Riverside Co.; 2 mi. E Gilman Hot; Springs, Lamb Canyon; V-18-1978/XI-13-1979; Fred G. Andrews; Antifreeze pit trap" (5 CSCA).

Etymology. This species name refers to its occurrence in the arid regions of the western Mojave/Colorado desert transition zone.

Diagnosis. This species can be immediately distinguished from all of its California congeners by the presence of a single ommatidium on each side of the head (Fig. 4D). Besides this somewhat cryptic character, *C. aridum* shares a sharply angulate humeral process only with *C. urbanum*. The mesosternal keel of *C. aridum*, however, has scale-like microsculpture between the mesocoxae (Fig. 2H), whereas that of *C. urbanum* has only setose punctures between the coxae, its scale-like microsculpture being restricted to the extreme anterior end (Fig. 2G). The mesosternal process of *C. urbanum* is also distinctly crescent-shaped (Fig. 2G), where that of *C. aridum* is angulate (Fig. 2H).

Description. Male. Length: 0.817–0.912 mm; pronotal width: 0.304–0.342 mm; elytral width: 0.352–0.418 mm. Body elongate, slender, weakly convex; amber-yellow, translucent; evenly and moderately pubescent; pubescence golden, slender, moderately long, weakly decumbent (Fig. 1H). Dorsal surface of head smooth, sparsely pubescent, narrowing anteriorly from antennal insertions. Single ommatidium present on each side of head (Fig. 4D). Antenna setose, antennomeres I and II longer than broad, antennomeres III–VI quadrate and smaller than antennomeres II and VII, antennomere VIII smaller than antennomeres VII and IX, antennomeres IX–XI gradually clavate forming a loose club. Pronotum moderately pubescent, broadest between middle and anterior third, very convex in disc part and moderately flattened near each posterior angle; anterior margin not visible from above; anterior and posterior margin lacking marginal bead; marginal bead complete laterally, gradually widening towards base; lateral edge broadly rounded to posterior third, then weakly sinuate to base (Fig. 1H). Hypomeron smooth, sparsely setose towards anterior quarter and along outside (lateral) edge. Prosternum with small, weakly protruding, oblique narrowly ovate nodules anterolaterad procoxal cavities (Fig. 2H). Elytra smooth, lacking striae, as pubescent as pronotum, covering all abdominal segments; elytral suture absent; basomedial fovea present on each elytron; fovea small, moderately pubescent (Figs. 1H, 3H). Humeral angle of elytron projecting laterally to sharp point (Fig. 3H). Scutellum weakly triangular, lacking setae (Fig. 3H). Mesosternal keel sparsely setose, with scale-like microsculpture over most of its length, abruptly smooth in posterior extreme, apex moderately bifid, divergent projections short, diverging at ~90° an-

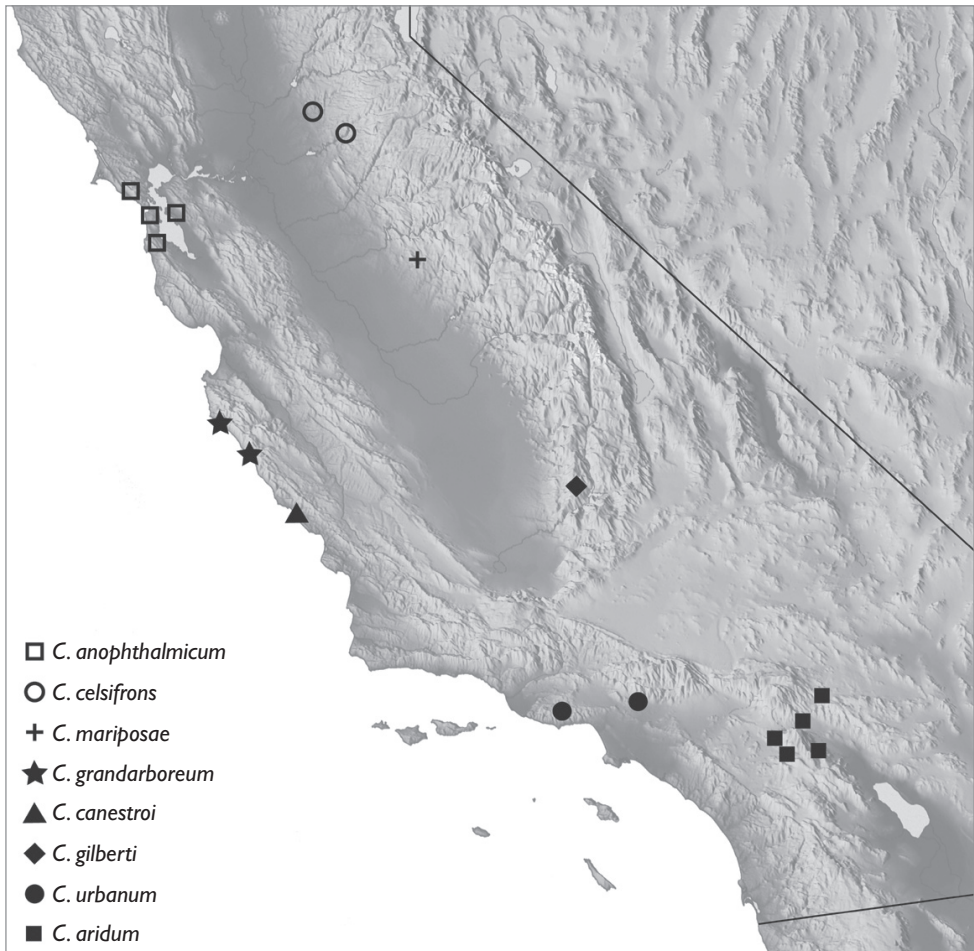


Figure 6. Distribution map for all California species of *Cephennium*.

gle (Fig. 2H). Metathoracic wings vestigial. Femora strongly clavate in distal half; tibiae expanded and becoming more densely setose towards distal half. Five visible abdominal sternites, ventrites V and VI largely fused. Aedeagus with median lobe bulbous, heavily sclerotized, truncate at apex, with very short median dorsal process, weakly emarginate for reception of apex of apical digiform process; apical collar not apparent; dorsal parameres slender, extending well beyond end of median lobe, each with two subapical setae (Fig. 1H).

Female. Unknown.

Biology. The type of this species was sifted from grass and flood debris in a small, spring-fed, but frequently dry drainage. Other specimens were sifted from litter of the native California Fan Palm (*Washingtonia filifera*), which also occur in scattered spring-fed drainages in the Colorado (and broader Sonoran) desert.

Distribution. This species is known from several localities in the far northeastern Colorado desert, in San Bernardino and Riverside Counties, CA (Fig. 6).

Cephennum canestroi Hopp & Caterino, sp. n.

San Luis Obispo Co.

Cephennium gilberti Hopp & Caterino, sp. n.

Kern Co.

Cephennium urbanum Hopp & Caterino, sp. n.

Los Angeles Co.

Cephennium aridum Hopp & Caterino, sp. n.

Riverside Co. and San Bernardino Co.

Discussion

The discovery of these new species constitutes a significant expansion of the known range of *Cephennium*, and Cephennini in general, in the New World. Previously represented by a single species, confined to moist coastal forests of central California, *Cephennium* appeared to have a minimal, possibly relictual, presence in North America. The discovery of several additional species, across widely separated and ecologically varied habitats instead indicates that the group has undergone considerable diversification in the region. The type localities of *C. grandarboreum* and *C. canestroii*, in Monterey and San Luis Obispo Counties, alone would represent only a slight extension of range down the coast, into an area otherwise known to host several southernmost records for various beetles (Caterino, unpublished data). The cool and foggy coastal environments conceivably provide similar microhabitats to those inhabited by the genus further northward. The discovery of *Cephennium* in the Santa Monica Mountains, however, represents a major disjunction, not only in distance, but into much drier environments, mostly dominated by chaparral and relatively sparse oak woodland. The presence of *C. aridum* on the fringes of the Colorado desert takes this to an extreme, occurring in areas receiving less than 10 inches of rain/year. Finding additional, localized species in the Sierra Nevada also extends the range of the genus into true montane habitats. Together these new localities indicate surprising adaptability in ecological requirements, and suggest that many other populations of these beetles will be discovered through diligent searching.

Aside from the above habitat-related observations, we know very little about the natural history of these beetles, as all were collected through Berlese extraction of sifted leaf litter. The litters represent a variety of plants and plant communities, from fan palm oases to chaparral, redwood forest, and oak woodland. In these habitats, species of *Cephennium* are expected to be armored mite predators, with suction disks on their labium, and rasp-like mandibles to slowly grind a hole in the thick dorsal surface of the mite (Schmid 1988; Newton and Franz 1998; O’Keefe 2001; Jałoszyński 2009). We have observed similar labial suction disks to those described for European species. Thus, it is probably a safe speculation that the new species are also specialist oribatid mite predators.

The biogeographic history of the California Floristic Province is complex and poorly understood. While broad scale distributional patterns have long been evident, understanding the finer scale movements of lineages through time has suffered from very fragmentary data on distribution patterns for those smaller, more sedentary taxa that would be most expected to reflect deep history. The cryptic fauna of leaf litter stands to greatly increase not only our knowledge of gross biodiversity, but also the evolutionary processes responsible for generating and maintaining it. The insect fauna of this region in general remains woefully underdocumented. Increased survey effort focusing on the more cryptic elements of the regional fauna would be repaid many times over in biogeographic understanding and in management applicability.

Acknowledgements

We are grateful to the managers of the University of California Big Creek Reserve (John Smiley, Kurt Merg, Feynner Arias), the UC Burns Piñon Ridge Reserve (William Bretz) and the UC Kenneth S. Norris Rancho Marino Reserve (Don Canestro), the Santa Monica Mountains National Recreation Area (Lena Lee), and the California Department of Fish & Game for field permissions. We are also grateful to Stylianos Chatzimanolis, Richard Leschen, and Maxi Polihronakis for field assistance. This study could not have been completed without the response to loan requests from all of the curators and collection managers who facilitated specimen loans (listed above under Materials and methods). Finally, we are appreciative of discussion of male genitalia morphological terminology with Al Newton. This work was supported in part by National Science Foundation grants DEB0447694 and MRI0420726 to M. Caterino, and the Santa Monica Mountains Fund, a non-profit organization working in partnership with the National Park Service, grant to M. Caterino and K. Hopp.

References

- Brendel E (1889) Descriptions of new Scydmaenidae and Pselaphidae. *Entomologica Americana* 5: 193–197. <http://www.biodiversitylibrary.org/item/42392>
- Caterino M (2006) California beetle faunistics: 100 years after Fall. *Coleopterists Bulletin* 60(2): 177–191.
- Caterino M, Chatzimanolis S (2007) Newly recorded and noteworthy California Staphylinidae. *Coleopterists Bulletin* 61:398–407.
- Caterino M, Leschen RAB, Johnson C (2008) A new genus of Caenoscelini (Cryptophaginae: Cryptophaginae) from California, with two new species. *Coleopterists Bulletin* 62(4): 509–523.

- Evenhuis N (2008) The insect and spider collections of the world website. Available at: <http://hbs.bishopmuseum.org/codens/> [Last accessed: August 11, 2009].
- Grebennikov VV, Newton AF (2009) Good-bye Scydmaenidae, or why the ant-like stone beetles should become megadiverse Staphylinidae sensu latissimo (Coleoptera). European Journal of Entomology 106: 275–301. http://www.eje.cz/pdfarticles/1451/eje_106_2_275_Grebennikov.pdf
- Ivie MA (1985) Nomenclatorial notes on West Indian Elaphidiini (Coleoptera: Cerambycidae). Pan-Pacific Entomologist 61(4): 303–314.
- Jałoszyński P (2007) The Cephenniini of China. II. *Cephennodes* Reitter of southern provinces, with taxonomic notes on the *Cephennodes-Chelonoidum* complex (Coleoptera: Scydmaenidae). Genus 18(1): 7–101.
- Jałoszyński P (2009) *Trurlia*, a new Oriental genus of the tribe Cephenniini (Coleoptera: Scydmaenidae). European Journal of Entomology 106: 261–274.
- Majka C, Klimaszewski J (2004) *Phloeocharis subtilissima* Mannerheim (Staphylinidae: Phloeocharinae) and *Cephennium gallicum* Ganglbauer (Scydmaenidae) new to North America: a case study in the introduction of exotic Coleoptera to the port of Halifax, with new records of other species. Zootaxa 781: 1–15. <http://www.mapress.com/zootaxa/2004f/zt00781.pdf>
- Myers N, Mittermeier RA, Mittermeier CG, da Fonseca GAB, Kent J (2000) Biodiversity hotspots for conservation priorities. Nature 403: 853–858.
- Newton AF, Franz H (1998) World catalog of the genera of Scydmaenidae. Koleopterologische Rundschau 68: 137–165.
- O’Keefe ST (2001) Scydmaenidae Leach, 1815. In: Arnett, R. H., M. C. Thomas (Eds), Vol. 1 American Beetles. Archostemata, Myxophaga, Adephaga, Polyphaga: Staphyliniformia. CRC Press, Boca Raton, Florida, 259–266.
- Schmid R (1988) Morphologische Anpassungen in einem Räuber-Beute-System: Ameisenkäfer (Scydmaenidae, Staphylinioidea) und gepanzerte Milben (Acari). Zoologische Jahrbücher, Abteilung für Systematik, Ökologie und Geographie der Tiere 115: 207–228.

A new species of *Plectromerus* Haldeman from Central America and description of the female of *Plectromerus dezayasi* Nearn & Branham (Coleoptera, Cerambycidae, Cerambycinae, Plectromerini)

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Academic editor: *Alexander Konstantinov* | Received 28 July 2009 | Accepted 15 September 2009 | Published 9 October 2009

[urn:lsid:zoobank.org:pub:2A63157B-77B9-4842-97BA-74356A71E25F](https://doi.org/urn:lsid:zoobank.org:pub:2A63157B-77B9-4842-97BA-74356A71E25F)

Citation: Nearn EH, Miller KB (2009) A new species of *Plectromerus* Haldeman from Central America and description of the female of *Plectromerus dezayasi* Nearn & Branham (Coleoptera, Cerambycidae, Cerambycinae, Plectromerini). ZooKeys 24: 55–62. doi: 10.3897/zookeys.24.242

Abstract

A new species, *Plectromerus roncavei*, **sp. n.** (Coleoptera, Cerambycidae, Cerambycinae, Plectromerini), from Honduras and Nicaragua is described and illustrated. Features distinguishing the new species from its congeners as well as a modified key to *Plectromerus* species are presented. In addition, the previously unknown female of *Plectromerus dezayasi* Nearn & Branham is described and illustrated.

Keywords

Honduras, Nicaragua, woodboring beetles, taxonomy

Introduction

Nearn and Branham (2008) conducted a revision and phylogenetic analysis of Plectromerini (Cerambycidae: Cerambycinae). Among the eight new species of *Plectromerus* Haldeman, one was described from a single male specimen (*Plectromerus dezayasi* Nearn & Branham) and three were described from only female specimens (*Plectromerus giesberti* Nearn & Branham; *Plectromerus michelii* Nearn & Branham; *Plectromerus*

thomasi Nearn & Branham). Subsequently, three additional specimens of *P. michelii* were discovered, and Nearn (2008) described the previously unknown male. Recently, specimens representing a new species of *Plectromerus* from Honduras and Nicaragua, as well as the first known female specimens of *P. dezayasi*, were discovered. The new species and newly discovered female specimens of *P. dezayasi* are described herein.

Methods

Specimens from the following collections were examined for a comparison of characters with the new species. The following acronyms are used throughout the paper:

DDPC Diethard Dauber Private Collection, Linz, Austria

DHPC Dan Heffern Private Collection, Houston, TX, USA

EMEC Essig Museum of Entomology, University of California, Berkeley, CA, USA

FSCA Florida State Collection of Arthropods, Gainesville, FL, USA

RDCC Ronald D. Cave Private Collection, Ft. Pierce, FL, USA

Observations of specimens were made using a Max Erb stereomicroscope with 10× eyepieces. Photographs were taken with Visionary Digital’s BK Plus imaging system. Label data are verbatim and placed in quotes.

Plectromerus roncavei Nearn & Miller, sp. n.

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Figs 1a–d.

Diagnosis. *Plectromerus roncavei* is one of the largest species in the genus, ranging in length from 8.6–14.1 mm. From congeners, *P. roncavei* is distinguished by the combination of the following characters: intricate elytral pattern; pronotal disk with moderately raised calli; and moderately to strongly, deeply serrate metafemoral teeth. This species is most similar to *P. dezayasi* but is distinguished by the elytral markings (Figs. 1a, 2a); the pronotal surface opaque, with sparse and shallow punctures (pronotal surface moderately shining, with dense, shallow punctures in *P. dezayasi*); the surface of the pronotum with moderately dense, short, recumbent, pale pubescence (absent in *P. dezayasi*); the surface of the meso- and metasterna with moderately dense, short, recumbent, pale pubescence (absent in *P. dezayasi*), and the posterior edge of the metafemoral tooth with about 15–22 serration “peaks” (about 11–14 serration “peaks” in *P. dezayasi*).

Description. Male. Length 8.6–12.4 mm, width 2.1–2.8 mm (measured across humeri). General form narrow, subcylindrical. Integument testaceous, with head, basal antennomeres, portions of pronotum, venter, and femoral apices ferrugineous; each elytron testaceous with three major macular regions as follows: (1) basal third with a ferrugineous, oblique, narrow, arcuate macula beginning below humerus and extending to above sutural midpoint; (2) a second ferrugineous, oblique, narrow, strongly arcuate

macula beginning at about midpoint and extending to below apical third of suture; and (3) apical third testaceous, with broader, ferrugineous, irregular, subreniform macula.

Head with front nearly flat, transverse, with a median, shallow line from between eyes to just beyond vertex; head slightly concave between antennal tubercles, which are slightly raised and separated by about the width of two antennal sockets; vertex

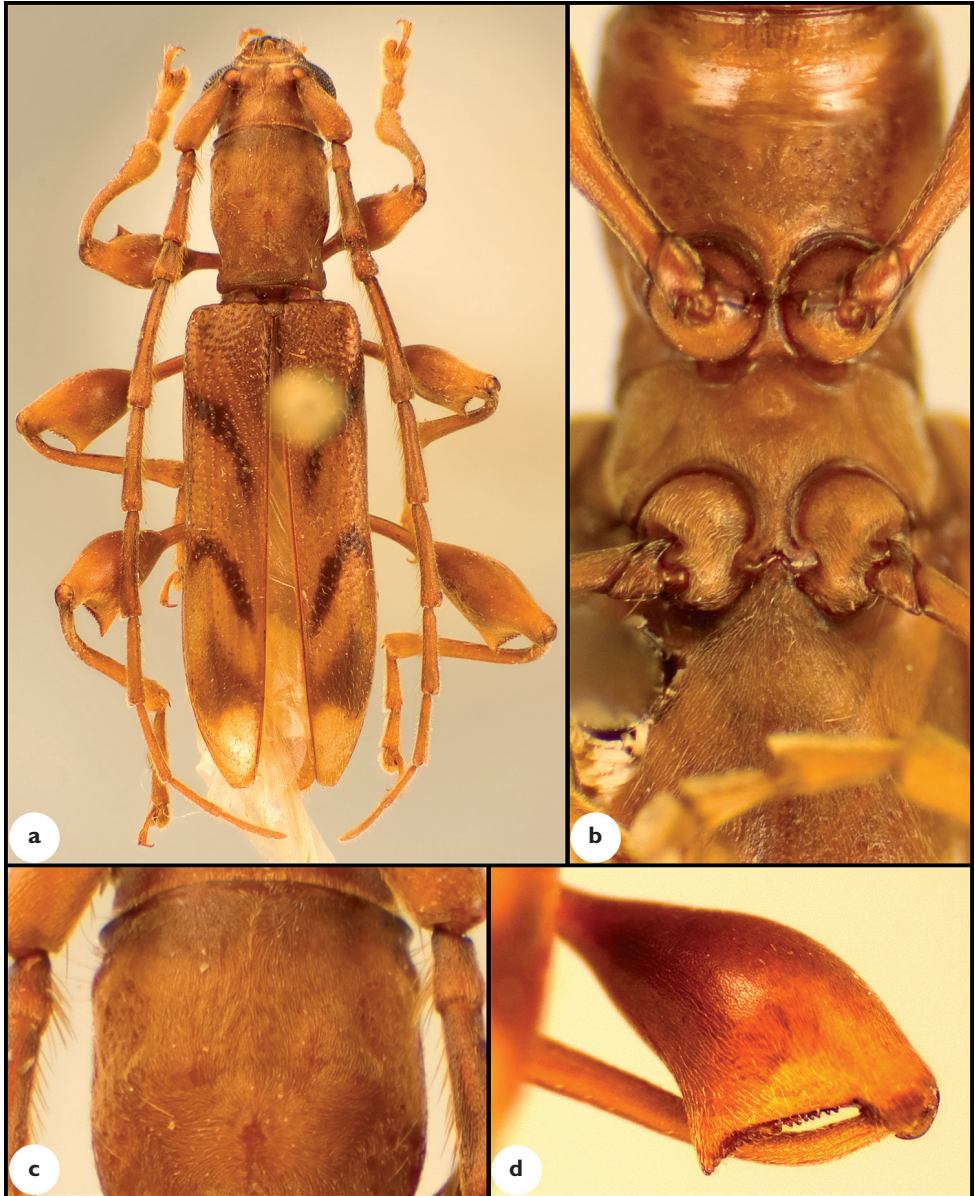


Figure 1. *Plectromerus roncavei* Nearns & Miller, sp. n. **a** dorsal habitus, paratype male **b** closeup of pro- and mesosternum, paratype male **c** closeup of pronotum, paratype male **d** closeup of metafemur and metatibia, dorsal view, holotype male.

microsculptured, with dense, shallow punctures; vertex with short, recumbent, pale pubescence. Eyes coarsely-faceted, transverse, subreniform, with shallow indentations around antennal insertions.

Antennae eleven segmented, slightly longer than body; scape bowed; third antennomere about as long as scape, about twice as long as fourth; fifth antennomere longest, almost 4 times longer than fourth, about 2 times longer than third; antennomeres 6–10 becoming progressively shorter; eleventh slightly longer than tenth; basal antennomeres subcylindrical, from third moderately flattened; apices of antennomeres 5–10 produced externally. Scape with short, recumbent, pale pubescence; antennomeres 2–8 ciliate beneath with coarse, moderately long, suberect, pale hairs.

Pronotum subcylindrical, about 1.3 times as long as wide, widest at middle, slightly broader at apex than base; pronotal sides broadly inflated, arcuately constricted at basal third, with a slight inflation just before apex; basal margin moderately arcuate; disk convex, slightly flattened, with one moderately raised, median callus at about the center; disk with two moderately raised, submedial calli slightly anterior to center, and two moderately raised, submedial calli slightly posterior to center; lateral margins of pronotum with patch of coarse, deep punctures, and two to four long, suberect setae anterolaterally. Basal third of disk with two to four long, pale, recumbent setae positioned submedially, arising from deep punctures. Surface opaque, microsculptured, sparsely and shallowly punctate; surface with moderately dense short, recumbent, pale pubescence (Fig. 1c).

Scutellum small, rounded, almost as long as broad, impunctate. Elytra about 2.7 times as long as width at humeri, about 3 times as long as pronotal length, about 1.5 times broader basally than pronotum at widest point (at middle); sides nearly parallel, slightly sinuate around middle, somewhat evenly rounded to apex; elytral apices individually rounded, nearly subtruncate; epipleural margin strongly sinuate. Elytral disk moderately concave medially, subsuturally, creating a distinct costa on each elytron; base of each elytron moderately raised. Elytral surface strongly shining; elytral punctation moderately dense, coarse, and deep at basal third; punctures becoming more shallow toward apex and sides, almost obsolete at apical third; each puncture with a short, fine, pale hair.

Venter with portions of prosternum strongly shining; one irregular patch of coarse, deep punctures front of and spanning the width of procoxae (Fig. 1b); narrowest area of prosternal process between procoxae about 0.2 times as wide as procoxal cavity, and about 0.3 times width of apex of process which is subtriangular with rounded corners; prosternal process between procoxae gradually declivous; procoxal cavities open behind. Mesosternum surface moderately shining, nearly impunctate; mesosternal surface with moderately dense short, recumbent, pale pubescence (Fig. 1b). Metasternum surface moderately shining, sparsely and finely punctate, with scattered deeper punctures and sparse suberect, pale hairs interspersed; metasternal surface with moderately dense short, recumbent, pale pubescence. Metepisternum clothed with short, recumbent, pale pubescence, which is denser posteriorly. Abdomen moderately shining; finely, shallowly punctate; abdomen with sparse long, suberect, pale hairs and punctures each with short, fine, pale hair; abdominal surface with moderately dense short, recumbent, pale pubescence; fifth sternite broadly subtruncate, about as long as preceding sternite.

Legs with femora pedunculate-clavate; basal portion of metafemora slightly shorter than metafemoral club; meso- and metafemora slightly arcuate, shining, clothed with moderately densely, recumbent, short, pale pubescence; clavate portion darker than base; underside of each femoral club with broad, acute triangular tooth; metafemoral teeth with posterior edge strongly, deeply serrate, with about 15–22 serration “peaks” of uneven height and distribution (Fig. 1d), each peak with short, curved, pale hair; metatibiae slightly sinuate, nearly straight, slightly flattened, about 0.8 times as long as metafemora; metatibiae gradually expanded distally; clothed with moderately dense, fine, recumbent, pale pubescence, becoming longer and coarser distally.

Female. Length 11.8–14.1 mm; width 2.8–3.0 mm (measured across humeri). Similar to male except pronotal sides lacking coarse punctures and prosternum lacking irregular patch of punctures in front of procoxae. Abdomen with terminal sternite evenly, broadly rounded, slightly longer than preceding sternite.

Etymology. We take pleasure in naming this species for Ronald D. Cave, for his contributions to the study of cerambycids and who provided the holotype specimen. The epithet is a noun in apposition.

Specimens examined. Type material: Holotype ♂ (Fig. 1a), “HONDURAS: Yoro, Parq Nac Pico Bonito, San Antonio 900 m, 15°45′03″N 86°59′49″W, 25 February 2001, A. Hernández” (FSCA). Allotype ♀, “NICARAGUA: Jinotega, Datanli Diablo 1200 m, 28–29 IV 2006, leg van den Berghe” (FSCA). Two paratypes as follows: “NICARAGUA, Matag, Matagalpa, Fuente Pura, I-8-1994, E. van den Berghe”, 1 ♂ (DHPC); “HONDURAS: Yoro, Parq Nac Pico Pijol, 25 April 1998, RD Cave collector”, 1 ♀ (RDCC).

Distribution. Known from Honduras (Yoro Department) and Nicaragua (Jinotega and Matagalpa Departments).

Remarks. Nothing is known about the biology of this species. Thomas et al. (2009) provided a color habitus photograph of the holotype.

Plectromerus dezayasi Nearn & Branham, 2008

Figs 2a–b

Plectromerus dezayasi Nearn & Branham, 2008 was described from a single male specimen (Fig. 2a) collected by Dr. Henry Stockwell in Nicaragua, Jinotega Department, Cerro Chimborazo, 1400 m elevation, 13°02′N, 85°56′W, beating dead branches, 20 November 1971. The holotype is deposited in the EMEC. Two additional specimens collected by Dr. Stockwell, both female, with exactly the same label data are in the STRI. The following description supplements the description of this species using the methods indicated in Nearn and Branham (2008).

Description. Female. Length 8.0–9.5 mm; width 1.8–2.1 mm (measured across humeri). Similar to male except pronotal sides without coarse punctures and prosternum without one irregular patch of coarse, deep punctures in front of each procoxa. Legs similar to males except metafemoral teeth with posterior edge strongly, deeply



Figure 2. *Plectromerus dezayasi* Nearn & Branham, dorsal habitus **a** holotype male **b** female.

serrate, with about 11 serration “peaks” of uneven height and distribution. Abdomen with terminal sternite broadly rounded, slightly longer than preceding sternite.

Modified couplets to key to Species of *Plectromerus*

A modified key to species of *Plectromerus* is presented based on Nearn and Branham’s (2008, page 21) key to the genus. In their key, *P. roncavei* will run to couplet 19. Couplets 18–26 can be modified, as presented below, to accommodate this new species as well as the newly described female of *P. dezayasi*.

- 18(17) Metafemoral teeth with posterior edge moderately to strongly serrate, with 10 or more distinct serration “peaks” **19**
- Metafemoral teeth with posterior edge nearly smooth, at most weakly serrate **24**
- 19(18) Posterior edge of metafemoral teeth with 15 or more serration “peaks” **20**

- Posterior edge of metafemoral teeth with with about 10–14 serration “peaks” **21**
- 20(19) Metafemoral teeth with posterior edge moderately serrate, with about 20–24 serration “peaks”; pronotal disk with a slightly raised median callus (Guatemala) ***P. giesberti* Nearn & Branham**
- Metafemoral teeth with posterior edge moderately to strongly serrate, with about 15–22 serration “peaks”; pronotal disk with one moderately raised, median callus at about the center; disk with two moderately raised, submedial calli slightly anterior to center, and two moderately raised, submedial calli slightly posterior to center (Honduras, Nicaragua)
..... ***P. roncavei* Nearn & Miller, sp. n.**
- 21(19) Elytral apices broadly rounded; metatibiae slightly sinuate, nearly straight (Nicaragua) ***P. dezayasi* Nearn & Branham**
- Elytral apices variable; metatibiae moderately to strongly sinuate **22**
- 22(21) Elytral apices narrowly rounded; pronotal surface moderately shining, often with fine wrinkles, sparse to moderately densely, shallowly, moderately coarse punctation on disk (Puerto Rico, Virgin Islands) ***P. ramosi* Micheli & Nearn**
- Elytral apices variable; if elytral apices narrowly rounded, then pronotal surface not moderately shining **23**
- 23(22) Elytral apices broadly rounded to subtruncate; elytra with two major macular regions: basal third of each elytron with a ferrugineous, oblique, narrow, macula beginning below humerus and reaching sutural midpoint; apical third of each elytron with a ferrugineous, arcuate-transverse, narrow macula (Costa Rica, Honduras) ***P. hovorei* Nearn & Branham**
- Elytral apices narrowly rounded; elytra usually uniformly testaceous, without distinct macular regions (Dominican Republic) ***P. serratus* (Cameron)**
- 24(18) Metafemoral teeth distinctly wider than base of metatibiae (e.g., Nearn and Branham 2008; Figs. 30c, 35b) **25**
- Metafemoral teeth minute, about as wide as base of metatibiae (e.g., Nearn and Branham 2008; Figs. 19c, 29c) **26**
- 25(24) Mesosternum with deep punctures; metafemora suddenly clavate; metafemoral teeth with posterior edge weakly, irregularly serrate (Jamaica)
..... ***P. unidentatus* Fisher**
- Mesosternum without deep punctures; metafemora gradually clavate; metafemoral teeth with posterior edge smooth, not serrate (Cuba) ***P. pinicola* Zayas**
- 26(24) Body length approx. 5 mm; pronotum with five to nine distinct, small, dark maculae (Cuba) ***P. ornatus* Fisher**
- Body length approx. 6–8 mm; pronotum variable, but without five distinct, small, dark maculae **27**
- 27(26) Elytral apices broadly rounded (fossil in Dominican amber)
..... ***P. tertiarius* Vitali †**
- Elytral apices subtruncate (fossil in Dominican amber)
..... ***P. grimaldii* Nearn & Branham †**

Acknowledgments

We thank Annette Aiello (Smithsonian Tropical Research Institute, Panamá City, Panamá), Ronald D. Cave (University of Florida, Ft. Pierce, FL), Jim Cope (San Jose, CA), Diethard Dauber (Linz, Austria), and Dan Heffern (Houston, TX) for the loan of specimens. Thanks also to Alexander S. Konstantinov (SEL/USDA, Washington, DC) and Nathan P. Lord (University of New Mexico, Albuquerque, NM) and two anonymous reviewers for critical suggestions to improve an earlier version of this manuscript.

References

- Nearn EH (2008) Description of the male of *Plectromerus michelii* Nearn and Branham, 2008 (Coleoptera: Cerambycidae). Insecta Mundi 0038: 1–2. <http://centerforsystematicentomology.org/insectamundi/0038Nearn.pdf> [accessed on 27.VII.2009]
- Nearn EH, Branham MA (2008) Revision and phylogeny of the tribes Curiini LeConte and Plectromerini Nearn & Branham, new tribe (Coleoptera: Cerambycidae: Cerambycinae). Memoirs of the American Entomological Society 47: 1–117.
- Thomas MC, Skelley PE, Lingafelter SW, Nearn EH (2009) Cerambycidae Holotypes of the Florida State Collection of Arthropods (FSCA). <http://www.cerambycids.com/usa/fsc/> [accessed on 27.VII.2009].

A new genus and species of oonopid spider (Araneae, Oonopidae) from Ukraine

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Academic editor: Dmitry Logunov | Received 15 September 2009 | Accepted 3 October 2009 | Published 9 October 2009

urn:lsid:zoobank.org:pub:9425C63A-2B04-4E5B-8E02-3F647EA2E5CD

Citation: Saaristo MI, Marusik YM (2009) A new genus and species of oonopid spider (Araneae, Oonopidae) from Ukraine. ZooKeys 24: 63–74. doi: 10.3897/zookeys.24.278

Abstract

The new genus and species *Spinestis nikita*, **gen. n.** and **sp. n.** from the Crimea, Ukraine is described from both sexes. The new genus resembles *Tapinesthis* and *Megaoonops*. The type species of these genera are illustrated. The conformation of the male palp and endogyna in Oonopidae are briefly discussed. The relationships of *Spinestis*, **gen. n.**, *Megaoonops*, *Oonopinus*, *Oonops* and *Tapinesthis* are discussed.

Keywords

Psempolus, stylus, spermatheca, receptaculum, taxonomy, *Oonopinus angustatus*, *Megaoonops avrona*, *Tapinesthis inermis*

Introduction

This paper is the second in a series of joint studies of the Palearctic Oonopidae. The first was devoted to the monotypic genus *Ferchestina* from the Russian Far East (Saaristo and Marusik 2004). In March 2002 the second author undertook a two-week collecting trip to the Crimea and visited several places on the eastern and western shores. Numerous oonopids were found in almost all the sites sampled, even though the group was previously unrecorded from the peninsula (cf. Mikhailov 1997; Kovblyuk 2003). Among hundreds of *Oonops pulcher* Templeton, 1835 (*sensu* Thaler 1981), there were a few specimens

that were larger in size, paler in colour and had more pairs of tibial spines than *O. pulcher* (6 pairs compared to 4 in the latter species). Examination of the male palp revealed that its structure was very different from those known in *Oonops* Templeton, 1835 and related genera. Instead, it resembled more closely that of the European oonopid *Tapinesthis inermis* (Simon, 1882). For example, both *T. inermis* and the Crimean specimens have a conical, rather than globular bulb. However, careful comparison of *T. inermis* and the Crimean material revealed significant differences in leg spination, coloration, the shape of the terminal part of the bulb and the epigyne. Previously we studied almost all the types of European Oonopidae molles (=species without dorsal abdominal scuta) described by Simon (1882) and Dalmas (1916), but the new specimens from southern Ukraine resembled none of them. Therefore, in this paper we describe the new species in a new genus.

Material and methods

Specimens were photographed using an Olympus SZX12 stereomicroscope and Olympus Camedia C-5050 camera. The images were montaged using “CombineZM” image stacking software in the Zoological Museum, University of Turku. Photographs were taken in dishes with paraffin on the bottom. Different size holes were made in the paraffin to keep the specimens in the correct position. The epigynes were macerated either with KOH or lactic acid. Internal structures of the bulb became more distinct after exposing the palp in lactic acid.

The type specimens are deposited in the Zoological Museum of Moscow State University (ZMMU; curator – KG Mikhailov) and the Zoological Museum, University of Turku (ZMUT; curator – S Koponen). The terminology follows Saaristo (2001, 2007), Saaristo and Marusik (2004) and Saaristo and van Harten (2006), with additional terms adopted from Burger et al. (2003).

Descriptions

Spinestis, gen. n.

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Type species: Spinestis nikita Saaristo & Marusik, sp. n. from the Crimea.

Etymology: Derived from the words “spine” and “*Tapinesthis*” (an oonopid genus with a somewhat similar palp). The gender is feminine.

Composition: Only the type species.

Diagnosis: Members of this new genus can be easily distinguished from all known Palearctic (at least Western Palearctic) Oonopidae molles, by having 6 pairs of ventral tibial spines on legs I and II (Fig. 9). The male palp is similar to that of *Tapinesthis inermis* (which belongs to a spineless genus) due to the conical structure of the bulb (Fig. 27), but differs in having a stylus on the psemboleus. The female genital area is also

rather different from other West Palaearctic Oonopidae molles, and particularly from the sympatric *Oonops pulcher* (*sensu* Thaler 1981), in lacking a distinct translucent receptacle. The endogyna with a thin, long, tube like receptaculum serves to easily differentiate *Spinestis*, gen. n. from all other Mediterranean Oonopidae.

Description: As for the type species.

Relationships. In terms of the habitus, this new genus resembles the generotypes of *Oonops* Templeton, 1835 and *Oonopinus* Simon, 1893. These three genera are similar in having lock-spines on the first two pairs of legs, and a stylus on the psembolus (only one European species attributed to *Oonops*, *O. domesticus* Dalmat, 1916, lacks a stylus. However, there are several significant differences: 1) *Spinestis*, gen. n. has a greater number of tibial spines (6 pairs) than any other oonopids (4–5 pairs in European *Oonops sensu lato* and *Oonopinus*); 2) The stylus (*St*) of the psembolus is fixed (unflexible) and strongly turned (it is flexible in *Oonops pulcher*, and never turned in *Oonopinus*); 3) All *Oonops sensu lato* and *Oonopinus* have a globular bulb, and the base of the psembolus is easily visible (Figs 28–29), whereas in the new genus the bulb is conical and the origin of the psembolus is inconspicuous. In addition, the vulva of *Spinestis*, gen. n. has an unusually long “receptacle” (*Se*), which has no widening in the terminal region.

The palpal bulb of the new species resembles that of *Tapinesthis inermis* (Fig. 23) and the recently described *Megaoonops avrona* Saaristo, 2007. In all three species it is conical, but all other characters are entirely different. *T. inermis* has no leg spines, has a more or less distinct pattern on the carapace (Fig. 12), a simple psembolus lacking a stylus (Figs 13, 27), with its opening on the tapering tip as in *Orchestina flagella* Saaristo et van Harten, 2006 or *Segestria* spp. (Segestriidae). The new genus differs from *M. avrona* in having lock-spines and by lacking spines on legs III and IV, having much shorter legs, possessing a stylus and several other characters. Females of the three genera have very different genitalia. In *T. inermis* the epigastric scutum is covered with dense hairs and has a large translucent pattern (Fig. 14). In *M. avrona* the receptacula are situated far from the epigastric furrow (Fig. 19). Aside from *Oonops s.l.*, *Oonopinus* and *Spinestis*, gen. n., lock-spines are known in *Ischnothyreus* Simon, 1893, *Ischnothyrella* Saaristo, 2001 and *Liyonneta* Benoit, 1979, These genera belong to two different genus groups of scutate oonopids (Saaristo 2001).

At present, it is unclear which genus of Oonopidae is most closely related to *Spinestis*, gen. n. on the basis of morphology, but the genus is more similar to *Oonops* and *Oonopinus* (due to presence of lock-spines, a stylus and in the shape of the epigyne) than it is to *Tapinesthis* or *Megaoonops*.

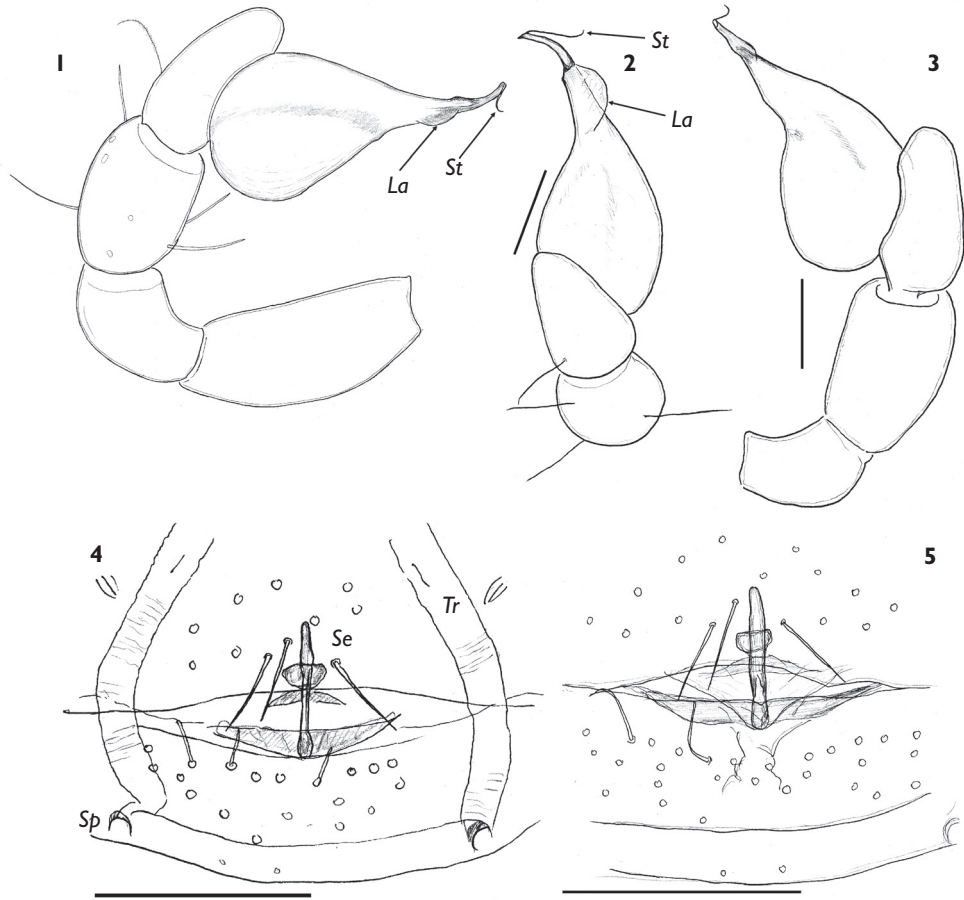
Distribution. South Crimea only, western and eastern shores.

***Spinestis nikita*, sp. n.**

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Figs 1–10, 20–22

Material examined: Holotype ♂ and paratypes 2 ♀ with label “UKRAINE, the Crimea, Nikita Vill., Nikitski Botanical Garden, 44°30'N 34°14'E, 5–70m, 11.03.2002 leg.



Figures 1–5. Copulatory organs of *Spinestis nikita*, sp. n.; **1–3** – male palp, retrolateral, dorsal and prolateral views respectively **4–5** – endogyna after maceration, ventral view. Scales = 0.1 mm.

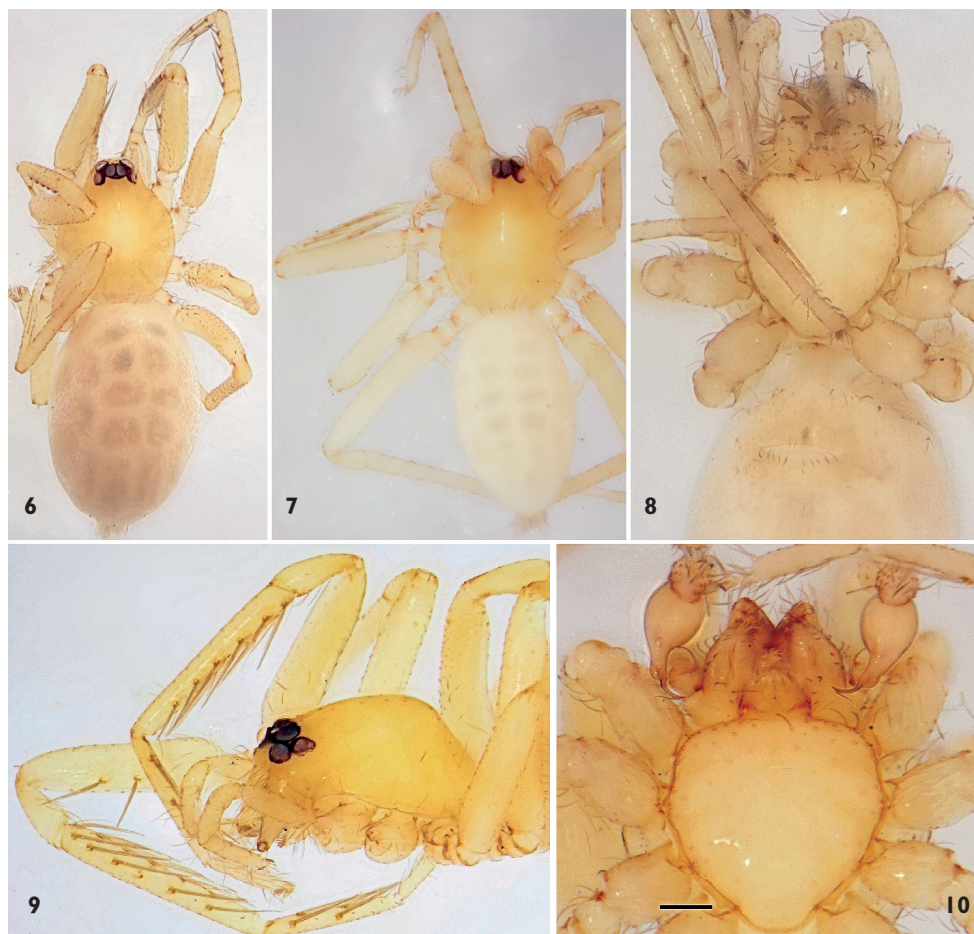
Yu. M. Marusik” (ZMMU). Other paratypes: 1 ♂ and 1 ♀ same data (MZT AA 3.728); 1 ♂ (ZMMU) “UKRAINE, the Crimea, Cape Martyan Reserve, 44°30’N 34°15’E, 1–70m, 10.03.2002 leg. Yu. M. Marusik”; 1 ♂ and 1 ♀ (ZMMU) “UKRAINE, Crimea, env. of Balaclava, Aya Cape, 44°29’482”N 33°36’579”E, 170m, 14.03.2002 leg. Yu. M. Marusik”.

Material was collected on open seashore slopes by sifting and hand picking among leaf and conifer needles. The exact habitat is unclear because this species was collected together with numerous *Oonops pulcher* Templeton, 1835 (*sensu* Thaler 1981), from which it seems indistinguishable in the field.

Etymology. The specific name is derived from the type locality - Nikita Village.

Diagnosis. As for genus.

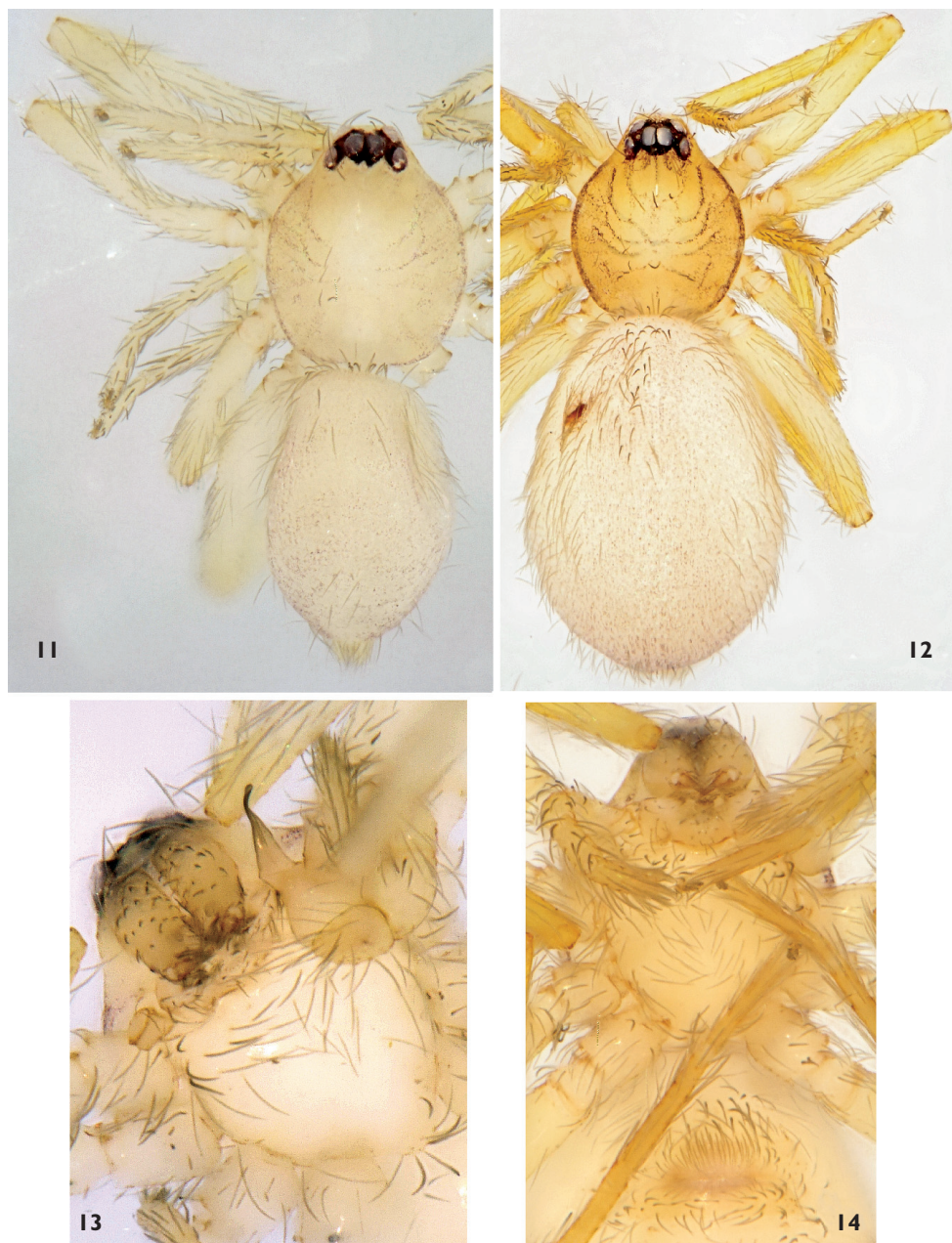
Description. Both sexes with uniform pale orange coloration (Figs 6–7), lacking any pattern. After some years in alcohol a translucent pattern appeared on the dorsal and ventral aspects of the abdomen (Fig. 6). Carapace almost as wide as long, rather



Figures 6–10. Habitus of *Spinestis nikita*, sp. n.; **6–7** female and male, respectively, dorsal view **8–9** female, ventral and lateral view respectively; **10** male, ventral view. Scales (if indicated) = 0.1 mm.

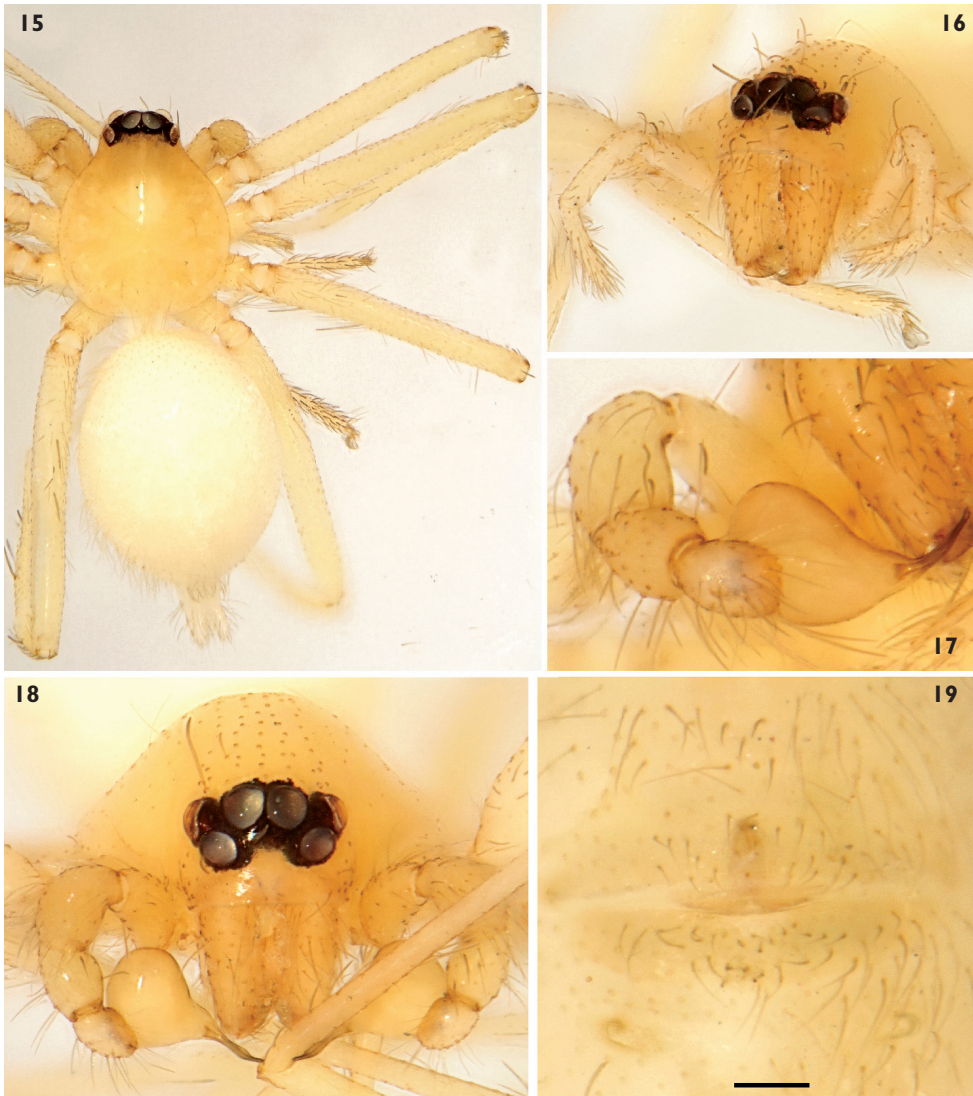
high, highest point in the posterior third (Fig. 9). Clypeus low, less than $\frac{1}{2}$ of ALE diameter. Median eyes largest. Sternum shield-like (Fig. 10), unmodified, not touching the carapace. Female palp unmodified (Fig. 9). Male maxillae elongate (Fig. 10). Legs rather long, femora subequal to or longer than the carapace. Spines present on legs I and II. Femur I with 2 prolateral spines, tibiae I–II with 6 pairs of ventral spines, metatarsi I–II with 2 pairs of ventral spines (Fig. 9).

Palp as in Figs 1–3, 10, 20–21, relatively long, cymbium large, as long as tibia, longer than patella. Size of bulbus subequal to length of tibia+cymbium. Bulbus conical, gradually tapering, without a clear division between the bulb itself (tegulum) and the psempobolus. Psempobolus with fixed stylus (*St*), sharply turned (as if appearing to be broken) backwards-retrolaterally, tip of stylus slightly bent, without distinct barb. Psempobolus rather simple, without any spines, with one thin membranous semiround lamella (*La*), more easily observed in dorsal view.



Figures 11–14. Habitus of *Tapinesthis inermis* from Belgium. **11–12** male and female, respectively, dorsal view **13–14** male and female, respectively, ventral view.

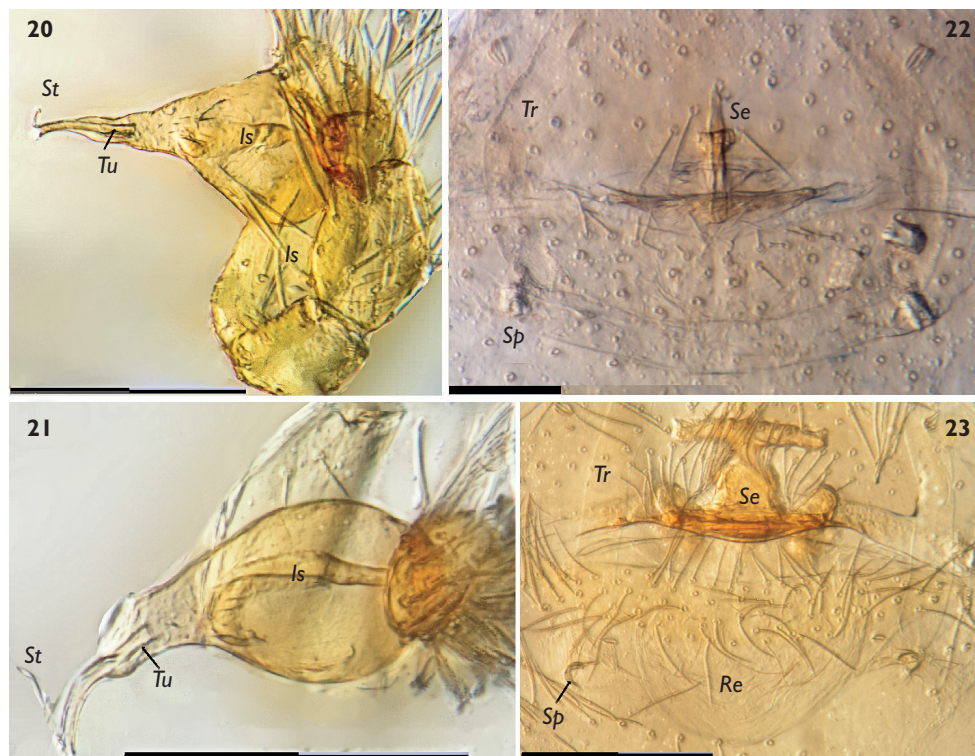
Female genital area lacking outgrowths, depressions or distinct pattern (Figs 4–5, 22), with short translucent longitudinal band above the epigastric furrow. Hairs in the genital area sparse, long; thick, short ciliate hairs on postepigastric scutum absent. Internal part (visible after maceration) consists of a long tube-like structure (*Se*,



Figures 15–19. *Megaoonops avrona* (paratypes). **15** male, dorsal view **16** female, frontal view **17** male palp, prolateral **18** male prosoma, frontal view **19** genital area of female.

spermathecae? *sensu* Burger et al. 2003) associated with a transverse plate. Behind the tube-like structure in the upper third is a transverse rectangular structure (anterior wall of the spermathecae? *sensu* Burger et al. 2003), seemingly connected to the tube. The rectangular structure is also associated with transverse chitinized “wings”. Tracheal spiracles (*Sp*) are situated far from the epigastric furrow, tracheae (*Tr*) rather thin.

Measurements: ♂ - Total length 1.67, carapace: 0.71 long, 0.66 wide, 0.3 high; abdomen: 0.97 long, 0.57 wide; carapace width/length ratio 0.92, carapace height/length ratio 0.42, tibia I/carapace length ratio 0.9, femur IV/carapace length ratio



Figures 20–23. Copulatory organs after maceration of *Spinestis nikita* (20–22), sp. n. and *Tapinesthis inermis* (23, from Belgium) **20–21** male palp, prolateral and dorsal views respectively **22–23** endogyna. Scales (if indicated) = 0.2 mm.

1.14. Leg I: $0.71+0.29+0.64+0.51+0.29 = 2.44$, Leg IV: $0.81+0.29+0.76+0.74+0.29 = 2.89$, Chelicera 0.29 high, clypeus low, less than $\frac{1}{2}$ of ALE diameter.

♀ - Total length 2.43, carapace 0.79 long, 0.71 wide, 0.33 high; abdomen: 1.31 long, 0.089 wide; carapace width/length ratio 0.91, carapace height/length ratio 0.42, tibia I/carapace length ratio 1.0, femur IV/carapace length ratio 1.1. Leg I: $0.74+0.29+0.79+0.53+0.29 = 2.63$, Leg IV: $0.86+0.33+0.73+0.77+0.3 = 2.99$.

Distribution. Southern shore of the Crimean Peninsula, Ukraine.

Discussion

Remarks on morphology of the copulatory organs.

Psembolus: Since Saaristo and van Harten (2006: p.129) invented the term psembolus (“trunk-like, sometime filamentous outgrowth from its [bulb] frontal side”), it has become necessary to invent epithets to describe the morphological variation of this structure. The simple type occurs in *Tapinesthis inermis* and *Megaonops avrona* Saaristo, 2007 (opening of seminal duct at the tip, bulb gradually turning into psembolus,

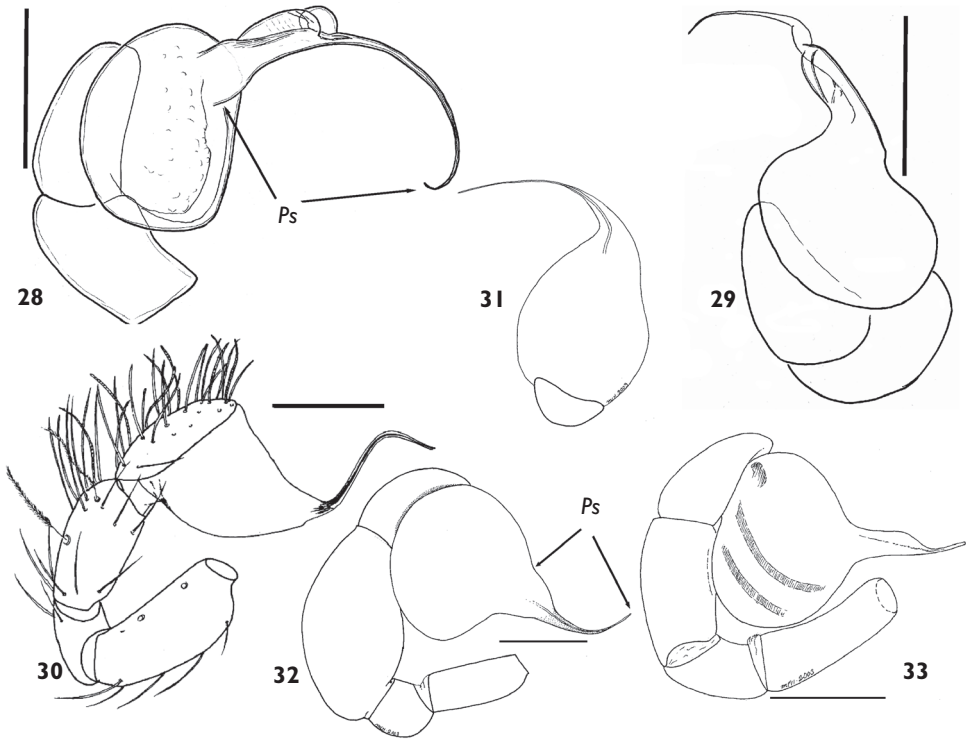


Figures 24–27. Macerated male palp of *Megaoonops avrona* (24–26, paratype) and *Tapinesthis inermis* (27, from Belgium). **24, 27** prolateral view **25** retrolateral view **26** dorsal view. Scales (if indicated) = 0.2 mm.

Figs 24–27). More advanced, but still simple psemboli are found in several species: *Orchestina avrona* Saaristo, 2007, *O. sedotmikha* Saaristo, 2007, “*Oonopinus*” *kilikus* Saaristo, 2001 (Figs 30–33). In these species the psembolus is more or less clearly distinguishable from the bulb.

If the psembolus is different, for example, by having some outgrowths (spines, stylus, ridges) and/or invaginations (*fenestra* in *Opopaea*) and/or the seminal duct opening is not at the tip of the tapering psembolus, then this can be called a modified psembolus. The diversity of modified types of psemboli is high, yet poorly studied. It is unclear whether the simple psembolus is the primitive state or a derived form, but several species in the presumably most primitive group of Oonopidae, *Orchestininae* (a single subfamily in oonopids with a blunt seminal duct, as in all other spider families) have a simple psembolus. A simple psembolus is known among both extant and extinct *Orchestininae* (cf. Wunderlich 2004; Marusik and Wunderlich, 2008).

Seminal duct. All Oonopidae except *Orchestininae* (*Orchestina s.l.* (Fig. 33), *Gallorchestina* Wunderlich, 2008, *Burmorchestina* Wunderlich, 2008, *Canadorchestina* Wunderlich, 2008 and *Ferchestina* Saaristo & Marusik, 2004) lack a blind sperm duct (Saaristo and van Harten, 2006; Marusik and Wunderlich, 2008) and have a large sinus for storing sperm. There are two different types of connection between the



Figures 28–33. Male palp of *Oonopinus angustatus* (28–29), “*Oonopinus*” *kilikus* (30), *Orchestina flagella* (31–32) and *O. sedotmikka* (33). **28, 30, 32–33** retrolateral view **29, 31** dorsal view. Scales = 0.1 mm.

sinus and pore through which sperm can enter and leave the bulb. Most oonopids have a connecting duct formed by the walls of the psembolus, but *Tapinesthis inermis*, *Megaonops avrona* and *Spinestis nikita*, sp. n. have an additional conical tube inside the duct (*Tu*, Figs 20–21, 24–27). This tube appears to hang on a sclerite (*Is*) connected to the base of the bulb (readily visible in *Spinestis*, gen. n. Figs 20–21). Inside the bursa (sinus) there is a kind of large sac (*Ss*, Fig. 24) that opens into the tube.

It is possible that the connecting duct is a remnant of the seminal duct, otherwise it is difficult to imagine how it may have evolved. If so, it is a plesiomorphic character, in comparison to the totally reduced seminal duct present in most Oonopidae. Thus, genera possessing this character are not necessary members of the same group (monophyletic).

Spermatheca/receptaculum: Burger et al. (2003) called the column-shaped, most sclerotized structure in the central part of the genital area the spermatheca. However, such a small spermatheca is not large enough to receive all the seminal fluid stored in two male palps. It seems that the true spermatheca lies behind the epigastric furrow and is weakly sclerotized (cf. Figs 18–22 in Platnick and Brescovit 1995 and Fig. 23 (*Re*)). Platnick and Brescovit (1995) described spermathecae as the “Anterior portion of female genitalia with single anterior receptaculum, expanded distally, pair of sclero-

tized lateral plates, and single, circular, sclerotized median plate; posterior portion with globose, membranous median receptaculum”.

Remarks on the relationships between *Megaonops* and *Tapinesthis*.

While comparing this new genus with other genera, we found that *Megaonops* and *Tapinesthis* had very similar palps. In addition, the body size of both genera is relatively large, and both lack lock-spines. However, other characters suggest that they are not closely related. For example, *Megaonops* has distinct spines on legs III and IV (absent in *Tapinesthis*), a male palpal femur with a heel-like structure (*He*, Fig. 25) (absent in *Tapinesthis* and other Oonopidae molles known to us), lacks a carapace pattern and has an entirely different epigyne. Therefore, the similar palps of *Megaonops* and *Tapinesthis* males are as a result of convergence.

Acknowledgements

We would like to thank Mykola M. Kovblyuk (Simferopol, Ukraine) who helped to organize the expedition in Crimea, Seppo Koponen (Turku, Finland) for organizing the stay of YM in Turku and Irina Marusik (Magadan, Russia) for help during the preparation of the manuscript. The English of the final draft was kindly checked and improved by David Penney (Manchester, UK). This project was supported in part by the Russian Foundation for Basic Research grant 09-04-01365.

References

- Burger M, Nentwig W, Kropf C (2003) Complex genital structures indicate cryptic female choice in a haplogyne spider (Arachnida, Araneae, Oonopidae, Gamasomorphinae). *Journal of Morphology* 255: 80–93.
- Dalmas R (1916) Révision du genre *Orchestina* E.S., suivie de la description de nouvelles espèces du genre *Oonops* et d’une étude sur les Dictynidae du genre *Scotolathys*. *Annales de la Société entomologique de France* 85: 203–258.
- Kovblyuk MM (2003) Catalogue of the spiders (Arachnida. Aranei) of the Crimea, South Ukraine. *Voprosy razvitiya Kryma. Vyp. 15. Problemy Inventarizatsii krymskoi bioty. Tauria-Plus, Simferopol*: 211–262. [in Russian]
- Marusik YM, Wunderlich J (2008) A survey of fossil Oonopidae (Arachnida: Aranei). *Arthropoda Selecta*, 17: 65–79.
- Mikhailov KG (1997) Catalogue of the spiders of the territories of the former Soviet Union (Arachnida, Aranei). Moscow: Zoological Museum of the Moscow State University, 416 pp.
- Platnick NI, Brescovit AD (1995) On *Unicorn*, a new genus of the spider family Oonopidae (Araneae, Dysderoidea). *American Museum Novitates* 3152: 1–12.
- Saaristo MI (2001) Dwarf hunting spiders or Oonopidae (Arachnida, Araneae) of the Seychelles. *Insect Systemetic and Evolution* 32: 307–358.

- Saaristo MI (2007) The Oonopid spiders (Araneae: Oonopidae) of Israel. *Arthropoda Selecta* 15(2): 119–140.
- Saaristo MI, Harten A van (2006) The oonopid spiders (Araneae: Oonopidae) of mainland Yemen. *Fauna of Arabia* 21: 127–157.
- Saaristo MI, Marusik YM (2004) *Ferchestina*, a new genus of oonopid spiders from Russian Far East (Aranei, Oonopidae). *Arthropoda Selecta* 13(1–2): 51–54.
- Simon E (1882). Etudes Arachnologiques. 13e Mémoire. XX. Descriptions d'espèces et de genres nouveaux de la famille des Dysderidae. *Annales de la Société entomologique de France* 2: 201–240.
- Thaler K (1981) Bemerkenswerte Spinnenfunde in Nordtirol (Österreich). *Veröffentlichungen des Museum Ferdinandeum*, 61: 105–150.
- Winderlich J (2004) Fossil spiders in amber and copal. *Beiträge zur araneologie*, 3A, 848 pp.