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## Two new *Oedanomerus* species from Zimbabwe (Coleoptera: Scarabaeidae: Melolonthinae: Tanyproctini)

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*Oedanomerus* Waterhouse, 1875 (Coleoptera: Scarabaeidae: Melolonthinae: Tanyproctini) was established for a single species *Oedanomerus hirsutus* Waterhouse, 1875 from Botswana. Arrow (1936) later described *O. longicornis* from Zambia and Frey (1960) described *O. pilosus* from Mozambique. Evans (1987) revised the genus and described *O. capriviensis* and *O. bicolor* from Namibia. Finally, Lacroix (2005) described *O. snizeki* from Zimbabwe, *O. squamosus* from Botswana, and *O. uhligi* from Namibia.

*Oedanomerus*, *Scapanoclypeus* Evans, 1987, and *Trichinopus* Waterhouse, 1875 constitute a trio of genera that are distinguished from other African Tanyproctini by their small size (12 mm or less), reduced mouthparts, and antennae with 8–10 antennomeres (Evans 1987). Species of *Scapanoclypeus* and *Oedanomerus* have simple claws, without cleft or teeth at base, a slightly conical labrum, and antennomere 3 that is equal in length to antennomere 4. *Trichinopus* has bifid claws, a distinctly conical labrum with rounded end, and antennomere 3 approximately as long as antennomere 4 (Lacroix 2005, 2007). The antennal club of *Scapanoclypeus* is at least three times longer than the combined length of antennomeres 1–4 and the clypeal surface is at nearly right angle in relation to the plane of the frons, while *Oedanomerus* has the antennal club about as long as the combined length of antennomeres 1–4 and the clypeal and frontal surfaces coplanar (Evans 1987; Lacroix 2005, 2007; Sehna 2013, 2014). *Oedanomerus* was subsequently mentioned by Lacroix (2005, 2007), who re-drew the figures and adopted the key from Evans (1987).

Recently, Miroslav Snížek (České Budějovice, Czech Republic) gave me a series of interesting specimens of *Oedanomerus* collected in Zimbabwe, and Sergey V. Murzin (Moscow, Russia) gave me material from Namibia. Examination of this material revealed two undescribed species and additional specimens of the previously described *O. squamosus*. The purpose of this paper is to describe the two new species, provide detailed photographs of *O. squamosus* and *O. uhligi*, and present an updated distribution map (Fig. 3) of the 10 known species of *Oedanomerus*.

Specimens were examined with a Novex stereomicroscope; measurements were taken in 20 mm with an ocular grid. Length measurements are from the anterior margin of the clypeus to apices of the elytra. The habitus photographs were taken with a Canon MP-E 65mm/2.8 1–5× macro lens attached to a Canon EOS 550D camera. Partially focused images of each specimen were stacked using the Helicon Focus 3.20.2 Pro software. Specimens in the type series are provided with one red printed label: “*Oedanomerus bidentatus* sp. n. or *Oedanomerus lupanus* sp. n., HOLOTYPUS or PARATYPUS [with type number], ♂, Richard Sehna det. 2016”. Exact label data are cited for type material examined. Separate labels are indicated by double vertical slashes [[]], lines within each label are separated by a vertical slash [[]]. Information in quotes indicates the original spelling. My remarks and additional comments are placed in brackets [].

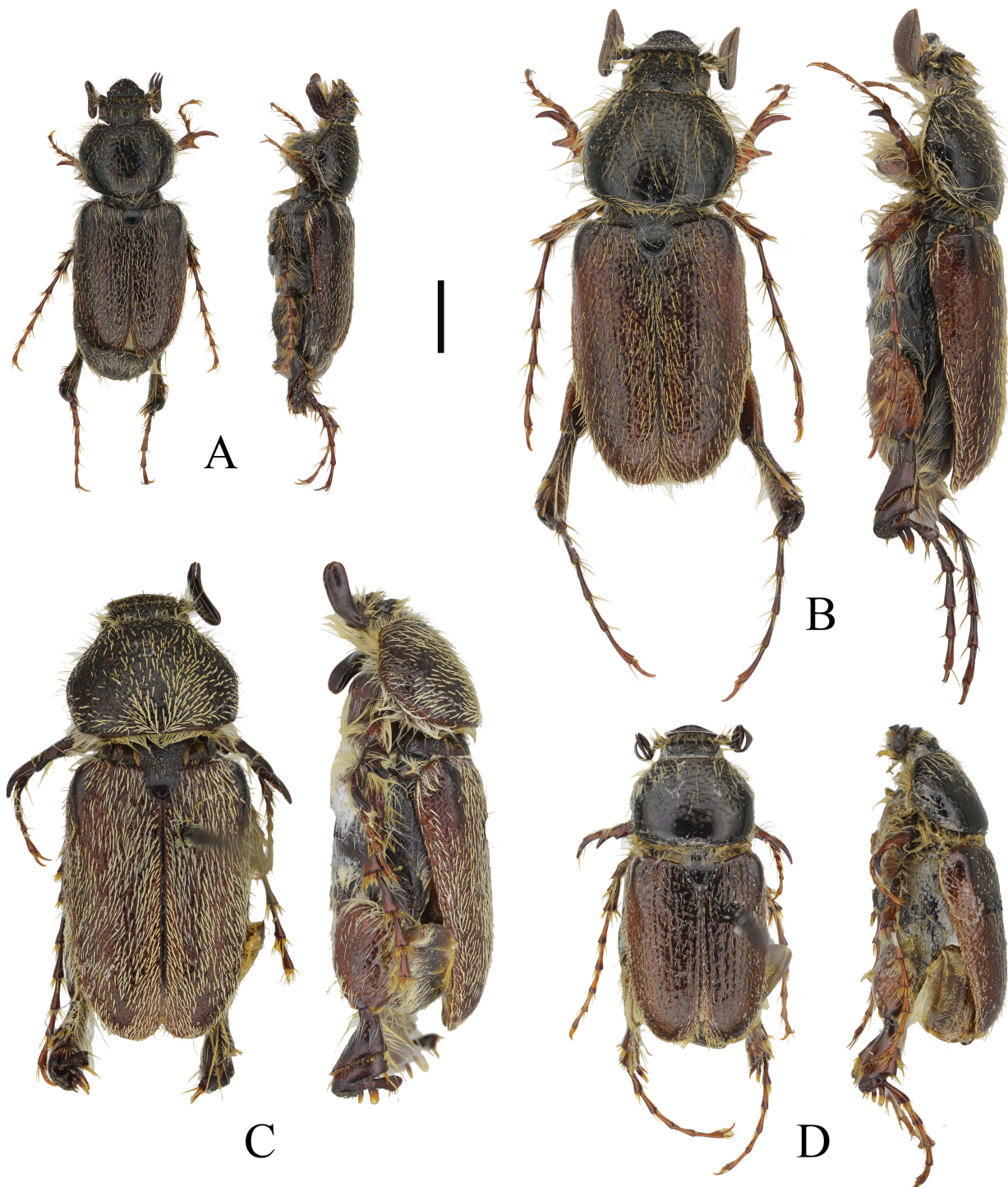
### *Oedanomerus bidentatus* Sehna, new species (Figs. 1A, 2A, 3A, 4A, 4E, 5J)

**Type locality.** Zimbabwe, [Matabeleland North Province], Bulawayo, Kenmaur.

**Type material.** Holotype and two paratypes (all males): “ZIMBABWE W | NW Bulawayo | Kenmaur env. | 18. 11. 2014 Snížek [white label, printed]”.

**Type depository.** Holotype in Národní muzeum Praha, Czech Republic; paratypes in Richard Sehna collection, Velenice, Czech Republic.

**Description of holotype (male).** Body length 6.1 mm. Body narrow, elongate. Head, pronotum, and scutellum black; antennae dark brown (Fig. 2A); elytra black with brownish-black margins (Fig. 1A). Protibiae and mesotibiae brown, metatibiae black, protarsi and mesotarsi testaceous, metatarsi brownish black, abdomen black.



**FIGURES 1A–D.** Habitus, dorsal and lateral views. A, *Oedanomerus bidentatus* Sehnal, new species, holotype male; B, *Oedanomerus lupanus* Sehnal, new species, holotype male; C, *Oedanomerus squamosus* Lacroix, 2005, holotype male; D, *Oedanomerus uhligi* Lacroix, 2005, holotype male. Scale bar = 1 mm.

Head. Clypeus pointed; clypeal carina broadly prominent, clypeal plate vertical; strongly punctate; each puncture bearing a long, erect, posteriorly inclined, yellow macroseta (Fig. 2E). Labrum reduced, triangular; lobes rounded. Frons deeply rugose; edge of clypeus strongly punctate; each puncture bearing a short, semierect, posteriorly inclined yellow macroseta.

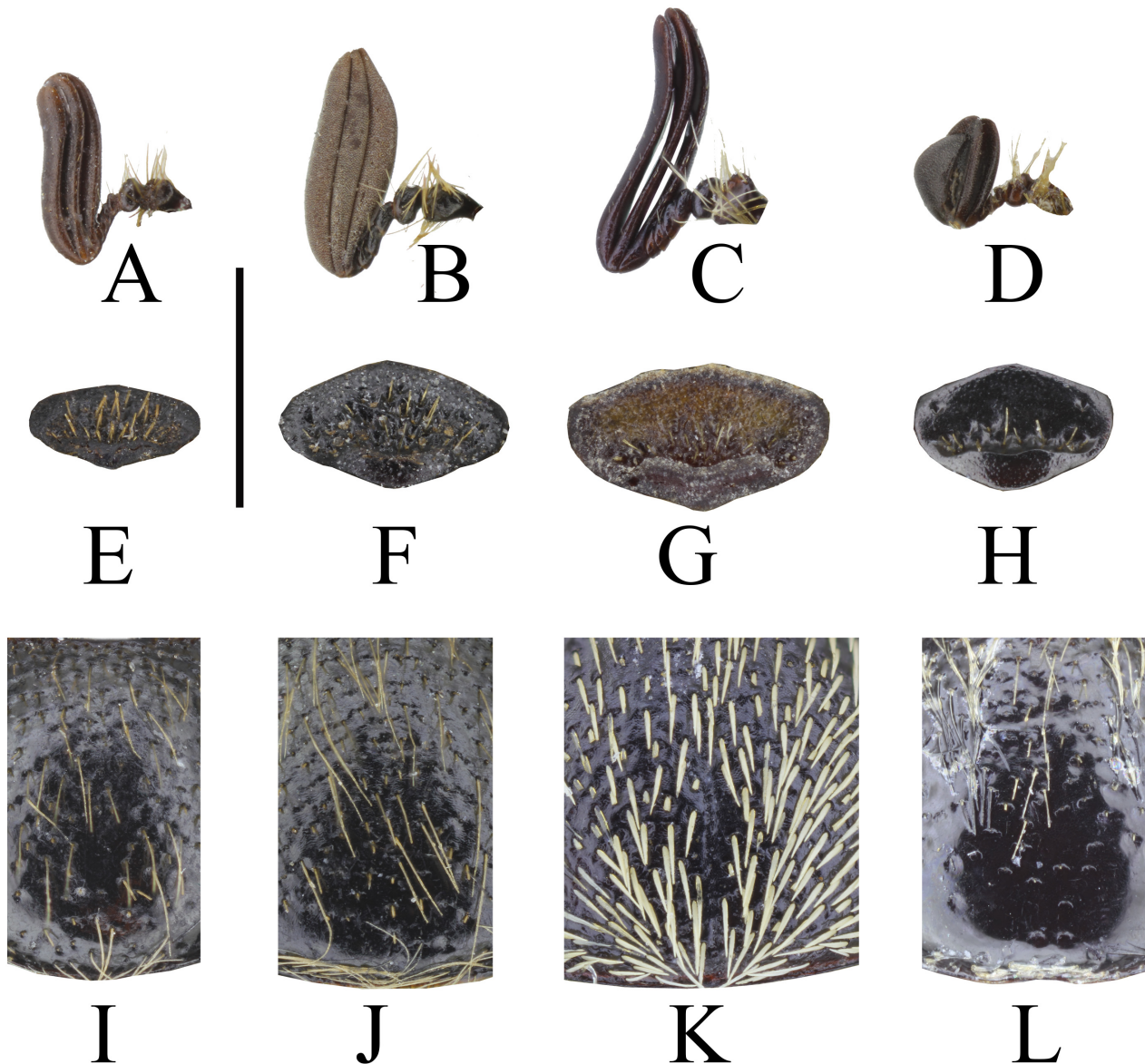
Eyes large, exceeding genae externally in dorsal view. Genae rugopunctate, with group of long macrosetae. Antennae (Fig. 2A) with eight antennomeres; antennomeres 6–8 forming long, apically curved club at least 1.8x times

longer than antennal shaft; antennomeres 1–5 with sparse, long macrosetae; antennal club completely finely punctate, without smooth areas. Pedicel bulbous and as long as antennomeres 3–5 combined. Terminal maxillary palpomere elongate, longer than palpomeres 2 and 3 combined; sub-basally with apically pointed, flat, oval alutaceous area tapering toward apex.

Pronotum (Fig. 2A) weakly convex, approximately tetragonal, 1.42x times wider than long, widest approximately at middle; margin nearly completely bordered, anterior border widely interrupted medially. Anterior angles strongly rounded; posterior angles broadly rounded, poorly defined. Surface with long, yellow macrosetae; shallowly punctate.

Scutellum matte, punctate only on margins, slightly longer than wide; margins broadly arcuate.

Elytra moderately convex, narrow. Disc wrinkled and punctate; punctures evenly distributed, separated approximately by more than 3x the puncture diameter; macrosetae short and denser than on pronotum, inclined posteriorly, absent from humeri. Sides punctate, with lateral margins and apices diffusely lighter-colored than disc.



**FIGURES 2A–L.** Antenna (A–D), clypeus (E–H) and pronotal disc (I–L). A, E, I, *Oedanomerus bidentatus* Sehnal, new species, holotype male; B, F, J, *Oedanomerus lupanus* Sehnal, new species, holotype male; C, G, K, *Oedanomerus squamosus* Lacroix, 2005, holotype male; D, H, L, *Oedanomerus uhligi* Lacroix, 2005, holotype male. Scale bar = 1 mm.

**Macropterous.** Legs. All femora shiny and irregularly, coarsely punctate; macrosetae relatively long. Protibia bidentate (Fig. 4E). Claws simple. Metafemora black with intermixed long macrosetae and long macrosetae. Mesotibiae moderately expanded apically. Metatibiae strongly expanded apically, with one oblique carina externally; carina and

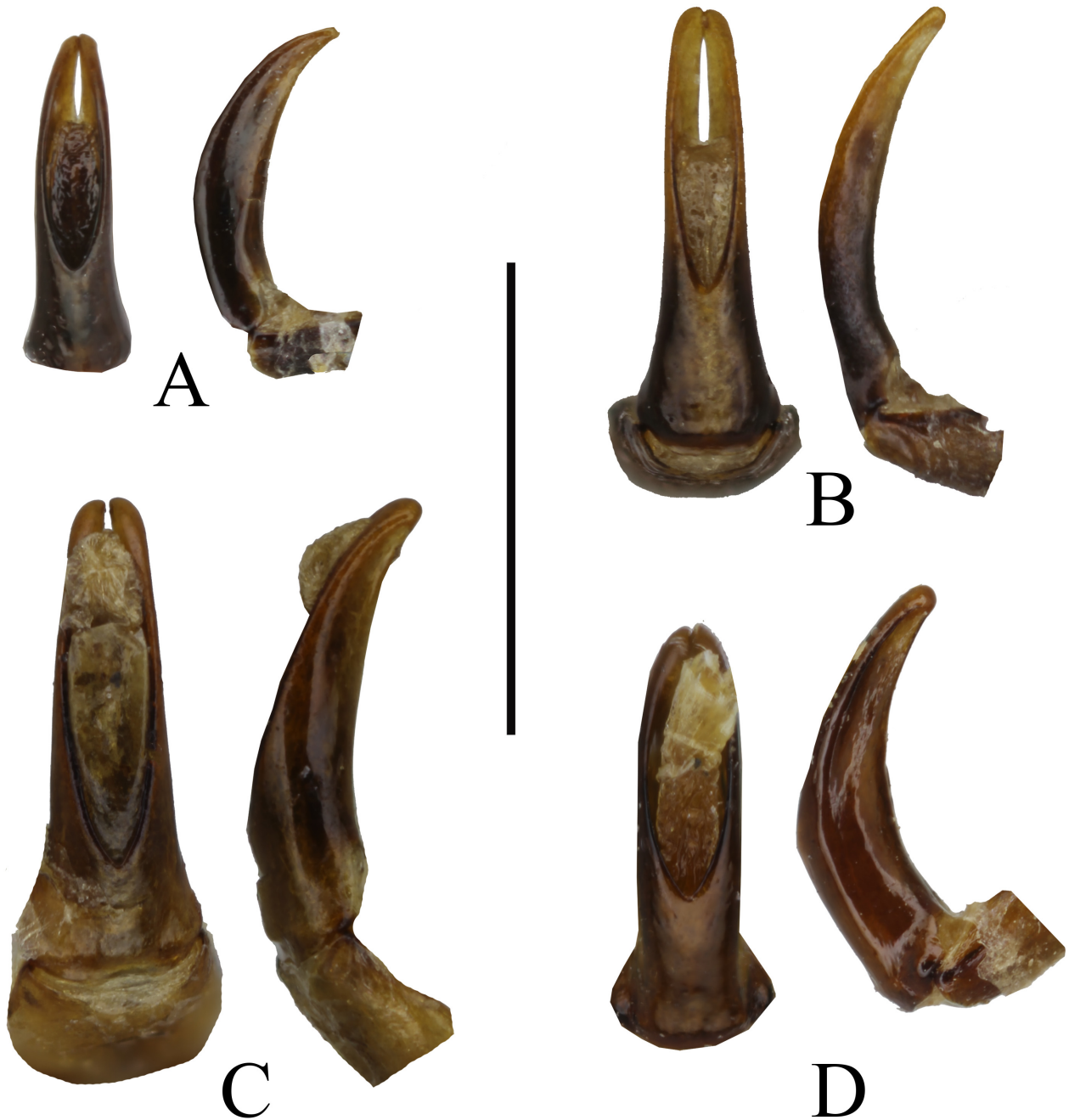
apical edge with row of elongate, stout macrosetae (Fig. 4A); terminal calcars stout, long, lower calcar slightly shorter than upper calcar. Pro-, meso- and metatarsomeres without patches of short, dense macrosetae; metatarsomeres ventrally covered with long, sparse macrosetae.

Abdominal sternites black, with yellow, recumbent macrosetae. Pygidium black, flat, very finely punctate, with fine, long macrosetae.

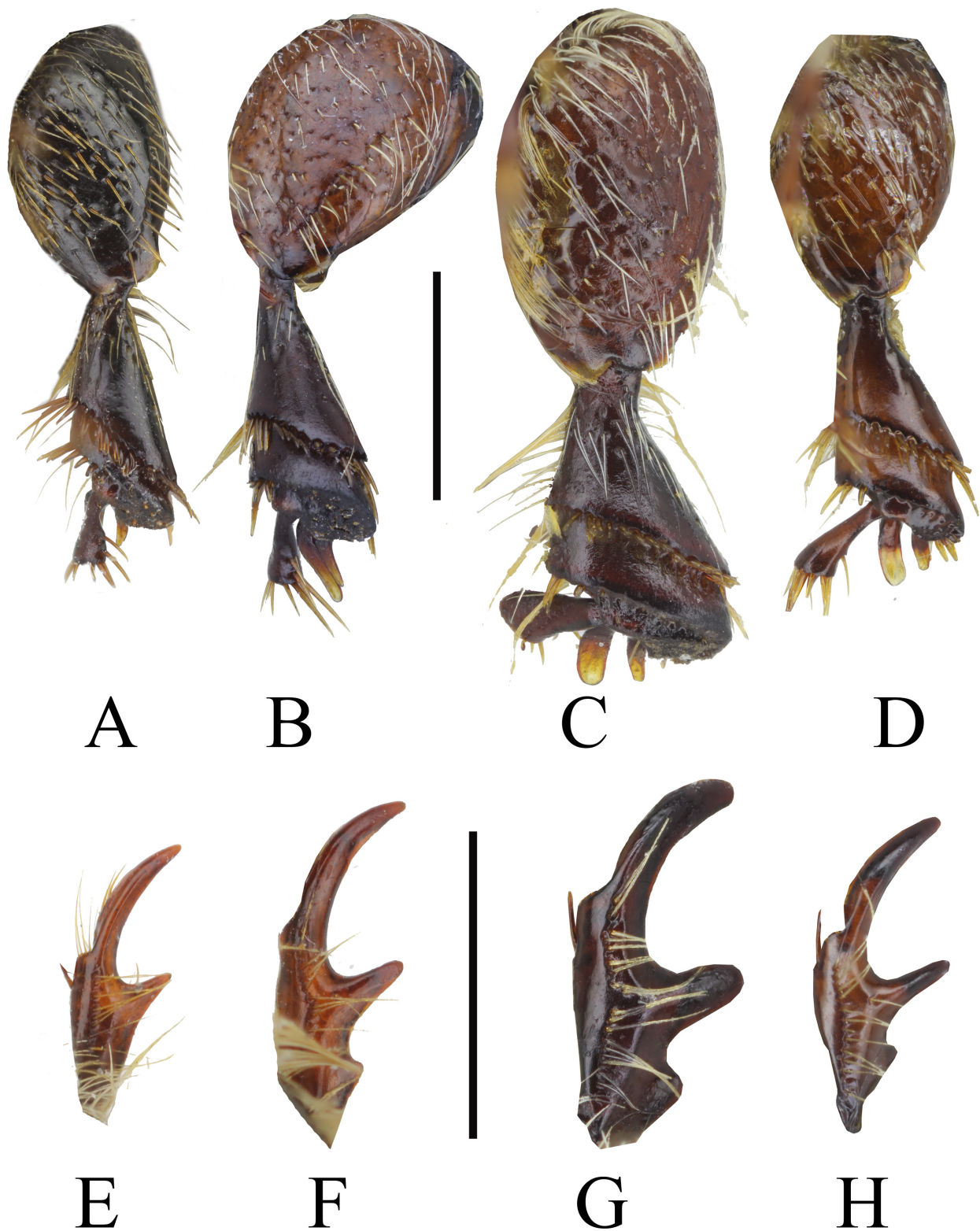
Male genitalia (Fig. 3A). Aedeagus symmetrical, parameres slender, relatively long.

**Variability in males.** Paratypes somewhat variable in body length (5.2–5.4 mm), slightly variable in dorsal punctation density and length and distribution of macrosetae. Coloration of one paratype is the same as the holotype, while the other paratype has dark brown elytra, with brownish-black humeral umbones.

**Female.** Unknown.



**FIGURES 3A–D.** Aedeagus, dorsal (left) and lateral (right) views. A, *Oedanomerus bidentatus* Sehnal, new species, holotype male; B, *Oedanomerus lupanus* Sehnal, new species, holotype male; C, *Oedanomerus squamosus* Lacroix, 2005, holotype male; D, *Oedanomerus uhligi* Lacroix, 2005, holotype male. Scale bar = 1 mm.



**FIGURES 4A–H.** Metafemur with metatibia (A–D) and protibia (E–F). A, E, *Oedanomerus bidentatus* Sehnal, new species, holotype male; B, F, *Oedanomerus lupanus* Sehnal, new species, holotype male; C, G, *Oedanomerus squamosus* Lacroix, 2005, holotype male; D, H, *Oedanomerus uhligi* Lacroix, 2005, holotype male. Scale bar = 1 mm.

**Diagnosis.** Based on characters stated in Evans (1987), the new species differs from its congeners by the following combination of characters: smaller and narrow species; antennae with eight antennomeres; bidentate protibia; clypeus pointed; clypeal carina broadly prominent; head, pronotum and elytra black with brownish-black margins; metafemur

black. Generally, the new species is similar to *O. lupanus* new species and *O. pilosus*. *Oedanomerus lupanus* new species has elytra brown with black suture and humeral umbones; tridentate protibia; larger body; wide clypeus; different shape of antennal club and shape of aedeagus (Figs. 1B, 2B, 3B, 4B, 4F). *Oedanomerus pilosus* has head and pronotum piceous, tridentate protibia, anterior clypeal margin broadly rounded; larger body; different shape of aedeagus (Evans 1987).

**Etymology.** The specific epithet is given for the two protibial teeth. The name is an adjective in the nominative singular.

**Distribution.** Zimbabwe, Matabeleland North Province, Kenmaur (Fig. 5J).

### ***Oedanomerus lupanus* Sehnal, new species (Figs. 1B, 2B, 3B, 4B, 4F, 5K)**

**Type locality.** Zimbabwe, [Matabeleland North Province], Hwange, Lupane.

**Type material.** Holotype and two paratypes (all males): “ZIMBABWE W | SE Hwange | 40 km NW of Lupane | 15. 11. 2014 Snížek [white label, printed]”.

**Type depository.** Holotype in Národní muzeum Praha, Czech Republic, paratypes in Richard Sehnal collection, Velenice, Czech Republic.

**Description of holotype (male).** Body length 7.1 mm. Body elongate. Head, pronotum and scutellum black (Fig. 1B); antennae bicolorous, antennal club pale brown, antennal shaft black (Fig. 2B); elytra chestnut brown with black suture and humeral umbones (Fig. 1B). Pro-, meso- and metatibiae brown, protarsi testaceous, meso- and metatarsi dark brown. Abdomen brownish black.

Head. Clypeus pointed; clypeal carina broad, prominent; clypeal plate vertical; shallowly punctate; each puncture bearing a long, erect, posteriorly inclined, yellow macrosetae (Fig. 2B). Labrum reduced, triangular; lobes rounded. Frons deeply rugose; edge of clypeus strongly punctate; each puncture bearing a long, semierect, posteriorly inclined, yellow macroseta.

Eyes large, exceeding genae externally in dorsal view. Genae rugopunctate, with group of long macrosetae. Antennae (Fig. 2B) with eight antennomeres; antennomeres 6–8 forming long, straight club at least 1.7x times longer than antennal shaft; antennomeres 1–5 with sparse, long macrosetae; antennal club completely densely punctate, without smooth areas. Pedicel bulbous and as long as antennomere 3. Terminal maxillary palpomere elongate, longer than palpomeres 2 and 3 combined; sub-basally with apically pointed, flat, oval alutaceous area tapering toward apex.

Pronotum (Fig. 2B) weakly convex, approximately tetragonal, 1.28x times wider than long, widest approximately at middle; margin nearly completely bordered, anterior border broadly interrupted medially. Anterior and posterior angles broadly rounded, poorly defined. Surface with very long, yellow macrosetae, basal border with white macrosetae; disc shallowly punctate and wrinkled, posterior angles without punctures.

Scutellum slightly longer than wide, matte, completely shallowly punctate, with long, fine macroseta, margins broadly arcuate.

Elytra moderately convex, narrow. Disc wrinkled and punctate; punctures evenly distributed, separated by more than 2x the puncture diameter; macrosetae short and denser than on pronotum, inclined posteriorly, absent from distinct humeri. Sides punctate, with lateral margins and apices diffusely lighter-colored than disc.

**Macropterous.** Legs. All femora shiny and irregularly, coarsely punctate; yellow macrosetae short and white macrosetae long. Protibia tridentate (Fig. 4F). Claws simple. Metafemora chestnut brown with intermixed long macrosetae and long macrosetae. Mesotibiae moderately expanded apically. Metatibiae black, strongly expanded apically, with one oblique carina externally; carina and apical edge with row of stout, yellow macrosetae; terminal calcar stout, long, lower calcar longer than upper calcar (Fig. 4B). Pro- and mesotarsomeres without patches of short, dense macrosetae; metatarsomeres ventrally covered with long, sparse macrosetae.

Abdominal sternites brownish black, with yellowish-white, recumbent macrosetae. Pygidium chestnut brown, flat, finely punctate, with very long, white macrosetae.

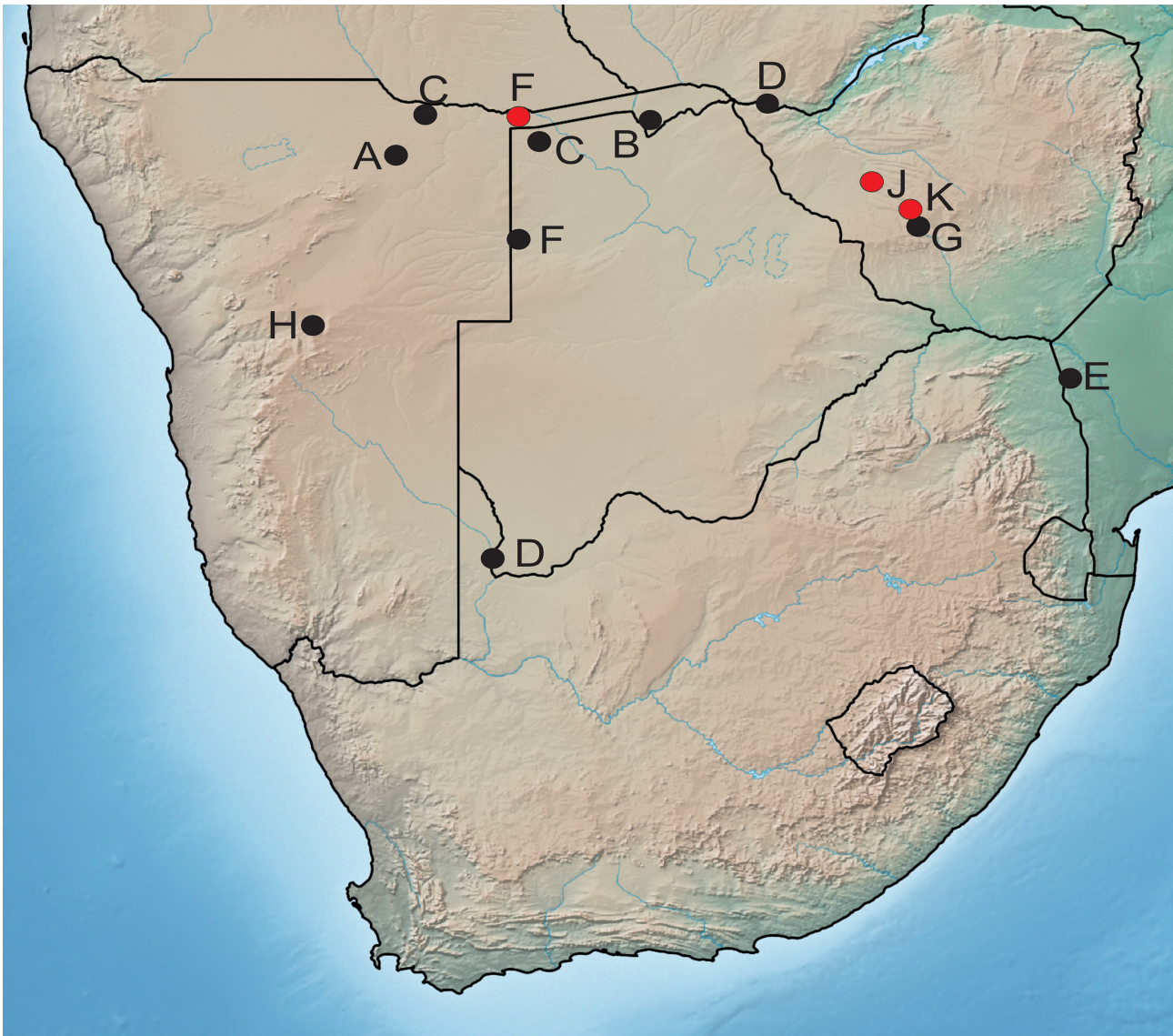
Male genitalia (Fig. 3B). Aedeagus symmetrical, parameres slender, long.

**Variability in males.** Paratypes somewhat variable in body length (7.3–7.4 mm), slightly variable in dorsal punctation density and length and distribution of macrosetae. Color as in holotype.

**Female.** Unknown.

**Diagnosis.** Based on characters stated in Evans (1987), the new species differs from its congeners by the following combination of characters: smaller and narrow species; antennae with eight antennomeres; tridentate protibia; clypeus pointed apically; clypeal carina broad, prominent; posterior pronotal angles without punctures, basal border with very long, white macrosetae; head and pronotum black, elytra chestnut brown with black suture and humeral umbones;

metafemur brown. Generally, the new species is similar to *O. pilosus* and *O. bidentatus* new species. *Oedanomerus pilosus* has head and pronotum piceous; anterior clypeal margin broadly rounded, clypeal subapical carina long; smaller body; and different shape of aedeagus (Evans 1987). *Oedanomerus bidentatus* new species has elytra black with brownish-black margins; narrower clypeus; bidentate protibia; smaller body; and differently shaped aedeagus and antennal club (Figs. 1A, 2A, 3A, 4A, 4E).



**FIGURE 5.** Map with currently known geographic distribution in southern Africa: A—*Oedanomerus bicolor* Evans, 1987; B—*Oedanomerus capriviensis* Evans, 1987; C—*Oedanomerus hirsutus* Waterhouse, 1875; D—*Oedanomerus longicornis* Arrow, 1987; E—*Oedanomerus pilosus* Frey, 1960; F—*Oedanomerus snizeki* Lacroix, 2005; G—*Oedanomerus squamosus* Lacroix, 2005; H—*Oedanomerus uhligi* Lacroix, 2005; J—*Oedanomerus bidentatus* Sehnal, new species; K—*Oedanomerus lupanus* Sehnal, new species. Red dots indicate new species or new locality.

#### Notes on other *Oedanomerus* species

##### *Oedanomerus squamosus* Lacroix, 2005 (Figs. 1C, 2C, 3C, 4C, 4G, 5G)

**Type material studied.** Holotype: “HOLOTYPE [red label, printed] | Botswana | Shakawe—Camp | 22.-24. ii. 1958 | leg. U. Göllner [blue label, printed] || *Oedanomerus* | *squamosus* n. sp. [handwritten] | M. LACROIX det. 2005 [white label, printed]” deposited in Museum für Naturkunde, Leibniz-Gemeinschaft, Berlin, Germany.

**Other material studied.** Namibia: Kavango region: 130 km E Rundu, 1030 m, 13–31.xii. 2013, S. Murzin, two males deposited in Národní muzeum Praha, Czech Republic, 22 males deposited in Richard Sehnal collection, Velenice, Czech Republic.

**Note.** To date, the species has been known only from the holotype. Specimens from Kavango Region near Rundu (Fig. 4G) represent the only additional material collected outside of the type locality. The species is recorded here for the first time from Namibia. Variability in males (between holotype and males from Kavango): body length 5.1–8.2 mm (holotype = 8.0), slightly variable in dorsal punctation density and length and distribution of scales. Color as in holotype. Detailed photographs are here presented for the first time.

***Oedanomerus uhligi* Lacroix, 2005 (Figs. 1D, 2D, 3D, 4D, 4H, 5H)**

**Type material studied.** Holotype: “HOLOTYPE [red label, printed] || Namibia 17.ix.2002 | 25°10'S/19°58'E, Farm | Viljoenskroom 122 km ESE | Gochas, leg. M. & B. Uhlig [blue label, printed] || *Oedanomerus* | uhligi n. sp. [handwritten] | M. LACROIX det. 2005 [white label, printed]” deposited in Museum für Naturkunde, Leibniz-Gemeinschaft, Berlin, Germany.

**Note.** This species is still known only from the holotype. Detailed photographs are here presented for the first time.

**Key to species of *Oedanomerus* (modified from Evans 1987 and Lacroix 2005)**

- 1 Antenna with nine antennomeres; club twice combined length of adjacent five antennomeres; clypeus with a subapical carina... 2
- Antenna with eight antennomeres; club subequal to combined length of adjacent four antennomeres; clypeus with apical margin reflexed..... 5
- 2 Pronotum and elytra with long, fine pilosity; elytral striae clearly visible ..... *O. snizeki* Lacroix, 2005
- Pronotum and elytra covered with short scales, elytral striae weakly visible..... 3
- 3 Clypeus flat, matte, micropunctate, without keel..... *O. squamosus* Lacroix, 2005
- Clypeus concave, strongly punctate, with keel ..... 4
- 4 Anterior margin of clypeus pointed..... *O. capriviensis* Evans, 1987
- Anterior margin of clypeus rounded..... *O. longicornis* Arrow, 1936
- 5 Pronotum squamose ..... *O. hirsutus* Waterhouse, 1875
- Pronotum setose ..... 6
- 6 Protibia bidentate..... *O. bidentatus* Sehnal, **new species**
- Protibia tridentate ..... 7
- 7 Elytra squamose; pronotum shiny ..... *O. bicolor* Evans, 1987
- Elytra setose; pronotum matte ..... 8
- 8 Pronotal disc with medial line; elytral striae distinct..... *O. uhligi* Lacroix, 2005
- Pronotal disc without medial line; elytra without striae..... 9
- 9 Smaller species, < 7.0 mm; clypeal subapical carina long, clypeus widely curved, anteriorly broadly arcuate; Namibia.....
- ..... *O. pilosus* Frey, 1960
- Larger species, > 7.3 mm; clypeal subapical carina short, clypeus pointed apically; Zimbabwe.....
- ..... *O. lupanus* Sehnal, **new species**

**Acknowledgments**

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