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NEW SPECIES OF *TOKTOKKUS* FROM MOZAMBIQUE (TENEBRIONIDAE: SEPIDIINI: MOLURINA)

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Abstract.— A new species of the genus *Toktokkus* Kamiński and Gearner, 2021 (*T. o-serraferrus* **sp. nov.**) (Coleoptera: Tenebrionidae) is described from Boroma, Mozambique. The new species can be distinguished from its congeners by the shape and sculpturing of the elytra: disc flat, with two distinct rows of sharp tubercles on the lateral margins of the elytra. An updated identification key and distribution map for all known *Toktokkus* species are included.

Key words.— Pimeliinae, tok-tokkie beetles, species discovery, Africa, Mozambique

INTRODUCTION

Toktokkus Kamiński and Gearner, 2021 (Tenebrionidae: Pimeliinae: Sepidiini) is a widespread, commonly collected genus from southern Africa, which currently contains 13 species and subspecies (Kamiński *et al*. 2021). Before the genus was established, this taxonomic grouping was classified as the *Psammodes vialis* species-group (Koch 1955). Species of *Toktokkus* are recognizable by their large size (18.0–33.0 mm), presence of tubercles on the sides and apex of the elytra, and expanded epipleuron, which surrounds the fifth ventrite (Kamiński *et al*. 2021). As in many members of Sepidiini Eschscholtz, particularly in the subtribe Molurina Solier, species in this genus locate mates by tapping their abdomens on the ground (Lighton 1987, 2019, Matthews *et al*. 2010, Kamiński *et al*. 2021). Their colloquial name, tok-tokkies, is based on this behavior. Presently, two papers investigating the phylogeny of Sepidiini are available, and both support the monophyly of *Toktokkus* (Kamiński *et al*. 2021, Gearner *et al*. 2021).

While examining specimens at the Ditsong Museum in Pretoria (Republic of South Africa), the authors found two specimens, which represent a previously unknown species of *Toktokkus*. Description of the new taxon is provided below.

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Material and methods

The present paper is a direct follow-up to the recently published revision of the genus (Kamiński *et al*. 2021). The authors have investigated a diverse set of specimens originating from several entomological collections of the world, including most of the type material (see Appendix S2 in Kamiński *et al*. 2021). The newly discovered specimens were found, and deposited, in the collection of the Ditsong Museum of Natural History, Pretoria (TMSA). Description style and morphological terminology follows that of Kamiński *et al*. (2021). Images were taken using a Canon 77D body with Canon EF 100 mm macro lens. The distribution of species was illustrated using QGIS version 2.4. Distributional records for previously recognized species were taken from Kamiński *et al*. (2021).

Taxonomy

Key to the species of the genus *Toktokkus* (modified from Kamiński *et al*. 2021)

1. Elytral disc flat (Fig. 1B); tubercles pointed, arranged in two distinct rows confined to the lateral margins which merge toward the base of the elytra (Fig. 1C) . . . . . ***T. o-serraferrus*** sp. nov.
–. Elytral disc mostly convex, flattened only in case of *T. waclawae* (Fig. 3F in Kamiński *et al*. 2021); tubercles sharp or obtuse, arranged in several rows, widely distributed on elytral sides **2**
2. Apex of elytra not sloped (dorsal view) and depressed with clear margin . . . . . ***T. congolensis*** Kamiński & Gearner, 2021
–. Apex of elytra sloped (dorsal view) and flat to slightly convex **3**
3. Margin of prosternal collar expanded and folded out into a large lip (Fig. 3C in Kamiński *et al*. 2021) elytra round, almost heart shaped; declivous portion of elytra with little to no tubercles . . . . . ***T. tschinkeli*** Kamiński & Gearner, 2021
–. Margin of prosternal collar not expanded, only occasionally folded out; elytra round or elongate; declivous portion of elytra with tuberculate rows . . . **4**
4. Disc of pronotum with prominent punctures (Fig. 3D in Kamiński *et al*. 2021); gold setae present on elytra . . . . . ***T. herero*** Gearner, 2021
–. Disc of pronotum only with micropunctures; elytra not covered with setae **5**
5. Tubercles on elytral sides round/globular, vertically direct **6**
–. Tubercles on elytral sides pointed, directed posteriorly 7
6. Elytral tubercles dense (1.0–1.5 diameters apart), laterally reaching humerus; elytra round . . . . . ***T. mulleri*** (Péringuey, 1899)
–. Elytral tubercles sparse (2–3 diameters apart), laterally terminating prior to humerus; elytra elongate to round . . . . . ***T. schultzei*** (Péringuey, 1908)
7. Elytral tubercles sparse (4–6 lateral rows), deeply angled **8**
–. Elytral tubercles dense (more than 6 lateral rows), slightly angled **9**
8. Elytral tubercles distinct, not confluent, nearly reaching humeri . . . . . ***T. barclayi*** Kamiński & Gearner 2021
–. Elytral tubercles small and short, confluent into rows, terminating well before humeri . . . . . ***T. mashunus*** (Péringuey, 1896)
9. Microtubercles present between tuberculate rows, tuberculate rows rarely elevated on ridges **10**
–. Elytral tubercles all relatively the same size, no microtubercles present between rows, tuberculate rows often elevated on ridges **11**
10. Body size fairly small (18.0–23.0 mm); elytral tubercles relatively dense, almost confluent; tubercles relatively short . . . . . ***T. tuberculipennis*** (Haag-Rutenberg, 1871)
–. Body size medium to large (28.0–32.0 mm); elytral tubercles less dense, only occasionally confluent; tubercles taller . . . . . ***T. makuya*** Gearner, 2021
11. Elytral tubercles large, often confluent; tuberculate rows extend over humeri to scutellum; humeri prominent; disk of elytra where smooth often flat . . . . . ***T. waclawae*** Kamiński 2021
–. Tubercles medium sized, not confluent; tuberculate rows end at humeri; humeri not prominent; disc of elytra where smooth generally convex . . . . . ***T. vialis*** (Burchell 1822)

Toktokkus o-serraferrus sp. nov.

Type material. **Holotype** (TMSA), male: 'Boroma'. **Paratype** (TMSA), female: no label.

Diagnosis. *Toktokkus o-serraferrus* is most easily differentiated from its congeners by the shape and sculpturing of the elytra (Fig. 1). In particular, the flatness of the elytral disc and presence of the two rows of sharp tubercles on the lateral margins of the elytra (Fig. 1C). All other species in the genus have more than two tuberculate rows (Kamiński *et al*. 2021); one species, *T. waclawae*, also has a flat elytral disc (Fig. 3 in Kamiński *et al*. 2021), however, it can be differentiated from *T. o-serraferrus* by its dense tuberculate rows, which are present on the reflexed lateral sides of the elytra. Furthermore, in *T. o-serraferrus* the elytral disc is flatter (Fig. 1B, C).

Description. Length 23.0–24.0 mm, width of pronotum 7.0–9.0 mm and elytra 15.0–17.0 mm.

Head: Hypognathous. Frons finely punctate (~1–3 diameters apart); frontoclypeal suture coarse,

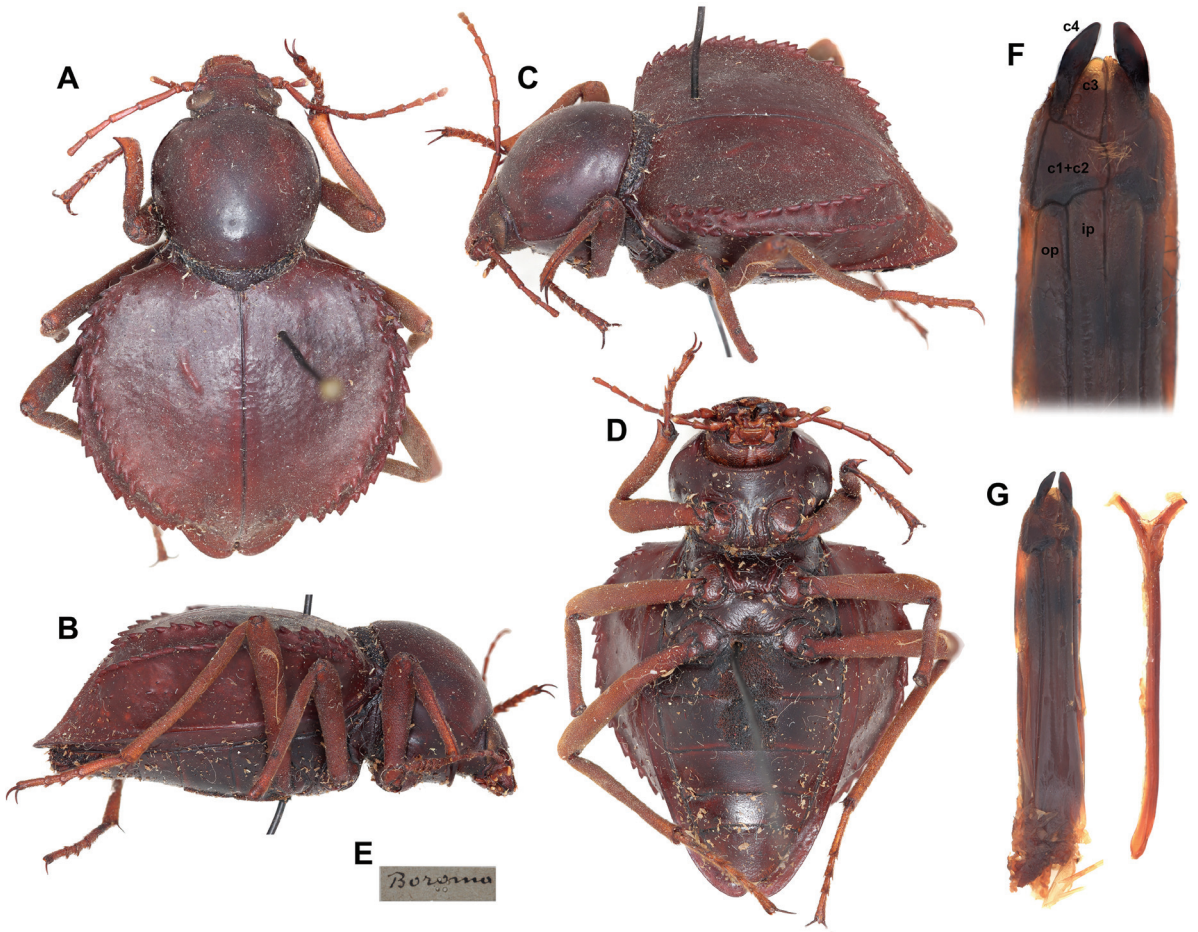

Figure 1. New *Toktokkus* species (*T. o-serraferrus*) from Mozambique: (A) Dorsal; (B) lateral, and (C) dorso-lateral display of flattened elytral disc and rows of tubercles; (D) ventral view of holotype; (E) locality label; (F) close-up of the ovipositor apex (paratype); (G) ovipositor and spiculum ventrale (paratype). Abbreviations: c1–c4 – coxites; ip – inner plate of paraproct; op – outer plate of paraproct.

presenting as a deep groove in middle; apical clypeal margin broad and weakly emarginate; labrum coarsely punctate laterally with shallow groove along apical margin bearing yellow, acuminate setae. Eyes comma-shaped, with ventral portion reduced, strongly emarginate around epistomal base. Mentum trapezoidal and narrowing basally; apical margin straight and not emarginated. Antennae slender, bearing recumbent, acuminate, yellow setae; length of antennomere 2 equal to ~0.1 of antennomere 3; length of antennomere 4 about half antennomere 3; length of antenna nearly equal to pronotum. **Prothorax**: Pronotal lateral margin rounded. Pronotum widest in anterior half. Disc shining, finely punctate; anterior apices not produced (or at most weakly so). Hypomeron convex, shining, and sparsely and finely punctate (>3 diameters apart). Prosternal process rounded in lateral view, longitudinally depressed in middle and rugosely sculptured (ventral view). **Pterothorax**: Scutellum densely tuberculate. Elytra widest in basal third, disc flat, sharply angled inward laterad below margin; disc finely and sparsely punctured (>3 diameters apart), without tubercles; two parallel rows of sharp tubercles on the dorsally visible lateral margins converging basally and curving inwardly toward the midline preapically; remaining lateral elytral area visible only ventrally, finely and sparsely punctured (>3 diameters apart), becoming weakly tuberculate apically. Elytral slope steep, weakly tuberculate medially, elytral apex rounded and explanate. Epipleura impunctate and without tubercles, clearly differentiated from neighbouring portion of elytra and encircling ventrite 5. Mesoventrite with median groove. Metaventrite finely and sparsely punctured and setose. Male with small, densely setose patch medially. Lateral regions of metaventrite (between coxae) extremely short. Metaepisternal suture abbreviated posteriorly. **Legs**: densely covered in golden setae. Procoxa exposed basally. Apex of protibia with prominent denticle on outer margin, lateral carina terminating in basal third; protibial spurs inequal in

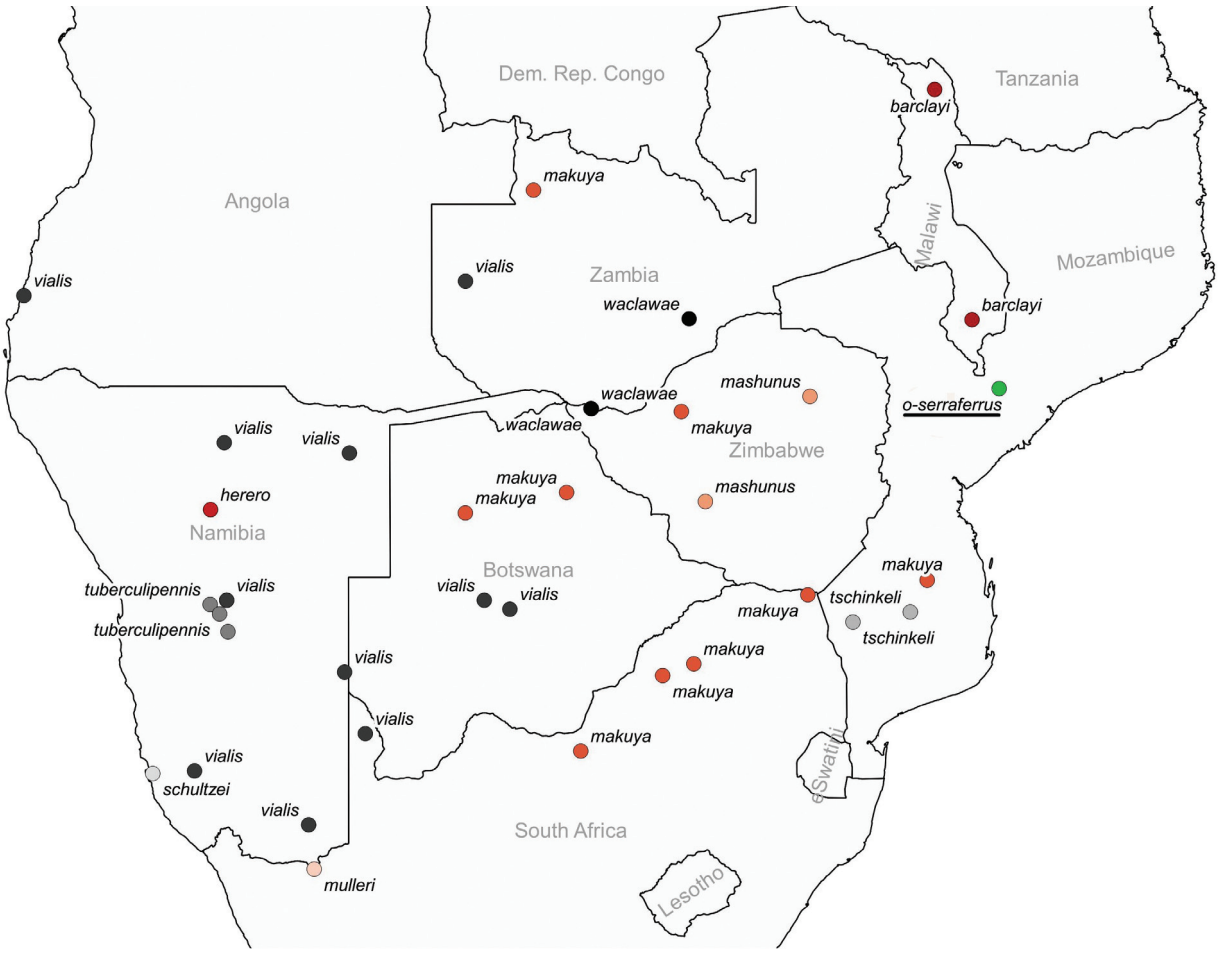

Figure 2. *Toktokkus* distribution from Kamiński *et al*. (2021), modified to include the newly described Mozambican *T. o-serraferrus* (underlined).

length. Meso- and metatibial spurs of equal length. Tarsi laterally compressed. **Abdomen**: ventrites 1–4 finely and sparsely punctate laterally (>3 diameters apart), punctation denser in midregion of ventrites 1–3. Female with sparse, short, yellow setae and male with ventrites 2 and 3 bearing large, dense patches of setae.

Terminalia: Male terminalia not dissected. Ovipositor elongate; paraprocts much shorter than coxites; coxites 1 and 2 merged, apical plate strongly sclerotized. Inner plate of paraproct elevated relative to outer plate (Fig. 1F). Spiculum ventrale with elongate base (Fig. 1G).

Note. While it is generally considered good practice to describe male terminalia of new taxa, the aedeagal morphology is not among diagnostic characters for the majority of Sepidiini. Taking this into consideration the holotype of *Toktokkus o-serraferrus* sp. nov. was not dissected to preserve the specimen.

Etymology. The specific epithet refers to diagnostic features of the species. In particular, the outer perimeter of the elytra of this species resembles a circular saw blade. The Latin "ferrum" and "serra" refer to "blade" and "saw" respectively, while "o-" refers to the circular outline of the elytra seen from above. The format of the newly introduced name follows the International Code of Zoological Nomenclature Art. 32.5.2.4.3 (ICZN 1999).

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