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A NEW GENUS OF THE TRIBE ASIDINI (COLEOPTERA: TENEBRIONIDAE) FROM SOUTH AFRICA, WITH DESCRIPTION OF TWO NEW SPECIES

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Abstract.— A new genus (*Saeculum* gen. nov.) of South African endemic Asidini is described to accommodate two newly described species (*Saeculum zoologicum* sp. nov. – type species, and *Saeculum merkli* sp. nov.) and *Saeculum tuberosum* (Wilke, 1925) comb. nov. (previously treated as *incertae sedis* within Asidini). A key to the species is provided.



Key words.— darkling beetles, Pimeliinae, *Machleida*, new taxa, South Africa

INTRODUCTION

Currently seven genera and over 70 species representing the darkling beetle tribe Asidini (Coleoptera: Tenebrionidae) have been recorded from Southern Africa (Koch 1962). The most comprehensive treatment of this taxonomic group was presented by Koch (1962), in which he revised the generic concepts for the Sub-Saharan and Malagasy faunas at the species-level. Since then, only a single paper has been published on the taxonomy of the Afrotropical asidines (Kamiński *et al.* 2019). In that contribution, Kamiński *et al.* revised the genus *Machleida* Fahraeus, 1870. Based on a revised circumscription of *Machleida*, the

authors excluded *Machleida tuberosa* Wilke, 1925 from the genus, treating it as *incertae sedis* within Asidini. Apart from not sharing the diagnostic characteristics proposed for *Machleida* (*i.e.*, pronotal disc with large primary sculpturing consisting of two median carinae), the only known representative of that species (the holotype) had a pronotal disc densely covered with setose tubercles. This feature has not been observed in any of the other known genera of the Southern African Asidini (Koch 1962). Based on this observation, Kamiński *et al.* (2019) suggested that *M. tuberosa* should likely be assigned to a new genus. However, due to the scarcity of available materials no taxonomic decisions were made.

During a recent investigation of material from the Ditsong National Museum of Natural History (Pretoria, South Africa) more specimens representing forms similar to *tuberosa* were identified. This supports the taxonomic distinctiveness of the *tuberosa* lineage within Asidini and is used here as a justification for designation of a new genus. Detailed description of the studied material is presented below.

MATERIAL AND METHODS

This study was based on material from the Natural History Museum, London, United Kingdom and Ditsong National Museum of Natural History Pretoria, South Africa. Label data for the studied specimens is presented verbatim. Line breaks on labels are denoted by a slash (/), while data originating from different labels is separated by comma. Morphological terminology follows Doyen (1994). Due to scarcity of materials, terminalia were not dissected. Images were taken using a Canon 1000D body with extension rings and a Canon Macro Lens EF 100 mm. The distribution of species was illustrated using Quantum GIS (QGIS) v. 2.4. The concept of ecoregions was adopted after Olson *et al.* (2001).

RESULTS

Saeculum gen. nov.

Type species. *Saeculum zoologicum*; here designated.

Diagnosis. The representatives of this genus can be distinguished from other Southern African Asidini by the unique structure of the pronotum (Koch 1962); *i.e.* pronotal disc is densely covered with setose tubercles (Fig. 1).

Saeculum shares many diagnostic features with *Machleida* Fåhræus, 1870, to which it is most likely closely related (Kamiński *et al.* 2019). Both genera have antennae appearing as 10-segmented, with antennomeres 10+11 of equal width; mentum reduced basally, not fully filling buccal cavity; hypomeron with shallow, posteriorly abbreviated antennal sulcus; mesoprescutum with deeply emarginate base; elytra covered with tubercles; and expanded epipleura. *Saeculum* can be distinguished from *Machleida* by the lack of median carinae on the pronotal disc (Kamiński *et al.* 2019).

Description. Length 5.0–9.5 mm, width of elytra 3.5–6.0 mm. Integument reddish-brown to dark brown. **Head:** Frontoclypeal suture medially indistinguishable, weakly indented at margins, with pair of lateral depressions; apical clypeal margin broadly and shallowly emarginate; apical margin of labrum emarginate.

Eye elongate oval, weakly emarginate around epistomal base. Mentum with rounded base, not fully filling buccal cavity; anterior margin medially emarginate. Antenna appearing as 10 segmented, with merged antennomeres 10+11. **Prothorax:** Pronotal lateral margin sinuate, rounded at base, slightly raised. Pronotum widest below middle. Disc densely covered with small tubercles, each tubercle with acuminate setae; base bisinuate, with triangular extension in middle (partly covering scutellum). Hypomeron with shallow antennal sulcus. Prosternal process strongly convex, without median sulcus (ventral view). **Pterothorax:** Scutellum with median groove. Elytra covered with tubercles. Epipleura indistinguishable from neighbouring elytral area. **Legs:** Apex of profemora with small denticle on outer margin. Femora and tibia densely punctate and setose. Tarsi cylindrical, not flattened. **Abdomen:** ventrite 5 without submarginal sulcus. **Terminalia:** Not investigated.

Species included (3): *S. merkli* sp. nov.; *S. tuberosum* (Wilke, 1925) comb. nov.; *S. zoologicum* sp. nov.

Etymology. Named to celebrate the 100th anniversary of Annales Zoologici (1921–2021). From Latin “saeculum” meaning century (gender: neuter).

Distribution. Representatives of this genus have been collected in the following ecoregions of South Africa (Fig. 2): KwaZulu-Cape coastal forest mosaic, Maputaland-Pondoland bushland and thickets, Southern Africa bushveld.

Key to the species of the genus *Saeculum*

1. Surface between elytral tubercles moderately punctate (2–4 diameters apart) (Fig. 1A). Ventral and dorsal portions of elytra delimited by sharp carina *Saeculum zoologicum*
- . Surface between elytral tubercles smooth or extremely finely punctate (Fig. 1B). Ventral portion of elytra not delimited from dorsal portion by continuous carina, instead row of tubercles present 2
2. Body size: 5.0–7.0 mm. Elytral slope with two large tubercles in middle *Saeculum merkli*
- . Body size: 8.0 mm. Elytral slope covered with several small tubercles (Fig. 1C) *Saeculum tuberosum*

Saeculum zoologicum sp. nov. (Figs 1A, 2)

Type material. Holotype (Ditsong National Museum of Natural History, Pretoria, South Africa): “Entabeni, Zpbg / Nov. 1931 / G. van Son”, “B/7”.

Diagnosis. This species can be distinguished from its congeners by the unique structure of elytra – disc

with median and marginal carinae (visible at least near the base) and relatively coarse punctation (punctures 2–4 diameters apart) of elytral surface (glabrous or with fine punctation in the remaining species).

Description. Length 9.5 mm, width of elytra 6.0 mm. Integument dark brown. **Head:** Frons with shallow longitudinal median depression, densely punctate (~0.2 diameters apart), area between punctures tuberculate, each tubercle with acuminate seta; frontoclypeal suture medially indistinguishable, weakly indented at margins, with pair of lateral depressions; apical clypeal margin broadly and shallowly emarginate; clypeus slightly projected toward front of body; apical margin of labrum strongly and sharply emarginate, densely punctate (~0.2 diameters apart), each puncture with short yellowish acuminate setae. Eye elongate oval, length approximately 4x width, weakly emarginate around epistomal base. Mentum with rounded base, not fully filling buccal cavity; anterior margin weakly medially emarginate; densely punctate, each puncture with single acuminate seta. Submentum semicircular, concave medially, densely punctate. Antenna moderately clothed in erect acuminate yellowish setae; merged antennomeres 10+11 widened, length of antennomeres 10+11 equal to 0.8 length of antennomere 3; length of antenna equals to 0.9 of pronotal length. **Prothorax:** Pronotal lateral margin sinuate, rounded at base, slightly raised. Pronotum widest posterior to middle. Disc densely covered with small tubercles (1–2 diameters apart), each tubercle with acuminate setae; anterior margin strongly emarginate, anterior apices strongly produced; base bisinuate, with triangular extension in middle (partly covering scutellum). Humeri obtuse, slightly projecting towards dorsal side of body. Hypomeron with shallow antennal sulcus; sulcus densely covered with transverse rugosities. Prosternal process strongly convex, without median sulcus (ventral view). **Pterothorax:** Scutellum with median groove. Elytra widest behind middle, clothed with acuminate setae and densely distributed (1–2 diameters apart) small tubercles (same as on pronotal disc); medial and marginal costae present; medial branch visible at elytral base and prior to elytral slope, interrupted in middle; marginal branch visible exclusively near humeri; elytra without any trace of intervals and rows; ventral portion of elytra basally impunctate. Elytral slope steep (falling at a 75° angle). Epipleura indistinguishable from neighbouring elytral area. Mesanepisternum, mesepimeron, and metepimeron impunctate or sparsely punctate. Meso- and metaventre densely punctate and covered with acuminate setae. Lateral regions of metaventre (between coxae) extremely short. **Legs:** Apex of profemora with small denticle on outer margin. Femora and tibia densely punctate and setose. Tarsi cylindrical, not flattened. **Abdomen:** Ventrites 1–3 moderately punctate

and weakly rugulose; ventrites 4–5 densely punctate and setose; ventrite 5 without submarginal sulcus.

Etymology. Named to celebrate the 100th anniversary of *Annales Zoologici* (1921–2021).

Distribution. The single known specimen of this species is from the South African bushveld ecoregion (Fig. 2).

Saeculum merkli sp. nov.

(Figs 1B, 2)

Type material. Holotype (Ditsong National Museum of Natural History, Pretoria, South Africa): “Petermaritzburg / SA Museum”, “R. Lawrence / nov 1940”, “B/51”. Paratype (Ditsong National Museum of Natural History, Pretoria, South Africa): “Upper / Transvaal / N. 11/07”, “Durban Museum”.

Diagnosis. This species can be easily distinguished from its congeners by smaller body size (5.0–7.0 vs. 8.0 in *S. tuberosum*, 9.5 in *S. zoologicum*). *S. merkli* shows a high degree of morphological similarity to *S. tuberosum* since both share similar structure of elytra; i.e. lack of elytral costae, smooth surface between tubercles. The above mentioned species can be distinguished by the different arrangement of tubercles on the elytral slope – two large tubercles present in *S. merkli*; several small tubercles present in *S. tuberosum*.

Description. Length 5.0–7.0 mm, width of elytra 3.5–4.0 mm. Integument reddish-brown. **Head:** Frons with shallowly indicated longitudinal median depression, densely punctate (~0.2 diameters apart), area between punctures tuberculate, each tubercle with acuminate seta; frontoclypeal suture medially indistinguishable, weakly indented at margins, with pair of lateral depressions; apical clypeal margin broadly and shallowly emarginate; clypeus slightly projected toward front of body; apical margin of labrum strongly and sharply emarginate, densely punctate (~0.2 diameters apart), each puncture with short yellowish acuminate setae. Eye elongate oval, length approximately 5x width, weakly emarginate around epistoma base. Mentum with rounded base, not fully filling buccal cavity; anterior margin weakly medially emarginate; densely punctate, each puncture with single acuminate seta. Submentum semicircular, concave medially, densely punctate. Antenna moderately clothed in erect acuminate yellowish setae; merged antennomeres 10+11 widened, length of antennomeres 10+11 equals to 0.8 length of antennomere 3; length of antenna equals to 0.9 of pronotal length. **Prothorax:** Pronotal lateral margin sinuate, rounded at base, slightly raised. Pronotum widest posterior to middle. Disc densely covered with small tubercles (1–2 diameters apart), each tubercle with acuminate setae, with median pair of rounded

depressions; anterior margin strongly emarginate, anterior apices strongly produced; base bisinuate, with triangular extension in middle (partly covering scutellum). Humeri sharp, projecting outwards. Hypomeron with shallow antennal sulcus; sulcus glabrous. Prosternal process strongly convex, without median sulcus (ventral view). **Pterothorax:** Scutellum with median groove. Elytra widest behind middle, covered with large tubercles, each tubercle covered with acuminate setae, surface between tubercles smooth; medial and marginal costae absent. Elytral slope with; elytra without any trace of intervals and rows; ventral portion of elytra basally impunctate. Elytral slope steep (falling at 75° angle). Epipleura indistinguishable from neighbouring elytral area. Mesanepisternum, mesepimeron, and metepimeron impunctate or sparsely punctate.

Meso- and metaventre densely punctate and covered with acuminate setae. Lateral regions of metaventre (between coxae) extremely short. **Legs:** Apex of pro-femora with small denticle on outer margin. Femora and tibia densely punctate and setose. Tarsi cylindrical, not flattened. **Abdomen:** Ventrites 1–3 moderately punctate and weakly rugulose; ventrites 4–5 densely punctate and setose; ventrite 5 without submarginal sulcus.

Etymology. This species is dedicated to the memory of our late colleague dr. Ottó Merkl (1957–2021), Hungarian Natural History Museum (Budapest), prominent specialist in Tenebrionidae.

Distribution. Representatives of this species have been collected in the Maputaland-Pondoland bushland and thickets ecoregion of South Africa (Fig. 2).

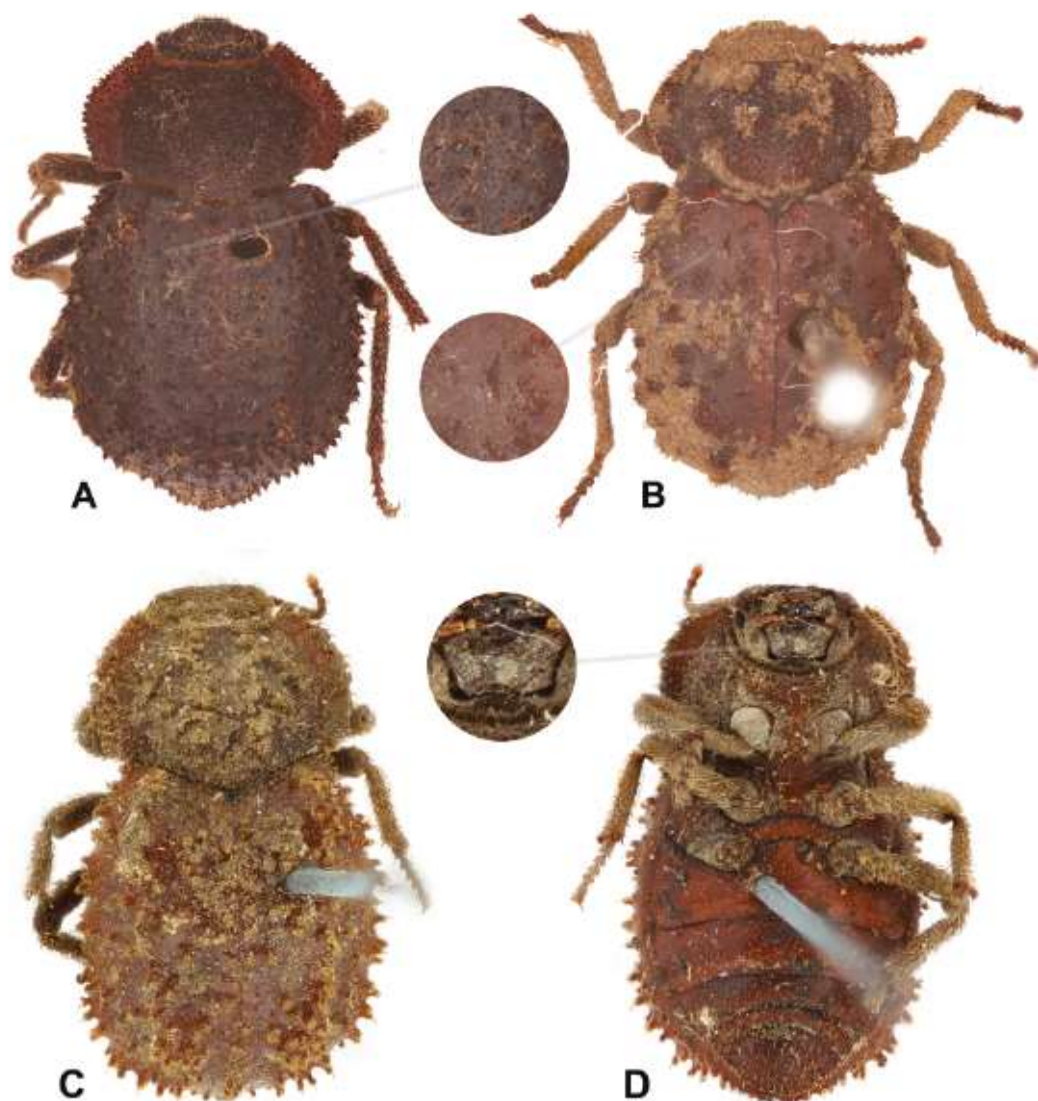


Figure 1. Habitus images of the studied species. *Saeculum zoologicum* sp. nov., (A); *S. merkli* sp. nov. (B), *S. tuberosum* (Wilke, 1925) comb. nov. (fot. Keita Matsumoto, Natural History Museum, London) (C–D).

Saeculum tuberosum (Wilke, 1925) comb. nov.
(Figs 1C, D, 2)

Machleida tuberosa Wilke, 1925: 535.

tuberosa (*Asidini incertae sedis*) Kamiński *et al.* 2019: 86.

Material studied. Holotype (Natural History Museum, London, United Kingdom): "Pt. Sheptone", "tuberosa / sp.n. det. S Wilke", "? sp", "Type", "1913: 466", "NHMUK 013903124".

Notes. This species was recently excluded from the genus *Machleida* (Kamiński *et al.* 2019). Because of

the scarcity of the materials, it was not clear if this species should be assigned to a new genus within the tribe Asidini. The present discovery of the species described here as *S. zoologicum* and *S. merkli* provided support for the taxonomic distinctiveness of the lineage represented by *S. tuberosum*. As a result the following combination is proposed: *Saeculum tuberosum* comb. nov.

Distribution. The single known specimen of this species is from the KwaZulu-Cape coastal forest mosaic ecoregion (Fig. 2).

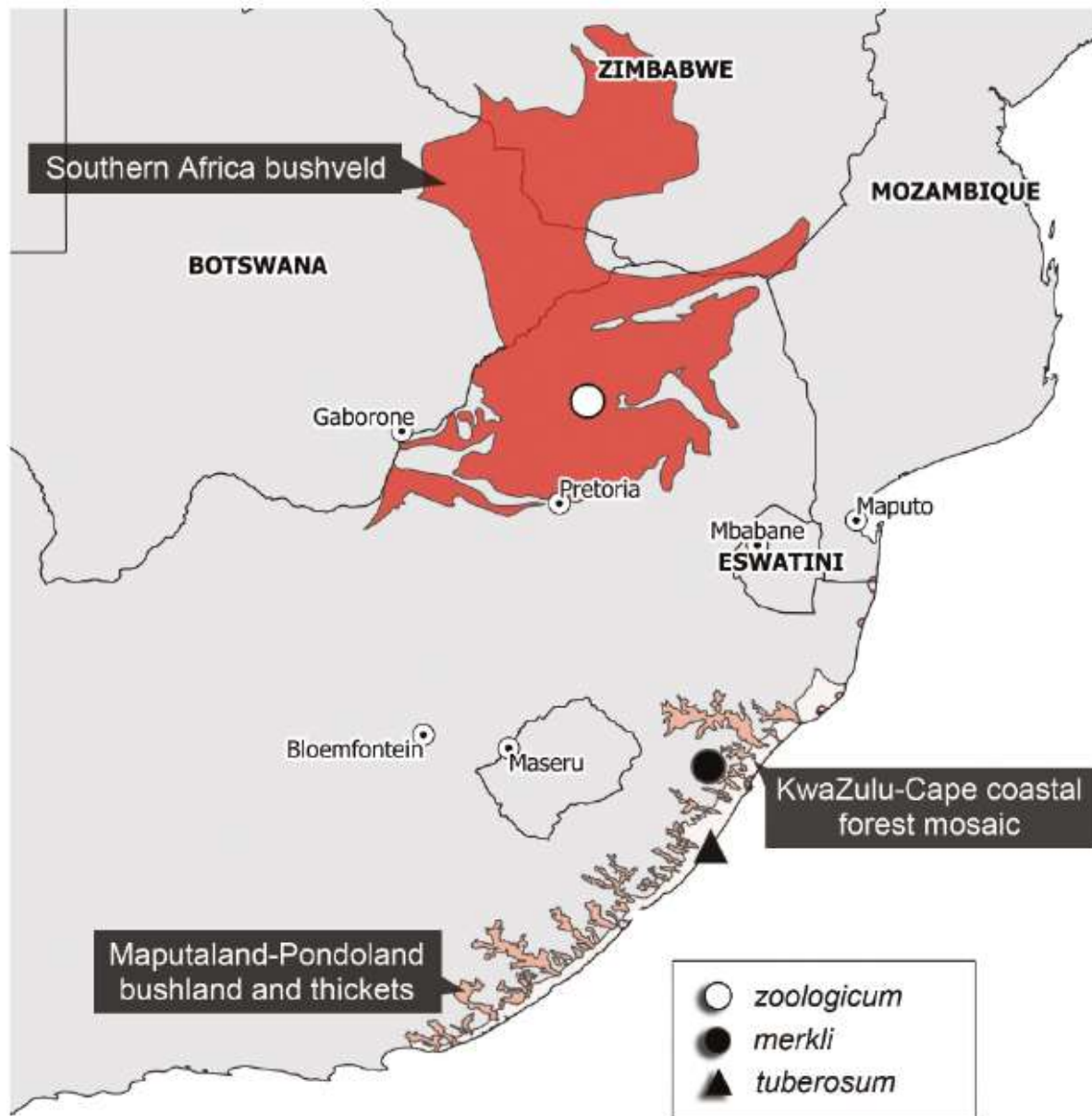


Figure 2. Distribution of the genus *Saeculum* gen. nov.

REMARKS

This study is a part of a larger phylogenetic project on the Sub-Saharan Asidini. Due to this fact, the conclusions presented here are supported by the results of a wide taxonomic investigations of all Afrotropical genera (see also Kamiński *et al.* 2019). The hitherto conducted studies suggest that previously proposed classification concepts of Sub-Saharan Asidini, especially at the generic level, are far from stable (*e.g.* Koch 1962). This is mainly caused by the homoplastic nature of many diagnostic characters. For example, the presence of elytral tubercles originally treated as an autapomorphy for the genus *Machleida* (Koch 1962) was shown to also occur in at least three distinct lineages of Afrotropical Asidini; *i.e.* *Afrasida* Wilke, 1925, *Machleida*, and *Saeculum* (Kamiński *et al.* 2019, present study).

The following morphological characters and their states seems to be reliable for diagnostic purposes within the South African Asidini: (1) mentum – fully filling the buccal cavity versus reduced in size (state characteristic for *Asidomorpha* Koch, 1962, *Machleida*, *Machlomorpha* Péringuey, 1899 and *Saeculum*); (2) antennal sulcus – anteriorly deep (unique to *Amachla* Koch, 1962 and *Machla* Herbst, 1799) versus weakly incised or absent; (3) epipleuron – widened at the base (shared by *Asidomorpha*, *Machleida*, *Machlomorpha* and *Saeculum*) versus entirely narrow. In the majority of studied cases the distinction between the above stated states can be unambiguously made.

As discussed above (see diagnosis), *Saeculum* and *Machleida* share many key morphological features, which probably indicates their close phylogenetic affinity. However, both those genera are defined by their own autapomorphies; *i.e.* presence of setose tubercles on pronotal disc in *Saeculum*, and pronotal carinae in *Machleida* (Kamiński *et al.* 2019).

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