

New information about and illustrations of Psammodiini species (Coleoptera: Scarabaeidae: Aphodiinae).

3. *Leiopsammodius modestus*

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Abstract. Results of studying the lectotype of *Leiopsammodius modestus* (Péringuey, 1901) are presented. Photographs of its habitus as well as details are published for the first time. Most important features differentiating the species from other members of the genus are discussed.

INTRODUCTION

The communication presented here is the third study within the framework of a series of works focused on refining knowledge of particular species in the tribe Psammodiini, particularly in the subtribe Psammodiina. Studies 1 and 2 (Rakovič et al. 2017, 2018) dealt with the species *Rakovicius thailandicus* (Balthasar, 1965) and *Granulopsammodius transcaspicus* (Petrovitz, 1961), respectively.

In the present work, the authors offer results of the examination and photographic documentation of the species *Leiopsammodius modestus* (Péringuey, 1901) lectotype.

MATERIAL AND METHODS

The specimens were observed by using the MBS-10 and SZP 1120-T stereoscopic microscopes. The photos published here were taken by the use of the Meopta laboratory microscope, CMEX 5 digital camera and Helicon Focus programme.

Prior to the study and taking photos, they were kept in a detergent solution for 30 to 60 minutes and submitted to mechanical cleaning.

The following acronym is employed for the collection, in which the specimen studied here is kept:

SAMC Iziko South African Museum, Cape Town, Republic of South Africa.

TAXONOMY

Leiopsammodius modestus (Péringuey, 1901)

(Figs. 1-17)

Psammodius modestus Péringuey, 1901: 446 (original description).

Psammobius modestus: Schmidt 1922: 477 (monograph - Aphodiinae, world fauna); Endrődi: 1964: 337 (monograph -

Aphodiinae, Afrotropical species).

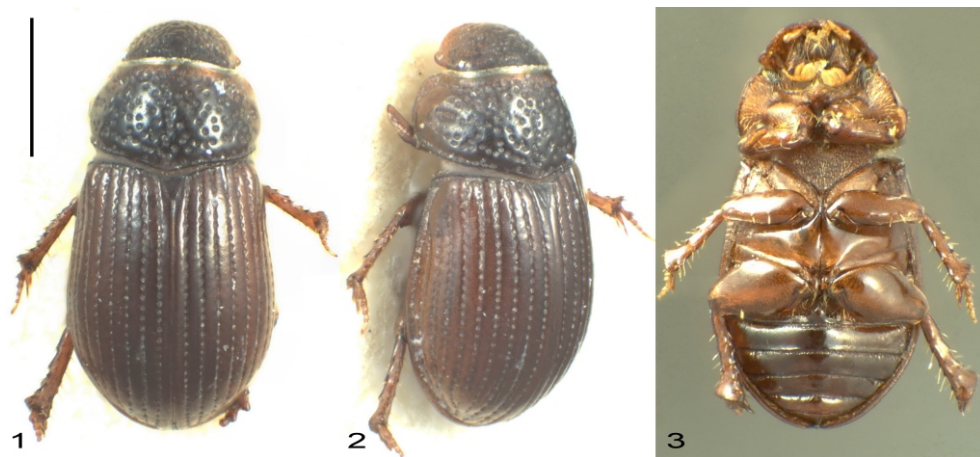
Psammodius (*Leiopsammodius*) *modestus*: Rakovič 1981: 27 (revision of *Psammodius* Old World species); Endrödi & Rakovič 1981: 62 (review of Aphodiinae from S. and SW. Africa); Rakovič 1986: 6 (notes to revision).

Leiopsammodius modestus: Dellacasa 1988: 418 (catalogue); Rakovič 1990: 11 (outline of *Leiopsammodius* - world fauna), 1995: 6 (key to Afrotropical *Leiopsammodius* species).

Type locality. "Frere [KwaZulu-Natal Province, the Republic of South Africa]".

The material examined. The type from the SAMC (not sexed) bearing the following labels as shown in Fig. 17:

- 1) labels provided by the collector, by Péringuey himself or by staff members of the SAMC;
- 2) pale green label added by the third author of the present work (L. M.), concerning his photo-documentation system;
- 3) red printed label associated with the present designation of the lectotype.



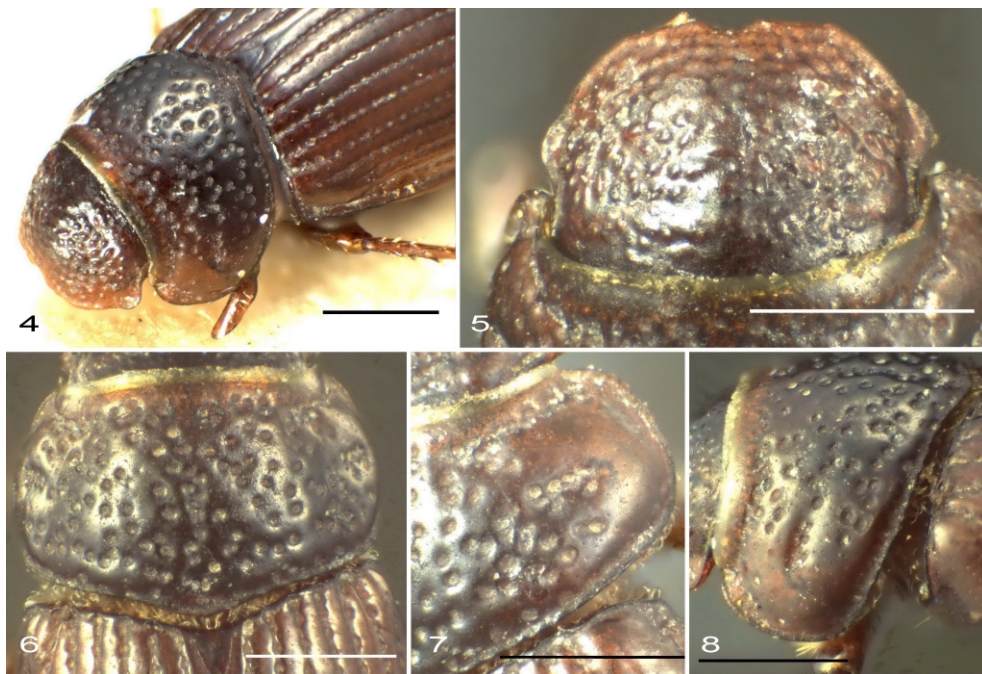
Figs. 1-3. *Leiopsammodius modestus*, lectotype, habitus: 1- dorsal view; 2- dorsolateral view; 3- ventral view. Scale line 1 mm. Photographs by L. Mencl.

Lectotype redescription. Small (body length of 3.0 mm), convex, oblong oval, distinctly broader behind (maximum width of 1.5 mm), glabrous, vaguely shining, dark brown (head and pronotum moderately darker than elytra) (Figs. 1-2).

Head (Figs. 4, 5) convex, granulate. Clypeus rounded each side of anteromedian emargination, its lateral margins glabrous, arcuate before genae; genae about semicircular and symmetrical around their transversal axes, glabrous, well differentiated from clypeus lateral margins. Middle protuberance of head (as known in numerous *Psammodiini*) essentially absent (not distinctly elevated above remaining areas of head). Granules not very dense, round to moderately oval, head vertex rather irregularly uneven than granulate.

Pronotum (Figs. 6-8) transversal (length-to-width ratio 0.632), narrower than head, widest at about midlength, its lateral margins arcuately narrowing from there toward rounded anterior as well as posterior angles (narrower at anterior margin compared to its width at basal margin). Lateral margins glabrous, basal margin and partially also margins of posterior angles setaceous (their setae fine, acuminate, mostly relatively long and curved in direction of midline. Pronotum surface covered with very coarse (large and deep) punctures (intervals between punctures rather irregular in size - larger than, equal to or smaller than puncture diameter). In strictly dorsal view (Figs. 1 or 6), punctation on pronotal disc seemingly quite disarranged (not arranged in vestiges of pronotal structural elements characteristic of *Psammodiini* having complete pronotal structure

consisting of five transversal ridges, five transversal furrows); in inclined positions (as shown for example in Figs. 4, 7-8) vestiges of complete pronotal structure (of transversal furrow 1, lateral impressions of pronotal furrow 3 and posterior longitudinal furrow) become observable with some punctures inside of them.



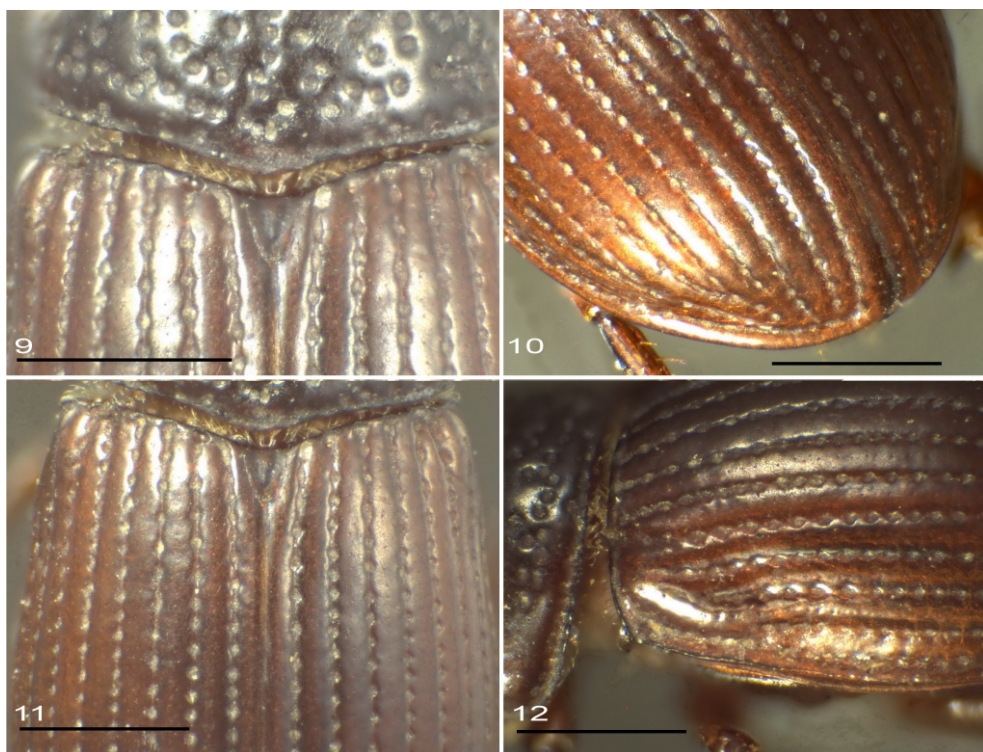
Figs. 4-8. *Leiopsammodius modestus*, lectotype, details of head and pronotum: 4- forebody and part of elytra, oblique frontal view; 5- head, dorsal view; 6- pronotum, dorsal view; 7- lateral area of pronotum, dorsal view; 8- pronotum, lateral view. Scale lines 0.5 mm. Photographs by L. Mencl.

Scutellum (Figs. 9 and 11) small, triangular, narrow (about twice as long as wide), shagreened, impunctate, with a triangular longitudinal impression extending from scutellum base to about $2/3$ scutellum length.

Elytra (Figs. 1, and 9-12) without distinct humeral denticles, with ten striae and ten intervals, elongate (length-to-width ratio of 1.30), broader behind (broadest point at about 0.6 elytra length), 2.36 times longer than pronotum and 1.22 times wider at broadest point than pronotum. Elytral striae narrow, but distinct, with round to moderately elongate punctures; in dorsal striae, punctures distinctly crenating elytral intervals (punctures in striae 4-6 crenating both inside and outside margins of adjacent intervals, those in striae 4-5 rather crenating outside margins of intervals only); separation between neighbouring punctures comparable to puncture size. Elytral intervals convex, with sparse and very fine punctures (observable under high magnification only), tending to be arranged in a rather irregular row in each interval; interval 10 not reduced in length, reaching nearly to elytral apex (Fig. 10); arrangement of elytral intervals in humeral area as in Fig. 12.

Underside (Figs. 3 and 13-16). Mostly smooth, glabrous (with exception of individual setae on femora) and impunctate (with exception of enormously sparse and fine punctures nearly non-

observable even under high magnification), abdominal ventrites and posterior edge of metafemora dark brown, remaining areas yellowish brown. Metaventral plate with short, anteriorly as well as posteriorly reduced and medially widened midline furrow (Figs. 13-14). Abdominal ventrites as in Fig. 15; smooth, impunctate, glabrous, with indicated short fluting along anterior margins, ventrite 3 (first observable ventrite) with shallow impression in lateral 1/3 on each side, ventrite 4 with peculiar fluting present anterolaterally. Pygidium also smooth. Femora as in Figs. 3 and 13; metafemora very wide, their length-to-width ratio of 0.62. Left metatibia and metatarsus (metatarsomere 5 with claws missing) as in Fig. 16: metatarsomere 1 triangularly widened, metatarsomeres 2 and 3 rather globular, metatarsomere 3 cylindrical; apical spines of metatibia stout, superior apical spine longer than metatarsomeres 1 and 2 combined, moderately S-shaped, inferior apical spine thick, straight, rounded apically, about 1.8 times shorter than superior one.



Figs. 9-12. *Leiopsammodius modestus*, lectotype, details of elytra: 9- basal parts of pronotum and elytra, dorsal view; 10- elytral apex, dorsocaudal view; 11- anterior part of elytra with scutellum, dorsal view; 12- humeral area of left elytron, lateral view. Scale lines 0.5 mm. Photographs by L. Mencl.

Sexual dimorphism. Not available.

Variability. Not available.

Differential diagnosis. The species discussed here is very characteristic particularly thanks to

the punctation of the pronotum and dark colour. The pronotum disc is covered with numerous, very coarse (large and deep) punctures. In strictly dorsal view (Figs. 1 or 6), the punctation appears to be quite disarranged. In inclined positions (as shown for example in Figs. 4, 7-8), rather weak vestiges of complete pronotal structure (of transversal furrow 1, lateral impressions of pronotal furrow 3 and posterior longitudinal furrow) become observable with a minor proportion of punctures present inside of them. In other Afrotropical *Leiopsammodius* Rakovič, 1981 species, the punctures on the pronotal disc are finer, more superficial and/or their considerable proportion is concentrated in the above mentioned vestigial elements. Most Afrotropical species of the genus are yellowish brown, reddish brown or at most castaneous. There is also another dark Afrotropical species, *L. kenyensis* (Rakovič, 1978), but its pronotal punctures are much sparser and superficial and not as numerous as in the species *L. modestus*.

Distribution. The Republic of South Africa (KwaZulu-Natal).



Figs. 13-17. *Leiopsammodius modestus*, lectotype, details of underside and etiquettes 13- mesofemora and metafemora, ventral view; 14- metaventral plate, ventral view; 15- abdominal ventrites; ventral view; 16- outer face of left posterior tibia and tarsus, ventral view; 17- etiquettes pinned under the specimen. Scale lines 0.5 mm. Photographs by L. Mendl.

DISCUSSION

In the course of the compilation of keys to Afrotropical *Leiopsammodius* species (Rakovič 1981, 1986, 1995), specimens of all the species were available to the first author of the present work (M. R.) just with exception of the species *L. modestus* discussed here. It was described based on a unique type specimen (Péringuey 1901) and, as to our knowledge, it has never been studied by any specialist since then. Data from a correct, though if rather brief original Péringuey's

description were thus only repeated in later works (Schmidt 1922, Endrödi 1964, Rakovič 1981, 1986, 1995). In spite of this, the species was correctly included into keys, but there were some questions, for example about possible synonymy of some species described by different authors later.

In the work presented here, we took advantage of having the extraordinary chance to examine the type specimen and provide appropriate detailed photos. Because of the uniqueness of the specimen, we avoided any dissection (for example searching for epipharynx or aedeagus). The detailed description and illustrations will make it possible to unambiguously identify the species in the case of its rediscovery any time in the future. It is also possible to conclude that none of *Leiopsammodius* species described later is synonymous with *L. modestus*.

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