New information about and illustrations of Psammodiini species (Coleoptera: Scarabaeidae: Aphodiinae). 2. *Granulopsammodius transcaspicus*

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Abstract. Results of studying seven specimens of *Granulopsammodius transcaspicus* Petrovitz, 1961 (five from Uzbekistan and two from Turkmenistan) are presented. Photographs of details including the epipharynx are published for the first time. Faunistic data based on the present work and on data from the literature are summarized. Most important features differentiating the species from other members of the genus are discussed.

INTRODUCTION

The communication presented here is the second study within the framework of a series of works focused on refining knowledge of particular species in the tribe Psammodiini, mostly in the subtribe Psammodiina. The first study dealt with the species *Rakovicius thailandicus* (Balthasar, 1965).

In the present (second) work, the authors studied a series of specimens of *Granulopsammodius transcaspicus* (Petrovitz, 1961) and provided a new, detailed photographic documentation (including a photo of the epipharynx), which may be useful for unambiguous identification of the species. Faunistic data from the literature were also summarized and considered in the Discussion including relatively recent reports by Russian authors.

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 min and submitted to mechanical cleaning.

The following acronyms are employed for the collections, in which the specimens studied here are kept:

DKCP David Král collection, deposited in the National Museum, Praha, Czech Republic;
LMCT Ladislav Mencl private collection, Týnec nad Labem, Czech Republic;
MRCD Miloslav Rakovič private collection, Dobřichovice, Czech Republic.

TAXONOMY

Granulopsammodius transcaspicus (Petrovitz, 1961)

(Figs. 1-14)

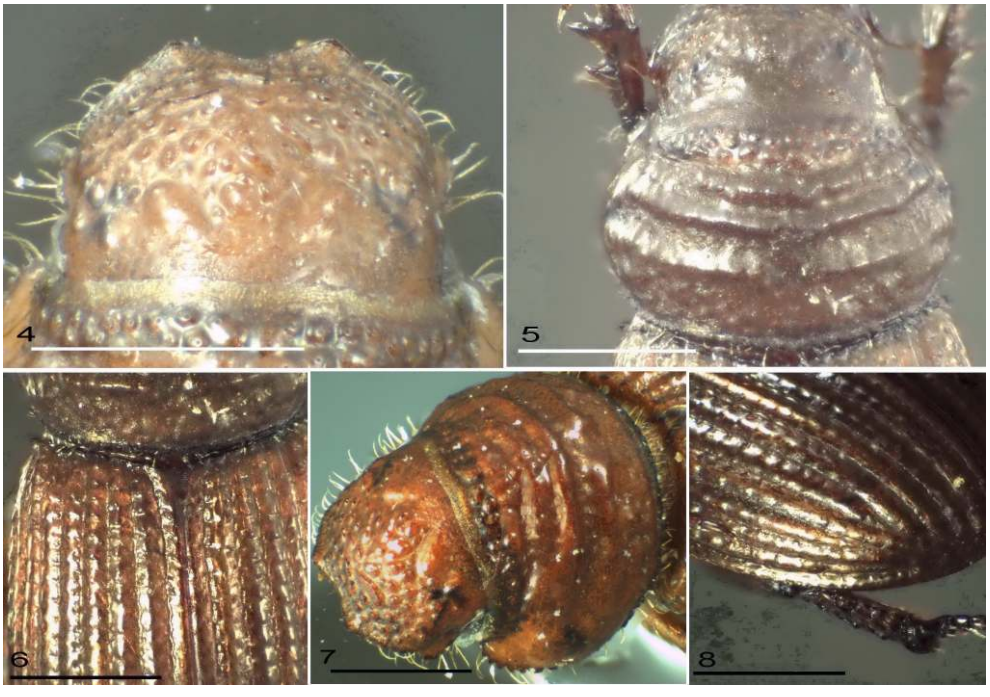
Psammobius transcaspicus Petrovitz, 1961: 134.
Psammobius transcaspicus: Balthasar 1964: 539 (monograph – Palaearctic and Oriental Regions).
Psammodius transcaspicus: Rakovič 1977 (faunistic record), 1978: 141 (study of holotype); Pittino 1980: 72 (revision of *Psammodius plicatulus* (Fairmaire, 1892) group); Nikolajev 1987: 85 (fauna of Kazakhstan and Central Asia); Komarov 1998: 206 (Coleoptera of south-eastern European part of Russia).
Psammodius (*Granulopsammodius*) *transcaspicus*: Rakovič 1981: 69 (revision of *Psammodius* Old World species), 1986: 11 (notes to revision).
Granulopsammodius transcaspicus: Dellacasa 1988 (catalogue): 418; Rakovič 1998: 46 (key); Rakovič, Král & Löbl 2006: 145 (catalogue), Rakovič & Král 2015: 114 (notes to catalogue), Rakovič, Král & Bezděk 2016: 158 (catalogue); Shokhin 2007: 131 (occurrence in southern Russia – Astrakhan Region); Shokhin et al. 2014: 77 (fauna of Caspian Sea coast and isles).

Type locality: "Transcaspia, Dortkuju [a location in the The Repetek State Biosphere Reserve, which is situated in the south-eastern Karakum desert, Turkmenistan]".

The material examined. 2 specimens in DKCP: Turkmenia or., Mary reg., 3.-7. iii., UTSCH – ADZHI env, Klimenko lgt. 1994. 1 specimen in DKCP: Buchara, Kyzylkum, Uzbekist., 27. iv., Olexa 1980. 3 specimens in MRCD: UZBEKISTAN, Khorezm, Khiva env., Kara Kum sands, 8. iv. 2015, T. Lackner leg. 1 specimen in LMCT: UZBEKISTAN, Termiz env., 14. iv. 2015, T. Lackner leg.
The first author also formerly studied the holotype of the species.
See also Fig. 14 for etiquettes pinned under the specimen documented here by photographs.

Figs. 1-3. *Granulopsammodius transcaspicus*, ♀, habitus: 1- dorsal view; 2- dorsolateral view; 3- ventral view. Scale line 1 mm. Photographs by L. Mencl.

Supplementary outline of important characters. Small (body length of 2.3 to 2.9 mm), convex, considerably broader behind, dorsal surfaces (Figs. 1-2) granulate, glabrous, reddish brown. Elevated elements (granules and ridges on head and pronotum sometimes moderately darker).



Figs. 4-8. *Granulopsammodius transcaspicus*, ♀, details: 4- head, dorsal view; 5- posterior part of head and pronotum, dorsal view; 6- anterior part of elytra, dorsal view; 7- head and pronotum, lateral view; 8- elytral apex. Scale lines 0.5 mm. Photographs by L. Mencl.

Head (Fig. 4) convex, granulate. Clypeus considerably angulate each side of anterior triangular anteromedian emargination, its anterior angles lifted upward, lateral margins slightly to moderately sinuate behind anterior angles and then nearly straight toward genae; genae rather moderately auriculate than semicircular (moderately asymmetrical around their transversal axes); lateral margins of clypeus and genae with acuminate macrosetae. Clypeus surface with not very dense, round to slightly oval granules. Elevated middle protuberance (as known in numerous Psammodiini) essentially absent. Posterior oblique ridges of head poorly distinct, sometimes nearly absent.

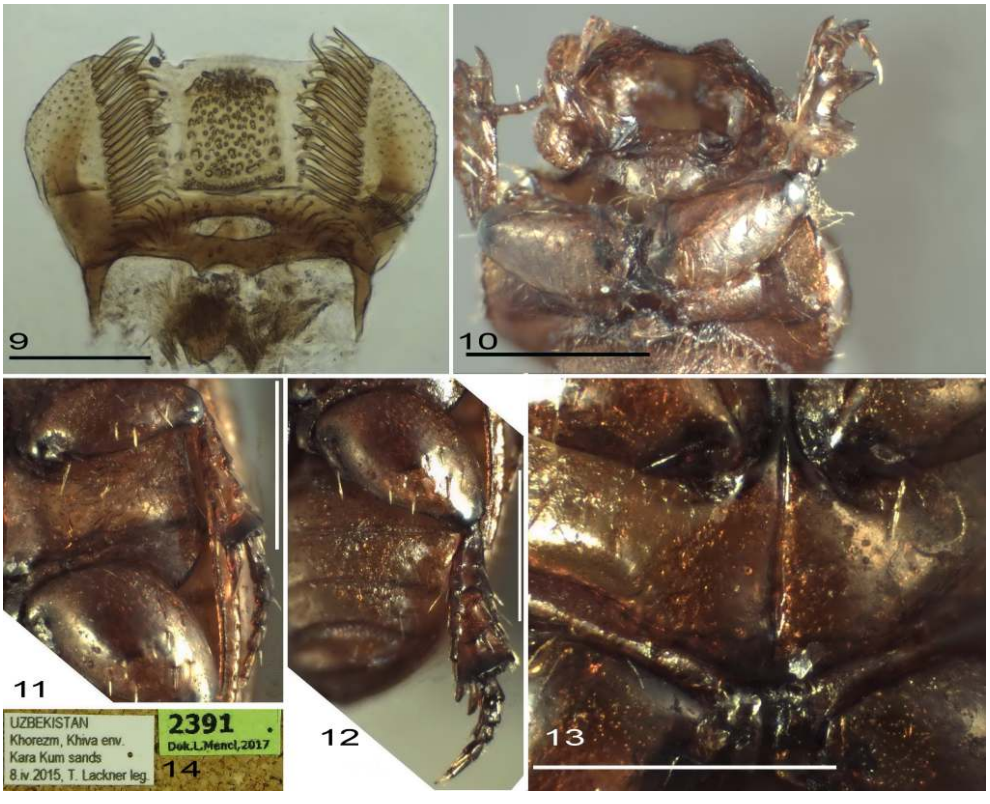
Eipharynx as in Fig. 9. Transversal, anterior outline almost straight, lateral outlines regularly widely rounded; tormae and nesium well sclerotised, approximately symmetrical, apotormae missing; epitorma almost quadrate, weakly sclerotised, covered with large, somewhat irregularly spaced sensilla, helus with group of numerous distinctly densely spaced sensilla and row of densely spaced sensilla basally; corypha and zygum absent; phobae weakly sclerotised, glabrous; chaetoparia with row of 19 long, stout, closely spaced spines; between chaetoparia and epitorma short longitudinal row of three stout spines; area of prophobae well sclerotised, bearing longitudinal row of four short, stout, densely spaced sensilla.

Pronotum (Figs. 5 and 7) transversal, with five transversal ridges and five transversal furrows. Ridge 1 broken into discrete granules differing in size and shape, ridge 2 partially granulate, but continuous at middle, ridges 3 and 4 mostly continuous, not granulate at middle, ridge 5 vestigial, consisting of only moderately distinct and sparse discrete granules and widely interrupted at middle by posterior longitudinal furrow; transversal furrows with uneven, but rather obsolete, poorly defined sculpture; pronotum lateral margins crenulate, with fine, short macrosetae.

Elytra (Figs. 1, 2 and 6) with more or less distinct humeral denticles, with ten striae and ten intervals, each interval with a row of oval, backward elevated granules. Interval 10 nearly achieving elytral apex (Fig. 8).

Ventral surfaces sparingly finely punctate and sparingly macrosetaceous, as shown in Fig. 3. Metaventral plate complete anteriorly, reduced posteriorly (Figs. 3 and 13).

Legs. Metatibiae robust, their spines rounded at apex, superior terminal spine longer than basal metatarsite, metatarsites 1-4 triangularly widened toward their apices. Undersides of anterior, intermediate and posterior legs as in Figs. 10, 11 and 12, respectively.



Figs. 9-14. *Granulopsammodius transcaspicus*, ♀, details and etiquettes: 9- epipharynx; 10- underside of anterior leg; 11- underside of intermediate leg; 12- underside of posterior leg; 13- metaventral plate; 14- etiquettes. Scale lines 0.1 mm for Fig. 9, 0.5 mm for Figs. 10-13. Photographs by L. Mencl.

Sexual dimorphism. Not available. All the specimens studied were females.

Variability. Most species studied here are reddish brown, with head, pronotum and elytral suture moderately darker than elytra; one species from Uzbekistam (Kyzylkum desert) is dark brown. Humeral denticles are more or less distinct. The sculpture of dorsal surfaces is relatively constant.

Differential diagnosis. The species discussed here is very characteristic particularly as to its posterior longitudinal furrow of the pronotum interrupting ridges 4 and 5 at the middle: in *Granulopsammodius transcaspicus*, the transversal ridge 5 is broken into discrete tubercles and is unusually widely interrupted by the posterior longitudinal furrow, as shown in Fig. 5. A further species occurring in Central Asia, *Granulopsammodius centralasiae* (Rakovič, 1978), has pronotal ridge 5 continuous each side of the posterior longitudinal furrow, which is not as enormously wide at this point as in *G. transcaspicus*. In addition, *G. centralasiae* has pronotal ridges 1 and 2 wide, consisting of discrete tubercles and not separated from each other at the middle (transversal pronotal furrow 1 is present only laterally). *G. transcaspicus* is also smaller on average (body length mostly between 2 and 3 mm) than *G. centralasiae* (body length mostly between 3-4 mm).

Note. It is to mention that the posterior oblique structural elements (ridges and furrows in front of them are more or less poorly observable. The clypeus is more or less dentate anteriorly and more or less sinuate anterolaterally. These characters are more or less obvious depending on the head inclination and illumination direction.

Distribution. Southern Russia, Kazakhstan, Turkmenistan, Uzbekistan.

DISCUSSION

Species of the genus *Granulopsammodius* Rakovič, 1981 are 11 in number. From among them, ten species were outlined by Rakovič (1986) and a further species was described since then (Rakovič 1998). It is a mostly Palaearctic genus. Only one species comes from East Africa and one species exerts Palaearctic distribution with partial extension to the Afrotropical Region.

There are two species prevalently occurring in Central Asia: *Granulopsammodius transcaspicus* and *G. centralasiae*.

The species *G. transcaspicus* discussed in the present work inhabits desert areas in southern Russia, Kazakhstan, Uzbekistan and Turkmenistan. The material studied here comes from deserts Karakum and Kyzylkum as mentioned above. More detailed data are considered below based on the material studied here on the one hand and on reliable data from the literature on the other.

Nikolajev (1987) writes that the species is widely distributed in Kazakhstan and Central Asia with specifying the following areas: valley of the river Ural (Kazakhstan), Aral Sea region (Kazakhstan, Uzbekistan), valley of the river Ili (SE Kazakhstan), Muyunkum (desert in Kazakhstan) and Uzboy (river in Turkmenistan). Shokhin et al. (2014) with a reference to Komarov (1998) summarized knowledge concerning the fauna of coasts and islands of the Caspian Sea and reported the species from the Astrakhan Region (Republic of Dagestan, the Russian Federation), and Mangistau Region (western Kazakhstan). The communication by Komarov (1988) concerns a finding of the species in surroundings of the Dosang station in the Astrakhan Region.

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