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RESEARCH PAPER

A review of the genus *Psammocryptus* (Coleoptera: Tenebrionidae: Tentyriini)

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Abstract. A taxonomic review of the tenebrionid genus *Psammocryptus* Kraatz, 1865 (Coleoptera: Tenebrionidae: Pimeliinae: Tentyriini) is given. Species of this genus are distributed in the south of Russia (Caspian depression), Transcaucasia, Kazakhstan and Central Asia, Afghanistan and Pakistan, occurring in areas with salty soil, often in tugay forests of river basins. Two new species and one new subspecies are described: *P. bogatchevi* Nabozhenko, Chigray & Bekchanov, sp. nov. (Kazakhstan: Syrdarya basin, Kyzylkum desert; Uzbekistan: Amudarya lower reaches and delta, Syrdarya basin, Kyzylkum desert); *P. kompantsevae* Nabozhenko & Chigray, sp. nov. (Uzbekistan and Tajikistan: Amudarya, upper river basin); *P. bayeri vachshianus* Nabozhenko & Chigray, subsp. nov. (Tajikistan: Vakhsh River valley). The nominotypical subspecies *P. bayeri bayeri* Koch, 1943 occurs in Turkmenistan (Tejen valley and Amudarya valley middle river course) and Tajikistan (a new record for the country: Kafirnigan River valley). *Psammocryptus minutus* (Tauscher, 1812) is recorded for Armenia for the first time, but the population from Yerevan has become extinct due to urbanization. The following synonymy is restituted: *Psammocryptus minutus* (Tauscher, 1812) = *P. bergi* Kuzin 1934, syn. restit.

Key words. Coleoptera, Tenebrionidae, Pimeliinae, Tentyriini, *Psammocryptus*, darkling beetles, new record, new species, new subspecies, Palaearctic Region

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Introduction

The genus *Psammocryptus* Kraatz, 1865 comprises three species and one subspecies, according to Iwan et al. (2020). Representatives of the genus are widely distributed from the western part of the Caspian Depression and Apsheron Peninsula to eastern Kazakhstan, also occurring in Turkmenistan, Uzbekistan, Afghanistan and Pakistan (Fig. 1). *Psammocryptus* are among the most abundant beetles in subdeserts and deserts with fixed sands and salty-sand habitats (Davletshina 1967, Pirnazarov 1970, Davletshina et al. 1979, Nepesova 1980, Kaluzhnaya 1982, Kaluzhnaya et al. 2000).

Kraatz (1865) presented a detailed diagnosis and comparative analyses of *Psammocryptus* in the original description and included only one species, *Tentyria minuta* Tauscher, 1812, in the genus. Reitter (1897a) provided a key to genera of Tentyriini, where he compared *Psammocryptus* with the African genus *Scelosodis* Solier, 1835. In the same year, Reitter (1897b) added Chinese *Psammocryptus rugiceps* Reitter, 1897 to the genus. Later, Reitter (1900) erected a separate monotypic genus *Tamena* Reitter, 1900 for *Psammocryptus rugiceps*. Kuzin (1934) described *Psammocryptus bergi* Kuzin, 1934 from the Ili River valley in Kazakhstan based on one female, which is now interpreted as a subspecies of *P. minutus* (Skopin 1968, Iwan et al. 2020). Koch (1943) described two additional species of *Psammocryptus* from Turkmenistan (*P. bayeri* Koch, 1943) and Pakistan (*P. prosternalis* Koch,

1943). Later Bogatchev (1946) added *Psammocryptus semenovi* Bogatchev, 1946 from Afghanistan, a junior synonym of *P. prosternalis* (Iwan et al. 2020).

Species of the genus *Psammocryptus* were also mentioned in the following important taxonomic and faunistic works: *P. prosternalis* (Gridelli 1954; Kaszab 1959, 1974), *P. minutus* (Bogatchev 1934, 1965; Skopin 1961, 1964, 1968; Medvedev 1965; Davletshina 1967; Pirnazarov 1970; Davletshina et al., 1979; Kaluzhnaya 1982; Medvedev & Nepesova 1985; Kaluzhnaya et al. 2000; Abdurakhmanov & Nabozhenko 2011), and *P. bayeri* (Medvedev & Nepesova 1985, Egorov & Rakhimov 2015).

Below we describe three new *Psammocryptus* taxa from Kazakhstan, Uzbekistan and Tajikistan, revise other taxa of the genus and provide an illustrated key to species.

Material and methods

The studied adult beetles are deposited in the following institutions:

IZUZ Institute of Zoology of the Academy of Sciences of Uzbekistan, Tashkent, Uzbekistan;
PCMN Maxim Nabozhenko's private collection, Rostov-on-Don, Russia;
ZIN Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia.

The following acronyms of measurements are used:

E_lE_w ratio of the elytral length (from apices to the base of scutellar shield) to the maximal width;
EH_w ratio of the maximal elytral width to the maximal head width;
EP_w ratio of the maximal elytral width to the maximal pronotal width;
EP_l ratio of the elytral length (from apices to the base of the scutellar shield) to the pronotal length in the middle;
PH_w ratio of the maximal pronotal width to the maximal head width;
P_lP_w ratio of the pronotal length in the middle to the width at widest level.

Terms for the structure of male genitalia are taken from Matthews & Bouchard (2008). Beetle photographs were taken with a Canon EOS 5D Mark IV Body, Canon MP-E65MM F2.8 Macro lens and Canon Macro Twin Lite MT-26X-RT flush bulb, and stacking was done using Stack-shot 3X with enlarged macro rails s/n 3734; the photosystem is installed on a Kaiser Copy Stand RS 1 reproduction machine. Images were stacked in Helicon Focus 7.7.4 Pro.

The order of species corresponds to their morphological similarity and begins with the type species of the genus.

Localities on the map (Fig. 1) are based on the material presented below as well as the literature data.

Taxonomy

Psammocryptus Kraatz, 1865

Psammocryptus Kraatz, 1865: 239. Type species: *Tentyria minuta* Tauscher, 1812, by monotypy.

Diagnosis. Body small, robust. Anterior margin of epistoma with triangular asymmetric tooth in middle. Eyes weakly convex to almost flattened. Frontal keels above eyes poorly developed. Mandibles deeply bifurcated at apex, with additional dorsal tooth and inner molar tooth. Labrum partially visible dorsally. Eyes weakly emarginated at anterior and posterior margins (lateral view), narrowed from upper to lower parts, not divided (partly or completely) into dorsal and ventral portions by genae. Ventral side of head with wide transverse depression (not deep groove with clear edges). Antennae short, weakly widened to apex, antennomeres 8–11 slightly flattened, antennomeres 8 and 9 with outer lateral area of sensillar brush, 9th one with two lateral areas of sensillar brush. Head and pronotum usually coarsely and densely punctured. Pronotum more or less cordate, with distinct angles; posterior angles always pointed at apex; base completely bordered, weakly bisinuate or rounded. Prothoracic hypomera coarsely and densely punctured. Elytral base wider than pronotal base, completely widely bordered, with vertical edge, in which base of pronotum rests. Humeral angles well developed. Scutellum also with vertical edge. Elytra with distinct 9 striae of round punctures and short scutellar striole. Epipleura reaching sutural angle. Hind wings absent. Mesoventrite with coarse longitudinal or rarely round foveolate punctures in anterior half and finely and sparsely punctured apophysis between mesocoxae. Legs short, robust; male femora with small brush spot on inner side.

Male genitalia are typical for Palaearctic Tentyriini and do not differ from the other genera of the tribe.

Notes. The genus belongs to the *Hyperops* genus group, created by Koch (1943) for the taxa of Tentyriini with the hair brush on the inner side of the male femora. The four genera of this group, *Hyperops* Eschscholtz, 1831, *Freyitia* Koch, 1943, *Psammocryptus* and *Tamena* Reitter, 1900, can be distinguished using the key below. Bogatchev (1965) proposed to include *Tamena* (Fig. 2) as a subgenus within *Psammocryptus* but we do not support this proposal yet, because differences between these two taxa are clear. Characters of *Freyitia* are taken from the original description and figures (Koch 1943).

Key to the genera of the *Hyperops* group

1 Base of pronotum strongly bisinuate, forming obtuse triangle and not bordered in middle. Genae half protrude into the eyes, temples from behind also protrude into the eyes. ..... ***Freyitia*** Koch, 1943
– Base of pronotum rounded or weakly bisinuate, rarely strongly bisinuate (*Tamena*), but in this case middle widely rounded and bordered. Genae might or might not protrude into eyes, temples not protruding. 2
2 Genae protruding into eyes from 1/4 of length to completely divided eyes on dorsal and ventral portions. ... . ***Hyperops*** Eschscholtz, 1831
– Genae not protruding into eyes. 3
3 Eyes subequal in length and width. Punctation in elytral striae and interstriae coarse and dense; punctures equal in size and striae not clear. .... ***Tamena*** Reitter, 1900
– Eyes elongate (transverse). Strial punctures larger than interstrial ones and striae always well developed. .... ***Psammocryptus*** Kraatz, 1865

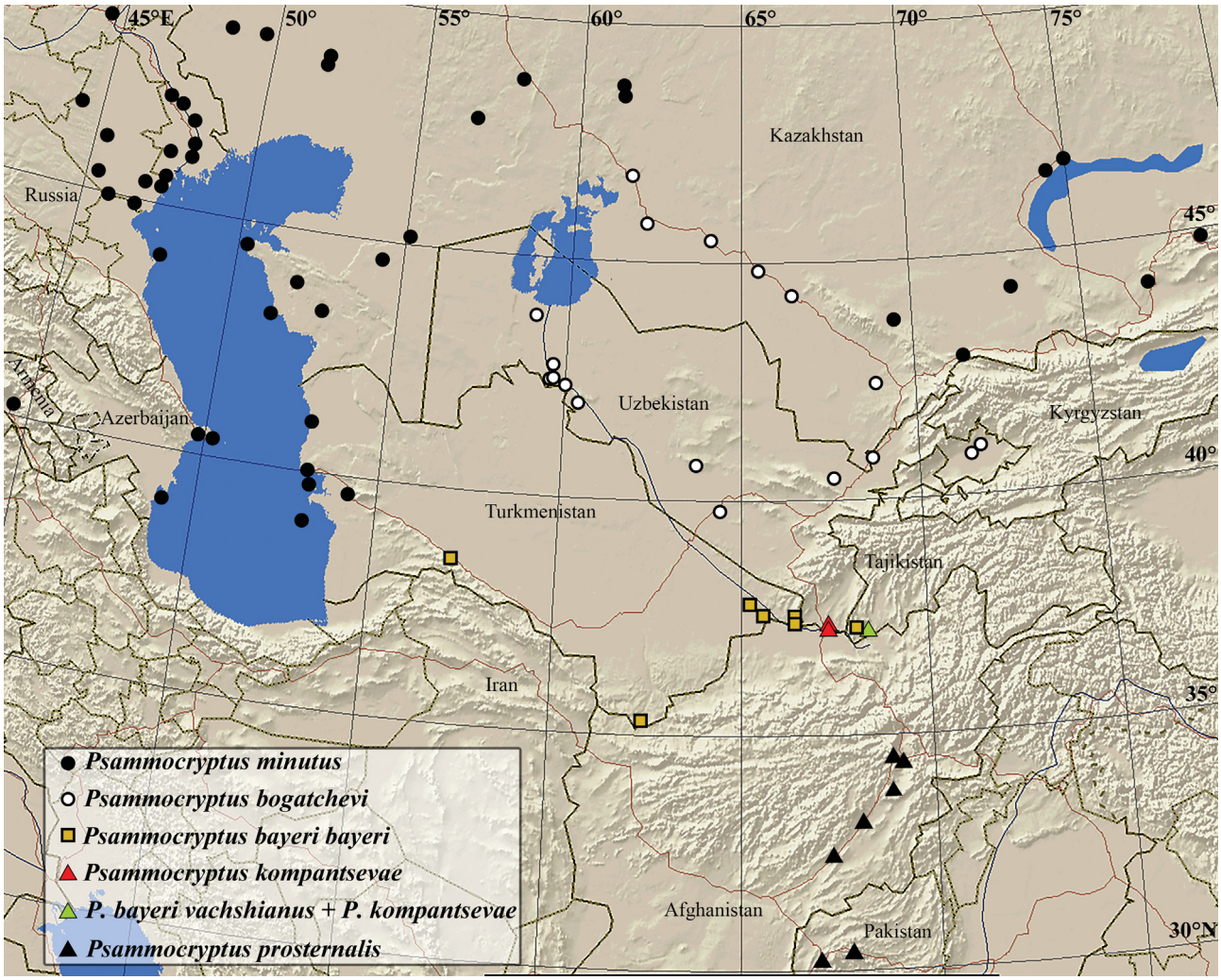

Fig. 1. Map of distribution of *Psammocryptus* species.

Psammocryptus minutus (Tauscher, 1812)

(Figs 3–4)

Tentyria minuta Tauscher, 1812: 33, fig. 4a, b. Type locality: "Circa Astrachan" [= Russia, environs of Astrakhan].

Tentyria minuta: Steven (1828: 83); Ménétriés (1832: 196).

Hyperops minuta: Faldermann (1838: 141); Kraatz (1862: 94).

Psammocryptus minutus: Kraatz (1865: 240); Jacquelin du Val (1861: t. 61, f. 301); Faust (1875: 180); Schneider & Leder (1878: 223); Heyden et al. (1883: 127); Heyden et al. (1891: 238); Reitter (1900: 144); Gebien (1911: 57); Bogatchev (1934: 46); Gebien (1937: 612); Bogatchev (1938: 121); Skopin (1961: 178); Skopin (1964: 291); Skopin (1968: 104); Kryzhanovskij (1965: 167); Medvedev (1965: 362); Pirnazarov (1970: 27 (part)); Abdurakhmanov (1971: 2); Kalyuzhnaya (1982: 69); Abdurakhmanov (1983: 485); Medvedev & Nepesova (1985: 67); Medvedev & Abdurakhmanov (1988: 74); Abdurakhmanov & Medvedev (1994: 129); Abdurakhmanov et al. (1995: 187); Nabozhenko (1999: 50); Kalyuzhnaya et al. (2000: 147); Abdurakhmanov & Abdulmuslimova (2002: 42); Löbl et al. (2008: 202); Abdurakhmanov & Nabozhenko (2011: 31 (fig. 28), 63, 67 (fig. 24), 185); Abdurakhmanov & Nabozhenko (2014: 34); Iwan et al. (2020: 243).

Psammocryptus bergi Kuzin 1934: 160. Type locality: "Tamgaly Tas" . Synonymy was established by Skopin (1961).

Psammocryptus bergi: Gebien (1937: 612); Skopin (1961: 178, as a junior synonym of *P. minutus*); Kryzhanovskij (1965: 167, as a junior synonym of *P. minutus*); Skopin (1968: 104, as a subspecies of *Psammocryptus minutus*); Löbl et al. (2008: 202); Iwan et al. (2020: 243), **syn. restit.**

Material examined. RUSSIA: 1 ♀ (ZIN): '*minuta* / Russ. mer.'; 1 ♀ (ZIN): 'Sarepta', '*Psammocryptus minutus* Tausch', 'k. G. Siversa' [now part of Volgograd: 48°30′43″N, 44°32′59″E]; 1 ♀ (ZIN): 'Sarepta, Bekker"', 'k. A. Yakovleva'; 1 ♂ (ZIN): 'Astrach.', '80.', 'Astrachan (Obert) [Astrakhan', Obertür]'; 6 ♂♂ 10 ♀♀ (ZIN): 'Astrakhan', Bekker"' [or Astrachan Becker on some labels]; 1 ♀ (ZIN): 'Astrakhan', 'k. Rybakova'; 1 ♂ (ZIN): 'Astrachan / 1891 / König', '*Psammocryptus minutus* Tausch', 'k. G. Siversa'; 1 ♀ (ZIN): 'Volga / Astrakhan" / 23.v.1894 / G. Suvorova'; 9 ♂♂ 7 ♀♀ (ZIN): 'Selitrennoe / Enot u Astr. g. / 9.iv.910 / Chernavin', '*Psammocryptus minutus* Tausch / A. Bogatchev det.'; 1 ♂ (PCMN): Astrakhan Region, Ikryanoe Distr. / Ilmen' Kapitansky env., 46°09′29″N, 47°23′32″E, 29.04.2006 / leg. M.V. Nabozhenko'; 1 ♂ (PCMN): 'Kalmykia, / Kaspiyskiy, at light / 25.vi.1975 Arzanov Yu.'; 14 ♂♂ 18 ♀♀ (PCMN): Dagestan, Chechen' island / 25–31.05.2012 / leg. G. Abdurakhmanov'. **ARMENIA:** 2 ♂♂ 2 ♀♀ (ZIN): 'Erivan / Maljushenco'. **AZERBAIJAN:** 2 ♀♀ (ZIN): 'Baku.', 'gen. *Psammocryptus* Kraatz'; 1 ♂ (ZIN): 'Baku.'; 1 ♂ (ZIN): 'Baku. / A. Gebel', '*Psammocryptus minutus* Tausch / A. Bogatchev det.'; 1 ♂ (ZIN): 'Baku. / Bekker', '*Psammocryptus minutus* Tausch. / Bogdanov-Katjkov det.'; 1 ♀ (ZIN): 'Baku. / 14.vi.1899 / Sumakov'; 2 ♂♂ 2 ♀♀ (ZIN): 'Bailov / Baku. / pervaya polov. maya [first half of May] 1900 / Bleker'; 3 ♂♂ 2 ♀♀ (ZIN): 'Bakinskiy u. [Baku Uezd] / 17.I.[18]95 / Rossikov'; 1 ♂ (PCMN): 'Baku 1926 / Khadarin'; 1 ♀ (ZIN): 'Kurinskaya kosa / Kasp. more. 1914–1945 [now Kura Island in the Caspian Sea: 38°58′30″N, 49°07′30″E] / N. Knipovich', '*Psammocryptus minutus* Tausch / A. Bogatchev det.'; 3 ♀♀ (ZIN): 'Caucas. / Baku', '*Psammocryptus minutus* Tausch'. **KAZAKHSTAN:** 1 ♂ (ZIN): 'fl. Ural' [valley of Ural River], '*Hyperops* / *minutus* / Russia m[eridionale]. Tausch.'; 1 ♂ (ZIN): 'Mangischlak' [Mangystau Region: Magyshlak peninsula], '*Psammocryptus*

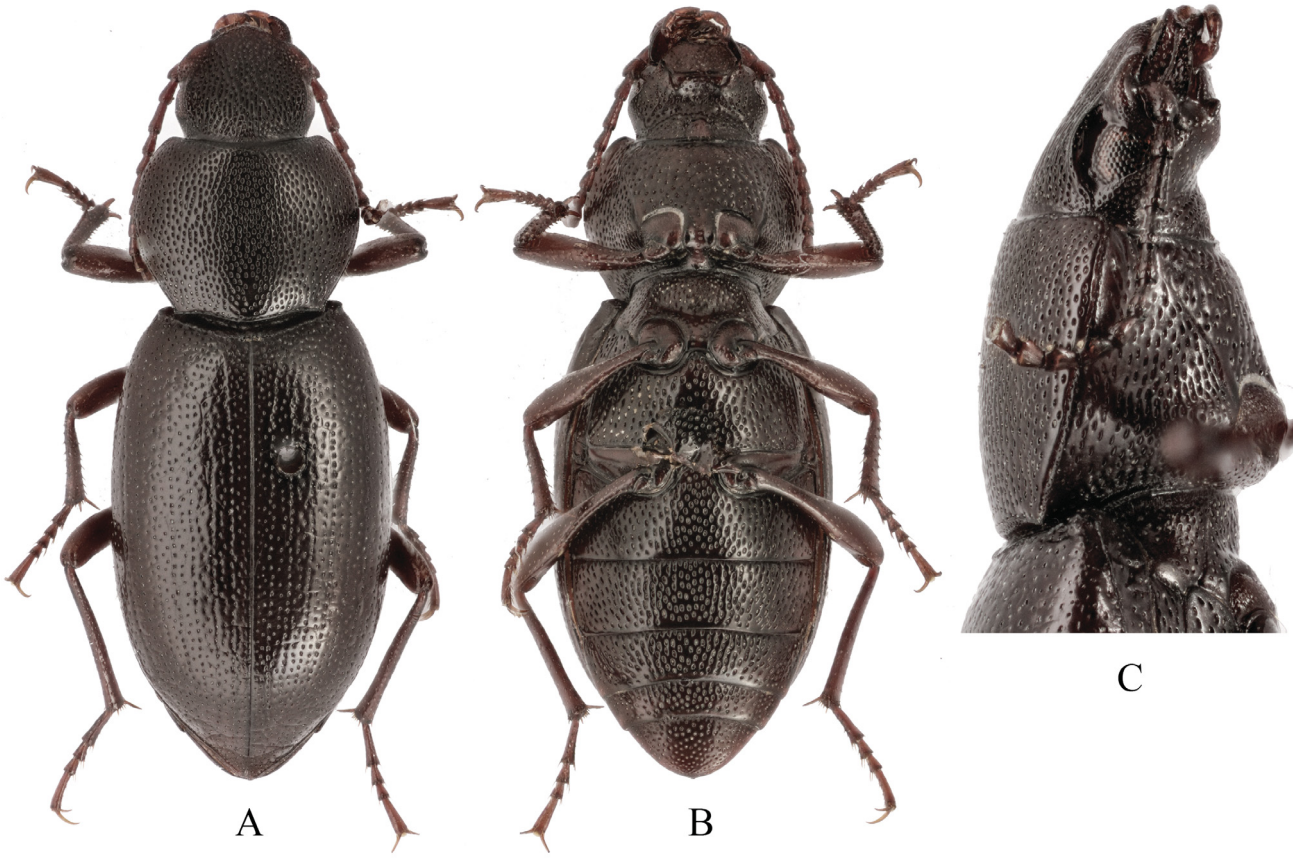

Fig. 2. *Tamena rugiceps* (Reitter, 1897): A – male dorsally; B – male ventrally; C – head laterally.

minutus Tauch'; 1 ♂ (ZIN): 'B. Barsuki [Aktobe region, Bolshiye Barsuki desert: 47°46′59″N, 59°42′42″E] / 11.x.[1]930 / E. Luppova'; 1 ♂ (ZIN): 'Okr. Chelkara [Aktobe region: Shalkar env.] / Turg. Obl. / Step' B Barsuki / N.V. Androsov', '*Psammocryptus minutus* Tsch / Breit det.'; 1 ♂ (ZIN): 'Step' B Barsuki / bl. Kara-Chekata [near Kara-Chekat] / Turg. obl. / N.V. Androsov'; 1 ♀ (ZIN): 'Temir. u., Ural. obl. / r. Astau-saldy [Aktobe Region, Astau-Saldy River, left tributary of Emba River] / 5.vi. [19]08 / D. Borodin and B. Uvarov', '*Psammocryptus minutus* Tausch'; 1 ♂ (ZIN): 'Irgiz, Turg. obl. [now Aktobe Region: Yrgyz, 48°37′N, 61°16′E] / 10.vi.[1]928 / N. Olenev, V. Popov'; 1 ♀ (ZIN): 'Irgiz, Turg. obl. / 12.vi.928 / V. Popov'; 2 ♂♂ 2 ♀♀ (ZIN): 'Dzhalangach [Aktobe Region, lake: 48°28′N, 61°18′E] / yu. Irgiza, Tur. o. / 3.iv.[18]98 / Sushkin; 1 ♂ (ZIN): 'Khar'kin [West Kazakhstan Region: Khar'kino: 48°44′N, 51°48′E] / lev. b. r. Ural [left bank of Ural River], Kazakhst. / 2.v.[1]951 / Romadina'; 1 ♀ (ZIN): 'Khar'kin / lev. b. r. Ural, Kazakhst. / 2.v.[1]951 / L. Arnol'di'; 17 ♂♂ 16 ♀♀ (ZIN): 'Khar'kin / ber. r. Ural, nizhn. tech. / 22.vi.[1]951 / Romadina', 'na *Peganum* i pod kustom' [on *Peganum* and under a bush], '*Psammocryptus minutus* Tausch / A. Bogačev det.'; 10 ♂♂ 6 ♀♀ (ZIN): 'Khar'kin / r. Ural, Kazakhst. / 19.vi.[1]951 / Gur'eva', 'pod *Peganum*', '*Psammocryptus minutus* Tausch / A. Bogačev det.'; 1 ♀ (ZIN): 'Khar'kin / r. Ural, Kazakhst. / 21.vi.[1]951 / Gur'eva', '*Psammocryptus minutus* Tausch / A. Bogačev det.'; 1 ♂ 2 ♀♀ (ZIN): 'Khar'kin / r. Ural, Kazakhst. / 28.vi.951 / Gur'eva'; 1 ♂ (ZIN): 'Khar'kin / lev.b. r. Ural, Kazakhst. / 3.vii.[1]951 / L. Arnol'di'; 1 ♂ (ZIN): 'Khar'kin / pustynya nizhn. t. r. Ural [desert in lower reaches of the Ural River] / 5.viii. [1]951 / L. Arnol'di'; 1 ♂ 2 ♀♀ (ZIN): 'Zap. Kazakh. o. / okr. N. Kazanki [West Kazakhstan Region: Zhanakazan env., 48°56′01″N, 49°36′29″E] / 14.vi.1952 g. / L. Arnol'di'; 3 ♂♂ 4 ♀♀ (ZIN): 'Pr. b. Urala, protiv Inderborstroya [Atyrau Region: Inderborskiy, 48°32′59″N, 51°46′59″E] / Gur'evsk. obl. / peski [sands] / 3.v.[19]51 / L. Arnol'di'; 1 ♂ (ZIN): 'Pr. b. Urala, protiv Inderborstroya / Gur'evsk. obl. / peski / 3.v.[19]51 / L. Arnol'di', 'pod tamariksom' [under *Tamarix*]; 1 ♂ (ZIN): 'Zap. Kaz. obl. / put' Urda – N. Kazanka [West Kazakhstan Region: way between Urda and Zhanakazan] / 11–13.vi.[1]952 / L. Arnol'di'; 2 ♀♀ (ZIN): 'r. Ural u Khar'kina / Kazakhst. / 4.vii.[1]951 / L. Arnol'di', '*Psammocryptus minutus* Tausch / A. Bogačev det.'; 1 ♂ 2 ♀♀ (ZIN): 'Semirech'e / ushch. r. Kopaly [Almaty Region: Kapal River, 45°02′13″N, 78°58′47″E] / 19.v.[19]09 / Nedovitskiy', '*Psammocryptus* Ktz. *minutus* Tausch / G. Suvorov det.'; 1 ♂ (ZIN): 'Mujunkum [Jambyl Region: Moiynkum: 44°17′9″N, 72°56′14″E] / E. Fischer', 'k. E. Fishera'; 1 ♂ (ZIN): 'S. Pribalkhash'e / Gul'shad [Karaganda Region: Gulshat: 46°38′00″N, 74°21′40″E] / 18.09.1964 / leg. N. Skopin' // '*Psammocryptus* / *minutus* Tausch. / ab. *bergi* Kuzin / 1969 N. Skopin det.'; 1 ♀ (ZIN): 'dolina r. Ili / 20 km N Kopchegaya [Almaty Region: 20 km N Kapgachay, Ili River valley, Tamgaly-Tas, 44°03′43″N, 77°00′02″E] / 9.07.1969 / leg. N. Skopin'; 1 ♂ 1 ♀ (ZIN): 'UdSSR / Kasachatan occ / Džambul [now Taraz] / 6. 1964 / Ing. Gottwald lgt.'; 1 ♂ 1 ♀ (ZIN): 'G. Balkhash [Karaganda Region: Balkhash town, 46°50′34″N, 74°58′39″E] / 24.09.1971 / leg. N. Skopin'; 1 ♂ 3 ♀♀ (PCMN): 'Kazakhstan, S-Kazakhstan Region / south shore of Kyzylkol Lake / 43°44'20"N 69°27'23"E / 30.iii-1.iv.2010 leg. A. Matalin'. **TURKMENISTAN:** 11 ♂♂ 4 ♀♀ (ZIN): 'Turkest. / Krsnv.'; 1 ♂ (ZIN): 'Krasnovodsk / 13.iv.[18]99', 'k. A. Yakovleva', '*Ps. minutus intermedius* A. Bogačev det.'; 1 ♂ (ZIN): 'Krasnovodsk / 30.v.1902 / G. Sumakov', '*Psammocryptus minutus* Tausch / A. Bogačev det.'; 1 ♀ (ZIN): 'Krasnovodsk, Zaksp.ob. / 16.vi.[190]0 / G.G. Sumakov', '*Ps. minutus* Taus.'; 13 ♂♂ 8 ♀♀ (ZIN): 'Krasnovodsk / Zakasp. obl. / 22.vi.[1]910 / E. Fisher'; 3 ♂♂ (ZIN): 'Krasnovodsk / 13.vi.[1]928 / V. Gusakovskiy'; 4 ♂♂ 3 ♀♀ (ZIN): 'Krasnovodsk / 14.vi.[1]928 / V. Gusakovskiy'; 2 ♂♂ (ZIN): 'Krasnovodsk / 17.vi.[1]928 / V. Gusakovskiy'; 2 ♂♂ 2 ♀♀ (ZIN): 'Krasnovodsk" / Zakasp. obl. 6.v.[1]900 / G.G. Sumakov'; 2 ♀♀ (ZIN): 'Krasnovodsk" / Zakasp. obl. 16.vi.[18]99 / G.G. Sumakov'; 1 ♀ (ZIN): 'Krasnovodsk / Zakasp. obl. / 22.vi.[1]910 / E. Fisher'; 1 ♂ 1 ♀ (ZIN): 'Tarta, Krasnovodsk. Kosa [Krasnovodsk spit: 39°48′35″N 53°1′18″E] / pesok ok. Salsola [sand near *Salsola*] / 18.iv. [19]32 / E. Kuznetsova'; 2 ♀♀ (ZIN): 'o. Ogurchinskiy [island in the Caspian Sea] / Kaspiyskoe more / 15 (28). vii. [19]14 / Knipovich"'; 1 ♂ (ZIN): 'Kara-Bogaz / 40 km N Kizyl-Arvat / 14.iv.[1]952 / Shteynberg', 'peski' [sands]; 1 ♂ (ZIN): 'st. Dzhebel, Turkmen. [Jebel: 39°37′51″N, 54°14′14″E] / 9.vii.[1]934 / V. Popov'.

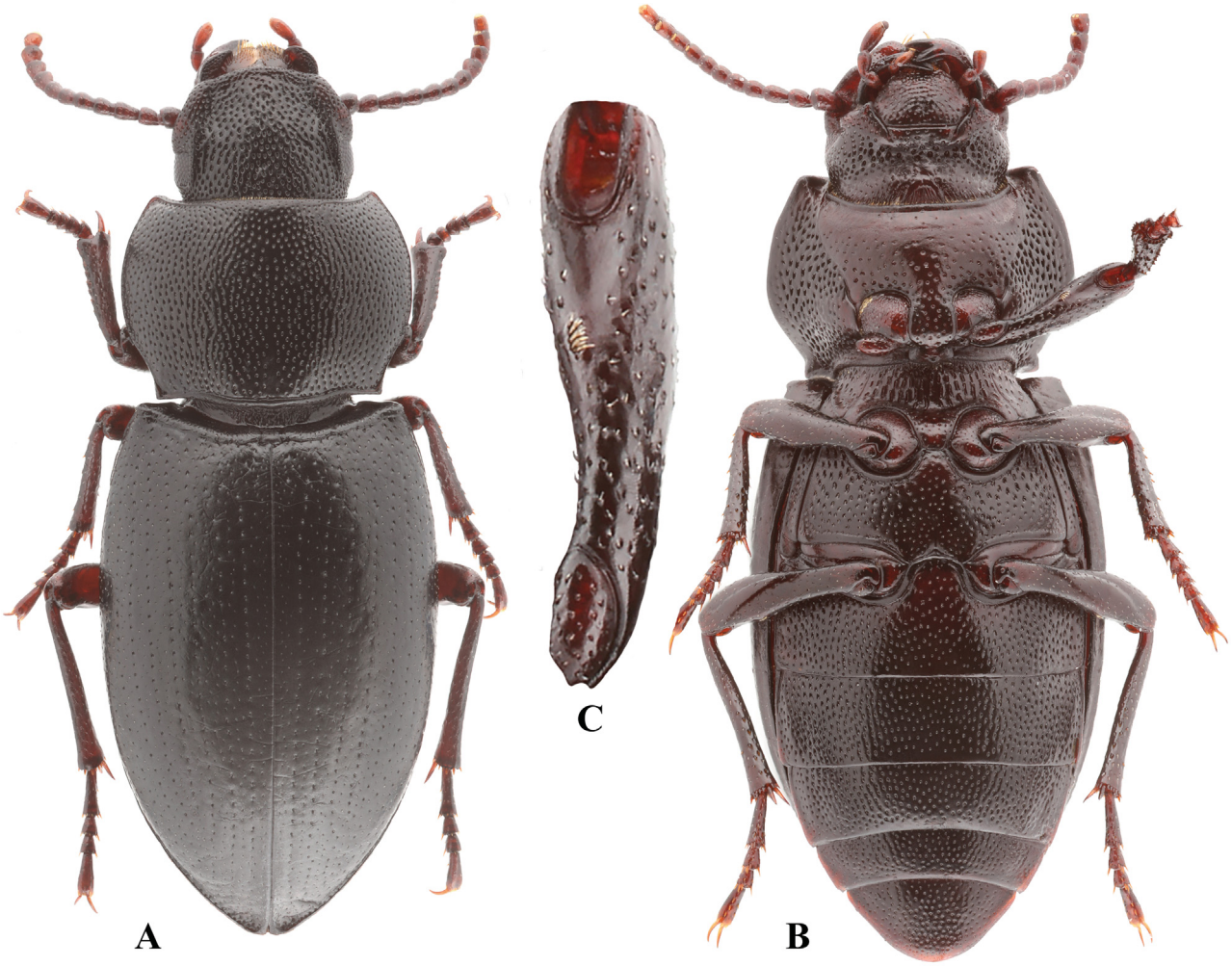

Fig. 3. *Psammocryptus minutus* (Tauscher, 1812), habitus, profemur. A – female, dorsally; B – male, ventrally; C – male profemur, flexion side.

Redescription. Body length 5.50–8.00 mm, width 2.00–2.60 mm. Measurements: PH_w – 1.60, P_wP_l – 1.38, E_lE_w – 1.47, EH_w – 1.87, EP_w – 1.15–1.16, EP_l – 2.38–2.40.

Body and legs robust, shiny. Head widest at level of genae and eyes. Anterior margin of head without emarginations between genae and epistoma; surface with or without short furrows between epistoma and other surface. Puncturation of head dorsally coarse and dense; punctures round or weakly elongate. Lateral surface of mandibles with dense and coarse longitudinal puncturation basally and round puncturation distally. Ventral side of head without deep foveae, only with simple wide transverse depression behind prementum. Prementum and head surface in middle transversely with coarse and sparse non-contiguous punctures.

Prothorax. Pronotum strongly transverse, subcordate, widest in middle. Lateral margins widely emarginated in basal quarter; anterior margin almost straight; base bisinuate. Antero-lateral corners right or weakly obtuse, pointed at apex; postero-lateral corners right or weakly acute, pointed at apex. Border of anterior margin widely interrupted in middle, and this interruption subequal in length to bordered part on one side. Puncturation of disc coarse and dense, punctures large; puncture diameter subequal to distance between punctures; punctures on sides elongate and denser. Prosternum sparsely punctured by coarse punctures; space between punctures 2–4 times as long as puncture diameter. Prosternal process with conical tubercle at apex. Prothoracic hypomera with large sparse punctures (puncture diameter subequal to space between punctures).

Pterothorax. Punctures in striae not impressed, moderate in size, 2–3 times larger than interstrial ones; interstria with sparse and fine distinct puncturation. Mesoventrite with strongly elongate narrow longitudinal fovea arranged in about three–four transverse rows (each row with 12–15 foveae). Metaventrite with large sparse puncturation (puncture diameter 2 times shorter than interpunctural space) on latero-anterior sides and much finer punctures on other surface.

Legs robust, short. Metatibiae straight. First metatarsomere 1.3–1.4 times longer than fourth one.

Abdominal ventrites 1–5 with coarse, moderately dense puncturation. Abdominal ventrite 5 rounded at apex.

Male genitalia. Apical piece of aedeagus fusiform, widest in middle.

Notes. Kuzin (1934) described *P. bergi* as a new species based on one female from Ili River valley (Kazakhstan:

Fig. 4. *Psammocryptus minutus* (Tauscher, 1812), details of structure. A – head and anterior margin of pronotum (arrows: absence of emargination on head; pointed angles of pronotum); B – head and prothorax, laterally (arrow: conical tubercle); C – mesoventrite; D – abdomen (arrow: rounded apex); E – aedeagus, ventrally (non-inverted position); F – male inner tergite VIII; G – male inner sternite VIII.

Tamgaly-Tas, 44°03′43″N, 77°00′02″E). We examined specimens from the type locality of *P. bergi* and didn't find any clear differences between this and other populations of *P. minutus*. Skopin (1961) synonymized this name with *P. minutus*, but later (Skopin 1968) interpreted it as a subspecies *P. minutus bergi*. The same available name was listed in the catalogues by Löbl et al. (2008) and Iwan et al. (2020). The following synonymy is restituted according to Skopin's (1961) work: *Psammocryptus minutus* (Tauscher, 1812) = *Psammocryptus bergi* Kuzin, 1934, **syn. restit.**

Variability. We found that one specimen from Kyzylkol Lake environs (Kazakhstan) has a very small tubercle on

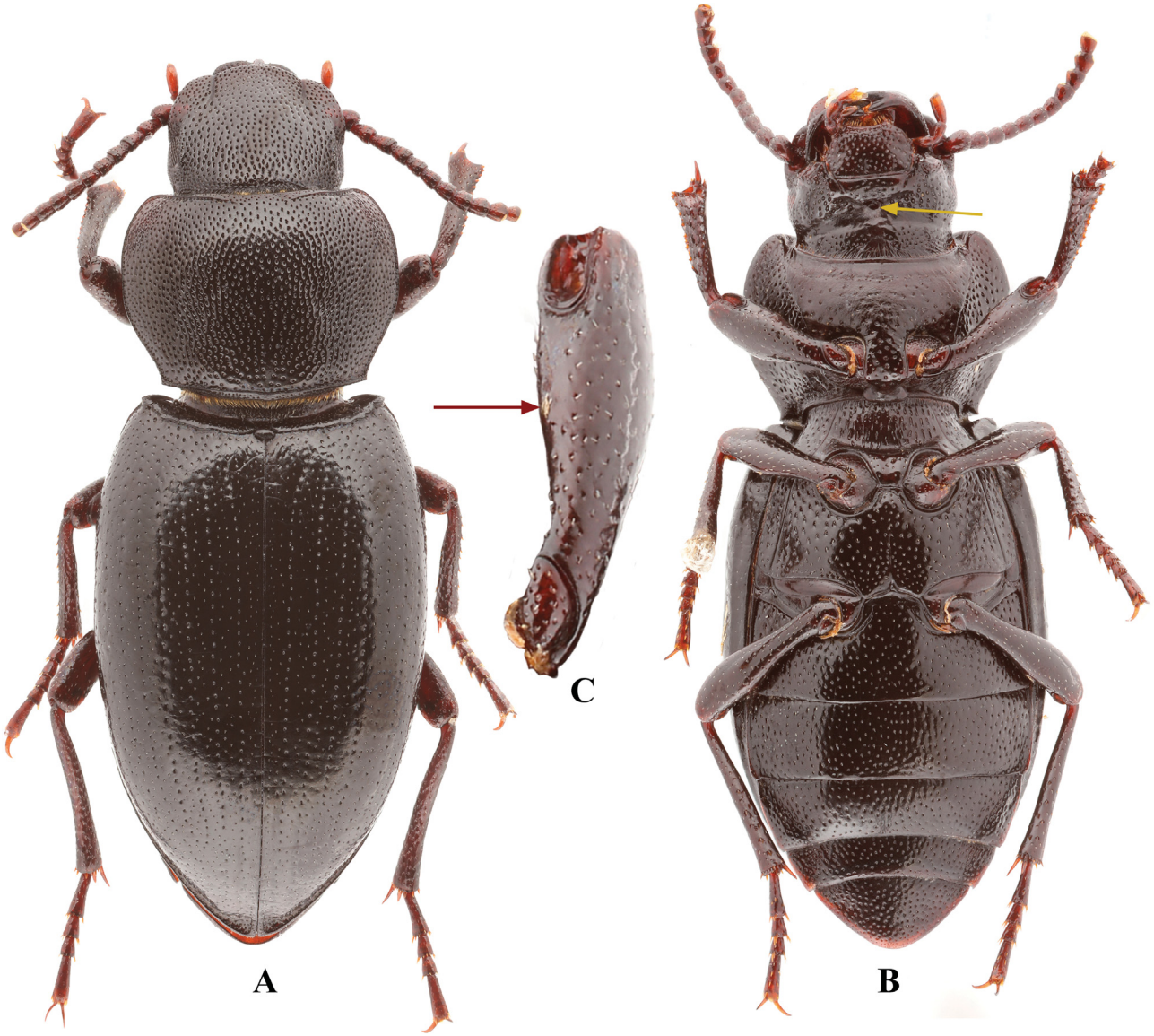

Fig. 5. *Psammocryptus bogatchevi* sp. nov., male, habitus, profemur. A – dorsally; B – ventrally; C – profemur, flexion side.

the prosternal process. Another one from this locality has only a convexity instead of the tubercle. At the same time, the other two specimens from Kyzylkol bore a well-developed conical tubercle.

Distribution (Fig. 1). Southern Russia (Caspian Depression) (based on cited references and the material above), Armenia (new record for the country), Azerbaijan (Apsheron Peninsula) (Bogatchev 1934, the material above), Kazakhstan (from Volga River to Balkhash Lake and Ili River, excluding Syr-Darya valley and Kyzylkum desert) (Skopin 1961, the material above), NW Turkmenistan (Medvedev & Nepesova 1985, the material above), N Kyrgyzstan (listed for the country by Skopin (1964), but it was omitted in the catalogue (Iwan et al. 2020)).

We studied four specimens of *P. minutus* from Yerevan (Armenia) collected by Malushenco at the beginning of the 20th century. In the last faunistic revision of Armenia (Nabozhenko et al. 2021), this species is absent; it has not been collected for more than 100 years and probably the Armenian population has now become extinct due to urbanization.

Psammocryptus bogatchevi Nabozhenko, Chigray & Bekchanov, sp. nov.

(Figs 5–7)

Psammocryptus minutus intermedius A. Bog. (nomen nudum): Davletshina (1967: 526); Skopin (1968: 104); Davletshina et al. (1979: 48, erroneous record; 106).

Psammocryptus minutus (misidentification): Pirnazarov (1970: 27) (part, see Notes below).

Type material examined. Holotype: ♂ (ZIN): **KAZAKHSTAN:** Перовск Сыр- / Дарьинск. обл. / В. Попов 30.IV. 928 [Cyrillic print label; translation: Perovsk, Syr-Darya region, leg. V. Popov; now: Kyzylorda, 44°51′0″N 65°31′0″E] // *P. minutus* / *intermedius* ssp. n. m. cotyp / A. Bogačev det [handwritten by A. Bogatchev] // Paratypus [print, red]. Paratypes (ZIN): 4 ♂♂ 5 ♀♀, with the same geographic label, but one female has additional labels: *P. minutus* / *intermedius* ssp. n. m. typ / A. Bogačev det [handwritten by A. Bogatchev] // Paratypus [print, red]; 1 ♂ (ZIN): 108 [country unknown, probably Kazakhstan] // *Psammocryptus bayeri* Koch. 1962. N. Skopin det.; 6 ♀♀ (ZIN): ‘st. Aral’skoe more O. T. zh.d. [now Kyzylorda Region: Aral, 46°47′0″N, 61°40′0″E] / 8.x.[1]910 / E. Fisher’; 1 ♀ (ZIN): ‘st. Aral’skoe more / 7.ix.[19]25 / M. Berg’; 2 ♀♀ (ZIN): ‘Perovsk / Syr-Dar’ens. obl. / Sumakov / 24.v.[1]905’; 4 ♀♀ (ZIN): ‘Perovsk / Syr-Dar’ens. obl. / Sumakov / 27.v.[1]907’; 1 ♂ 1 ♀ (ZIN): ‘Perovsk / Syr-Dar’insk. obl. / V. Popov / 30.iv.[1]928’; 1 ♂ (ZIN):

Fig. 6. *Psammocryptus bogatchevi* sp. nov., details of structure. A – head and anterior margin of pronotum (arrows: emargination of head; rounded angles of pronotum); B – head and prothorax, laterally (arrow: absence of conical tubercle); C – mesoventrite; D – abdomen (arrow: rounded apex); E – aedeagus, ventrally (non-inverted position); F – spiculum gastrale; G – male inner tergite VIII; H – male inner sternite VIII.

'Perovsk / Syr-Dar'insk. obl. / V. Popov / 14.v.[1]928'; 1 ♂ (ZIN): 'Perovsk / Syr-Dar'insk. obl. / V. Popov / 27.iv.[1]928'; 1 ♀ (ZIN): 'Perovsk / Syr-Dar'insk. obl. / V. Popov / 2.v.[1]928'; 1 ♀ (ZIN): 'Perovsk / Syr-Dar'insk. obl. / V. Popov / 5.v.[1]928'; 1 ♀ (ZIN): 'Baygakum / iii.[1]912 / V. Kozhanchikov'; 1 ♂ 1 ♀ (ZIN): 'g. Kazalinsk / Syr-Dar'insk. ob. / 26.v.[1]928 / V. Popov', '*Ps. minutus intermedius* Tausch / A. Bogačev det.'; 1 ♀ (ZIN): 'Karmakchi [now Zhosaly: 45°29′17″N, 64°05′32″E] / Syr-Dar. ob. / 22.v.[1]928 / N. Olenev, V. Popov'; 2 ♂♂ (ZIN): 'Iskele, Chikmen. [? W of Shymkent] / u. Syrdar. o. / 19.v.[18]98 / Geyer"', '*Ps. minutus intermedius* Tausch / A. Bogačev det.'; 1 ♂ 5 ♀♀ (ZIN): 'Baygakum / iii.[1]912 / V. Kozhanchikov'; 1 ♂ (ZIN): 'Dzhukel" [now Baygakum] / Syrdar. obl. / 30.v. [18]98 / Geyr"'; 1 ♀ (ZIN): 'Dzhukel" [Baygakum], Orenb. / Tashk.zh.dSyr-Dar / 6.vii.[19]10 / Kozhanchikov'; 2 ♂♂ (ZIN): 'N. Turkestan / Dshulek / 5.vi.1911 / Koshantshikov; 1 ♀ (ZIN): 'Syr-Darja Gebiet / Perovsk / 2.v.[19]05 / J. Baekmann.', '*Ps. minutus intermedius* Tausch / A. Bogačev det.'; 1 ♀ (ZIN): 'Syr-Darja Gebiet / Perovsk / 6.v.[19]05 / J. Baekmann.'; 1 ♂ (ZIN): 'Syr-Darja Gebiet / Perovsk / 19.iv.[19]05 / J. Baekmann.'; 1 ♀ (ZIN): 'Syr-Darja Gebiet / Perovsk / 21.iv.[19]05 / J. Baekmann.'; 1 ♀ (ZIN): 'N. Turkestan / Perovsk / 16.v.[19]05'; 1 ♀ (ZIN): 'Baygakum / 22.vi.[18]97'; 1 ♂ (ZIN): 'St. Kazalinsk / O. T.zh.d. / 19.v.[19]10 / G.G. Sumakov"'; 1 ♀ (ZIN): 'Dzhulek / Perovskogo u. / 25.vi.[1]915 / E.Pavlovskiy'; 1 ♂ (ZIN): 'Kara-Uzyak / Perovskogo u. / 20.vi.[19]16 / N. Pulikovskaya'. **UZBEKISTAN:** 1 ♂ 1 ♀ (ZIN): 'g. Bukhara / 12.v.1888 / A. Semenov'; 1 ♂ 1 ♀ (ZIN): 'Kara-Teren' / Aral'sk. More [Aral Sea] / 11.ix.[19]25 / M. Berg'; 5 ♂♂ 1 ♀ (ZIN): 'Muynak / Aral'sk. More / 4.ix.[19]25 / M. Berg'; 1 ♀ (ZIN): 'Ayak-agytma / Bukharsk. obl. / 18.v.[1]948 / Kirichenko'; 1 ♂ (ZIN): 'Nukus, niz. Amudar'i / 20.viii.[1]910 / E. Fisher'; 1 ♂ (ZIN): 'st. Syr-Dar'inskaya [Syr-Darya (Syrdaryo) ralway station: 40°51′N, 68°40′E] / 8.v.[1]903 / N.N. Ivanov"'; 1 ♂ (ZIN): 'st. Syr-Dar'inskaya / 13.v.[1]903 / N.N. Ivanov"'; 1 ♂ (ZIN): 'Kizil kumy / st. SyrDar'in., Dzhiz / 13.v.[19]03 / G. Yakobson'; 1 ♂ 2 ♀♀ (ZIN): 'Mullya Vul'gan / Il'be Kuybak, Dzhz [near Jizzakh: 40°28′N, 67°34′E] / 9.v.[19]03 / G. Yakobson'; 3 ♂♂ 2 ♀♀ (IZUZ): 'Karakalpakstan Republic, between / Amudarya and Beruni districts, Lower / Amudarya State Biosphere Reserve, / 41°58′26.1″N, 60°22′45.2″E and 41°58′26.1″N / 60°22′42.2″E, 41°58′24.5″N 60°23′04.3″E, 27– / 28.08.2021 leg. N. Bekchanov'; 3 ♂♂ 2 ♀♀ (ZIN): 'Fergana, Min- / Bulak [Namangan Region, Mingbuloq District: 40°51′48″N, 71°27′35″E] 14.vii.1909 / Zarudnyi'; 1 ♂ (ZIN): 'Namang. u. Ferg. dolina [Namangan Distr., Fergana valley] / vesna 904 [spring 1904] / Yankovskiy'.

Description. Body length 6.00–8.00 mm, width 2.50–2.80 mm. Measurements: PH_w – 1.56, P_wP_l – 1.33, E_lE_w – 1.54, EH_w – 1.88, EP_w – 1.20, EP_l – 2.46.

Body robust, black or black-brown, shiny.

Head widest at level of posterior margin of eyes. Anterior margin of epistoma with long rostrum in middle; genae separated from epistoma by distinct obtuse emargination on outer margin and by longitudinal grooves on head surface. Labrum partly visible under rostrum. Puncturation of head dorsally coarse and dense; punctures subequal to puncture diameter in anterior half of head; punctures longitudinal and denser at base of frons. Lateral surface of mandibles with sparse smooth puncturation. Head ventrally with deep large tunnel foveae in middle, continued under prementum. Prementum and head surface around prementum with coarse and sparse non-contiguous punctures.

Prothorax. Pronotum strongly transverse, cordate, widest in anterior third. Lateral margins weakly emarginated near base; anterior margin straight; base evenly widely rounded. Antero-lateral corners obtuse, widely rounded at apex; postero-lateral corners weakly obtuse or right, pointed at apex. Base widely bordered; lateral margins narrowly bordered; border of anterior margin shortly interrupted in middle, and this interruption much shorter than bordered part on one side. Puncturation of disc coarse and dense; puncture diameter subequal to distance between punctures; punctures on sides weakly elongate and denser. Prosternum very sparsely punctured by moderate in size smooth punctures; space between punctures 4–5 times as long as puncture diameter. Prosternal process without tooth or conical tubercle at apex. Prothoracic hypomera with large sparse punctures (puncture diameter subequal to space between punctures).

Pterothorax. Scutellar shield widely pentagonal. Elytra widest in middle and basal third. Punctures in striae not impressed, small, but larger than interstrial ones; interstria with sparse and fine puncturation. Mesoventrite with strongly elongate narrow longitudinal fovea arranged in about four transverse rows (each row with 13–15 foveae). Metaventrite with sparse coarse puncturation (puncture diameter 2–3 times shorter than interpunctural space).

Legs robust, short. Metatibiae slightly curved inwards. Metatarsomeres 1 and 4 subequal in length.

Abdomen with coarse moderately sparse puncturation; diameter of punctures 1.5–2.0 times as short as interpunctural space; puncturation of abdominal ventrite 5 the same as on other ventrites and slightly denser. Abdominal ventrite 5 rounded at apex.

Male genitalia. Anterior margin of inner tergite VIII shortly emarginated in middle. Inner sternite VIII with deep emargination in middle and rounded apices. Rods of spiculum gastrale not merged in common stem. Apical piece of aedeagus fusiform, widest in middle.

Comparative diagnosis. The species is close to *P. minutus* in the robust body and legs, the structure of the male aedeagus (the apical piece is widest in middle), in similar puncturation of all abdominal ventrites. The new species is different from other species of *Psammocryptus* in very deep large fovea on the ventral side of head, continuing under the prementum (Fig. 5B) and in the absence of tooth or conical tubercle at the apex of the prosternal process (Fig. 6B) (except for the population from Fergana valley). It additionally differs from *P. minutus* in the presence of weak but distinct emarginations at the anterior margin of the head between gena and epistoma, widely rounded anterolateral corners of pronotum (pointed in *P. minutus*), widely rounded pronotal base (bisinuate in *P. minutus*), very short interruption of the border of the anterior margin of the pronotum (much longer in *P. minutus*), the pronotum widest in the anterior third (at the middle in *P. minutus*), and in subequal length of metatarsomeres 1 and 4.

Etymology. The species is named in memory of a famous specialist on Tenebrionidae, Prof. Alexey Vladimirovich Bogatchev (1909–1977), who scheduled this taxon for a description.

Bionomics. The species was collected in a tugay forest with the dominance of *Populus euphratica* and *P. pruinosa* (sect. *Turanga*) (Fig. 7A) under bedding of leaves on sandy saline soil (Fig. 7B), 5–35 m from the shore of the Amudarya River.

Distribution (Fig. 1). Kazakhstan: Syrdarya basin, Kyzylkum desert; Uzbekistan: Amudarya lower reaches and delta, Syrdarya basin, Kyzylkum desert.

Notes. Davletshina (1967) was the first who used the

Fig. 7. Habitat of *Psammocryptus bogatchevi* sp. nov., Amudarya State Biosphere Reserve (Uzbekistan). A – Tugay forest with trails of *Cervus elaphus bactrianus* Lydekker, 1900; B – habitat with leaf bedding on sandy soil (and collector Norbek Bekchanov).

name "*Psammocryptus minutus intermedius* A. Bog." for here described *P. bogatchevi* sp. nov. She presented only data on bionomics and mentioned that the species inhabit *Salsola arbuscula – Salsola orientalis – Artemisia* biocenosis. Later she (Davletshina et al. 1979) repeated these ecological data (p. 106) and added erroneous information (p. 48) that this species flies at light together with *Sphenaria karelini* Ménétriés, 1849 (Tenebrionidae: Epitragini) in sand dune habitats with saxaul *Haloxylon persicum*. In fact, *Psammocryptus* spp. are wingless and do not inhabit non-fixed sand dunes. Skopin (1968) also listed the name "*Psammocryptus minutus intermedius* A. Bog." for *P. bogatchevi* sp. nov., but he mentioned only notes on the distribution in Syr-Darya valley and Kyzylkum desert. We checked all publications of A. Bogatchev according to the full bibliographic list (Kryzhanovskij & Medvedev 1979) but did not find a description of this species. However, two specimens with labels of syntypes (handwritten by Bogatchev) are deposited in ZIN. Bogatchev determined Tenebrionidae for Davletshina, and he probably wrote this unpublished name on the labels, which (name) was subsequently published. Thus, the name "*Psammocryptus minutus intermedius*" is nomen nudum. Pirnazarov (1970) recorded *Psammocryptus minutus* from western Uzbekistan (Karakalpakstan), but in fact, he listed two species: *Psammocryptus minutus* from Kosbulak (now Qo'sbuloq, northern part of Ustyurt plateau) and *P. bogatchevi* sp. n. from Amu-Darya delta. Skopin (1968) distinguished three subspecies with transitional features between them: *P. minutus minutus*, *P. minutus bergi* and *P. minutus intermedius*. We examined large series of *P. minutus* and *P. bogatchevi* sp. nov. and did not find any transitional characters in diagnostic structures of the epistomal anterior margin, ventral side of head and the pronotum.

Psammocryptus bayeri bayeri Koch, 1943

(Figs 8, 9)

Psammocryptus bayeri Koch, 1943: 581. Type localities: Saramsakli (now Turkmenistan: Sarymsakly spring) and Kerki (Turkmenistan).

Psammocryptus bayeri: Medvedev & Nepesova (1985: 67); Löbl et al. (2008: 202); Iwan et al. (2020: 244).

Material examined. TURKMENISTAN: 1 ♂ (ZIN): "Bukhara, Amu-Darya, Mukry 6.vi.1904 G. Suvorov" [Cyrillic label; now Turkmenistan, Lebap Province, Köýtendag District, Mukry, 37°35′52″N, 65°43′30″E]; 1 ♂ 4 ♀♀ (ZIN): 'Kushka [Mary Prov., Serhetabad: 35°16′33″N, 62°20′30″E] / vi.[1]912 / V. Kozhanchikov'; 1 ♂ 1 ♀ (ZIN): 'Turkmeniya / khr. Kugitangtau / Kaynar-Baba [Lebap Province, Köýtendag District, Kaynar Baba hot lake: 37°32′16″N, 66°24′21″E] / (Karlyuka) / 21.vi.1977 / G.S. Medvedev'; 1 ♀ (ZIN): 'V. Turkm. / 6 km O. Kelifa [Lebap Province, Köýtendag District: 6 km E of Kelif: ~ 37°20′25″N, 66°21′55″E] / 19.iv.[1]968 / G. Medvedev'. **TAJIKISTAN:** 1 ♂ (ZIN): 'W of Shaartuz, Chilichor-Chashma [37°17′37″N, 68°02′16″E], 20.iv.1962, leg. Gur'eva'; 1 ♀ (ZIN): 'Shaartuz / Aruk-Tau range / 6.v.1964 M. Tadzhibaev'.

Redescription. Body length 8.00–9.50 mm, width 2.60–3.00 mm. Measurements: PH_w – 1.43, P_wP_l – 1.24, E_lE_w – 1.60, EH_w – 1.84, EP_w – 1.28, EP_l – 2.57.

Body and legs slender, shiny. Head widest at level of genae, there slightly wider than at level of eyes. Anterior margin of head: genae separated from epistoma by distinct obtuse emargination on outer margin and by longitudinal

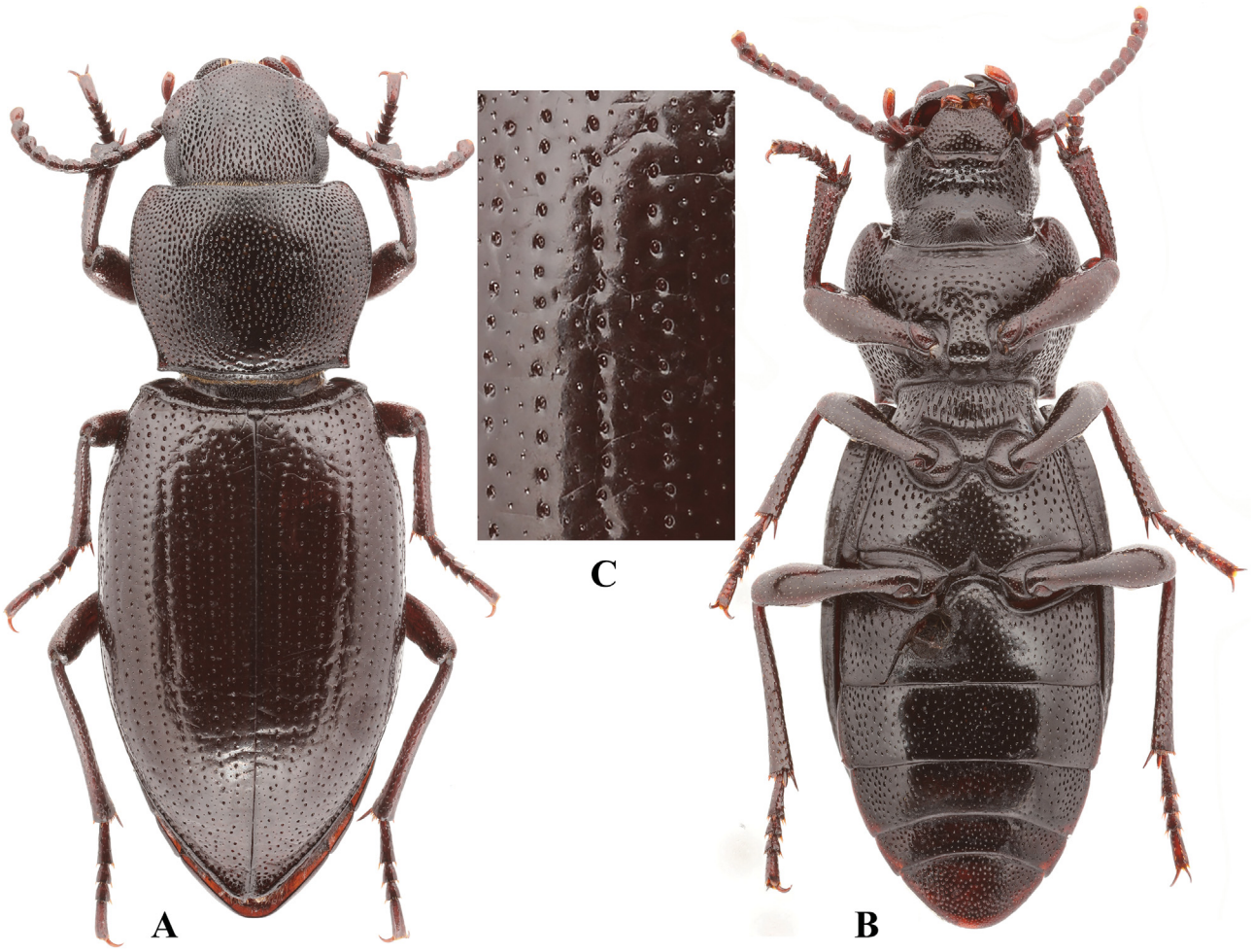

Fig. 8. *Psammocryptus bayeri bayeri* Koch, 1943, habitus, elytral puncturation. A – male, dorsally; B – male, ventrally; C – elytral puncturation.

grooves on head surface. Puncturation of head dorsally coarse and dense; punctures longitudinal and denser at base of frons. Lateral surface of mandibles with dense and coarse distinct puncturation. Ventral side of head without deep foveae, only with simple wide transverse depression behind prementum. Prementum and head surface around prementum with coarse and sparse, sometimes contiguous punctures.

Prothorax. Pronotum moderately transverse, cordate, widest in anterior third. Lateral margins widely emarginated in basal quarter; anterior margin almost straight; base bisinuate. Antero-lateral corners obtuse, rounded at apex; postero-lateral corners right or acute, pointed at apex. Border of anterior margin widely interrupted in middle, and this interruption subequal in length to bordered part on one side. Puncturation of disc coarse and dense, punctures large; puncture diameter subequal to distance between punctures; punctures on sides elongate and denser. Prosternum moderately sparsely punctured by coarse distinct punctures; space between punctures 3–4 times as long as puncture diameter. Prosternal process with conical tubercle at apex. Prothoracic hypomera with large sparse punctures (puncture diameter subequal to space between punctures).

Pterothorax. Punctures in striae not impressed, moderate or large, much larger than interstrial ones; interstria with sparse and fine distinct puncturation. Mesoventrite with strongly elongate narrow longitudinal fovea arranged in about four transverse rows (each row with 14–17 foveae). Metaventrite with large sparse puncturation (puncture diameter 2–3 times shorter than interpunctural space).

Legs slender, comparatively long. Metatibiae straight. First metatarsomere 1.09–1.10 times longer than fourth one.

Abdominal ventrites 1–4 with coarse moderately sparse puncturation on lateral sides, but with fine and sparse puncturation in middle; puncturation of abdominal ventrite 5 much coarser and denser, than in middle of ventrites 1–4. Abdominal ventrite 5 rounded at apex.

Male genitalia. Apical piece of aedeagus strongly widened from base to apex, widest in apical quarter.

Distribution (Fig. 1). S Turkmenistan (Koch 1943, Medvedev & Nepesova 1985, the material above), SW Tajikistan (a new record for the country).

Psammocryptus bayeri vachshianus Nabozhenko & Chigray, subsp. nov.

(Figs 10, 11)

Type material examined. Holotype: ♂ (ZIN), **Tajikistan: Khatlon Region:** ‘Заповедник «Тигровая балка» Насреддинов, 17.IV. [19]72’ [“Tigrovaya balka” Nature Reserve, leg. Kh.A. Nasreddinov] // ‘в почве’ [in soil]. Paratypes: 5 ♂♂ 3 ♀♀ (ZIN), the same data as holotype.

Description. Body length 7.50–9.20 mm, width 2.50–3.00 mm. Measurements: PH_w – 1.54, P_wP_l – 1.32, E_lE_w – 2.58,

Fig. 9. *Psammocryptus bayeri bayeri* Koch, 1943, details of structure. A – head and anterior margin of pronotum (arrows: emargination of head; rounded angles of pronotum); B – head and prothorax, laterally (arrows: dense puncturation on head; conical tubercle of prosternal process); C – mesoventrite; D – abdomen (arrow: rounded apex); E – tegmen, ventrally (non-inverted position); F – median lobe of aedeagus; G – spiculum gastrale; H – male inner sternite VIII.

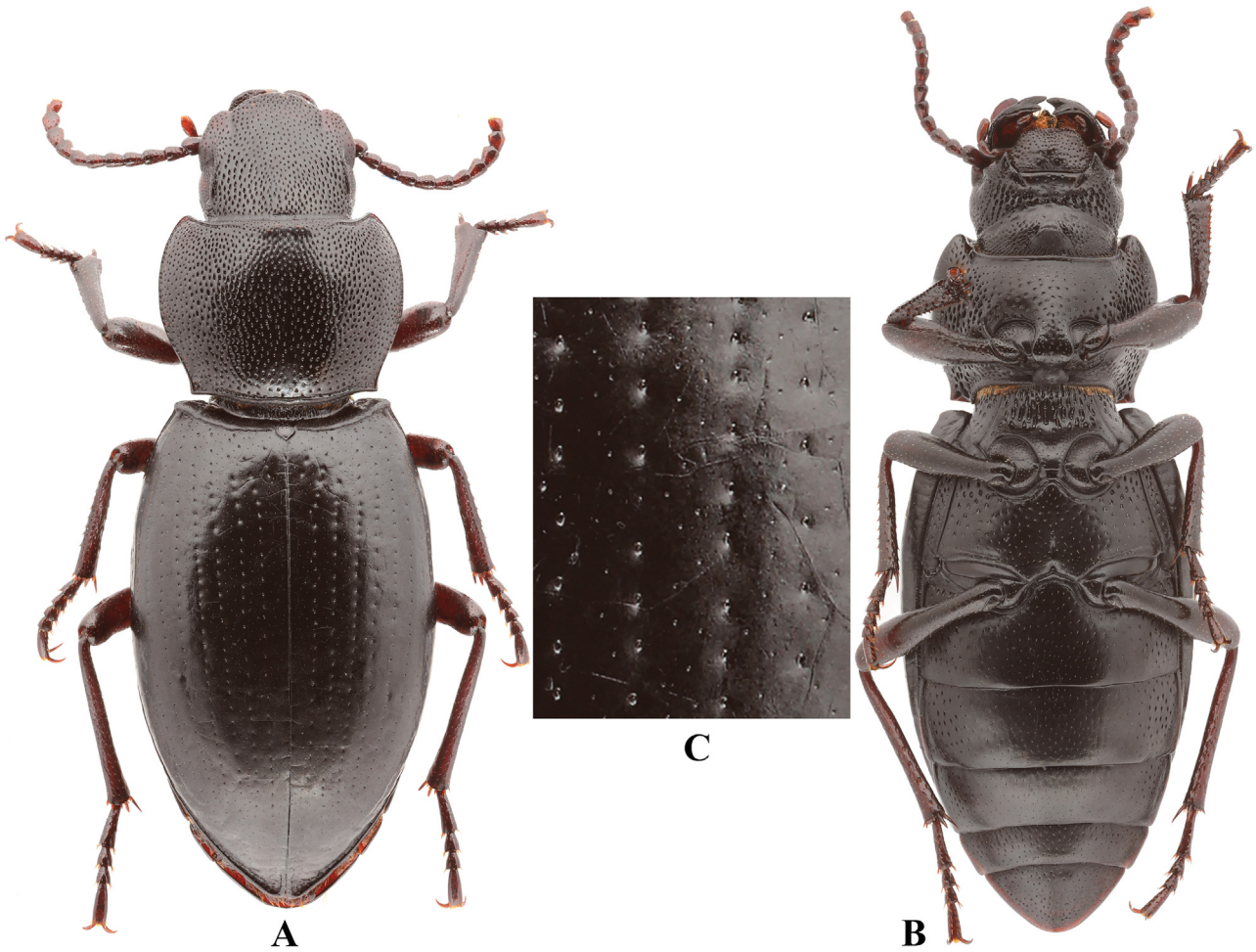

Fig. 10. *Psammocryptus bayeri vachshianus* subsp. nov., habitus, elytral puncturation. A – male, dorsally; B – male, ventrally; C – elytral puncturation.

EH_w – 1.90, EP_w – 1.23, EP_l – 2.58.

Body and legs slender, pronotum and head dorsally shiny, other surface dull. Head widest at level of eyes and genae. Anterior margin of head: genae separated from epistoma by distinct deep emargination on outer margin and by longitudinal grooves on head surface. Puncturation of head dorsally coarse and dense; punctures longitudinal and denser at base of frons. Lateral surface of mandibulae with sparse and fine puncturation. Ventral side of head without deep foveae, only with simple wide transverse depression behind prementum. Prementum with very sparse punctures moderate in size; head surface around prementum with very coarse, dense, contiguous, large, foveolate punctures.

Prothorax. Pronotum moderately transverse, cordate, widest in anterior third. Lateral margins widely emarginated in basal quarter; anterior margin almost straight; base bisinuate. Antero-lateral corners obtuse, pointed or very narrowly rounded at apex; postero-lateral corners right or acute, pointed at apex. Border of anterior margin widely interrupted in middle, and this interruption subequal in length to bordered part on one side. Puncturation of disc coarse and dense, punctures large; puncture diameter subequal to distance between punctures; punctures on sides elongate and denser. Prosternum moderately sparsely punctured by coarse distinct punctures; space between punctures 3–4 times as long as puncture diameter. Prosternal process with conical tubercle at apex. Prothoracic hypomera with very large sparse punctures (puncture diameter subequal to space between punctures) in middle and much smaller puncturation along outer margin.

Pterothorax. Punctures in striae small, impressed (especially in middle), larger than interstrial ones; interstria with extremely sparse and fine puncturation. Mesoventrite with very large longitudinal fovea arranged in about four transverse rows (each row with 9–12 foveae). Metaventrite with large sparse puncturation only on latero-apical sides (puncture diameter 2–3 times shorter than interpunctural space), but with fine and sparse puncturation on other surface.

Legs slender, comparatively long. Metatibiae straight. First metatarsomere 1.3 times longer than fourth one.

All abdominal ventrites with very fine and sparse puncturation, that slightly coarser and elongate on lateral sides of ventrites 1–3. Abdominal ventrite 5 rounded at apex.

Male genitalia. The same as in nominotypical subspecies, only male inner sternite VIII emarginated more deeply.

Comparative diagnosis. The new subspecies differs from

Fig. 11. *Psammocryptus bayeri vachshianus* subsp. nov., details of structure. A – head and anterior margin of pronotum (arrows: emargination of head; pointed angles of pronotum); B – head and prothorax, laterally (arrows: sparse puncturation on head; conical tubercle of prosternal process); C – mesoventrite; D – abdomen (arrow: rounded apex); E – aedeagus, ventrally (non-inverted position); F – spiculum gastrale; G – male inner tergite VIII; H – male inner sternite VIII.

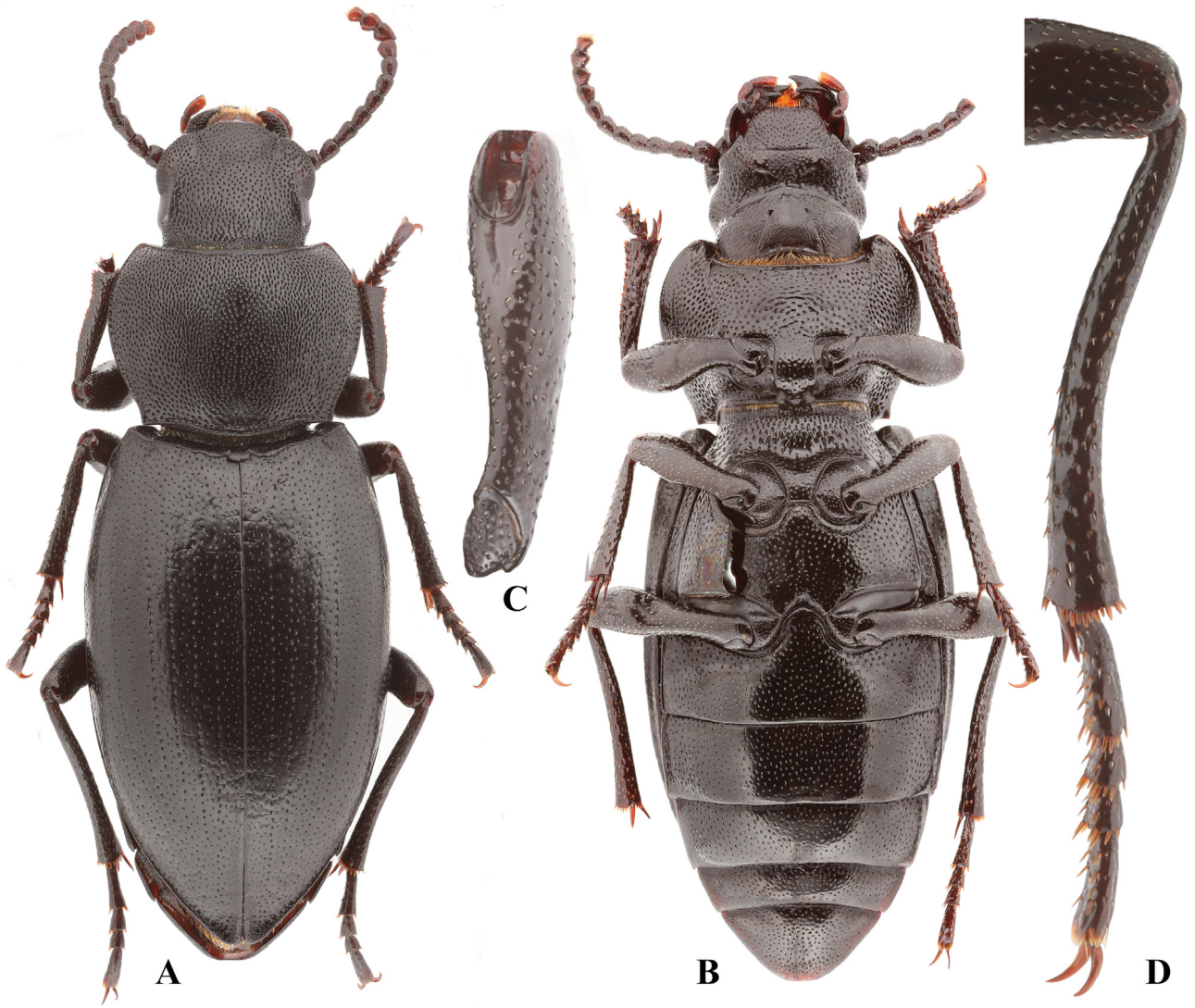

Fig. 12. *Psammocryptus kompantsevae* sp. nov., female, habitus, legs. A – dorsally; B – ventrally; C – profemur, flexion side; D – metatibia.

the nominotypical one in the sparse and fine puncturation of lateral sides of mandibles (Fig. 11B) (coarsely and densely punctured in *P. bayeri bayeri* (Fig. 9B)), dull body except for pronotum and head (Figs 10A, B) (shiny in nominotypical subspecies (Figs 8A, B)), elongate foveae on mesoventrite much larger and lesser in number (Fig. 11C), very small impressed strial punctures (Fig. 10C) (not impressed and larger in nominotypical subspecies (Fig. 8C)), extremely fine and sparse interstrial puncturation (Fig. 10C), very finely and sparsely punctured abdominal ventrites, where ventrite 5 has the same punctation as other ventrites (Fig. 11D).

Etymology. The name is derived from Vakhsh River (tributary of Amu Darya River), where the "Tigrovaya Balka" Nature Reserve is located; adjective.

Distribution (Fig. 1). Tajikistan: Vakhsh River valley.

Psammocryptus kompantsevae Nabozhenko & Chigray, sp. nov.

(Figs 12, 13)

Psammocryptus bayeri Koch, 1943 (misidentification): Egorov & Rakhimov (2015: 32).

Type material examined. Holotype: ♂ (ZIN), 'Uzbekistan, Surkhandarya region / Surkhandarya River 37°18′58.7″N / 67°23′41.2″E, 341 m / 19.iv.2014, tugay / leg. M.V. Mokrousov, T.U. Rakhimov'. Paratypes: **UZBEKISTAN: Surkhandarya Region:** 1 ♀ (ZIN): 'Termes [Termez]' 19.v.1907'. **TAJIKISTAN: Khatlon Region:** 2 ♀♀ (ZIN): № 7.V.[19]86 / ТАДЖИКИСТАН / ниж. теч. р. Вахш / зап. «Тигр. Балка» / Компанцева Т.В. [lower reaches of Vakhsh River, "Tigrovaya balka" Nature Reserve, leg. T.V. Kompantseva].

Description. Body length 9.00 mm, width 3.00 mm. Measurements: PH_w – 1.60, P_wP_l – 1.38, E_lE_w – 1.60, EH_w – 1.95, EP_w – 1.20, EP_l – 2.69.

Body slender, black, moderately shiny.

Head widest at level of genae. Anterior margin of epistoma with long rostrum in middle; genae separated from epistoma by obtuse emargination on outer margin and by longitudinal grooves on head surface. Labrum completely visible under rostrum, coarsely and densely punctured. Puncturation of head dorsally moderately coarse and dense; punctures subequal to puncture diameter in anterior half of head; punctures longitudinal on frons. Lateral surface of mandibles with distinct dense puncturation. Ventral side of head without deep foveae, only with simple wide transverse depression behind prementum. Prementum with

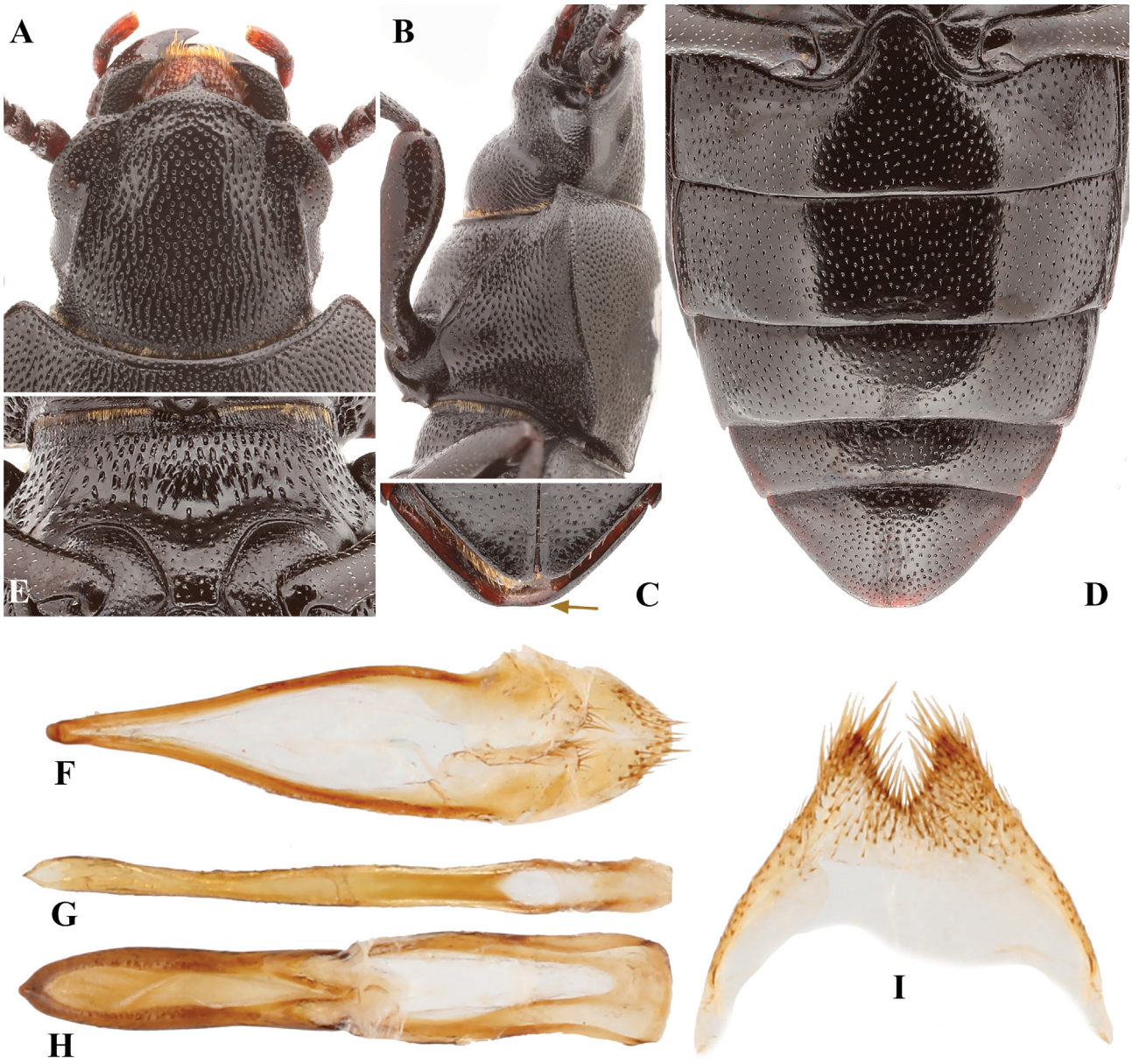

Fig. 13. *Psammocryptus kompantsevae* sp. nov., details of structure. A – head and anterior margin of pronotum; B – head and prothorax, laterally; C – apex of elytra and abdomen dorsally (arrow: truncated apex of ventrite 5); D – abdomen ventrally; E – mesoventrite; F – spiculum gastrale and IX tergite; G – median lobe of the aedeagus; H – aedeagus; I – male inner sternite VIII.

smooth sparse puncturation in anterior half; basal half of prementum and head surface around prementum with moderately coarse and dense non-contiguous punctures.

Prothorax. Pronotum strongly transverse, cordate, widest in anterior third. Lateral margins weakly emarginated near base; anterior margin evenly widely emarginated; base bisinuate. Antero-lateral corners right, pointed at apex; postero-lateral corners weakly obtuse, pointed at apex. Base widely bordered; lateral margins narrowly bordered; anterior margin almost completely bordered, only very shortly interrupted in middle. Puncturation of disc moderately coarse and very dense; puncture diameter subequal to distance between punctures; punctures on sides of middle denser, elongate and merged into longitudinal wrinkles. Prosternum with moderately coarse and moderately dense puncturation; space between punctures nearly 2 times as long as puncture diameter. Prosternal process with conical tubercle at apex. Prothoracic hypomera with comparatively small dense punctures (puncture diameter subequal to space between punctures).

Pterothorax. Scutellar shield pentagonal. Elytra widest slightly before middle. Punctures in striae not impressed, small, slightly larger or subequal to interstrial ones; interstria with sparse and comparatively coarse puncturation. Mesoventrite with slightly elongate punctures arranged in about six transverse rows (each row with 15–20 punctures). Metaventrite with fine, moderately dense puncturation (puncture diameter subequal to interpunctural space).

Legs slender, comparatively long. Metatibiae strongly curved inwards. Metatarsomeres 1 and 4 subequal in length.

Abdomen with fine moderately sparse puncturation; diameter of punctures 1.5 times as short as interpunctural space; puncturation of abdominal ventrite 5 same as on

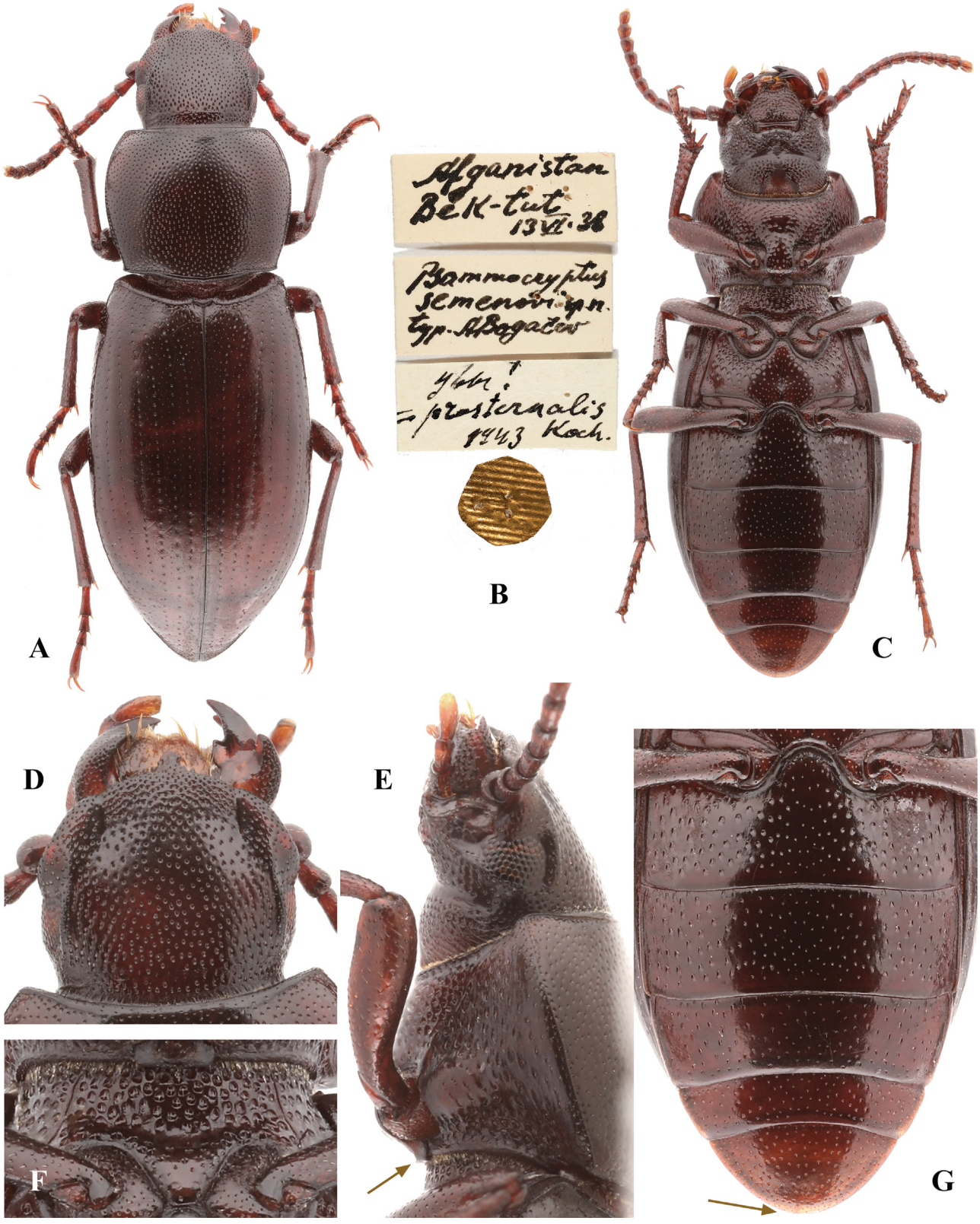

Fig. 14. *Psammocryptus prosternalis* Koch, 1943, female, habitus, details of structure. A – holotype of *P. semenovi* Bogatchev, 1946, dorsally; B – ditto, labels; C – habitus ventrally; D – head and anterior margin of pronotum; E – head and prothorax, ventrally (arrow: conical tubercle of prosternal process); F – mesoventrite; G – abdomen (arrow: rounded apex).

other ventrites. Abdominal ventrite 5 shortly truncate at apex.

Male genitalia. Lateral margins of apical piece of aedeagus widely emarginated in basal third; apical piece slightly widened in apical third.

Comparative diagnosis. The new species differs from all species of the genus in the truncated apex of the abdominal ventrite 5 (Figs 13C, D), very dense puncturation of the pronotum with punctures often merged in longitudinal wrinkles on sides (Fig. 12A), puncturation of mesoventrite

(weakly elongate and dense punctures in contrast with other species with strongly longitudinal or round foveolate punctures) (Fig. 13E), inward-curved metatibiae in female (Fig. 12D).

Etymology. The species is named in honour of Dr Tatiana Vladimirovna Kompantseva (Moscow Zoo), a known specialist on saproxylic Tenebrionidae and Elateridae and the collector of the type specimens.

Distribution (Fig. 1). Uzbekistan and Tajikistan: Amudarya, upper river basin.

Notes. Egorov & Rakhimov (2015) recorded *P. bayeri* as a new record for Uzbekistan (Surkhandarya River, tugay forest), which was omitted in the Palaearctic Catalogue (Iwan et al. 2020). Leonid Egorov recently examined this specimen from Uzbekistan, using our illustrations and the key, and identified it as the male of *P. kompantsevae* sp. nov. The first author also examined this specimen and confirmed the identification.

Psammocryptus prosternalis Koch, 1943

(Fig. 14)

Psammocryptus prosternalis Koch, 1943: 583. Type locality: "Quetta, Belutschistan".

Psammocryptus prosternalis: Gridelli (1954: 195); Kaszab (1959: 388, Tafel II, Fig. 14); Kaszab (1961: 115); Kaszab (1973: 38); Kaszab (1974: 188); Löbl et al. (2008: 202); Iwan et al. (2020: 244).

Psammocryptus semenovi Bogatchev, 1946: 393. Type locality: Afghanistan, Bek-tut. Synonymy was established by Kryzhanovskij (1965).

Psammocryptus semenovi: Kryzhanovskij 1965: 167 (as a junior synonym of *P. prosternalis*).

Type material examined. *Psammocryptus semenovi*: Holotype: ♀ (ZIN), 'Afganistan / Bek-tut / 13.VI.38', '*Psammocryptus* / *semenovi* sp. n. / typ. A. Bogačev', 'Увы! [Alas!] = *prosternalis* Koch 1943', goldish circle.

Additional material examined. AFGHANISTAN: 2 ♀♀ (ZIN): 'Afghanistan / №. 409 / 27.ix.[1]957 / Dr. K. Lindberg', 'Kabuol / Mont Cher Dervazen', '*Psammocryptus prosternalis* Koch / Dr. Z. Kaszab det., 1967'; 1 ♀ (ZIN): 'Afghanistan / №. 400 / 27.ix.[1]957 / Dr. K. Lindberg', 'Kabuol / Mont Cher Dervazen'; 1 ♀ (ZIN): 'Afghanistan / №. 336 / 10.ix.[1]957 / Dr. K. Lindberg', 'Qara Bagh / entre Ghazni et Moqor'; 1 ♀ (ZIN): 'Afghanistan / №. 332 / 10.ix.[1]957 / Dr. K. Lindberg', 'Gadjoui'; 1 ♀ (ZIN): 'Afghanistan / Umgeb. Kabul / leg. J. Klapperich / 19.5.[19]52', '*prosternalis* / Koch / Dr Z. Kaszab det.'; 2 ♀♀ (ZIN): 'J. Klapperich / Umgeb. V. Kabul / 1740 m, 20.3.[19]53 / O - Afghanistan', '*Psammocryptus* / *prosternalis* Koch / det. Kaszab det., 1957'.

Redescription. Body length 5.50–7.00 mm, width 1.90–2.00 mm. Measurements: PH_w – 1.50, P_wP_l – 1.20, E_lE_w – 1.60–1.63, EH_w – 1.80, EP_w – 1.20, EP_l – 2.37.

Body and legs slender, moderately shiny. Head widest at level of genae, where it is slightly wider than at level of eyes. Anterior margin of head with very small emarginations between genae and epistoma. Puncturation of head dorsally fine and sparse; punctures round. Lateral surface of mandibles with dense and coarse raduliform punctures. Ventral side of head without deep foveae, only with simple wide transverse depression behind prementum. Prementum and head surface around prementum with large and dense flat-bottomed foveae.

Prothorax. Pronotum weakly transverse, weakly cordate, widest in anterior third. Lateral margins evenly weakly rounded, shortly emarginated near postero-lateral corners; anterior margin straight; base weakly bisinuate. Antero-lateral corners obtuse, pointed at apex; postero-lateral corners weakly obtuse, pointed at apex. Border of anterior margin very widely interrupted in middle, and this interruption longer than bordered part on one side. Puncturation of disc fine and sparse, punctures round; puncture diameter 2–3 times shorter than interpunctural space. Prosternum and prothoracic hypomera with same large round foveae as on head ventrally. Prosternal process with small conical tubercle at apex.

Pterothorax. Punctures in striae not impressed, comparatively large, much larger than fine and sparse interstrial ones. Mesoventrite with large and dense flat-bottomed foveae. Metaventrite with large sparse not deep foveae in anterior part; each fovea with smooth margin posteriorly.

Legs slender, comparatively short. Metatibiae straight. First and fourth metatarsomeres subequal in length.

Abdominal ventrites 1–4 with coarse moderately sparse puncturation on lateral sides, but with fine and sparse puncturation in middle; puncturation of abdominal ventrite 5 much coarser and denser than in middle of ventrites 1–4. Abdominal ventrite 5 rounded at apex.

Male genitalia. Apical piece of aedeagus strongly widened from base to apex, widest in apical quarter.

Distribution (Fig. 1). Afghanistan (Gridelli 1954), Pakistan (Quetta) (Koch 1943).

Key to species of the genus *Psammocryptus*

Note. Species of *Psammocryptus* have an external sexual dimorphism: males bear a small brush of setation on the flexion side of the femora, and they have a transverse furrow in the anterior part of the prosternum, in contrast to females. However, other characters of males and females are the same; therefore, we do not give separate keys for males and females.

1 Mesoventrite with large, foveolate, round punctures (Fig. 14F). Puncturation of pronotum fine and sparse, consists of round punctures (Fig. 14A). .... ***P. prosternalis*** Koch, 1943

– Mesoventrite with large or moderate, foveolate, longitudinal punctures (Figs 4C, 6C, 9C, 11C, 13C). Puncturation of pronotum coarse and dense (or moderately dense), punctures elongate on sides of middle. 2

2 Abdominal ventrite 5 shortly truncated at apex (Figs 13C, D). Female metatibiae moderately or strongly curved inwards (Fig. 12D). Puncturation of pronotum finer but very dense, punctures on sides of middle often merged in longitudinal wrinkles (Fig. 12A). .... ***P. kompantsevae*** Nabozhenko & Chigray, **sp. nov.**

– Abdominal ventrite 5 rounded at apex (Figs 4D, 6D, 9D, 11D). Metatibiae straight or very weakly curved. Puncturation of pronotum coarser, punctures on sides elongate, but not merged in longitudinal wrinkles (Figs 3A, 5A, 8A, 10A). 3

3 Ventral side of head with very deep tunnel fovea in middle continuing under prementum (Fig. 5B). Prosternal process without conical tubercle at apex (Fig. 6B) (except for population from Fergana valley with

the majority specimens having conical tubercle; in this case anterior corners of pronotum widely rounded at apex (Fig. 6A)). ..... ***P. bogatchevi*** Nabozhenko, Chigray & Bekchanov, **sp. nov.**

– Ventral side of head without deep foveae, only with simple wide transverse depression behind prementum (Figs 3B, 8B, 10B). Prosternal process with conical tubercle at apex (4B, 9B, 11B) (very rarely this tubercle not developed in *P. minutus*; in this case anterior corners of pronotum pointed and other characters as in *P. minutus* below). 4

4 Anterior margin of head without emarginations between genae and epistoma on each side (Fig. 4A). Pronotum widest in middle (Fig. 3A). Body more robust. ..... ***P. minutus*** (Tauscher, 1812)

– Anterior margin of head with obtuse emarginations between genae and epistoma on each side (Figs 9A, 11A). Pronotum widest before middle (Figs 8A, 10A). Body slender. 5

5 Mandibles with dense and coarse puncturation (Fig. 9B). Pronotum with rounded antero-lateral corners (Fig. 9A). Mesoventrite with smaller, longitudinal, foveolate punctures (near four rows with 14–17 punctures each) (Fig. 9C). Strial punctures on elytra large, not impressed; puncturation of interstriae fine and sparse, but coarser, punctures distinct (Fig. 8C). Elytra shiny (Fig. 8A). Abdominal ventrites 1–4 with fine and sparse puncturation in middle; ventrite 5 with much coarser and denser puncturation (Fig. 9D). .... ***P. bayeri bayeri*** Koch, 1943

– Mandibles with sparse smoothed puncturation (Fig. 11B). Pronotum with pointed antero-lateral corners (Fig. 11A). Mesoventrite with very large, longitudinal, foveolate punctures (near four rows with 9–12 punctures each) (Fig. 11C). Strial punctures on elytra small, impressed; puncturation of interstriae very fine and sparse, weakly visible (Fig. 10C). Elytra matt (Fig. 10A). Abdominal ventrites completely with very fine and sparse puncturation (Fig. 11D). ..... ***P. bayeri vachshianus*** Nabozhenko & Chigray, **subsp. nov.**

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