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TAXONOMIC NOTES ON THE GENUS *OPATRUM* FABRICIUS, 1775 (COLEOPTERA: TENEBRIONIDAE: BLAPTINAE) OF THE CAUCASUS AND CISCAUCASIA WITH A KEY TO SPECIES

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ТАКСОНОМИЧЕСКИЕ ЗАМЕЧАНИЯ ПО РОДУ *OPATRUM* FABRICIUS, 1775 (COLEOPTERA: TENEBRIONIDAE: BLAPTINAE) КАВКАЗА И ПРЕДКАВКАЗЬЯ С ОПРЕДЕЛИТЕЛЬНОЙ ТАБЛИЦЕЙ ДЛЯ ВИДОВ

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Caucasian and Ciscaucasian representatives of the genus *Opatrum* Fabricius, 1775 are briefly reviewed. In total, four species and one subspecies occur in this area. *Opatrum sabulosum sabulosum* (Linnaeus, 1758) is widely distributed on all studied territory of the Caucasus up to 3000 m in Transcaucasia; *O. sabulosum amauropterum* Reichardt, 1936 occurs only in the eastern part of the North Caucasus: Ingushetia, Chechnya and Daghestan; *O. riparium* W. Scriba, 1865 was collected in Volgograd Region (Don River coast) and Krasnodar; *O. triste* Steven, 1828 is known from Crimea and Taman Peninsula; *O. geminatum* Brullé, 1832 is distributed in Armenia and Nakhichevan. Lectotypes are designated for *Opatrum tricarinatum* Motschulsky, 1859 (junior synonym of *O. sabulosum*) and *O. sabulosum amauropterum* Reichardt, 1936. A key to species from the Caucasus is given.

Сделан краткий обзор кавказских и предкавказских представителей рода *Opatrum* Fabricius, 1775. Всего отмечено четыре вида и один подвид. *Opatrum sabulosum sabulosum* (Linnaeus, 1758) широко распространен по всей территории Кавказа до высоты 3000 м в Закавказье; *O. sabulosum amauropterum* Reichardt, 1936 встречается только в северной части Восточного Кавказа (Ингушетия, Чечня, Дагестан); *O. riparium* W. Scriba, 1865 был собран в двух местонахождениях – в Волгоградской области (Трехостровская) и Краснодаре; *O. triste* Steven, 1828 известен из Крыма и с Таманского полуострова; *O. geminatum* Brullé, 1832 распространен в Армении и Нахичевани. Обозначены лектотипы для *Opatrum tricarinatum* Motschulsky, 1859 (младший синоним *O. sabulosum*) и *O. sabulosum amauropterum* Reichardt, 1936. Составлена определительная таблица для кавказских видов рода.

Keywords: fauna, lectotypes, *Opatrum*, darkling beetles, Caucasus, Ciscaucasus.

Ключевые слова: фауна, лектотипы, *Opatrum*, жуки-чернотелки, Кавказ, Предкавказье.

The genus *Opatrum* Fabricius, 1775 includes 43 species distributed from the Mediterranean region to Eastern Siberia and Mongolia [1]. Some species are strongly variable and contain many dubious subspecies. Caucasian taxa were revised by Reichardt [2], who listed five species and two subspecies from this territory. Abdurakhmanov and Nabozhenko [3] recorded four species and one subspecies for the Caucasus, synonymized one subspecies and published full bibliography for each taxon and a key to species. Later, Nabozhenko et al. [4] added one species to the Caucasian faunistic list. Nabozhenko et al. [5] excluded *O. verrucosum* Germar, 1817 from the fauna of Armenia. To the present time four species and one subspecies are known from the Caucasus and south plains of the European part of Russia.

Below I analyzed the distribution of species in the Caucasus and designate lectotypes for some valid and invalid taxa. After changes in the composition of this genus in the Caucasus and some doubtful records, I consider it necessary to present an illustrated key to a reliable identification of species.

Material and methods

The research is based on the material from the collection of Zoological Institute of the Russian Academy of Sciences (ZIN, St. Petersburg, Russia). In addition, author collected beetles (deposited in his private collection) in all Caucasian countries during 1997–2022.

Photographs of beetles were taken with Canon EOS 5D Mark IV Body, lens Canon MPE65MM F2.8 Macro, flush bulb Canon Macro Twin Lite MT-26X-RT, while stacking was made using Stack-shot 3X with enlarged macro rails s/n 3734; the photosystem is installed on a reproduction machine Kaiser Copy Stand RS 1. Images were stacked in Helicon Focus 7.7.4 Pro.

Results

Opatrum sabulosum sabulosum (Linnaeus, 1758)

(Fig. 1)

Full bibliography for Caucasian records see in Abdurakhmanov and Nabozhenko [3].

Type material (ZIN). Lectotype of *Opatrum tricarinatum* Motschulsky, 1859, sex unknown, is designated here: “*O. tricarinatum* m L. Inderski” (handwritten by Motschulsky), (now: Kazakhstan, Atyrau Region, Inder Lake: 48°28'00"N, 51°54'00"E), bronze circle, “c. Motshulsky” (printed), “Lectotypus *Opatrum tricarinatum* Motsch. des. M. Nabozhenko, 2022” (red, handwritten). Paralectotype (ZIN), sex unknown: “*Opatrum tricarinatum* m Bogdo” (now Russia, Astrakhan Region, Bogdo Mt.), “Paralectotypus *Opatrum tricarinatum* Motsch. des. M. Nabozhenko, 2022” (red, handwritten). ”.

Notes. This is the most numerous and widespread species with four Mediterranean and one Caucasian subspecies. The nominotypical subspecies is widely distributed in the Caucasus and Ciscaucasia in steppe xerophytic habitats to height 2400 m in the North Caucasus (Daghestan) and 3000 m in Transcaucasia (Nakhichevan) [3]. Schuster [6] described *O. reitteri* from Tiflis. Some populations from Central Transcaucasia (especially from central and eastern Georgia, western Azerbaijan, Talysh and precaspian North Iran) have raduliform and smoothed granules on pronotum, but specimens with usual granules or with transit characters are also presented within these populations. It was one of the main reason to synonymize *O. reitteri* with *Opatrum sabulosum* [3].

Motschulsky [7] did not mentioned the type locality and number of specimens in the original description of *Opatrum tricarinatum*. We found two specimens with handwritten labels of Motschulsky, one of which is designated here as a lectotype. Thus, the vicinity of Inder Lake in Kazakhstan is the type locality of *O. tricarinatum*. This species was described on the basis of some North Pre-Caspian specimens having strongly elevated elytral ribs. Such specimens are rare in populations and considered by Reichardt [2] only as aberrations of *O. sabulosum*. Infrataxa are not regulated by zoological nomenclature and *O. tricarinatum* is interpreted as a junior synonym of *O. sabulosum*.

Opatrum sabulosum amauropterum Reichardt, 1836

(Fig. 2A–D)

Type material (ZIN): Lectotype, male, designated here: golden circle, “Салги, Ингушетия 5462'. Терск. обл. Кириченко 26.VII.927” (printed Cyrillic label, excluding day and month) (now: Russia, Ingushetia, Salgi 42°47'52"N, 44°49'11"E; leg. Kirichenko), “*O. sabulosum* Holotyp. ssp. *amauropterum* Rchdt. Reichardt det.” (handwritten, last line printed), “Lectotypus *O. sabulosum amauropterum* Rchdt. des. M. Nabozhenko, 2022”. Paralectotypes (all with labels: “Paralectotypus *O. sabulosum amauropterum* Rchdt. des. M. Nabozhenko, 2022”). 3 females with the same labels; 2 specimens: golden circle, “Шатоевское укр. Терск. обл. Bogdanov-Katjkov” (Cyrillic label: Shatoy fortification; now: Russia, Chechen Republic, Khakkoy village near Shatoy: 42°52'54"N, 45°40'29"E), “*O. sabulosum* Holotyp. ssp. *amauropterum* Rchdt. Reichardt det.” (handwritten, last line printed); 1 specimen: golden circle, “Cauc. II/VI [18]89 [unclear two first letters]dok”, “Coll. Semenov-Tian-Shansky”, “*O. sabulosum* typ. ssp. *amauropterum* Rchdt. Reichardt det.”.

Addition material (ZIN). 4 specimens: “Cauc. II/VI [18]89 [unclear two first letters]dok”, “Coll. Semenov-Tian-Shansky”; 1 specimen: “Cauc. 9/XI [18]89 Shatoy”, “Coll. Semenov-Tian-Shansky”.

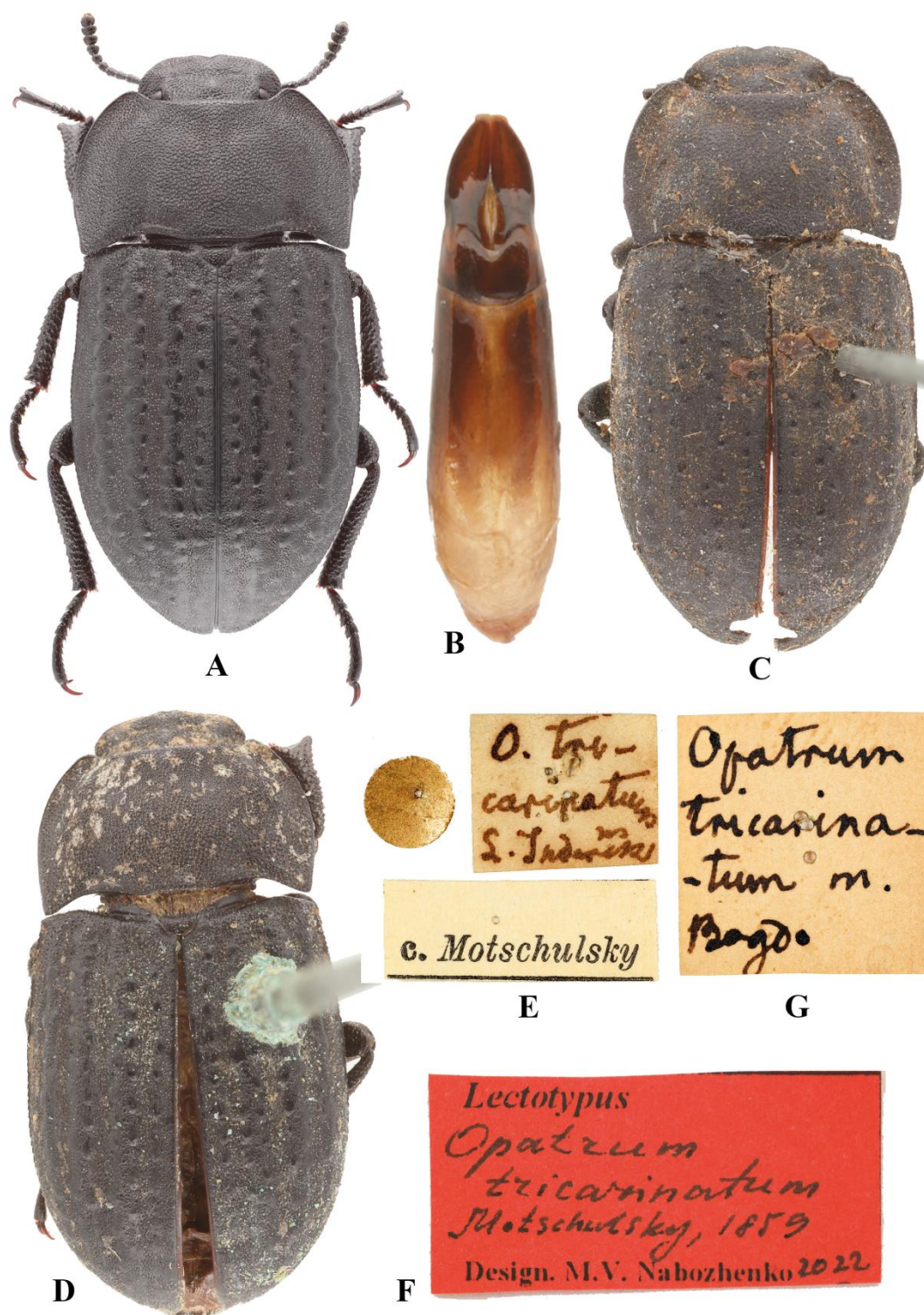


Fig. 1. *Opatrum sabulosum*. A – male, dorsally; B – aedeagus, dorsally;
C – lectotype of *O. tricarinatum* (junior synonym);
D – the same, paralectotype; E, F – labels of the lectotype; G – label of paralectotype.

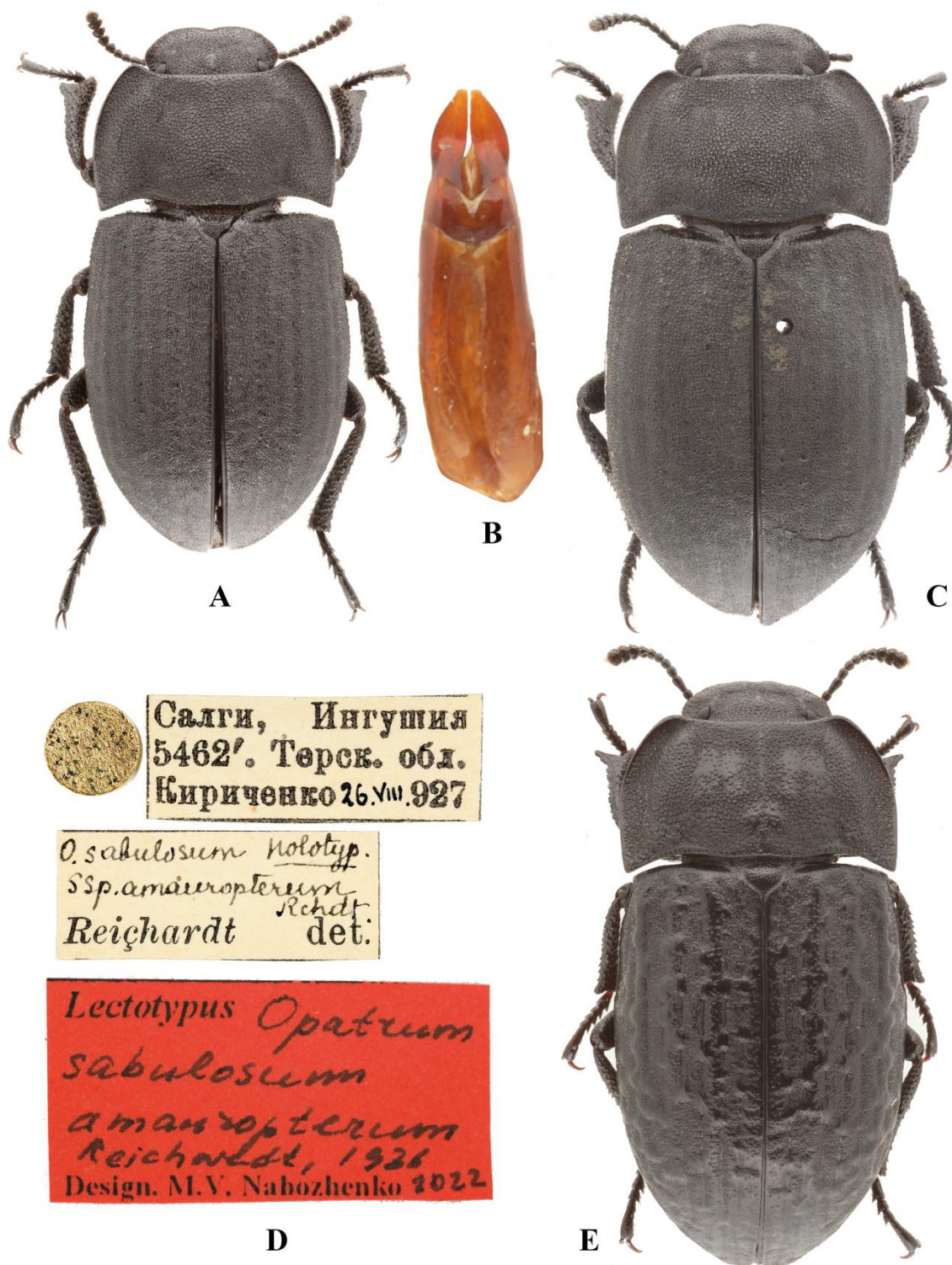


Fig. 2. *Opatrum sabulosum amauropterum* and *O. riparium*.

A – *O. s. amauropterum*, male, lectotype; B – the same taxon, aedeagus; C – the same taxon, female, paralectotype;
D – *O. s. amauropterum*, labels of the lectotype; E – *O. riparium*

Notes. This subspecies was described from mountain regions of the Eastern Caucasus: Ingushetia (Salgi), Chechnya (Shatoy) [2]. Later it was recorded for Daghestan (Agvali) [3]. This subspecies differs from other subspecies of the genus by the absence of large smooth paired tubercles on elytra. Each row of tubercles in the nominotypical subspecies is transformed to striae row of granules. In *O. s. amauropterum*

striae are more or less clear, without granules or large, smooth, flattened tubercles; interstriae 5 and 7 slightly elevated; sometimes striae with small not flattened granules, little larger than interstitial granulation. Some specimens from the same population (Shatoy) have transit characters between the nominotypical subspecies and *O. s. amauropterum*: 4th and 5th interstriae with sparse (3–4) small flattened tubercles. Aedeagus in the nonimotypical subspecies and *O. s. amauropterum* are identical (Figs 1B, 2B).

Opatrum riparium W. Scriba, 1865

(Fig. 2E)

Distribution. This species is widely distributed in nemoral and boreal zones of Eurasia from Central Europe to Eastern Siberia (Kansk of Krasnoyarsk kray) [2]. One specimen was collected in Volgograd Region near the Don River coast (Tryochostrovskaya) [8]. The species was also recorded for Krasnodar [2], where it was probably found in sand coast of left bank of Kuban River. *Opatrum riparium* inhabits sand coasts of rivers.

Opatrum triste Steven, 1828

(Fig. 3A, B)

Distribution. The species was known as endemic of Crimean Peninsula [2]. Later it was found in Taman Peninsula (Krasnodar region, Temryuk district, Il'ich: 45°25'18"N, 36°46'18"E) [4]. Reichardt [2] listed this species from Abkhazia based on several specimens collected by Alexander Nordmann. I studied these specimens in ZIN collection and confirm, that they belong to *O. triste*, but these records are doubtful, because the species has not been found in Abkhazia since the middle of the 19th century. Nordmann traveled in Crimea together with famous naturalist Christian Steven and probably some labels for beetles were mixed for Crimean and Caucasian beetles. Reichardt [2] also mentioned that hybrid specimens occur in areas of sympatric habitats of *O. sabulosum* and *O. triste*. I studied these "hybrid" specimens in ZIN collection and didn't find any mixed features; all characters of the so-called hybrids comprise the variability of *O. sabulosum*. Iwan et al. [1] listed this species only for Crimea.

Opatrum geminatum Brullé, 1832

(Fig. 3C, D)

The Caucasian material for this species is listed by Nabozhenko et al. [5].

Distribution. This species is widely distributed in the Near East and Greece [1]. In the Caucasus it occurs in Armenia and Nakhichevan Autonomous Republic of Azerbaijan [3, 5].

Key to Caucasian and Ciscaucasian species of *Opatrum*

- 1(2). Elytra without smooth large flattened or moderate tubercles, only with simple fine granulation (Figs 2A, C) *O. sabulosum amauropterum*
- 2(1). Elytral stria rows with large flattened or moderate smooth tubercles (Figs 1A, 2E, 3).
- 3(6). Elytral interstria 3, 5 and 7 strongly elevated, much narrower, than other ones; striae 2–3, 4–5, 6–7 paired with large round flattened tubercles (Figs 1A, 2E).
- 4(5). Pronotum with three smooth areas: one at base and pair in the middle of disc (Fig. 2E) *O. riparium*
- 5(4). Pronotum completely granulated, without smooth areas (Figs 1A, C, D).....*O. sabulosum sabulosum*
- 6(3). Elytral interstriae subequal in width, not strongly elevated, can be slightly convex; striae with elongate tubercles (Fig. 3).
- 7(8). Base of pronotum narrower than elytral base. Elytral striae with small elongated smooth tubercles (Fig. 3A, B) *O. triste*
- 8(7). Base of pronotum wider than elytral base. Elytra striae with large elongated tubercles (Fig. 3C, D) *O. geminatum*

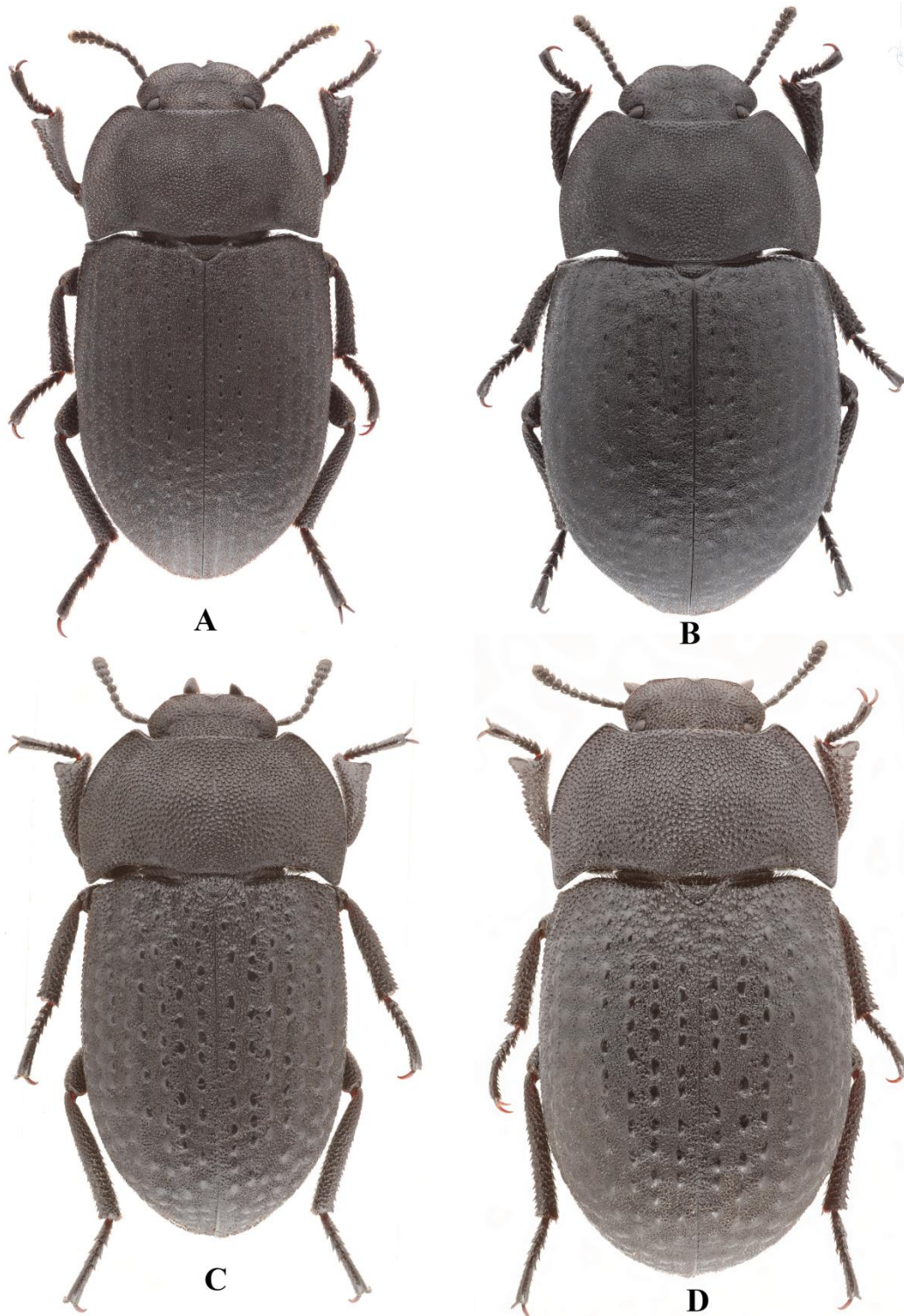


Fig. 3. *Opatrum* spp. from the Caucasus. A – *O. triste*, male; B – the same, female; C – *O. geminatum*, male; D – the same, female

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