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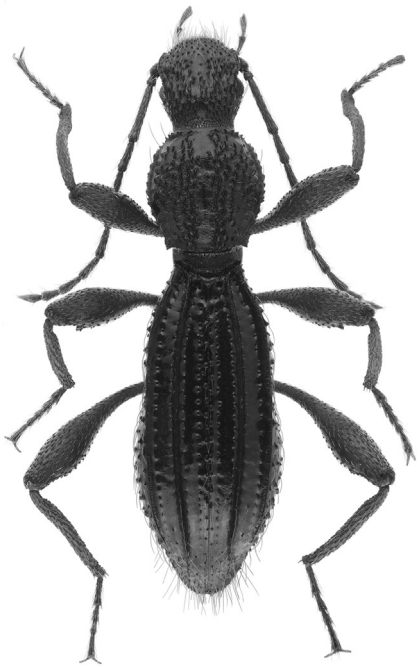

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New and interesting records of comb-clawed beetles (Coleoptera: Tenebrionidae: Alleculinae) in the European part of Russia and the Caucasus

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Abstract. New data on distribution of rare and little-known species of comb-clawed beetles (Tenebrionidae: Alleculinae) in the European part of Russia and the Caucasus are presented. *Allecula morio* (Fabricius, 1787) is recorded for Russia for the first time; Crimean Peninsula is the easternmost border of its range. Information about three very rare species, *Gonodera luperus luperus* (Herbst, 1783), *Hymenalia smirnovi* Dubrovina, 1978 and *Hymenalia morio* (L. Redtenbacher, 1849), is given; the record of the second species is the only reliable and confirmed by material from Ulyanovsk Region. *Gonodera pulcherrima* (Faldermann, 1837) is recorded for the Greater Caucasus for the first time. *Mycetochara* (*Ernocharis*) *armeniaca* Novák, 2022 is firstly recorded in Georgia. Information on distribution and bionomics of *Omophlus* (*Phibalus*) *subalpinus* (Ménétriés, 1832) is given; the species is very local and inhabits small limestone steppe areas in Stavropol Region, Karachay-Cherkessia, Kabardino-Balkaria and Ingushetia at 700–3000 m. All species are illustrated as well as male genitalia.

Key words: distribution, Coleoptera, Tenebrionidae, Alleculinae, Russia, Caucasus.

Новые и интересные находки жуков-пыльцеедов (Coleoptera: Tenebrionidae: Alleculinae) в европейской части России и на Кавказе

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Резюме. Представлены новые данные о распространении редких и малоизвестных видов жуков-пыльцеедов (Tenebrionidae: Alleculinae) в европейской части России и на Кавказе. *Allecula morio* (Fabricius, 1787) впервые указан для фауны России; Крымский полуостров является самой восточной границей его ареала. Приведены сведения о трех очень редких видах – *Gonodera luperus luperus* (Herbst, 1783), *Hymenalia smirnovi* Dubrovina, 1978 и *Hymenalia morio* (L. Redtenbacher, 1849); находка последнего вида является единственной достоверной и подтвержденной материалом из Ульяновской области. *Gonodera pulcherrima* (Faldermann, 1837) впервые указан для Большого Кавказа. *Mycetochara* (*Ernocharis*) *armeniaca* Novák, 2022 впервые зарегистрирован в Грузии. Приведены сведения о распространении и биотопах *Omophlus* (*Phibalus*) *subalpinus* (Ménétriés, 1832): вид встречается очень локально и населяет небольшие участки известняковых степей в Ставропольском крае, Карачаево-Черкесии, Кабардино-Балкарии и Ингушетии на высоте 700–3000 м. Даны изображения всех видов, включая гениталии самцов.

Ключевые слова: распространение, Coleoptera, Tenebrionidae, Alleculinae, Россия, Кавказ.

Introduction

Comb-clawed beetles more or less satisfactorily studied in Russia in general, but representatives of the subfamily Alleculinae from the south of Russia (including the Russian Caucasus) need revision. Most of publications on the taxonomy of alleculine beetles of the Greater Caucasus dates back to the late 19th – early 20th centuries. The most significant works with information on comb-clawed beetles from the European part of Russia and the Caucasus were published in the 20th century by Russian researchers [Ogloblin, Znojko, 1950; Striganova, 1961; Dubrovina, 1968, 1976, 1978, 1982; Iablokoff-Khnzorian, 1976, 1983; Dubrovina et al., 1979; Dubrovin, Kompantseva, 1990, 1992]. Several taxonomic and faunistic data on the Caucasian alleculine beetle were published by German entomologist Muche [1964, 1971, 1972]. Some important papers on comb-clawed beetles from the Caucasus were presented by Novák [2011, 2013, 2016, 2018, 2020a–c, 2022, 2023] and Nabozhenko with coauthors [Nabozhenko et al., 2010; Arzanov et al., 2019; Nabozhenko, 2022]. Isaev and Egorov [2000] compiled the annotated list of comb-clawed beetles from Ulyanovsk Region of Russia with clear localities. Egorov and coauthors [Egorov, 2019; Egorov, Semionenkov, 2023] added a brief information about Alleculinae of the Chuvash Republic. Interesting faunistic data on Alleculinae of steppe Cis-Ural region of

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Russia (Orenburg and Bashkortostan) are presented by Nemkov [2011] and Kozminykh [2015]. Nikitsky [2019] added faunistic and ecological information about comb-clawed beetles from Moscow Region.

Below we present a new data on distribution and morphological structures of adults for some rare and little-known species. Images for the majority of species are given for the first time.

Material and methods

Specimens were studied using binocular microscopes Micromed MC-4 Zoom Led and Micromed MC-5 Zoom Led. 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 flash 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. Images of beetles and their structures are not scaled.

The studied material is deposited in the following collections and museums:

PCMN – private collection of Maxim Nabozhenko (Rostov-on-Don, Russia);

PCRKh – private collection of Roman Khryapin (Moscow, Russia);

ZIN – Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia);

ZMMSU – Zoological Museum of the M.V. Lomonosov Moscow State University (Moscow, Russia).

Tribe Alleculini Laporte, 1840
Subtribe Alleculina Laporte, 1840

Allecula morio (Fabricius, 1787)
(Figs 1–4)

Material. 1♂ (ZIN), Russia, Crimea, Simferopol Distr., 1.1 km SE Mramornoe, W foothills of Chatyrdag Mt., 738 м, 44°48′21.0″N / 34°16′27.3″E, Fagus forest, 8.06.2022 (A.S. Prosvirov).

Distribution. Europe [Novák, 2020a]. This species was known on the territory of the former USSR only from western regions of the Ukraine and Belarus [Dubrovina et al., 1979]. Series of larvae were found in Transcarpathian Region (now the Ukraine) in rotten beech wood in 1972, and adults were subsequently hatched from larvae [Dubrovina et al., 1979]. The species is recorded for Crimea and Russia for the first time. Crimean Peninsula is the easternmost border of the range.

Hymenalia smirnovi Dubrovina, 1978
(Figs 5, 6, 8, 10–12)

Material. 1♂, holotype (ZMMSU), "Ворошиловгр. обл. Меловский р-н Стрелецкая степь выпас, в почв. пробе 17.VI.1973 Л. Прохорова" (Cyrillic, handwritten) (now: Russia, Lugansk People's Republic, Melovoe Distr., Lugansk State Nature Reserve, "Streltsovskaya steppe" sector, grazing, 49°17′59″N / 40°05′46″E, in soil sample), "Holotypus *Hymenalia caraboides* М. Дубровина", "*Hymenalia smirnovi* Dubrovina sp. n.".

Distribution. The species is very rare, known only from the type locality [Dubrovina, 1978].

Hymenalia morio (L. Redtenbacher, 1849)
(Figs 7, 9, 13–15)

Material. 1♂ (ZIN), Russia, Ulyanovsk Region, Novospasskoe Distr., Vasil'evka, saline steppe, 17.07.1999 (A.Yu. Isaev).

Distribution. Central and southern Europe: Austria, Hungary, Slovakia, Russia (steppe Cis-Ural region, Ulyanovsk Region). Isaev and Egorov [2000] indicated the mentioned above specimen as *Hymelalia* sp. This species was listed for the steppe Cis-Ural region by Nemkov [2011] and Kozminykh [2015] (with reference to Nemkov [2011]). The mentioned above record is the only reliable and confirmed by material. The species is very rare, at least in Russia. It was known on the territory of the former USSR only in the western Ukraine [Dubrovina, 1978].

Subtribe Gonoderina Seidlitz, 1896

Gonodera luperus luperus (Herbst, 1783)
(Figs 16, 17, 20–22)

Material. 1♂ (ZMMSU), "Теллерман Ворон. 1.6.51 Г. Коралькова" (Russia, Voronezh Region, Tellermanovskiy, 51°21′59″N / 42°02′50″E); 1♀ (ZIN), Russia, Ulyanovsk Region, Sengiley Distr., Shipovka, under Ulmus bark, 23.06.2022 (A.V. Kovalev).

Notes. Striganova [1961] indicated that larvae of *G. luperus* are widely distributed in forest-steppe and steppe zones and the Caucasus. However, Striganova did not breed adults from these larvae, and the species (at least records of imagoes) is extremely rare in Russia and is known from only several localities. Therefore, we cannot confirm the accuracy of her data. Dubrovina et al. [1979] collected *G. luperus* and its larvae on the territory of the former USSR only in the Ciscarpathian (vicinity of Lvov, the Ukraine).

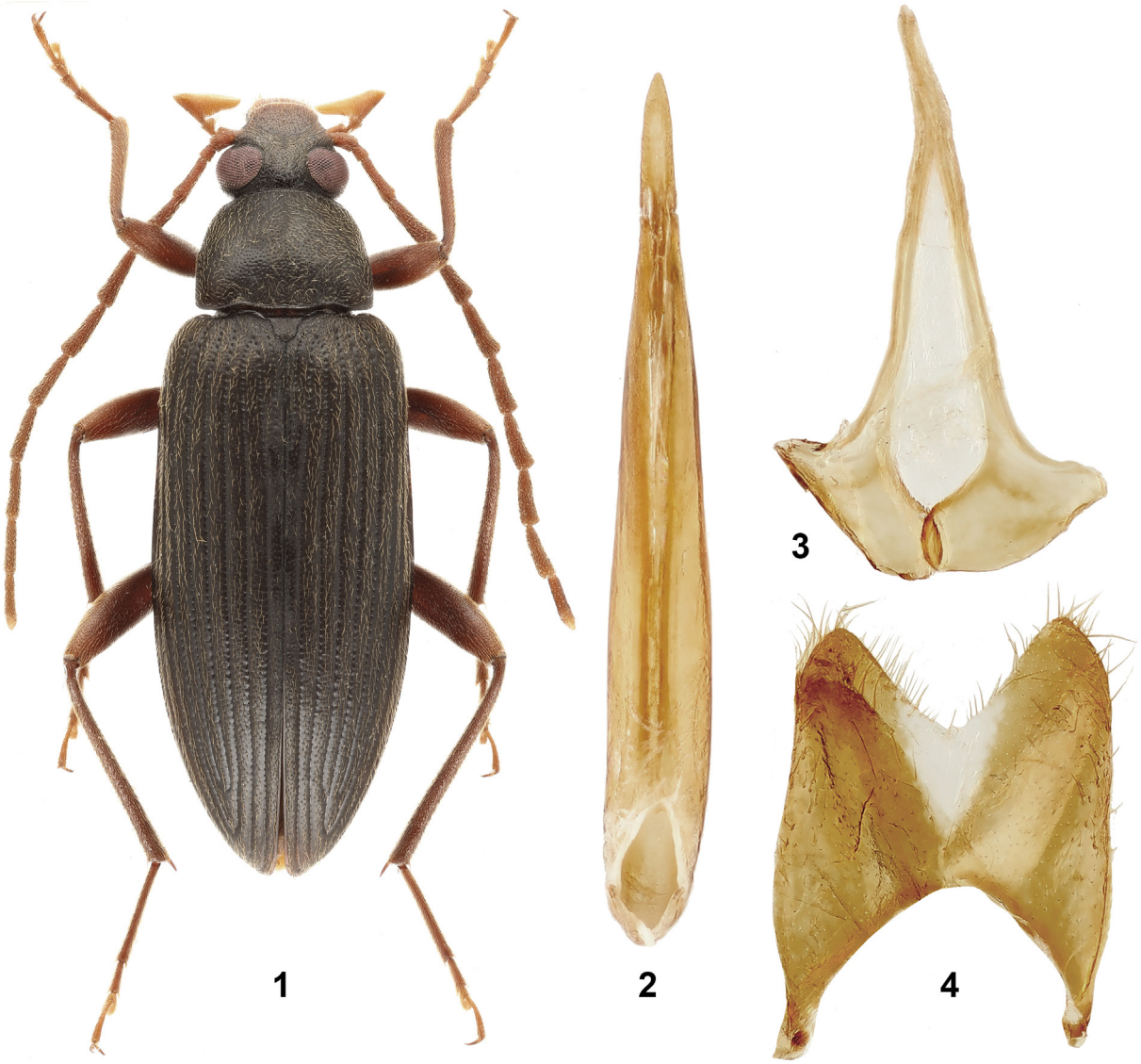
Distribution. British Isles, Europe from the Atlantic coast [Novák, 2020a] to the South Urals in Russia. This species was listed for Ulyanovsk Region by Isaev and Egorov [2000] and the steppe Cis-Ural region by Nemkov [2011] and Kozminykh [2015] (with reference to Nemkov [2011]).

Gonodera pulcherrima (Faldermann, 1837)
(Figs 18, 19, 23–25)

Material. 2♂, 1♀ (ZIN), "Kaukas Leder"; 2♂ (ZIN), "Caucasus Thana-Thal E. König." (Georgia, Tana River valley S of Gori); 3♂, 1♀ (ZIN), South Ossetia, Dzau Distr., Verkhniy Erman, 42°30′45″N / 44°15′56″E, 2350–2400 m, 16.06.2023 (M.V. and S.V. Nabozhenko, O.S. Guskova).

Bionomics. Dubrovina et al. [1979] collected larvae of this species under litter in a coniferous-deciduous mountain forest near Borjomi. Other specimens were collected in deciduous low mountain forests. We collected adults of *G. pulcherrima* in subalpine zone by mowing method. Beetles sat on long dry shoots of cereals.

Distribution. This species was known only from the Lesser Caucasus and Surami Range connecting Greater and Lesser Caucasus. In addition to the mentioned above localities, this species is also known from Borjomi [Dubrovina et al., 1979]. It was described from Surami Range as *Euboues viridis* Allard, 1877 [Allard, 1877; Schneider, Leder, 1878]. Mařan [1944] mentioned two specimens with labels "Caucasus". Medvedev [1965] erroneously listed *G. pulcherrima* for Ciscaucasia; nobody



Figs 1–4. *Allecula morio*, male, Crimea.
1 – habitus; 2 – aedeagus ventrally; 3 – spiculum gastrale; 4 – inner sternite VIII.
Рис. 1–4. *Allecula morio*, самец, Крым
1 – габитус; 2 – эдеагус вентрально; 3 – гастральная спикула; 4 – внутренний стернит VIII.

collected this species in Russia. The first record for South Ossetia and the Greater Caucasus.

Subtribe Mycetocharina Gistel, 1848

Mycetochara (*Ernocharis*) *armeniaca* Novák, 2022
(Figs 26–23)

Material. 2♂, 1♀ (PCRKh), Georgia, Tsalka Distr., Chapaevka (Kavta), 21.05.2015 (R.A. Khryapin).

Bionomics. Adults were collected in mountain steppe on grass and soil (information of the collector Roman Khryapin). This is an unusual habitat for *Mycetochara* because the majority of species are associated with forests and adults can be found on tree trunks at night.

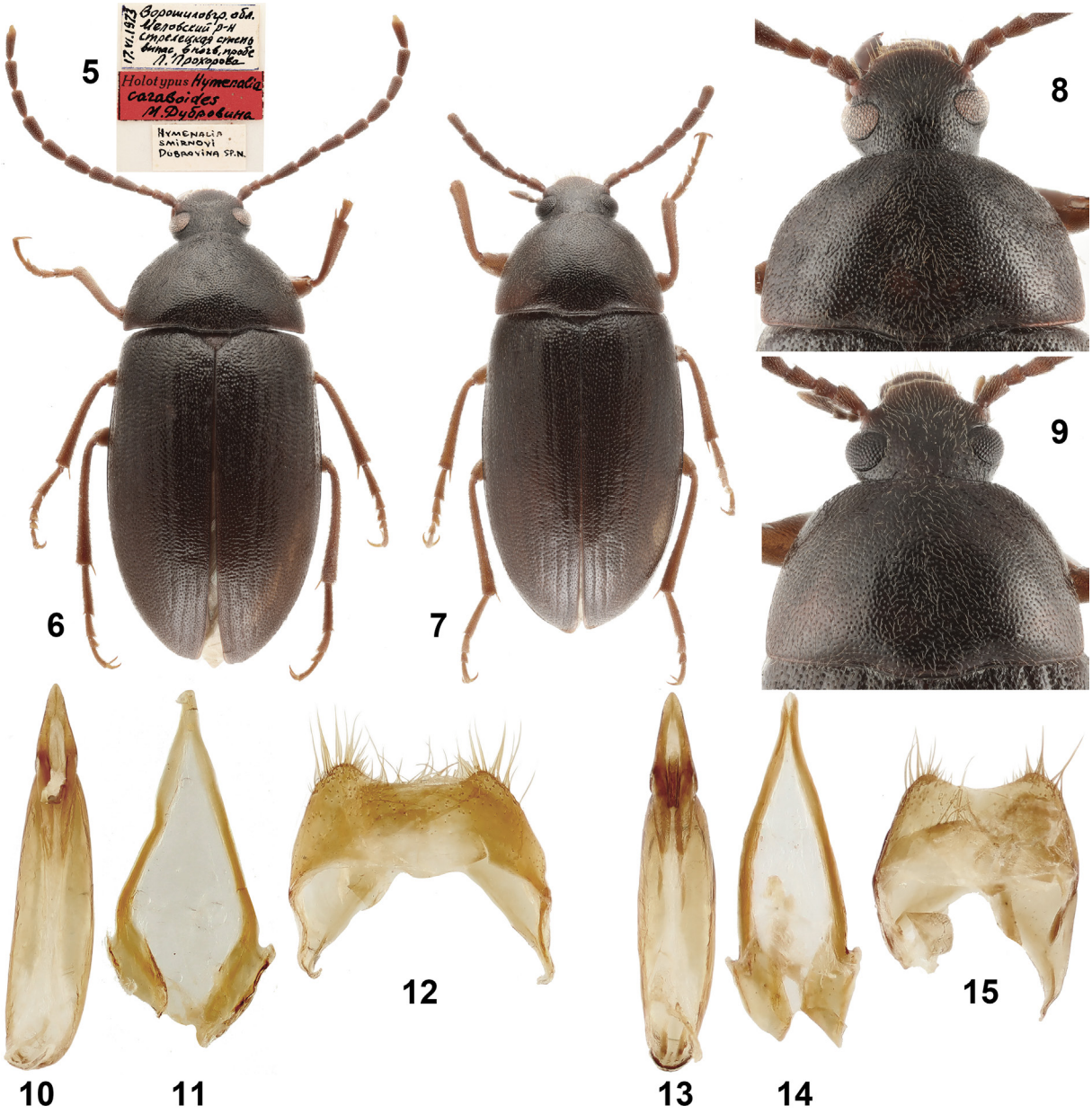
Distribution. This species was known only from Western and Central Armenia [Novák, 2022]. New record for Georgia.

Tribe Cteniopodini Solier, 1835

Omophlus (*Phibalus*) *subalpinus* (Ménétriés, 1832)
(Figs 33–37)

Material. 2♂ (ZIN), Russia, Karachay-Cherkessia, Kandelyabr Ridge, 3000 m, 29.09.1956 (Kurnakov); 1♂ (PCMN), Russia, Karachay-Cherkessia, Dzhalovchat (vicinity of the glacier W of the Alibek Pass), 16.08.1998 (D.G. Kasatkin). 29♂, 1♀ (ZIN, PCMN), Russia, Ingushetia, "Erzi" Reserve base, 42°49′54″N / 44°54′17″E, meadows, 1335 m, 11–14.06.2023 (M.V. and S.V. Nabozhenko, O.S. Guskova, M.A. Gadaborsheva).

Bionomics. The species is confined to limestone outcrops from 700 to 3000 m. Muche [1972] collected imagoes on Fabaceae in limestone steppe on the Borgustanskiy Range near Podkumok village. We found multiple beetles in Ingushetia in a small limestone steppe area (approximately 20 × 20 meters), mainly on Festuca. The species is very local and occurs infrequently, which was also noted by Muche [1972].



Figs 5–15. *Hymenalia* spp., males, habitus and details of structure.

5, 6, 8, 10–12 – *H. smirnovi*, holotype; 7, 9, 13–15 – *H. morio*. 5 – labels of the holotype; 6, 7 – habitus; 8, 9 – head and pronotum; 10, 13 – aedeagus ventrally; 11, 14 – spiculum gastrale; 12, 15 – inner sternite VIII.

Рис. 5–15. *Hymenalia* spp., самцы, габитус и детали строения.

5, 6, 8, 10–12 – *H. smirnovi*, голотип; 7, 9, 13–15 – *H. morio*. 5 – этикетки голотипа; 6, 7 – габитус; 8, 9 – голова и переднеспинка; 10, 13 – эдеагус вентрально; 11, 14 – гастральная спикула; 12, 15 – внутренний стернит VIII.

Distribution. Russia: Stavropol Region, Karachay-Cherkessia, Kabardino-Balkaria, Ingushetia. This little-known species was described from the alpine zone of the Caucasus, “Alpes du Caucase” [Ménétriés, 1832]. Baudi di Selve [1877], Seidlitz [1896] and Reitter [1906] listed this species from the Caucasus without details. Ogloblin and Znojko [1950] indicated the distribution of *O. subalpinus* as mountains of the Caucasus (without distinct localities), at high 1200–1800 m. Muche [1964] mentioned the species from the Caucasus. Later he collected adults near Itkol boarding house in Kabardino-Balkaria at 2100–2600 m, in Dzhemagat canyon in the Karachay-Cherkess Republic and Podkumok in Stavropol Region [Muche, 1972].

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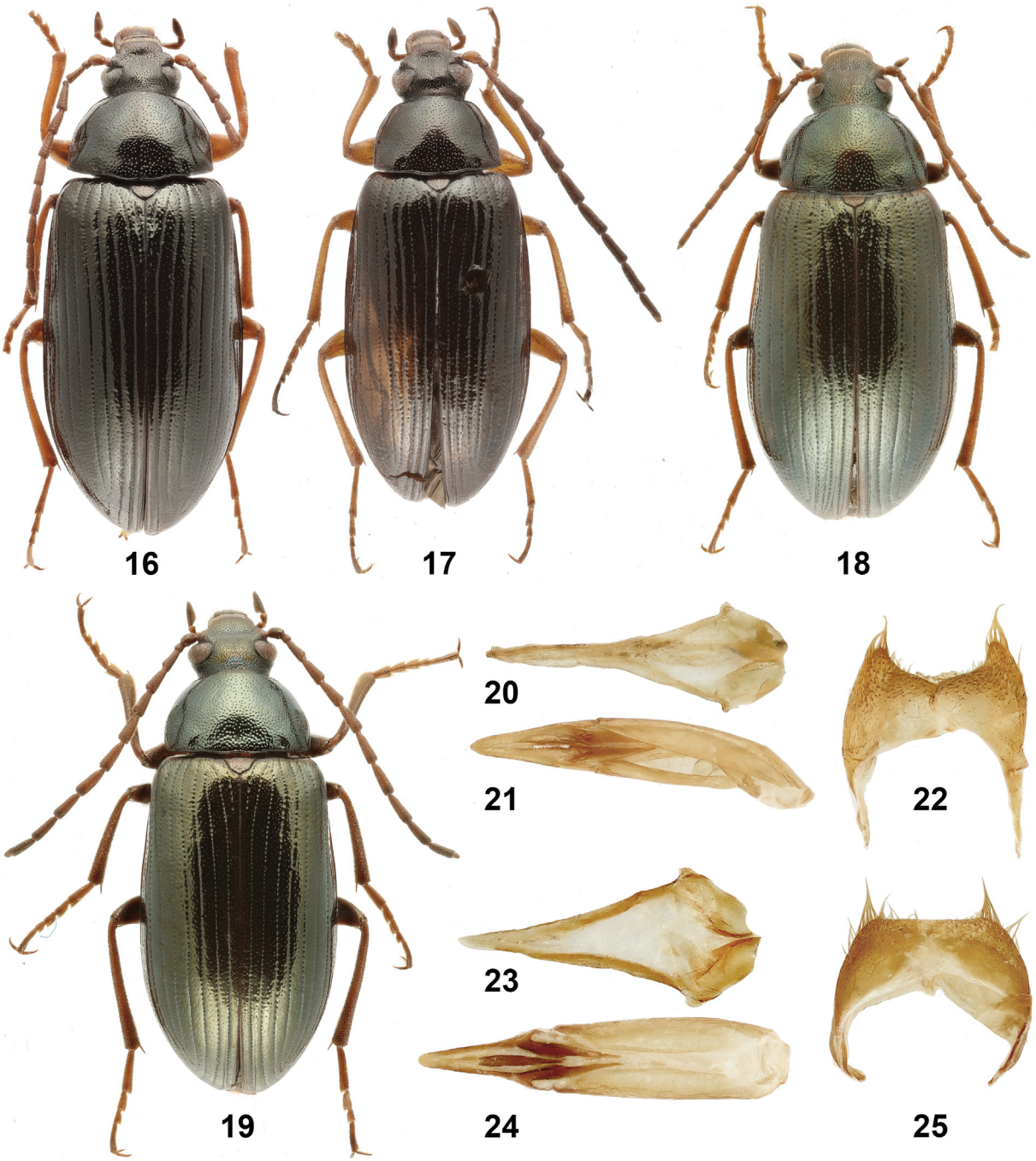

Figs 16–25. *Gonodera* spp., habitus and details of structure.

16, 17, 20–22 – *G. luperus luperus*; 18, 19, 23–25 – *G. pulcherrima*. 16, 18 – habitus of females; 17, 19 – habitus of males; 20, 23 – spiculum gastrale; 21, 24 – aedeagus ventrally; 22, 25 – male inner sternite VIII.

Рис. 16–25. *Gonodera* spp., габитус и детали строения.

16, 17, 20–22 – *G. luperus luperus*; 18, 19, 23–25 – *G. pulcherrima*. 16, 18 – габитус самок; 17, 19 – габитус самцов; 20, 23 – гастральная спикула; 21, 24 – эдеагус вентрально; 22, 25 – внутренний стернит VIII самца.

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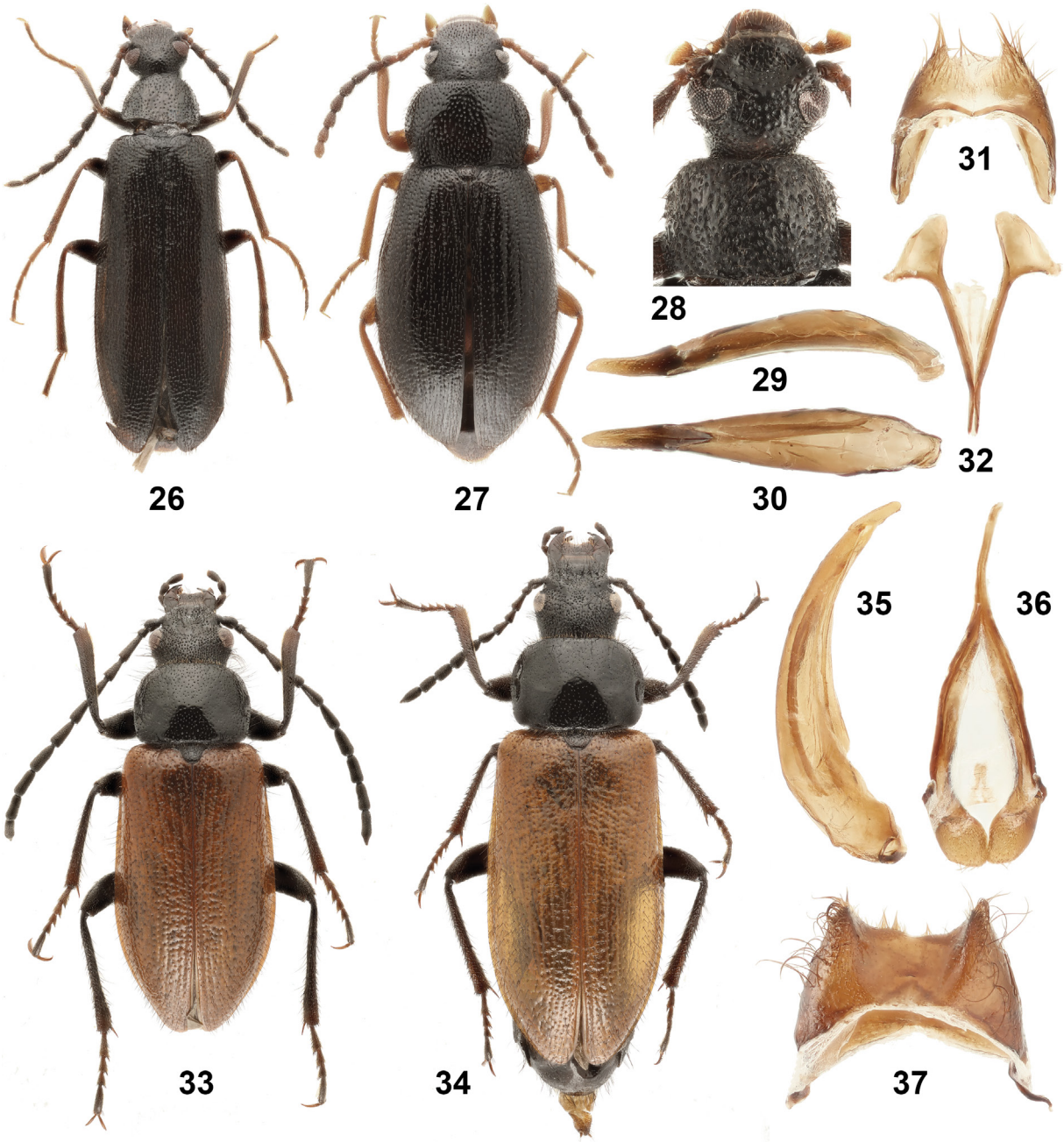

Figs 26–37. Alleculinae from the Caucasus, habitus, details of structure.

26–32 – *Mycetochara armeniaca*; 33–37 – *Omophlus subalpinus*. 26, 33 – habitus, male; 27, 34 – habitus, female; 28 – head and pronotum, male; 29, 35 – aedeagus laterally; 30 – aedeagus ventrally; 31, 37 – male sternite VIII (abdominal ventrite 6); 32, 36 – spiculum gastrale.

Рис. 26–37. Alleculinae с Кавказа, габитус и детали строения.

26–32 – *Mycetochara armeniaca*; 33–37 – *Omophlus subalpinus*; 26, 33 – габитус, самец; 27, 34 – габитус, самка; 28 – голова и переднеспинка, самец; 29, 35 – эдеагус латерально; 30 – эдеагус вентрально; 31, 37 – внутренний стернит VIII самца (абдоминальный вентрит 6); 32, 36 – гастральная спикула.

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