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COMPOSITION AND DISTRIBUTION OF THE GENUS *ALLECULA* FABRICIUS, 1801 (COLEOPTERA: TENEBRIONIDAE) IN RUSSIA WITH DESCRIPTION OF A NEW SPECIES

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Summary. Comb-clawed beetles of the genus *Allecula* Fabricius, 1801 (Coleoptera: Tenebrionidae) of Russia are briefly reviewed. A new species, *A. sundukovi* sp. n., is described from the Russian Far East (Khabarovsky Krai). This new species differs from all congeners by the shape of the pronotum, very similar to those in tenebrionid of the tribe Lagriini, very coarsely and densely punctured elytral interstriae, the shape of the aedeagus, male inner sternite VIII and spiculum gastrale. In total, six species are known in Russia, one of which (*Allecula ussuriensis*) has the amphipalaearctic range, two occurs in Europe and the Caucasus, one is Caucasian endemic and two other species collected only in the Russian Far East.

Key words: comb-clawed beetles, Alleculini, fauna, taxonomy, new species, new synonymy, key, Palaearctic region.

М. В. Набоженко. Состав и распространение рода *Allecula* Fabricius, 1801 (Coleoptera: Tenebrionidae) в России с описанием нового вида// Дальневосточный энтомолог. 2025. N 518. С. 1-13.

Резюме. Дан краткий обзор жуков-пыльцеедов рода *Allecula* Fabricius, 1801 (Coleoptera: Tenebrionidae) фауны России. С Дальнего Востока России (Хабаровский край) описан новый вид *A. sundukovi* sp. n., который отличается от всех представителей рода формой переднеспинки, очень похожей на таковую у чернотелок трибы Lagriini, очень грубо и густо пунктированными междурядьями надкрылий, строением эдеагуса, VIII внутреннего стернита самца и гастральной спикулы. К настоящему времени из России известно шесть видов, один из которых (*Allecula ussuriensis*) имеет амфипалеарктический ареал, три встречаются в Европе и на Кавказе, а еще два вида собраны только на Дальнем Востоке России.

INTRODUCTION

The genus *Allecula* Fabricius, 1801 comprises 68 species in the Palaearctic (Novák, 2020). The majority of species are distributed in the Eastern Palaearctic, especially in China and Japan, while in the Western Palaearctic eleven species are known (Dubrovin & Kompantseva, 1990; Novák, 2020). Larvae of *Allecula* spp. develop in decaying wood of old trees, usually in hollows (Dubrovina *et al.*, 1979; Dubrovin & Kompantseva, 1990), so species of this genus are often used in the indication and monitoring of old-growth nemoral forests (Novák *et al.*, 2012; Zumr *et al.*, 2024).

Until recently, five species of *Allecula* were known in Russia, two of which were registered in the European part of the country (Nikitsky *et al.*, 2008; Alekseev & Bukejs, 2010; Nabozhenko & Gadaborsheva, 2023), and three others were listed for the Far East (Dubrovin, 1992; Sergeev, 2021). One of species was later transferred to *Borboesthes* Fairmaire, 1897 (Novák *et al.*, 2017).

Here we describe one new species from the Russian Far East. One of the Far Eastern species is record from Crimea.

MATERIAL AND METHODS

The examined material is deposited in the following collections: ZIN – Zoological institute of the Russian Academy of Sciences (St Petersburg, Russia); PCMN – Private collection of Maxim Nabozhenko.

Specimens were cleaned in an ultrasonic bath VBS-1D (Vilitek, Russia) and either mounted onto transparent plates. The male genitalia were soaked in alkaline solution for 24 hours, then photographed in glycerin on a glass slide and then glued onto transparent plates. Beetles were examined using binocular microscopes Micromed MC-4 Zoom Led (Nablyudatel'nye pribory, Russia). Beetle photographs were taken using a Canon EOS 5D Mark IV camera body, a Canon MP-E 65mm f/2.8 Macro

Lens, and a Canon Macro Twin Lite MT-26EX-RT (Canon Inc., Japan) flash. Stacking was done using Stackshot 3X with enlarged macro rails s/n 3734 (Cognisys Inc., USA). The photosystem was installed on a Kaiser Copy Stand RS 1 (Kaiser Fototechnik, Germany) reproduction machine. Images were stacked using Helicon Focus 7.7.4 Pro software (Helicon Soft, Ukraine). Figures are not scaled.

Measurements: ocular index $OI = (100 \times \text{minimum distance between eyes dorsally}) / \text{maximum width of head at eye level}$ (Campbell & Marshall, 1964); pronotal index $PI = (100 \times \text{length of pronotum in the middle}) / \text{width of pronotum at the level of posterior angles}$ (Campbell, 1965).



Figs 1–6. *Allecula ussuriensis*, habitus, details. 1, 3, 4 – male from the Far East (type locality of *A. ussuriensis*: Partizansk = Suchan); 5, 6 – male from Crimea; 2 – female (Primorsky Krai: Dersu); 3, 6 – head and pronotum; 4, 5 – elytra.

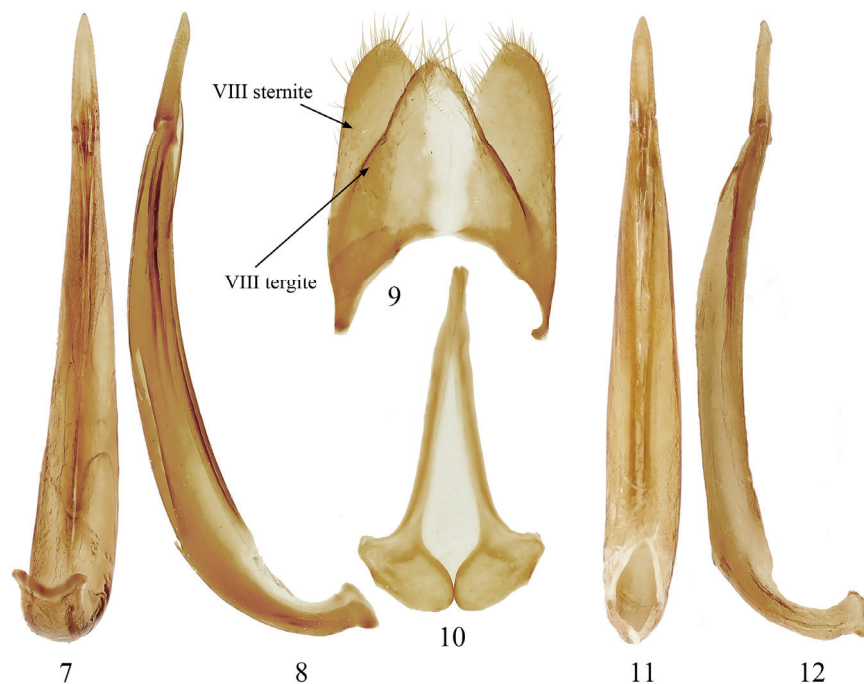
LIST OF THE RUSSIAN SPECIES OF THE GENUS *ALLECULA*

Allecula ussuriensis Borchmann, 1937

= *Allecula mandshurica* Mařan, 1940.

Figs 1–12

MATERIAL EXAMINED (only for the Russian Far East). **Russia:** Primorsky Krai; Shkotovsky Distr., 30 km W of Partizansk, Anisimovka village, light trap, 24.VIII 2022, 1♂ (I.D. Solodkiy) (ZIN); same locality and collector, 13.VIII 2023, 2♂, 1♀ (ZIN); Partizansky Distr., Vasil'evka village, 7.VIII 2023 1♂ (I.D. Solodkiy) (PCMN); Vladivostok, Okeansky ridge, light trap, 11.VIII 2023, 2♂, 1♀, (S. Veriga) (PCMN); Krasnoarmeysky Distr., Dersu env., 45°45'N, 135°19'E, 9–15.VIII 2023, 3♂, 2♀, (M.E. Sergeev) (PCMN).



Figs 7–12. *Allecula ussuriensis*, male genitalia. 7–10 – male from the Far East (type locality of *A. ussuriensis*: Partizansk = Suchan); 11, 12 – male from Crimea; 7, 11 – aedeagus ventral; 8, 12 – aedeagus lateral; 9 – male inner sternite and tergite VIII; 10 – spiculum gastrale.

NOTES. We studied specimens of *A. ussuriensis* from the type locality and several other localities and didn't find any differences between one male from Crimea

(listed as *Allecula morio* in Nabozhenko & Gadaborsheva (2023)) and Far Eastern specimens. They have the same OI, measurements of antennomeres, the shape and puncturation of the pronotum, dull pronotum and elytra and shiny head. The shape of the male VIII inner sternite, spiculum gastrale and the aedeagus are identical in both species. The shape of the aedeagus in lateral view is slightly different in specimen from Crimea, due to desiccation of the parameres. There are two explanations for this gap in the range: the introduction of the species from the Far East with timber or historical disjunction.

Disjunctions in the nemoral animal ranges in the Palaearctic are well known, including among insects. Gorodkov (1984) called such ranges “Trans-Eurasian nemoral”. He associated these disjunctions with the disappearance of broad-leaved forests in Siberia during the glacial periods in Pleistocene. Dubatolov and Kosterin (1998, 2000) discussed in details disjunctions of nemoral ranges on the example of Lepidoptera. They called such ranges as amphipalaeartic and showed that the ranges of elm, linden and oak were restored in Siberia during interglacial periods and were continuous from Atlantic to Pacific oceans.

DISTRIBUTION. This species with the amphipalaeartic range is widely distributed in the Russian Far East (south of Khabarovsk Krai and Primorsky Krai), Korean peninsula and Ulleungdo Island (Lee *et al.*, 2024), NE China (Mařan, 1940). One male was collected in Crimea (Nabozhenko & Gadaborsheva, 2023).

***Allecula rhenana* Bach, 1856**

Figs 13–19

MATERIAL EXAMINED. (ZIN), **Russia:** Stavropol Krai, Lermontov env., Beshtau Mt., light trap, 25–27.VII 2015, 1♂ (E.N. Terskov); **Abkhazia:** Tsadriphs near Russian border, 15.VIII 2011, 1♂ (E.A. Khachikov).

NOTES. The shape of the aedeagus imaged (outline drawing) in Novák *et al.* (2011) differs from those in our specimen from Russia and similar to *A. olexai* dorsally and to European specimens of *A. rhenana* laterally. This difference is probably due to a slight deformation of the parameres during drying. The photo presented here was taken with the newly dissected aedeagus.

DISTRIBUTION. Widespread in Europe east to the Caucasus and Iran (Novák, 2023). This species was listed from Transcaucasia (Dubrovina, 1978; Dubrovina *et al.*, 1979): Abkhazia (Sukhum) and Georgia (Borjomi). In Russia, *A. rhenana* was known only from Ubinskaya (Dubrovina, 1978) and Guzeripl’ of Krasnodar Krai (Nikitsky *et al.*, 2008; Nabozhenko *et al.*, 2010). Beshtau (Western Ciscaucasia) is the easternmost locality of the species in the North Caucasus and Russia.

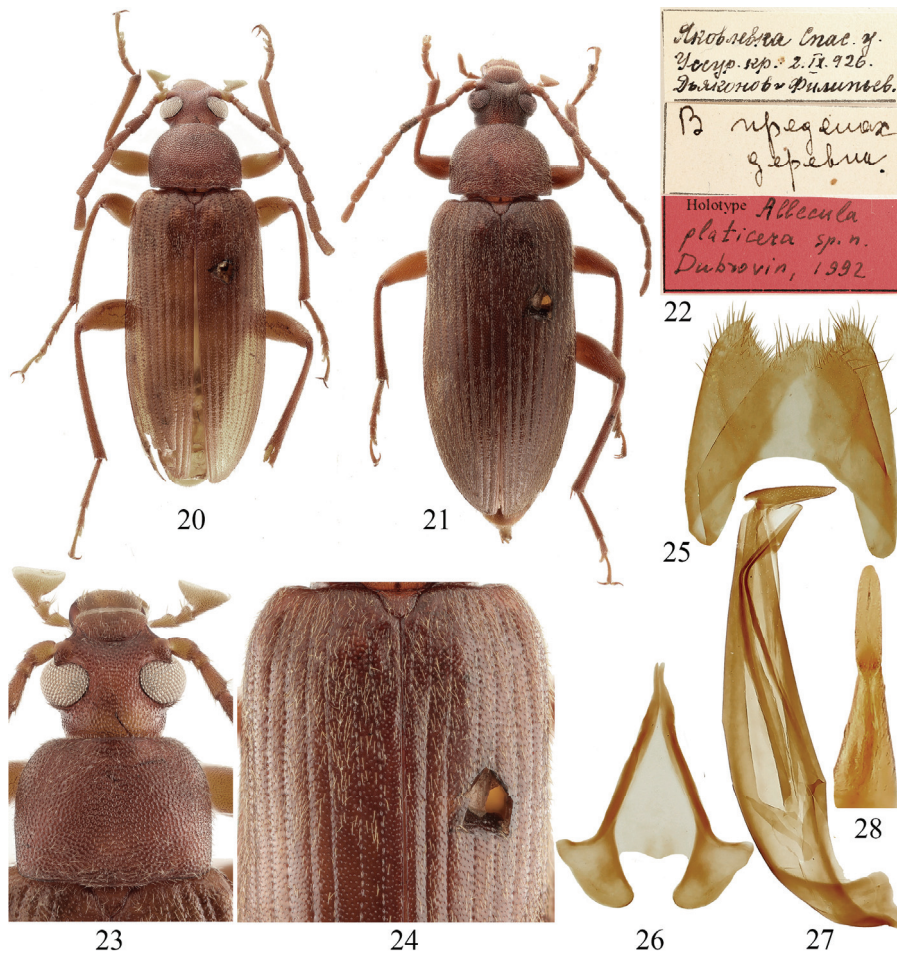
***Allecula olexai* Novák, 2016**

NOTES. This species was described from Sochi (Novák, 2016) and so far known only from the holotype (male). Images are published in the original description in open access.

DISTRIBUTION. This species is known only from the type locality by the type series, despite that Dubrovin (1992) indicated in the original description also Khabarovsky Krai of Russia and North-Eastern China.



Figs 13–19. *Allecula rhenana*, male habitus and details. 13 – habitus; 14 – head and pronotum; 15 – elytra; 16 – aedeagus ventral; 17 – aedeagus dorsal; 18 – inner sternite and tergite VIII; 19 – spiculum gastrale.



Figs 20–28. *Allecula platycera*, habitus, labels, details and male genitalia. 20 – holotype, male; 21 – paratype, female; 22 – labels of the holotype; 23 – male head and pronotum; 24 – elytra; 25 – male inner sternite and tergite VIII; 26 – spiculum gastrale; 27 – aedeagus, lateral; 28 – parameres, dorsal.

***Allecula platycera* Dubrovin, 1992**

Figs 20–28

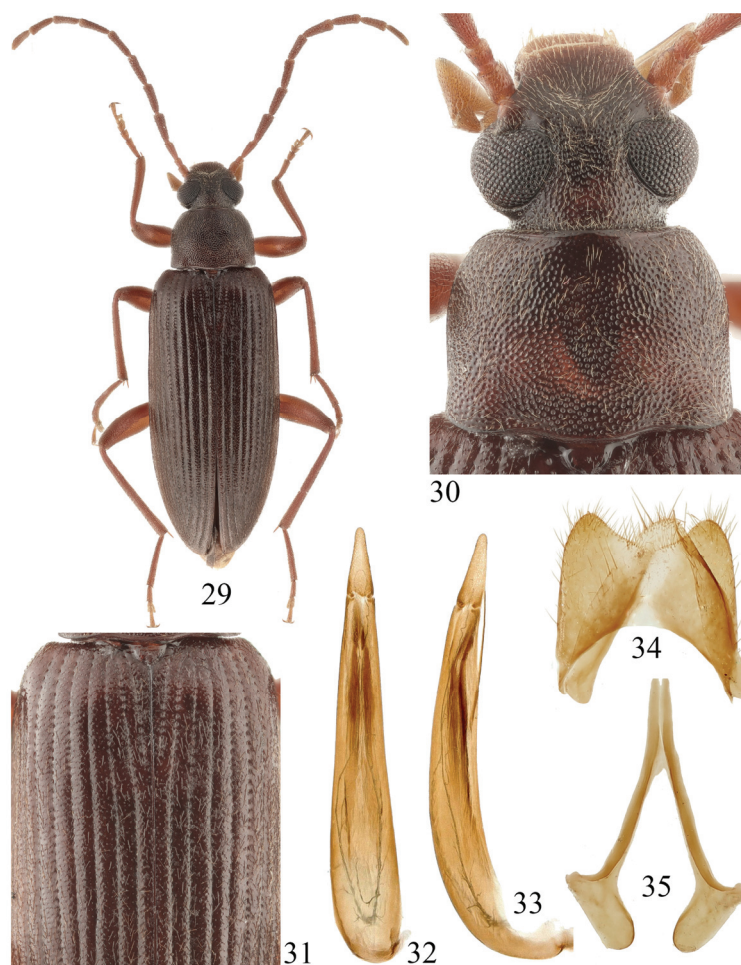
TYPE MATERIAL EXAMINED. Holotype – ♂ (ZIN): “Yakovlevka Spas. u, Ussur kr. 12.VIII 1926, D’yakonov Filip’ev” (now **Russia**: Primorsky Krai, Yakovlevka Distr., Yakovlevka village, 44°25’37”N, 133°28’47”E). Paratypes, 3 specimens: the same locality and collectors, but different dates: “15.VIII 1926” (♂), “26.VIII 1926” (♂), and “2.IX 1926” (♀).

DISTRIBUTION. This species is known only from the type locality by the type series, despite that Dubrovin (1992) indicated in the original description also Khabarovsk Krai of Russia and North-Eastern China.

Allecula morio (Fabricius, 1787)

Figs 29–35

NOTES. This species is known in Russia from Kaliningrad Region (Alekshev & Bukejs, 2010).



Figs 29–35. *Allecula morio*, male, habitus, details. 29 – habitus; 30 – head and pronotum; 31 – elytra; 32 – aedeagus, ventral; 33 – aedeagus, lateral; 34 – inner sternite VIII; 35 – spiculum gastrale. Figures 32 and 33 modified after Lompe (2024).

***Allecula sundukovi* sp. n.**

<https://zoobank.org/NomenclaturalActs/1EC8CA22-30E0-4DBA-9568-9840651B6824>

Figs 36–42

TYPE MATERIAL. Holotype – ♂ (ZIN): **Russia**: Khabarovsky Krai, Anyuysky National Park, mouth of Bogbasu River, 49°22'32.1"N, 137°43'15.3"E, 20.VII 2024 (Yu.N. Sundukov, L.A. Sundukova).

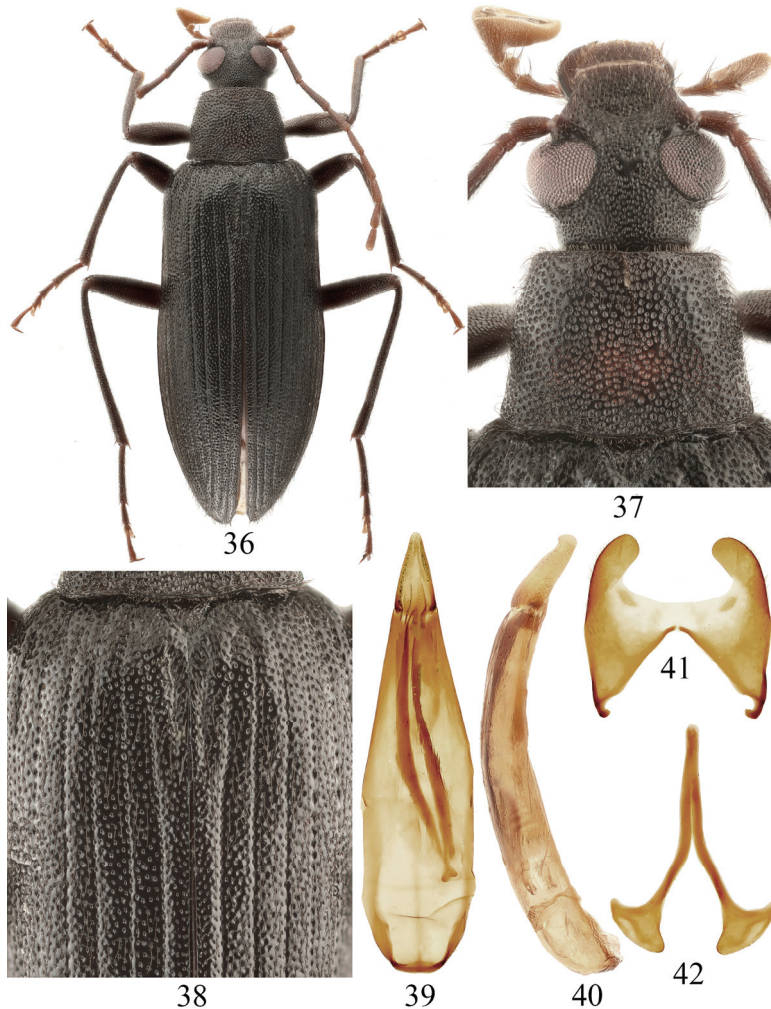
DESCRIPTION. Body large (length 11 mm, width 3.5 mm), slender, black and shiny, gently convex, densely covered by dark-brown recumbent and subrecumbent setae. Anterior margin of epistome slightly rounded. Lateral margin of genae straightly converging to epistome, shortly subparallel at base; lateral margin of head between gena and epistome with obtuse emargination. Eyes large and convex, OI = 30.5. Punctuation of head dense and coarse, puncture diameter near two times as long as interpuncture space; middle of frons with small unpunctured area. Ventral side of head smooth and shiny, only temples with coarse and dense puncturation. Maxillary palpomeres 1–2 asymmetrical, 1st palpomere 2 times as long as 2nd one; apical palpomere strongly asymmetrical, securiform, 1.46 times as wide as interocular distance. Antennae thin, filiform, reaching elytral middle, when directed backward; antennomeres 3 and 4 long, subequal in length; antennomeres 5–11 slightly shorter.

Prothorax. PI = 73.9. Pronotum narrow, trapezoid, strongly converging from base to anterior margin, 1.28 times as wide as head; lateral margins almost straight, only near middle slightly shortly rounded; anterior margin straight, base slightly trisinate. Anterior margin and base finely emarginated; lateral margins emarginated only from base to middle. Anterior and posterior angles obtuse (posterior ones obtuse, because base rounded near angles). Disc flattened in middle and strongly convex laterally, with two median round depressions in middle and one transverse median depression in basal third. Punctuation of disc coarse and dense, puncture diameter 2–3 times as long as interpuncture space; punctures slightly sparser on sides from middle. Prohypomera and prothoracic sternite coarsely and very densely punctured, but punctures smaller than on pronotum. Prosternal process protruded in apical portion.

Pterothorax. Scutellum triangle, with acute apex, densely punctured. Elytra 2.15 times as long as wide, widest slightly behind the middle, 2.1 times as wide as head, 1.6 times as wide and 4.75 times as long as pronotum. Lateral margins of elytra slightly widely emarginated in basal half. Striae consist of coarse and dense round punctures, in basal half merging in entire furrow; interstriae with moderately dense and coarse puncturation, punctures only slightly smaller than strial ones. Epipleura coarsely and densely punctured, almost reaching suture angle. Mesoventrite with very dense and coarse rugose puncturation; intercoxal process strongly longitudinally impressed in middle. Metaventrite moderately punctured, punctures small, raduliform, diameter slightly lesser than interpuncture space. Sclerites of meso- and metathorax coarsely and densely punctured by simple rounded punctures.

Legs long and slender, mesotibiae slightly curved. Tarsi narrow, pro- and mesotarsomeres 3–4 lobed, slightly widened, metatarsomer 4 also lobate, but longer

and narrower. Ultimate protarsomere slightly longer than first one. First tarsomere longest in meso- and metatarsi. Each tarsal claw with six teeth.



Figs 36–42. *Allecula sundukovi* sp. n., male, habitus, details. 36 – habitus; 37 – head and pronotum; 38 – elytra; 39 – aedeagus, ventral; 40 – aedeagus, lateral; 41 – inner sternite VIII; 42 – spiculum gastrale.

Abdomen. Intercostal process of the first abdominal ventrite strongly depressed and located below the level of the rest surface. Punctuation of ventrites fine and sparse; ventrite 5 without depressions. Inner sternite VIII with very wide and deep emargination medially, large and wide rounded apices, folded on inner side, covered

with short and sparse recumbent setae. Spiculum gastrale with securiform blades (outer portion slightly larger than inner) and with long and straight common stem. Aedeagus wide, parameres comparatively wide, triangle in dorso-ventral position and thickened in lateral position.

COMPARATIVE DIAGNOSIS. The new species differs from all known Old world *Allecula* (s. str.) spp. in the unusual shape of the trapezoid pronotum, very similar to those in *Lagria* Fabricius, 1775, having lateral edges margined only from the base to the middle; coarsely and densely punctured interstriae also distinguish this species from other congeners. The new species is also different in the structure of the male inner sternite VIII, with very wide, deep emargination and very wide, rounded lateral apices with short sparse recumbent setation (other *Allecula* spp. have male inner sternite VIII with triangle emargination and acute, pointed lateral angulations with dense erected long hairs). The aedeagus and spiculum gastrale is also different from those in all known species. The new species is one of the largest representative of the genus (s. str.) together with several taxa from Taiwan (Masumoto *et al.*, 2019), having body length 11 mm and more. See additional differences in a key below.

ETYMOLOGY. The species is named in honour of Yuri Sundukov (Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia), known specialist on the Far Eastern Carabidae and one of the collectors of a new species.

A key to the Russian species of *Allecula*

1. Body black, large (body length 11 mm). Male antennae filiform. Pronotum trapezoid, with almost straight lateral edges, margined only from base to middle. Elytral striae densely and coarsely punctured, interstitial punctures subequal in size to striae ones. Intercostal process of mesoventrite strongly longitudinally depressed in middle *A. sundukovi* **sp. n.**
- Body from reddish-brown to dark-brown, smaller (body length to 8.3 mm). Male antennae serrate. Pronotum bell-shaped or rectangle shape, with lateral margins rounded at least in anterior third. Elytral striae finely punctured, interstitial punctures much smaller than striae ones. Intercostal process of mesoventrite not depressed, flat or slightly convex 2
2. Antennomeres 3 and 4 subequal in length. Head shiny, pronotum and elytra dull. Puncturation of pronotum fine and moderately sparse, diameter of punctures much shorter than interpuncture space *A. ussuriensis*
- Antennomere 4 longer than 3. Body dorsally shiny. Puncturation of pronotum coarse and dense, puncture diameter subequal or more than interpuncture space 3
3. Each of antennomeres 9–11 distinctly shorter than each of antennomeres 4–8 *A. olexai*
- Each of antennomeres 9–11 subequal in length or longer than each of antennomeres 4–8 4
4. Body dark-brown. Puncturation of elytral interstriae sparser, with 2–3 punctures in transverse section of one interstria 5
- Body reddish-brown. Puncturation of elytral interstriae denser, with 4–5 punctures in transverse section of one interstria *A. platicera*
5. Antennomere 4 twice as long or slightly longer than twice as long as antennomere 3. Male pronotum wider, 1.45 times as wide as long (PI about 70) *A. rhenana*
- Antennomere 4 less than twice as long as antennomere 3. Male pronotum narrower, near 1.3 times as wide as long (PI about 77). *A. morio*

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