

A new cave-dwelling species of the genus *Cimmerites* Jeannel, 1928 (Coleoptera: Carabidae: Trechini) from the West Caucasus**Новый пещерный вид рода *Cimmerites* Jeannel, 1928 (Coleoptera: Carabidae: Trechini) с Западного Кавказа**

I.A. BELOUSOV & A.G. KOVAL

И.А. БЕЛОУСОВ, А.Г. КОВАЛЬ

I.A. Belousov, All-Russian Institute for Plant Protection (VIZR), 3 Podbelskogo Shosse, St. Petersburg, Pushkin, 196608, Russia. E-mail: ibelous@yandex.ru

A.G. Koval, All-Russian Institute for Plant Protection (VIZR), 3 Podbelskogo Shosse, St. Petersburg, Pushkin, 196608, Russia. E-mail: agkoval@yandex.ru

A new species of the genus *Cimmerites* Jeannel, 1928, *C. maximovitshi* sp. nov., is described from the Akhunsкая Cave and Labirintovaya Cave, both located in the Akhun Karst Massif on the Black Sea Coast of the West Caucasus (Krasnodar Territory, Russia). The new species is rather isolated within the genus *Cimmerites* and occupies an intermediate position between species related to *C. kryzhanovskii* Belousov, 1998 and species close to *C. vagabundus* Belousov, 1998. Though both *C. maximovitshi* sp. nov. and *C. kryzhanovskii* are still known only from caves, these species are quite similar in their life form to other members of the genus which are all true endogean species.

Новый вид рода *Cimmerites* Jeannel, 1928, *C. maximovitshi* sp. nov., описан из Ахунской и Лабиринтовой пещер, расположенных в Ахунском карстовом массиве на Черноморском побережье Западного Кавказа (Краснодарский край, Россия). Новый вид весьма обособлен в пределах рода, занимая промежуточное положение между видами, родственными *C. kryzhanovskii* Belousov, 1998, и видами, близкими к *C. vagabundus* Belousov, 1998. Несмотря на то, что *C. maximovitshi* sp. nov. и *C. kryzhanovskii* пока известны только из пещер, по своей жизненной форме они не отличаются от других представителей рода, которые являются типично эндогеями видами.

Key words: West Caucasus, Russia, caves, endogeans, Coleoptera, Carabidae, Trechini, *Cimmerites*, new species

Ключевые слова: Западный Кавказ, Россия, пещеры, эндогеимый, Coleoptera, Carabidae, Trechini, *Cimmerites*, новый вид

INTRODUCTION

Among blind genera of the West Caucasus, members of the genus *Cimmerites* Jeannel, 1928 are easily recognised by a combination of the following characters: the body surface regularly pubescent (the

hairs adherent, directed clearly backward), the frons with supernumerary setae (both the frontal and the parietal setae present, for details see Belousov, 1998); the labrum trilobed, with prominent median part; the mandibles slender and only weakly curved; the tooth on the right mandible small, ei-

ther triangular or asymmetrically bidentate; the maxillary palpi asetose; the paraglossae glabrous or with indistinct hairs; six or seven submental setae; the pronotal sides not ciliate; the posterior lateral seta of the pronotum distinctly removed from the hind angles; the elytral base completely bordered; the humeral margin serrate; the apical striole long, finely but distinctly impressed, joining stria 5 anteriorly; two discal setiferous pores attached to stria 3; the subapical (= preapical) pore normally on interspace 3, far distant from the elytral apex, located at the apical anastomosis of striae 2 and 3; visible abdominal sternites 4–5 with a transverse row of setae; the first protarsomere simple or dilated in males, the second always simple. It is worth noting that the shape of the labrum and mandibles, the structure of the tooth on the right mandible, the maxillary palpi completely glabrous and the chaetotaxy of the abdominal sternites are unique within the *Nannotrechus*-complex (the Caucasian subset of the *Neotrechus* phyletic series sensu Jeannel, 1928) and each of these characters is sufficient to diagnose members of the genus. The new species described below matches perfectly the diagnosis of the genus. It belongs to a group of species characterised by the first protarsomere simple or nearly so in males, the tooth on the right mandible triangular, and the elytral striation rather shallowly impressed.

Measurements used in the present study were taken as described earlier (Belousov, 1998). The number of specimens studied is followed by the number of genitalic preparations given in parentheses.

The following abbreviations are used: MPU, Moscow Pedagogical University, Moscow; ZIN, Zoological Institute, Russian Academy of Sciences, Saint Petersburg; cAG, collection of A. Gitzen (Neuhofen, Germany); cAK, collection of A.G. Koval, Saint Petersburg; cIB, collection of I.A. Belousov, Saint Petersburg; cVZ, collection of V. Zieris, Pardubice (Czech Republic).

TAXONOMIC PART

Order **COLEOPTERA**

Family **CARABIDAE**

Subfamily **TRECHINAE**

Tribe **TRECHINI**

Cimmerites Jeannel, 1928

Cimmerites maximovitchi Belousov & Koval, sp. nov.

(Figs 1–2)

Holotype. Male (genitalic preparation); **Russia, Krasnodar Terr.**, “W Caucasus, Sochi, Akhunskaia Cave, traps, 16.V – 31.VIII. 1998. A.G. Koval leg.”; ZIN.

Paratypes. **Russia, Krasnodar Terr.**: 4 (3) males, 2 females, collected with holotype (MPU, cAK, cIB); 1 (1) male, 1 female, same locality, traps, 28 Aug. 1997 – 16 May 1998; leg. A. Koval (cAK, cIB); 2 (1) males, 2 (1) females, same locality, traps, 11 Aug. 1999 – 26 Aug. 2000; leg. A. Koval (cAK, cAG); 3 males, 5 females, same locality, traps, 26 Aug. 2000 – 19 Aug. 2001; leg. A. Koval (ZIN, cAK, cIB, cAG, cVZ); 5 (4) males, 2 females, same locality, traps, 19 Aug. 2001 – 6 Aug. 2002; leg. A. Koval (ZIN, MPU, cAK, cIB); 1 female, same locality, traps, 30 Aug. 2003 – 31 Aug. 2004; leg. A. Koval (cAK); 1 (1) male; “W Caucasus, Sochi, valley of Khosta River near Akhun Mt., Labirintovaya Cave, traps, 26.VIII. 1998 – 23.VIII. 1999. A.G. Koval leg.”; cAK. 30 specimens (17 males, 13 females) measured.

Description. Rather small-sized species (as compared with most congeners), males and females approximately equal in size, body length (without mandibles) 2.35–2.75 (on average, 2.53) mm. Habitus slender and elongate, subcylindrical, dorsum convex. Colour of body, including legs and antennae, uniformly amber-testaceous, rather pale. Body surface pubescent, moderately shining.

Head medium-sized, 0.74–0.81 times as wide as pronotum (in females, on average, larger: 0.79 versus 0.77 in males). Tempora gently convex, subparallel-sided in the middle. Frontal furrows slightly and regularly arcuate, nearly parallel in median part. Labrum distinctly trilobed, median lobe being markedly shorter than lateral ones (Fig. 1).

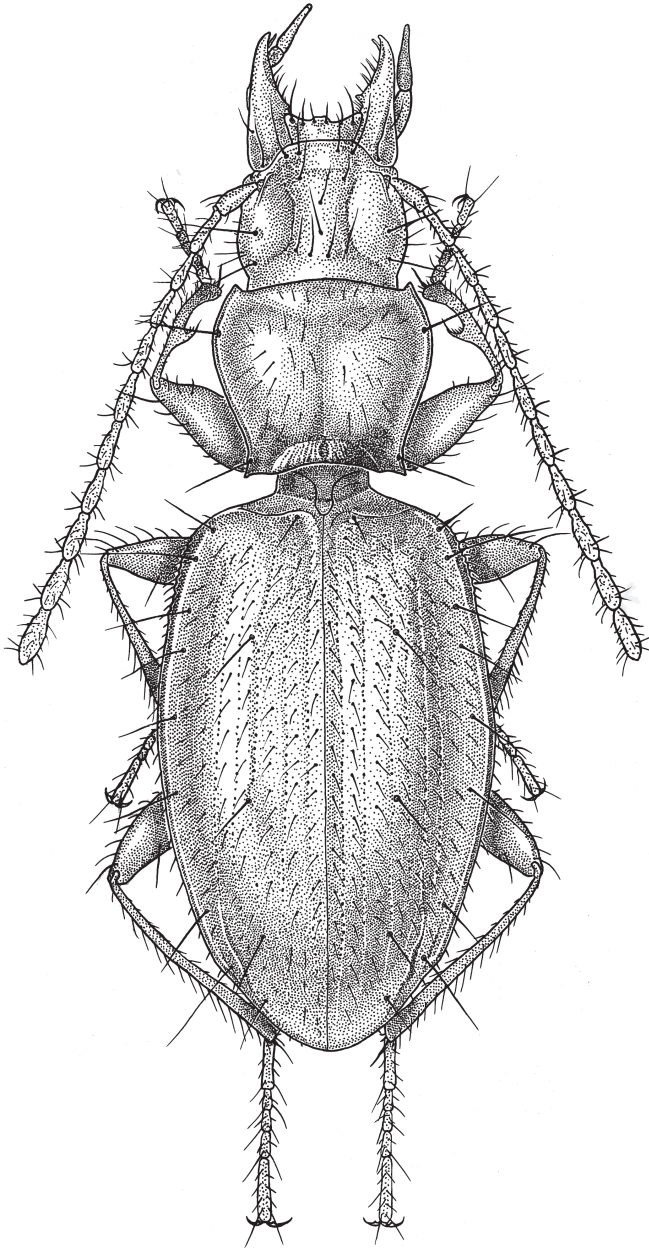


Fig. 1. *Cimmerites maximovitchi* sp. nov., habitus.

Mandibles slender, slightly curved in apical third. Retinaculum of right mandible small and narrow, subtriangular, though usually with a small second denticle. Antennae of medium length, 0.92–1.04 (mean

0.95) times as long as elytra, not reaching level of anterior discal pores on elytra and surpassing pronotal base by three apical antennomeres. Third antennal segment 0.98–1.13 (mean 1.05) times as long as second and 2.00–2.74 (mean 2.34) times as long as wide. Middle antennomeres considerably longer than wide. Additional chaetotaxy of head as follows: two to five (in almost half the cases three) frontal setae; if their number greater than two, anterior two setae normally arranged transversely; usually four (more seldom three and quite seldom two) parietal setae. Transverse parietal impression shallow but distinct. Normally two well-isolated temporal setae and one more seta located ventrad. Two clypeal setae on each side of head. Labium free, though labial suture extremely fine. Labial tooth rather narrow, distinctly cleft at apex. Usually six (occasionally seven) submental setae. Palpi slender, their last segments relatively long, gradually narrowing toward apex. Penultimate segment of labial palpi quadrisetose. Maxillary palpi glabrous. Pubescence of head short and irregular.

Pronotum (Fig. 1) weakly transverse, 1.13–1.27 (mean 1.19) times as wide as long, cordiform, strongly constricted at base; sides distinctly sinuate in posterior half. Posterior angles rather large, vari-

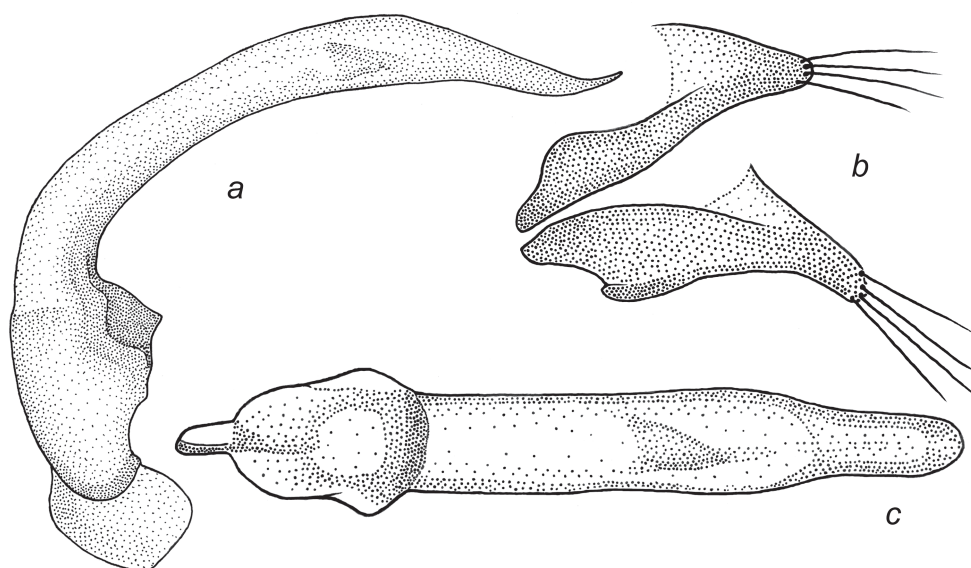


Fig. 2. *Cimnerites maximovitchi* sp. nov., male genitalia: median lobe of aedeagus, lateral view (a), parameres (b), median lobe of aedeagus, dorsal view (c).

able in shape, from slightly acute to subrectangular, pointed apically, their apices produced backward and occasionally outward. Anterior angles rather strongly produced forward. Lateral margins narrowly reflexed. Pronotum at anterior margin 1.06–1.16 (mean 1.10) times as wide as at basal margin, and 1.34–1.47 (mean 1.39) times as wide at broadest part as at base. Basal margin slightly to moderately concave. Transverse prebasal impression regularly arcuate. Basal foveae not large but comparatively deep. Median part of pronotal base with only a few irregular wrinkles. Transverse apical impression distinct though shallow, more distinctly developed laterally. Posterior lateral seta clearly removed from hind angle, lateral margin distinctly salient at its level. Anterior lateral seta located in anterior quarter of pronotum length (26%). Median line distinct, becoming deeper near base. Pubescence of pronotum long and regular. Lateral margins glabrous, not ciliate.

Elytra rather narrow and convex, widest near mid-length, their sides broadly rounded and slightly angularly bent near middle,

shoulders subrectangular, their exterior margins clearly serrate. Elytra 1.53–1.65 (mean 1.60) times as long as wide, 1.31–1.50 (mean 1.43) times as wide as pronotum (in males elytra on average larger, 1.44 versus 1.42 in females) and 1.64–1.96 (mean 1.84) times as wide as head (1.87 in males versus 1.80 in females). Elytral apex slightly attenuated, more noticeably in females. Basal border of elytra continuous, strongly developed and more or less distinctly sinuate. Lateral margins beaded and rather narrowly reflexed, more strongly in humeral area. Elytral striae moderately impressed and distinctly but not coarsely punctured, nearly effaced on apical slope and except for four or five inner striae in basal half of elytra. Apical striole long and well-impressed, sinuate and connected to stria 5 anteriorly. Apical carinula weak but distinct. First discal pore usually located at level slightly anterior to umbilicate pore 4, second one weakly behind level of umbilicate pore 6, preapical pore at level between umbilicate pores 7 and 8. Within humeral group of umbilicate series, pores 1 and 2 closest, pores 2 and 3 most distant. Umbilicate pore

5 strongly removed from lateral margin as compared to pore 6. Discal formula (for details, see Belousov, 1998): 19–27 (mean 23), 51–58 (mean 54), 76–84 (mean 79). Formula of umbilicate series: 4–5 (mean 4.6), 9–11 (mean 10.1), 17–19 (mean 18.3), 20–26 (mean 24.6), 38–41 (mean 39.4), 50–55 (mean 52.6), 72–79 (mean 74.6), 81–90 (mean 86.3), thus, median group only weekly distant from humeral one. Elytral pubescence average for genus.

Microsculpture of dorsum isodiametric, rather shallow, more so in middle of frons and pronotum, becoming deeper on occiput and base of pronotum.

Ventrites irregularly and densely pubescent. Normally, apart from a pair of much longer paramedian setae, five to eight hairs present on each side of abdominal ventrites along their posterior margins. Anal ventrite with one pair of setae in male and two pairs in female.

Basal segment of male protarsi not dilated, without distinct tooth on inner corner, but scarcely pointed here, and hence, its shape somewhat different from that in females.

Aedeagus (Fig. 2a–c) slender, with simple and narrow apex distinctly curved upward in lateral view; lamella parallel-sided for most of its length, broadly rounded at apex in dorsal view. Parameres average in length, rather stout, each bearing four apical setae, left one slightly arcuate in distal half and provided with a small ventral apophysis. Sagittal aileron well-developed. Copulatory piece spatulate, slightly sclerotised, located in apical third of aedeagal tube.

Comparisons. The new species appears to be most closely related to *Cimmerites kurnakovi* Jeannel, 1960 from the Bzybian Mountain Range (Abkhazia) and *C. kryzhanovskii* Belousov, 1998 from the Malaya Kazatshebrodskaya Cave (Sochi region, Krasnodar Territory, Russia). All these species share the same set of main characters: an elongate habitus, simple protarsi in males, a triangular-shaped retinaculum on the right mandible, a strongly serrate humeral mar-

gin of the elytra, and posterior lateral seta of the pronotum markedly removed from the hind angles (the lateral margin of the pronotum slightly protruding in front of the seta). Nonetheless, *C. maximovitchi* **sp. nov.** can be easily distinguished from the above two species by its considerably greater size (2.34–2.74 mm versus 2.00–2.26 in its counterparts), a more ovate, less parallel-sided habitus with the elytra widest and most convex near their mid-length, anterior angles of the pronotum more strongly produced, lateral margins of the pronotum much more strongly sinuate before the hind angles, elytral striae shallower and less strongly punctured (the outer striae at their base and most striae on the apical slope are indistinct), and a quite variable shape of the aedeagus with the apex attenuated and pointed in lateral view. Additionally, the new species differs from *C. kryzhanovskii* in having slightly longer antennae (on average, the elytra are 1.05 times as long as antennae in the new species vs. 1.12 in *C. kryzhanovskii*), a proportionally smaller head (which, on average, is 0.54 times as wide as elytra and 0.78 times as wide as pronotum vs. 0.58 and 0.81, respectively, in *C. kryzhanovskii*), humeral umbilicate pores more distant from the elytral base, and some other characters of secondary importance. From *C. kurnakovi*, the new species differs, apart from the above mentioned characters, in a more cordiform shape of its pronotum, and, especially, a more slender median lobe of the aedeagus with its apex much narrower in lateral view.

As far as the male genital characters concerned, *C. maximovitchi* **sp. nov.** is most similar to *C. vagabundus* Belousov, 1998 known from the Aibga Mountain Range (Sochi region). The only difference is shape of the median lobe which, in the new species, is more distinctly curved at the base in lateral view, having its apical portion more strongly attenuated. Externally, the new species differs readily from *C. vagabundus* and close *C. subcylindricus* Belousov, 1998 from Iegoshka Mount (Sochi region) in the

following characters: a concolourous dorsum (in the two latter species, the elytra are distinctly paler than both the head and the pronotum); a more ovate habitus, with longer legs and antennae; more strongly produced pronotal anterior angles; the sides of the pronotum more strongly sinuate before the large and acute hind angles; a less parallel-sided elytra, with distinctly attenuated apex and more strongly rounded humeri, and, especially, a simple, non-dilated basal segment of the male protarsi.

To summarize, despite of certain similarity with some congeners, *C. maximovitshi* sp. nov. appears to be rather isolated within the genus *Cimmerites* and occupies an intermediate position between the two groups of species mentioned above: that of *C. kryzhanovskii* and that of *C. vagabundus*.

Distribution. The new species was found in two caves located in the Akhun Karst Massif not far from Khosta (Sochi region, Krasnodar Territory, Russia). One of these, the Akhunskaia Cave, is situated on the western slope of Akhun Mount at an elevation of 350 m above sea level. It represents one of few Caucasian labyrinth caves. In its morphology, the cave is similar to some huge gypsum caves of Podolia (Ukraine). We have been exploring the Akhunskaia Cave since 1988. Nonetheless, a few specimens of the species described in the present paper, had been firstly collected only 10 years afterwards. In summer, the air temperature was observed to range between 8 and 11 °C. In this cave, *C. maximovitshi* sp. nov. co-occurs with *Caucasorites victori* Belousov, 1999. The second cave, the Labirintovaya Cave, is located in the valley of the Khosta River in the southeastern spurs of the same mount at an elevation near 100 m above sea level. Morphologically, the cave is a system of narrow corridors. It is distinct in having rather high air temperatures ranging from 12 to 15 °C the whole year round even in the most remote parts. A single male specimen originated from

this cave as well as all specimens from the Akhunskaia Cave were captured only in the pitfall traps which were installed in the most remote and difficult of access parts of the caves, though traps were placed randomly throughout all the caves.

Habitat. Though found only in caves, *Cimmerites maximovitshi* sp. nov. doesn't exhibit any special troglobitic adaptations other than those usually occurring in endogean species. In this respect, it is quite similar to *C. kryzhanovskii* which is also known only from caves. A comparatively dry microclimate in the immediate vicinity of Akhun Mount may result in the species becoming associated with deeper hypogean horizons, at least in summer.

Etymology. The species is named in memory of one of the founders of the Russian speleology, an outstanding scientist, Professor Georgy Alexeevitch Maximovitch (Russia, Perm, 1904–1979).

ACKNOWLEDGEMENTS

We heartily thank A.I. Roubchenya (Belarus, Minsk) who helped us while collecting material in caves. Our special gratitude goes to V.A. Koval (Saint Petersburg) for his long-term assistance in the field work. We are pleased to thank A.E. Korolev (Saint Petersburg) for mounting some type specimens. We are also indebted to the Gorbachevs' and Gakayevs' families (Sochi) for their cordial hospitality during our stay in the area of investigations.

REFERENCES

- Belousov, I.A. 1998. *Le complexe générique de Nannotrechus Winkler du Caucase et de la Crimée (Coleoptera, Carabidae, Trechini)*. Pensoft, Sofia–Moscow–St. Petersburg. 256 p.
- Jeannel, R. 1928. Monographie des Trechini. Morphologie comparée et distribution géographique d'un groupe de coléoptères. (Troisième livraison). Les Trechini cavernicoles. *L'Abeille, Journal d'Entomologie*, **35**: 1–808.

Received February 7, 2011 / Accepted June 1, 2011