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## **A new hypogean species of the genus *Duvalius* Delarouzée from the West Caucasus (Coleoptera, Carabidae, Trechini)**

by I. A. Belousov & A. S. Zamotajlov\*

**Abstract:** A new species of the genus *Duvalius* Delarouzee, *Duvalius miroshnikovi* n.sp., from the West Caucasus is described. It seems to be strictly troglobitic and is easily distinguishable from the Caucasian congeners by strongly reduced elytral striae and aphepoid appearance.

**Key words:** Coleoptera, Carabidae – Trechini – *Duvalius* – systematics – new species – Caucasus.

### **Introduction**

The morphometric characters are used as follows in the present note. Length of body measured from the anterior margin of labrum to the elytral apex; width of base of pronotum measured at the narrowest part before hind angles; length of elytra measured from the anterior termination of the marginal gutter to their apex; length of antennomeres measured from the distal constriction of articulation to their apex.

### **Depositories**

The holotype of the new species is deposited at the Zoological Institute of the Academy of Sciences of Russia in St.-Petersburg (ZISP). Paratypes are shared with the collections of the Natural History Museum in Basel (NHMB) and the authors (IB & AZ)

### **Acknowledgements**

Before going into further details, we wish to express our deep indebtedness to Dr A. MIROSHNIKOV and Ing. V. SHCHUROV (Krasnodar) for their willing and invaluable help during collecting trips.

***Duvalius miroshnikovi* n.sp.**

Figs 1–4.

**Description:** Relatively large-sized species (Fig. 1), body length 5.65–6.60 mm (females somewhat larger, their average length 6.30 mm versus 6.05 mm in males). Apterous. Appearance ovate and convex with elongate and narrow fore part. Strongly depigmented,

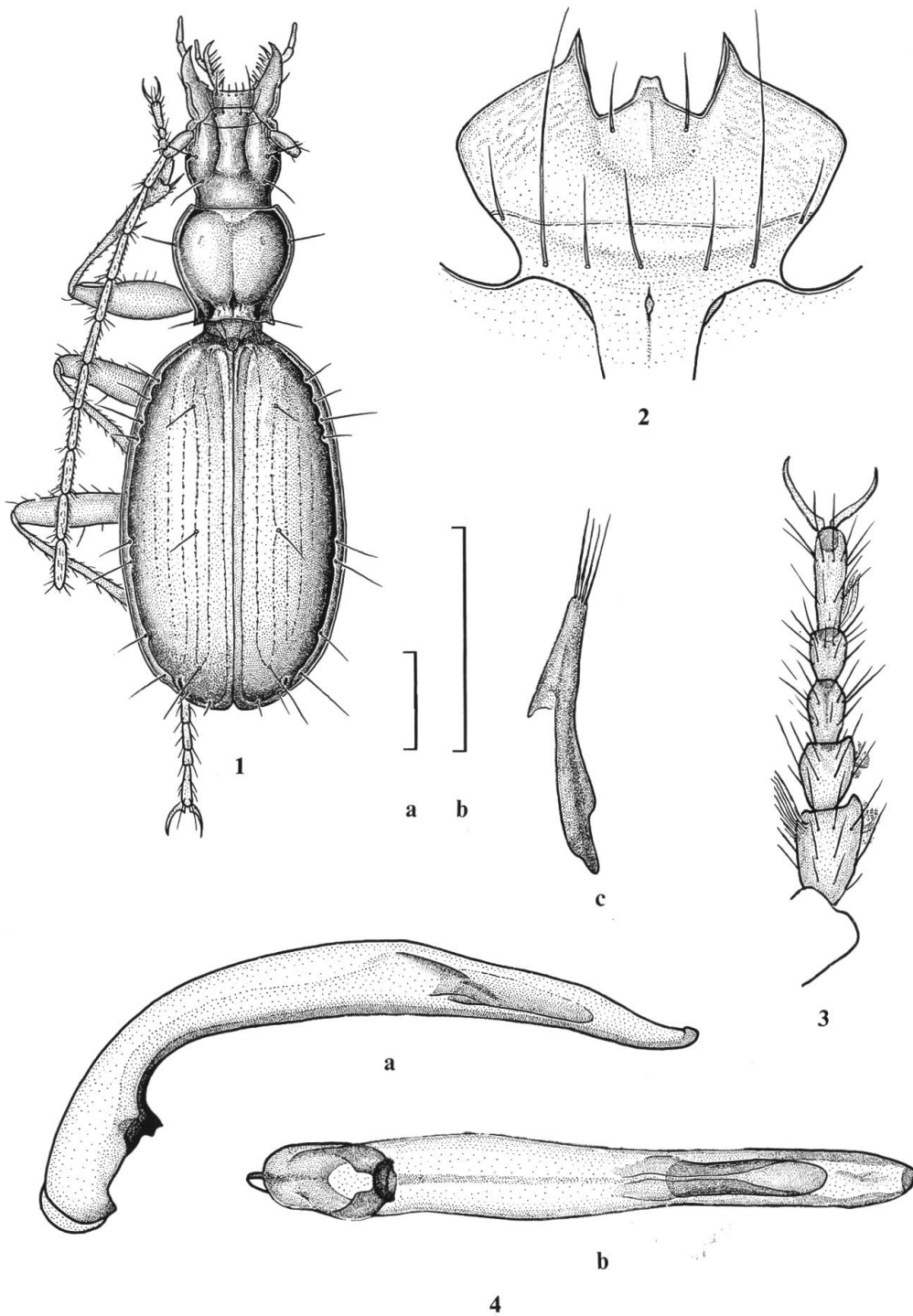
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colour pale testaceous. Upper side shiny, completely glabrous, including temples. Eyes strongly reduced but distinguishable, represented by more or less pigmented spots without any trace of facets. Appendages very long.

Head small and somewhat parallel-sided, 1.20–1.35 (1.29) times narrower than pronotum. Eyes indicated as small pigmented spots being 2.5–3.7 times as short as temples. Frontal furrows very deep and sharp, subparallel in anterior and middle parts but quite superficial and almost evanescent in posterior one. Temples faintly tumid, widely rounded. Two supraorbital pores and two setiferous pores at every side of clypeus. Labrum moderately transverse, only about 4 times as wide as long, its anterior margin almost straight, hardly emarginated, bearing 6 setae, extreme ones being the longest. Mandibles elongate, faintly curved apically, bidentate (premolar tooth indistinguishable). Labium free, i.e. mentum separated from submentum by distinct labial suture. Mentum tooth comparatively short and deeply cleft at apex. Sensorial labial organ well-developed, far removed from basal margin. Mentum with two small setae, submentum with 6–7 setae, the subangular ones being the smallest and hardly distinguishable, the sublateral ones are the longest. Maxillary and labial palpi slender, their ultimate segments subcylindrical and nearly as long as the penultimate ones, hardly narrowed towards apex. Penultimate segment of labial palpus with 4 setae, that of maxillary palpus glabrous. Antennae very long, considerably surpassing midlength of elytra and reaching to posterior seta of the median group of umbilicate series. Their antennomere 3 ca. 3.8–4.5 (4.0) times as long as wide and 1.6–2.0 times as long as antennomere 2.

Protonum cordate, strongly constricted toward base, hardly transverse, only 1.04–1.14 (1.09) times as wide as long. Its lateral borders widely rounded and sharply sinuate before acute and strongly protruding hind angles, directed somewhat backwards and outwards simultaneously. Base straight and distinctly incised on sides, 1.35–1.47 (1.43) times as narrow as protonum maximum width. Anterior margin rectilinear, only weakly salient in the middle. Anterior angles distinctly prominent although rounded at apex. Transverse basal impression very superficial and not distinctly outlined. Basal foveae not large but relatively deep. Basal surface rugous and vaguely punctured. Median line distinct throughout, becoming much deeper near base. Apical transverse impression distinguishable only on sides. Small, nicely delimited impression perceptible in anterior third



Figs 1–4: *Duvalius miroshnikovi* n.sp. 1, General appearance. 2, Submentum and mentum. 3, Fore tibia of male. 4, Aedeagus. a) Median lobe, lateral view, b) idem, dorsal view, c) left paramere. Scales: a = 1 mm for fig. 1; b = 0.5 mm for figs 2, 3, 4.

of pronotum. Marginal gutter well-developed, of moderate width throughout. Anterior pronotal seta somewhat behind the anterior quarter of pronotum length, posterior one just in hind angles. Lateral borders glabrous, not ciliate.

Elytra ovate and convex, broadest behind the middle, 1.42–1.54 (1.48) times longer than wide combined, 2.77–3.08 (2.95) times as long as pronotum, and 2.26–2.47 (2.35) times as wide as head. Shoulders completely effaced. Marginal gutter of elytra wide. Prehumeral borders not reaching basal peduncle, being interrupted inward. Disk of elytra strongly depressed near scutellum, thus the suture becomes salient here. Diskal striae superficial, but distinct and well-punctured, becoming shallower and obsolete towards the side, apex and partly towards base of elytra. The exteriormost striae represented by a rang of fine isolated punctures visible only on disk of elytra. All interspaces flat. Apical striola very short and hardly perceptible. Both scutellar striola and pore well-developed. Fore diskal pore of elytron is level to between pores 2 and 3 of umbilicate series, the second far before its median group. Usual number and disposition of pores of umbilicate series; 4 pores of humeral group regular and well-aggregated being ranged equidistantly. Median group well removed from the humeral one. Diskal formula 16–18 (17)/46–55(51).

Microsculpture superficial, consisting of comparatively high meshes on vertex and more irregular on front, hardly distinguishable on pronotum and elytra, consisting there of fine and serried transverse lines.

Legs very long and slender; hind tibiae only 1.96–2.18 (2.08) times shorter than elytra. Fore tibiae strongly grooved on exterior surface and sparsely pubescent. Segment 4 of fore and middle tarsi with processus and hyaline appendages beneath.

Anal sternites provided with a pair of setae in male and two pairs in female.

Two proximal segments of male protarsi dilated and dentated inwards, provided with adhesive appendages beneath.

Aedeagus (Fig. 4) very small, its median lobe slender. Sagittal aileron almost completely reduced. Parameres elongate, with narrow apex bearing 4–5 apical setae, one of them sometimes very small. Copulatory piece unique and spatulate, symmetric, in ventral position, its distal part rounded, not incised.

Holotype: ♂ (ZISP): W Caucasus, Sochi env., cave „grotto Bariban“, pitfall traps, 20.V.–3.VIII.1994, A. Zamotajlov, A. Miroshni-

kov, V. Shchurov. Paratypes: 1 ♂ & 1 ♀ (NHMB); 14 ♂ & 10 ♀ (IB & AZ), same locality, together with holotype. 1 ♂ (IB & AZ), same locality, 3.VIII.1994, A. Zamotajlov. 1 ♂ & 5 ♀ (AZ), same locality, 14.IV.–16.VII.1995, A. Zamotajlov, A. Miroshnikov, V. Shchurov. 1 ♂ & 4 ♀ (AZ), same locality, 16.VII.–28.VIII.1995, A. Zamotajlov, A. Miroshnikov, V. Shchurov. 2 ♂ (col. A. Koval), same locality, 23.V.1995, A. Koval.

Remarks: *Duvalius miroshnikovi* n.sp. seems to be most closely related to *D. sokolovi* LJOVUSHKIN (1963) from Arabika Mt (Gagry Mt Range). Both species are of similar shape but easily distinguishable in colour and elytral striae. The new species is much more depigmented, testaceous pale versus red brownish in *D. sokolovi*. From all other hitherto known Caucasian species of the genus *Duvalius*, the new species is easily distinguishable by larger size, more elongate fore-body and especially by superficial striae of elytra. It seems to be important to indicate a surprising aedeagal similarity of *Duvalius miroshnikovi* n.sp. and *D. megrel* BELOUSOV (1991) including the shape of the copulatory piece. This concerns even the size of the median lobe, despite the fact that the new species is much larger. *Duvalius miroshnikovi* n.sp. is also somewhat similar to *D. gusevi* BELOUSOV (1989), but strongly differs from it by more reduced eyes completely deprived of facets.

In appearance, *Duvalius miroshnikovi* n.sp. is somewhat similar to species of some troglobitic genera, for example, *Jeannelius* and *Meganophtalmus*. Besides the habitus, it shares with them the hyaline appendages on segment 4 of middle and fore tarsi and the frontal furrows of irregular depth, almost obliterated in posterior part. As far as the first of these characters are concerned, it is also found in other species of the genus *Duvalius* and possesses rather adaptive than phylogenetic significance. To some extent, this is also right concerning the second character. Anyhow there are some *Duvalius*-species with incomplete frontal furrows, for example species of the subgenus *Neoduvalius*. The new species differs readily from the species of both mentioned above troglobitic genera in aedeagal conformation with symmetrical copulatory piece highly characteristic for the *Duvalius* species.

*Jeannelius iljukhini* DOLZANSKY et LJOVUSHKIN, (1985) seems to be also a *Duvalius* species. This viewpoint is ascertained by the presence of eyes in this species, the strongly grooved on exterior surface fore tibiae, the general appearance and some other charac-

ters. This problem may be definitively resolved only after studying of male genitaliae of this species. Nevertheless, it should be noted that the new species differs from the above mentioned taxon by larger size and much more shallow striae of elytra. Special attention should be drawn also to the comparison of *Duvalius miroshnikovi* n.sp. with two hitherto known species of the genus *Inotrechus* DOLZANSKY et LJOVUSHKIN (1989), namely: *I.injaevae* DOLZANSKY et LJOVUSHKIN and *I.kurnakovi* DOLZANSKY et LJOVUSHKIN. This genus was established for two troglobitic species from Georgia based mainly on two dilated segments of protarsi in male and was not originally compared with similar in this respect *Duvalius*. By the way, only two characters seem to be different in two the above genera: mentum tooth simple in *Inotrechus* and bifide in *Duvalius*, and 8 submental setae present in the former and 6 setae in the latter. Bearing in mind a certain variability of number of submental setae (even intraspecific, see e.g. the description of the species considered) and the fact that mentum tooth is wide and obtuse in *Inotrechus* according to figures of DOLZANSKY et LJOVUSHKIN, we have to declare these differences too weak to be sure in the generic status of this taxon. In addition, the first authors was able to study the aedeagus of a paratype of *I.injaevae* through the courtesy of Mr. DOLZANSKY. Its conformation doubtlessly confirms the closeness of this species to the genus *Duvalius*. Further investigations of the troglobitic fauna of the Transcaucasus are required to estimate the degree of the segregation of *Inotrechus*. In any event, *Duvalius miroshnikovi* n.sp. differs from both species of *Inotrechus* besides two the above cited characters, by much more shallow elytral striation.

Distribution: Known only from cave "grotto Bariban", at Alek Mt. Range within the limits of "Large" Sochi.

Ecology: The most part of the type series was collected in barber traps within cave and one more specimen was found on the wall of the same grotto by the second author.

It is a great pleasure for us to dedicate this species to our friend and colleague, Dr A. I. MIROSHNIKOV of Krasnodar who provided us with his willing and priceless help during collecting trips.

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