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Two new species of the genus *Notiophilus* Dumeril, 1806 (Coleoptera: Carabidae) from India and Afghanistan

Arvīds Barševskis

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This article describes two new species of the genus *Notiophilus* Dumeril, 1806 (Coleoptera: Carabidae) from the West Himalayas: *N. dostali sp.n.* has been found in India, Himachal Pradesh, Jalaori pass, and *N. nuristanensis sp.n.* has been collected in Afghanistan, i.e. in the province of Nuristan. The new species are compared with other species of this genus distributed in the West Himalayas and neighbouring territories. The key for determination of West Himalayan species is presented.

Key words: *Notiophilus*, new species, dostali, nuristanensis, Himalayas, India, Afghanistan

Arvīds Barševskis. Institute of Systematic Biology, Daugavpils University, Vienības Str. 13, Daugavpils, LV-5401, Latvia; e-mail: arvids.barsevskis@du.lv

INTRODUCTION

The genus *Notiophilus* Dumeril, 1806 (Coleoptera: Carabidae) in the world fauna is presently represented by 60 species. The fauna of the West Himalayas and adjacent territories has not been thoroughly studied as yet. To date, there are 5 species of the genus *Notiophilus* D. known from this region: *N. orientalis* Chaudoir, 1850, *N. sublaevis* Solsky, 1873, *N. radians* Andrewes, 1929, *N. kirschenhoferi* Dostal, 1981, and *N. heinzi* Dostal, 1986 (Dostal 1981, 1986; Barševskis 2003).

There is much more information on the fauna of the genus *Notiophilus* D. from another part of the Himalayas, i.e. Nepal. J. Schmidt and M. Hartman (2001) carried out the revision of the species of this genus distributed in Nepal, and described three new subspecies of *N. radians* A.: *N. radians bhotyia* Schmidt & Hartman, 2001, *N. radians gerdmuelleri* Schmidt & Hartman, 2001, and *N. radians dhaulagiricus* Schmidt & Hartman, 2001. *N. franzi* Dostal, 1986 has been classified as the sub-species *N. radians franzi* Dostal, 1986, and *N. dargha riensis* Dostal, 1986 is now regarded as a synonym for this subspecies (*N. radians franzi* Dostal, 1986).

The present article describes two new species of the genus *Notiophilus* D. from Jalaori pass, Himachal Pradesh, India, and, respectively, from Waigal valley in the province of Nuristan in Afghanistan. The key for determination of West Himalayan species is now published.

MATERIAL AND METHODS

The specimens of the species described are deposited in the collection of the Institute of Systematic Biology, Daugavpils University, Daugavpils, Latvia (DUBC). The methodology of measurements has been described by J. Schmidt and M. Hartman (2001). Laboratory research and measurements have been done using *Nikon* AZ100 and *Nikon* SMZ745T digital stereomicroscopes, NIS-Elements 6D software, and the photo camera *Canon* 60D.

High-resolution habitus images of both new species are available at http://www.carabidae.pro.

DESCRIPTION OF THE NEW SPECIES

Notiophilus dostali sp.n.

Holotype. Male. India, Himachal Pradesh, Jalaori pass. Env., 06.1976. Deposited with the Institute of Systematic Biology, Daugavpils University, Daugavpils, Latvia (DUBC) (Fig. 1).

The body is elongated, 5.04 mm in length. Surface is monochrome with metallic lustre.

Head. The head is slightly narrower than the pronotum, together with the eyes it is 1.51 mm wide. Its upper side is black with metallic lustre. Eyes are large and hemispherical. Forehead with 8 frontal furrows that are slightly approximated in the basale part. The outer furrows are almost straight. The stria at the base of the eye is deep with two setiferous punctures. Clypeus with elongated, deeply impressed, irregular ridges. Some ridges of the clypeus are doubled in the forward direction. The clypeus has 2 setiferous punctures. Labrum is mat, only in the very front there is a visible rudiment of a median line. There is a convex line of 6 setiferous punctures along its rounded front margin. Antennae are dichromatic: segments 1-4 are russet with the 3rd and the 4th segment being darker at their ends, but other segments are black. The last segment of the maxillary palp is sharp and dark. The end of the last segment of the labial palp is more or less sharp and dark. The basic segments of both palps are lighter, russet. The bottom of the head is rather lustrous, without punctures, with many smoothed but well-visible plications.

Thorax. Pronotum length is 0.98 mm, width 1.54 mm. Pronotum is black, with bronze lustre, lateral sides being slightly concave before the base. Its discal part is lustrous, almost smooth with smoother, slightly uneven vestiges of plications and, in some places along the sides of the disc, a very delicate puncture. Along the sides of the pronotum there are rough dots, which in some places, especially at the base angles, change into plications. The median line of the pronotum is deeply impressed in its discal part, but at the base and the frontal part it is practically unmarked. The hind angles are sharp, slightly forwarded to the sides. Its basal dimples are deeply impressed. The lateral setiferous puncture is located 0.83 mm from the frontal angle. The prothorax is lustrous and dispersedly dotted. The prothorax protuberance has a smooth surface; along its sides there are U-shaped striae. The foreleg coxae are black, their trochanters, femurs, tibiae, and tarsi are russet brown. Tarsomeres are slightly darker. Three tarsomeres of the male's foreleg tarsus are widened with a sole of thick silvery hair. The mesothorax is black, lustrous, roughly dotted. The midlegs are of the same colour as the forelegs. The metathorax is black, lustrous, and heavily dotted. Episterna are dotted, too. The proportion of the length and width of the episterna is 2.4. The coxae of hindlegs are black. Trochanters and femurs are also almost black; tibiae and tarsi are russet brown.

Elytrae. Length is 2.96 mm, width 1.82 mm. Surface is monochrome black with bronze lustre. The sides of elytra are not parallel, but almost evenly elongated and ovally convex. The elytral striae consist of fine dots which are distinct only in the basal and lateral parts but almost disappear in the apical third. The 1st elytral stria merges with the scutellar stria, its rudiment can be seen as some little punctures only at the base. Only the

5th and the 6th elytral stria at the base have a few rough, slightly impressed punctures. The outer elytral striae are practically invisible on the sides of the elytrae. Their rather little punctures mix with the rather rough interval puncture. In the basal part the elytral interval puncture is rougher and thus the rows of punctures in this area are more difficult to notice. In the ends of the elytrae there are 2 apical setiferous punctures. The apex of elytrae has distinct reticulate microsculpture and fine dissipated puncture. The 2nd interval of the elytra is specular, without fine puncture, approximately as wide as the two following taken together. The 2nd elytral interval at the base is noticeably wider than elytral intervals in the middle of the elytra. The dorsal setiferous puncture is situated in the middle of the 4th elytral interval.

Abdomen. Abdominal segments are flat, lustrous, and smooth. The male's anal segment has two setiferous punctures.

Male genitalia. The apical part of the aedeagus lamella is wide, but its sclerotized part is narrow and extended in the end (Fig. 2).

Differential diagnosis. This species is very similar to *N. orientalis* Chaudoir, 1850, and *N. kirschenhoferi* Dostal, 1981, but it differs from all other species distributed in the western part of the Himalayas and its adjacent territories by the fact that the prothorax is roughly dotted, 1st row of dots before the scutellum merges with the scutellar stria, and only at the base a rudiment of some dots is preserved. Elytrae have a different bend of the sides, which are not parallel, with regard to their puncture, microsculpture, proportion between the length and width of the episternum, as well as by a range of other features.

Type locality. West Himalayas, India, Himachal Pradesh, Jalaori pass.

Derivatio nominis. The new species is named in honour of Austrian carabidologist Alexander Dostal (Wien, Austria), researcher of genus *Notiophilus* Dum. in Himalaya.

Notiophilus nuristanensis sp.n.

Holotype. Male. Afghanistan, Nuristan, Waigal valley, 10.07.1992. Deposited with the Institute of Systematic Biology, Daugavpils University, Daugavpils, Latvia (DUBC) (Fig. 3).

The body is elongated, 4.96 mm in length. Surface is monochrome with metallic lustre.

Head. The head is approximately as wide as the pronotum, together with the eyes it is 1.51 mm wide. Its upper side is black and slightly lustrous. Eyes are big and hemispherical. Forehead has 8 frontal furrows, the outer furrows being doubled at the base and, in relation to the middle ones, which are parallel, their outer ridges are symmetrical and slightly C convex. The outer striae, which separate the forehead ridges, form the rest of the forehead and are heavily impressed. The stria at the eye base is deep with a big setiferous puncture in the middle. A ridge-like elevation between the outer forehead stria and the stria at the eye is rather roughly dotted and has rudiments of some short striae. Scutellum has elongated ridges, but at its base there is a transversal stria. Some scutellar ridges are doubled in the forward direction. Scutellum has 2 setiferous punctures. Labrum is mat with a median line, but along its rounded front margin has a convex row of setiferous punctures. Antennae are dichromatic: segments 1-4 are brown, but the rest are black. The last palpomere of the maxillary palp is sharp and dark. The end of the last labial palp segment is not sharp; it has a straight margin and is dark. The basic segments of the probes of the mandibles and the labium are lighter, russet. The lower side of the head is lustrous, without puncture, except for some fine dots at the lower side of the eye.

Thorax. Pronotum length is 0.91 mm, width 1.49 mm. Pronotum is black, lustrous, and slightly heart-shaped. Its discal part is lustrous, almost smooth, with sparse and very fine puncture. Along the sides of the pronotum there is a rather rough puncture. The median line of the pronotum is rather deeply impressed in its discal part, not

so distinct at the base, and at the frontal part not marked at all. The hind angles of the pronotum are curtailed and do not project to the sides. Its base dimples are deeply impressed. Although the pronotum is slightly heart-shaped, the bent of its side margins at the base is rather unmarked and does not form a distinct neck-like narrowing. The prothorax is lustrous with a specular surface and groups of rough dots on its sides. The prothorax protuberance has deep U-shaped striae at its margins. The coxae of the forelegs are black, their trochanters are russet, femurs are dark brown, tibiae are brown, and tarsi are dark brown. In males, 3 tarsal segments of the forelegs are widened and have soles of thick silvery hair. The mesothorax is black and lustrous, too. The midleg coxae are black with russet trochanters, dark brown femurs, brown tibiae, and dark brown tarsus segments. The metathorax is black, lustrous, and slightly punctured on the sides. Episterna are dotted. The proportion of the length and width of the episterna is 2.0. The femurs of the hind legs are black, large, and smooth. Trochanters and femurs are also almost black, tibiae, similarly to the forelegs and midlegs, are brown, and tarsi are dark black.

Elytrae. Length is 2.91 mm, width 1.91 mm. Surface is monochrome black, slightly lustrous. The rows of dots on the elytrae are distinct in their basal, dorsal, and lateral parts, but in the apical part the size of dots is smaller as they gradually disappear while not reaching the top. The elytra ends have 2 apical setiferous punctures, along which there is a distinct reticulate microsculpture and fine dissipated puncture. The spaces between the rows of dots, including the 2nd wide interval, have very fine puncture, which is similar to the puncture of *N. sublaevis* Solsky, 1873. The 2nd elytral interval between the rows of dots is approximately of the same width as the following two taken together, the latter being of the same width. The next two spaces between the rows of dots are also of the same width, but they are narrower than the previous ones. The rows of dots 4-6 are slightly impressed at the base and slightly convex in the direction of the scutellum. The dorsal setiferous puncture is situated in the 4th space between rows, approximating the 3rd row. There is a row of dots at the scutellum.

Abdomen. Every sternite is convex, lustrous, and smooth with an uneven, relief surface. The anal sternite in males has two setiferous punctures, which on the side sport a little plicated area that stands out from the overall smooth background.

Male genitalia. The beetle's genitalia have been dissected and glued to a paper triangle, but during the preservation period the end of the aedeagus has been broken.

Differential diagnosis. The new species bears resemblance to *N. sublaevis* Solsky, 1873, but differs in a range of features. The elytra of the new species has less parallel sides, a wider 2nd interval, which is almost as wide as the following 2 intervals taken together, and, at the base, impressed and distinct rows of dots 4-6 with narrower intervals, whereas in *N. sublaevis* S. the rows 4-6 are not so deeply impressed but straight with wider intervals. These intervals, in the new species, are noticeably narrower than each following 2 intervals taken together. In addition, the forehead ridges have a slightly different form.

This species is also very similar to *N. heinzi* Dostal, 1986, which is known from the Pakistani province of Swat, Jabba surroundings, but differs by a less contracted prothorax sclerite, which does not show protruding, sharp angles, as in *N. heinzi* D., but rather obtuse, curtailed angles and a slightly different puncture. The elytra rows of dots in the new species, unlike in *N. heinzi* D., are smoothed at the top part and do not reach the top. They have a slightly different microsculpture. The proportion between the length and width of the metathorax episterna in *N. heinzi* D. is 1.35 while in the new species it is 2.0.

From *N. radians* Andrewes, 1926, which is distributed in the North Indian Himalayas, this species differs by a much less expressed metallic lustre of the body, different form and puncture of the prothorax sclerite, different microsculpture

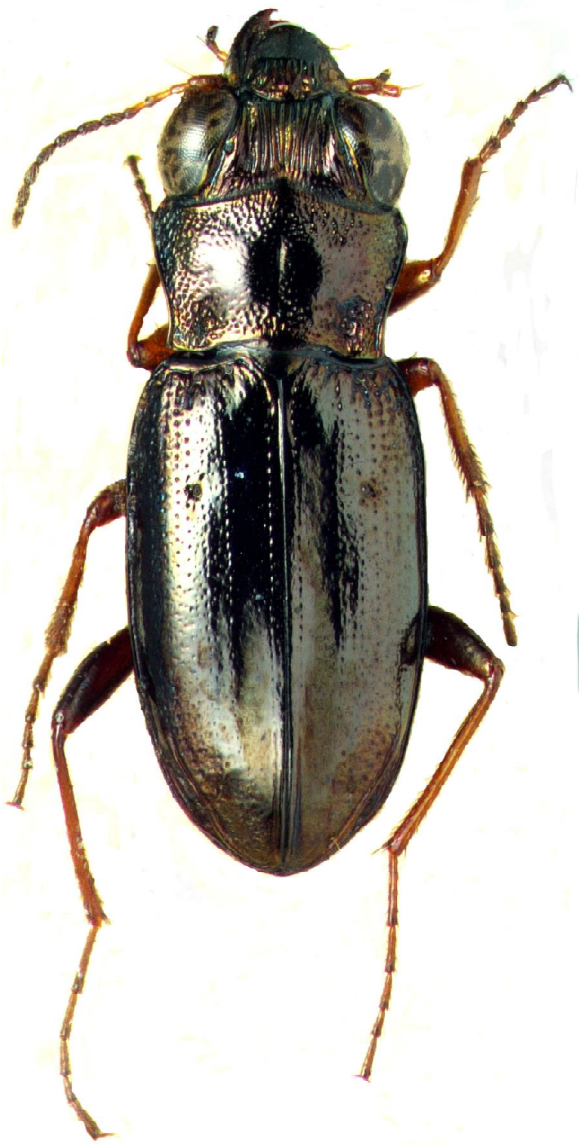

Fig. 1. *Notiophilus dostali* sp.n. habitus

Fig. 2. *Notiophilus dostali* sp.n. aedeagus (lateral view)

Fig. 1. *Notiophilus nuristanensis* sp.n. habitus

of the elytrae, and other features. In the new species the 3rd and 4th intervals of the elytra are of almost equal width, but in *N. radians* A. the 3rd interval is almost one half wider than the 4th. Besides, the latter one is mat and has an isodiametric microsculpture. The metathorax episterna have a different form.

From *N. orientalis* Chaudoir, 1850, which is distributed in the west part of the Himalayas, the new species differs by the body form and colour, surface microsculpture, metathorax episternal form, and a number of other features.

Type locality. Afghanistan, Nuristan, Waigal valley.

Derivatio nominis. The name of the species has been created from the province of Nuristan, Afghanistan, where it has been detected.

Note. Both new species are described only on the basis of their holotype as the totality of their morphological features is sufficient to determine that these specimens belong to new, up to now unknown species. After almost 20 years of research, having processed the materials depos-

ited with more than 60 entomological collections worldwide, no other specimens from Afghanistan, Pakistan, or Northern India have been found that possibly belong to these species. Besides, there is very little material of the genus *Notiophilus* D. from these countries in the collections in general.

THE KEY FOR DETERMINATION OF THE SPECIES TO BE FOUND IN THE WEST HIMALAYAS AND ADJACENT TERRITORIES

1(2) Prothorax is roughly dotted. Sides of elytra from the bases are more or less convex, not parallel. Their first rows of dots merge with scutellar stria near the scutellum; at the base, instead of separate dots, only rudimental dots are visible. The dorsal rows of dots on the elytra's apical part have very fine dots and do not reach the top. India: Jalauri pass .... *N. dostali* sp.n.

2(1) Prothorax is smooth or has fine, scarce puncture. The sides of elytrae are parallel or convex in the middle. Their first row of dots develops from the base and does not merge with the scutellar stria. The dorsal rows of dots on the elytra's apical part are more developed.

3(4) The 3rd interval of the elytra is wider than the 4th one; it is lustrous, but the 4th is mat and has an isodiametric microsculpture. India: Jammu & Kashmir, Almora, Uttar Pradesh .... *N. radians* Andrewes, 1926

4(3) The 3rd and 4th intervals of the elytra are approximately of the same width and equally lustrous.

5(12) The elytra's apical parts are mat, at least around the apical setiferous punctures, and have a distinct isodiametric microsculpture and fine puncture.

6(9) The mat area with reticulate microsculpture in the apical part of the elytra is like a narrow band stretching from the top to a little behind the apical pores; it is small but clearly distinguishable.

7(8) The 2nd interval of the elytra is as wide as the 3rd and 4th intervals taken together. The 5th and 6th rows of dots on the elytra are roughly dotted in the basal quarter; they are annealed, impressed, slightly convex. Afghanistan: Nuristan .....*N. nuristanensis* sp.n.

8(7) The 2nd interval of the elytra is as wide as the 3rd and 4th intervals taken together. The 5th and 6th rows of dots on the elytra have rather small, more or less regular dots; they are not annealed, impressed, or convex at the base. Pakistan: Baluchistan ..... *N. kirschenhoferi* Dostal, 1981

9(6) The mat area with reticulate microsculpture in the apical part of the elytra is a wide marginal band that occupies at least the top quarter of the elytra.

10(11) Episterna are comparatively short, the proportion of their width and length is 1.35. Sides of the elytra are elongated and oval, not parallel; their intervals have finer puncture. The 8th interval of the elytra is as wide as the 2nd interval. Pakistan: Swat .....……..…..... *N. heinzi* Dostal, 1986

11(10) Episterna are comparatively long, the proportion of their width and length is 2.10. Sides of the elytra are parallel; their intervals have rougher puncture, which sometimes changes into plications.

The 8th interval of the elytra is narrower than the 2nd interval. N. India, Pakistan: Swat .... *N. orientalis* Chaudoir, 1850

5(12) The elytrae are evenly lustrous at the apical part, there are no distinct mat areas or bands. Afghanistan, Tajikistan, Uzbekistan, Turkmenistan, Kazakhstan ..... *N. sublaevis* Solsky, 1872

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REFERENCES

Barševskis A. 2003. Materials to knowledge of genus *Notiophilus* Dumeril, 1806 (Coleoptera: Carabidae) of worlds fauna. 1. Rewiew of China's fauna with description of five new species. Baltic J. Coleopterol. 3 (1): 1–13.

Dostal A. 1981. Beschreibung einer neuen *Notiophilus*-Art aus Beluchistan (Carabidae, Col.). Koleopterologische Rundschau 55: 53-55.

Dostal A. 1986. Die *Notiophilus*-Arten Nordindiens, Pakistans und Nepals (Carabidae, Col.). Koleopterologische Rundschau 58: 71-81.

Schmidt J., Hartmann M. 2001. Revision der *Notiophilus* – Arten Nepals (Coleoptera, Carabidae). Veroffentlichungen Naturkundemuseum Erfurt. 20: 165 - 179.

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