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Brachynopterus rufulus Bedel, 1898 rediscovered almost 130 years after its original description and first report for Morocco (Coleoptera, Carabidae, Lebiinae)

Alexander Anichtchenko, Daniele Sechi

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An enigmatic ground-beetle species *Brachynopterus rufulus* Bedel, 1898 were collected in Morocco for the first time. Detailed redescription of the genus and species were made. Its taxonomic position within the subfamily is discussed. Photographs of the habitus and details of the structure are provided.
Key words: ground beetles, redescription, taxonomy, country record.

Alexander Anichtchenko. Institute of Life Sciences and Technologies, Daugavpils University, Vienibas 13, Daugavpils, LV-5401, Latvia; e-mail: alexander.anishchenko@du.lv;
ORCID: https://orcid.org/0000-0001-8512-830X

Daniele Sechi. Via F. Cocco Ortu, 75 – 09128 Cagliari (CA), Italy; e-mail: daniele.sechi1973@tiscali.it;
ORCID: https://orcid.org/0009-0005-6309-5216

INTRODUCTION

During an expedition to Morocco, an interesting beetle was collected. At first glance, it looked like a representative of a recently described genus *Disciferella* Kataev & Muilwijk, 2020. After a more detailed study, it became clear that it belongs to the genus *Brachynopterus* Bedel, 1898, an enigmatic monotypic dromiusine, described from one female specimen collected in Algeria (Mzab: Ghardaïa), and known so far only from the rather brief original and subsequent additional, also very brief, descriptions, probably of the same specimen (Bedel 1905; Jedlička 1941; Basilewsky 1984; Kataev & Muilwijk 2020). Jan Muilwijk kindly provided us with a photograph of the holotype, which dispelled any doubts. This peculiar genus deserves redescription and discussion of its taxonomic position.

MATERIAL AND METHODS

One female specimen of *Brachynopterus rufulus* Bedel, 1898 were collected on 9.V.2024 at UV light by Daniele Sechi in Morocco: Ouarzazate, Zagora, N17 m 720 (30°18'49.0"N 5°50'53.0"W). Zagora, is situated at the edge of the Sahara desert, acting as a gateway to the expansive dunes. The environment is characterized by an arid desert climate with scorching summers and cool, dry winters, and very little precipitation. Zagora lies in the Draa River

valley, where lush date palm groves contrast with the surrounding desert landscape.

All measurements were made using a Nikon SMZ 745T stereomicroscope. Measurements of the total body length were made from the front of the clypeus to the apex of the elytra. The other measurements were taken at their respective maxima, i.e., the greatest width or length of the head, pronotum, elytra, and aedeagus.

Specimen deposited in collection of Daniele Sechi.

Female genitalia were prepared using DMHF (Dimethyl hydantoin formaldehyde resin dissolved in water).

The illustrations were made using either a Canon EOS 6D digital camera with a Canon MP-E 65mm macro lens using a StackShot macro rail system, or a Nikon D5600 digital camera with a Nikon 18-105 mm lens on reversing ring, and Helicon Focus software. Obtained images were subsequently edited in Photoshop CC 2019. High-resolution images of holotype and additional material are available at the "Carabidae of the World" web project (https://carabidae.org/taxa/lebiini-bonelli).

REDESCRIPTION

Brachynopterus Bedel, 1898

Type species *Brachynopterus rufulus* Bedel, 1898 by monotypy.

Habitus as in Figs 1. Body length 4.6 mm, width 2.4 mm. Uniformly brownish yellow, mat; fronto-clypeal suture, borders of eyes and inner margin of mandibles blackish brown; fine setation of body yellow.

Head (Fig. 3) medium-sized, with moderately deep neck constriction, narrower than pronotum. Eyes large, convex. Tempora long and slightly convex, 2/3 as long as eye. Labrum with almost isodiametrical reticulation; with three pairs of setigerous pores; flat, transverse; its anterior margin with shallow incision at middle. Clypeus flat, transverse, anterior margin with wide shallow incision and stright posterior margin, with one setigerous pore at each apical angle and minutely setose throughout. Fronto-clypeal suture distinct. Frons with elongate wrinkles along inner margins of eyes. Frontal foveae, frontal and supraorbital furrows moderately deep. Two supraorbital setigerous pores, anterior pore situated at the anterior third of margin of eye, and posterior one located behind eye, opposite the middle of temple. Mandibles evenly and strongly rounded in apical third, widened at base and with distinct basal scrobe; rugate along exterior margin. Maxillae with ultimate palpomere longer than penultimate one, fusiform. Lacinia moderately wide, with dense row of long, straight setae; tooth acute, long. Mentum with acute apical angles and long, acute median tooth; completely fused with submentum; with two long paramedial mental seta and with two primary submental seta. Ligula with almost right latero-apical angles, medially prominent; with four apical setae. Paraglossae longer than ligula, setose apically, widely rounded at apex. Labial penultimate palpomere slightly widened anteriorly, with 7-8 setae at anterior margin; ultimate palpomere approximately as long as penultimate one, fusiform, narrowed to apex. Dorsal microsculpture strong and irregular, granulate. Setigerous punctures large, present both dorsally and ventrally; setae relatively thick. Antennae moderately long, surpassing elytral base approximately by two apical antennomeres; densely pubescent from antennomere 4; antennomere 3 covered throughour with twice sparser setae, antennomeres 1–2 with a few scattered short setae; antennomere 1 short, slightly longer than antennomere 2, with one longer dorsoapical seta.

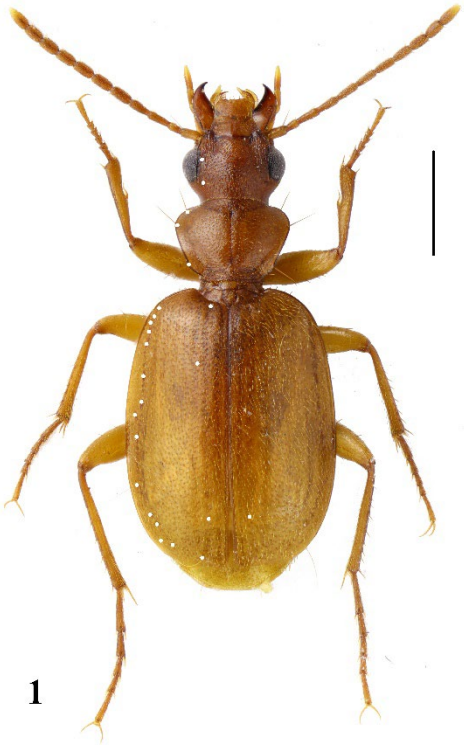

Figure 1. Habitus of *Brachynopterus rufulus* Bedel, 1898 in dorsal view. Scale bar 1 mm.

Pronotum relatively small, slightly transverse, widest at anterior fifth near long and strong lateral seta; strongly narrowed posteriorly. Sides rounded from lateral seta to completely rounded anterior angle, bearing long seta; almost straight from lateral seta towards obtuse hind angle; the latter removed ahead from basal margin and bearing a strong and long seta. Apical margin slightly convex, gently bordered in the middle. Basal margin gently bordered. Disc evenly punctate, punctures relatively large and bearing hairs; strongly and irregularly microrreticulated. Anterior transverse depression shallow; basal transverse depression deep. Basal groowes and median line deep.

Elytra ellyptic, widest at middle and obliquely truncate at apex. Humeri widely rounded. Basal border short. Disc moderately convex, evenly covered by large setigerous micropunctures, heir relatively long setae inclined posteriorly. Striae absent, except barely marked eigth stria. Parascutellar setigerous pores large. Each elytron in position of interval 3 with one very small discal setigerous pore located in basal quarter and with one larger, setiferous preapical pore. Marginal umbilicate series consisting of 14 large setigerous pores. Microsculpture visible throughout, somewhat similar to that on pronotum, consisting of very distinct isodiametric meshes. Epipleura markedly widened in basal third.

Figure 2. Ventral view of *Brachynopterus rufulus* Bedel, 1898.

Wings fully developed.

Ventral surface of thorax and abdomen (Fig 2) evenly covered with fine background setae throughout. Proepisterna gently and

sparsely punctate in anterior part only, punctures bearing short setae. Prosternum throughout evenly punctate and setose; prosternal process truncated, not bordered and without long setae at apex. Metepisternum elongate, about 1.5 times as long as wide, narrowed posteriorly, gently and sparsely punctate. Three basal abdominal sternites fused, fisure indistinct; four penultimate ones each with a pair of long setae at posterior margin. Apex of last visible abdominal sternite in female subtruncate.

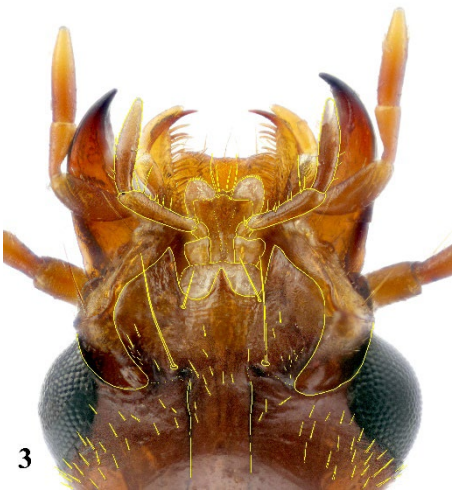

Figure 3. Head of *Brachynopterus rufulus* Bedel, 1898 in ventral view.

Figures 4-6. 4, metatibia; 5, gonocoxites of *Brachynopterus rufulus* Bedel, 1898; 6, gonocoxites of *Disciferella psammophila* Kataev & Muilwijk, 2020 (gscx – gonosubcoxite, gcx – gonocoxite; image 6 from Kataev & Muilwijk, 2020).

Legs (Fig. 4) slender, relatively long. Protibia with two slender apical spurs; inner spur as long as second protarsomere. Metatibia with row of relatively strong and long spines along outher margin. Inner apical spur of metatibia relatively long, 0.6 times as long as first metatarsomere; minutely serrate. Meso- and metafemur with two setae, one at middle and second in apical third of anterior margin. Tarsomeres slender, parallel-sided, finely and densely setose; tarsomere 4 truncate at apex; tarsal claws elongate, smooth.

Female genitalia (Fig. 5) gonosubcoxite very wide, without setae and spines; gonocoxite elongate, curved and narrowed to the apex, without setae and spines.

Male genitalia unknown.

Distribution. This species is known from Algeria and Morocco (country record).

Bionomics. Judging by the body shape and locality where specimen was collected (Fig. 7), the species seems to be a psammophile. Unfortunately, beyond the fact that it appears to be nocturnal, we can't say more about its behavior. It likely burrows into the sand during the day, like most desert species. Given one of the authors' extensive research in the desert areas of Morocco over the past 25 years, it's safe to say that this is a rather sporadic species.

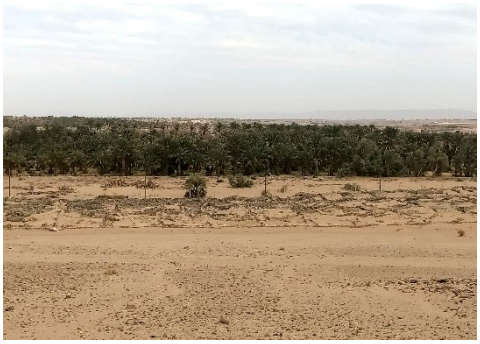

Figure 7. Biotope of *Brachynopterus* Bedel, 1898.

DISCUSSION

The classification of lebiine subtribes always has been unstable (Anichtchenko 2025; Ball 1975; Ball & Hilchie 1983; Ball & Shpeley 1983; Ball et al. 1995; Casale 1998; Habu 1967, 1983; Jeannel 1949; Kabak 2017; Lorenz 2005; Ober & Maddison 2008; Shpeley 1986), and subtribal boundaries and composition are difficult to determine. Recent research of philogenetic relationship within Harpalinae (Ober & Maddison 2008) has shown that Lebiine clades do not correspond to subtribes, and there is no clear correspondence with these previous hypotheses. At present, lebiine phylogenetic relationships remain unresolved and problematic. Although *Brachynopterus* is treated by all authors as a member of Dromiusina, its systematic position within Lebiinae is obscure. Until now nothing was known about the characters visible from ventral side, i.e. structure of the labium, presence or absence of the suborbital setae, abdominal sternites, etc. (Kataev & Muilwijk 2020). Back in 1984, Basilewsky noticed that its smooth claws and elongate gonocoxite distinguished it from other Dromiusina. In overall appearance *Brachynopterus* is very similar with the recently described genus *Disciferella*, sharing same size and color; flattened body evenly covered with hairs; long seta in apical pronotal angle; smooth claws and not striate elytra, but it is distinctly differing in having sternites 1-3 fused (Fig. 2) and gonocoxite elongate and narrowed apically (Fig. 5). In having pubescent elytra without striae, not bilobe fourth tarsomere and the shape of gonocoxite the genus is also resembling some representatives of the tribe Cyclosomini Laporte, 1834. Problems with delineation of the lebiomorph assemblages with "cyclosomine" morphological characters were discussed by Ober & Maddison (2008) and Assmann et al. (2015). Similarities and differences of *Brachynopterus* with related genera and subtribes are summarized in the table (Tab. 1).

Tab. 1. Similarities and differences of *Brachynopterus* with related genera and subtribes

	Tribe Cyclosomini Subtr. Masoreina	**Tribe Lebiini Subtr. Dromiusina**	***Disciferella***	***Brachynopterus***
Sternites I-III	fused	fused	not fused	fused
Mentum and submentum	separated	fused	fused	fused
Suborbital setae	without	without	without	without
Tarsomere IV	not bilobe (except *Sarathrocrepis*)	not bilobe	not bilobe	not bilobe
Claws	smooth or pectinate	pectinate	smooth	smooth
Antennae pubescence	from first three smooth, to all pubescent in genus *Mnuphorus*	first three smooths	third moderately pubescent	third moderately pubescent
Penultimate segment of labial palpi	bisetose	vary	1 seta	7-8 setae
Gonocoxites	slender, cylindric or triangular with one preapical hair	not slender	short	slender, without setae or hairs
Tibiae with spines	strong or moderate	without	moderate	moderate
Metatibial spur	long or median	short	median	median
Elytra	with or without striae	striate	without striae	without striae

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