



Note on the identity and distribution of *Mesostena puncticollis* Solier, 1835 (Coleoptera, Tenebrionidae) in Central Asia

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ABSTRACT. The darkling beetle *Mesostena puncticollis* Solier, 1835 is recorded for Uzbekistan for the first time. Beetles were collected in the Sundukli desert and the foothills of the Nurota Mountains. The species is widely distributed from the Northern Afrotropics to Central Asia, but our records significantly expand the range of the species to the northeast. Male genitalia are imaged and compared with other Tentyriini genera for the first time. Bionomics and distribution of *M. puncticollis* in Central Asia are analysed.

Keywords: Tentyriini, Karakum, Sundukli, Nurota, male genitalia.

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INTRODUCTION

The tenebrionid beetle *Mesostena puncticollis* Solier, 1835 is one of the most widespread species of the genus *Mesostena* Eschscholtz, 1831. It is widely distributed from the Afrotropic to the South Palaearctic regions. In Central Asia, this species was known only from Southern Turkmenistan and the Caspian Sea to the Eastern Karakum desert (Nepesova, 1980; Medvedev & Nepesova, 1985, 1989), in the desert foothills of Kopetdag and Nebitdag (Medvedev & Nepesova, 1990).

Despite the increasing knowledge of the darkling beetle fauna of Uzbekistan in recent years, the species *Mesostena puncticollis* is not listed in faunistic works (Egorov & Rakhimov, 2015; Bekchanov et al., 2023a; Nabozhenko et al., 2024). The authors collected this species firstly in Uzbekistan in the western Sundukli desert and western spurs of the Hissar-Alay mountain system, which significantly expands the range of the species to the north and east.

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MATERIAL AND METHODS

Beetles were collected in southern and central Uzbekistan during expeditions in 2024. Material is deposited in the following museums and collections:

ZIN – Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia;

MNHN – Muséum national d'Histoire naturelle (Paris, France);

PCMN – private collection of Maxim Nabozhenko (Rostov-on-Don, Russia);

PCNB – private collection of Norbek Bekchanov (Xonqa, Khorezm Region, Uzbekistan);

PCMK – private collection of Mahliyo Kamolova (Navoiy Region, Uzbekistan).

Specimens were studied using binocular microscopes, Micromed® MC-4 Zoom LED and Micromed MC-5 Zoom LED. Beetle images were taken with a Canon® EOS 5D Mark IV Body, Canon® MP-E65MM F2.8 Macro lens and Canon Macro Twin Lite MT-26X-RT flash bulb, and stacking was done using Stack-shot 3X with enlarged macro rails s/n 3734; the photosystem is installed on a Kaiser® Copy Stand RS 1 reproduction machine. Images were stacked in Helicon Focus® 7.7.4 Pro. Since the aedeagus in living beetles of *Mesostena* spp. is inverted (the ventral side of the tegmen is located dorsally, and the medial lobe is ventral), we use the sides of the tegmen in the unfolded state (tegmen ventrally).

RESULTS

Taxonomic hierarchy

Class Insecta Linnaeus, 1785

Order Coleoptera Linnaeus, 1785

Family Tenebrionidae Latreille, 1802

Subfamily Pimeliinae Latreille, 1802

Tribe Tentyriini Eschscholtz, 1831

Genus *Mesostena* Eschscholtz, 1831

Type species. *Mesostena punctata* Eschscholtz, 1831 (= *Pimelia angustata* Fabricius, 1775), by monotypy.

Mesostena puncticollis Solier, 1835 (Fig. 1)

Mesostena puncticollis Solier, 1835:405. Type locality: "Egypte".

Material. 6 ♂♂ (PCNB), 9 ♂♂ (ZIN, PCMN): Uzbekistan, Bukhara Region, SW coast of Dengizkul Lake, 39°10'16"N, 64°01'46"E, 180 m a.s.l., 11–12.iv.2024 (M.V. and S.V. Nabozhenko, N.Kh. and Kh.U. Bekchanov, D.A. Yavkachev); 4 ♂♂, 1♀ (ZIN, PCMK): Uzbekistan, Navoiy Region, foothills of Nurota mountains, S of Sarmyshsoy Gorge, 40°16'53.1"N, 65°32'47.1"E, 4.iv.2024 (M. Kamolova).

External diagnostic characters of this species were described in many works since the original description (Solier, 1835) to further revisions and keys (Reitter, 1900; Koch, 1940; Medvedev & Nepesova, 1985; Lillig & Pavlíček, 2022). We didn't find images and comparative analysis of the male genitalia, so we characterised them below.

Male genitalia (Fig. 1D–H). Apical piece of the aedeagus almost straight in dorso-ventral view, converging from base (widest portion) to apex, where parameres bifurcated; lateral margins straight; apical tip of parameres narrowly rounded; basal piece 1.13 times as long and 1.5 times as wide as apical piece, widest at basal third (Fig. 1D, E). Aedeagus (median lobe) slightly curved, almost straight in lateral view, with the same length as tegmen (Fig. 1F). Spiculum gastrale with slightly curved rods and subtriangle blades; apical margin of blades emarginated, with several longer setae and row of shorter setae apically (Fig. 1G). Inner sternite VIII with curved apical angulations, narrowly rounded at tip, densely covered with long setae (Fig. 1H).

Variability. In our series, males are presented by narrower (Fig. 1A) and wider specimens (Fig. 1B).

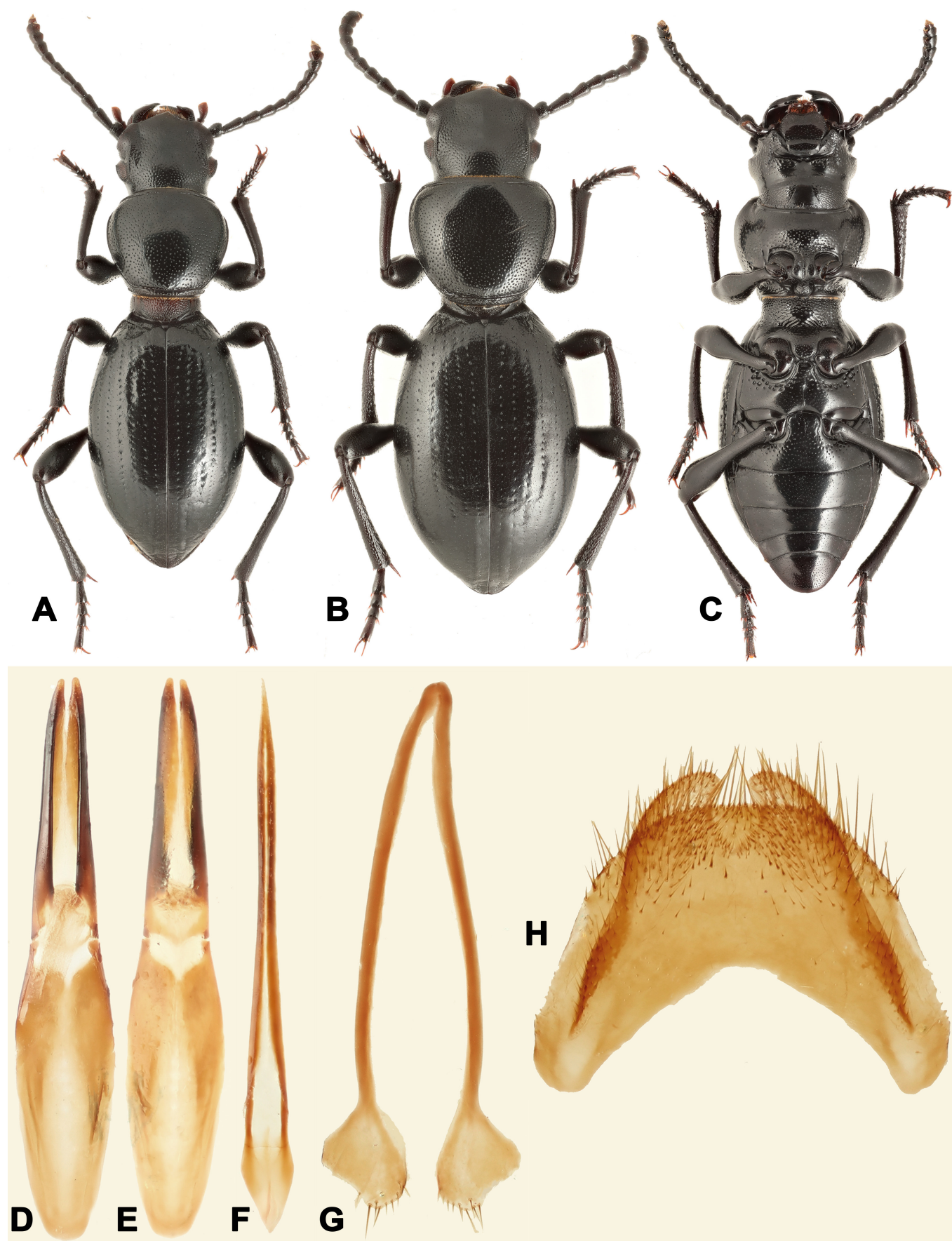


Figure 1. *Mesostena puncticollis* Solier, 1835, males from Dengizkul, Uzbekistan, habitus, genitalia. **A.** Narrow specimen, dorsal view; **B.** Wide specimen, dorsal view; **C.** Habitus, ventral view; **D.** Tegmen, ventral view; **E.** Tegmen, dorsal view; **F.** Aedeagus (median lobe); **G.** Spiculum gastrale; **H.** Inner sternite and ventrite VIII.

Bionomics. Specimens were collected on the gravel dumps of the asphalt road, under the stones and at night between stones (Fig. 2A). In Sarmishsoy gorge (Navoiy Region, western Nurota Mts.), beetles occur in a clayey habitat characterized by small stones and gravel (Fig. 2B). Little information is available regarding the seasonal and daily activity patterns of this species. Aldryhim et al. (1992) wrote that peak month activity for *M. puncticollis* is June, and they occur everywhere of research sites in the Central Region of Saudi Arabia, especially in uncultivated areas. In our case, beetles were collected in April, with crepuscular and nocturnal activity.

General distribution. Azerbaijan (Abdurakhmanov & Nabozhenko, 2011), Uzbekistan (new record), Türkiye (Keskin, 2005), Egypt (at least Sinai), Turkmenistan, Iran, Iraq, Syria, Jordan, Israel, Arabian Peninsula, Somalia and Djibouti (Lillig & Pavlíček, 2022), Sudan (Girard & Pierre, 1965).

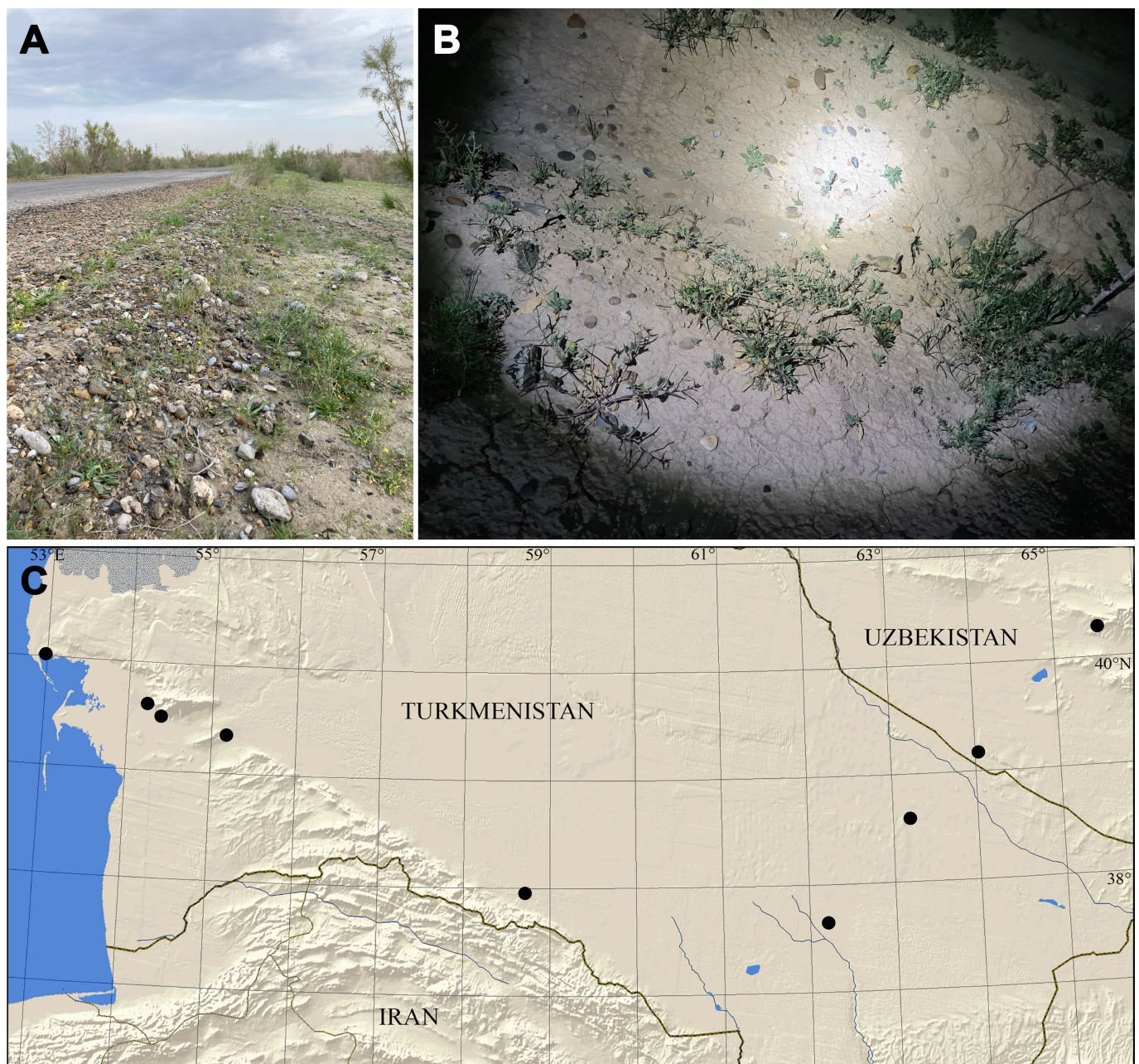


Figure 2. Habitats and distribution of *Mesostena puncticollis* Solier, 1835. **A.** gravel dumps of the asphalt road (Sundukli desert, Dengizkul Lake, Uzbekistan); **B.** clayey semi-desert with gravel and crushed rock (S of Sarmysh, foothills of Nurota Mts., Uzbekistan). **C.** Distribution of the species in Central Asia.

Distribution in Central Asia (Fig. 2C). Turkmenistan: Türkmenbaşy (= Krasnovodsk: 40°01'00.0"N, 52°58'00.0"E), Jebel (39°37'51.0"N, 54°14'14.0"E), Balkanabat (= Nebit-Dag: 39°31'00.0"N, 54°22'00.0"E), Akcha-Kuyma (39°21'00.5"N, 55°10'03.7"E), Gyaurs (37°47'38"N, 58°43'46"E), Baýramaly (= Bayram-Ali: 37°37'00.1"N, 62°09'00.0"E), Repetek (38°33'45"N, 63°10'38"E) (Medvedev & Nepesova, 1989); Uzbekistan (see material).

DISCUSSION

According to Iwan et al. (2020) the genus *Mesostena* Eschscholtz, 1831 comprises 38 species and subspecies distributed in Sahel and North Africa, Middle East countries (including Afrotropic part of Arabian Peninsula) and Central Asia. *Mesostena puncticollis* is the only representative of the genus that occurs in Central Asia (Turkmenistan and Uzbekistan). The structure of the male genitalia is very important for the separation of taxa in the tribe Tentyriini. The aedeagus of *Mesostena puncticollis* demonstrates the most archaic structure among other at least flightless Tentyriini, having distinctly bifurcate parameres and almost straight aedeagus laterally, with a slightly curved (laterally) aedeagus. Other genera of Tentyriini, at least with known qualitative published photo images of the aedeagus, such as *Calypsoptis* Solier, 1835 (Eshraghi Mofrad & Nabozhenko, 2025), *Capnisiceps* Chatanay, 1914 (Wagner, 2007) *Colposcelis* Dejean, 1834 (Bekchanov et al., 2023b), *Hegeter* Latreille, 1802 (Grimm & Lillig, 2022), *Microdera* Eschscholtz, 1831 (Bekchanov et al., 2025), *Psammocryptus* Kraatz, 1865 (Nabozhenko et al., 2022), *Tentyria* Latreille, 1802 (Bujalance et al., 2023, Nabozhenko et al., 2024), *Thraustocolus* Kraatz, 1865 (Grimm & Merkl, 2018; Wagner, 2023), have the aedeagus with entirely merged parameres, without any trace of suture between them.

AUTHOR'S CONTRIBUTION

The authors confirm their contribution to the paper as follows: N.K. Bekchanov: fieldwork, collecting and preparation of the specimens, writing the manuscript, and illustrations, and conducting observations on bionomics; M.V. Nabozhenko: preparation and identification of specimens, writing the manuscript, and preparing the illustrations on morphology; K. Bekchanov, M. Bekchanov & B. Kholmatov: reviewing of the manuscript; M. Kamolova: preparation of specimens, landscape photography, contribution on bionomic surveys. All authors approved the final version of the manuscript. The authors read and approved the final version of the manuscript.

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AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia, and are available from the curator, upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study only included arthropod material, and all required ethical guidelines for the treatment and use of animals were strictly adhered to in accordance with international, national, and institutional regulations. No human participants were involved in any studies conducted by the authors for this article.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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یادداشتی بر شناسایی و انتشار *Mesostena puncticollis* Solier, 1835 (Tenebrionidae, Coleoptera) در آسیای مرکزی

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چکیده: حضور سوسک تاریک‌زی *Mesostena puncticollis* Solier, 1835 برای اولین بار در ازبکستان ثبت شد. این گونه سخت‌بالپوش در بیابان سوندوکی و دامنه‌های کوه‌های نوروتا جمع‌آوری شدند. این گونه به‌طور گسترده‌ای از آفروتروپیک‌های شمالی تا آسیای مرکزی انتشار دارد، اما بر اساس یافته‌های جدید ما، دامنه انتشار این گونه به‌طور قابل توجهی به سمت شمال شرق گسترش می‌یابد. اندام تناسلی نر برای اولین بار تصویربرداری و با سایر جنس‌های Tentyriini مقایسه شد. تعاملات زیستی و انتشار *M. puncticollis* در آسیای مرکزی مورد تجزیه و تحلیل قرار گرفت.

واژگان کلیدی: Tentyriini، کاراکوم، سوندوکی، نوروتا، اندام تناسلی نر