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A new ant-mimicking and flightless species of *Troglops* Erichson, 1840 (Coleoptera: Melyridae) from Oman

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Abstract

The genus *Troglops* Erichson, 1840 (Melyridae: Malachiinae: Malachiini: Troglopina) is reported from Oman for the first time. One new species, viz. *T. succinipennis* sp.n. from Dhofar, is described and illustrated. The new species differs from all congeners occurring in Arabia in colouration and morphology. The collectors of *T. succinipennis* sp.n. report that the specimens move like ants. At one collecting site, they were observed in numbers at the sides of an ant trail consisting of *Crematogaster delagoensis* Forel, 1894. The exact nature of this ant-beetle association is currently unknown.

Keywords. Malachiinae, taxonomy, mimickry, South Arabian fog oasis.

Introduction

The region of the Dhofar mountains is a local centre of endemism (Miller & Nyberg 1991, Ghazanfar 1992, 1999, Patzelt 2015) characterized by the interplay of topography, monsoon fog interception and vegetation (Ball & Tzanopoulos 2020), which creates the ecosystem of a fog oasis (Hildebrandt & Eltahir 2006, Patzelt 2022).

Aim of the present study is to describe another endemic soft-winged flower beetle discovered recently in the aforementioned region. For the last contribution to the knowledge of Omani Malachiinae including considerations about climate, weather and phenology, see Plonski et al. (2021).

Material and methods

Ninety-six beetle voucher specimens were available for the present study; they are dry preserved and housed in the following collections:

CAA Coll. Ali Al-Jahdhami, Al Khoudh, Oman.

CIP Coll. Isidor Plonski, Vienna, Austria.

CJP Coll. Jan Pelikán, Hradec Králové, Czechia.

CJV Coll. Jaroslav Větrovec, Hradec Králové, Czechia.

CKO Coll. Kamil Orszulik, Frýdek-Mistek, Czechia.

CTK Coll. Tomáš Kopecký, Hradec Králové, Czechia.

NHMW Natural History Museum Vienna, Austria.

ONHM Natural History Museum Masqat, Oman.

Label data are cited verbatim, a backslash (\) separates lines on a label, a double backslash (\\) separates different labels, and square brackets ([…]) contain additional information or explanation. The cited locality-collector labels are always made out of white paper, and have the information printed on them. The types have been provided with one red printed label each: "HOLOTYPUS [or PARATYPUS, respectively] \ Troglops \ succinipennis \ spec.nov. \ des. I. Plonski 2023".

The holotype was stored in alcohol (70%) and is now dry preserved. The equipment for dissection and preservation of its terminalia is the same as described in Plonski (2014).

The following optical instruments were used during the description process: an Olympus SMZ 10 stereo-microscope was used for observation and dissection; a Nikon SMZ 1500 stereo-microscope equipped with an ocular micrometre was used to take measurements of body parts at 80× magnification; an Olympus BX 40 microscope equipped with a camera lucida was used to make hand drawn sketches of the male terminalia (iconotype = holotype).

The digital habitus photographs were taken by Harald Schillhammer, and edited with the same equipment and software as detailed in Schillhammer (2023: 54).

The following abbreviations are used for beetle morphometry:

AL antennal length

EL elytral length

EW elytral width

HL head capsule length

HW head capsule width

IOW inter-ocular width

PL pronotal length

PW pronotal width

SW shoulder width

Results

Troglops succinipennis sp.n. (Figs 1–9)

Type locality. Summit plateau of Jabal Samhan at 17°06′37.80″ N, 54°42′31.32″ E (ca. 1260 m a.s.l.); Salalah district, Dhofar governorate, Oman.

Type material. Holotype (♂, in NHMW) labelled with "Oman, Dhofar, \ Samhan mountain, \ 17.1105N, 54.7087E, \ 29.08.2021 \ leg. Ali Al-Jahdhami". – Paratypes (19 ♂♂, 76 ♀♀): 2 ♀♀ (1 ♀ in ONHM; 1 ♀ in CAA), with identical locality-collector labels as holotype, but respective type labels. 1 ♀ (in CKO) labelled with "OMAN 5.9.2017 \ [5.5 km NNW of] Dhalaut [sic!, = Dhalqut]. Wadi Sava [sic!, = Wadi Sayq: Ayn al Mughsayl] \ 16[°]44′55″[N], 53[°]13′27″[E] \ lgt. Orszulik". — 5 ♂♂, 27 ♀♀ (4 ♂♂, 23 ♀♀ in CTK; 1 ♂, 4 ♀♀ in CIP) labelled with "Oman, 21.9.2022, Dhofar \ Govern., E of Aytin, Wadi \ Hinnah, wadi – Baobab Forest \ 17.0536011[°]N, 54.6089286[°]E, \ Lgt. T. Kopecký, 300 m". — 2 ♂♂, 6 ♀♀ (in CJP) ibidem, but labelled "S Oman, Dhofar Gov. \ E of Aytin, Wadi \ Hinnah, 21.9.2022 \ lgt. Jan Pelikán \\ Baobab forest, stream \ 17°3′12.964″N 300 m \ 54°36′32.143″E \ individual collection". — 12 ♂♂, 40 ♀♀ (9 ♂♂, 30 ♀♀ in CJV; 3 ♂♂, 10 ♀♀ in CIP) ibidem, but labelled "OMAN - DHOFAR PR. \ E of Aytin Wadi \ Hinnah, wadi – Baobab Forest, 300 m \ 17°3′12.964″N, 54°36′32.143″E \ Vétrovec J. leg. 21.9.2022".

Figs 1–2. Habitus, dorsal, of *Troglops succinipennis* sp.n., (1) male; (2) female.

Description of male. Habitus as in Figure 1. Measurements (n = 14): TL: 2.36 (2.19–2.59) mm. AL: 1.76 (1.57–1.98) mm; HL: 0.59 (0.54–0.67) mm; HW: 0.83 (0.78–0.85) mm; IOW: 0.51 (0.48–0.54) mm; PL: 0.56 (0.54–0.63) mm; PW: 0.62 (0.59–0.67) mm; SW: 0.54 (0.50–0.61) mm; EL: 1.40 (1.26–1.46) mm; EW: 0.72 (0.63–0.83) mm.

Indices (n = 14). HW/HL: 1.40 (1.23–1.56); HW/PW: 1.34 (1.29–1.41); PW/PL: 1.08 (1.03–1.12); EL/PL: 2.44 (2.24–2.60); EL/EW: 1.95 (1.67–2.13).

Colouration. Head and thorax black with a blue (azure to cerulean) hue and abdomen and extremities just black, with exception of underside of first three antennomeres and ante-clypeus pale lemon yellow, and antennal sockets, adjoining parts of epistomal plate, median tongue, inner margin and bottom of cranial excavation, and parts between margins of cranial excavation and eyes saffron yellow (Fig. 3); scutellum dark brown with lighter parts; elytra saffron yellow to orange (in alcohol material just yellow).

Pubescence composed of short white reclinate setae.

Structures. Antennae long (75% of body length), filiform; antennomeres elongate; scape subclavate; pedicel with a small tuft of hairs; antennomeres III–V each a bit longer than preceding segment, broadest from middle to apex; antennomeres VI–X of comparable

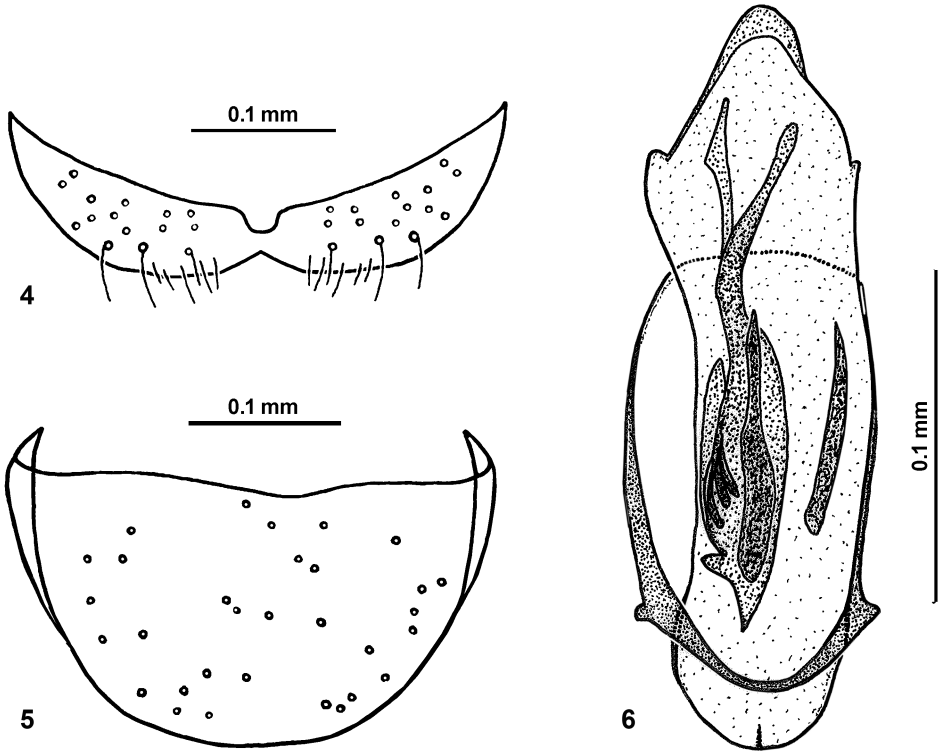
Fig. 3. *Troglops succinipennis* sp.n., head capsule and pronotum of male, dorsal.

size, first two each a bit protruding on inner side, all broadest before the apex; antennomere XI broadest in the middle.

Head capsule (Fig. 3) broader than long; frons deeply excavated between the eyes; side margin of excavation beset with hairs; median tongue with a basal and a subapical crest of hairs; epistomal plate with a median sulcus and raised next to the antennal sockets; surface sculpture coriaceous and with fine punctures, whose interspaces are about as wide as a seta is long.

Pronotum (Fig. 3) broader than long, more slender than head capsule (incl. compound eyes); apex strongly arcuate, sides sub-sinuous, base subarcuate; pronotal disc convex and with coriaceous surface sculpture; pronotal base more slender than apex and flattened, with a notch on each side close to posterior corners; pubescence and puncturation as on vertex. – Scutellum semi-circular, with strigose surface structure.

Elytra without pronounced humeri; with a sub-humeral impression on disc; broader than pronotum in apical half; sides subparallel; suture margined; apical tips not conjointly rounded; punctate with hairs throughout, punctures rather large, interstices with almost



Figs 4–6. Terminalia of *Troglops succinipennis* sp.n., male: (4) sternite VIII, ventral; (5) tergite VIII (pygidium), dorsal; (6) aedeagus, ventral.

smooth surface sculpture. – Hind wings absent. – Legs long and slender, front-tarsi tetramerous; claws with a small, ungual apodeme.

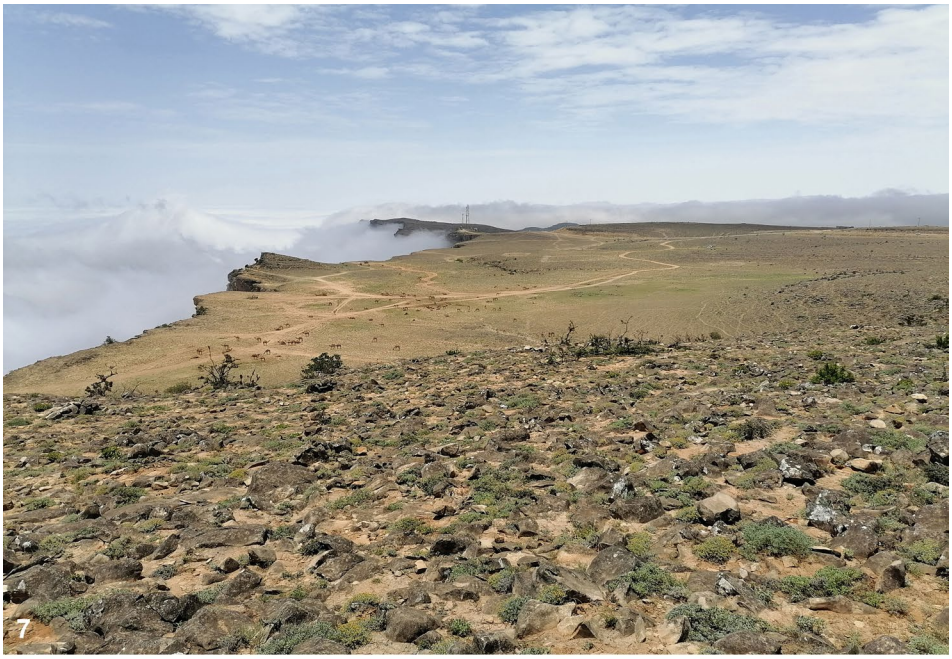
Abdomen with five visible segments. Terminalia: sternite VII normal; sternite VIII (Fig. 4) partially divided, without median strut; tergite VIII (Fig. 5) semi-circular; aedeagus (Fig. 6) consisting of a malachiine type tegmen, with distinct basal ring, and an elongated, subsymmetrical median lobe, with mostly asymmetric endophallites.

Description of female. Habitus as in Figure 2. Measurements (n = 14): TL: 2.27 (2.25–2.66) mm; AL: 1.42 (1.28–1.34) mm; HL: 0.60 (0.54–0.63) mm; HW: 0.73 (0.65–0.78) mm; IOW: 0.47 (0.44–0.52) mm; PL: 0.60 (0.52–0.65) mm; PW: 0.64 (0.59–0.67) mm; SW: 0.58 (0.50–0.65) mm; EL: 1.49 (1.30–1.57) mm; EW: 0.87 (0.78–0.91) mm.

Indices (n = 14): HW/HL: 1.24 (1.14–1.35); HW/PW: 1.13 (1.10–1.17); PW/PL: 1.08 (1.03–1.13); EL/PL: 2.48 (2.33–2.67); EL/EW: 1.71 (1.61–1.80).

Colouration and pubescence as in male, but head unicolorous dark. In some females, the apices of front- and mid-tibiae plus tarsi are brownish.

Structures. Antennae shorter than in male (around 63 % of body length). Head capsule normal, without cranial excavation (excitator).



Figs 7–8. Habitats of *Troglops succinipennis* sp.n.: (7) Jabal Samhan, type locality (photo: A. Al-Jahdhami, 24.08.2021); (9) Wadi Hinna–Baobab Forest (photo: J. Větrovec, 21.09.2022).

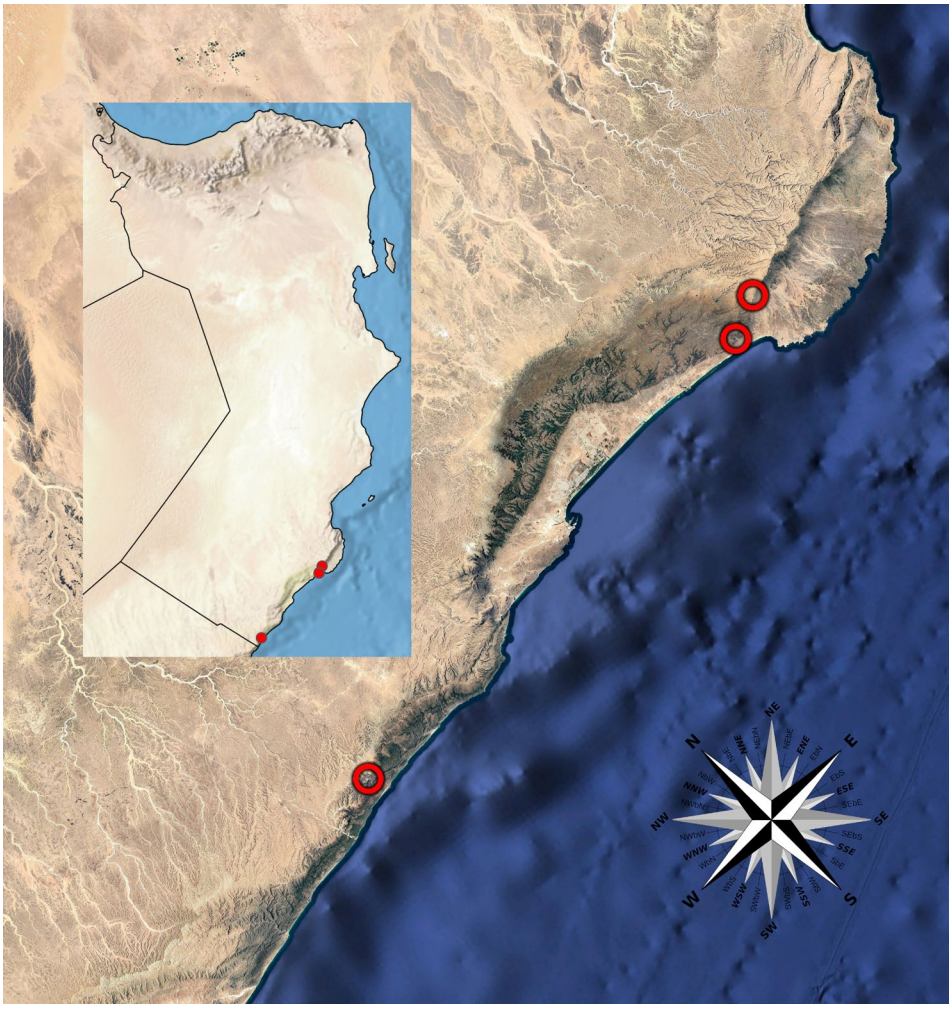


Fig. 9. Collection sites (red circles) of *Troglops succinipennis* sp.n. in Oman in relation to the extent of the Dhofar Fog Oasis (dark green terrain). Source: Google Earth (Imagery © Landsat / Copernicus; Data © SIO, NOAA, U.S. Navy, NGA, GEBCO). Insert: Overview of the eastern Arab Peninsula. Source: SimpleMappr (Shorthouse 2010). Digitally edited by the first author.

Pronotum, scutellum, and elytra as in male. Legs as in male, except front-tarsi pentamerous.

Abdomen as in male. Terminalia not examined.

D i a g n o s i s . The new species is tentatively placed into the genus *Troglops* Erichson, 1840, because of the tetramerous front-tarsi of males. However, it differs from the Arabian species of *Troglops* known so far (viz. *T. maculatus* Wittmer, 1954, *T. buettikeri* Wittmer, 1979, *T. arabicus* Wittmer, 1979, *T. sonyae* Wittmer, 1982, *T. muehlei* Wittmer, 1988, and *T. nasutus* Wittmer, 1988), which are all fully winged and differently coloured, in possessing a notch on each side of the pronotal base, and a terricolous ant-mimicking life style.

Troglops succinipennis sp.n. should be compared to the flightless *T. apterus* Wittmer, 1935, which is distributed in Egypt and differs in possessing a black body except clypeus and basal antennomeres, which are light coloured.

Collecting circumstances and behaviour. All questioned collectors unanimously reported that the specimens exhibit a fast and "erratic" running behaviour matching that of foraging ants. At the type locality, the collected specimens were observed running between and easily hiding under stones (A. Al-Jahdhami, pers. obs.), and were caught by hand by pouring some water on them. At the locality Wadi Hinna–Baobab Forest, the large series was collected along the sides of an ant trail (T. Kopecký, pers. comm.; J. Větrovec, pers. comm.) – the sampled ant workers were identified as *Crematogaster delagoensis* Forel, 1894 (genus level ID by D.M. Sorger and A. Laciny; species level by ISP using the keys by Collingwood & Agosti (1996) and Sharaf et al. (2019), which has been discussed with H. Zettel). The exact nature of this ant-beetle-association is currently unknown.

Habitat and ecology. Terricolous in colline to montane woodlands and xeromorphic shrublands of the Dhofar fog oasis. The beetles inhabit several landscape elements (foothills, summit plateaus, wadis) with different plant communities. The collecting sites are located at the fringe of the monsoon-affected area (Fig. 7).

An aspect of the type locality is given in Figure 7, and some ecological information on it can be found in Kilian & Hein (1999: 191), Knees et al. (2007: 111), Patzelt (2015: 302 ff.; cf. 2019), and Mosti et al. (2012 [site M23]). An aspect of the collection site Wadi Hinna–Baobab Forest is shown in Figure 8, while a climate diagram is provided by Slotta et al. (2021: fig. 1C) and a plant list by Mosti et al. (2012 [site LH14]). Short characterisations and aspects of the collection site in Wadi Sayq (viz. the Ayn al Mughsayl) are given by Ball et al. (2015: 8 [arid upper reaches], pl. 1) and Verovnik et al. (2022: 123 [site 9], fig. 2).

It is currently unknown if the beetles also occur in the arid coastal plain and pre-desert areas, or if they also inhabit the seasonally humid cloud forests and tall-grass savannas.

Distribution. So far, only known from three localities in the Dhofar mountains region (Fig. 9) in Oman. An occurrence in easternmost Yemen (Al Mahrah) is possible.

Etymology. The species epithet is a Latin adjective, which means "amber-winged" (derived from succinum = amber, and penna = wing) and refers to the coloration of the elytra.

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