

Research article

Submitted: October 19th, 2024 – Accepted: April 15th, 2025 – Published: June 30th, 2025

DOI: 10.13133/2284-4880/1694

Anophthalmus drpensis n. sp. from Slovenia (Coleoptera: Carabidae, Trechinae)

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Abstract

Anophthalmus drpensis n. sp. is described from caves of Soriška planina (north-west Slovenia). This new species differs from the related species of the “*Anophthalmus schatzmayri* species group” by external morphology and by shape of the copulatory lamella of endophallus.

Keywords: Coleoptera, Carabidae, Trechinae, *Anophthalmus*, new species, Slovenia.

urn:lsid:zoobank.org:pub:42720968-CB98-4A2E-B6F4-6E8E57DA4F20

Introduction

According to Belousov (2017), *Anophthalmus* Sturm, 1844 is a very speciose genus of blind Trechini. Anitchchenko (2024) listed 49 species and many subspecies arranged into several group of species. According to Daffner (1998), Bognolo (2002) and Kofler (2006, 2010), the *Anophthalmus schatzmayri* group includes 10 species (*Anophthalmus schatzmayri* P. Moravec & Lompe, 2003 (= *mariae* Schatzmayr, 1904), *A. baratellii* Sciaky, 1985, *A. egonis* Müller, 1923, *A. tolminensis* Müller, 1922, *A. besnicensis* Pretner, 1949, *A. bojani* Daffner, 1998, *A. kahleni* Daffner, 1998, *A. annamariae* Bognolo, 2002, *A. miroslovae* Kofler, 2006 and *A. bog-noloi* Kofler, 2010) and one subspecies (*A. besnicensis frater* Daffner, 1998).

This group inhabits limestone areas of the south-eastern parts of the Alps.

The northern border of this area is formed by Gailtal Alps, Karavanke Alps and Julian Alps. In the south, the area of distribution extends from Matajur, through Tolmin to Logaške Rovte, which geologically already belong to the Dinaric karst. During many years of biospeleological research, conducted by one of the author (BK) in caves of Soriška planina, he managed to collect a series of interesting specimens of this eyeless genus.

Daffner (1998), in reviewing them, decided that they belonged to the newly described subspecies *Anophthalmus besnicensis frater*. However, he did not perform a detailed

analysis of the copulatory organ. Our subsequent analysis of the lamellae showed that it was undoubtedly a new species never described before. The purpose of this note is the description of this new species.

Materials and methods

Measurements. Biometric measurements, aimed at comparing the new species with its most closely related taxon *Anophthalmus besnicensis frater*, were carried out on 10 males and 19 females of the new species and on 10 males and 10 females of *Anophthalmus besnicensis frater* from mine Štoln na Altemavru on the Mountain Ratitovec.

All measurements were made by an Olympus SZ 61 microscope equipped with an eyepiece micrometer. The total length was measured from the tip of mandibles to the end of elytra.

The length of head was measured from the anterior edge of clipeus to neck constriction.

The lengths of pronotum and head caps were measured at middle, and the widths at the widest point of each part of the body.

The picture of habitus was taken by Gianni Allegro using a Leica DFC295 camera attached to a Leica M205C stereomicroscope at the CREA-FL in Casale Monferrato (AL).

The pictures of genitalia were taken by PMG using a Sony 20.1 camera attached to a Leitz Dialux and composed by Combine ZP software.

Table 1 – Distinguishing features of *A. drpensis* n. sp from *Anophthalmus besnicensis frater*.

	<i>besnicensis frater</i>	<i>drpensis</i> n. sp.
Size	Medium-sized species (5.4-6.0 mm)	Large-sized species (5.8-6.7 mm)
Head	L/W: 0.91	L/W: 0.94
Antennae	L: 4.3 mm	L: 4.6 mm
	Tenth antennomere in males 3.2 times longer than wide	Tenth antennomere in males 3.6 times longer than wide
Pronotum	L/W: 0.88	L/W: 0.86
Elytra	L/W: 1.81	L/W: 1.76
Umbilicate series	First pore at level of the second one	First pore before the level of the second one
Aedeagus	L: 1.7-1.8	L: 1.8-1.9
Tip	Markedly curved upwards	Less curved upward
Ligula	Large	Very large
	trapezoidal, slightly triangular, notched at anterior edge	heart-shaped, strongly triangular, notched at anterior edge
Copulatory lamella	L: 0.84	L: 0.82
	L/W: 2.47	L/W: 1.68
	teeth large, flat, tips turned outwards, not exceeding the base plate	teeth large, flat, tips facing forward, exceeding the base plate
Distribution	High altitude of Jelovica, Dražgoška Gora and Ratitovac	High altitudes of the Soriška planina

Materials were deposited in the following collections:
 CBKS: Bojan Kofler Collection, Škofja Loka, Slovenia
 CPMG: Pier Mauro Giachino Collection, San Martino Canavese (TO), Italy.
 CGAI: Gianni Allegro Collection, Moncalvo (AT), Italy.

Acronyms

L: overall length (from tip of mandibles to apex of elytra).
 L/W: length/width ratio.
 HT: Holotype
 PT/PTT: Paratype/s

Anophthalmus drpensis **sp. n.** (Figs 1-7)
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Loc. Typ.: [SLOVENIA]: Slovenija, Julijske Alpe, Soriška planina, Jama Ocvirk, kat. št.: 10406, m 1385.

Type series. HT ♂, [SLOVENIA]: SLO, Soriška pl., Jama Ocvirk, 5.7.2013 – 6. 6. 2014, leg. B. Kofler (CBKS).
PTT: 1♀, same data as HT; 1 ♀, same data, 29.9.2012-5.7.2013; 1♀, same data, 6. 6.2014-27.5.2015; 2 ♀♀, same data, 25.5-25.7.2011; 1 ♂ 1 ♀, same data, 27.5.2015-23.8. 2016; 1 ♀, same data, 1.6.2019-19.9.2020; 2 ♀♀, same data, 5. 6-29.9.2012; 1 ♀ SLO, Soriška pl., Navihana malina, kat. št.: 9663, 1325 m, 25.5-6.9.2011, leg. B. Kofler; 1 ♂ 3 ♀♀, same data, 3.9. 2016-1.8. 2017; 2 ♂♂, same data, 1.8.2017-8.8.2018; 1 ♂, same data, 27.5.2015-

23. 8.2016; 1 ♂ 1 ♀, same data, 10.6-7.10.2023; 1 ♂, same data, 29.9.2012-5.7.2013; 1 ♀, same data, 5. 6 -29.9.2012; 1 ♀, SLO, Soriška pl., Spodmol v Brezovcu (Jama Črni vrh- Brezovec), kat. št.: 4462, 1270 m, 4.7.2013-6.6.2014, leg. B. Kofler; 1 ♀, SLO, Soriška pl., Jama v Bihki (Jama na Brezovcu), kat. št.: 4463, 1295 m, 25.7-6.9.2011, leg. B. Kofler; 1 ♂, same data, 4.7.2013-6.6.2014 (CBKS, CPMG, CGAI).

Diagnosis

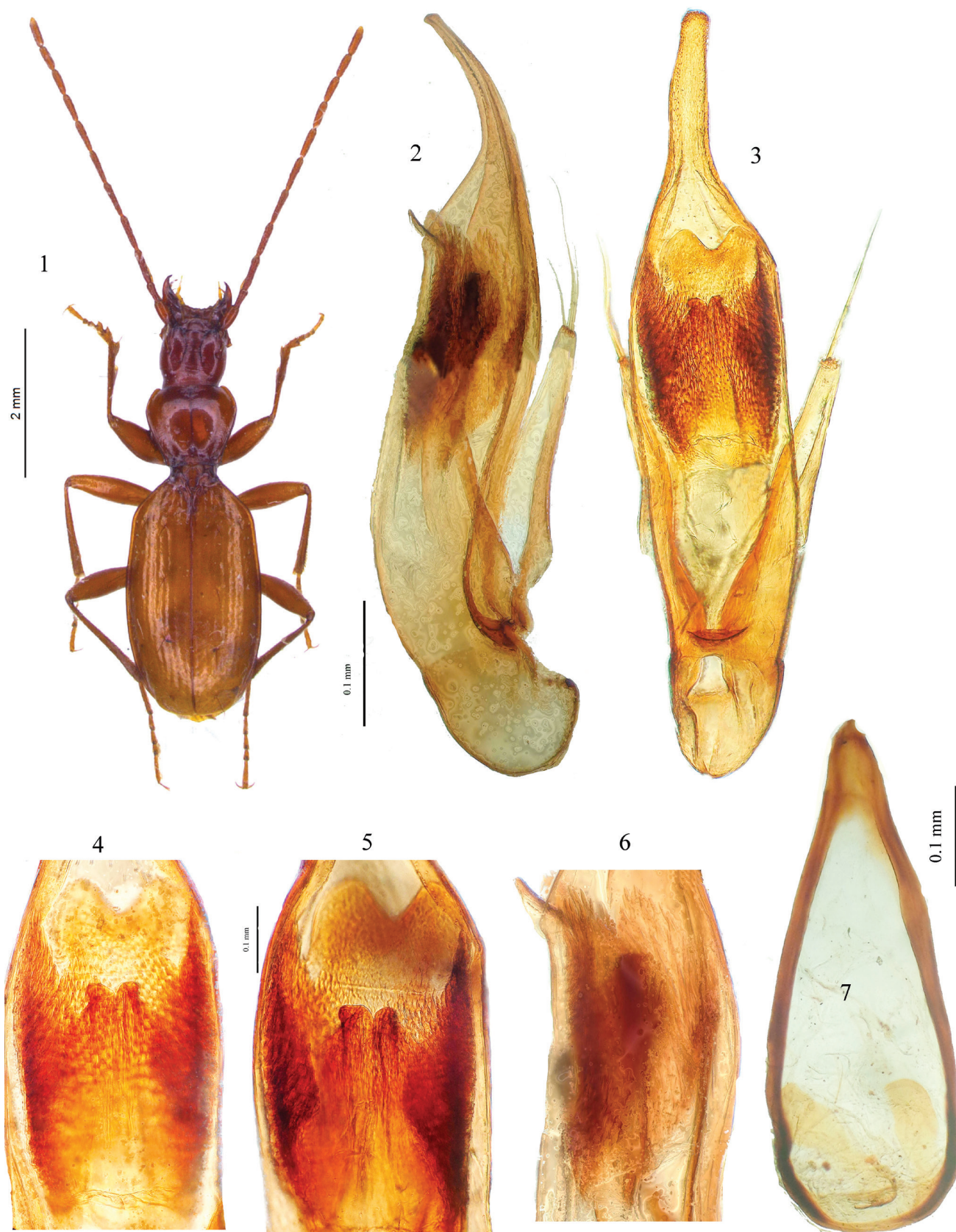
A large *Anophthalmus* (5.5-6.7 mm) belonging to the group of *A. schatzmayri*. Closely related to *A. besnicensis frater* Daffner, 1998 in the structure of aedeagus, it differs from this taxon by the characters listed in Table 1.

Description

Large body size, L: 5.5 – 6.7 mm (6.1 mm in HT). Body stout, head reddish-brown, pronotum yellowish-brown and elytra yellowish (Fig. 1). Dorsal surface with sparse and very short pubescence.

Head short (L/W = 0.84-0.89), posteriorly convex elongated, with very short pubescence.

Antennae (length 4.6 mm in HT) robust, aligned against the body they extend to the last fourth of elytron, the tenth antennomere 3.6 times longer than wide.



Figs 1–7 – *Anophthalmus drpensis* sp. n., HT ♂. 1, Habitus; 2, Aedeagus in lateral view; 3, Aedeagus in dorsal view; 4, Lamella copulatrix in dorsal view; 5, Lamella copulatrix in ventral view; 6, Lamella copulatrix in lateral view; 7, Male invaginated segment.

Pronotum wide ($L/W = 1.01\text{--}1.18$), lateral marginal furrows wide. Sides subrectilinear before the basal angles, that are right and concavely notched. Pronotum disk covered with rudimentary sparse hairs, very short and clearly visible only at sides.

Elytra elongated ($L/W = 1.74\text{--}1.88$), slightly convex on the disk. Sides delicately convex, widest at second half. Shoulders obliquely risen rectilinearly; shoulder angles strictly rounded.

Tips of elytra broadly rounded and concavely notched before apex. Elytral disk covered with sparse, very short, hairs. The distance between the hairs is more than three times their length.

Chaetotaxis. The first point of the „umbilicate series“ placed before the level of the second point. Elytra with four long discal setae on the third stria.

Legs long and robust. First protarsomere dilated in male.

Aedeagus: length 1.8 mm. In lateral view (Fig. 2): moderately curved at base and strongly elongated at middle; apex narrow, curved upwards and tuberosely thickened at end. In dorsal view (Fig. 3): base of median lobe moderately rounded, median part very elongated, tip long and slender. Ligula (Fig. 4) very large, heart-shaped, and markedly triangularly incised at anterior edge. Copulatory lamella, in ventral view (Fig. 5) tiny, with denticles large and flat, facing forward and clawed at tip. Basal plate very wide, with parallel sides and teeth extending beyond the basal plate. Parameres long, each bearing three long apical setae.

Etymology

The new species is named *drpensis* in gratitude to our cave colleagues from the DRP (Društvo za raziskovanje podzemlja) Škofja Loka (Society for the Subterranean Research of Škofja Loka).

Ecology and Distribution

A. drpensis n. sp. is a rare species known only from the entrance parts of shallow caves lying in the ground on Soriška planina (north-western Slovenia). It also lives in the forest, deep in the ground (only one specimen found in a subterranean trap set about 0.4 meters deep). Associated beetle fauna are: *Anophthalmus ravasinii soriscensis* Daffner, 1996, *Laemostenus schreibersi* Küster, 1846, *Trechus alpicola* Sturm, 1825, *Nebria diaphana bohiniensis* Müller, 1928, *Oryotus micklitzi* Reitter, 1885, *Sphaerobathyscia hoffmanni* (Motschoulsky, 1856), *Pretneria soriscensis* Perreau, 2003, *Catops nigricans* (Spence, 1815), *Catops subfuscus* Kellner, 1846, *Aphaobius kaplai* Bognolo & Vailati, 2010, *Bryaxis argus* Kraatz, 1863, *Necrophilus subterraneus* Dahl, 1807, *Leptusa schaschli*

Ganglbauer, 1897, *Otiorhynchus (Trogloorhynchus) anophthalmus* (Schmidt, 1854).

Remarks

Faille et al. (2013), following a molecular approach, proposed the systematic position of the genus *Anophthalmus* in a basal clade of the filogram, near some specialized Trechini as *Arctaphaenops* Meixner, 1925, *Agostinia* Jeannel, 1928, *Luraphaenops* Giordan, 1989 and *Trichaphaenops* Jeannel, 1916. In the same paper, the authors hypothesized such an origin dating back to at least the middle Miocene. Even before this important contribution, Daffner (1998), using a morphological approach, hypothesized that *schatzmayri* group may be a very old species group in *Anophthalmus* phylogeny, by its eyes completely atrophied and the upper side of the body provided by short, but distinct pubescence.

In Daffner's opinion (1998), the strongly sclerotized and still slightly pigmented exoskeleton of this species group indicates a near-surface way of life. Their preferred habitats are crevice systems in coarse blockwork and caves with low soil cover. At intermediate temperatures (spring and autumn), specimens can migrate to the surface of soil, where usually hide under large stones.

Acknowledgements – We would like to thank our friend Gianni Allegro who provided the habitus photos and reviewed the text giving useful comments. The authors also thank an anonymous reviewer for helpful suggestions on an earlier version of the paper.

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