

Coarazuphium pains, a new species of troglobitic beetle from Brazil (Coleoptera: Carabidae: Zuphiini)

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Abstract

Coarazuphium pains sp. n., a troglobitic Carabidae, is described and illustrated from a male specimen collected in the Tabocas III cave, at Pains, Minas Gerais, Brazil. This species, like *C. bezerra*, differs from the remaining species of the genus *Coarazuphium* by having two pairs of setae close to the posterior margin of the head, and differs from all others by having two pairs of setae at the ventral surface of the protorax and by having the apex of the elytra not sinuous.

Keywords: Coleoptera, Carabidae, Zuphiini, *Coarazuphium*, Cave, Brazil.

Introduction

The carabid tribe Zuphiini is currently represented by six genera in the Neotropical region: *Zuphium* Latreille, 1806, *Pseudaptinus* Castelnau, 1835, *Thalpius* LeConte, *Metaxidius* Chaudoir, 1852, *Mischocephalus* Chaudoir, 1862, 1851, and *Coarazuphium* Gnaspini et al., 1998. The former five were known since the revision made by Reichardt (1977). The latter one was proposed by Gnaspini et al. (1998) to include the troglobitic species *C. cessaima* Gnaspini et al., 1998, *C. bezerra* Gnaspini et al., 1998 and *C. tessai* (Godoy & Vanin, 1990). According to Gnaspini et al. (1998), the genus *Coarazuphium* shares some characters with *Zuphium*, world wide distributed, and with *Parazuphium*, with no species in the New World, but differs from them by the relative size of the first segment of the antenna (shorter than the segments 2-4 together), and because its species have the margins of the head rounded and a pair of setae laterally (and not anteriorly) to the eyes. Another important character in the genus *Coarazuphium* is the marked reduction of the eyes and pigmentation, and also the elongation of the legs and antenna (Gnaspini et al., 1998). These characters are typically presented by troglobitic carabids (Casale et al., 1998) and are considered to be evolutionary responses from these beetles to the cave environment.

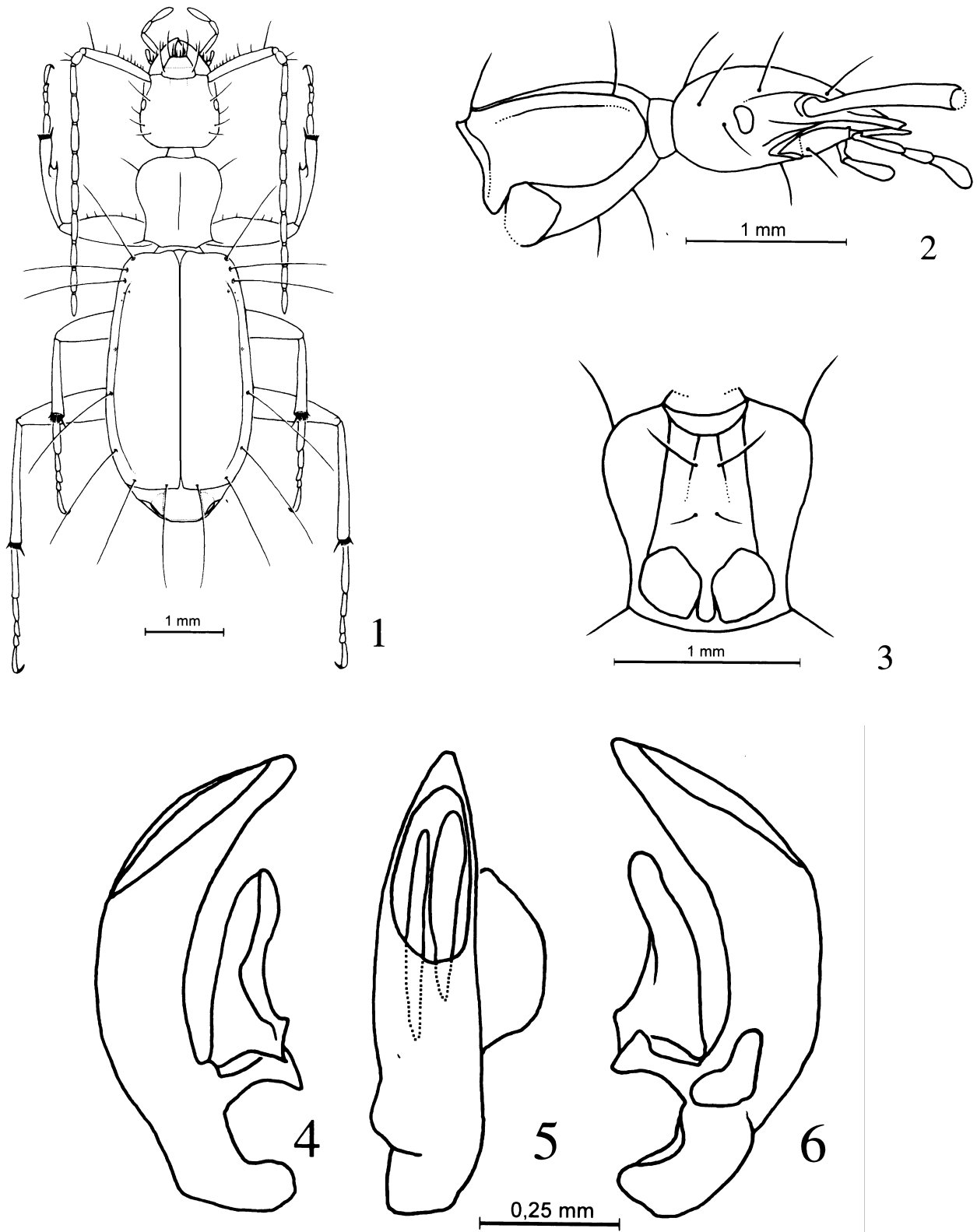
So far specimens of *Coarazuphium* have been found only in some caves from the Bambuí speleological province: *C. tessai*, in the Gruta do Padre, at Santana municipality; *C. cessaima*, in the Lapa do Bode, at the Itaetê municipality, both in Bahia state, and *C. bezerra*, in the Lapa do Bezerra, at São Domingos municipality, Goiás state. Herein we describe *Coarazuphium pains* sp. n., found in a limestone cave in the region of Pains, Minas Gerais, also included in the Bambuí speleological province.

Coarazuphium pains sp. n.

Figs. 1-6.

Description. Male (holotype, Fig. 1). Total length (from the apex of the mandible to the apex of the elytra): 5.91 mm. Maximum width (located in the posterior third of the elytra): 1.87 mm. Body pale reddish brown, covered with small recumbent hairs. Cephalic capsule subtrapezoid (Figs. 1-2), with similar width and length (relation width/length = 1.04). Head slightly narrower than pronotum. Maximum width of head between its base and the eyes. Dorsal surface with one pair of lateral setae located immediately behind eyes, one pair above eyes and two pairs close to posterior margin of head: one lateral and the other more internal. Ventral surface with a pair of posterior setae close to median line of head, and an anterior pair, close to margin of gular region. Clypeus and labrum fused. Labrum trapezoid, with six setae in anterior margin. Clypeus almost rectangular, with one pair of lateral setae. Eyes present, but reduced, reniform, laterally positioned, at final portion of the antennal impression at head. Antenna (Fig. 1) 4.42 mm, 3.75 times longer than pronotum. Segments 2-4 together longer 1. First antennal segment with a long bristle close to apex and many accessory shorter setae. Pronotum (Figs. 1-3) trapezoid, 1.07 times longer than wide. Maximum width close to anterior angle, which is wider than head. Anterior angle rounded. Posterior angle acute. Dorsal surface (Figs. 1-2) with two pairs of erect setae: one close to the anterior angle of pronotum and the other, shorter, close to posterior angle. Two pairs of ventral median setae: those of anterior pair are longest (Fig. 3). Legs (Fig. 1): procoxa glabrous. Mesocoxa and metacoxa with two pairs of setae close to the internal margin. Metacoxa with one pair of setae close to median margin. Protrochanter and mesotrochanter with a medial bristle in posterior margin; metatrochanter glabrous. Profemur, 1.30 mm, 1.06 times the length of the mesofemur and 0.72 times the length of metafemur. Protibia 1.15 mm, 0.98 times the length of mesotibia and 0.73 times the length

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Figs. 1-6 - *Coarazuphium pains* sp. n., male holotype. 1, habitus; 2, head and pronotum, lateral view; 3, pronotum, ventral view; 4-6, aedeagus, left lateral view, dorsal view and right lateral view, respectively.

of metatibia. Protibia 1.37 times longer than tarsus. Meso- and metatibia almost equal to tarsus. First segment of anterior tarsus shorter than segments 2-4 together (0.68). First segment of medium and posterior tarsus almost equal to length of the segments 2-4. Protibia and tarsus, together, 1.86 times, mesotibia and tarsus, 1.99 times, and metatibia and tarsus, 2.79 times longer than pronotum. Elytra free (Fig. 1), 1.70 times longer than wide. Maximum width at about one third from apex, 2.67 times longer than pronotum. Apex of elytra straight, not sinuous. Seven large setae in each elytron: 3 close to the anterior angle, 2 marginal, in posterior half, and 2 in posterior margin. Shorter setae located along lateral margin of elytra. Posterior wings absent. Abdominal sterna 1-5 glabrous, sixth sternum with a pair of setae close to its posterior margin. Aedeagus (Figs. 4-6) curved and elongated. Left paramere about two times longer than wide. Right paramere curved and elongated.

Female. Unknown.

Material studied. Male (holotype). Tabocas III cave (20° 22' 54" S, 45° 44' 34" W, 780 m altitude), Pains, Minas Gerais, Brasil, 30.X.1999, R. L. Ferreira & M. S. Silva leg. Holotype deposited in the Entomological Collection of the Departamento de Zoologia, Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brasil.

Etymology. *pains* refers to the municipality of Pains, where the type specimen was collected.

Ecological considerations. The only individual collected was found on a dry stalagmitic floor full of concretionary mollusk shells, located 30 m from the main entrance of the cavity. This cave consists basically in an oligotrophic system without permanent water courses. Its community depends mainly on the organic matter imported from the epigeal habitat by floods. The cave has three small communications (of few centimeters) with the external habitat, in its median portion. Vegetal matter penetrates through these communications in the rainy seasons. The cave presents two different climatic systems, caused by the existence of a constriction in the conduct of the cave nearly 28 m from the main entrance. This constriction has about 35 cm height and 70 cm width, and seems to keep the most interior portion of the cavity moister than the portion closest to the entrance. The specimen was collected at a site in the most internal system.

Discussion

One of the characters pointed by Gnaspini et al. (1998) to differentiate the genus *Coarazuphium* from the genera *Parazuphium* and *Zuphium* is the aspect of the posterior margin of the elytra (sinuous in the former and truncated in the latter two), which must be reconsidered, since *C. pains* has such margin not sinuous. All the remaining characters are consistent with the description of the genus *Coarazuphium*.

Coarazuphium pains, as *C. bezerra*, differs from the remaining species of the genus by having two pairs of setae (and

not a single one) close to the posterior margin of the head, and *C. pains* differs from *C. bezerra* by having the body more elongate and the head narrower than the pronotum, and differs from all other species by having two pairs of setae at ventral surface of the protorax and by having the apex of the elytra not sinuous.

The troglomorphy shown by the species of the genus *Coarazuphium* is considered one of the most evident among the cave beetles from Brazil (Gnaspini & Trajano, 1994). Gnaspini et al. (1998) suggest that *C. cessaima* is the species most derived in the genus regarding such troglomorphisms, because it has total absence of eyes and more elongated body and appendices. *Coarazuphium pains*, however, seems to present a condition of body and appendices elongation intermediate between *C. cessaima* and the remaining species of the genus. The eyes, however, are larger than those of all other species, which can be considered an eventual plesiomorphic trait in this species. However, only with the intensification of morphological, ecological, and molecular studies, will be possible to infer about the phylogenetic relationship among the species in this genus, as so as their evolution in the subterranean environment.

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