



Ultrastructural analysis of *Coarazuphium formoso* (Coleoptera: Carabidae, Zuphiini), a new Brazilian troglotic beetle

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Abstract

It is described *Coarazuphium formoso* **sp. n.**, from male and female specimens collected in Barriguda cave and Calor de Cima cave, both in the municipality of Campo Formoso (Bahia, Brazil). The most striking difference between *C. formoso* and other species of the genus is the presence of three pairs of setae on the dorsal surface of the head close to the posterior margin, while the other species have only one or two pairs. Species from this genus showed advanced troglotomorph characters in comparison to other Brazilian cave beetles. Characters as increased extra-optic sensory structures, and the presence of particular sensilla, and sensory and gustatory receptors were not detected under routine microscopy but required ultrastructural scrutiny. Similar analyses are needed in other epigeal Zuphiini species for better interpreting their functional meaning.

Key words: *Coarazuphium*, ground beetle, cave dwelling, sensilla, antenna, eyes, mouthparts, legs

Introduction

Members from the Zuphiini tribe are normally winged epigeal organisms (Casale, 1998). The first record of a troglotic Zuphiini was that of *Parazuphium tessai* (Godoy & Vanin, 1990), found in Padre Cave (municipality of Santana, Bahia, Brazil). This species has common traits with two other Zuphiini genera, *Parazuphium* Jeannel, 1942 and *Zuphium* Latreille, 1806. Later on, Moore (1994) recorded two new genera of troglotic Zuphiini, *Speozuphium* and *Speothalpius*, each with a new species, *Speozuphium poulteri* and *Speothalpius grayi*, respectively. Both were found in the cave systems of the Nullarbor Plain in Australia. Gnaspini *et al.* (1998), then, have proposed a new genus, *Coarazuphium*, which included *Parazuphium tessai* and two other new species, *C. cessaïma* and *C. bezerra*. These three species differ from other zuphiinids in relation to their relatively elongated first antennomeres (although this is still shorter than the second to fourth together), rounded head margins, and a pair of setae lateral to the eyes (rather than anterior to them). Another important characteristic of this genus is the presence of typical troglotomorphisms, such as the reduction or absence of pigmentation, eyes, and wings and the elongation of appendages and antennae.

To date, all *Coarazuphium* specimens have been found only in caves in the Bambuí Speological Province (Gnaspini *et al.*, 1998; Álvares & Ferreira, 2002). *C. tessai* was found in Gruta do Padre Cave, in the municipality of Santana and *C. cessaïma* was found in the Lapa do Bode Cave, in the municipality of Itaetê, both in Bahia. *C. bezerra* was found in the Lapa do Bezerra Cave, in the municipality of São Domingos in Goiás, and *C. pains* was found in the Tabocas III cave, in the municipality of Pains in Minas Gerais.

Our objective is to describe a new species of troglotic beetle, *Coarazuphium formoso*, from the Una Speological Province. This description is focused on an ultrastructural analysis of the antennae, eyes, mouthparts, and legs. According to Moldovan *et al.* (2004), these structures indicate the degree of adaptation to life in caves. They also provide adequate criteria to identify cave species with otherwise homogeneous morphologies.