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Two new species of *Pseudonannolene* Silvestri, 1895 from Brazilian limestone caves (Spirostreptida: Pseudonannolenidae): synotopy of a troglophilic and a troglobiotic species

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Abstract

Pseudonannolene ambuatinga **n. sp.** and *Pseudonannolene saguassu* **n. sp.** are described from individuals collected in limestone caves in the municipality of Pains, Minas Gerais, Brazil, which comprises a scenario of great conflict between speleological preservation and limestone extraction. The two species differ in their gonopod morphology and in size and color. *Pseudonannolene ambuatinga* **n. sp**. is regarded as the second troglobite species known for the family. This is the first report for Brazil of syntopy in two congeneric species in the same cave.

Key words: Diplopoda, *Pseudonannolene*, Cave, Brazil, Conservation, Neotropics, Troglobiotic

Introduction

The genus *Pseudonannolene* Silvestri, 1895 is often found in Brazilian caves of different lithologies (Mauriès 1974; Fontanetti 1996a; Trajano *et al.* 2000; Ferreira 2004; Trajano & Bichuette 2010; Souza-Silva *et al.* 2011; Iniesta & Ferreira 2013) and is thus considered as typically troglophile, establishing populations in both the external and subterranean environment (Culver & White 2005). Currently in Brazil, among the twenty known species, nine have been described from individuals found in caves, but only one is considered a troglobiont (Iniesta & Ferreira 2013). In Brazil, studies on the genus began at the end of the nineteenth century with descriptions of epigean species (Brölemann 1909). The first species described from Brazil, *Pseudonannolene longicornis* Porat, found in 1888 in the state of São Paulo, was initially described as *Alloporus longicornis* (Spirostreptidae), and later relocated in the genus *Pseudonannolene* (Brölemann 1909). The first species directly described in this genus was *Pseudonannolene alegrensis* Silvestri 1897 (state of Rio Grande do Sul) described by the Italian Filippo Silvestri (Brölemann 1909). Subsequently, several other species have been described from different regions (Silvestri 1902; Brölemann 1909; Mauriès 1987) making this genus the most diverse in the family in Brazil.

The first troglophilic species described was *Pseudonannolene strinatii* Mauries, 1974, found in the Gruta das Areias in the state of São Paulo (Mauriès 1974). Subsequently, others have been described (Mauriès 1987; Fontanetti 1996b), the most recent being *Pseudonannolene tocaiensis* Fontanetti, 1996 (Fontanetti 1996a), found in the Toca Cave (state of São Paulo). According to Trajano & Bichuette (2010), individuals found in this environment are usually associated to organic debris of animal origin, such as bat guano deposits (especially from hematophagous species). However, such authors apparently based their findings on few observations on the genus, reaching a generalized conclusion about an alleged preference for certain organic resources. These organisms can feed in a huge variety of organic debris inside caves, not only on bat guano. Furthermore, in most cases, organisms of this genus are found walking on the floor or on the walls of caves, and it is not rare to observe specimens buried under the cave sediments. In addition to taxonomic work referring to the genus, other works were published in Brazil on the reproductive histology, physiology and cytogenetics of some species (Penteado & Hebling-Beraldo 1991; Fontanetti 1991; Fontanetti 2000; Freitas & Fontanetti 2003; Campos & Fontanetti 2004).

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