



NOTA CORTA / SHORT NOTE

FIRST RECORD OF *Edentomyia piauiensis* (DIPTERA: PSYCHODIDAE) IN MARANHÃO STATE, BRAZIL

Primer registro de *Edentomyia piauiensis* (Diptera: Psychodidae) en el Estado de Maranhão, Brasil

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ABSTRACT

We report the first record of *Edentomyia piauiensis* in Maranhão State, Brazil in a cave, a similar ecotope where this species has been previously described in the literature. The specimens were captured in Toca do Inferno Cave, Barão de Grajaú, Maranhão, from September/2021, January, and May/2022. Twelve Hoover Puggedo (HP) light traps were installed at 1.5 m above the ground, uninterruptedly for 24h. We captured 1778 specimens of *E. piauiensis*. This finding expands knowledge of the geographical distribution of this species in Brazil.

Keywords: Biodiversity, Ecotope, *Edentomyia* genus, Sandfly Fauna, Sandstone Cave.

RESUMEN

Edentomyia piauiensis es reportada por primera vez en el estado de Maranhão, Brasil, en una cueva, en un ecotopo similar donde esta especie ha sido descrita previamente en la literatura. Las colectas de flebotomos se realizaron en la cueva Toca do Inferno, Barão de Grajaú, Maranhão, en septiembre de 2021, enero y mayo de 2022. Se instalaron doce trampas de luz modelo HP a 1,5 m del suelo por un período de 24 horas. Fueron recolectaron un total de 1778 ejemplares de *E. piauiensis*. Este hallazgo amplía el conocimiento sobre la distribución geográfica de esta especie de flebotominos en Brasil.

Palabras clave: Biodiversidad, Ecotopo, género *Edentomyia*, Fauna flebotomínica, Cueva de arenisca.

Phlebotominae (Diptera: Psychodidae) are hematophagous insects with a wide spatial distribution, inhabiting the most varied ecotopes (Young and Duncan, 1994). This group of insects has a great ecological importance (Andrade-Filho et al., 2001), as it includes species with vectorial capacity for leishmaniasis transmission.

In Brazil, there have been few studies on cave environments and the sandfly fauna composition in this habitat is poorly known. Moreover, this lack of knowledge makes it difficult to record new species in many cave-dwelling (Carvalho et al., 2011; Carvalho et al., 2013). A systematic review of

cave-dwelling reported 108 sandfly species, and this value represents about 40 % of the number of sandfly species record from Brazil (Dutra-Rêgo et al., 2022).

Edentomyia piauiensis Galati, Andrade Filho, Silva & Falcão, 2003 is the only species of *Edentomyia* genus. It was first described from specimens collected in a cave in Piauí State (Galati et al. 2003) and later in Pará State (Galati, 2021).

The bioecology of *E. piauiensis* is poorly known. According to ecological data of the Phlebotomini tribe, the genera inhabit humid places rich in organic matter, feeding on sugar solutions and only females are hematophagous because

this is necessary for egg development (Maroli et al., 2013; Akhouni et al., 2016). Sandflies have nocturnal habits (Killick-Kendrick, 1999), but in cave-dwelling by a permanent lack of light, in areas far from the entrance, this abiotic factor allows these insects to have different circadian schedules from those observed in epigeal environments (Carvalho et al., 2012; Campos et al., 2017).

The literature shows that Maranhão State sandfly fauna consists of 98 species distributed in eight genera (*Brumptomyia*, *Lutzomyia*, *Bichromomyia*, *Micropygomyia*, *Nyssomyia*, *Evandromyia*, *Psathyromyia* and *Psychodopygus*), comprising 18 vector species for *Leishmania* spp. transmission (Rebêlo et al., 2010; Silva et al., 2010; Moraes et al., 2015; Silva et al., 2015; Da Silva et al., 2019; Silva et al., 2019; Moraes et al., 2020).

In this paper, we reported the occurrence of *E. piauiensis* in sandfly fauna in Maranhão State, Brazil for the first time.

This study was conducted in the Toca do Inferno cave, located at Comunidade Faveirinha, rural area of Barão de Grajaú, Maranhão, Brazil, located at the coordinates 06°39' S and 43°20' W.

Sandflies were collected in September/2021, January and May/2022, once a month for 24 hours, inside and around the cave. Four HP light traps (Pugedo et al., 2005) were installed outside the cave and eight were placed inside the

one, during three night of capture. The traps were installed at 1.5 m above the ground, at least 10 m of distance from each trap. The collection effort was 864 hours.

The captured sandfly were transported to the Laboratory of Natural History and Applied Biology at Federal University of Piauí, prepared in Berlese's fluid and mounted on slides for identification according to Vilela et al. (2003). We followed the taxonomic classification proposed by Galati (2021). All vouchers were deposited in Coleção de História Natural da Universidade Federal do Piauí (CHNUFPI) (catalog number CHNUFPI 1164 a CHNUFPI 1856).

The sandfly collection was authorized by Chico Mendes Institute for Biodiversity Conservation (ICMBio) under the license number 78923-1.

A total of 1778 of which were identified as *E. piauiensis* (461 females and 1317 males). Of the total, 169 *E. piauiensis* were collected outside the cave and 1609 inside the cave. (Fig. 1), shows the main characters used for specie identification.

The first record of *E. piauiensis* occurred in caves composed of limestone (Galati et al., 2003; Dutra-Rêgo et al., 2022), however, we reported the occurrence of this species in a sandstone cave. In these caves, bats and other mammals play an important role in providing organic matter, especially because they are permanently dry caves (Dutra-Rêgo et al., 2022).

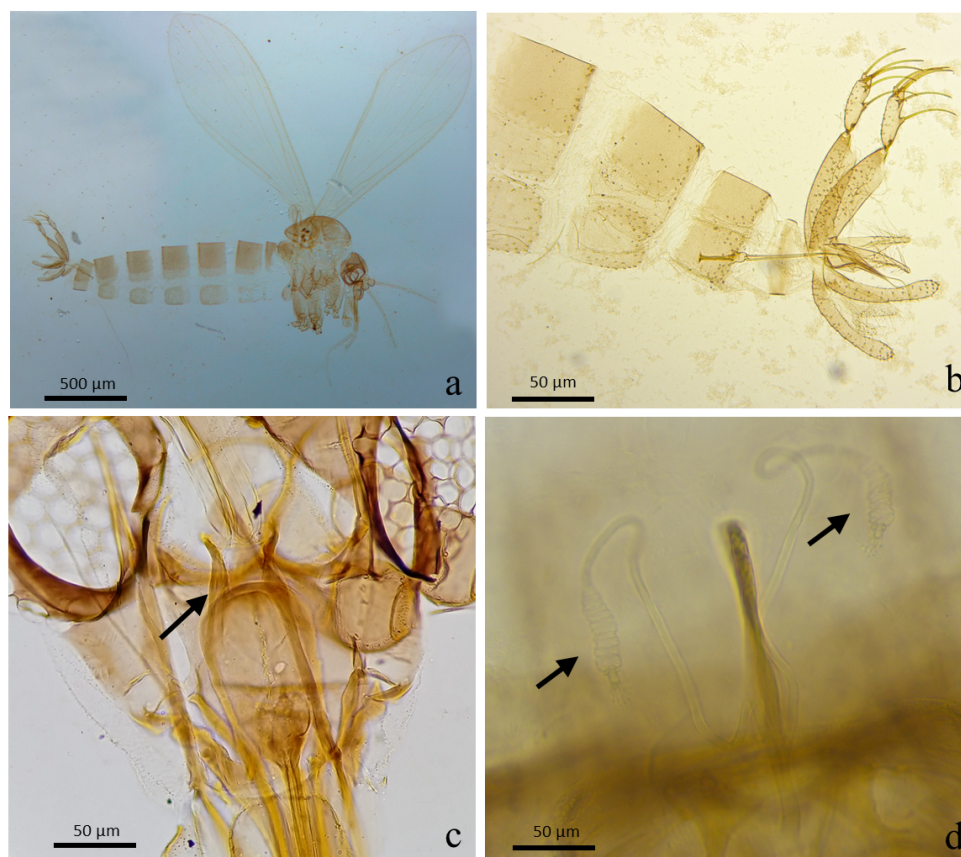


Figure 1. Anatomical structures used in taxonomic determination of *Edentomyia piauiensis*. a: Male. b: Genital characters. c: Female head with cibarium. d: Genital fork and spermathecae.

In this study, sandflies were collected both inside and around the cave, which suggests the maintenance of a flow with the internal and external environment (Carvalho et al., 2013), distinctly from *Deanemyia maruaga* a cave-dwelling species adapted to live in aphotic zone, being its immature stages depending on organic matter from this environment (Alves et al., 2011).

We suggest that *E. piauiensis* has habits strongly linked to the interior of the cave, since the light traps installed within the cave collected an expressive number of sandflies. However, the occurrence of specimens around the cave may show a certain dependence on the external environment of the cave, probably because of a greater availability of food resources or light sources have attracted them.

With this new record of *E. piauiensis* for Maranhão, the list of phlebotomine sandfly in this state is expanded to 99 species. Until the present date of the submission of this manuscript, this is the only species belonging to the genus *Edentomyia* (Galati et al., 2003, Galati, 2021).

The expansion of knowledge about this species is important in order to understand the evolution of phlebotomine sandflies, especially in cave environments, which can pressure the retention of primitive morphological characters such as the absence of cibarium teeth as in *E. piauiensis* (Dutra-Rêgo et al., 2022, Galati et al., 2003).

The results contribute to the knowledge of wild sandfly fauna in Maranhão State. In addition, this study expands the distribution of this species in a cave formation other than the one originally described.

AUTHORS PARTICIPATION

Maria Regiane A. Soares designed research; Maria José A. P. Barbosa, Maria Regiane A. Soares, Diogo B. S. Barbosa collected and analysed the data; Maria José A. P. Barbosa, Maria Regiane A. Soares, Diogo B. S. Barbosa led the writing of the manuscript. All authors contributed critically to the drafts and gave final approval for publication.

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CONFLICT OF INTEREST

All the authors declare that there is no conflict of interest.

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