



Phlebotomine Fauna (Diptera: Psychodidae) of Species of Medical Importance from Caves in the States of Minas Gerais, Rio De Janeiro and Sao Paulo, Brazil

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Abstract

This study aimed to update the phlebotomine fauna in caves and compare the species of medical importance with those documented in previous studies conducted in the southeastern region, specifically in Minas Gerais, Rio de Janeiro, and São Paulo. Notably, there is no recorded research on cave fauna in the state of Espírito Santo. This research was conducted based on the review of the Brazilian cave-dwelling phlebotomine fauna published in 2022.

Keywords: Phlebotomine Fauna; Caves; Minas Gerais; *Lutzomyia longipalpis*; Leishmania

Abbreviations

ATL: American Tegumentary Leishmaniasis; CEIOC: Coleção Entomológica do Instituto Oswaldo Cruz.

Introduction

Phlebotomines (Diptera: Psychodidae) serve as invertebrate hosts for protozoan species of the genus *Leishmania* Ross, 1903 (Kinetoplastida, Trypanosomatidae), which cause leishmaniasis in humans and other mammals, such as pets: dogs, cats, horses, and wild animals such as: possum, armadillo, rodents, felines, sloths. These protozoa are transmitted through bites of infected female phlebotomine sandflies [1]. This information is relevant, considering that Leishmaniasis predominantly occur in rural areas and near forests. The anthropogenic environment facilitates the

existence and perpetuation of the vector species of American cutaneous leishmaniasis, adapted to this system, such as *Lutzomyia intermedia*, *L. whitmani*, and *L. migonei* [2]. In the Atlantic Forest, the population of *L. intermedia* is significantly smaller than that of other species. Hence, the importance of studying the cave-dwelling fauna. In Brazil, 279 species have been recorded to date, constituting 31% of all known species worldwide. Currently, the phlebotomine fauna of Brazilian caves comprises 110 species, representing approximately 36% of the species known in Brazil to date.

Those occurring in the southeastern region of Brazil and considered vectors of *Leishmania* are *Lutzomyia longipalpis*, *L. intermedia*, *L. migonei*, and *L. whitmani*. In 2022, a review of the phlebotomine fauna of Brazilian caves was published [3]. The objective of this research was to analyze the species of medical importance among the studies of the phlebotomine

fauna in caves in the southeastern region of Brazil (Figure 1).

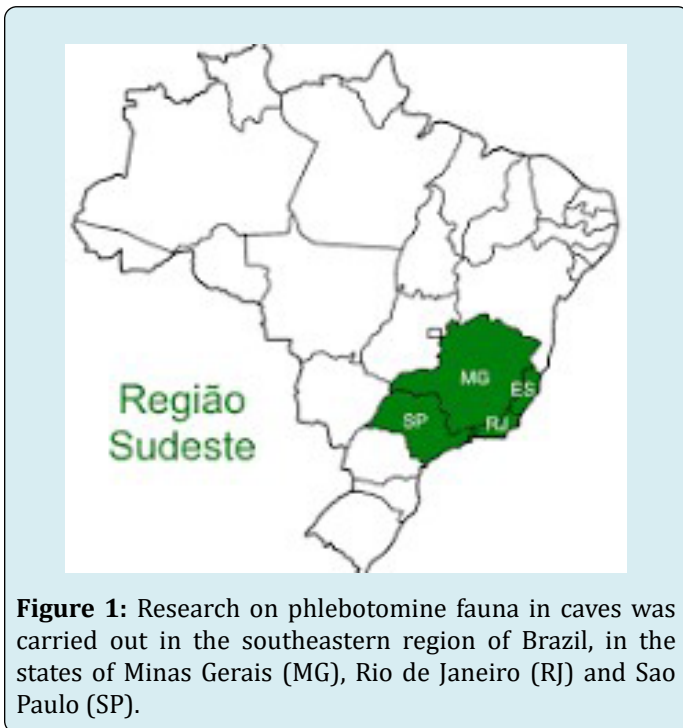


Figure 1: Research on phlebotomine fauna in caves was carried out in the southeastern region of Brazil, in the states of Minas Gerais (MG), Rio de Janeiro (RJ) and Sao Paulo (SP).

Materials and Methods

These data were obtained from a review article on the phlebotomine fauna of Brazilian caves [3]. The phlebotomine fauna of caves in the state of Rio de Janeiro was not recorded in this study, prompting us to conduct this update and analysis [4-6].

Results and Discussion

In the states of Minas Gerais and Rio de Janeiro, the species *L. migonei* and *L. whitmani* were recorded, whereas *L. longipalpis* and *L. intermedia* occurred in Sao Paulo and Minas Gerais.

Considering that the states of Minas Gerais, Rio de Janeiro, and São Paulo engage in ecotourism activities such as hunting, fishing, hiking, and camping in forested areas and that Minas Gerais and São Paulo are considered endemic regions for leishmaniasis, it is noteworthy that in 2022, 1,141 cases of cutaneous leishmaniasis were reported in the Southeast region, with 932 cases in Minas Gerais [7]. Between 2007 and 2017, 31 cases of cutaneous leishmaniasis were recorded in the municipality of Sumidouro and its neighboring areas. In the study area, two cases of ATL were documented, one of which was autochthonous, occurring near the studied cave region, where *Lutzomyia intermedia* was found in the vicinity. Additionally, *L. migonei* and *L. whitmani* were collected in the cave [4,6]. These findings

underscore the significance of detecting these species in caves and adjacent areas in the states of Minas Gerais and Rio de Janeiro.

Lutzomyia longipalpis, considered the primary vector of visceral leishmaniasis in the New World [8], was found exclusively in a cave in the state of São Paulo and Minas Gerais. The State Health Department of São Paulo confirmed the occurrence of 88 cases and nine deaths in 2022 [9]. These records highlight the importance of studying the phlebotomine fauna in caves.

Conclusion

The presence of these species within caves, inconclusive natural infection research, and ecotourism activities suggest the potential transmission of *Leishmania sp.* to humans and other mammals, with cases of leishmaniasis occurring near cave areas and settlements. Further research is needed to fully understand this reality.

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