

NEW RECORDS OF PHLEBOTOMINE FAUNA (DIPTERA, PSYCHODIDAE) IN THE AMANÃ SUSTAINABLE DEVELOPMENT RESERVE, AMAZONAS, BRAZIL

NOVOS REGISTROS SOBRE A FAUNA FLEBOTOMÍNICA (DIPTERA, PSYCHODIDAE) NA RESERVA DE DESENVOLVIMENTO SUSTENTÁVEL AMANÃ, AMAZONAS, BRASIL.

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KEY WORDS:

Vectors;

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Tefé, AM.

ABSTRACT

This paper presents the preliminary results of a survey of phlebotomine fauna collected in the Amanã Sustainable Development Reserve - Amanã SDR. This group of insects has public health importance due to the fact that they are vectors of Leishmaniasis. Over three days of collection, 440 specimens of nine species were identified, with two new records: one for Brazil and another for the State of Amazonas.

PALAVRAS - CHAVE:

Vetores;

Leishmaniose;

Tefé, AM.

RESUMO

O presente trabalho apresenta resultados preliminares da fauna flebotomínica da Reserva de Desenvolvimento Sustentável Amanã - RDS Amanã, onde foram realizadas coletas de levantamento deste grupo de insetos, que têm importância em saúde pública, devido ao fato de serem vetores de Leishmanioses. Em três dias de coleta, 440 espécimens de nove espécies foram identificados, com dois novos registros: um para o Brasil e outro para o estado do Amazonas.

INTRODUCTION

American tegumentary leishmaniasis (ATL) is a non-contagious infectious disease caused by a Trypanosomatid protozoa of the genus *Leishmania* that affects the skin and mucous membranes. In Brazil, phlebotomine sand flies are ATL vectors. They are from the family Psychodidae, belonging to the genus *Lutzomyia*. ATL is a health problem in 88 countries and is considered by the World Health Organization to be one of the six most important parasitic infectious diseases in the world (MINISTÉRIO DA SAÚDE/SECRETARIA DE VIGILÂNCIA EM SAÚDE, 2007 - Ministry of Health/Secretary of Health Inspection, 2007). In the last ten years, environmental or climatic changes, alterations resulting from anthropic actions, and possible changes in the distribution of tropical diseases have been analyzed by various authors (AMBROISE-THOMAS, 2000; CURTIS et al., 2000; PAATZ et al, 2000; PETNEY, 2001; MOLINEUX, 2006).

The Amanã Sustainable Development Reserve (Amanã RDS) was created because it represents a conservation unit of high ecological value, according to the Amanã RDS Demographic Census (2011). Its principle economic activities are agriculture, hunting, fishing and logging.

This is the first survey of phlebotomine fauna in the Amanã RDS. Phlebotomine sand flies were gathered in the Reserve in order to confirm the presence, and identify possible species, of vectors of leishmaniasis in the area.

MATERIAL AND METHODS

Area of study: Amanã RDS, located in the middle course of the Solimões River, approximately 650 km west of the municipality of Manaus (Figure 1).

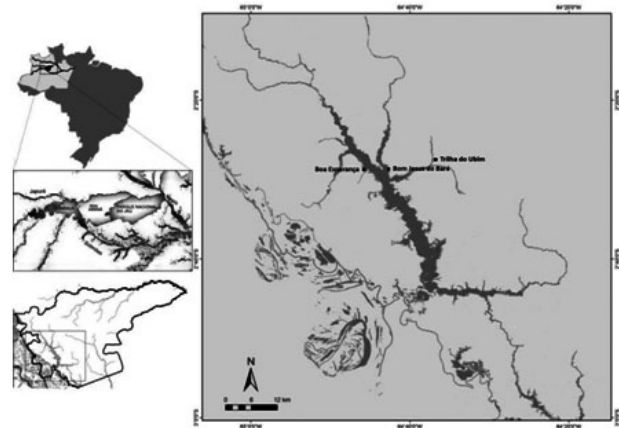


Figure 1 - Map with the locations of sampling sites (Comunidade Boa Esperança, Casa do Baré, and Trilha do Ubim).

Phlebotomine sand flies were caught in different locations: 1) Casa do Baré; 2) Trilha do Ubim and 3) Comunidade Boa Esperança. Four CDC light traps were used in each locality (SUDIA; CHAMBERLAIN, 1962). They were lit from 5:00 p.m. until 8:00 a.m. the next morning for three days in July of 2011. The traps were distributed in the following manner: 1) Casa do Baré: at the edge of the forest near the radio tower, at the manatee laboratory, and both inside and outside researcher housing; these areas are near the coordinates ($64^{\circ} 42' 31''$ W/ $-2^{\circ} 29' 26.44''$ S), with a variance of about 10 to 20 meters; 2) Trilha do Ubim ($64^{\circ} 40' 15''$ W/ $-2^{\circ} 29' 08''$ S) - the four traps were distributed along the trail: one at the “zero” point, another at the “one hundred” point, and the other two at

different points along the trail, with a variation of about 100 to 150 meters from the coordinates; 3) Comunidade Boa Esperança (64° 44' 47" W/ -2° 29' 14"S) - one in a hen house, another in a *capoeira* area, and the other two at the edge of the forest, all around 20 to 30 meters from the coordinates. The traps were placed on different consecutive days; only one day for each locality, from July 21 to 24, 2011, for a period of 15 hours for each trap.

The material collected was placed in jars with 70% alcohol. The phlebotomines were placed in Berlese's fluid between two glass slides with the aid of a Stereo Zeiss Stemi DV4 stereoscopic microscope. For taxonomic identification, the Young and Duncan (1994) key was used, with females being identified by the preoral cavity, ascoids of the antenna segments, and spermathecas; males were identified through the ascoids and genitalia. The mounted slides were photographed using a JVC 3 CCD digital camera combined with a Leica DM 100 trinocular optical microscope and a computer, using the Auto Montage 4.0 (Syncroscopy) program. After photographing and digitalization, the images were edited using Adobe Photoshop CS6. The nomenclature used for identification of the species was taken from Young and Duncan (1994).

The material collected was placed in the Prof. Paulo Bürnheim Zoological Collection at the Federal University of Amazonas (UFAM), in the Leônidas and Maria Deane Institute (ILMD - FIOCRUZ), and in the Amazônia Research Institute (INPA).

RESULTS AND DISCUSSION

In total, 440 phlebotomine sand flies were collected, including 263 males and 177 females across nine species (Table 1). Some of these have medical importance: (*Psychodopygus davisi* (ROOT, 1934), which is suspected of transmitting *Leishmania (Viannia) naiffi* and *L. (Trichophoromyia) ubiquitous* (MANGABEIRA, 1942), which is a probable transmitter of *Leishmania (Viannia) lainsoni* (GIL et al., 2003; LAINSON et al., 1992). The presence of *L. caprina* (OSORNO-MESA; MORALES; OSORNO, 1972) in the collections is the first registration of that species in Brazil. It had previously been recorded only in Colombia and Peru (Figure 2). Also, *L. flochi* (ABONNENC; CHASSIGNET, 1948), registered in the states of Acre and Rondônia, was collected in the state of Amazonas. Some females of the subgenus *Trychophoromyia* were collected, but due to the similarity of their spermathecas, it was impossible to identify the species; we believe they are females in this subgenus that have not yet been described, as females have been described in only 11 of the 35 species (YOUNG; DUNCAN, 1994). For northern Brazil, 166 species of phlebotomine sand flies have been registered (AGUIAR; MEDEIROS, 2003); therefore, the number of species collected in the area under study is considered to be low, probably due to the transitional environments between the floodplains and dry land, and also due to sample size.

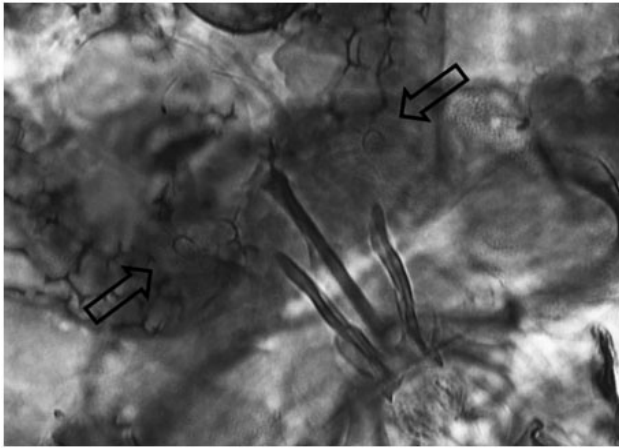


Figure 2 - *Lutzomyia (Viannamyia) caprina* - spermatheca of female caught in Amanã RDS, July 2011.

OBS. As setas em preto mostram a espermatoca (*L. caprina*), que é usada como caráter taxonômico para identificação das fêmeas de flebotomíneos.

Table 1 - Number of species of phlebotomine sand flies collected and their abundance in Amanã RDS, July 2011.

| Species | Males | Females | M/F (%) |
|--|------------|------------|--------------|
| <i>L. (Viannamyia) caprina</i> | - | 1 | 0.2 |
| <i>L. (Psychodopygus) carrerai</i> | 10 | 5 | 3.4 |
| <i>L. (Psychodopygus) davisi</i> | 25 | 18 | 9.7 |
| <i>L. (Trichophoromyia) flochi</i> | 20 | - | 4.5 |
| <i>L. (Psychodopygus)hirsuta</i> | 13 | 9 | 5.0 |
| <i>L. (Trichophoromyia) lopesi</i> | 170 | - | 39.0 |
| <i>L. (Sciopemyia)preclara</i> | 1 | - | 0.2 |
| <i>L. saulensis (Saulensis group)</i> | 8 | 5 | 2.9 |
| <i>L. (Trichophoromyia)ubiquitalis</i> | 16 | 11 | 6.1 |
| <i>L. (Trichophoromyia) sp.</i> | - | 128 | 29.0 |
| Total | 263 | 177 | 100.0 |

CONCLUSIONS

Undertaking new collections will be fundamental for maintaining entomological and epidemiological surveillance in the Amanã RDS in particular because the majority of the specimens were collected at the forest's edge around Casa do Baré. In Comunidade Boa Esperança, where a case of ATL was diagnosed, at least three species of

vectors of leishmaniasis were detected (*L. davisi*, *L. ubiquitalis* and, *L. hirsuta*). Combined with new records, this justifies greater research into local phlebotomine sand flies, which reinforces the importance of knowledge of the diversity of phlebotomine sand flies present in the Mamirauá and Amanã Sustainable Development Reserves.

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