Data on sand fly fauna (Diptera, Psychodidae, Phlebotominae) in Itatiaia National Park, Rio de Janeiro State, Brazil

Dados sobre a fauna flebotomínica (Diptera, Psychodidae, Phlebotominae) do Parque Nacional de Itatiaia, Estado do Rio de Janeiro, Brasil

Abstract

The sand fly fauna in Itatiaia National Park, Rio de Janeiro, Brazil, was investigated in different habitats ranging from sylvatic areas to those altered by human activity related to ecotourism, specifically identifying species that have been suggested as potential leishmaniasis vectors. Sand flies were captured from June 2002 to March 2004, using CDC light traps and Shannon traps. A total of 1,256 sand fly specimens were captured, from species belonging to genera Lutzomyia and Brumptomyia: Brumptomyia guimaraesi, B. troglodytes, Lutzomyia (Lutzomyia) amarali, L. lanei, L. migonei, L. sallesi, L. edwardsi, L. tupynambai, L. (Psathyromyia) pessoai, L. (Ps.) bianchigalatie, L. rupicola, L. (Psathyromyia) shannoni, L. pascalei, L. (Psychodopygus) matosi, L. (Ps.) davisi, L. (Ps.) hirsuta hirsuta, L. (Ps.) ayrozai, L. peresi, L. monticola, and L. misionensis. Worthy of special attention were four species that are considered potential leishmaniasis vectors in Brazil: L. ayrozai, L. hirsuta hirsuta, L. migonei, and L. davisi, representing 19.19% of the specimens captured in this study.

Psychodidae; Leishmaniasis; Disease Vectors

Introduction

Itatiaia National Park in Rio de Janeiro State is the oldest officially demarcated environmental conservation unit in Brazil and is characterized by considerable biodiversity, while still presenting inexhaustible potential for developing research in various fields of knowledge.

As recommended previously in the Handbook for Surveillance and Control of Visceral Leishmaniasis published by the Health Surveillance Secretariat of the Brazilian Ministry of Health 1, entomological surveys aim to obtain quantitative and qualitative information on sand fly vectors with the key objective of verifying vector presence in locations and municipalities (or counties) without human cases (so-called “silent” municipalities).

The current study assesses the presence of sand fly species in environments that have been ecologically altered by human activity and identifies potential leishmaniasis vectors in Itatiaia National Park.

Materials and methods

Study area description

Itatiaia National Park is a federal conservation unit that was created in June 14, 1937, as Brazil’s first national park. It is located in the Itatiaia
Massif on the highest portion of the Mantiqueira mountain range, in southwestern Rio de Janeiro State, on land located in the municipalities of Resende and Itatiaia, and in southern Minas Gerais State, in the municipalities of Bocaina de Minas, Alagoa, and Itamonte (Figure 1), between latitudes 22°19’ and 22°45’ S and longitudes 44°45’ and 44°50’ W. With altitudes varying from 700 to 2,787m and peaks including Agulhas Negras, the fifth highest in Brazil, the Park extends along a 10km-wide strip with a total area of 120,000 hectares.

Itatiaia National Park has a mesothermal climate and a mountainous and rocky relief, thus the original name (Itatiaia means “rock full of points” in the indigenous Tupi-Guarani language). With such variation in altitudes, the region displays different types of vegetation, such as the Moun-

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Figure 1

Map with the location of Itatiaia National Park, States of Rio de Janeiro and Minas Gerais, Brazil. June 2002-March/2004. (A) Stations of sand fly collections and (B) some informations about the Itatiaia National Park.

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(A) ▲ Station I; • Station II; ◀ Station III; ● Station IV; ■ Station V; ♦ Station VI.
(B) — Rivers; — Railroad; — Path; ▼ Rafting; ▶ Waterfall; □ Hotel.
tainous Atlantic Rainforest and the Mountainous Dense Ombrophilous Forest.

Sand fly captures

Sand flies were captured from June 2002 to June 2003, three times a month, and from July 2003 to February 2004, twice a month, except for December 2002, January 2003, November 2003, and February 2004, at six stations distributed along the lower portion of Itatiaia National Park: Station I (Pedra Fundamental), Station II (Atalho da Brigada), Station III (shelters for hikers/climbers), Station IV (barbecue pits), Station V (Blue Lake), and Station VI (Véu da Noiva Waterfall) (Figure 1), using a total of five CDC-type light traps at Stations I, II, III, IV, and V, from 18:00 to 6:00h and Shannon traps at Stations I, V, and VI from 18:00 to 20:00h. Capture time totaled 2,020 hours (40 with Shannon traps and 1,980 with CDC light traps).

During captures, mean temperature remained close to 16.7°C, ranging from 8°C to 29.5°C, while relative humidity ranged from 72 to 93%, with a mean of approximately 83.72%, and annual rainfall ranged from 1,800 to 2,100mm.

The sand flies were identified as follows, as proposed by Young & Duncan.

Evaluation of anthropophilic species included the sand flies that bit the collectors who were using the Shannon trap.

The study is the result of an agreement between the Oswaldo Cruz Foundation (FIOCRUZ) and the Brazilian Institute of the Environment and Renewable Resources (IBAMA) (Technical Cooperation Term no. 12/2002) and received Environmental Conservation Unit Research Permit no. 153/2003.

Results

A total of 1,256 sand flies (Table 1) were collected in 2,020 capture hours, including the following: Brumptomyia guimaraesi (Coutinho & Barreto, 1941), B. troglodytes (Lutz, 1922), Lutzomyia (Lutzomyia) amarali (Barreto & Coutinho, 1940),

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M = male; F = female.
Table 2


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| Brumptomyia troglodytes  | 2 | 23 | – | – | – | – | – | – | 25
| Lutzomyia amarali        | 3 | – | – | – | – | – | – | – | 3
| Lutzomyia lanei          | 12 | 4 | – | – | – | – | – | – | 16
| Lutzomyia migonei        | – | 3 | – | – | – | – | – | – | 3
| Lutzomyia sallesi        | – | 1 | – | – | – | – | – | – | 1
| Lutzomyia edwardsi       | 4 | 2 | – | – | – | – | – | – | 6
| Lutzomyia tupynambai     | 13 | 7 | – | – | – | – | – | – | 20
| Lutzomyia pessoai        | 1 | – | – | – | – | – | – | – | 1
| Lutzomyia bianchigalatiae| 2 | – | 8 | 1 | 11 | – | – | – | 22
| Lutzomyia rupicola       | – | 6 | – | – | – | – | – | – | 6
| Lutzomyia shannoni       | 2 | – | 2 | – | 3 | – | – | – | 7
| Lutzomyia pascalei       | 78 | 101 | 4 | 25 | – | – | – | – | 208
| Lutzomyia matosi         | 13 | 13 | 117 | 120 | – | – | – | – | 263
| Lutzomyia davisi         | 2 | – | 3 | – | – | – | – | – | 5
| Lutzomyia hirsuta hirsuta| 5 | 4 | 3 | – | 1 | – | – | – | 13
| Lutzomyia ayozaí         | 21 | 46 | 45 | 14 | 91 | 3 | 220 |
| Lutzomyia peresi         | – | – | – | – | 1 | – | – | – | 1
| Lutzomyia monticola      | 13 | 1 | – | 89 | 322 | – | 425 |
| Lutzomyia misionensis    | 6 | – | – | – | – | – | – | – | 6
| Total                    | 175 | 216 | 271 | 160 | 431 | 3 | 1,256 |

M = male; F = female.
species proved to be highly anthropophilic and was found naturally infected with *L. (V.) naiffi*.

*L. hirsuta hirsuta* has been recorded in the State of Rio de Janeiro in areas where the plant cover is still preserved. In 1985, *L. h. hirsuta* was found naturally infected with *Leishmania (Vian- nia)* sp. in Além Paraíba, Minas Gerais State. In a cutaneous leishmaniasis transmission area in the State of Rondônia, this sand fly was found naturally infected with *L. (V.) braziliensis* in Baturité, Ceará State. In the State of Rio de Janeiro, considering its anthropophilic habits and the fact that it was recently found naturally infected with *L. (V.) braziliensis* at the Juliano Moreira mental health facility in Jacarepaguá, the species could be considered a secondary cutaneous leishmaniasis vector.

In a comparative analysis, the captures performed at Pedra Fundamental (Station I) produced more species and specimens, with a high frequency of *L. matosi*. Interestingly, the captures at Véu de Noiva Waterfall (Station VI) produced a limited diversity of species (only two) but included the second largest number of specimens.

Some species were collected biting humans: *L. bianchigalatie*, *L. hirsuta hirsuta*, *L. ayrozai*, and especially *L. monticola* (Table 2). Of the 425 specimens captured, 76.4% were biting humans.

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**Contributors**

E. F. Rangel, A. C. R. Azevedo, M. M. S. Afonso, M. L. Vilela, S. M. Costa, and W. A. Costa, participated in the fieldwork (sand fly captures), taxonomy (specimen identification), and analysis of the results.

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**Resumo**

References


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