

Research Article

Evandromyia cortelezzii (Diptera: Psychodidae: Phlebotominae) in an Endemic Area of Leishmaniasis, Lavras, Brazil

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Submitted: 28 February 2018

Accepted: 26 March 2018

Published: 29 March 2018

ISSN: 2475-9430

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Keywords

- Sand fly
- *Leishmania*
- Vector-borne disease

Abstract

The eco-epidemiology of leishmaniasis is driven by the presence of sand flies that serve as vectors infecting humans with *Leishmania* spp. parasites. The emergence and re-emergence of this disease across Latin America calls for further studies to identify geographical distribution of vectors and reservoir species associated. This is the first report of *Evandromyia cortelezzii* (Brèthes) occurrence at the urban area of Lavras, Minas Gerais State, Brazil. The sand flies were captured with HP luminous traps, during an investigative study. Nine specimens were collected and classified into the genus *Evandromyia*.

INTRODUCTION

Leishmaniasis is a vector-borne disease that affects approximately 12 million people in more than 98 countries. The disease remains a public health problem worldwide that can occur in cutaneous and visceral forms [1], caused by different species of *Leishmania* genus which transmit the disease to humans through phlebotominae bites [2].

In the Neotropical region, several phlebotominae species (Diptera: Psychodidae: Phlebotominae) are involved in the transmission of the disease. The subfamily Phlebotominae consists of about 800 species known worldwide and 98 of these are vectors proven or suspected of transmitting *Leishmania* sp., being among these species of the genus *Evandromyia* [3,4].

During the period from 2004 to September 2013, the Health Environmental Surveillance reported five cases of human ACL and more than 1,200 dogs infected with *L. infantum* (= *L. chagasi*) in the municipality of Lavras. Due to the risk of transmission of cutaneous and visceral leishmaniasis in Lavras, an entomological survey of phlebotominae sand flies was carried out in the city, aiming at detecting the presence of the vectors and to investigate the autochthony of the registered cases of the diseases. The geographical distribution of the sand flies species depends on their ability to adapt to different ecological niches [5]. In this way, knowledge about local phlebotominae fauna composition and the

behavior of sand flies species helps shed light on several aspects involved in the transmission of leishmaniasis and has been the focus of several investigations [6-8].

MATERIAL AND METHODS

Lavras is a city in Southern Minas Gerais state, Brazil; located at an altitude of 919 m. It has a population density of roughly 99,229 inhabitants and an area of the city is 564.7 km² (IBGE 2014).

The climate of the areas is of the CWA type according to the Köppen classification, with an average annual temperature of 19°C and average annual rainfall of 1,530 mm. In the soil sampling period, the temperature variation ranged from 10.0 to 33.8°C with an average temperature of 28°C and average precipitation of 14 mm (Meteorological Station of the Federal University of Lavras - UFLA). The town native vegetation is represented by a mosaic of different phytophysognomies of forest and Cerrado, which have been partially by substituted by pastures and agricultural crops, only small fragments of native vegetation remaining, usually quite anthropized [9].

The captures were undertaken by the teams from the Ambiental Surveillance and from the BIOPAR laboratory of the Universidade Federal de Lavras (BIOPAR/UFLA), in October 2014. The entomological survey was performed during three

consecutive nights for 12h per night (6:00pm to 6:00am). Twenty HP light traps were installed being ten in the urban area and ten in the rural area.

The second and most current source of information for the sand flies classification of the New World was proposed by [10]. Females were identified by transferring the guts of the sand flies to a drop of buffered saline on a microscope slide using a pair of mounted entomological pins. A cover slip was then placed over the drop and the thorax, sperm thecae and cibarium were examined under an optical microscope. The male specimens were prepared and mounted. A cover slip was then placed over the drop and the thorax and cibarium were examined under an optical microscope.

RESULTS AND DISCUSSION

During the period of September 2014 to October 2014, a total of nine phlebotomine as were collected and identified (5 male and 4 female) collected in the urban area were identified as belonging to the species *Evandromyia cortelezzii*.

The species *E. sallesi*, *E. spelunca*, *E. cortelezzii* and *E. corumbaensis*, are part of the complex *cortelezzii* [9,11]. These species have many similar morphological characteristics, generating errors in identification. Because of this difficulty, allied the morphological parameters, information on the geographical distribution are used to guide the classification of different species to each other, which further increases the importance of the reports of these flies in the entire Brazilian territory [11].

Evandromyia cortelezzii is present in many regions in Brazil. It was demonstrated that the three species of the complex *cortelezzii* including *Evandromyia cortelezzii* occur in all states of the Center-west Region, in the Southeast Region and Northeast Region [9,12,13]. The natural infections by the *Leishmania* spp. in this specie of sand flies are described in this country [14].

Although it is not considered an important species in the epidemiology of leishmaniasis in Brazil, *Evandromyia cortelezzii* has aroused scientific interest by virtue of its having been found naturally infected by *Leishmania infantum* in an endemic area for ACL in Argentina [15]. The authors found *Evandromyia cortelezzii* females naturally infected, thus reinforcing the hypothesis that the members of the *cortelezzii* complex act as vectors of the disease [15]. In that country it is considered to be the probable secondary vector species both for AVL and ACL [16].

In the present work, although the number of captured *Evandromyia cortelezzii* specimens was small, this species is rarely abundant in entomological surveys of sand flies in Brazilian leishmaniasis transmission areas [17]. Despite the low densities found, this is the first report of *Evandromyia cortelezzii* in the municipality of Lavras. The present record not only contributes to our knowledge of the geographical distribution of sand flies, but can also contribute to the epidemiology of leishmaniasis, including the possibility of new species in the transmission of the parasites.

ACKNOWLEDGEMENTS

The authors are thankful Andrey José de Andrade for all support during this work. This work was supported by Fundação de Amparo à Pesquisa de Minas Gerais (APQ 02553-14), Conselho Nacional de Desenvolvimento Científico e Tecnológico, Brazil and CAPES.

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Cite this article

Milagres TF, Castro JC, Moulin DI, Blanco YAC, Alvarenga IM, et al. (2018) *Evandromyia Cortezzi* (Diptera: Psychodidae: Phlebotominae) in an Endemic Area of Leishmaniasis, Lavras, Brazil. *Ann Clin Cytol Pathol* 4(1): 1098.