
PHLEBOTOMINE SANDFLIES

OF AN URBAN FOCUS OF

VISCERAL LEISHMANIOSIS,

PERNAMBUCO STATE

Filipe Dantas-Torres,¹ Francisco de Assis Almeida² and Sinval Pinto Brandão-Filho³

ABSTRACT

We have recently found a high prevalence of anti-*Leishmania* antibodies among pet dogs in an urban area of the municipality of Paulista, coast of Pernambuco State, where cases of visceral leishmaniosis have sporadically been reported. In the present communication, preliminary notes on the phlebotomine sandflies (Diptera: Psychodidae) of Paulista are given.

KEYWORDS: *Lutzomyia longipalpis*. Visceral leishmaniosis. Urban area. Brazil.

Visceral leishmaniosis is by far the most severe form of leishmaniosis and continues to be a serious public health problem worldwide. In the Americas, this zoonosis was previously known as a typically rural disease. In recent years, however, visceral leishmaniosis has become endemic in large urban areas, particularly in Brazil (Dantas-Torres & Brandão-Filho, 2006a). In the attempt to improve the current understanding of the epidemiology of visceral leishmaniosis in urban areas of Brazil, we have recently carried out a cross-sectional survey on canine leishmaniosis in the municipality of Paulista, State of Pernambuco, where human cases of visceral leishmaniosis have sporadically been reported. The prevalence of anti-*Leishmania* antibodies among pet dogs was 40.3% (Dantas-Torres et al., 2006), which is the highest reported in Pernambuco (Dantas-Torres, 2006). This is of particular concern, because dogs are the principal domestic reservoir hosts of the aetiological agent of visceral leishmaniosis. From 1990 to 2001, a total of 30 cases

1 Departamento de Imunologia, Centro de Pesquisas Aggeu Magalhães (CPqAM), Fundação Oswaldo Cruz (FIOCRUZ).

2 Fundação Nacional de Saúde (FNS), Coordenação Regional de Pernambuco.

Financial support: Fundação de Amparo à Ciência e Tecnologia do Estado de Pernambuco (FACEPE)

Corresponding address: Sinval P. Brandão-Filho. Departamento de Imunologia, CPqAM/FIOCRUZ, Avenida Moraes Rego, s/n, Campus UFPE. CEP 50670-420, Recife, Pernambuco. E-mail: sinval@cpqam.fiocruz.br

Recebido para publicação em 5/5/2006. Revisto em 15/9/2006. Aceito em 20/9/2006.

of visceral leishmaniosis was reported in Paulista (Dantas-Torres & Brandão-Filho, 2006b). Although *Lutzomyia longipalpis* (Diptera: Psychodidae) is known to occur in this area (Dantas-Torres et al., 2004), information about the phlebotomine sandfly fauna of Paulista is scarce. This preliminary note describes the phlebotomine sandfly collected in this municipality of Pernambuco.

Paulista (latitude 07°56'27"S, longitude 34°52'23"W, altitude 13 m) is located in the metropolitan region of Recife (Figure 1), the most highly urbanized area of Pernambuco. The climate is tropical with the rainy period concentrated in autumn and winter (February to June). Average annual air temperature is 25.8°C, varying from 24 to 26°C. Relative air humidity ranges from 72.5 to 85% and the annual pluviometric index is often over than 1,600mm. Total land area of Paulista is about 94 sq km. Although the vegetation coverage is scanty, there are some small areas of residual secondary forest and some fruit trees, mainly banana plants.

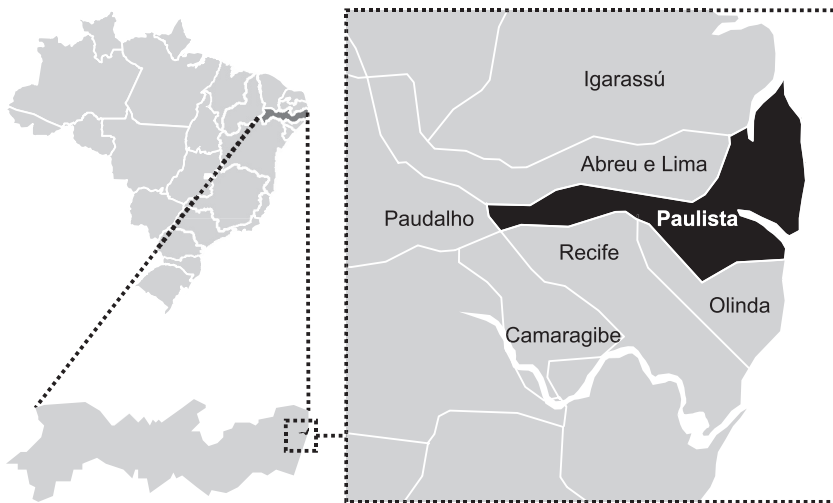


Figure 1. Location of the study area.

Prior to the phlebotomine sandfly collections, five houses were selected based on the following criteria: their proximity to residual secondary forests, presence of domestic dogs and livestock in the backyards, and their proximity to houses where cases of visceral leishmaniosis have recently been reported. CDC light traps were placed at a height of one meter above the ground level, both inside and outside the houses selected (close to animal shelters). The traps were operated between 6:00 pm and 6:00 am. Manual collections were also carried out. In this case, we spent 15–20 minutes inside and outside of each house, between 6:00 and 8:00 pm. The collections of phlebotomine sandflies took place every first week of each month, during three consecutive days, from October 2005 to January 2006. All

the specimens captured were kept in 70% alcohol until processing for identification, according to traditional taxonomic keys for New World phlebotomine sandflies (Young & Duncan, 1994).

All phlebotomine sandflies captured were identified as *Lutzomyia longipalpis*, which is the principal vector of the causal agent of visceral leishmaniasis in the New World (Lainson & Rangel, 2005). *Lutzomyia longipalpis* was found in all the houses where the collections were carried out. Since this is a preliminary study and the number of specimens per collection was very low (n = 86), no further quantitative data were provided.

Most of the specimens collected were males (2 females/84 males). No phlebotomine sandfly was collected inside the houses, indicating some degree of exophily, exophagy or both. In the manual collections, most of the specimens were collected on horses and in the walls of chicken houses, which are frequently found in the backyards of houses in the area studied. According to our field observations, horses were the blood source most preferable by *Lutzomyia longipalpis*. Likewise, hens appeared to be highly attractive to the phlebotomine sandflies. In previous studies on visceral leishmaniasis in urban areas of Brazil, the proximity of hen houses has been seen as a possible environmental risk factor for the disease in humans (Arias et al., 1996). Chickens are undoubtedly attractive for females of *Lutzomyia longipalpis*. On the other hand, chickens are unable to sustain infections with *Leishmania* parasites. For this reason, the relationship between chicken raising and visceral leishmaniasis is still not well understood (Alexander et al., 2002).

In the houses where the captures were made, the soil was rich in organic matter, such as the feces of livestock and garbage. Furthermore, the soil is poorly drained and retains some humidity throughout the year. These conditions are important for the establishment of phlebotomine sandfly populations (Killick-Kendrick, 1999; Feliciangeli, 2004). The soil of animal shelters is a well known ecotope for immature stages of certain species of phlebotomine sandflies, such as *Lutzomyia longipalpis* (Feliciangeli, 2004). There is a small secondary forest next to the five selected houses. Some of these houses were built almost within the forest. There appears to be some relationship between sites with *Lutzomyia longipalpis* and forest closeness (Lainson & Rangel, 2005).

Despite its urban features, Paulista still retains some rural characteristics, such as the presence of livestock in the backyards, and small areas of residual secondary forest, favoring the establishment of phlebotomine sandfly populations throughout the year. In view of the high seroprevalence of canine leishmaniasis (Dantas-Torres et al., 2006) and the poor living conditions of certain communities (e.g., Tururu) of Paulista, the present results indicate that there is a risk of future outbreaks of visceral leishmaniasis in the municipality of Pernambuco.

Further studies focusing on the seasonality of the phlebotomine sandfly fauna of Paulista and its natural infection rate should be undertaken. It is important to verify the prevalence of *Leishmania* infection in pet and stray dogs and also to

identify the species of *Leishmania* circulating within this canine population. Finally, a monitoring system ought to be implemented to diagnose human cases of visceral leishmaniasis in order to provide them all with early treatment.

ACKNOWLEDGMENTS

We are indebted to the Secretaria Municipal de Saúde of Paulista and the Secretaria Estadual de Saúde of Pernambuco for their help with the field collections. The first author is receiving a scholarship from the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

RESUMO

Flebotomíneos de um foco urbano de leishmaniose visceral no Estado de Pernambuco.

Em estudo recente, detectamos uma elevada prevalência de anticorpos anti-*Leishmania* entre cães domiciliados numa área urbana do município de Paulista, litoral do Estado de Pernambuco, onde casos humanos de leishmaniose visceral têm sido esporadicamente registrados. Na presente comunicação, são fornecidas notas preliminares sobre os flebotomíneos (Diptera: Psychodidae) de Paulista.

DESCRITORES: *Lutzomyia longipalpis*. Leishmaniose visceral. Área urbana. Brasil.

REFERENCES

1. Alexander B, De Carvalho RL, McCallum H, Pereira MH. Role of the domestic chicken (*Gallus gallus*) in the epidemiology of urban visceral leishmaniasis in Brazil. *Emerg Infect Dis* 8: 1480-1485, 2002.
2. Arias JR, Monteiro OS, Zicker F. The reemergence of visceral leishmaniasis in Brazil. *Emerg Infect Dis* 2: 145-146, 1996.
3. Dantas-Torres F. Situação atual da epidemiologia da leishmaniose visceral em Pernambuco. *Rev Saude Publica* 40: 537-541, 2006.
4. Dantas-Torres F, Francisco D, Brandão-Filho SP. Análise situacional da leishmaniose visceral no município de Paulista, Pernambuco, nordeste do Brasil. In: Congresso Norte Nordeste de Zoonoses e Bem Estar Animal, 1., 2004, Natal. *Anais...* Secretaria Municipal de Saúde, 2004. CD-ROM.
5. Dantas-Torres F, Brandão-Filho SP. Visceral leishmaniasis in Brazil: revisiting paradigms of epidemiology and control. *Rev Inst Med Trop Sao Paulo* 48: 151-156, 2006a.
6. Dantas-Torres F, Brandão-Filho SP. Expansão geográfica da leishmaniose visceral no Estado de Pernambuco. *Rev Soc Bras Med Trop* 39: 352-356, 2006b.
7. Dantas-Torres F, Brito MEF, Brandão-Filho SP. Seroepidemiological survey on canine leishmaniasis among dogs from an urban area of Brazil. *Vet Parasitol* 140: 54-60, 2006.
8. Feliciangeli MD. Natural breeding places of phlebotomine sandflies. *Med Vet Entomol* 18: 71-80, 2004.
9. Killick-Kendrick R. The biology of phlebotomine sand flies. *Clin Dermatol* 17: 279-289, 1999.
10. Lainson R, Rangel EF. *Lutzomyia longipalpis* and the ecoepidemiology of American visceral leishmaniasis, with particular reference to Brazil: a review. *Mem Inst Oswaldo Cruz* 100: 811-827, 2005.
11. Young GD, Duncan MA. Guide to the identification and geographic distribution of *Lutzomyia* sand flies in Mexico, The West Indies, Central and South America (Diptera: Psychodidae). *Mem Amer Ent Inst* 54: 1-881, 1994.