Research Note

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Phlebotomine fauna (Diptera: Psychodidae: Phlebotominae) in a residential area and in a fragment of savanna vegetation in the municipality of Pontal do Araguaia, Mato Grosso, Brazil

Fauna flebotomínica (Diptera: Psychodidae: Phlebotominae) em área residencial e em fragmento de cerrado no município de Pontal do Araguaia, Mato Grosso, Brasil

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Abstract

Identification of phlebotomine species in endemic areas is fundamental for analyzing the eco-epidemiological determinants of leishmaniasis. This study had the aim of investigating the phlebotomine fauna in an urban area and in a fragment of native savanna in the municipality of Pontal do Araguaia, State of Mato Grosso, Brazil, using CDC light traps. One hundred and twenty-three phlebotomine specimens belonging to seventeen different species were caught. Our results indicate synanthropic potential among vector species for leishmaniasis, such as the species *Lutzomyia cruzi, L. sallesi* and *L. whitmani.* The species *L. cerradincola* had never been recorded in this region, such that this is the first report of this species in the State of Mato Grosso.

Keywords: Mato Grosso, Leishmaniasis, *Lutzomyia cerradincola,* Phlebotomines.

Resumo

A identificação das espécies de flebotomíneos em áreas endêmicas é fundamental para analisar os determinantes eco-epidemiológicos das leishmanioses. Este trabalho teve como objetivo verificar a fauna flebotomínica em área urbana e em fragmento de cerrado nativo no município de Pontal do Araguaia, Mato Grosso utilizando armadilhas luminosas tipo CDC. Foram capturados 123 flebotomíneos pertencentes a 17 espécies diferentes. Nossos resultados indicam potencial sinantrópico de espécies vetoras das leishmanioses, como as espécies *Lutzomyia cruzi*, *L. sallesi* e *L. whitmani.* A espécie *L. cerradincola* não havia sido registrada na região, sendo este o primeiro relato desta espécie no Estado de Mato Grosso.

Palavras-chave: Mato Grosso, Leishmanioses, *Lutzomyia cerradincola,* Flebotomíneos.

Identification of phlebotomine species in endemic areas is of fundamental importance for assessing the eco-epidemiological determinants of leishmaniasis. This disease constitutes a serious public health problem in Brazil. In the municipality of Pontal do Araguaia (15° 50' 43" S and 52° 00' 33" W), which is located in the middle Araguaia region of the State of Mato Grosso, the numbers of cases of American tegmental leishmaniasis (ATL) have increased by around 350% over the last five years (DATASUS, 2010). Entomological investigations carried out in this municipality have indicated that vector species both for American visceral leishmaniasis (AVL), i.e. *Lutzomyia longipalpis* (Lutz & Neiva, 1912) and *L. cruzi* (Mangabeira, 1938) (MISSAWA et al., 2008) and for LTA, i.e. *L. whitmani* (Antunes & Coutinho, 1939) (ZEILHOFER, 2008) are present. However, surveys on the presence of secondary species and the synanthropic potential of wild species of phlebotomines have not yet been conducted. Thus, the present study had the aim of investigating the phlebotomine fauna in an urban area and in a fragment of native savanna in the municipality of Pontal do Araguaia.

The urban area considered for specimen collection consisted of a residential area in this municipality, while the fragment of native savanna considered was an area on the Araguaia university campus of the Federal University of Mato Grosso (UFMT), which is located six kilometers from the city of Pontal do Araguaia. The collections were carried out between August 22 and 28, 2009, between the times of 05:00 PM and 07:00 AM hours, thus totaling

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seven nights of specimen collection. Five Centers for Disease Control (CDC) light traps were used in each area (SUDIA; CHAMBERLAIN, 1962), positioned at 50 cm from the ground and at around 50 m from each other, in each area studied. The insects that were caught were sacrificed using cotton wool soaked in ethyl acetate and were transported to the Biology Laboratory of UFMT, on the Araguaia university campus, Pontal do Araguaia, Mato Grosso. Subsequently, the specimens were processed and mounted in Canada balsam, between a slide and cover slip. The identification procedure followed the classification proposed by Young and Duncan (1994).

Table 1 shows the total numbers of phlebotomine specimens caught in the residential area or in the fragment of savanna during the study period. In the cases of 11 specimens (8.94%), it was only possible to identify them down to genus level, and these were determined as *Lutzomyia* sp. (França, 1924). It was observed that among the 123 insects that were caught, 30 individuals (24.4%) belonged to two species of phlebotomines of the genus *Brumptomyia* (França & Parrot, 1921). The insects of this genus have not been incriminated in maintaining the transmission cycle of leishmaniasis, since they have restricted zoophilic habits (FORATTINI, 1973). After these species, the next most abundant species was *Lutzomyia sallesi* (Galvão & Coutinho 1939), with 23 individuals caught (18.7%). Recently, the parasite *Leishmania chagasi* (Cunha & Chagas 1937), the species that causes AVL (SARAIVA et al., 2009), was isolated from this species. The presence of *L. cruzi* (eight individuals or 6.5%) was also noted: this species has also been implicated in AVL transmission. Among the other species identified, only *L. whitmani* (seven specimens or 5.7%) is considered to be an important vector species for transmission of *L. brasiliensis* (Vianna 1911), which is the etiological agent for ATL (CUTOLO; VON ZUBEN, 2008). The females of the species *L. carmelinoi* (Ryan, Fraiha, Lainson & Shaw 1986) and *L. lenti* (Mangabeira 1938) are morphologically very similar and traditional identification does not allow distinction between the females of these species. In turn, the males of these species were differentiated by observing the tip of the genital filament. Given the impossibility of distinguishing between the females of these two species, the females obtained were arbitrarily classified as belonging to the species *L. carmelinoi*, because a greater number of males of this species had been identified. Although these species were caught in considerable proportions in the residential area, there is no evidence that they could be vectors for leishmaniasis in Brazil (ANDRADE FILHO et al., 2001).

The low capture frequencies of other species, such as: *Lutzomyia walkeri* (Newstead 1914) (4.9%), *L. sordellii* (Shannon & Del Ponte 1927) (4.1%), *L. cerradincola* (Galati, Nunes, Oshiro & Dorval 1995) (2.44%), *L. termitophila* (Martins, Falcão & Silva 1964) (1.62%), *L. saulensis* (Floch & Abonnenc 1944) (0.81%), *L. inflata* (Floch & Abonnenc, 1944) (0.81%) and *L. goiana* (Martins, Falcão & Silva 1962) (0.81%), can be explained by the presumption that in any given locality, only a small number of species will be encountered in abundance. These species would therefore be the determinant species in the community, while most other species would be represented by relatively few individuals (RICKLEFS, 2003; ALMEIDA et al., 2010). The species *L. cerradincola* had never been recorded in this region, such that this is the first report of this species in the State of Mato Grosso.

Table 1. Numbers and percentages of phlebotomines caught using CDC light traps, according to species, sex and environment, in the municipality of Pontal do Araguaia, Mato Grosso, between August 22 and 28, 2009. H = Shannon diversity index.

Species	Residential area		Fragment of savanna		Total	%
	♂	♀	♂	♀		
Brumptomyia brumpti	13	12	4	-	29	23.50
Brumptomyia pintoi	1	-	-	-	1	0.81
Lutzomyia carmelinoi	3	3	11	2	19	15.45
Lutzomyia walkeri	1	2	-	3	6	4.90
Lutzomyia sallesi	9	14	-	-	23	18.7
Lutzomyia whitmani	4	2	-	1	7	5.70
Lutzomyia sordellii	1	4	-	-	5	4.10
Lutzomyia lenti	1	-	1	-	2	1.62
Lutzomyia cruzi	3	5			8	6.50
Lutzomyia termitophila	-	2	-	-	2	1.62
Lutzomyia intermedia	-	-	1	-	1	0.81
Lutzomyia aragaoi	-	-	2	-	2	1.62
Lutzomyia lutziana	-	-	1	-	1	0.81
Lutzomyia cerradincola	1	2	-	-	3	2.44
Lutzomyia inflata	-	1	-	-	1	0.81
Lutzomyia saulensis	-	1	-	-	1	0.81
Lutzomyia goiana	-	1	-	-	1	0.81
Lutzomyia sp.	-	-	4	7	11	8.94
Subtotal	37 (43.1%)	49 (56.9%)	24 (74.9%)	13 (35.1%)	123	100.0
Total	86 (70%)		37 (30%)		123	100.0
H	2.05		0.84			

The traps installed in different environments also revealed differences regarding species diversity. Thus, traps installed in the savanna area showed a lower diversity index (H) than did those in the residential area (Table 1). However, future studies with longer capture periods and concomitant use of flight interception traps, such as Malaise traps, might be useful to complement the information on the phlebotomine fauna in this region.

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