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Occurrence of *Lutzomyia longipalpis* Lutz & Neiva 1912 and *Cerdocyon thous* Linnaeus 1977, in a visceral leishmaniasis endemic area in Brazil

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ABSTRACT

Cerdocyon thous presents a wide geographic distribution in Brazil and its role as a possible *Leishmania infantum* reservoir in a visceral leishmaniasis (VL) transmission cycle regardless of dogs (*Canis familiaris*) has been discussed. From this perspective, this work describes the occurrence and use of the habitat by *Cerdocyon thous* in a *Lutzomyia longipalpis* occurrence area Teresina (Piaui − Brazil), VL endemic region. Three specimens of *C. thous* were monitored with the use of radio telemetry and trails and footprints, seeking to find possible natural dens in order to collect the sanflies from the site. Luminous CDC and Damasceno traps were simultaneously installed at the visited sites, where two specimens of *L. longipalpis* and one *L. termitophila* were captured. The identification of the dens and trails, allows us to infer that the dens are not used only by the *C. thous*. Finding the VL vector in natural *C. thous* natural dens, reinforces the hypothesis of transmission of *Le. infantum* in the outskirts of the large urban centers, in a cycle that independs from dogs.

1. Introduction

Visceral Leishmaniasis (VL) is caused by the protozoa *Leishmania infantum* and is transmitted though the bite of the *Lutzomyia longipalpis*, widely known as the disease's main vector (Lainson and Rangel, 2005; Dantas-Torres, 2006). Some domestic and wild mammals are the disease's infection and dissemination sources, such as domestic dogs (*Canis familiaris*) and wild (*Cerdocyon thous*) and marsupials (*Didelphis marsupialis* and *D. albiventris*) (Lainson et al., 1990; Travi et al., 1998).

In Piaui State, VL is endemic and know since 1934, being Teresina, the state's capital, the background of a series of epidemic outbreaks since the 80s, when the disease was first described in an urban area (Costa et al., 1990). Historically, several strategies have been planned in an attempt to decrease the morbimortality caused by this disease, involving no-cost distribution of specific treatment drugs, domestic reservoirs control with the elimination of seropositive dogs and vector control. However, many studies acknowledge the low efficiency of these strategies, indicating the complexity of this disease's transmission scenario and that the involved elements are still not well understood (Dietze et al., 1997; Ashford et al., 1998).

The natural infection by *Le. infantum* in wild dogs has been described in South-American dogs, bringing earlier discussions about the existence of a wild transmission cycle (Lainson et al., 1969; Curi et al., 2006; Luppi et al., 2008). Among the factors that would had induced urban transmission are the sylvatic environmental changes, that could had altered the dynamic of reservoir and vector populations, and the rural exodus phenomena, which led to the migration of rural humans to *peri*-urban areas, where *C. thous* is frequently found (Patz et al., 2000; Diniz et al., 2008).

C. thous, the common fox is found in several environments, reaching from the Atlantic rain forest Cerrado, in south Brazil to the north of South America (Berta, 1982). It has a general feeding habit, where most of the items are associated to human presence (Facure and Monteiro-Filho, 1996). These animal's synanthropic behavior, as well as the records of natural infection by *Le. infantum* reinforce the hypothesis of the existence of a VL transmission cycle in *peri*-urban and wild areas.

The use of the same habitat by populations of wild reservoirs and vectors, as well as the influence such reservoirs are able to exercise towards the maintenance of the disease in the urban centers were elements approached during this study.

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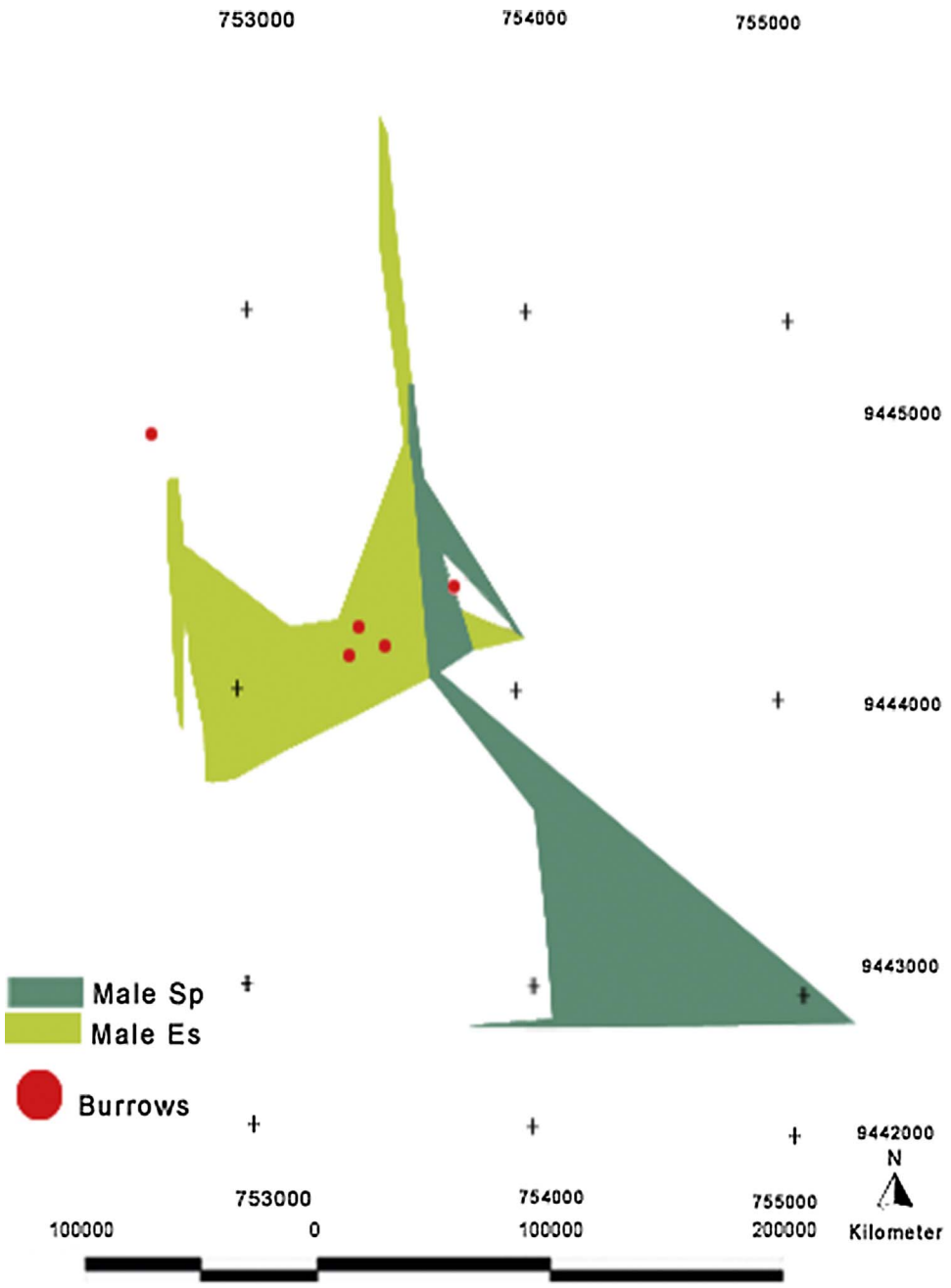

Fig. 1. Live are for two *C. thous*, monitored through radio-telemetry at the Arvores Verdes village, rural district of Teresina, Piauí, Brazil.

2. Materials and methods

2.1. Study area

The study was conducted in two areas: Arvores Verdes village, rural district of Teresina and the citie's Zoo and Botanical Park. Arvores Verdes village is 12 km outside of Teresina (Piaui) located at latitude 05°01′05" S and longitude 42°42′41" W, with altitude of 72 m. The origin of the village's name derives from the great vegetation, that when settling was virgin woodland, currently characterized by the predominance of residual rainforest and anthropized caatinga trees, a consequence of real estate especulation and agricultural activities.

Teresina's Zoo and Botanical Park is located at latitude 05°05′12" S and longitude 42°48′48" W, 9 km away from the city's downtown and 1200 m from the Federal University of Piaui. It covers an area of 137 ha, predominating semidecidious broadleaved forests, secondary woods and *babaçu* palm trees (*Attalea speciosa*).

There are swamps and dense forests with elevations varying from 82 m to 90 m. The climate is Awi (Rainy Tropical Climate, according to the Koeppen classification system), with average annual rainfall of 1300 mm^3 and average temperature of 29.7 °C. The rainy season is from January to April, and the highest temperatures are registered from August to December.

2.2. C. thous captures, natural dens and radio-telemetry

To capture the animals, cage traps of metallic structure and guillotine door measuring 60 × 50 × 110 cm (width, height and length, including bait space) with a distance between bars of 2–3 according to the methodology proposed by Brito et al., (2001). The traps were disposed based on the presence of traces (footprints) on roads and trails, using as baits a variety of foods, as fruits, chicken and bovine bones. The trapping period lasted for 24 months (February 2002 to February 2004), with an average of 15 working traps. The traps inspection was