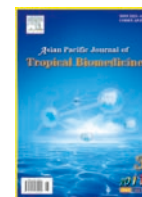




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## The first case report of *Leishmania (leishmania) chagasi* in *Panthera leo* in Brazil

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## ABSTRACT

We reported here the first known case of natural infection of a lion (*Panthera leo*–Linnaeus, 1758) with *Leishmania (Leishmania) chagasi* (*L. chagasi*) in Brazil. The specimen was created by a circus handler in the state of Mato Grosso and was donated to the zoological park of the Federal University of Mato Grosso. Infection by *L. chagasi* was detected using a PCR–RFLP test. It was known that the domestic felids can act as reservoir of infection of *L. chagasi* in endemic areas, making it important that studies demonstrate their participation in the epidemiological chain. We demonstrate in this work that wild animals can have an important role in the epidemiological chain and must be considered in order to plan methods of control of this zoonosis.

### 1. Introduction

In Brazil, American visceral leishmaniasis represents a serious public health problem, which affects humans and animals, mainly domestic and wild canids[1].

Cats (*Felis domesticus*) are still regarded as unusual hosts for *Leishmania* spp., although the first record of feline leishmaniasis dates back to 1912[2]. Originally, dogs were considered to be the only domestic reservoirs of *Leishmania chagasi* (*L. chagasi*) in Brazil[3]. However, the increasing number of cases of feline leishmaniasis described in the literature since 1990 suggests that cats may also have some role in the epidemiology of visceral leishmaniasis[4].

In the present study, we described the first report of *Leishmania* infection in *Panthera leo* in Mato Grosso state, Brazil.

### 2. Case report

In this study, one exemplar of *Panthera leo* kept in captivity in the zoological park of Federal University of Mato Grosso (UFMT) was used. The molecular analysis was performed by collecting blood venocentese cephalic. The blood was collected in tubes with EDTA. The sample was stored at –20 °C until the extraction of DNA samples and the technique of PCR–RFLP were performed according to Almeida (2009)[5].

The amplification of DNA of *Leishmania* sp. was performed. This result was obtained in samples of blood. Using restriction enzymes, it was characterized as a species *L. chagasi* after comparison with standard sample of *L. chagasi* (MHOM/BR/74/PP75) and *L. (Viannia) braziliensis* (MHOM/BR/75/M2903) from the Oswaldo Cruz Institute /Rio de Janeiro.

### 3. Discussion

In European countries, the seroprevalence of domestic cats to visceral leishmaniasis in endemic areas varies from 0.9%[6] to 4.29% in Italy[7], 30.4% in Portugal[8], 60% in Spain[9] and 6.7% in Jerusalem[10–12]. In the southwestern region of Brazil, the seroprevalence for visceral leishmaniasis in this

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was about 25% in domestic cats<sup>[13]</sup>.

Diagnosis of visceral leishmaniasis infection in domestic cats by PCR was described in Brazil<sup>[14]</sup> and in Italy<sup>[7]</sup>. However, there is no report of infection of *L. chagasi* in *Panthera leo*. It was reported infection of *L. chagasi* in wild felids kept in captivity of the species *Panthera onca* and *Leopardus pardalis* at the zoological park in the city of Cuiaba, Mato Grosso<sup>[1]</sup>.

The animal studied here did not present any clinical signs or any alteration on the hemogram exam. However, there are reports of clinical presentation in domestic cats<sup>[14, 16]</sup>.

It has been described the transmission of *Leishmania* by the feline vector (*Phlebotomus perniciosus*), suggesting that domestic cats may represent an additional reservoir for *L. chagasi*<sup>[2]</sup>. Possibly the transmission of the parasite to wild felidae was investigated by the bite of the genus *Lutzomyia* phlebotomy, endemic in the region. Noting the high rate of asymptomatic feline leishmaniasis described in the literature<sup>[13]</sup>, we can infer that felines, both domestic and wild, can act as reservoir of infection of normal host *L. chagasi* in endemic areas. Further studies are necessary in order to demonstrate their participation in the epidemiological chain.

Author's contributions: MAAD, ABPFA, VRFS and RLS were responsible for the study design; MAAD, VD, LN, CES, LDG and RLS were responsible for the collection of biological sample and the clinical examination of the animal; MAAD, CES and LDG were responsible for the monitoring of the animals; MAAD, ABPFA, VD, LN and VRFS were responsible for the execution of the laboratory work; MAAD, ABPFA, VRFS, LN and RLS drafted the manuscript. All authors critically revised the manuscript for intellectual content, and read and approved the final version. MAAD and RLS are guarantors of the paper.

### Conflict of interest statement

We declare that we have no conflict of interest.

### Ethical approval

Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA); document: SISBIO No. 12207–1.

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