Short Communication

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Coinfection by *Toxoplasma gondii* and *Leishmania* spp. in domestic cats (*Felis catus*) in State of Mato Grosso do Sul

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ABSTRACT

Introduction: Leishmaniasis and toxoplasmosis are important to public health. **Methods:** Antibodies for *Toxoplasma gondii* and *Leishmania* spp. were evaluated in cats from Campo Grande, State of Mato Grosso do Sul, Brazil, a region endemic for canine visceral leishmaniasis. Serum samples from 50 asymptomatic cats were titrated for *T. gondii* by the immunofluorescence antibody test and modified agglutination test and for *Leishmania* spp. by the immunofluorescence antibody test. **Results:** These two agents coinfected two (4%) of the 50 tested animals. **Conclusions:** These findings demonstrate the concomitant presence of two important zoonoses in cats from Brazilian endemic regions for canine visceral leishmaniasis.

Keywords: Cats. *Leishmania* species. *Toxoplasma gondii*.

Toxoplasma gondii and *Leishmania* spp. are protozoan parasites that cause zoonosis, are distributed worldwide, and affect domestic and wild animals and humans. Cats are important in the epidemiology of toxoplasmosis because they are the only hosts that can excrete the environmentally resistant stage: the oocysts[1].

In 1999, visceral leishmaniasis in cats was first recorded by Hervas et al.[2] in Spain. Since then, current cases represent a widespread distribution, and include reports from Italy[3], Portugal[4], the United States[5]. In Brazil, the first occurrence of *Leishmania infantum* in a cat was recorded in 2004 by Savani et al[5]. Some authors consider this animal an accidental host, while others suggest that felids can act as potential peridomestic reservoirs[6]. However, the role of cats in the epidemiology of leishmaniasis remains to be clarified.

The present study was approved by the Animal Ethics Committee (protocol 65/2007) of the School of Veterinary Medicine and Animal Husbandry, São Paulo State University, following the Ethical Principles in Animal Experimentation. A total of 50 cats (*Felis catus*) that were domiciliated in the City of Campo Grande (20°26'34''S, 54°38'47''W) in the State of Mato Grosso do Sul, Brazil were selected randomly without predilection for sex breed, or age. Blood samples were obtained to detect antibodies for *T. gondii* and *Leishmania* spp. The immunofluorescence antibody test (IFAT) was performed, according to the method described by Camargo[7], which used whole Leishmania major-like promastigote and the RH strain of *T. gondii* as the antigen for the diagnosis of leishmaniasis and toxoplasmosis, respectively. Modified agglutination test (MAT) using the RH strain was performed, as described by Desmonts and Remington[8]. The cutoff *T. gondii* antibody titer for both tests was 16, and the corresponding value in IFAT for *Leishmania* spp. was 40.

Two (4%) of the 50 animals presented titers of antibodies for *T. gondii* and *Leishmania* spp., which suggested coinfection by these two protozoa in the same animal. Cat #1 was a female of undefined breed, 2 years of age, and presented *T. gondii* antibody titers of 64 (based on IFAT) and 1,024 (based on MAT), and an antibody titer of 320 for *Leishmania* spp. Cat #2 was also a female of undefined breed, 3 years of age, and presented *T. gondii* titers of 16 (based on IFAT) and 1,024 (based on MAT), and a *Leishmania* spp. titer of 320 **(Table 1)**. Neither cat presented clinical signs. Similar results were obtained by Cardia et al.[9] with specific anti-*Toxoplasma* immunoglobulin G (IgG) in 63 (16.3%) of 386 cats and IgG against *Leishmania* spp. in two serum samples with titers of 1:160 and 1:320, respectively. In a study conducted by Sobrinho et al.[10] in another Brazilian endemic area, 25.7% cats were coinfected with both agents. However, the authors did not observe a significant association between these infections.

In this study, the MAT and IFAT were used, based on the results for cats obtained by Macrì et al.[11], with a concordance of 0.98 (i.e., nearly perfect), an MAT sensitivity of 97.8% and specificity of 100%, and using IFAT as the gold standard test. In conclusion, coinfection by *T. gondii* and *Leishmania* spp. occurs in cats in Brazil in regions endemic or epidemic for canine

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TABLE 1 - Antibody titers in the immunofluorescence antibody test and modified agglutination test against *Toxoplasma gondii* and *Leishmania* spp. in two naturally infected cats from Campo Grande, State of Mato Grosso do Sul, Brazil.

	Toxoplasma gondii		*Leishmania* spp.
Animal	IFAT	MAT	IFAT
Cat #1	64	1,024	320
Cat #2	16	1,024	320

IFAT: immunofluorescence antibody test; **MAT:** modified agglutination test.

visceral leishmaniasis. Serological surveys may be useful for understanding zoonosis dissemination in urban environments. More detailed studies are needed to clarify the role of cats in the epidemiology of leishmaniasis (e.g., as reservoirs or accidental hosts for dogs and humans) to prevent and control zoonosis in these endemic regions.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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