



Revista Brasileira de Parasitologia
Veterinária

ISSN: 0103-846X

zacariascbpv@fcav.unesp.br

Colégio Brasileiro de Parasitologia
Veterinária
Brasil

dos Santos, Karina R.; Facciulli, Paula; Paparotto, Telma; Takahira, Regina K.; Lopes,
Raimundo S.; da Silva, Reinaldo J.

First report of *Strongyloides* sp. (Nematoda, Strongyloididae) in *Leopardus tigrinus*
(Carnivora: Felidae) in the municipality of Botucatu, State of São Paulo, Brazil

Revista Brasileira de Parasitologia Veterinária, vol. 18, núm. 1, diciembre, 2009, pp. 77-79

Colégio Brasileiro de Parasitologia Veterinária
Jaboticabal, Brasil

Available in: <http://www.redalyc.org/articulo.oa?id=397841474016>

- How to cite
- Complete issue
- More information about this article
- Journal's homepage in redalyc.org

redalyc.org

Scientific Information System

Network of Scientific Journals from Latin America, the Caribbean, Spain and Portugal

Non-profit academic project, developed under the open access initiative

First report of *Strongyloides* sp. (Nematoda, Strongyloididae) in *Leopardus tigrinus* (Carnivora: Felidae) in the municipality of Botucatu, State of São Paulo, Brazil

Primeiro relato de *Strongyloides* sp. (Nematoda, Strongyloididae) em *Leopardus tigrinus* (Carnivora: Felidae) do município de Botucatu, Estado de São Paulo, Brasil

Karina R. dos Santos¹; Paula Faciulli²; Telma Paparotto³; Regina K. Takahira³; Raimundo S. Lopes²; Reinaldo J. da Silva^{1*}

¹Departamento de Parasitologia, Instituto de Biociências, Universidade Estadual Paulista – UNESP

²Departamento de Clínica Veterinária, Enfermidades Parasitárias dos Animais Domésticos, Faculdade de Medicina Veterinária e Zootecnia – FMVZ, Universidade Estadual Paulista – UNESP

³Departamento de Clínica Veterinária, Laboratório Clínico Veterinário, Faculdade de Medicina Veterinária e Zootecnia – FMVZ, Universidade Estadual Paulista – UNESP

Received February 19, 2008

Accepted May 28, 2009

Abstract

The present study reports the first case of infection by *Strongyloides* sp. in *Leopardus tigrinus* in the municipality of Botucatu, State of São Paulo, Brazil. Feces of the infected *L. tigrinus* specimen were cultivated in sterilized equine feces and a cat (*Felis catus domesticus*) was experimentally infected with three thousand infective L₃ subcutaneous route, in order to identify the *Strongyloides* species involved in the parasitism. Parthenogenetic females recovered from the experimental animals were analyzed but comparison between the biometric data found and the data in the literature did not enable identification of the species. This is the first report on the occurrence of *Strongyloides* sp. in *L. tigrinus*.

Keywords: *Leopardus tigrinus*, wild felids, parasitic infection, disease, new host.

Resumo

O presente estudo reporta o primeiro caso de infecção por *Strongyloides* sp. em *Leopardus tigrinus* no município de Botucatu, Estado de São Paulo, Brasil. Fezes do exemplar parasitado de *L. tigrinus* foram cultivadas em fezes equínas esterilizadas e foi realizada infecção experimental em gato (*Felis catus domesticus*) com três mil larvas L₃ infectantes por via subcutânea, para a identificação da espécie de *Strongyloides* envolvida no parasitismo. As fêmeas partenogenéticas obtidas do animal experimental foram analisadas porém a comparação dos dados biométricos encontrados com os dados da literatura não permitiu a identificação da espécie. Este é o primeiro relato sobre a ocorrência de *Strongyloides* sp. Em *L. tigrinus*.

Palavras-chave: *Leopardus tigrinus*, felídeos selvagens, infecção parasitária, doença, novo hospedeiro.

The genus *Strongyloides* includes 52 parasite species that infect numerous vertebrates, such as snakes, felids, canids and ruminants (DORRIS et al., 2002). In Brazil, several *Strongyloides* species have been reported, infecting a wide diversity of hosts. These include *S. chapini*, *S. ferreirai*, *S. fuelleborni*, *S. myopotami*, *S. papillosus*, *S. ransomi*, *S. ratti*, *S. stercoralis*, *S. vezzeuensis* and *S. westeri*, which were found in mammals (VICENTE et al., 1997).

Strongyloides spp. have been described worldwide in felids. There are reports of *S. planiceps* in tigers in Malaysia and in

domestic cats in Japan; *S. felis* in domestic cats in Calcutta, India, and in Australia; and *S. tumefaciens* in domestic cats in the USA (Louisiana, Florida, Texas and Georgia) and in *Felis chaus* (jungle cat) in India, *Felis rufus* (bobcat) and *Felis concolor coryi* (Florida panther) in Florida (BOWMAN et al., 2002). In Brazil, *S. stercoralis* has also been found in domestic cats (*Felis catus domesticus*) (VICENTE et al., 1997). However, there are no reports on the occurrence of *Strongyloides* spp. in the little spotted cat (*Leopardus tigrinus*).

The aim of this study was to report the first case of *Strongyloides* sp. in this felid species.

In the municipality of Botucatu, State of São Paulo, Brazil, a male of the species *L. tigrinus* was cared for at the Veterinary Hospital, Faculdade de Medicina Veterinária e Zootecnia, Universidade

*Corresponding author: Reinaldo J. da Silva

Departamento de Parasitologia, Instituto de Biociências, Universidade Estadual Paulista – UNESP,

Distrito de Rubião Júnior s/n, CEP 18618-000 Botucatu - SP, Brasil

e-mail: reinaldo@ibb.unesp.br

Estadual Paulista Julio de Mesquita Filho, Botucatu, after it was run over by a motor vehicle. Coproparasitological examinations revealed the presence of embryonated eggs in its feces. Cultures on the feces demonstrated the presence of L3 larvae with a notched tail, which is a characteristic of the genus *Strongyloides*.

In order to identify the *Strongyloides* species involved in this parasitism, experimental infection in a domestic cat (*F. catus domesticus*) was conducted subsequently. For this, samples of the *L. tigrinus* feces were cultivated in sterilized equine feces and maintained in an incubator at 25 °C and 80% humidity, for seven days.

The material was analyzed under a microscope in order to detect any third-stage filariform larvae. These larvae were collected using Baerman's method. About 17,000 larvae were thus obtained to experimentally infect a domestic cat (a 30-day-old female). This animal had previously treated with antihelminthic drugs and coproparasitological examinations had been performed to confirm that it was free from helminth infection.

Three thousand infective (L3) larvae were inoculated subcutaneously in this animal. After inoculation, fecal flotation

examinations were successively performed until the feces become positive for embryonated eggs. The cat was then sacrificed and parthenogenetic female were recovered. In order to obtain free-living males and females, cultures with feces from domestic cats were made, but no positive results were obtained.

Biometric analyses on both the parthenogenetic females and the eggs were performed using a computerized image analysis system (Qwin Lite 3.1; Leica). The results presented below are expressed as means and ranges (minimum and maximum).

The measurements on the parthenogenetic females were as follows (n = 6; Figure 1): total length 3,561 µm (3,314-3,966); maximum width 48 µm (42-52); esophagus 753 µm (728-784) in length and 21.2% (19.7-22.3) of total body length; vulva 1251 µm (1,194-1,338) from the anterior extremity; tail 33 µm (28-36); eggs (inside the uterus) 71 µm (58-84) in length and 29 µm (24-36) in width. Comparison of this biometric data with the data in the literature did not enable identification of the species.

The present study reports the first case of *Strongyloides* sp. in *L. tigrinus*. Other cases in domestic and wild felids have been

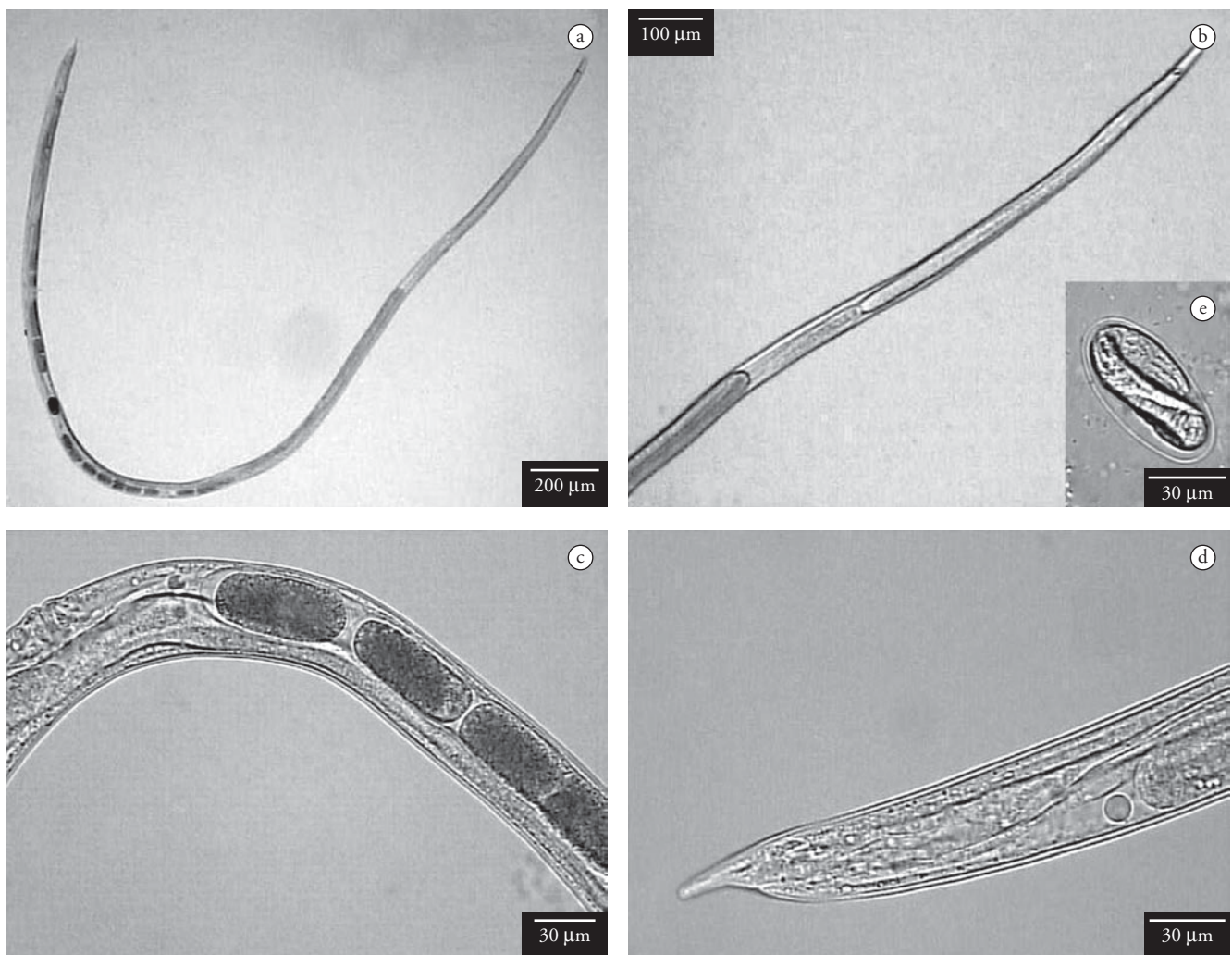


Figure 1. *Strongyloides* sp. collected from the small intestine of *Felis catus domesticus* after experimental infection with *Strongyloides* infective larvae (L3) obtained from culturing of *Leopardus tigrinus* feces: a) general view; b) Detail of the esophagus, initial portion of the intestine and ovary; c) Detail of vulva and uterus with eggs; d) Detail of tail and anus; and e) egg.

reported (VICENTE et al., 1997; BOWMAN et al., 2002), but this is a rare finding. Oliveira and Cassaro (1999) reported that because wild felids have solitary habits and most of them are predominantly nocturnal, field observations are scarce and, thus, few data about their biology are available.

An experimental infection was conducted in order to identify the *Strongyloides* species found in this *L. tigrinus* individual because no parthenogenetic female could be recovered from this host, since the animal was reintroduced to the environment after proper medical treatment. The attempted use of another host in the same family for experimental infection produced positive results, since parthenogenetic females were recovered from the domestic cat used in this experiment. However, from the three thousand infective larvae inoculated, only six parthenogenetic females were recovered. In addition, no free-living males or females were recovered from the feces cultures.

Since a low percentage of the larvae completed the biological cycle, few parthenogenetic adult females were recovered. This may have been either because *F. catus domesticus* is not the specific host for the nematode that was examined, or because the felid immune system was able to react, thereby expelling these larvae (through IgA, which activates the eosinophils) (OLIVEIRA SEQUEIRA, 2000; CLAEREBOU, 2000; SOULSBY, 1987). In addition, since the host was not specific, the growth and morphology of the parthenogenetic *Strongyloides* females might have undergone changes, thus causing difficulties for parasite species identification (OLIVEIRA SEQUEIRA, 2000; CLAEREBOU, 2000; SOULSBY, 1987).

Other helminths have been reported infecting *L. tigrinus*. Hungria (1978) reported an occurrence of *Toxascaris leonina* (Hungria, 1978) in *L. tigrinus* in Venezuela. Eggs of *Capillaria* sp., *Ancylostoma* sp., *Trichuris* sp. and *Toxocara* sp. and adults of *Vigospirura potekhina*, *Didelphonema longispiculata*, *Pterygodermatites cahirensis*, *Trichuris campanula*, *Ancylostoma tubaeforme* and *Toxocara cati* have also been reported in this felid species by Beldomenico (2005). However, there are no reports on occurrences of a *Strongyloides* spp. infecting *L. tigrinus*. Thus, this felid is a new host recorded for *Strongyloides* sp. These data reinforce the importance of the

present report, which contributes towards knowledge of the helminth fauna of wild felids in Brazil.

Acknowledgement

The authors are indebted to Betina Metzger for her assistance with the English review.

References

- BELDOMENICO, P. M.; KINSELLA, J. M.; UHART, M. M. Helminths of Geoffroy's cat, *Oncifelis geoffroyi* (Carnivora, Felidae) from the Monte desert, central Argentina. *Acta Parasitologica*, v. 50, n. 3, p. 263-266, 2005.
- BOWMAN, D. D. et al. **Feline clinical parasitology**. Ames: Iowa State University Press, 2002. p. 469.
- CLAEREBOU, E.; VERCROY, J. The immune response and the evaluation of acquired immunity against gastrointestinal nematodes in cattle: a review. *Parasitology*, v. 120, n. S25-S42, p. 25-42, 2000.
- DORRIS, M.; VINEY, E. M.; BLAXTER, L. M. Molecular phylogenetic analysis of the genus *Strongyloides* and related nematodes. *Internacional Journal for Parasitology*, v. 32, n. 12, p. 1507-1517, 2002.
- HUNGRÍA, C. D. Helminths parasites of vertebrates in the state of zulia (Venezuela) algunas especies nuevas para Venezuela. *Veterinária Tropical*, v. 3, n. 1, p. 15-37, 1978.
- OLIVEIRA-SEQUEIRA, T. C. G.; AMARANTE, A. F. T.; SEQUEIRA, J. L. Parasitological characteristics and tissue response in the abomasum of sheep infected with *Haemonchus* spp. *Arquivos Brasileiro de Medicina Veterinária e Zootecnia*, v. 52, n. 5, p. 447-452, 2000.
- OLIVEIRA, T. G.; CASSARO, K. **Guia de identificação dos felinos brasileiros**. 2 ed. São Paulo: Sociedade de Zoológicos do Brasil, 1999. 60 p.
- SOULSBY, E. J. P. **Immune response in parasitic infections: immunology, immunopathology and immunoprophylaxis**. Boca Raton: CRC, 1987. 336 p. (v. 1).
- VICENTE, J. J. et al. Nematóides do Brasil. Parte V: Nematóides de mamíferos. *Revista Brasileira de Zoologia*, v. 14, Suppl. 1, p.1-452, 1997.