



Taxonomy and systematics

Parasitic nematodes of three species of wild carnivore mammals from Atlantic forest in the state of Minas Gerais, Brazil

Nemátodos parásitos de tres especies de mamíferos carnívoros silvestres del bosque atlántico en el estado de Minas Gerais, Brasil

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Abstract

This study aimed to report the occurrence of species of nematodes in wild carnivore mammals from a locality of Atlantic forest in Brazil. Specimens of wild carnivore mammals of 3 species were necropsied: *Chrysocyon brachyurus* (Illiger, 1815), *Cerdocyon thous* (Linnaeus, 1766), and *Puma (Herpailurus) yagouaroundi* (É. Geoffroy, 1803). Seven species of nematodes were recorded: 5 in *C. brachyurus* [*Uncinaria stenocephala* (Railliet, 1884), *Dioctophyma renale* (Goeze, 1782), *Strongyloides* sp., *Trichuris vulpis* (Froelich, 1789), and *Oslerus (Oslerus)* sp.]; 2 in *C. thous* [*Angiostrongylus raillieti* (Travassos, 1927), and *Strongyloides* sp.], and only 1 species [*Cylicospirura subaequalis* (Molin, 1860)] in *P. (H.) yagouaroundi*. *Strongyloides* sp., *T. vulpis* and *Oslerus (Oslerus)* sp. were recorded for the first time in *C. brachyurus* from Brazil, and the first one of *C. subaequalis* in a host from Brazil in their type host since the original description date from 1860.

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Keywords: Parasitic nematodes; Brazil; Wild mammals

Resumen

El objetivo de este estudio fue registrar la presencia de especies de nemátodos en mamíferos carnívoros salvajes de una localidad del bosque atlántico en Brasil. Ejemplares de 3 especies de mamíferos carnívoros silvestres fueron necropsiados: *Chrysocyon brachyurus* (Illiger, 1815), *Cerdocyon thous* (Linnaeus, 1766) y *Puma (Herpailurus) yagouaroundi* (É. Geoffroy, 1803). Se registraron 7 especies de nemátodos: 5 en *C. brachyurus uncinaria stenocephala* (Railliet, 1884), *Dioctophyma renale* (Goeze, 1782), *Strongyloides* sp., *Trichuris vulpis* (Froelich, 1789) y *Oslerus (Oslerus)* sp.; 2 en *C. thous* (*Angiostrongylus raillieti* [Travassos, 1927] y *Strongyloides* sp.) y solo una especie (*Cylicospirura subaequalis* [Molin, 1860]) en *P. (H.) yagouaroundi*. *Strongyloides* sp., *T. vulpis* y *Oslerus (Oslerus)* sp. fueron colectados por primera vez en *C. brachyurus* de Brasil, mientras que *C. subaequalis* se registra en su hospedador tipo en Brasil desde la descripción original hecha en 1860.

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Palabras clave: Nemátodos parásitos; Brasil; Mamíferos silvestres

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Introduction

The first reports of helminths in wild carnivore mammals from Brazil were made by Rudolphi (1819), who described the cestode *Taenia crassipora* Rudolphi, 1819 and the nematode *Toxocara alienata* (Rudolphi, 1819), both collected in the intestine of *Nasua nasua* (Linnaeus, 1766). Until the early 20th Century, one of the most significant contributions to the study of helminths of wild carnivores from Brazil was that of Diesing (1850, 1851), in which a total of 18 species of nematodes, cestodes, acanthocephalans, and trematodes, were described and reported.

The first helminth species described in wild carnivore mammals by Brazilian researchers was the nematode *Uncinaria carinii* Travassos, 1915, collected in the intestine of *Cercopithecus thomasi* (Linnaeus, 1766) in the municipality of São Paulo, State of São Paulo (Travassos, 1915). Since then, according to the checklist of helminth parasites in wild carnivore mammals from Brazil (Vieira, Luque, & Muniz-Pereira, 2008), 21 species of hosts are reported for a total of 95 helminth species. After the study of Vieira et al. (2008) some new records of helminths in this group of hosts were reported (see Filoni et al., 2009; Gallas & Silveira, 2011; Gallas, Silveira, & Périco, 2014; Gomes, Olifiers, Santos, Simões, & Maldonado, 2015; Gomes, Olifiers, Souza, et al., 2015; Lux-Hoppe, Araújo-de Lima, Tebaldi, & Nascimento, 2010; Pinto, Knoff, Gonçalves, Sanches, & Noronha, 2009; Ribeiro, Verocai, & Tavares, 2009; Suárez, Pesenti, Macedo, Mascarenhas, & Müller, 2015; Vieira, Luque, Souza-Lima, Moraes-Neto, & Muniz-Pereira, 2012; Vieira, Muniz-Pereira, et al., 2012; Vieira et al., 2013). This demonstrates the potential for discovery of new data on the helminth parasites in wild carnivore mammals in Brazil.

The current study aimed to report the species of nematodes found in wild carnivore mammals from the municipality of Juiz de Fora, Minas Gerais state, Brazil.

Materials and methods

Twelve specimens of 3 species of wild carnivore mammals (Table 1) were necropsied, between June 2002 and January 2010: *Chrysocyon brachyurus* (Illiger, 1815) (Carnivora, Canidae) (Maned Wolf) (5 specimens), *Cercopithecus thomasi* (Linnaeus, 1766) (Carnivora, Canidae) (Crab-eating Fox) (6 specimens), and *Puma (Herpailurus) yagouaroundi* (É. Geoffroy, 1803) (Carnivora, Felidae) (Jaguarundi) (1 specimen). The hosts examined were accidentally ‘road killed’ and were donated by the Regional Office of the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA), in the municipality of Juiz de Fora, in the state of Minas Gerais (21°41'20" S, 43°20'40" W). The hosts were identified according to Berta (1982), Dietz (1985), and Oliveira (1998).

The nematodes collected were fixed in AFA for 48 h, and preserved in 70% ethanol with 5% glycerin. For light microscopy studies, the nematodes were cleared in Amann's lactophenol, and mounted on temporary slides.

Identification and classification of nematodes to the generic level follow Anderson, Chabaud, and Willmott (2009) and Gibbons (2010). The specific identification follows Grisi (1971), Junker et al. (2013), Travassos (1927), Vicente, Rodrigues, Gomes, and Pinto (1997), and Waid and Pence (1988).

Voucher specimens are deposited in the Instituto Oswaldo Cruz Helminthological Collection (CHIOC), Rio de Janeiro, Brazil (Table 1).

Table 1
Quantitative data of nematode species reported in 3 species of wild carnivore mammals in the state of Minas Gerais, Brazil (% = prevalence, M = mean intensity, SD = standard deviation).

	<i>Chrysocyon brachyurus</i> (n = 5)		<i>Cercopithecus thomasi</i> (n = 6)		<i>Puma (H.) yagouaroundi</i> (n = 1)	
	%	M ± SD	%	M ± SD	%	M ± SD
Ancylostomatoidea						
<i>Uncinaria stenocephala</i> (CHIOC 35935)	60	33 ± 16	–	–	–	–
Dioctophymatoidea						
<i>Dioctophyma renale</i> (CHIOC 35932)	60	1.66 ± 1.15	–	–	–	–
Metastrongyloidea						
<i>Angiostrongylus raillietii</i> ^a (CHIOC 35930)	–	–	20	19	–	–
<i>Oslerus (Oslerus) sp.</i> (CHIOC 35929c)	40	205.5 ± 82.7	–	–	–	–
Rhabditoidea						
<i>Strongyloides sp.</i> (CHIOC 35933)	100	232.8 ± 120.2	100	227 ± 131.2	–	–
Spiruroidea						
<i>Cylicospirura subaequalis</i> ^a (CHIOC 35931)	–	–	–	–	100	27
Trichinelloidea						
<i>Trichuris vulpis</i> ^a (CHIOC 35934)	20	27	–	–	–	–

^a The nematodes were collected in only 1 host.

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