Research Note

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Mesocestoides sp. (Eucestoda, Mesocestoididae) parasitizing four species of wild felines in Southern Brazil

Mesocestoides sp. (Eucestoda, Mesocestoididae) parasitando quatro espécies de felinos silvestres no Sul do Brasil

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Abstract

Leopardus colocolo, *Leopardus geoffroyi*, *Leopardus tigrinus* and *Puma yagouaroundi* are wild feline species endangered mainly due to habitat destruction and vehicle run overs. Seventeen felines hit on the roads were collected in Southern Brazil and examined for parasites. Cestodes were identified as *Mesocestoides* sp. The parasites were found in the small intestine of the hosts with a prevalence of 66.7% (*L. colocolo* and *L. tigrinus*), 60% (*P. yagouaroundi*) and 50% (*L. geoffroyi*). Rodents and lizards were found in the stomach contents and they possibly were intermediate hosts of *Mesocestoides* sp. This is the first report of *Mesocestoides* sp. in wild felines in Brazil.

Keywords: Cestodes, *Leopardus colocolo*, *Leopardus geoffroyi*, *Leopardus tigrinus*, *Puma yagouaroundi*.

Resumo

As espécies *Leopardus colocolo*, *Leopardus geoffroyi*, *Leopardus tigrinus* e *Puma yagouaroundi*, são felídeos silvestres ameaçados de extinção, principalmente pela destruição do hábitat e morte em rodovias. Dezessete felídeos foram coletados atropelados no sul do Brasil e, analisados na pesquisa de parasitos. Cestóides encontrados foram identificados como *Mesocestoides* sp. Os parasitos foram encontrados no intestino delgado dos hospedeiros com prevalência de 66,7% (*L. colocolo* e *L. tigrinus*), 60% (*P. yagouaroundi*) e 50% (*L. geoffroyi*). Roedores e lagartos foram encontrados no conteúdo estomacal, podendo ser os hospedeiros intermediários para *Mesocestoides* sp. Este é o primeiro registro de *Mesocestoides* sp. em felídeos silvestres no Brasil.

Palavras-chave: Cestóides, *Leopardus colocolo*, *Leopardus geoffroyi*, *Leopardus tigrinus*, *Puma yagouaroundi*.

According to Raush (1994), the family Mesocestoididae (Fuhrmann, 1907) includes two monogeneric subfamilies: Mesogyninae (Chertkova & Kosupko, 1977), with the genus *Mesogyna* (Voge, 1952) and Mesocestoidinae (Lühe, 1894) with the genus *Mesocestoides* (Vaillant, 1863). According to the author, this group of cestodes has unique and distinct characteristics among cyclophyllidean cestodes such as the median ventral position of the genital atrium and bipartite vitelline gland.

Witenberg (1934), in a study about *Mesocestoides*, recognized three species: *Mesocestoides lineatus* (Goeze, 1782), *Mesocestoides perlatus* (Goeze, 1782) and *Mesocestoides charadrii* Fuhrmann, 1909. However, the author proposed three subspecies for *M. lineatus*: *Mesocestoides lineatus lineata* (Goeze, 1782), *Mesocestoides lineatus litterata* (Batsch, 1786) and *Mesocestoides lineatus caesta* (Cameron, 1925). Yamaguti (1959), while studying cestode parasites of vertebrates, recognized 27 species of *Mesocestoides*, including the species validated by Witenberg. Chertkova and Kosupko (1978) recognized 12 valid species of *Mesocestoides* and another 11 were considered as *species inquirendae*. Given the difficulty in the identification of the species by morphologic characters and their complex life cycle, several authors have argued in favor of the exclusion of the Mesocestoididae from the Cyclophyllidea (van Beneden in Braun, 1900) (WARDLE et al., 1974; MARIAUX, 1998).

Mesocestoides sp. are found in different hosts (birds and carnivore mammals) in different geographic regions. However, the majority of these hosts are animals protected by law, limiting the studies about this group of helminths. Roads cause great changes in ecosystems, reducing populations of various species. When found killed on roads these species can be studied in research studies. In this context, some species of felines are included in the list of endangered species of extinction (INDRUSIAK; EIZIRIK, 2003). This is the first report of *Mesocestoides* sp. in felines of the species

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Leopardus colocolo (Molina, 1782) (pampas cat), *Leopardus geoffroyi* (d'Orbigny & Gervais, 1844) (Geoffroy's cat), *Leopardus tigrinus* (Schreber, 1775) (oncilla) and *Puma yagouaroundi* (É. Geoffory Saint-Hilaire, 1803) (jaguarundi) in Rio Grande do Sul State, Southern Brazil.

Between 2007 and 2009, different specimens of felines were collected after being ran over in supervised roads in Rio Grande do Sul State, Brazil. The hosts were taken to the Laboratório de Zoologia dos Invertebrados of the Museu de Ciências Naturais at Universidade Luterana do Brasil (ULBRA). A total of 17 hosts of the species *L. colocolo* (n = 3), *L. geoffroyi* (n = 6), *L. tigrinus* (n = 3) and *P. yagouaroundi* (n = 5) were examined for parasites. The viscera were analyzed and the cestodes found were processed according to the techniques described by Amato et al. (1991). Ecological terms were used according to Bush et al. (1997). For each character, there were presented the minimum and maximum values, followed by the mean, standard deviation and number of specimens measured indicated in parentheses. Morphometric data was measured in micrometers, or indicated otherwise. Drawings were made using a microscope equipped with draw tube. Representative specimens were deposited in the "Coleção Helmintológica do Instituto Oswaldo Cruz" (CHIOC), Rio de Janeiro, RJ, Brazil.

There were found eucestodes belonging to *Mesocestoides* sp. (Figure 1). Description based on 10 specimens. Small scolex, 331.92-350.26 (341.09; 12.97; n = 2) wide; suckers 110.64-138.03 (122.1; 11.47; n = 4) long, 92.2-110.64 (101.42; 7.52; n = 4) wide (Figure 1a). Immature and mature proglottids wider than long; gravid proglottids longer than wide (Figures 1b, c). Male reproductive system with cirrus 276-529 (354.2; 71.26; n = 10) long, 92-253 (158.7; 41.21; n = 10) wide (Fig 1c). Cirrus pouch 69-230 (151.8; 54.43; n = 10) long, 299-598 (448.5; 107.47; n = 10) wide (Figures 1b, c). Numerous testes 92-129.08 (101.31; 14.54; n = 15) long, 55.32-92 (73.01; 10.64; n = 15) wide (Figure 1b). Female reproductive system with ovary consisting of two contiguous lobes 207-345 (255.3; 47.82; n = 10) long, 299-552 (414; 86.74; n = 10) wide (Figures 1b, c). Vitelline gland ventral to the ovary (Figures 1b, c). Paruterine organ 460-828

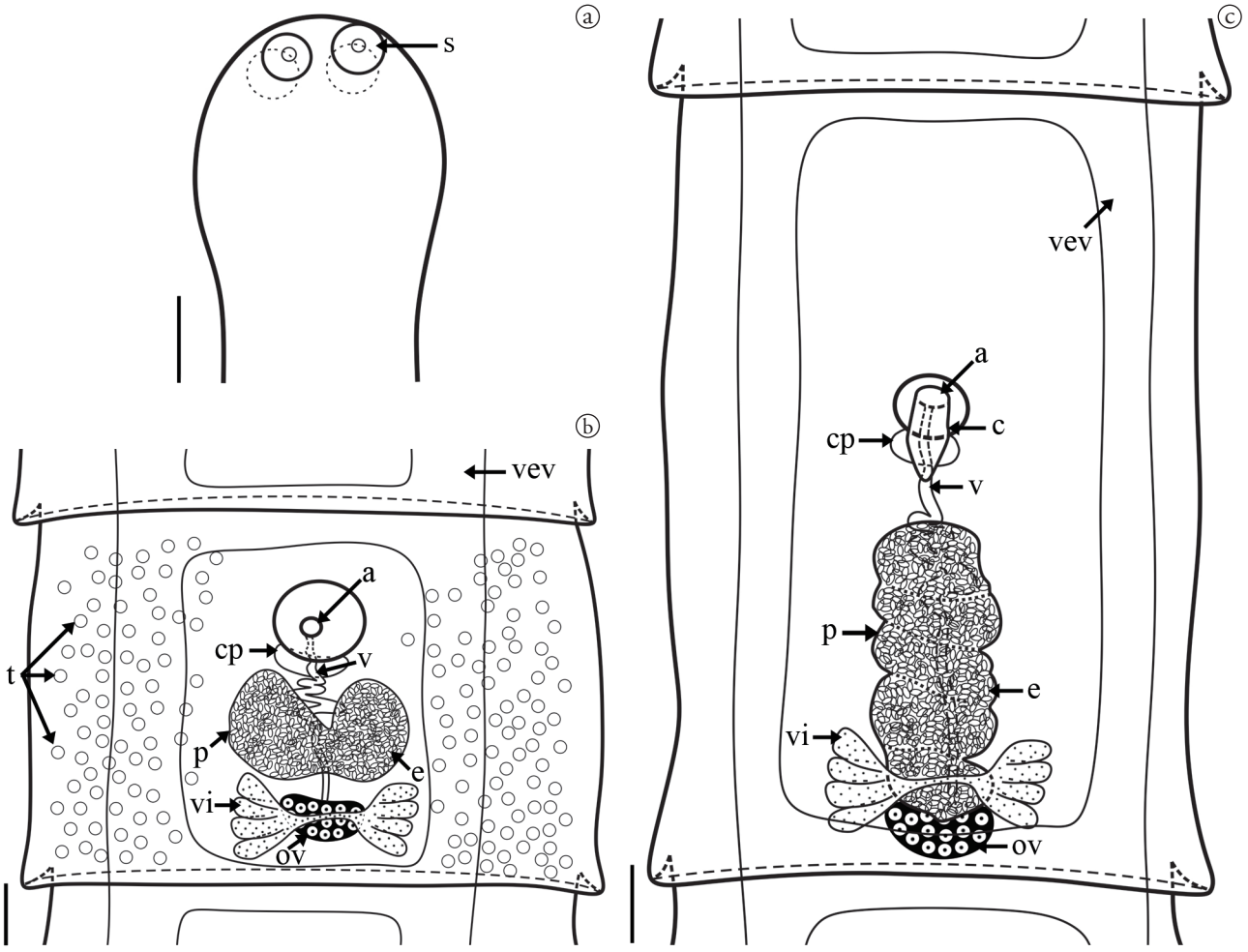

Figure 1. Incomplete diagrams of *Mesocestoides* sp. Vaillant, 1863 parasite of wild felines: a) scolex with suckers (s), Scale bar = 200 µm; b) mature proglottid showing the genital atrium (a), cirrus pouch (cp), testes (t), paruterine organ (p), vagina (v), vitelline glands (vi), ovary (ov), eggs (e) and ventral excretory vessel (vev), Scale bar = 300 µm; c) gravid proglottid showing the extroverted cirrus (c) and other organs, Scale bar = 300 µm.

(598; 148.61; n = 9) long, 690-1288 (1017.11; 235.34; n = 9) wide in mature proglottids (Figure 1b), becoming longer in gravid proglottids with 1058-1564 (1360.29; 175.38; n = 7) long, 391-575 (560; 63.68; n = 7) wide (Figure 1c). Numerous eggs, 55.32-64.54 (58.39; 4.50; n = 15) long, 27.66-36.88 (28.89; 3.24; n = 15) wide (Figures 1b, c). Voucher specimens deposited: CHIOC 37540 a, b, c.

The specimens found were compared with the species presented by Witenberg (1934). They are similar to *M. perlatus* due to the shape of mature proglottids and the position of the testes. However, *M. perlatus* has ovary with separate lobes, and the species found in the present study has an ovary with contiguous lobes; furthermore *M. perlatus* is reported as parasite of birds. For the identification at specific level, the analysis of more specimens collected from trampled hosts that are not in process of putrefaction is required.

The prevalence of cestodes ranged among the felines: 66.7% (*L. colocolo* and *L. tigrinus*), 60% (*P. yagouaroundi*) and 50% (*L. geoffroyi*). The intensity and abundance of infections were 12.5 and 8.33 in *L. colocolo*; 9.33 and 4.67 in *L. geoffroyi*; 70 and 23.3 in *L. tigrinus*; 15.6 and 9.4 in *P. yagouaroundi*, respectively. The high prevalence of helminths in the feline species studied indicates persistent ingestion of hosts infected by *Mesocestoides* sp. larvae, a characteristic related to the diet of felines and the life cycle of helminth species. The felines have diurnal and nocturnal habits and their diet consists of small vertebrates, mainly rodents, birds and lizards (SUNQUIST; SUNQUIST, 2002).

In the analysis of the stomach contents parts of rodents and lizards were found. These data suggest that mammals and reptiles could be the possible intermediate hosts of *Mesocestoides* sp. in Rio Grande do Sul. Our study contributes to the knowledge of the helminth parasites of endangered wild felines in Brazil.

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