PARASITISM BY *Dioctophyme renale* (GOEZE, 1782) IN MANED WOLF (*Chrysocyon brachyurus*), BRAZIL

Janaina Duarte[1]
Adriana Miranda Bezerra Costa[1]
Satie Katagiri[2]
Jéssica Amancio Martins[1]
Maria Elena Oliveira[1]
Claudia Mello Ribeiro[1]

ABSTRACT

This paper reports a case of parasitism by *Dioctophyme renale* in a maned wolf (*Chrysocyon brachyurus*) found in *rigor mortis* in São Paulo State. The wolf was subjected to necropsy which indicated that its right kidney was parasitized by three *D. renale* specimens: one female, one male and one larva. The right kidney was atrophied and had bloody content. In such bloody content, there were eggs showing morphology characteristic of D. *renale*. The left kidney was hypertrophied. On account of its predatory action, *D. renale* can reduce the survival of maned wolves in their natural habitat.

Keywords: *Dioctophyme renale*, *Chrysocyon brachyurus*, dioctophymosis, renal hypertrophy

PARASITISMO POR *Dioctophyme renale* (GOEZE, 1782) EM LOBO-GUARÁ (*Chrysocyon brachyurus*), BRASIL

RESUMO

Este artigo relata um caso de parasitismo por *Dioctophyme renale* em um lobo-guará (*Chrysocyon brachyurus*), encontrado em *rigor mortis* no Estado de São Paulo. O animal foi necropsiado, e o rim direito estava parasitado por três exemplares de *D. renale*: uma fêmea, um macho e uma larva. O rim direito encontrava-se atrofiado e continha conteúdo sanguinolento. Nesse conteúdo sanguinolento foram encontrados ovos com morfologia característica de *D. renale*. O rim esquerdo estava hipertrofiado. Devido a sua ação espoliadora, *D. renale* pode diminuir a sobrevida dos lobos-guarás em seu habitat natural.

Palavras-chave: *Dioctophyme renale*, *Chrysocyon brachyurus*, dioctofimose, hipertrofia renal.

PARASITISMO POR *Dioctophyme renale* (GOEZE, 1782) EN UN LOBO COLORADO (*Chrysocyon brachyurus*), BRASIL

RESUMEN

En este trabajo se reporta un caso de parasitismo por Dioctophyme renale en un lobo colorado (Chrysocyon brachyurus), encontrado en rigor mortis en el estado de São Paulo. El animal fue sometido a necropsia y fueron encontrados una hembra, un macho y una larva de D. renale en el riñón derecho, así como atrofia del mismo órgano y contenido sanguinolento. En ese contenido fueron encontrados huevos con características morfológicas de D. renale. Se

[1] Universidade Paulista
[2] Universidade Federal de Sergipe

observó también hipertrofia del riñón izquierdo. Debido a la naturaleza de su ciclo biológico D. renale puede disminuir el tiempo de vida del lobo colorado en su hábitat natural.

Palabras clave: *Dioctophyme renale*, *Chrysocyon brachyurus*, dioctofimosis, hipertrofia renal.

INTRODUCTION

Dioctophyme renale (Goeze, 1782) is known as giant kidney worm since it is frequently found in the renal pelvis of the definitive host and can be up to 100 cm long, the largest nematode described in mammals. In the evolutionary cycle of *D. renale*, the intermediate host is an aquatic oligochaete of the genus *Lumbriculus* which ingests eggs containing the first-instar larva of the parasite, while the definitive host is infected by ingesting water containing the oligochaete, or the paratenic host which can be a fish or an amphibian (1).

Parasitism by *D. renale* has been frequently reported in dogs (2), but this parasite has also been found in wild animals all around the world. *D. renale* was already described in gray fox (*Urocyon cinereoargenteus*) from Mexico (3), american marten (*Martes americana)* and mink (*Mustela vison*) from the United States (4, 5). In Brazil, *D. renale* was found in bush dog (*Speothos venaticus*) (6), southern two-toed sloth (*Choloepus didactylus*) (7), crab-eating fox (*Cerdocyon thous*) (8) and maned wolf (*Chrysocyon brachyurus*) (9). Additionally, there are sporadic reports in other mammals as atypical definitive hosts, such as cattle, horses, swine. Regarding humans infections, *D. renale* is a zoonotic or public health concern, since unequivocal cases in human beings have been documented (10).

The maned wolf is a wild canid found in cerrado areas or in open fields in Brazil. A large number of these animals host parasites such as *D. renale*, *Dipylidium* spp., *Toxocara* spp., *Ancylostoma caninum*, *Uncinaria* spp., *Trichuris* spp., *Capillaria* spp. and coccidia which may lead to death due to stressing situations. Although scarce, epidemiological studies of wild canids have cited that parasitic diseases can be the first causes of maned wolf mortality (11).

CASE REPORT

In this paper, a case of a maned wolf parasitized by *D. renale* is reported. In August 2011, a young male maned wolf was found dead and in *rigor mortis* in a road at Pindamonhangaba Municipality, São Paulo, Brazil (22° 55′ 26″ S, 45° 27′ 43″ W). During necropsy, intense epistasis, oral cavity bleeding, hemothorax and hemoperitoneum were observed, suggesting that the cause of death of this maned wolf was traumatism, probably due to road killing. In the stomach, several rats and *Diptera* larvae were found partially digested. Those larvae were also seen in the small intestine of this animal. The right kidney showed renal parenchyma atrophy (Figure 1), bloody content and three *D. renale* specimens: one female, one male and one larva (Figure 2). The bloody content present in the kidney was analyzed under an optical microscope. The identified eggs were bioperculate, elliptical, brown and had a thick layer, characteristic of *D. renale*. The left kidney was hypertrophied (Figure 3). The urethra and the bladder did not show macroscopic lesions.

D. renale is frequently descripted in brazilian dogs in comparison to other countries suggesting that the disease is more prevalent in this country, where the diversified tropical ecosystems may facilitate the harmonious coexistence (and adaptation) of the intermediate, paratenic and/or accidental hosts of this parasite thereby increasing the chances of infection and diagnosis (10). Maybe it can be extrapolate to wild animals.

Figure 1. Right kidney of maned wolf parasitized by *D. renale*

Figure 2. *D. renale* specimens present in the right kidney of the maned wolf

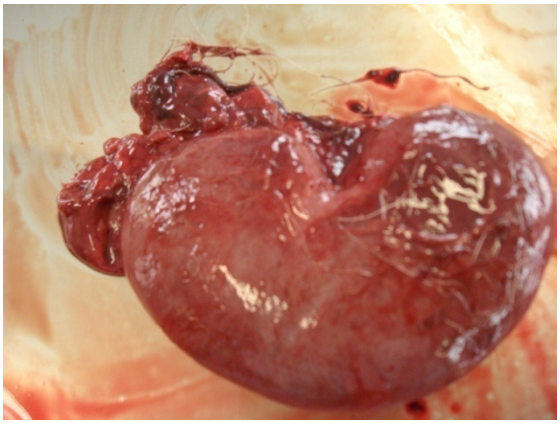

Figure 3. Left kidney of the maned wolf with hypertrophy

Diagnosis of dioctophymosis in dogs is made by means of *D. renale* egg search in the urine or imaging techniques such as radiography and ultrasonography (12). For wild animals, however, parasitism by *D. renale* is generally diagnosed during *post-mortem* inspection. In canids, this parasite is usually found in the right kidney due to its proximity to the duodenum and can cause renal atrophy, pelvis dilation, fibrosis, urethral obstruction, chronic inflammation or even total destruction of the renal parenchyma. In addition, *D. renale* can migrate to the abdominal cavity. In dogs, clinical signs are not specific and may include pain,

fever, prostration, hematuria, pyuria, reluctance to walk, increased frequency of urination, anorexia, convulsions, anemia, ascites, renal and abdominal colic, weight loss, irritability, polydipsia, proteinuria and uremia (2, 10). Considering maned wolves, there is lack of studies of the pathological and clinical aspects of parasitism by *D. renale*. Parasitism by *D. renale* in maned wolves is diagnosed during the capturing of such animals, and a large number of them do not show clinical signs of dioctophymosis at that moment. Nevertheless, intense deterioration caused by *D. renale* may lead this parasite to reduce the survival of maned wolves in their natural habitat, acting in the population control and helping maintain the genetic variability of these animals.

The presence of *D. renale* in maned wolves is related to the ingestion of water containing the oligochaete or to the ingestion of the paratenic host, a fish or an amphibian, containing the third-instar larva of *D. renale*. In Brazil, there are a few studies of the feeding habits of maned wolves. On the other hand, studies based on the observation of these animals, in the wild, have reported that their diet is constituted especially of fruits such as wolf apple (*Solanum lycocarpum*) and small mammals or armadillos as the main sources of animal protein. Birds, reptiles and medium- and large-size vertebrates are also found in the diet of this species (13). Bueno, Belentani and Motta-Junior (14) were the only investigators to report fish and amphibians in the diet of this animal, but always at very low proportions. Thus, further studies of the diet of these animals are needed since they may be consuming fish infected by *D. renale.*

This paper reports parasitism by *D. renale* in a maned wolf (*C. brachyurus*) and suggests the implantation of measures to monitor parasitic load in this species, since the parasites may lead to a decline in the population contingent of these animals.

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