Journal of Zoo and Wildlife Medicine 40(3): 586–587, 2009

CAPILLARIA HEPATICA IN *PUMA CONCOLOR*: FIRST REPORT IN BRAZIL

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Abstract: *Capillaria hepatica* was detected by histopathologic diagnosis in two cougars that were shot in April 2008 in Painel, Santa Catarina, Brazil. Macroscopic analysis of their livers revealed the presence of diffuse granulomas, and the histopathologic analysis indicated the presence of *C. hepatica* eggs, surrounded by mononuclear inflammatory cell infiltrate, small foci of necrosis, and mild-to-moderate fibrosis. This is the first report of *C. hepatica* in cougars (*Puma concolor*) in Brazil.

Key words: Brazil, *Capillaria hepatica*, Felidae, nematode, *Puma concolor*.

BRIEF COMMUNICATION

Puma concolor is found in several Brazilian states. In the southern region, although confined to restricted areas, it is quite uncommon. It has been jeopardized by hunting and deforestation, and population declines have occurred in areas that are heavily populated by humans.

Capillaria hepatica, a nematode in the family Trichuridae, infects the liver parenchyma of several hosts and has a ubiquitous distribution and a zoonotic pattern of transmission. It is commonly found among rodents. Susceptible species include coyotes (*Canis latrans*), skunks (*Spilogale putorius*), dogs (*Canis familiaris*), cats (*Felis catus*), pigs (*Sus scrofa*), rabbits (*Oryctolagus cuniculis*), hares (*Lepus* sp.), nonhuman primates (*Hominidae* family), and humans.[3,6] Humans are seldom infected, but when that occurs, infection is severe and life-threatening.[7] The presence of domestic rodents has been suggested to play a role in its human epidemiology. Street dogs, or those dogs that have access to the street, often eat rodent carcasses and are therefore more susceptible, contributing to the dissemination of eggs and serving as a source of infection for other animals and humans.[6] *Capillaria hepatica* in humans was documented by Govil and Desai[5] and Juncker-Voss et al.[7] and is described as a granulomatous lesion around the parasite eggs. Liver fibrosis is more evident with the extended longevity of the infection and results from the immune response against parasite antigens.[1,2,4,8]

Capillaria sp. eggs were detected by Paton et al.[10] in the feces of four cougars in Central America, by Patton and Rabinowitz[11] in wild felines in Thailand, and by Yasuda et al.[12] in *Felis bengalensis* in Japan.

In April 2008, two adult cougars, a male and a female, were rescued by the Environmental Police in Painel, Santa Catarina, Brazil (27°55′44″S, 50°06′18″W), on the side of a highway. They were screened and necropsied at the Laboratory of Zoology and Parasitology of Universidade do Planalto Catarinense, in Lages, Santa Catarina, Brazil. Several gunshot wounds were identified. The animals had hemorrhagic spots in the head, neck, thighs, lumbar region, and right forepaw. The temporal region of one of the cougars showed that it had been shot at point-blank range, showing a large "hole," indicating that the shot had been fired with the barrel held against the left side, behind the ear, and had transversed to the right side. In addition, presence of burnt fur was detected around the gunshot wound. The animal's lung was congested, but its heart had no abnormal findings. There was a large amount of blood in the thoracic and abdominal cavities. No findings were identified in the gallbladder, kidneys, ovaries, and bladder, but brain hemorrhage was found. The macroscopic analysis of the livers demonstrated diffuse yellowish spots and plaques (granulomas).

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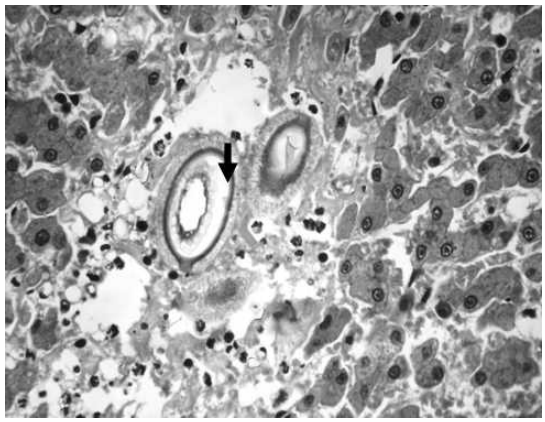

Figure 1. Histologic section of the liver of female *P. concolor* showing *C. hepatica* eggs (arrowhead), measuring 62.4 μm × 33.8 μm), mononuclear inflammatory cell infiltrate, and fibrosis. H&E, ×40.

Specimens were collected from the brain, liver, spleen, and heart of both cougars and from the ovary of one cougar; mounted onto slides; and stained with hematoxylin and eosin. The histopathologic analysis of brain, spleen, heart, kidney, and ovary did not show any abnormal findings. The liver obtained from the female cougar contained a large number of parasite eggs with a thick-walled capsule and a second layer with a spoke-like pattern (Fig. 1). The eggs had opercular plugs at both ends and were surrounded by inflammatory reaction and mild-to-moderate fibrosis, small foci of necrosis with hemorrhage, and mild and randomly distributed mononuclear inflammatory cell infiltrate. In the male cougar, the lesions were similar to those of the female cougar, with necrosis and a more intense inflammatory reaction. Two parasite structures were identified, which corresponded to the adult parasite. This is the first report of *C. hepatica* in *P. concolor* in Brazil.

The aspects of the macroscopic and microscopic lesions produced by *C. hepatica* infection described in this report are in line with the reports by Ferreira and Andrade,[2] Ilha and Barros,[6] Andrade,[1] and Klenzak et al.[8] Although this feline species is rare and confined to restricted areas, there is neither awareness about nor a humane approach to its preservation.[9]

LITERATURE CITED

1. Andrade, Z. A. 2005. Regressão da fibrose hepática. Rev. Soc. Bras. Med. Trop. 38: 514–520.

2. Ferreira, L. A., and Z. A. Andrade. 1993. *Capillaria hepatica*: a cause of septal fibrosis of the liver. Mem. Inst. Oswaldo Cruz 88: 441–447.

3. Galvão, V. A. 1981. *Capillaria hepatica* study: an evaluation of its pathogenic role on man. Mem. Inst. Oswaldo Cruz 76: 415–433.

4. Gomes, A. T., L. M. Cunha, C. G. Bastos, B. F. Medrado, B. C. Assis, and Z. A. Andrade. 2006. *Capillaria hepatica* in rats: focal parasitic hepatic lesions and septal fibrosis run independent courses. Mem. Inst. Oswaldo Cruz 101: 895–898.

5. Govil, H., and M. Desai. 1996. *Capillaria hepatica* parasitism. Indian J. Pediatr. 63: 698–700.

6. Ilha, M. R. S., and C. S. L. Barros. 2000. Capilariose hepática em cães e gatos: 15 casos. Cienc. Rural 30: 665–669.

7. Juncker-Voss, M., H. Pros, H. Lussy, U. Enzenberg, H. Auer, and N. Nowotny. 2000. Serological detection of *Capillaria hepatica* by indirect immunofluorescence assay. J. Clin. Microbiol. 38: 431–433.

8. Klenzak, J., A. Mattia, A. Valenti, and J. Goldberg. 2005. Hepatic capillariasis in Maine presenting as a hepatic mass. Am. J. Trop. Med. Hyg. 72: 651–653.

9. Mazzolli, M., and L. A. Hammer. 2008. Qualidade de ambiente para a onça-pintada, puma e jaguatirica na Baía de Guaratuba, estado do paraná, utilizando os aplicativos capture e presence. Biotemas 21: 105–117.

10. Patton, S., A. Rabinowitz, S. Randolph, and S. S. Johnson. 1986. A coprological survey of parasites of wild Neotropical Felidae. J. Parasitol. 72: 517–520.

11. Patton, S., and A. R. Rabinowitz. 1994. Parasites of wild felidae in Thailand: a coprological survey. J. Wildl. Dis. 30: 472–475.

12. Yasuda, N., M. Akuzawa, H. Maruyama, M. Izawa, and T. Doi. 1993. Helminths of the Tsushima leopard cat (*Felis bengalensis euptilura*). J. Wildl. Dis. 29: 153–155.

Received for publication 12 November 2008