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Case Report

Natural Infection by *Platynosomum illiciens* in a Stray Cat in Cruz das Almas, Recôncavo da Bahia, Brazil

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Abstract

This paper describes the main aspects of natural infection of a street cat with *Platynosomum illiciens* in Cruz das Almas, Bahia, Brazil. The most significant histopathological findings included nonsuppurative cholangiohepatitis and hepatic fibrosis, which explain partially the main clinical signs displayed by the patient: cachexia, jaundice, and stupor. The gallbladder, biliary ducts and ductus choledochus were dilated, thickened, and highly infested with flukes. This report should serve to warn veterinarians about the presence of *P. illiciens* in the Recôncavo region of Bahia, and reinforces the importance of platynosomiasis in the differential diagnosis for feline liver diseases.

Key words: platynosomiasis, *Platynosomum* sp., liver fluke, feline.

Introduction

Platynosomum illiciens (6), also referred to as *P. fastosum* and *P. concinnum* (13), is the most important trematode found in cats (*Felis catus domesticus*) living in tropical and subtropical regions. This small fluke has a complex life cycle that includes different intermediate and paratenic hosts before it infects the gallbladder and bile ducts of the definitive host (9, 12), where it is associated with cholangitis/cholangiohepatitis complex in domestic cats (15). The natural predatory instinct of cats ensures the completion of the life cycle. Platynosomiasis is difficult to diagnose because much of the affected population does not exhibit clinical signs (4, 5, 13). Moreover, when cats are ill, they manifest a nonspecific clinical spectrum, ranging from anorexia, lethargy, vomiting and diarrhea, to anemia and/or progressive jaundice. The major pathologic findings include cholangitis/cholangiohepatitis and cirrhosis, which commonly progress to liver failure and death (2, 11, 14, 16). The prevalence of platynosomiasis in Brazil varies from 1.07 to 61.54% (8, 3), with a unique case recorded in the state of Bahia, Brazil (14). This paper describes, for the first time, the main clinical, pathological and parasitological aspects of natural infection by *P. illiciens* in a street cat in Cruz das Almas, Bahia, Brazil.

Cases report

An adult female mongrel street cat was found outside of a residence in the urban area of Cruz das Almas, Bahia, in right lateral decubitus, exhibiting cachexia, dull fur, tachypnea, hypothermia, jaundice, pale mucous, stupor and shock. The animal was euthanized in view of the severity of its clinical signs and immediately subjected to necropsy at the Sector of Veterinary Pathology of the Federal University of Recôncavo da Bahia (UFRB). During necropsy, tissue samples of organs were excised, fixed in 10% neutral-buffered formalin, and routinely

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processed for histopathological examination. In addition to generalized jaundice observed in all apparent mucosal surfaces, macroscopic findings were limited to the liver and biliary tract. The liver was enlarged, with rounded edges, yellow and accentuation of the liver lobules, and clear areas mixed with dark red areas (Fig. 1). On the ventral surface of the liver lobes, the capsular surface was irregular and bile ducts were dilated. The capsule had whitish areas, thickened, which deepened throughout the parenchyma. The gallbladder, biliary ducts and ductus choledochus were dilated and thickened and highly infested with flukes.



Figure 1. Liver of street cat from Cruz das Almas, Recôncavo da Bahia, Brazil, naturally infected with *Platynosomum illiciens*. Enlarged liver with rounded edges, yellowish with accentuation of the lobules and depressed areas in the capsular surface.

Histopathological examination revealed moderate nonsuppurative cholangiohepatitis and fibrosis with occasional bridging, which became more severe around bile ducts (Fig. 2). There was an inflammatory infiltrate composed mainly of lymphocytes, some macrophages and plasma cells, which were seen in the periportal region and around bile ducts. Adenomatous hyperplasia of ductal epithelium, with dilatation and proliferation of bile ducts, was also found. Parasites were observed in some cross sections of bile ducts. Some dilated intrahepatic bile ducts contained flukes cut in cross section (Fig. 3). Finally, there was still in the hepatic parenchyma dilation and congestion of sinusoids and granular brown pigment within the Kupffer cells. Eighteen specimens of hepatic flukes were collected and transferred to 70% alcohol and then sent to Laboratory of Microbiology and Parasitology of UFRB. A parasitological analysis revealed flatworm parasites ranging from 2.9 to 4.3 mm in length and 1.7 to 2.6 mm in width. The parasites were cleared with lactophenol, after which important morphological parts of parasites were analyzed under a light microscopy. In summary, the parasites presented an oral sucker, acetabulum in the anterior portion of the body, unbranched intestinal cecum, and both male and female organs (Fig. 4). The testicles were elongated, paired, slightly lobulated, located in the same zone at the horizontal position. The ovary was transversally elongated, slightly lobulated and located behind the testes. The branching uterus occupied most of the posterior region of the parasite. The vittelline glands located in the lateral regions of the parasite and cirrus pouch occupied the preacetabular region. The morphological characteristics of the flukes were consistent with *P. illiciens*.

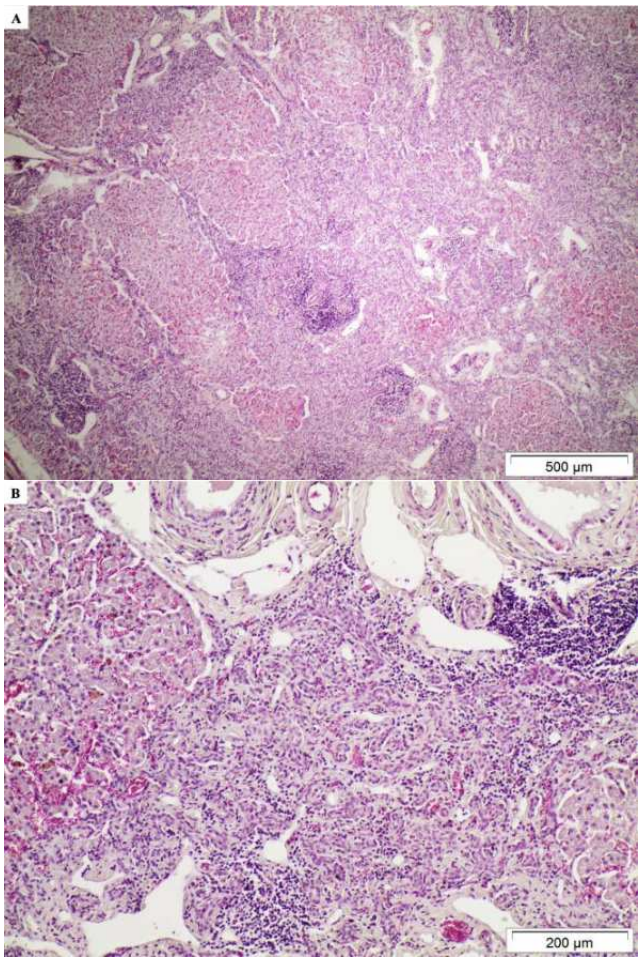


Figure 2. Histological image of a section of liver from a street cat naturally infected with *Platynosomum illiciens* from Cruz das Almas, Recôncavo da Bahia, Brazil. (**A**) Marked periportal bridging fibrosis with bile duct hyperplasia and inflammatory lymphocytic infiltrate (HE stain). (**B**) Higher magnification of bile duct hyperplasia (HE stain).

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Figure 3. Histological image of a section of liver from a street cat naturally infected with *Platynosomum illiciens* from Cruz das Almas, Recôncavo da Bahia, Brazil. Dilated intrahepatic bile duct with specimens of *Platynosomum* sp. in cross section (HE stain).

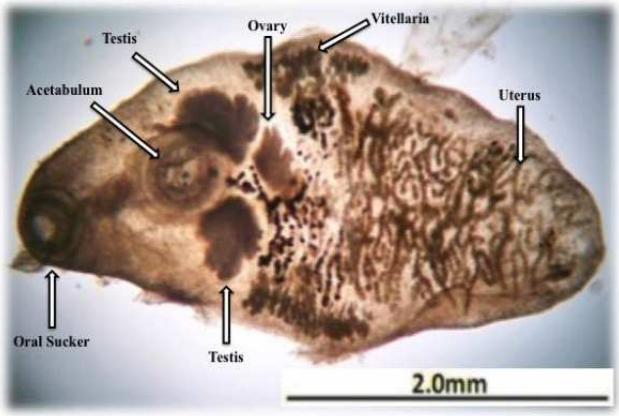


Figure 4. Internal morphological structures of *Platynosomum illiciens* collected from the gallbladder of a naturally infected street cat from Cruz das Almas, Recôncavo da Bahia, Brazil.

Discussion

To the best of our knowledge, this is first report of natural infection with *P. illiciens* in a domestic cat in Cruz das Almas, and the second case recorded in the state of Bahia, Brazil (14). The region's environmental characteristics and the asymptomatic course of the disease favor the biological cycle of *P. illiciens*, by allowing the presence and survival of intermediate hosts and large number of stray cats.

The course and severity of platynosomiasis appears to be associated with the parasitic load. In experimental infections, cats with mild parasitism (125 helminths) are asymptomatic and cats with high numbers of flukes (more than 1,000) usually manifest clinical signs (5). On the other hand, in natural infection previously registered in the state of Bahia, a feline of one year and three month-old showed weight loss and jaundice pronounced with only 250 adult specimens of *Platynosomum* spp. recovered from the gallbladder (14). In this report, although an exact count of the parasitic load was not made, it was estimated to be between 100 to 150 specimens. The most significant histopathological findings included nonsuppurative cholangiohepatitis and hepatic fibrosis, which explain the main clinical signs displayed by the patient: cachexia, jaundice and stupor. The association between parasitism and hepatic fibrosis has been reported as a cause of jaundice in platynosomiasis (10), because it impairs the bile flow. Although it cannot be confirmed, a possible liver failure could be related to the manifestation of stupor, given that hepatic encephalopathy caused by platinosomíase has been reported in the literature (11). Considering the fact that it was a stray cat, it is reasonable to assume that it had an active hunting habit (ingesting infected terrestrial isopods/lizards) and long exposure to the illness, which would lead to chronic parasitism and progressive destruction of the liver parenchyma, with replacement by fibrous tissue. Although the hyperplasia found in the liver parenchyma could not suggestive of preneoplastic changes, cholangiocarcinoma is considered a neoplastic disease secondary to parasitic infection (1). The other pathological findings were characteristic of platynosomiasis.

Early laboratory diagnosis of platinosomíase is fundamental in asymptomatic cases, but difficult to perform due to low and irregular elimination of eggs in the feces of infected cats. Therefore, it is recommended performing serial fecal examinations from sedimentation techniques, such as formalin-ether (5, 7) and restricting contact between domestic cats and other hosts involved in the transmission cycle.

This report should serve to warn veterinarians about the presence of *P. illiciens* in the Recôncavo region of Bahia, and reinforces the importance of platynosomiasis in the differential diagnosis for feline liver diseases.

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