Short Communication

Comparison of two coproparasitological techniques for the detection of *Platynosomum* sp. infection in cats

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**Abstract**

*Platynosomum* sp. is the etiologic agent of platynosomiasis, a hepatic disease that affects domestic cats. The parasite develops in the bile ducts and gallbladder, causing severe hepatobiliary disease. Considering the importance of the disease and the increase in the number of households with cats, the aim of this study was to compare two different techniques for the detection of the parasite’s eggs and to assess the frequency of *Platynosomum* sp. infection in cats. Forty fecal samples from cats of different ages, from an animal shelter in the city of Salvador, Bahia State, Brazil, were subjected to two different techniques: a centrifugal fecal flotation procedure in Sheather’s sugar solution and centrifugal sedimentation in formalin-ether solution. Positive results were found for 12.5% of the samples using the centrifugal fecal flotation assay, whereas all samples were negative when employing the centrifugal sedimentation test. The results suggest that this parasite can be found infecting cats in Salvador city and that centrifugal fecal flotation in sugar solution can be a more suitable detection of the parasite’s eggs at fecal samples. Therefore, platynosomiasis must be included in the diseases to be studied routinely in domestic felids.

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1. Introduction

Helminthes of the gastrointestinal system are among the various pathogens that cause health problems in cats and can trigger diseases in their hosts due to their obstructive and spoliative actions. The trematode *Platynosomum illiciens* (Trematoda: Dicrocoeliidae), considered by some authors as a synonym of *Platynosomum fastosum* and *Platynosomum concinnum*, is the most important trematode of cats in tropical and subtropical areas (Ferreira et al., 1999). It has a flat, ovoid, or ellipsoid body that measures an average of 2.8–6.8 mm long and 0.85–2.6 mm wide. The eggs measure 34–50 \(\mu\)m by 20–35 \(\mu\)m on average and are brown, thick, and symmetrical (Ferreira et al., 1999).

The life cycle of *P. illiciens* requires two intermediate hosts. The first is a terrestrial mollusk, and the second can be a terrestrial coprophage isopod or a beetle, as well as a lizard, gecko, frog, or toad (Arceo et al., 1999). Infection
occurs via ingestion of an intermediate or vertebrate host containing metacercariae (Foley, 1994).

Diagnosis is made by techniques based on fecal egg detection. Cats can be symptomatically or asymptptomatically infected, depending on the severity of infection (Bielsa and Greiner, 1985). According to the degree of parasitism, an obstruction of bile flow can occur, either mechanically or by the inflammatory process generated by parasitism in the bile duct wall (Lima et al., 2008). The symptoms are non-specific and may be characterized by a lack of appetite, lethargy, anorexia, and weight loss. The most common clinical signs include vomiting, mucoid diarrhea, and changes in stool characteristics. When the animal is highly parasitized, several symptoms can be observed, such as anemia, hepatomegaly, ascites, jaundice, and even death (Ferreira et al., 1999; Ribeiro, 2004).

The recent increase in the prevalence of cats as pets, as well as the current knowledge on the zoonoses that they can transmit, has stimulated many studies on these animals. Tropical and subtropical climates are critical for the development and survival of Platynosomum because intermediate hosts are found in these climatic types. Considering this situation, the present study had the objective of evaluating the parasitism of animals from a shelter in the city of Salvador, Bahia State and of comparing two different techniques for the detection of Platynosomum sp. eggs in the feces of cats.

2. Materials and methods

In this study, forty fresh fecal samples, from cats of various ages and both sexes at a received animal shelter located in the city of Salvador, Bahia State, Brazil, were used. All animals at the shelter were sampled. The feces were placed in plastic and refrigerated at the time of collection until analysis, which was made on the same day of collection. The number of samples to be tested ($n$) was given by $\log \beta / \log \rho$, where $\beta$ represents the likelihood of a false negative and $\rho$ is the proportion of uninfected animals (Van Sluyters, 2003). The likelihood of a false negative was given by adopting a confidence level of 95% ($\beta = 0.05$). The proportion of non-infected animals was given by the results described by Junquilho (2006), who studied animals in a veterinary hospital in the same city and found a prevalence of 9.9% ($\rho = 0.901$). Thus, the minimum number of animals to be used was 29 animals; however, 40 samples were used in this study.

Two different techniques were used for the identification of helminth eggs: the centrifugal fecal flotation procedure in Sheather’s sugar solution (Faust et al., 1939) and the centrifugal sediementation test in formalin-ether solution (Ritchie, 1948). Briefly, for the centrifugal sedimentation test, $2 \times g$ of fresh feces collected from various parts of the stools was placed in a flask containing 10 mL of water. The suspension was filtered through cheesecloth and centrifuged at $650 \times g$ for 1 min. After centrifugation, the supernatant was decanted, and 2 mL of water was added, with further homogenization. This washing process was repeated until the supernatant achieved a clear appearance; the pellet was then resuspended in 2 mL of 10% formalin and allowed to stand for 5 min.

Then, 3 mL of ether was added; the tube was shaken vigorously in an inverted position for 30 s and centrifuged at $500 \times g$ for 1 min. The three upper layers were discarded. A microscope slide was prepared using the remaining sediment and viewed under an optical microscope (Eclipse E-200, Nikon, Japan) at 400× magnification. For a qualitative analysis, the presence or absence of Platynosomum sp. eggs in each sample was recorded.

For the centrifugal fecal flotation in Sheather’s sugar solution technique, $2 \times g$ of fresh feces was collected from various parts of the fecal material and placed in a vial containing 10 mL of sterile water. The suspension was filtered through cheesecloth, and a 1.2 g/mL sucrose solution was added; the vial was vigorously stirred and centrifuged at $500 \times g$ for 10 min. The upper film formed was removed with a platinum loop, and transferred to a microscope slide. The material was analyzed in a qualitative manner using an optical microscope (Eclipse E-200, Nikon, Japan) at 400× magnification. The identification of the eggs was performed according to the description of Palumbo et al. (1976), and a photo of an egg identified in one of the samples is shown in Fig. 1.

3. Results and discussion

Despite the lack of investigation on the occurrence of intermediate hosts of Platynosomum sp. in the region studied herein, we observed the presence of infected animals. Among the forty fecal samples, five were positive for the presence of Platynosomum eggs using the centrifugal flotation assay, which represents 12.5% of the analyzed material. In contrast, no sample presented positive results by the centrifugal sedimentation test. This result was similar to that reported by Junquilho (2006) in the same town when analyzing 101 fecal samples. This author found 10 positive samples using both the centrifugation and sedimentation techniques for the identification of Platynosomum sp. eggs but did not present the individual results of each procedure.
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