First isolation of *Dioctophyme renale* eggs from an urban environment and identification of those from animal urine

Primeiro isolamento de ovos de *Dioctophyme renale* no ambiente urbano e identificação destes na urina de animais

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Abstract

*Dioctophyme renale* is a zoonotic parasite with worldwide distribution, although its occurrence is little known. The objective here was to evaluate the presence of parasite eggs in the environment and in the urine of dogs and cats in an urban area. Soil samples and urine were evaluated respectively by means of the Caldwell-Caldwell technique and urinalysis. Out of the 100 soil samples, 3% presented *D. renale* eggs, and out of the 43 urine samples, 18.6% were positive, including the feline samples. Thus, *D. renale* eggs are present in the urban environment, and dogs and cats are parasitized by this nematode, which therefore represents a risk to public health.

Keywords: Soil, urine, nematode, dog, cat, *D. renale*.

Resumo

*Dioctophyme renale* é um parasito zoonótico com distribuição cosmopolita, entretanto sua ocorrência é pouco conhecida. Assim, o objetivo foi avaliar a presença de ovos do parasito no ambiente e na urina de cães e gatos de zona urbana. As amostras de solo e urina foram avaliadas respectivamente, pela técnica de Caldwell e Caldwell e por urinálise. Das 100 amostras de solo, 3% apresentaram ovos de *D. renale*, e das 43 amostras de urina, 18,6% foram positivas, incluindo a de felino. Conclui-se que ovos de *D. renale* estão presentes no ambiente urbano, assim como os caninos e felineos apresentam-se parasitados, representando um risco para a saúde pública.

Palavras-chave: Solo, urina, nematódeo, cão, gato, *D. renale*.

*Dioctophyme renale* was first described by Goeze in 1782 (PEDRASSANI, 2009) and, despite having worldwide distribution, its incidence in some parts of the world is unknown. It is vital to obtain such data, since it gives rise to a zoonosis of public health importance. Dioctophymiasis has been reported in several species, such as ferrets (PESENTI et al., 2012), cats (PEDRASSANI et al., 2014) and dogs (STAINKI et al., 2011), as well as in humans (VENKATRAJAIAH et al., 2014). Occurrences of this parasitic infection in certain regions may be due to the high potential of these areas for water-borne transmission, and to the presence of stray dogs with unselective eating habits (KOMMERS et al., 1999; PEREIRA et al., 2006). The objective of this study was to evaluate the presence of parasite eggs in soil samples from the urban area of Pelotas, southern Brazil, and in urine samples from dogs and cats in this city.

Analysis on soil contamination by *D. renale* eggs was carried out in the region of a veterinary clinic near the center of Pelotas, a city located in the southern region of the state of Rio Grande do Sul, Brazil (31° 46’ 19” S, 52° 20’ 33” W). The sampling site was thus defined because many animals were being diagnosed as positive for this parasite in this region. This study formed part of an extension project of the Veterinary School of the Federal University of Pelotas (UFPel).

In July and August 2015, soil sampling and analysis were performed, with evaluations at four sites within the community. This place was chosen because it is located in the central area of the city with stray dogs and cats which has been diagnosed with dioctophymiasis. At each site, 250 g of sandy soil were obtained from the four corners and the center, thus corresponding to 20 samples. These were then identified and stored under refrigeration. Each
The frequency of *D. renale* eggs in the urine of animals was 18.6%, but it is not possible to define this as the actual frequency in Pelotas because it is just an initial study. However, other authors have demonstrated isolation frequency parasite eggs of 2% (COLPO et al., 2007) and 14.2% (PEDRASSANI, 2009) in the urine of dogs. In relation to the sex of the animals, the result of the present study was at odds with previous studies, in which the urine of dogs. In relation to the sex of the animals, the result of the present study was at odds with previous studies, in which the urine of dogs.

The eggs identified in the urine and soil samples were elliptical and yellowish-brown, with a thick and rough wall and bipolar buffers. Identification of *D. renale* eggs in urine is one of the most important means of diagnosing parasitic disease, and the microscopic characteristics of the eggs were in agreement with the literature (COLPO et al., 2007; PEDRASSANI, 2009).

The total number of positive urine samples (18.6%) may have been an underestimate, given that *D. renale* eggs are only observed if the female parasite is in the kidneys of dogs and cats. It is therefore possible that the true level of contamination among animals in the study area may be higher. In addition to the fact that stray dogs inhabit local wetlands and are unselective feeders, the presence of rats (*Rattus norvegicus*) may be an important factor in relation to the frequency of this parasite in the study area, since rodents could act as paratenic hosts for *D. renale* (KOMMERS et al., 1999), and would mostly serve as a source of infection for dogs and cats.

Given the above, it can be concluded that environmental contamination by *D. renale* eggs is present in Pelotas, and that dogs and cats have become infected. These findings serve as a public health warning for the city, since dioctophymiasis is a zoonosis for which most animals do not show any specific clinical signs. Undetected infected animals may be living in close contact with other animals and with humans.

### References


### Table 1. Distribution of animals parasitized by *D. renale* in Pelotas in terms of sex, species, breed, age and keeper.

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