Natural infections with filarioidea nematodes in *Hydrochoerus hydrochaeris* in the floodplain of Mato Grosso do Sul, Brazil

Infecções naturais com nematódeos Filarioidea em *Hydrochoerus hydrochaeris* no Pantanal do Mato Grosso do Sul, Brasil

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SUMMARY

From 36 capybaras, slaughtered between 1989 and 1996, 11 young, less than 6 months old, and 25 adults, in the floodplain region of Mato Grosso do Sul, 570 Filarioidea nematodes were collected. Three hundred and ninety-four specimen of *Cruorifilaria tuberocauda* were collected from the renal arteries (380) and from pulmonary arteries (14) and 176 specimen of *Yatesia hydrochoerus* from the fasciae of skeletal muscles, mainly from the *obliquus externus abdominis* region and from the internal faces of hind limbs.

UNITERMS: Nematoda; Filarioidea; Capybara; *Hydrochaerus hydrochaeris*.

INTRODUCTION

The capybara (*Hydrochoerus hydrochaeris*, L. 1766), a wild rodent of semi aquatic habits, inhabits the surroundings of river banks, dams, bays and swamps. This rodent is, under domestication in several States of Brazil, with the aim of producing a high quality feedingstuff, of sound proteic value and low caloric content. It can be parasited by helminths which determine from gastrointestinal mucosa erosions to extensive ceccum and colon ulcerations, endoarteritis, hypertrophia of vessel walls (intima and media) and renal pyramidal infarction.

The filariases of capybaras have been recently described in Venezuela-10, Colombia-12,13 and Brazil-1,3,8,9. In these studies, five species of Filarioidea were identified: *Dirofilaria acutiuscula*, *Cruorifilaria tuberocauda*, *Yatesia hydrochoerus*, *Mansonella longicapitata* and *Mansonella rotundicapitata*. The objectives of the present study were to determine the species of Filarioidea which parasite capybaras in the floodplain of Mato Grosso do Sul, as well as to investigate the characteristics of infections, such as: prevalence, intensity, mean intensity and abundance.

MATERIAL AND METHOD

Physiographic Region

The floodplain region of Mato Grosso do Sul (Paiaaguás) is an ecological system with an area of 25,457 km², of open pasture with patches of stunted vegetation, well-defined wet and dry seasons and a mean temperature about 28°C in summer.

Animals

Thirty-six capybaras, 11 young (less than 6 months old) and 25 adults, infected naturally, slaughtered in the floodplain between 1989 and 1996, in the counties of Pedro Gomes (7), Corumbá (17) and Coxim (12), Mato Grosso do Sul, were used in this study.

Methods

Following the slaughter, each animal was esfoliated, and skin and carcass examined macroscopically (muscle fasciae). Approximately 50% of the skin was divided into fragments of 30 cm² and maintained for 3 hours in waterbath, in metal trays containing a thin layer (2 cm) of saline solution (0.85% of NaCl) at the temperature of 37°C. At the end of this period, the obtained material was macroscopically examined and the worms found, both in
the muscle fasciae and the skin, were fixed in formol-acetic. Immediately after the host death, the examination of the heart blood vessels, lungs and kidneys was conducted by incision with a 10.5 cm thin end pair of scissors. The morphological studies of nematodes were accomplished after the consecutive diafanization in glacial acetic acid and Faya cresoto. Renal fragments were fixed in Bouin fluid, processed routinely, and stained with hematoxiline-eosin. The ecological terms (prevalence, intensity, mean intensity, abundance) are the committee’s recommendations of the American Society of Parasitologists.

**RESULTS**

In 13 capybaras Filarioidea nematodes were not found; 11 of these capybaras were young animals aging less than 6 months old. Infections with only one species of worm were observed in ten animals, and in 13 with 2 nematodes species. The total worm burden found in 23 capybaras was 570 nematodes adults, being 176 specimens of *Y. hydrochoerus* obtained from the fasciae, *obliquus externus abdominis*, region mainly in the internal face of the muscles from the hind limbs, and occasionally from the lumbar region (Fig. 1A) and 394 specimen of *C. tuberoencauda* from the renal (380 worms) (Fig. 1B) and pulmonary arteries (14 worms) (Tab. 1).

The number of *Y. hydrochoerus* varied from 1 to 40 worms per animal and *C. tuberoencauda* counts ranged from 1 to 134 nematodes.

In relation to the pathogeny of *C. tuberoencauda*, which develops mainly in the capybara kidneys, the histopathological examination showed that the main lesions occurred in the artery walls and consisted of endoarterites, hypertrophia of the vessel walls (intima and media) and rugged protuberance which invades the arterial lumen, causing renal pyramidal infarction. Renal arteries hasting dead and decalcified worms, granulomatous proliferation reached to the renal parenquima (Fig. 1C). Besides these lesions, a renal atrophy and presence of marked depressions on the surface of the organ were observed (Fig. 1D), suggesting cicatricial lesions.

**Figure 1**

A = Fasciae of skeletal muscles parasited for *Y. hydrochoerus*; B = Kidney of capybara parasited by *C. tuberoencauda*; C = Renal arteries hasting dead and decalcified worms; D = Marked depression on the surface of kidney parasited by *C. tuberoencauda* HE (obj X).

### Table 1

Prevalence, intensity, mean intensity and abundance of the Filarioidea nematodes parasites of the renal and pulmonary arteries and fasciae of skeletal muscles, found in capybaras slaughtered between 1986 and 1996 in the counties of Pedro Gomes, Corumbá and Coxim, from floodplain region of Mato Grosso do Sul, Brazil.

<table>
<thead>
<tr>
<th>Species of Nematodes</th>
<th>Host Location</th>
<th>Number of Animals</th>
<th>Infection Intensity</th>
<th>Mean Intensity</th>
<th>Abundance</th>
<th>Prevalence</th>
<th>Total of Nematodes</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cruorifilaria tuberocauda</em></td>
<td>Renal and Pulmonary Arteries</td>
<td>36</td>
<td>1 - 134</td>
<td>20.7</td>
<td>10.94</td>
<td>52.70</td>
<td>394</td>
</tr>
<tr>
<td><em>Yatesia hydrochoerus</em></td>
<td>Fasciae</td>
<td>36</td>
<td>1 - 40</td>
<td>10.35</td>
<td>4.88</td>
<td>47.20</td>
<td>176</td>
</tr>
</tbody>
</table>

### DISCUSSION

The careful examination of skeletal muscle fasciae taken immediately after slaughtering the animals, revealed the presence of *Y. hydrochoerus* in 47% of the capybaras. The adult worms do not produce important lesions (Fig. 1A), but their presence in the fasciae represent objections to the commercialization of frozen meat. The results of the infection intensity of *Y. hydrochoerus*, characterized by low and moderate values (Tab. 1), differed from the high rates of prevalence (93.5%) observed in Colombia, but on the other hand were similar to the data obtained in Brazil.

The observations on the basic characteristics of infections of *C. tuberocauda* revealed a prevalence of 52.7%, which are similar to data presented by other authors and differed from those reported in Colombia. Besides, low values of mean intensity (20.7 worms) and of abundance (10.94 nematodes) were obtained in this study.

The renal lesions observed in the present study were similar to those in Colombian capybaras that presented villous endarteritis, intimal and medial hypertrophy of the vessel walls and large rugose protuberances that encroached upon the lumen leading to pyramidal infarcts in the kidneys. The renal atrophy and depressions found on the surface of the organ (Fig. 1D) seem to be related to the areas of cicatrical retraction, due to the proliferation of the intertubular connective tissue.

### RESUMO

Foram coletados 570 nematódeos Filarioidea de 36 capivaras, sacrificadas entre 1989 e 1996, onze jovens menores que seis meses e 25 adultos, provenientes da região do pantanal do Mato Grosso do Sul (Paiaguás). Cento e setenta e seis (176) espécimes de *Yatesia hydrochoerus* foram encontrados nas fásicas dos músculos esqueléticos, principalmente da região do obliquus externus abdominis e na face interna dos membros posteriores e trezentos e noventa e quatro (394) espécimes de *Cruorifilaria tuberocauda* foram coletados das artérias renais (380) e das artérias pulmonares (14) dos animais.

UNITERMOS: Nematoda; Filarioidea; Capivaras; Hydrochoerus hydrochaeris.

### REFERENCES


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