

# NATURAL INFECTION BY PARAMPHISTOMOIDEA STILES AND GOLDBERGER, 1910 TREMATODES IN WILD MARSH DEER (*Blastocerus dichotomus* ILLIGER, 1815) FROM SÉRGIO MOTTAS'S HYDROELECTRIC POWER STATION FLOODING AREA\*

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**ABSTRACT:**- NASCIMENTO, C.G DO; NASCIMENTO, A.A. DO; MAPELI, E.B.; TEBALDI, J.H.; DUARTE, J.M.B.; HOPPE, E.G.L. [Natural infection by paramphistomoidea Stiles and Goldberger, 1910 trematodes in wild marsh deer (*Blastocerus dichotomus* Illiger, 1815) from Sérgio Mottas's hydroelectric power station flooding area.] Infecções naturais por trematódeos paramphistomoidea Stiles; Goldberger, 1910 em Cervos-do-Pantanal (*Blastocerus dichotomus* Illiger, 1815) provenientes da área de inundação da usina hidrelétrica de Sérgio Motta. *Revista Brasileira de Parasitologia Veterinária*, v. 15, n. 4, p. 133-137, 2006. Departamento de Medicina Veterinária Preventiva e Reprodução Animal, Faculdade de Ciências Agrárias e Veterinárias, Universidade Estadual Paulista, Via de acesso Prof. Paulo Donato Castellane, s/n, Jaboticabal, São Paulo, Brazil, 14887-900. E-mail: adjair@fcav.unesp.br

Studies on helminthfauna of marsh deer *Blastocerus dichotomus* Illiger, 1815 are rare, although helminthic diseases are an important cause of mortality in these animals. Fifteen male and female adult marsh deer from Sergio Motta's hydroelectric power station flooding area at Paraná River which died during the capture and quarantine procedures, between 1998 and 1999, were necropsied. Three trematodes species, *Paramphistomum cervi*, *Balanorchis anastrofus* and *Zygoctyle lunatum*, all belonging to superfamily Paramphistomoidea, were identified. The obtained trematodes were identified, counted and their respective descriptors of infection were determined. All necropsied animals were infected by helminths. *Paramphistomum cervi* was the most prevalent species, while *Zygoctyle lunatum* was found in only one animal.

**KEY WORDS:** Cervidae, *Blastocerus dichotomus*, Trematoda, Descriptors of infection.

## RESUMO

Estudos da helmintofauna de cervo do pantanal *Blastocerus dichotomus* Illiger, 1815 são raros, apesar de as helmintoses serem importantes causa de mortalidade nesta espécie. Quinze animais adultos, machos e fêmeas, de cervos-do-pantanal procedentes da Estação Hidrelétrica de Sergio Motta, que vieram a óbito durante os procedimentos de captura e quarentena entre 1998 e 1999, foram necropsiados. Três espécies de

trematódeos foram identificadas: *Paramphistomum cervi*, *Balanorchis anastrofus* and *Zygoctyle lunatum*, todas pertencentes à superfamília Paramphistomoidea. Todos os animais examinados apresentaram infecção helmíntica. *Paramphistomum cervi* foi a espécie mais prevalente, enquanto que *Zygoctyle lunatum* foi encontrado parasitando apenas um animal.

**PALAVRAS-CHAVE:** Cervidae, *Blastocerus dichotomus*, Trematoda, Indicadores de infecção.

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## INTRODUCTION

Marsh deer *Blastocerus dichotomus* Illiger, 1815, the largest cervid of South America, is an endangered species throughout its occurrence area. This species is well adapted to wetlands and other environments prone to flooding which, unfortunately, are among the most degraded by the lakes of hydroelectric power stations. The population of this cervid

species, originally distributed in central parts of South America, has suffered a considerable decline and fragmentation (TOMAS et al., 1997) and is now considered an endangered species (WEMMER, 1998; BRASIL, 2003). Currently, marsh deer occurs only in Bolivia, central parts of Brazil, Paraguay and northern Argentina (DUARTE et al., 2001). Efforts to preserve this mammal are ongoing and information about its life history will be needed.

Studies on *B. dichotomus* helminths are rare, though it is known that parasitic diseases are among the main causes of illness and mortality of these animals (ARANTES; NASCIMENTO, 1997). Considering this fact, this study aimed to evaluate species of trematodes of marsh deer in a population rescued in an area affected by the Sérgio Motta Hydroelectric power plant, Paraná River, Brazil, as a part of a major project named "Projeto Cervo-do-Pantanal".

## MATERIAL AND METHODS

### Study Area

The construction of Sérgio Motta hydroelectric powerplant (formerly Porto Primavera hydroelectric powerplant) has started in 1979, with the first flooding quote occurring in 1998, elevating the water level of Paraná River, originally in 247 m, to 253 m significantly affecting the wetlands next to the river's margin, where were located the largest sub-populations of marsh deer of the Paraná River basin. The water level elevation process lasted about 30 days, leading to a great environment alteration in a short fraction of time. Recently, in 2002, the water level reached 257 m.

The influence area of Sérgio Motta's hydroelectric powerplant comprises the flooding area and ciliar forests adjacent to Paraná River, at Municipalities of Quebracho, Bataguassu and Brasilândia in the State of Mato Grosso do Sul; and at Presidente Epitácio, Caiuá, Panorama, Paulicéia, São João do Pau D'Alho, Nova Independência and Castilho in State of São Paulo (Figure 1).

### Animals

The marsh deer population in this area was reduced in about 70% between 1998 and 2000. As part of an emergencial plan authorized by IBAMA (License 060/8 – DIFAS/DIREC, Process 02027.019574/97-85), the animals of this region were physically and chemically restrained, transported to quarantine facilities and, after that, relocated in other areas. Unfortunately, some animals did not survive to the capture and quarantine process. Fifteen adult animals, males and females, which died during this program, were included in this study, being necropsied just after death.

### Helminthological Methods

Immediately after natural death occurrence, each animal was necropsied, and viscera were placed in labeled plastic bags with the following identification: organ, animal number, necropsy date, and afterwards were frozen.

The material was processed at the Laboratório de Doen-

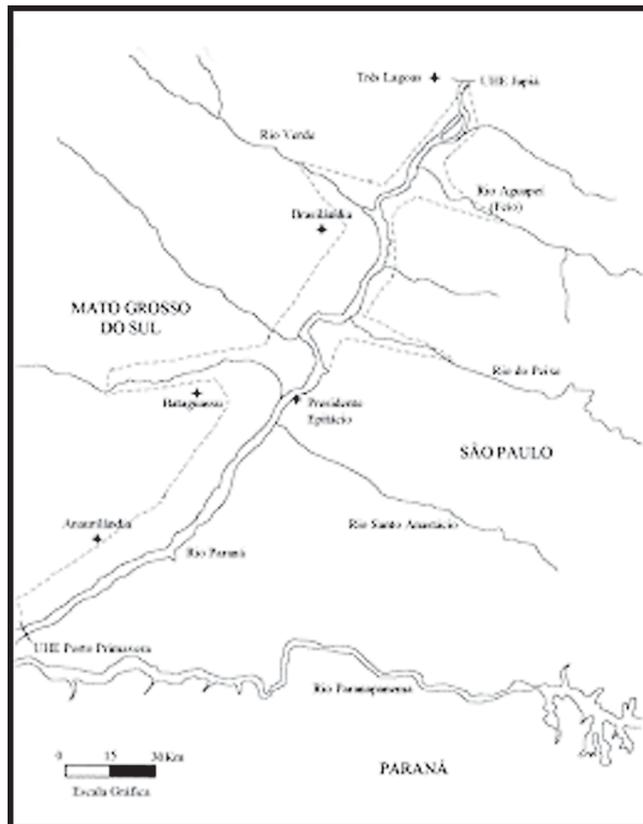


Figure 1. Schematic map of the study area (delimited by the pointed line), located between the Jupiá's (north) and Sérgio Motta's (south) hydroelectric powerplants.

ças Parasitárias dos Animais (LDPA), Departamento de Medicina Veterinária Preventiva e Reprodução Animal (DMVPRA), Faculdade de Ciências Agrárias e Veterinárias (FCAV), Universidade Estadual Paulista (UNESP), Campus of Jaboticabal. Visceras were thawed and separated in its anatomical segments (rumen and reticulum, omasum and abomasum, and intestines). Posteriorly, each segment was sectioned, whereas mucous membrane was washed over a metallic tray. All content obtained was fixed and conserved in Railliet and Henry solution after sieving. Due to the great amount of gastrointestinal content, a sample of 10% of rumenal content and 50% of intestinal contents were analyzed under stereoscopic microscope in search for helminths.

All detected trematodes were counted and separated in stereoscopic microscope. The obtained helminths were stored in identified vials and deposited in the LDPA/FCAV/UNESP helminthological collection.

For species identification, 10 specimens of each type were compressed between glass slides, dehydrated in alcohol series, stained in carmine acetic and clarified in beechwood creosote. The morphological study was performed with aid of a Carl-Zeiss microscope equipped with a camera lucida. Pictures were obtained in a Olympus BX-51® microscope equipped with a QColor3® digital camera. Taxonomic identification was according to Travassos (1934), Travassos et al. (1969), and Velazquez-Maldonado (1976). Descriptors of infection were

elaborated according to Bush et al. (1997). Otherwise stated, results are expressed as mean (minimum number – maximum number).

## RESULTS AND DISCUSSION

*Paramphistomum cervi* (Zeder, 1790) Fiscoeder, 1901 (Paramphistomoidea: Paramphistomidae) (Figure 5 and 6) and *Balanorchis anastrofus* Fiscoeder, 1901 (Paramphistomoidea: Balanorchiiidae) (Figure 7) were found in rumen of all necropsied deer, while *Zygodotyle lunatum* (Diesing, 1836) Stunkard, 1917 (Paramphistomoidea: Diplodiscidae) (Figure

8) was found in the large intestine of only one studied animal.

All examined animals presented helminthic infections, and the total number of identified trematodes was 501,074, being 2 (*Z. lunatum*) and 130,580 (*B. anastrofus*) minimum and maximum specimens number, respectively (Table 1).

*Paramphistomum cervi* was found in 14 animals, *B. anastrofus* was found in 13 animals, and *Z. lunatum* was found in just one animal, representing prevalences of 93.3, 86.66 and 6.66%, respectively.

The highest intensity of infection was obtained for *B.*

Table 1. Descriptors of infection of trematodes found on gastric and intestinal segments of 15 marsh deer (*Blastocerus dichotomus*) from Porto Primavera's hydroelectric power station flooding area at Paraná River, between 1998 and 1999.

Trematode species	Habitat	Variation of Intensity (n)	Mean Intensity (n)	Abundance (n)	Prevalence (%)	Total
<i>Paramphistomum cervi</i>	Rumen	117 – 33,014	9,032.78	8,430.60	93.33 (14)	12,6459
<i>Balanorchis anastrofus</i>	Rumen	210 – 130,580	28,816.38	24,974.20	86.66 (13)	37,4613
<i>Zygodotyle lunatum</i>	LI	-	2*	0.13	6.66 (1)	2
Total						501,074

LI – Large Intestine.

(n) – Number of helminths.

( ) – Absolute number of infected animals.

\* – Diagnosed in only one host.



Figure 2. *Paramphistomum cervi*, ventral view. Acetic carmine, 40x.



Figure 3. *P. cervi*, showing the lobed testicles. Acetic carmine, 200x.

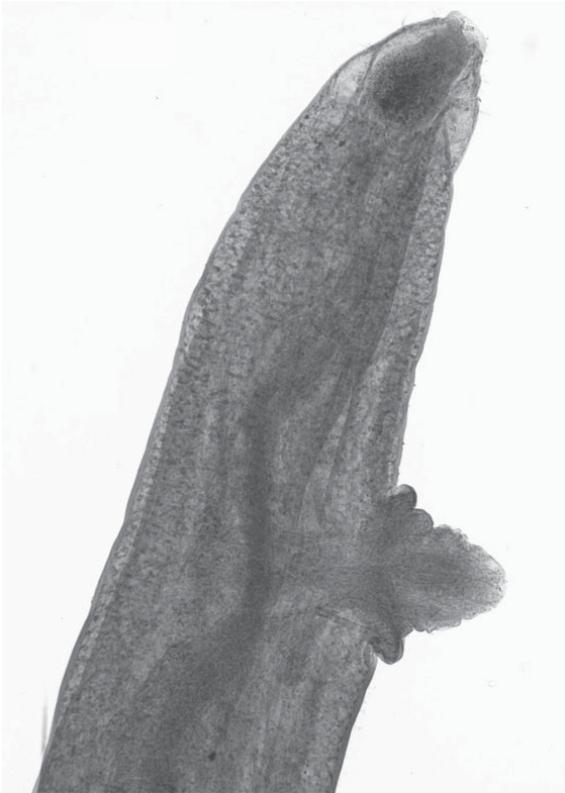


Figure 4. *Balanorchis anastrophus*, lateral view. Acetic carmine, 40x.



Figure 5. *Zygocotyle lunatum*, anterior region Beechwood creosote, 40x.

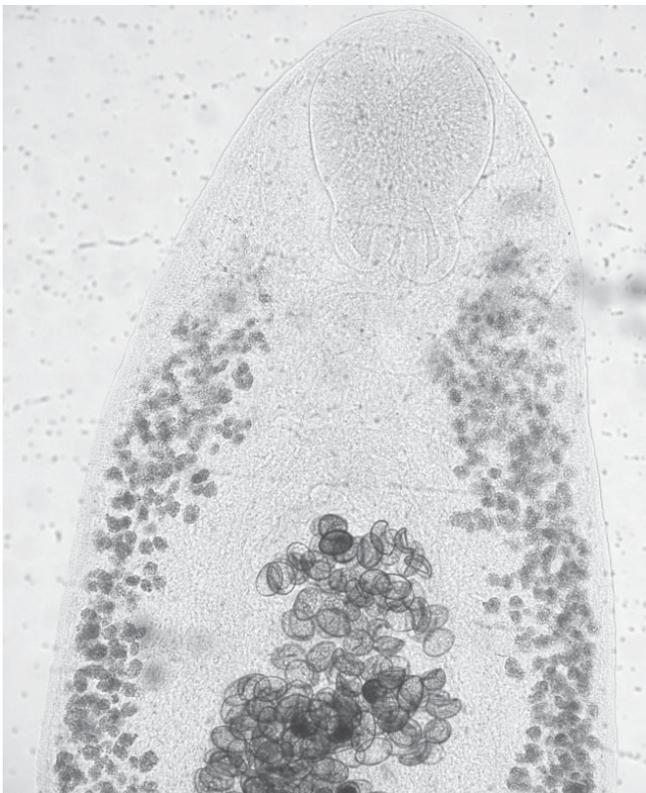


Figure 6. *Zygocotyle lunatum*, acetabular region Beechwood creosote, 40x.



Figure 7. *Zygocotyle lunatum*, posterior portion, ventral view. Beechwood creosote, 40x.

*anastrofus*, a mean of 28,816.38 (210 – 130,580) helminths for each animal and also an expressive abundance, being 24,974.20.

*Zigocotyle lunatum* showed the lower descriptors of infection, with intensity of 2 and abundance of 0.13. There was no variation of intensity.

*Balanorchis anastrofus* and *P. liorchis* were previously described parasitizing brazilian deer (TRAVASSOS et al., 1969). This is the first occurrence of *P. cervi* in *B. dichotomus* in Brazil. This helminth presented expressive indexes, with mean intensity of 9,032.78 and abundance of 8,430.60 helminths. All the exposed values are expressed in Table 1.

### CONCLUSION

The presence of parasitic trematodes occurring naturally in wild populations of marsh deer must be taken account in future plans of quarantine and translocation, as some parasites species may be introduced in areas previously free of them.

Besides, this is the first description of the occurrence of *P. cervi* parasitizing this vertebrate host in Brazil.

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