

ASCAROPSINAE (ALICATA & McINSTOCH, 1933) PARASITES OF DEER FROM THE LOWLANDS REGION OF THE STATE OF MATO GROSSO DO SUL, BRAZIL.

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SUMMARY: From the abomasa and small intestines of fifteen deer (five *Mazama americana*, five *M. gouazoubira* and five *Ozotoceros bezoarticus*) 1,116 nematodes of the family Ascaropsinae were identified, belonging to the following species: *Physocephalus sexalatus*, *P. lassancei*, *Texicospirura turki* and *Pygarginema verrucosa*. Infections from 2 to 721 nematodes were observed in 10 of the animals. *Physocephalus* was the predominant genus, being recovered from 10 deer (66.6%), representing 92.47% of all Ascaropsinae nematodes recovered. The highest (694 nematodes) and the lowest (2 nematodes) intensity of infection were observed in *M. gouazoubira*, infected with *P. lassancei*. Infections caused by other Ascaropsinae genera were characterized by low intensity of infection and of prevalence. In this way, 25 specimens of *P. sexalatus* and 10 *T. turki* were observed in *O. bezoarticus*, 50 specimens of *P. verrucosa* were observed in *M. gouazoubira* and 24 in *M. americana*. Infections by *T. turki* and *P. sexalatus*, helminth parasites of Suidae and Tayassuidae, represented inexpressive cases of cross infection among these wild animals.

KEY WORDS: Helminths, Ascaropsinae, Cervidae, *Mazama americana*, *Mazama gouazoubira*, *Ozotoceros bezoarticus*, Prevalence.

INTRODUCTION

The Lowlands region is an ecological system which comprises 140,000 km² near the South American geographical central area, with a mean altitude of 100m above sea level (ADAMOLI, 1982). Consisting of woodlands, savannah and lowlands, this region is inhabited by various species of deer, Tayassuidae, domestic animals and other animal species.

Deer constitute a group of animals belonging to the Order Artiodactyla and the family Cervidae, being the only present-day wild ruminants of the Brazilian fauna (SANTOS, 1984), with a worldwide distribution.

Ascaropsinae nematodes are an important group of parasitic helminths of wild ruminants, Suidae and Tayassuidae in Brazil. Studies on these parasites are old and were initiated by MOLIN (1860), cited by GRISI (1975), who proposed *Spiroptera verrucosa* n. g. and n. sp. to name a nematode of *Cervus*

dichotomus, originated from material collected in Brazil. Later, KANENAZII (1948), cited by GRISI (1975), created the genus *Pycarginema* and proposed, for the nematode named by MOLIN, a new combination: *P. verrucosa* n. g. Posteriorly, GRISI (1975) presented a redescription of the helminth, using specimens collected from *Ozotoceros bezoarticus* which proceeded from the State of Mato Grosso do Sul. The genus *Physocephalus*, according to YAMAGUTI (1961), may parasitize Suidae, dromedaries, Tayassuidae, rhinoceros and monkeys. TRAVASSOS (1921) created *P. lassancei* n. sp. to name an abomasal parasite of "veado-catingueiro" (*Mozama gouazoubira*). Later, CUOCOLO (1943) proposed for that nematode a new combination: *Pereiraia lassancei* n. g. However, CHABAUD (1975; 1976), maintained the nematode as *P. lassancei*.

CHITWOOD & CORDERO DE CAMPILLO (1966) proposed *Texicospirura turki*, n. g. n. sp., for a parasitic

nematode of the "cateto" (*Tayassu tajacu*). NETO & THATCHER (1986) identified the nematode in *T. tajacu*, the first such identification in Brazil.

The perspectives of zootechnical exploration of Brazilian deer are promising due to their easy adaptation to confinement, as well as to the excellent quality and commercial value of their meat and by-products. In Brazil, few researchers dedicated to parasitological studies in deer, thus the data currently available are scarce and mostly focused on helminth systematics. The aim of the present study was to identify the Ascaropsinae helminths in three species of deer and assess, under natural conditions, the features of the infections: intensity, abundance and prevalence, in the hope to get enough information for a better understanding of the helminthoses of these animals which are being domesticated in various physiographic regions of Brazil.

MATERIALS AND METHODS

Helminths were harvested from fifteen adult deer, from both sexes, belonging to three species: five *Mazama americana*, five *Mazama gouazoubira* and five *Ozotoceros bezoarticus*. Most animals were males, naturally infected and captured in the field, in the savannah or in the humidity lowland, proceeding from the cities of Coxim, Pedro Gomes and Corumbá (Lowlands region), State of Mato Grosso do Sul.

The deer were sacrificed in the period between September, 1985 and November, 1992. After slaughter, the gastrointestinal tract of each animal was removed and divided into its anatomical segments (rumen, reticulum, omasum, abomasum, small and large intestines). Then, each segment was opened inside a metal tray and the mucosae washed in tap water. All material was sieved in 100mm mesh sieves, and the resultant contents fixed in acetic formalin, identified and bottled in individual jars. All helminths in the whole contents were picked up, separated by genus and sex with the aid of a stereomicroscope and preserved in Railliet & Henry's fixative for posterior counting and identification. For identification, nematodes were diaphanised sequentially in 80% acetic acid solution and Faya's clarification.

RESULTS

From the abomasa of the fifteen deer necropsied, 1,116 nematodes were identified, belonging to four species of the subfamily Ascaropsinae (Nematoda: Spirocercidae) namely: *Physocephalus lassancei*, *Physocephalus sexalatus*, *Texicospirura turki* and *Pygarginema verrucosa*. For the species of Ascaropsinae, prevalence of 66.6% and intensity of infection varying from 2 to 721 worms were observed. The genus *Physocephalus* was observed in ten (66.6%) animals (Table 1). From all worms, 1,032 specimens were identified as belonging to the genus *Physocephalus*, 25 (2.24%) being *P. sexalatus*, obtained from *O. bezoarticus*, 782 (70.0%) and 225 (20.16%) being *P. lassancei*, obtained respectively from *M. gouazoubira* and *M. americana*.

The genus *Pygarginema* was observed in 05 (33.3%) animals. Seventy-four individuals (6.63%) were identified, 50 being harvested from *M. americana* and 24 from *M. gouazoubira* (Table 1).

The genus *Texicospirura* was observed in only 01 animal (6.6%), and 10 specimens of *T. turki* (0.89%) were identified in material harvested from *O. bezoarticus* (Table 1).

DISCUSSION

Members of the subfamily Ascaropsinae constitute an important group of nematodes, which parasitize domestic and wild Artiodactyla in Brazil. SILVA (1996), observed that 5.52% of the parasitic helminth fauna obtained from 20 deer individuals were composed by species of Ascaropsinae, with the highest intensity of infection being 721 worms and prevalence of 66.6%. Low values of infection intensity and prevalence were also observed by NASCIMENTO *et alii* (1996) in *M. gouazoubira*. The present findings, in what infection features are concerned, resemble those obtained by those authors.

The observations of GRISI (1975), SILVA (1996) and of NASCIMENTO *et alii* (1996) highlight, respectively, the presence of *P. verrucosa* in *O. bezoarticus*, *M. americana* and *M. gouazoubira*, in the State of Mato Grosso do Sul.

According to those findings, the infections by this nematode are characterized by low infection intensity and prevalence, agreeing to our results presented here (Table 1). The presence of *P. verrucosa* in deer in Brazil, which inhabit areas of tropical climate, is an interesting finding, since this nematode is frequently found in ruminants from temperate climates.

In relation to the genus *Physocephalus*, 1,032 specimens were observed, representing 92.47% of the Ascaropsinae nematodes obtained from 10 animals studied (66.6%). The lowest intensity of infection was found for *P. sexalatus* in *O. bezoarticus* and the highest for *P. lassancei* in *M. gouazoubira* (Table 1). SILVA (1996) and NASCIMENTO *et alii* (1996) obtained, for *P. lassancei*, intensity of infection and prevalence from 02 to 694 nematodes (means of 100) and 60%, and from 76 to 87 nematodes (means of 18.11) and 22.2%, respectively. The present results are similar to those of SILVA (1996) and differ, at least in part, from those of NASCIMENTO *et alii* (1996).

Infections by *T. turki* in wild Artiodactyla, according to the observations of SAMUEL & LOW (1970), CORN *et alii* (1985) and NETO & THATCHER (1986), carried out in *T. tajacu*, and those of SILVA (1996), in *O. bezoarticus*, are characterized by low infection intensities. In this respect, our findings are similar to those of the above mentioned authors.

Cross-infections from domestic animal parasitic helminths to wild animals and vice-versa, as well as among wild animal species, is a controversy matter. The observation of parasitism of *O. bezoarticus* by *P. sexalatus* and *T. turki*, parasites of Suidae and Tayassuidae of the physiographic region studied in the present work, may be considered as cases of cross-infections, caused by few worms and of lesser epidemiological importance.

Table 1- Intensity of infection, abundance and prevalence of Ascaropsinae parasites of deer in the Lowlands region of the State of Mato Grosso do Sul, Brazil.

| Helminths | Animal Species | | | | | | | | | | | |
|--------------------------------|-------------------------------|-------------------------------------|-----------|-----------------|---------------------------|-------------------------------------|-----------|-----------------|-------------------------|-------------------------------------|-----------|-----------------|
| | <i>Ozotoceros bezoarticus</i> | | | | <i>Mazama gouazoubira</i> | | | | <i>Mazana americana</i> | | | |
| | n.º of helminths | Variation in intensity of infection | Abundance | Prevalence (%)* | n.º of helminths | Variation in intensity of infection | Abundance | Prevalence (%)* | n.º of helminths | Variation in intensity of infection | Abundance | Prevalence (%)* |
| Abomasum | | | | | | | | | | | | |
| <i>Physocephalus sexalatus</i> | 25 | 0-25 | 5 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| <i>Physocephalus lassancei</i> | 0 | 0 | 0 | 0 | 782 | 2-694 | 156.4 | 60 | 225 | 28-93 | 45.0 | 80 |
| <i>Pygarginema verrucosa</i> | 0 | 0 | 0 | 0 | 50 | 2-27 | 100 | 60 | 24 | 6-18 | 4.8 | 40 |
| Small Intestine | | | | | | | | | | | | |
| <i>Texicospirura turki</i> | 10 | 0-10 | 2.0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* Relative to the five animals studied.

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SUMÁRIO

Identificaram-se, dos abomasos e dos intestinos delgados de quinze de cervídeos (cinco *Mazama americana*, cinco *M. gouazoubira* e cinco *Ozotoceros bezoarticus*), 1.116 nematódeos da subfamília Ascaropsinae (Nematoda: Spirocercidae), pertencentes às seguintes espécies: *Physocephalus sexalatus*, *P. lassancei*, *Texicospirura turki* e *Pygarginema verrucosa*. Em 10 desses foi observada intensidade de infecção variando de 2 a 721 nematódeos. *Physocephalus* foi o gênero prevalente, tendo sido observado em 10 cervídeos (66,6%), representando 92,47% dos nematódeos Ascaropsinae colhidos. A maior intensidade de infecção (694 nematódeos) constatada e a menor (02) foram obtidas em *M. gouazoubira*, infectadas com *P. lassancei*. Infecções causadas pelos outros gêneros de Ascaropsinae caracterizaram-se por apresentar baixos valores de intensidade de infecção e de prevalência e, por conseguinte, foram observados 25 exemplares de *P. sexalatus* e 10 de *T. turki* em *O. bezoarticus* e 50 espécimes de *P. verrucosa* em *M. gouazoubira* e 24 em *M.*

americana. As infecções de *T. turki* e de *P. sexalatus*, helmintos parasitos de suídeos e de taiassuídeos, representaram casos pouco expressivos de infecções cruzadas entre esses animais silvestres.

PALAVRAS-CHAVE: Helmintos, Ascaropsinae, Cervidae, *Mazama americana*, *Mazama gouazoubira*, *Ozotoceros bezoarticus*, Prevalência.

REFERENCES

- ADAMOLI, J. O Pantanal e suas relações fitogeográficas com os cerrados. Discussão sobre o conceito "Complexo do Pantanal". In: CONGRESSO NACIONAL DE BOTÂNICA, 32, Teresina, p.109-119, Anais. 1982.
- CHABAUD, A.G. Nº 3 keys to genera of the Order Spirurida. Part 2. Spiruroidea, Habronemoatoidea and Acuaroidea. In: ANDERSON, R.C., CHABAND, A.G., WILLMOTT, S. *CIH keys to the nematode parasites of vertebrates*. Wallingford. C.A.B. International, 1975-6, p.35.
- CHITWOOD, M.B., CORDERO DE CAMPILLO, M. (1966) *Texicospirura turki* gen. et sp. n. (Nematoda: Spiruroidea) from the stomach of the peccary in the United States and a key to the genera of Ascaropsinae. *Journal of Parasitology*, Lawrence, v.52, n.2, p.307-310.

- CORN, J.L., PENCE, D.B., WARREN, R.J. (1985) Factors affecting the helminth community structure of adult collared peccaries in southern Texas. *Journal Wildlife Disease*, Ames, v.21, n.3, p.254-63.
- CUOCOLO, R. (1943) *Pereiraia* n.g. para o *Physocephalus lassancei* Travassos, 1921 (Nematoda: Spiruridae), com redescritção da espécie-tipo. *Arquivo Instituto Biológico, São Paulo*, v.4, p.213-16.
- GRISI, L. (1975) Sobre *Pygarginema verrucosa* (Molin, 1860), em *Ozotoceros bezoarticus* L. no Estado do Mato Grosso (Nematoda: Spiruridae). *Revista Brasileira Biologia*, Rio de Janeiro, v.35, n.1, p.109-12.
- NASCIMENTO, A.A. et al. (1996) Helminths parasites of suíno (*Sus scrofa domesticus*) cateto (*Tayassu tajacu*) e veado-catingueiro (*Mazama gouazoubira*). In: CONGRESSO PANAMERICANO DE CIÊNCIAS VETERINÁRIAS, 15, Campo Grande. Abstracts...p.79.
- NETO, J.B., THATCHER, V. (1986) Estudos parasitológicos preliminares em taiassuídeos (*Tayassu tajacu*) na Amazônia Central. *Revista Brasileira Medicina Veterinária*, Niterói, v.8, n.6, p.175-8.
- SAMUEL, W.M., LOW, A. (1970) Parasites of the collared peccary from Texas. *Journal Wildlife Disease*, Ames, v.6, p.16-23.
- SANTOS, E. (1984) *Entre o gambá e o macaco: vida e costumes dos mamíferos no Brasil*. Belo Horizonte: Itatiaia, p.272.
- SILVA, M.I.S. (1996) Helminths Parasites of Cervídeos, provenientes dos municípios de Corumbá, Coxim e Pedro Gomes (Região do Pantanal), Estado do Mato Grosso do Sul e de Promissão. São Paulo, Tese de Mestrado. Faculdade de Ciências Agrárias e Veterinárias. UNESP, Jaboticabal, 83p.
- TRAVASSOS, L. (1921) Nematodeos novos. *Brasil Medico*, Rio de Janeiro, v.2, n.24, p.367-8.
- YAMAGUTI, S. (1961) *System Helminthum the Nematodes of Vertebrates*. New York: Interscience Publishers, v.3, ptel, 679p.

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