

Nematode parasites of the characid fish *Brycon hilarii* from the River Juba, Mato Grosso, Brazil

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Summary

Specimens of the characid fish *Brycon hilarii* collected in dry and wet seasons in the River Juba, Tangará da Serra, State of Mato Grosso, Brazil, were surveyed for nematode parasites. *Contracaecum* sp. Type 1 and Type 2 larvae of Moravec, Kohn et Fernandes, 1993 were detected in the mesentery and liver, and *Neocucullanus neocucullanus* and *Procamallanus (Spirocamallanus) inopinatus* were observed in the intestine and pyloric caeca. 75 % of the nematodes were detected in the wet season. This is the first report of fish parasites from the River Juba and of the occurrence of *Contracaecum* larvae in *B. hilarii*.

Key words: characid fish; *Brycon hilarii*; nematodes; Brazil

Introduction

Characidae is a large and diversified family comprising mainly by freshwater fishes from Central and South America (Britski *et al.*, 1999). The genus *Brycon* (Müller & Troschel) belongs to the subfamily Bryconinae and includes 43 valid species (Froese & Pauly, 2005). According to Lima (2003), fishes from this genus are important for human consumption in Central and South America. *Brycon hilarii* (Valenciennes) is an economically important species that was thought to occur only in the “São Francisco” River basin. However, according to Froese and Pauly (2005) *Brycon microlepis* Perugia, that occurs in the Paraguay River basin (Brazil and Paraguay), is a junior synonym of *B. hilarii*. A survey of helminth parasites of *B. hilarii* collected in the River Juba, Paraguay River basin, Tangará da Serra, State of Mato Grosso, Brazil, revealed the presence of some species of nematode parasites that we report in the present study.

Material and Methods

Fish specimens of “piraputanga”, *B. hilarii* (n = 60), were captured from the River Juba (14° 50' 10" S and 57° 51' 14" W), Tangará da Serra, State of Mato Grosso, Brazil, by fishing rods. 30 specimens (length: 29.6 ± 4.30 cm) were captured during the dry season (August and September 2003) and 30 (length: 32.6 ± 3.49 cm) during the wet season (December 2003 and January 2004). Fishes were deep frozen after capture and later dissected in the laboratory. The nematodes were washed in physiological saline, fixed in 5 % formalin and stored in 70 % ethanol. For light microscope examination nematodes were cleared in glycerine. The terms prevalence, intensity, mean intensity, abundance and mean abundance were used according to Bush *et al.* (1997).

Results

From the 60 specimens of fish examined, only 17 (28.3 %) were parasitized by nematodes. Data on nematode infections are recorded in Table 1. *Contracaecum* sp. Type 1 and Type 2 larvae of Moravec, Kohn et Fernandes, 1993 were detected mostly in liver (90 %) and less often in the mesentery. *Neocucullanus neocucullanus* Travassos, Artigas et Pereira, 1928 were only found in the wet season in the intestine and pyloric caeca. The percentage of specimens in these two organs was very similar (46.2 % in intestine and 53.8 % in pyloric caecum). *Procamallanus (Spirocamallanus) inopinatus* Travassos, Artigas et Pereira, 1928 was recorded mostly in pyloric caeca (77.8 %) and less often in the intestine.

Discussion

Species of *Contracaecum* Railliet et Henry, 1912 are world

Table 1. Prevalence (P), intensity (I) mean \pm SD (min – max) and abundance (A) mean \pm SD (min – max) of nematode parasites of *Brycon hilarii* from the River Juba and site of infection

Season (number of fish examined)	Dry season (30)			Wet season (30)			Total (60)			Organ
	P (%)	I	A	P (%)	I	A	P (%)	I	A	
<i>Contracaecum</i> spp. (Type 1 and Type 2 larvae)	3.3	16.0 (16)	0.53 \pm 2.92 (0 – 16)	13.3	8.5 \pm 9.88 (1 – 23)	1.1 \pm 4.30 (0 – 23)	8.3	10.0 \pm 9.19 (1 – 23)	0.8 \pm 3.67 (0 – 23)	Mesenteries Liver
<i>Neocucullanus neocucullanus</i>	0	0	0	26.7	1.6 \pm 0.52 (1 – 2)	0.4 \pm 0.77 (0 – 2)	13.3	1.6 \pm 0.52 (1 – 2)	0.3 \pm 0.59 (0 – 2)	Intestine P. caecum
<i>Procamallanus (Spirocamallanus) inopinatus</i>	6.7	1.0 (1)	0.07 \pm 0.25 (0 – 1)	16.7	1.4 \pm 0.55 (1 – 2)	0.2 \pm 0.57 (0 – 2)	11.7	1.3 \pm 0.49 (1 – 2)	0.2 \pm 0.45 (0 – 2)	Intestine P. caecum

wide distributed and their larvae are frequently found in freshwater and marine fishes. There are several papers reporting *Contracaecum* larvae from many species of Neotropical freshwater fishes (Travassos *et al.*, 1928; Vicente *et al.*, 1985; Kohn *et al.*, 1988, 1989; Moravec *et al.*, 1993a, 1997; Moravec, 1998, 2000; Vicente & Pinto, 1999; Caspeta-Mandujano, 2005; Martins *et al.*, 2005) but these larvae have never been reported from *B. hilarii*. Data on the infection levels of these nematodes were only reported by Moravec *et al.* (1997) and Martins *et al.* (2005). Of the 24 fish species examined from 6 Venezuelan localities, Moravec *et al.* (1997) recorded only one *Contracaecum* Type 1 larva and *Contracaecum* Type 2 larvae in 11 species of fish with variable values of prevalence and intensities (between 1 and 11). Martins *et al.* (2005) found prevalences higher than 80 % and intensities between 1 and 137 of *Contracaecum* Type 2 larvae from two fish hosts, *Hoplias malabaricus*, Pellegrin and *Hoplerhythrinus unitaeniatus* (Spix & Agassiz), from Brazil. This scarce information seems to reveal that levels of infection by *Contracaecum* larvae are quite variable.

Only two species of *Neocucullanus* Travassos, Artigas et Pereira, 1928 have been reported in Neotropical freshwater fishes, *Neocucullanus neocucullanus* Travassos, Artigas et Pereira, 1928 and *Neocucullanus multipapillatus* Petter, 1989. According to Petter (1989) the two species are very similar and it can not be excluded that these species could be considered the same. A detailed study of the material collected in the present work, which will be presented in other publication, allowed to confirm *N. multipapillatus* a junior synonym of *N. neocucullanus*. Apart from the report of Travassos *et al.* (1928) and Petter (1989) these nematodes have been reported only by Caspeta-Mandujano *et al.* (2005) from two *Brycon guatemalensis* specimens collected in Mexico with an intensity of infection (10 and 12) higher than reported in the present study. *Procamallanus* (S.) *inopinatus* has been reported in many freshwater fish species, mainly characoid fishes, from South America (Travassos *et al.*, 1928; Petter & Dlouhy, 1985; Vicente *et al.*, 1985; Kohn & Fernandes, 1987; Petter & Thatcher, 1988; Thatcher, 1991; Moravec *et al.*, 1993b, 1997; Mora-

vec, 1998; Hamann, 1999; Vicente & Pinto, 1999) including in *B. hilarii* (Thatcher, 1991; Moravec *et al.*, 1993b; Moravec, 1998) but no data on the degree of infection has been reported in this host.

This is the first report of fish parasites from the River Juba. Although the infection levels of all nematode species were low in both seasons, the wet season showed always the higher infection level (75 % of nematodes detected in this season). As larval *Contracaecum* may be transferred to humans (Moravec, 1998) the presence of these nematodes in fish may constitute a potential risk for public health.

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