Parasitofauna of Gymnotus SPP: In a commercial establishment in the municipality of Jaguariúna-SP

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Bruno Henrique de Souza[1], Luciene de Aguiar Rocha Donetti[2], Giovanni Henrique Braz Ferri[3], Julio Ferraz de Queiroz[4], Márcia Mayumi Ishikawa[5].

ABSTRACT

The tuvira (Gymnotus spp.) is a fish little used for consumption, being better known as live bait. It is present in the watersheds of Brazil, where it coexists with other commercial species that are used for human consumption. The objective of this work was to study the parasitofauna of tuviras in a commercial establishment. Technical visits were carried out to obtain information about the routine of the property and to collect fish. Samples of skin mucus scraped from the gills, intestine and stomach were analyzed. Nematode larvae were observed in the muscles of two specimens and a metacercalar cyst in the skin of one specimen. No ectoparasites were observed in the gills and skin of the specimens examined. The low frequency of parasites is related to good sanitary management and monitoring of fish health with the accompaniment of a veterinarian. The nematodes found have zoonotic potential, emphasizing the importance of continuing studies on the diagnosis, treatment and prevention of parasitosis in tuviras.

Keywords: Tuvira, Digenetic, Nematodes, Zoonoses.

[1] Environmental Consultant Biologist
E-mail: bruno.hs_92@hotmail.com
[2] Autonomous Veterinarian
Email: luciene.medvet@gmail.com
[3] Docto student at PPGBioAnimal/Unicamp
Email: giovannihf@hotmail.com
[4] Researcher at Embrapa Environment, Jaguariúna-SP
E-mail: julio.queiroz@embrapa.br
[5] Researcher at Embrapa Environment, Jaguariúna-SP
Email: marcia.ishikawa@embrapa.br

INTRODUCTION

The Gymnotus fish is popularly known as carapó, tuvira or ituí, and belongs to the class of actinopterygii, family of gymnotidae and the order gymnotiformes (Rotta, 2004). They are medium-sized fish that can reach about 50 cm in length and weigh approximately 300g. They have an elongated body and have small eyes due to the characteristics of the environment to which they are associated. They have a peculiar morphology due to the absence of caudal and dorsal fins, however, they have a long anal fin (Britski et.al., 1999). A great advantage presented by tuviras is the presence of accessory respiration, which allows them to live in practically anoxic environments where few species of fish are found. This type of breathing also allows them to remain in small containers which increases the animal's interest as live bait (Liem et al., 1984; Resende et al., 2006).

The tuvira's feeding habit is associated with the places where they live, so studies analyzing their stomach contents reveal that tuviras have a preference for insect larvae, as they are easy to digest. This preference is due to the fact that they live in environments with low oxygenation, which makes other types of food scarce (Resende et al., 2006). However, other organisms can compose their diet, such as some small fish, mollusks and even plant species (Pereira & Resende, 2006). This feeding habit and the environment in which tuviras live can favor the occurrence of endoparasites such as digenetic and nematodes, especially due to the presence of intermediate and definitive hosts (Ishikawa et al., 2014).

Tuviras are little used for human consumption, however, they are prey for fish species much appreciated by humans such as: pintado (Pseudoplatystoma corruscans), cachara (Pseudoplatystoma fasciatum), dourado (Salminus brasilienses), traíra (Hoplias malabaricus), among others (Buckup et al., 2007). In addition, the tuvira inhabits the same environment as many commercial species, thus being able to signal that other species of fish may also be parasitized by the same parasites. Some parasite species such as Cryptocaryon irritans, Ichthyophthirius multifiliis and Trichodina sp. (Protozoa), Clinostomun sp. and Austrodiplostomun sp. (Digenea), Contraceacum and Eustrongylides sp. (Nematoda), Henneguya sp and Kudoa sp. (Myxozoa) are examples of parasites present in several species of fish, including the tuvira (Pavanelli et al., 2002; Pádua et al., 2011; Ventura et al., 2016).

Tuviras are widely used as live bait in sport fishing, whether in rivers, lagoons or even "catch-pay", they have good palatability and total acceptance by carnivorous and/or omnivorous fish (Resende et al., 2006). However, the use of these species as food for other fish species can lead to undesirable situations, since they may be affected by endohelminths, including those with zoonotic potential (Ventura et al., 2016).

The technology for captive production of this species of fish has not yet been scientifically described. In the literature it is possible to obtain some studies on the tuvira related to its biology,

reproduction, socio-economic importance and biodiversity of commercialized species, but few studies address the area of health, such as diagnosis, control and treatment of tuvira diseases (Rotta, 2004; Marques & Calheiros, 2013; Rosa, 2015; Marques, 2017). In this sense, the adoption of good sanitary management practices is essential to ensure the health of the fish and the quality of the fish. Thus, the study of fish parasitofauna is a practical tool that can be successfully included in the routine of a commercial establishment (Ishikawa et al., 2020).

In this work, the parasitofauna of tuviras from a commercial establishment in the municipality of Jaguariúna, SP, was evaluated.

MATERIAL AND METHODS

WORKPLACE

The establishment was chosen considering the logistics, the ease of obtaining information and the existence of a veterinarian responsible for the establishment. The processing of the samples was carried out at the Aquaculture and Ecotoxicology Laboratory (LAE) of Embrapa Environment. The procedures used with the animals in this work were approved by the Ethics Committee on the Use of Animals CEUA of Embrapa Environment, Protocol 002/2016.

TECHNICAL VISITS, COLLECTION OF SPECIMENS AND PROCESSING OF SAMPLES

Technical visits were carried out to evaluate the property, obtain information on sanitary management, monitor the routine of the property and collect the specimens to be examined in the laboratory.

The tuviras specimens were collected with the aid of a puçá and transported to the laboratory in a plastic bag containing 2/3 of its total volume filled with water from the tank itself and 1/3 of the remaining volume filled with oxygen.

The biometry of the fish was performed and samples of skin mucus and gill scrapings of each tuvira were collected. These samples were analyzed by direct examination with the aid of a microscope.

Euthanasia was performed by deepening anesthetic with benzocaine (100mg/L) After euthanasia, an autopsy was performed for macroscopic evaluation of the kidney, liver, spleen, coelomatic cavity and musculature. Finally, the gastro-intestinal contents were collected and preserved in 5% formaldehyde until the completion of the parasitological analyses.

RESULTS AND DISCUSSION

Through the technical visits, the following information was obtained about the routine of the establishment:

- the monitoring of water quality parameters such as temperature (°C) and transparency (cm) were carried out daily, ammonia (mg/L) was measured weekly, using a commercial kit,
- the storage/maintenance systems used in the tanks with the tuviras were provided with water recirculation coupled to biological filters,
- the feeding of the tuviras was carried out after feeding training using commercial ration associated with natural food produced in the establishment itself,
- therapeutic baths with salt and/or medications have been performed on the fish whenever any sign of bacteriosis has been observed by the veterinarian,
- the health monitoring of the tuviras was accompanied by the veterinarian in charge,
- Control of the acquisition and introduction of new fish into recirculating systems was preceded by a quarantine of 3 to 7 days.

The average weight and length of the ten tuviras were, respectively, 60.50g and 25.60cm. The biometrics of each fish are described in table 1.

Table 1 – Biometrics, weight in grams (g) and length in centimeters (cm)

Fish No.	Weight (g)	Length (cm)
1	31	21
2	36	19
3	88	29
4	86	22
5	21	21
6	108	35
7	64	29
8	53	25
9	40	24
10	78	31

It was observed that of the ten specimens of Gymnotus spp analyzed, only three were parasitized, two of which had nematode larvae in the muscles of the abdominal region and a metacercarial cyst (digenetic) in the skin, close to the operculum of a tuvira.

In the macroscopic and microscopic analyses of the organs and coelomatic cavity, no cyst suggestive of myxosporids or nematode larvae was observed. Ventura et al., 2016 analyzed tuvira livers from commercial establishments in the Pantanal basin where they found high prevalence of endohelminths. However, according to what was reported by Ishikawa et al., 2014, tuviras generally acquire endoparasites in the natural environment, which justifies the differences in the prevalence of endoparasites in tuviras from different natural environments and subjected to different periods of permanence in storage environments.

It is believed that the low number of ectoparasites found in this work is related to some factors such as, for example, the good sanitary management of the establishment, the use of an adequate water recirculation system, the time of more than one year in which the animals were kept in the tanks with the monitoring of the specialist technician, in addition to the transport of the fish to the laboratory that may have favored the detachment of the ectoparasites from the fish.

The good practices of the establishment, especially in relation to the maintenance of water quality and the control of the entry of intermediate and definitive hosts, may have hindered the development of the life cycle of the parasites, allowing the control of endoparasites in the tuviras during the storage period in the establishment. This information is in accordance with what was observed by Ishikawa et al., 2014, and proves that the parasitofauna of tuviras in commercial live bait establishments is directly related to the stress and management of tuviras during the storage period.

CONCLUSION

The study of the parasitofauna of tuviras in the commercial establishment demonstrated through this work a low frequency of endoparasites. No ectoparasites were observed in the gills and skin mucus of the specimens examined. The nematode larvae observed have zoonotic potential, thus emphasizing the importance of continuing studies on the diagnosis, treatment and prevention of parasitosis in tuviras.

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