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Research Article

Gastrointestinal Helminth Parasites of the Parachanna Obscura from Epe Lagoon, Lagos, Nigeria

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Abstract

Parachanna obscura, the African snakehead fish, were randomly selected and subjected to parasitologic investigations. A total of one hundred and fifty were monthly obtained over a period of six months. Helminth infections was observed to have a prevalence of 17.3% which accounts for twenty six of the specimens to be infected with gastrointestinal helminth parasites. *Parachanna obscura* harboured two nematodes, *Procamallanus* sp (*Spirocamallanus*) and *Contracaecum* sp and a trematode, *Clinostomum metacercaria*. A sum total of twenty six helminths was recovered from the fish. The male specimens recorded a lower rate of infection (8,7%) than the females (which recorded a prevalence of 31%. The overall worm burden were low and independent of sex and size of the fish.

Results from this study buttress the point earlier suspected by the researchers that this snake head fish which is quite popular and regularly eaten in this area of Nigeria is a serious potential health hazard if not well taken care of. Food and delicacies prepared without adequate processing has the potential of infecting consumers with helminthiasis and thereby constituting serious health risk.

Keywords: Parachanna Obscura, Epe, Helminth, metacercariae, Lagoon.

Introduction

African snakehead, Parachanna obscura, is an emerging aquaculture candidate in Nigeria and the sub-Saharan region as a whole. The species is preferred for its palatable fillet and strong flesh integrity [1], and because that species is high in protein and fat contents thereby making it a good healing agent for post operation patients. Snakeheads are also sold as live, fried or smoked fish foods in ethnic markets, beaches and restaurants in India, South Eastern Asia, Japan, and in Epe Lagoon, Lagos states of Nigeria.

Snakeheads have medicinal uses which have been reported in Malaysia and Indonesia; extracted oils from the species *Channa striata* is used to reduce scarring following surgery [2]. Considering these huge benefits offered by Parachanna obscura, it is necessary to exploit the fish for commercial purpose in order to derive its enormous economic gains.

Helminthes generally are known to cause severaldegrees of damages in fish, ranging from lamellar destruction by monogenetic trematode [3] to reproductive impairment by Eustrongylides [4]. Yanong RP, et al. [5] mentioned some pathogenic effects of nematode on fish including haemorrhie, external lumps or nodules, reduced growth and mortality.

Gosse JP, et al. [6] stated that the young of Parachanna obscura are guarded by a large adult. The fish is being cultured in Ghana [7], and Nigeria [8,9]. The fish species has also been recommended for culture in the Central African Republic [10]. It is also reported that little was known of the reproductive biology of Parachanna obscura Bonoun and Teugels [11].

In the Eastern part of Nigeria, a number of gastrointestinal helminth worms have been documented to be present and isolated from this fish by Ogbulie, et al. [9]. They reported the occurrence of Camallanus species, Capillaria species, Acetodoxtra species, Clinostomum species, Diplostomum species and Polyonchobothrium species.

Parasites are the most common pathogens found by aquaculturists. Parasitological

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studies are therefore very important in the development of fisheries potential of freshwater habitat as well as public health safety for the final consumer who is going to consume this fish. Thepresent study investigates the parasitic helminth fauna of common Snakehead fish, Parachanna obscura from Lekki lagoon, Lagos, Nigeria.

Materials and Method

Study Area

Epe Lagoon lies between longitude 5 o 30' - 5 0 40'E and latitude 3 o 50' - 4 o 10'N and has a surface area of about 225 kilometers (km) and a maximum depth of 6 meters (m). The lagoon is sandwiched between the Lagos and Lekki Lagoons. However, a large area of the lagoon is relatively shallow with a minimum depth of 1 m and the vegetation surrounding the lagoon is of the mangrove swampy type [12]. The lagoon opens into the Gulf of Guinea via Lagos harbour.

The rich fish fauna of the lagoon includes Heterotis niloticus, Gymnarchus niloticus, Clarias gariepinus, Malapteruru electricus, Synodontis clarias, Chrysichthys nigrodigitatus, Channa obscura, Mormyrus rume, Calabaricus calamoichthys, Tilapia zilli, Tilapia galilae, hemichromis fasciatus and Sarotherodon melanotheron [12].

Collection and examination of specimens for Parasites

One hundred and fifty of fresh Parachanna obscura were purchased from fishermen at Epe Lagoon, Nigeria. The weights, standard length, and total lengths of the fishes were recorded. The weights were taken with the aid of standard digital weighing balance while the length of the fishes were taken with the metre rule. The collection was done for a period of one year. The abdominal cavity of each fish was cut open and the gastrointestinal section was removed and cut into parts. The gastrointestinal parts were separated from the other visceral organs and placed in Petri dishes containing physiological saline. The intestine was further carefully slit open to aid the emergence of the parasitic helminths. The emergence of any worm was easily noticed by its wriggling movement in the saline solution.

Processing of recovered Parasites

The different helminth parasites recovered were immediately fixed in 70% alcohol. They were counted and recorded against a specimen of Parachanna obscura.

Results

During the course of this study, two kinds of helminth parasites were recovered: two nematodes; Procamallanus species (Spirocamallanus) and Contracaecum species were recovered from the gastrointestinal tract of Parachanna obscura. One hundred and fifty specimens were subjected to parasitologic examinations. Thirty two of the specimens examined were infected with helminth parasites. The prevalence of intestinal helminth infections was 17.3% (Table 1).

A total of one hundred and fifty was examined for gastrointestinal helminth infections. Eight of the male specimens were infected with gastrointestinal helminth parasites which brings the prevalence of infections to be 8.7%. Fifty eight female specimens of Parachanna obscura were also subjected to parasitologic examinations. Eight of the female specimens were infected with gastrointestinal helminth parasites (31%) (Table 2).

	Combined sexes	Female	Male
Number examined	150	58	92
Number infected with Parasites	26	18	8
Percentage of Infection	17.3%	31.0%	8.7%

Table 1: Prevalence of intestinal helminth infections in relation to sex of *Parachanna obscura*

Lenghts groups (cm)	16-20	21-25	26-30	Total
Number examined	89	25	36	150
Number infected	14	3	9	26
Percentage of infection	15.7%	12%	25%	17.3%

Table 2: shows the effect of the *Parachanna obscura* size in infection by

The length groups 16-20 cm had a prevalence of 15.7%, 20-25 cm (12%), 26-30 cm (25%) while the highest length groups 26-30 cm recorded (25%) prevalence of infection. There was however no significant relationship between sex and size in relation to parasitic infections in *Parachanna obscura*. The results of gastrointestinal helminth infections in *Parachanna obscura* shows that the female specimens recorded a prevalence of 31% which implies that they are more susceptible to parasitic infections than the male specimens with a prevalence of 8.7%.

Discussion

Parachanna obscura, the dark brown African Snakehead fish, also known as Phiocephalus obscurus, were randomly selected for intestinal helminthic investigations. The fish harboured Clinostomum metacercaria, Procamallanus (Spirocamallanus) species, and Cointracaecum species. The present study recorded a prevalence of gastrointestinal infections of 17.3% and recorded a total of twenty six helminthes.

The occurrence of Clinostomum metacercaria by Ogbulie, et al. [9]. In River State, Nigeria, is in conformity with the presented study which also reported *Clinostomum metacercariae* from *Parachanna obscura* obtained from Epe lagoon, Lagos, Nigeria

The occurrence of *Procamallanus* species in *Parachanna obscura* is in conformity to the work done by Akinsanya and Hassan [13]. The feeding habits of fish often determine host-specificity of their parasites. *Contracaecum* species (larva) found in *Parachanna obscura* in this present study confirms the kind of feeding habits and diet of the fish.

Akinsanya and Hassan [13] also reported *Clinostomum metacercariae* from Cichlids purchased at Eleyele River, Ibadan, Nigeria. They observed that *metacercariae* were more pronounced on the skin.

Adekunle, et al. [14], in studies on the identification and description of the *metacercariae* cysts, also found encystment more pronounced on the skin and pharyngeal region than in the eyes, fins and other parts of the body.

Akinsanya and Hassan [13] examined the encystment of the encysted *metacercariae*. They reported that *Clinostomum marginatum metacercariae* excysted in avian bile and suggested that probable zone of encystment in the heron and other fish eating birds would be in the duodenum from where it migrates to the oral cavity where it becomes sexually mature. They also

observed that the *metacercariae* also excysted in toad bile, but died immediately after excystment in the bile. This implies that *Clinostomum* species cannot infect toad.

Although not a parasite of man, Chandler and Reed [15,16] reported that the *metacercariae* may cause acute irritation of the throat from temporary attacment of worms eaten with raw food. This disease is also referred to as Laryngo-Pharyngitis.

Conclusion

Results from this study buttress the point earlier suspected by the researchers that this snake head fish, which is quite popular and regularly eaten in this area of Nigeria, is a serious potential health hazard if not well taken care of. Food and delicacies prepared without adequate processing has the potential of infecting consumers with helminthiasis and thereby constituting serious health risk. The researchers hope that relevant government authorities and policy makers will take not of this serious health issues and ensure that measures are taken especially in the processing of this fish for consumption to ensure that the fish meets food safety standards.

References

1. Ama-Abasi D, Ogar A. Proximate composition of Snakehead, *Parachanna obscura* from the Cross River, Nigeria. *Journal of Fisheries and Aquatic Sciences*. 2013;8(1):295-298.
2. Mat Jais AM, Matori MF, Kittakoop P, Suwanthorirux K. Fatty acid composition in mucuc and roe of Haruan, *Channa striatus* for wound healing. *Gen, Pharmacol*. 1998;30(4):561-563.
3. Obiekezie AI, Ajah PO. Chemotherapy of macrogyrodactylosis in the culture ofAfrican clariid catfishes (Clarias gariepinus and Heterobranchus sp.) *J. Aquac Trop*. 1994;9:187-192.
4. Mir TA, Kour P, Monohar S. Pathogenic effects of nematode parasite Eustrongylides sp larva on serum LH level and histology of gonads of freshwater fish, Clarias gariepinus. *Recent Research in Science and Technology*. 2012;4(2):24-26.
5. Yanong RP. Nematode parasites of animals and humans; 2014.
6. Gosse JP . Le milieu aquatique et l'ecologie des poisons dans la region de Yangambi: Annales du Musee Royal de l'Afrique Centrale, *Sciences Zoologique*. 1963;116:113- 271.
7. Morrice C. Aquaculture in Ghanattope for the future. *Aquaculture News*. 1991;12:2.
8. Ajana AM. Brackish water fish culture in Nigeria: present status and practices. *Aquaculture*. 1983;31:329-337
9. Ogbulie JN, Obiajuru IOC, Ogbulie TE. Bacterial and helminth bioload of cultured Channa obscura fish. *Journal of Aquatic Sciences*. 2003;18(2):93-100.
10. Micha JC. Fish populations study of Ubangui River: Trying local wild species for fish culture. *Aquaculture*. 1974; 4:85-87.
11. Bonou CA, Teugels GG. Revision systamatique du genre Parachanna (Teugels et Daget, 1984) (Pisces: Channidae): *Revue d' Hydrobiologie Tropicale*. 1985;18(4):267- 280.
12. BalogunJK. Studies on some aspects of the Biology of *Pellonula afzeliusi* (Johnels) in Epe Lagoon, Nigeria. *Arch Hydrobiol.* 1987;109:517-530.
13. Akinsanya B, Hassan AA. Excystment of the metacercaria of the trematode *Clinostomum marginatum*. *Bioscience Research Communications*. 2002;14(4):445-450.
14. Adekunle AI. Identification and description of cysts found in various organs in Tilapia. *M.Sc Thesis*, University of Ibadan. 1989;4-8.
15. Chandler AC, Read CP. Introduction to parasitology. John Wiley and Son Inc., New York and London. 1961;307.
16. Akinsanya B, Hassan AA, Fawole OO. Prevalence of parasitic infections in Cichlids from Eleyeile River, Ibadan, Nigeria. *Bioscience Research Communications*. 2002;14(1):93-99.