The Parasitic helminth fauna of *Parachanna obscura* from Lekki 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 three hundred and forty specimens were monthly obtained over a period of one year. Helminth infections was observed to have a prevalence of 5.9% which accounts for twenty 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 two helminthes was recovered from the fish. The male specimens (229) recorded a lower rate of infection (5.2%) than the females (111) which recorded a prevalence of 7.2%. The overall worm burden were low and independent of sex and size of the fish. [Researcher. 2010;2(9):78-84]. (ISSN: 1553-9865).

Introduction

Parachanna obscura (Gunther, 1861) the African snakehead fish species is common in Nigeria and several West African countries. The species has a native range from White Nile specifically the Jebel and Ghazal systems of Sudan (Bailey, 1994), Gambela region of Ethiopia (Golubtsov *et al*. (1995), Lake Chad basin, Zaire (Congo), Senegal River basins (Boulenger, 1907, 1916, Irvine 1947; Teugels and Daget, 1984; Bonou and Teugels, 1985; Skelton, 1988).

The species was also recorded in Stanley Pool, Lualaba (Congo) River by Boeseman (1957). Dankwa, *et al*. (1999) reported that the fish is widely distributed in Ghana and can be both useful as food and aquarium species.

Parachanna obscura has been reported to have a preference for marginal vegetation and floodplain habitat in the Sudan,(Bailey 1994), and occupies a wide variety of habitats including streams, rivers, lakes, lagoons and marshes (Bonou and Teugels (1985). In flowing water, the species occupies calm areas. The species has also been indicated to be 'widely distributed' in marshy habitats and can also be found in bank vegetation of river channels (Lowe-McConnell, 1988).

Teugels *et al* (1992) also listed the species as common in stagnant side channels of the Cross River, Cameroon, Nigeria, and can be found among water logged fallen trees and leaf debris. The fish is in equatorial Africa which indicate it to be a strictly tropical species.

The fish has generally been classified as carnivorous predators. Bonou and Teugels (1985) reported that the fish species is being used to control the young Tilapias in aquaculture ponds.

Blache (1964) also recorded the food of young *Parachanna obscura* as Copepods and insect larvae. Adults of the fish prey on other fishes as reported by Copley (1952), Poll (157); Gosse (1963) and Teugels (1992). Adebisi (1981) reported that the juveniles of *Parachanna obscura* fed on prawn, copepods and aquatic insect larvae whereas adults fed only on fishes in Southern Nigeria.

Victor and Akpocha (1992) also reported that in monoculture in a Nigerian pond, young of this species fed primarily on detritus and larval insects, whereas larger individuals contained fish parts and juveniles with insects and fish making up the bulk of the diet.

The species has a distinct coloration among African Snakehead in having a series of dark blotches. The fish species does not also has Chevron shaped bars across the middle of the back. The fish has scales present in the jugular region, no canine teeth, head is depressed anteriorly, and is relatively long and covered with large scales.

The fish is being cultured in Ghana (Morrice, 1991), Nigeria (Ajana, 1983; Ogbulie *et al* 2003); Victor and Akpocha, 1992), and Bnin (Jackson, 1988). The fish species has also been recommended for culture in the Central African Republic (Micha, 1974). It is also reported that little was known of the reproductive biology of *Parachanna obscura* Bonoun and Teugels (1985).

Gosse (1963) stated that the young of *Parachanna obscura* are guarded by a large adult.

In the Eastern part of Nigeria, a number of gastrointestinal helminth worms have been documented by Ogbulie *et al.* (2003). They reported the occurrence of *Camallanus* species, *Capillaria* species, *Acetodoxtra* species, *Clinostomum* species,

Diplostomum species and *Polyonchobothrium* species.

Parasites are the most common pathogens the aquaculturist will encounter. Parasitological studies is therefore very important in the development of fisheries potential of freshwater habitat. This present study investigates the parasitic helminth fauna of common Snakehead fish, *Parachanna obscura* from Lekki lagoon, Lagos, Nigeria.

Materials and Methods

Study Area

Lekki lagoon supports a major fishery in Nigeria. The lagoon is located in Lagos State, Nigeria and lies between longitudes 4^0 00' and 4^0 15' E and between latitudes 6^0 25' and 6^0 37' N. It has a surface area of about 247 km^2 with a maximum depth of 6.4m, a greater part of the lagoon is shallow and less than 3.0m deep.

The Lekki lagoon is part of an intricate system of waterways made up of lagoons and creeks that are found along the coast of South-western Nigeria from the Dahomey border to the Niger Delta stretching over a distance of about 200km. It is fed by the River Oni discharging to the North-eastern and the Rivers Oshun and Saga discharging into North-western parts of the lagoon.

Lekki lagoon experiences both dry and rainy seasons typical of the southern part of Nigeria.

The vegetation around the lagoon is characterized by shrub and raphia palms, *Raphia sudanica* and oil palms, *Elaeis guneensis*. Floating grass occur on the periphery of the lagoon while coconut palms *Cocos nucifera* are widespread in the surrounding villages.

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* (Kusemiju, 1981). Fig. 1 shows map of Lekki lagoon, Lagos, Nigeria.

Collection and examination of specimens for parasites.

Three hundred and forty specimens of fresh *Parachanna obscura* were purchased at Oluwo market, Epe, Lagos, 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 were further carefully slit open to aid the emergence of the parasitic helminthes. 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*. Identification of the helminthes to species level was undertaken at the British Museum (Natural History), United Kingdom.

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*. Three hundred and forty specimens were subjected to parasitologic examinations.

Twenty of the specimens examined were infected with helminth parasites. The prevalence of intestinal helminth infections was 5.9%.

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

	Male	**Female**	**Combined Sexes**
Number Examined	229	111	340
Number infected with parasites	12	8	20
Percentage of Infection	5.2	7.2	5.9

Chi Square = 3.841

A total of two hundred and twenty nine male specimens was examined for gastrointestinal helminth infections. Twelve of the male specimens were infected with gastrointestinal helminth parasites which brings the prevalence of infections to be 5.2%. One hundred and eleven female specimens of *Parachanna obscura* were also subjected to parasitologic examinations. Eight of the female specimens were infected with gastrointestinal helminth parasites (72%).

Table 2 shows the infection in relation to size in *Parachanna obscura*.

Length groups (cm)	10-15	16-20	21-25	26-30	Total
Number examined	83	202	48	7	340
Number infected	5	12	3	0	20
Percentage of Infection	6.0	5.94	6.25	0	5.9

Chi Square = 7.815

The length groups 10 – 15cm had a prevalence of 6.0%, 16-20cm (5.94%), 21-25cm (6.25%) while the highest length groups 26-30cm recorded zero 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 7.2% which implies that they are more susceptible to parasitic infections than the male specimens with a prevalence of 5.2%.

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. This present study recorded a prevalence of gastrointestinal infections of 5.9% and recorded a total of twenty two helminthes.

Ogbulie *et al*. (2003) however reported a higher prevalence of 41% helminth infections in cultured *Channa* obscura. They isolated *Camallanus* species, *Capillaria* species, *Acetodoxtra* species, *Clinostomum* species, *Diplostomum* species and *Polyonchobothrium* species.

The occurrence of *Clinostomum metacercaria* by Ogbulie *et al.* (2003) in River State, Nigeria, is in conformity with this present study which also reported *Clinostomum metacercariae* from *Parachanna obscura* obtained from Lekki lagoon, Lagos, Nigeria.

Clinostomum marginatum is essentially a parasite of herons, bitterns and other fish eating birds (Krull 1934, Hunter and Hunter 1934, 1935a). They also observed that the *metacercariae* of *Clinostomum* species is fork tailed and penetrates the fish which is the intermediate host where it develops into large metacercariae popularly known as 'yellow grub'. When infected fish are eaten by water birds, the yellow grubs are freed and they migrate to the oral cavity of the host where they attain sexual maturity in a few days. Therefore, the occurrence of the *metacercariae* of *Clinostomum* species is in conformity with the report of Krull (1934), Hunter and Hunter (1934, 1935).

Akinsanya and Hassan (2002a) also reported *Clinostomum metacercariae* from Cichlids purchased at Eleyele River, Ibadan, Nigeria. They observed that *metacercariae* were more pronounced on the skin.

Adekunle (1989) 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 (2002b) examined the excystment of the encysted *metacercariae*. They reported that *Clinostomum marginatum metacercariae* excysted in avian bile and suggested that probable zone of excystment 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 (1961) reported that the *metacercariae* may cause acute irritation of the throat from temporary attachment of worms eaten with raw food. This disease is also referred to as Laryngo-Pharyngitis.

A few species may however rarely infect man. For instance, *Clistomum complantum* and *C. marginatum* both of which use a very large number of fish as intermediate hosts may infect man. Witenberg (1964), Yamaguti (1975).

Britz, Van As and Saayman (1984, 1985) has reported that *Clistomum tilapiae* and *Euclinostomum heterostomum* are a potential hazard to humans if *Orelochromis mosambicus* is not properly cooked or only partially dried in the sun.

Kabunda and Sommerville (1984) has reported the rejection for human consumption if *Oreochromis mosambicus* is infected with *Clinostomum* species. This present study did not however report *Capillaria* species, *Acetodoxtra* species, *Diplostomum* species and *Polyonchobothrium* species in *Parachanna obscura* as reported by Ogbulie *et al*. (2003).

Yakubu *et al* (2004) in a comparative study of gut helminthes of *Tilapia zillii* and *Clarias gariepinus* from River Uke, Plateau State, Nigeria,

reported similar parasite to those found in this present study. They reported *Camallanus* species, *Procamallanus laeviconchus*, *proteocephalid* species, and *Sphaerostoma bramae.*

The occurrence of *Procamallanus* species in *Parachanna obscura* is in conformity to the work done by Yakubu *et al*. (2004).

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.

Contracaecum and *Thynnascaris*, which are from shallow and intermediate water, respectively, occur in benthophagous host species, whereas *Terranova* and *Anisakis*, intermediate and open water types, respectively, occur in nekton feeders (Cannon, 1977). It is known that mollsucivorous hosts harbour parasite species as intermediate host (Cake, 1976, 1977, Cake and Menzel, 1980).

Rosenthal (1967) also recovered *Contracaecum* larvae in the peritoneal cavity of *Clupea barengus* larvae which was observed to cause distension of abdomen, external compression and eventual permanent distortion of gut, cessation of peristalsis and feeding, with death from damage caused by activity of larva. Elarifi (1982) however recovered *Contracaecum* larvae inside liver *Parenchyma of Merlangus merlangus* which provoked cellular response characterized by neutrophils, macrophages and proliferating fibroblasts.

Larval ascaridoid nematodes of the genera *Anisakis, Terranova, Thynnascaris* and *Contracaecum* are the most serious pathogens of the liver of marine fish. Margolis (1970a).

The appearance of *Contracaecum* larvae in *Parachanna obscura* in Lekki lagoon is in conformity with the observation of Rosenthal (1967) were *Contracaecum* larvae distended the abdomen and coiled around the gut in the peritoneal cavity of larval *Clupea barengus* which resulted in the death of the host after about eleven days.

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