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Short Communication

Comparison of parasitic helminth infection between the different age groups of *Clarias gariepinus* from Asa dam Ilorin, north-central Nigeria

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A total of 160 specimens of *Clarias gariepinus* comprising three age groups – juveniles (standard length 10.0 – 29.9 cm), sub-adults (fish length 30.0 – 39.9 cm) and adults (fish length 40.0 – 59.9 cm) were collected over a period of 8 months from Asa dam, a major river in Ilorin. The fish length and weight ranged from 12.5 to 41.0 cm and 152 to 597 g respectively. They were subjected to parasitological examinations. two cestode types - *Amonotaenia sp* and *Polyonchobothrium clarias*; two nematode types - *Paracamallanus sp* and *Procamallanus laevionchus* and one acanthocephalan – *Neoechino-rhynchus rutili* were detected. Eighty-eight parasites were recovered. 27.5% of all fish examined showed parasitic infection. Helminth infection was found in juveniles and sub-adults only. Infection rate was higher in sub-adults than in juveniles.

Key words: Parasite, helminths, *Clarias gariepinus*, Ilorin.

INTRODUCTION

Clarias gariepinus (Teugels, 1986) family Clariidae is generally considered to be one of the most important tropical catfish species for aquaculture in West Africa (Clay, 1979). *Clarias* species inhabit calm freshwaters ranging from lakes, streams, rivers, swamps to flood plains, many of which are subject to seasonal drying. The most common habitats of the catfish are flood plains, swamps and pools. The catfish can survive during the dry seasons due to the possession of accessory air breathing organ (Bruton, 1979a; Clay, 1979). Since the last three decades, *C. gariepinus* has been considered to hold great promise for fish farming in Africa; the fish having a wide geographical spread, a high growth rate, resistant to handling and stress, and well appreciated in a wide num-ber of African countries.

The fish is generally classified as omnivores or preda-tors feeding mainly on aquatic insects, fish and higher plants debris as reported for catfishes in the River Ubangui, Central African Republic (Micah, 1973). They have also been found to feed on terrestrial insects, mol-luscs and fruits. The catfishes utilize various kinds of food resources available in their habitat (Bruton, 1979b).

Parasitic fauna of fishes have been studied in many parts of the world (Ooi et al., 2001; Khalil, 1971; Van and Basson, 1984). Fish population studies showed high pre-valences in many cases (mostly with endoparasites that is, those that live inside the fish's body). For example, massive infection with heterophyid metacercariae of aquacultured eels have been documented in Taiwan (Ooi et al., 2001) . In Africa, over 40 species of adult tape-worms have been reported to occur in African catfish (Khalil, 1971; Van and Basson, 1984).

The emanating need to culture fishes for protein con-sumption for the teeming rapidly growing populations in the developing countries have made it necessary to intensify studies on the parasite fauna of the African freshwater fishes (Akinsanya et al., 2007a). There is appreciable documentation of parasite fauna of *C. gariepinus* in Nigeria. One of the earliest reports in Nige-ria in inland waters concerning fish parasites was that of Awachie (1966) who documented preliminary information on the parasites of fish in the Kainji reservoir. He observed that not many fishes were infected. However in a similar study, Ukoli (1969) observed heavy parasitic infection of fish species from the same reservoir. Similar works have also been done in Nigeria by - Oniye et al. (2004) in Zaria, Yakubu et al. (2002) in Plateau State, Ibiwoye et al. (2004) in Bida and Akinsanya and Otubanjo (2006) in Lagos.

C. gariepinus is a highly priced fish and forms the majority of the catches of fishermen in Ilorin and it's environ. Because of this, its different age groups that is,

Table 1. Pattern of helminth infection in *Clarias gariepinus* in relation to their standard length.

Standard Length (cm)	Number (%) of fish examined	Number (%) of fish infected	Total number of parasites recovered	Prevalence (%)	Intensity
10.0 – 29.9	52(32.5)	22(42.31)	40	13.75	1.82
30.0 – 39.9	88(55)	22(25)	48	13.75	2.18
40.0 – 59.9	20(12.5)	-	-	-	-

*Prevalence is the number of fish infected divided by the total number of fish used for the study, converted to % *Intensity is the total number of parasites recovered divided by the number of infected fishes, converted to %

adults, sub-adults and juveniles are being exploited in natural waters for food. It is as a result of this that this study was carried out to determine whether there is any difference in the rate of infection between the three age groups.

MATERIALS AND METHODS

Collection and examination of specimen

Fresh specimens of *C. gariepinus* from Asa dam (a major river in Ilorin) were purchased from fish sellers at a major market between August 2006 and March 2007. Ilorin, the capital of Kwara State is found in the Northern Guinea Savannah of Nigeria with a mean annual rainfall of 500 – 1000 mm. Asa dam is located approximately 4 km south of Ilorin Township. It is located between latitudes 80°28' and 80°52'N and longitudes 40°35' and 40°45'E. Asa reservoir has a surface area of 302 ha (Ita et al., 1985), with a maximum length of 18 km and a maximum depth of about 14 m at the dam site. The specimens were grouped into juveniles, sub-adults and adults on the basis of their length and weight. They were taken to the laboratory for examination of parasites. The total length (from the tip of the snout to the posterior extremity of the caudal fin) and standard length (from the tip of the snout to the end of the caudal peduncle) were measured for each fish specimen in centimeters with the aid of a Measuring Board. The total weight for each fish was obtained using a Salter Balance. The alimentary canals were removed and cut into various parts. Each section was placed separately into dishes containing normal saline, incised and examined for parasites under a dissecting microscope. Parasites found were counted, placed in physiological saline overnight in a refrigerator to enable it stretch and relax. Thereafter the parasites were fixed in 5% formalin.

Processing of recovered parasites

Parasites were stained overnight with a weak erlich's haematoxylin solution and passed through graduated alcohol (30, 50, 70, 90% and absolute) for 45 min to dehydrate, cleared in methyl-salicylate and mounted on a slide in Canada balsam. Parasites were identified by using the texts of Yamaguti (1959, 1961), Markevich (1963), Petrochenko (1971), Cheng (1973), Soulsby (1982), Williams and Jones (1994) and Paperna (1980; 1996).

RESULTS

A total of one hundred and sixty specimens were used for the study. These comprise the three age groups – juveniles, sub-adults and adults. Infection was limited only to the juveniles and sub-adults (Table 1). Infection was more in sub-adults compared to juveniles (Table 1). Eighty-eight parasites in all were recovered (Table1). They include two cestode types - *Amonotaenia sp* and *Polyonchobothrium clarias*; two nematode types – *Paracamallanus sp* and *Procamallanus laevionchus* and one acanthocephalan - *Neoechinorhynchus rutili*. 27.5% of all fish examined showed parasitic infection. Minimum weight of fish examined was 152 g while maximum weight was 597 g. Minimum length (Standard length) examined was 12.5 cm while maximum length examined was 41.0 cm. Table 1 shows the pattern of helminth infection in relation to standard length of fish. There was no statistically significant difference in the prevalence and intensity of infection that is, ($p>0.05$) between the juveniles and the sub-adults

DISCUSSIONS

Studies showed that only fish at the juvenile and sub-adult stages were parasitized. It also showed that there is higher parasitism in the sub-adults over the juveniles in terms of intensity of infection. The findings is in contrast to those of Oniye et al. (2004) and Anosike et al (1992) who though both reported infection only in sub-adults and adults. However, as reported by Roberts (1978), bigger fishes provides larger surface area for infection than smaller ones. Since it is not likely to be the adult stage of the parasites that the fish will ingest normally, (that is, it is the eggs or larva stages that will eventually multiply in numbers in the fish) it is therefore a plausible explanation that the big fishes provides a good ground for the parasites to multiply over time. An increase in size is a reflection of increase in length which is considered a measure of age (Lagler et al., 1979; Torres et al., 1977). *C. gariepinus* is an omnivorous fish at the adult stage with the tendency of being herbivorous at the juvenile stage. The higher parasitism observed in sub- adults over juveniles might be as a result of change in diet of the fish from weeds, seeds, phyto- and zooplanktons as juveniles to insect larvae, snails, crustaceans, worms and fish as adulthood is attained (Reed et al., 1967). Another possible reason for the higher parasitism in the sub –adults over juveniles may be that of activity. The sub-adults as expected would be more active than the juveniles and probably even adults. As such, they are able to compete better for food than the other age groups. This will only

mean more contact with food and hence a higher tendency of getting infected with parasites.

According to the table, there is no difference in the prevalence of infection. This might just be coincidental based on the number of specimen examined. However student's t-test analysis showed that there is no statistically significant difference in the prevalence and intensity of infection that is, ($p>0.05$) between the juveniles and the sub-adults. No parasite was found in the adult fishes. One reason for this might be the random selection of specimens. that is, more of the juveniles and sub-adults were examined as compared to the adult fishes. Another reason for it may be that of immunity as reported by Akinsanya et al. (2007a)

In conclusion, activity and feeding habit might have contributed to infection with with helminth parasites in different age groups of *C. gariepinus* in Ilorin area. It may be advisable to incorporate antihelminthic therapy into the diet of Clarias gariepinus obtained from the wild that might be used as broodstock. In-depth knowledge of the inter-play between the physico-chemical parameters of the water and fish will have to await further studies.

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