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Full Length Research Paper

Comparative analysis of parasitic helminth infection patterns in male and female *Clarias gariepinus* from Asa Dam, Ilorin, North-Central Nigeria

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One hundred and sixty (160) specimens of catfish *Clarias gariepinus* were examined for parasites. They comprise eighty (80) specimens each of males and females. 21(26.25%) males and 21(26.25%) females showed parasitic infection. A total of eighty six (86) intestinal helminthes belonging to three taxonomic groups were recovered. They are cestodes - *Amonotaenia* sp., *Polyonchobothrium clarias*; nematodes - *Paracamallanus* sp., *Procamallanus laevionchus* and acanthocephala - *Neochinorhynchus rutili.* Of these, thirty (30) were recovered from males and fifty-six (56) from females. Total prevalence of infection was the same for both sexes, that is, 13.13% but total intensity of infection was different, 1.43 for males and 2.67 for females. There was no statistically significant difference in the infection between the two sexes, that is, (p > 0.05).

Key words: *Clarias gariepinus*, helminth, parasites, Ilorin.

INTRODUCTION

Clarias gariepinus (Teugels, 1986) family, Clariidae is generally considered to be one of the most important tropical catfishes for aquaculture in West Africa (Clay, 1979). It is very common in swamps, lakes and rivers throughout Africa and it is the main fish in the catches of fishermen in Ilorin and its environs. Since the last three decades, *C. gariepinus* has been considered to hold great promise in fish farming in Africa, the fish having a wide geographical spread, a high growth rate, resistant to handling stress and well appreciated (Akinsanya and Otubanjo, 2006). It is highly priced and requested for by fish farmers and consumers in Nigeria either as smoked or fresh. Studies on the biology, nutrition/growth and management of catfish have been carried out (Viveen et al., 1977; Faturoti et al., 1986; Jeje, 1992; Adeyemo et al., 1994; Eyo and Olatunde, 2001; Banyighi et al., 2001; Ovie and Ovie, 2002). Irrespective of these, various parasites are associated with *C. gariepinus* in the wild and cultured environment where they cause morbidity, mortality and economic losses in aquaculture practice in the world (Subashinghe, 1995). There is appreciable documentation of parasite fauna of *C. gariepinus* in Nigeria (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. Males and females are readily distinguishable.

The males possess distinct sexual papillae that are conspicuously located behind the anus. The sexual papil-lae is absent in females. As a consequence of its high food value and the preference of the female fish for food (because of its delicious eggs when gravid) by some, an investigation of the helminth fauna of the fish was carried out to determine whether there is a signify-cant difference in the rate of infection between the sexes.

MATERIALS AND METHODS

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 kilometres 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 kilometres and a maximum depth of about 14 metres at the dam site.

Collection and examination of specimens

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 (twenty specimens per month) . They were taken to the laboratory for examination of parasites. Apart from the outward differentiation between the sexes, they were split open for confirmatory sex determination. Males have a whitish testis which is serrated at the margin while females have reddish ovary

Table 1. Prevalence and Intensity of infection of *C. gariepinus* with respect to sex.

Month	Sex	Number of fish Examined	Number and Percentage of fish infected	Total number of parasites recovered	Prevalence (%)	Intensity of Infection
August	M	8	4(50)	10	2.5	1.25
	F	12	-	-	-	-
September	M	8	1(12.5)	2	0.625	0.25
	F	12	3(25)	6	1.875	0.5
October	M	12	4(33.3)	4	2.5	0.33
	F	8	4(50)	8	2.5	1
November	M	12	2(16.67)	2	1.25	0.16
	F	8	-	-	-	-
December	M	10	4(40)	6	2.5	0.6
	F	10	4(40)	6	2.5	0.6
January	M	8	-	-	-	-
	F	12	2(16.67)	2	1.25	0.16
February	M	10	2(20)	2	1.25	0.2
	F	10	4(40)	24	2.5	2.4
March	M	12	4(33.3)	4	2.5	0.33
	F	8	4(50)	10	2.5	1.25

which may contain eggs. The fish were dissected to expose the alimentary canal. The alimentary canal was thereafter removed and sectioned into its various parts, Oesophagus and Stomach, Intestine and Rectum. The gut was used for parasitic examination because this is where food will be most abundant for the parasites. 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.

Processing of recovered parasites

Thereafter the parasites were fixed in 5% formalin (Seinhorst, 1966 and 1973). 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 and 1961), Markevich (1963), Petrochenko (1971), Cheng (1973), Soulsby (1982), Paperna (1980, 1996) and Williams and Jones (1994). The term prevalence was applied as defined by Margolis et al. (1982).

RESULTS

A hundred and sixty specimens (160) of wild *C. gariepinus* were examined for parasites.

Eighty were males and eighty were females. 21(26.25%) males and 21(26.25%) females showed parasitic infection (Table 1). Eighty-six (86) parasites belonging to three classes, Cestodes, Nematodes and Acanthocephala were recovered. Cestode types are, *Amonotaenia sp* and *Polyonchobothrium clarias*, nematodes – *Paracamallanus sp* and *Procamallanus laevionchus* and acanthocephalan – *Neoechinorhynchus rutili* were detected (Table 2). Thirty (30) helminthes were recovered from males and fifty six (56) from females (Table 1). Total prevalence of infection between the fish sexes was the same, that is, 13.13% though it varied for the different months (Table 1). There was however a difference in the total intensity of infection between the sexes, 2.67 for females and 1.43 for males (Table 1). There was no particular trend in the prevalence and intensity of infection between the two sexes. Parasites were recovered from both fish sexes in all other months that spanned the period of specimen collection except the months of September, December and February where parasite recovery was limited to a single sex (Table 1). Result also showed that except for the month of September in which no helminth was recovered from female fish. All other months recorded more helminthes in females than in males (Table 1). Infections in females were highest in the last two months of specimen collection (Table 1). Student's t-test analysis showed that there was no statistically significant difference in prevalence and intensity of infection between the two sexes.

DISCUSSIONS

From the result, both sexes had equal prevalence of infection, 13.13%. This result is in contrast to the findings of Anosike et al. (1992) and Oniye et al. (2004) who both reported more prevalence of infection in males. However the period of study of Oniye et al. (2004), that is, March – July is different from the period of this study. Breeding of *C. gariepinus* falls between March and July during which time gravid females are less active than males. It means therefore that both sexes had equal chances of host pa-

Table 2. Parasitic helminth abundance in relation to sex of *C. gariepinus*.

Parasite species	Taxonomic group	No recovered	No in males	No in females
Amonotaenia sp	Cestoda	6	1	5
Polyonchobothrium clarias	Cestoda	18	5	13
Paracamallanus sp	Nematoda	40	14	26
Procamallanus laevionchus	Nematoda	2	-	2
Neoechinorhynchus rutili	Acanthocephala	20	10	10

rasite contact, that is, equal activities and this may just account for their prevalence being equal.

In terms of the intensity of infection, females were more heavily infected. This may be attributed to their quest for survival. Since males are believed to be the stronger sex, they are able to explore available food resources better than the females. Females in their desperation for survival might have fed on other food particles that it will normally not feed on were food very abundant thereby taking up these infective organisms in the process.

The reason for the very high parasite load in the month of February is not farfetched. The sample area (Asa dam in Ilorin) usually experience high reduction in water volume during the dry season. The month of February is considered the peak of dry season in this part of the country. Food is expected to be scarce at this time and so less desired food particles might have been taken which can increase the chances of parasite contact. There was also a considerably high parasite load in the month of March.

According to Ibiwoye et al. (2004), fishes are susceptible to heavy infestation with parasites mainly in the early rain when fishes are weakened by hibernation (a state of exhaustion). On the other hand, the result agrees with that of Ibiwoye et al. (2004) and Mhaisen et al. (1988) who both reported more infection in female fish. Ibiwoye et al. (2004) reported that female fishes were generally more liable to infection with Cestodes, Nematodes and Acanthocephala which were the three groups of parasites recorded in this study. On the whole, student's t-test analysis showed there was no significant difference in infection between the sexes.

In conclusion, fish activities and time may have contributed to female *C. gariepinus* being more infected with parasites than males. Longer time period and collection of more specimens will await further studies to be able to determine if there is risk of transfer of parasitaemia to humans feeding on more of a particular sex.

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