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Prevalence of Intestinal Parasites of *Clarias Gariepinus* in Lau Fishing Landing Site of Upper Benue River Basin, Lau Local Government Area, Taraba State, Nigeria

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Abstract

Fish is very important to both piscivorous animals and humans because it contains protein of very high quality; but the activities of parasites cause depletion in both the aesthetic and nutritional qualities of the fish. A study to determine the prevalence of intestinal parasite in *Clarias gariepinus* vis a viz sex and size of fish was carried out .A total of one hundred and fifty (150) *Clarias gariepinus* were collected fortnightly for two months and examined for intestinal parasites at the Biological Sciences Department, Taraba State University, Jalingo. Seventy (70) males and eighty (80) females were investigated. Forty four males (55%) were infected with the intestinal parasites and thirty six females (45%) were infected. There was significant association between sex of fish and parasitic infection (χ^2 =4.783, p<0.05). Infection was higher in fish with size range of 21-25cm, where seventy seven (77) fish were examined; forty fish (50%) were infected; followed by size range of 26-30cm, where thirty fish were examined with twenty infected (25%). The relationship between size of fish and parasitic infection was not significant (χ^2 =8.286, p<0.05). The parasites recovered during the investigation were *Polyonchobothrium clarias, Monobothrium* sp. and *Procamallanus laevionchus*. Therefore, further studies on the identification and control of parasites on fish is highly recommended in order to protect the fish from continual loss due to parasites infestation.

Keywords: Intestinal; Parasite; Prevalence; *Clarias gariepinus*; Lau; River Benue; Taraba.

Introduction

The importance of fish as valuable source of protein cannot be overemphasised (Biu and Akorede, 2013), but their continued supply is mostly hampered by diseases and parasites, which always leads to massive mortalities especially if the fish are in confinement (Awharitoma *et al.*, 2012). Helminth parasites are prevalent in the *C. gariepinus* sampled in Nigeria (Kawe *et al*., 2016). Iwanowicz (2011) stated that parasites of fish do not normally cause harm to the fish if they are in less number, than when the parasitic burden is high. Fish parasite impede growth, block reproductive channels and also create mechanical routes of disease transmission via their attachment to organs; which opportunistic pathogens gain access into the fish and cause devastating consequences (Iwanowicz, 2011).

It is therefore expedient to study parasites of wild fish, to ascertain their prevalence rate of infection and intensities, because parasites that infest and infect the wild ones can also infect the cultured species. It is important to study parasites of fish because aquaculture is growing in popularity among the citizens of Taraba State, Nigeria and indeed the world at large. This will go a long way to help in the prevention and control of such parasites in an aquaculture setting.

Materials and Methods

Study Area

The study was conducted in Lau, Taraba State. It is located on latitude $9^0$12'29.77" N and longitude 11^0 16'31.48" E (www.latitude.to/map/ng/nig). Major occupation of the people in the study area are fishing and farming. Lau is well known fish market town in the region attracting people from far and near who come to buy fresh, dried and smoked fish (Oruonye and Abbas, 2011). The average production of fish in the state is about 1,987 metric tonnes per annum (TSEED, 2004). The vegetation of Lau is in the Guinea savanna geo-climatic zone. The seasons are well defined: Dry season lasting from April to early October. The annual rainfall is 1305mm, temperature varies considerably. The hottest months are between March and May with average temperature of 38.03^0C while coldest months are between

November and January with average temperature of 28.25^{0}C.

Fish Collection

A total of one hundred and fifty (150) *Clarias gariepinus* comprising of seventy (70) males and eighty (80) females were collected randomly from the fish landing sites in Lau. The fish were transported alive in a plastic jerry can to the Biological Sciences Department of Taraba State University, Jalingo. Collection was carried out weekly for two months in 2016.

Preparation of samples

The weight and standard length of the fish were first taken. Sex of the fish was determined by direct examination of the genital openings. Male have papilla while the females don't have. Sex is confirmed after dissection by observing the gonads. After dissection, the intestines were untangled using the fingers and placed in a petri dish. It was then cut opened using a pair of dissecting scissors and washed in a petri dish containing distilled water. The content of the petri dish was then placed under the dissecting microscope and observed. The cut intestines were also observed section by section. Parasites seen were recovered and placed in cavity blocks which were then fixed with warm water between 60-70^{0}C to retain their shape and quality, before preserving with 5% formalin.

Identification of Parasites

All recovered parasites were processed and mounted on permanent slides before examination. Cestodes were washed in distilled water, stained, de-stained and passed through graded levels of alcohol (Ethanol) (30%, 50%, 70%, 90% and absolute) for dehydration. Methyl salicylate was used to clear it before mounting in Canada balsam. The nematodes were washed in distilled water to remove the preservative. They were subsequently cleared in glycerine before mounting in Canada balsam. Parasites were then identified using Identification keys by Paperna (1980 and 1996).

Results

One hundred and fifty (150) *Clarias gariepinus* were examined for parasites, seventy (70) males and eighty (80) females. Forty four males (62.86%) were infected and thirty six females (45%) were infected (Table 1). Chi square test shows that relationship between infection and sex of fish is significant.

Table 1: Prevalence of intestinal parasites in relation to sex of fish

Sex	Number Examined	Number Infected (%)
Male	70	44 (62.86)
Female	80	36 (45.00)
Total	150	80 (53.3)

(χ^2 =4.783, df=1, P<0.05)

The prevalence of parasitic infection in relation to size (standard length in cm) of *Clarias gariepinus* showed that in the size range 15-20cm, 33 fish were examined and 12 (36.36%) were infected. seventy seven (77) fish were of size range 21-25cm and 40 (51.94%) were infected. Thirty (30) fish were of size range 26-30cm, 20 (66.66%) were infected. ten (10) fish were examined in the size range of 31-35cm and 8(80.00%) were infected. Chi square analysis did not show significant association between size and parasitic infection \\(p< 0.05).

Table 2: Prevalence of intestinal parasites in relation to size of fish

Size of Fish (cm)	Number Examined	Number Infected (%)
15-20	33	12 (36.36)
21-25	77	40 (51.94)
26-30	30	20 (66.66)
31-35	10	8 (80.00)
Total	150	80 (53.33)

(χ^2 =8.286, df= 3, p<0.05)

Table 3: shows the prevalence of the various parasite species recovered. The highest prevalence was by *Polyonchobothrium clarias*, cestodes with 182 (83%) recovered; 22 (10%) were

Procamallanus laevionchus a nematode and 15 (7%) were *Monobothrium* sp, a cestodes.

Table 3: Prevalence of parasite species

Parasite species	Number Isolated	Prevalence (%)
Polyonchobothrium clarias	182	83.10
Procamallanus laevionchus	22	10.04
Monobothrium sp.	15	6.84
Total	219	

Discussion

The higher prevalence of intestinal parasites among the male fish in Lau fish landing site was attributed to the season of fish collection, which was at the peak of the breeding season of *Clarias gariepinus* when the river overflows its banks into the surrounding ponds and marshes. The same was reported by Kotos and Bingari (2004) when they surveyed the helminths parasites of *Oreochromis niloticus* and *Clarias gariepinus* in Lake Geriyo, Yola. They observed that the males in *C. gariepinus* had higher prevalence as compared with the females. The reason they suggested was that during courtship, the males, in actively looking for mates, are exposed to chance encounter with the parasites or their intermediate hosts used as food, which is needed for the high energy needs during courtship. This also is in agreement with the work of Yakubu *et al.* (2002) who worked on fish of River Uke, Plateau State where the male fish had higher prevalence. Their work covered both dry and wet season, but higher prevalence was observed in the rainy season where the male fish had higher infection but the result differs from that of Dayok *et al.* (2014) who worked on fish sold for consumption in Anguldi-Zawan, Jos South Local Government Area of Plateau State, and reported that female fish had higher infection than the male fish. He attributed reasons of disparity to number of fishes examined and the environment where the fish were caught.

There was high prevalence in the fish with size range of 21-25cm. Sample size of fish within the various size ranges can result in high or low prevalence. Bingari (2015) reported that the higher the sample size of any size range, the higher the prevalence in that size range if there is parasite presence in the fish collection site. But Oniye *et al.* (2004) attributed reasons for higher prevalence in small sized fish than bigger sized fish to their ability to resist parasite infection; that with age of fish (in this respect size of fish), the bigger the size, the more resistant it will be because as the fish increases in size, there is increased resistance to infection or infestation due development of the immune system. Hassan *et al.* (2012) also observed higher prevalence in small sized fish than the larger ones when they worked on *Clarias gariepinus* and *Synodontis clarias* in the Lekki Lagoon in Lagos, Nigeria. The higher prevalence in fish with size range 21-25cm in the present study might be due to sample size and low immunity to resist the parasite infection as reported by Bingari (2015) and Oniye *et al*. (2004).

Polyonchobothrium clarias (cestodes) showed the highest prevalence of infection compared to *Procamallanus laevionchus* and *Monobothrium* sp (cestodes). Gossele *et al.* (2008) reported that cestodes, trematodes and nematodes are among the classes of helminths that infect *Clarias gariepinus.* Hassan *et al*. (2012) also reported Cestodes and Nematodes as the major helminths affecting *Clarias gariepinus.*

Conclusion

In conclusion, parasite attack on fish constitutes a major threat to fish production especially in Lau. Since the demand of fish is increasing significantly because of its safe source of protein to humans, further studies on the identification and control of parasites on fish is highly recommended.

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