PREVALENCE OF INTERNAL HELMINTH PARASITES OF *Bagrus bayad* IN KAFINCHIRI DAM, KANO STATE, NIGERIA

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ABSTRACT
This study was conducted to determine the prevalence of the internal helminth parasites of Bagrus bayad in kafinchiri dam Kano State, Nigeria. A total of 130 samples were subjected to examination for internal helminths parasites, lengths and weights of the fishes were measured prior to dissection and parasites recovered were identified. Result indicates that sixty two of the fish examined were infected with various species of helminth, which includes nematoda 50.42%, cestoda 19.75%, trematoda 28.11%, monogenea 10.92% and acanthophela7.14%,it was observed that fishes with standard length range of 21-30 (46.64%) were more infected than those of 11-20 (33.19%), 31-40 (18.07) and 41-50 (2.10 %). The highest prevalence of infection (76.47%) was recorded in fishes with body weight of 100-499g.The female fish had the highest percentage prevalence 34.61% while the males had 13.07% prevalence. The result of the study indicate that the association ($p<0.05$) between the prevalence of infection, sex, length and weight of the host was not statistically significant. In conclusion individuals with habit of consuming raw or partially cooked fish are at higher risk of becoming infected by Zoonotic parasites. Therefore awareness and control activities should be conducted in and around the reservoir.

Keywords*:* Helminths, Bagrus bayad,internal parasites,Dam,Infection

INTRODUCTION

Fish provides a comparatively cheap source of animal protein for man and his livestock and attention is now being focused on fish production, both from natural water and aquaculture (Coche *et al*., 1994; Khalil and Polling, 1997; Komatsu and Kitanishi, 2015). Like humans and other animals, fishes suffer from various diseases and parasite infections (Bamidele, 2015). Parasitic diseases of fish are very common all over the world and are of particular importance in the tropics (Roberts &Janovy, 2009; Soliman and Nasr, 2015) due to the prevalent Zoonotic diseases affecting the populace in the tropics especially in areas where fish is eaten raw or partially cooked.Various parasites are associated with fishes in the wild and cultured environment where they cause morbidity, mortality and economic losses in aquaculture practice in various parts of the world (Subashinghe, 1995; Biu *et al*., 2013). There is an increasing awareness of the importance of parasitic diseases as one of the major detrimental factors in fish farming (Paperna, 1996; Keremah and Inko-Tariah, 2013).Fish parasite also causes fish disease and spoil the appearance of the fish thus resulting in consumer's rejection, parasitic diseases reduces fish production by affecting the normal physiology of the fish and if left unchecked could result to massive mortality or in some cases could serve as source of infection for humans and other vertebrates consuming them (Ayotunde *et al.*, 2007) Endoparasites increases the chances of parasites being in our food which in turn serves as a threat to human health. Economic loss due to fish parasite occurs not only from mortality but also through cost of treatments and growth reduction during and after outbreak of disease hence, a slow growth in aquaculture is the result. Identifying a parasite is sufficient to implement an effective therapeutic or prophylactic strategy for combating parasite infection (Paperna, 1980)

The Bagrid fishes are commonly known as naked catfishes. The bagrus has a maximum size of about 112 centimeters (44.1in). It has a maximum published weight of 12.5 kilogram mean sizes and weight of male are less than those of females from the same age. Males grow up to7years old, females8years .they are found in lakes, swamps and rivers. It avoids salt water. Adults are exclusively piscivorous; it preys on small fish, they also feed on insects, crustaceans, mollusk, and vegetable matter. Spawning season extends from April to July. The aim of the study is to determine the prevalence of internal parasite of *Bagrus bayad* by establishing the extent/magnitude of helminths infecting *Bagrus bayad* in kafinchiri dam Kano state. This will aid in identifying the most common genera infecting *Bagrus bayad* which will in turn lead to effective management method of curbing the rate and pace of parasite infection.

Study Area

The study was carried out at Kafin chiri Dam, Garko local government Kano State (total surface is 23, 154km^2). The Dam was constructed in 1974, and became active in 1977, with the water capacity of 31.1 million m^3 The Dam is located at Kafinchiri village about 5km south- east of Garko metropolis along Rano road, in Kano.

MATERIALS AND METHODS

Study design and sample size determination

The study was conducted from February 2018 to May 2018 at kafinchiri dam to determine and identify the prevalent helminths parasite on randomly selected *Bagrus bayad*.

Sample Collection

One hundred and thirty live and freshly killed specimens of *Bagrus bayad*of different sizes were bought from local fishermen at kafinchiri dam landing sites and were transported to the Department of Fisheries and Aquaculture Laboratory, Federal University Dutse. The Fish samples were collected once weekly directly from the landing site atkafinchiri dam over a three month period.

Length-weight measurement

The total lengths, standard lengths and body weights were measured using a meter rule and the weight of the fish was taken using a weighing scale. The sexes of the fishes were determined by visual examination of the urinogenital system.

Parasite identification

For the parasites survey, the fishes were dissected through the abdomen by making a longitudinal slit on the ventral surface from the anus to a point level with the pectoral fins using a surgical blade. The alimentary canals of the dissected fishes were grouped into Stomach and Intestine, and liver; they were taken out one after the other and placed into the Petri dishes containing 0.9% solution of NaCl. The external of each organ were examined by making a smear and placing it in a glass slide and then viewing it under the microscope, then using a pair of scissors, the organs were cut open and the mucus from the inner parts of those organs were scraped lightly using a scalpel.

The mucus where then smeared and added with a drop of saline water on the glass slide and then observed under the microscope, the same procedure where carried out for all other organ. The parasites were identified using the identification guideline as earlier described by Modu (2014) and Paperna *et al.*, (1998)

Data Analysis

The data collected from the study area was analyzed using SPSS. Descriptive statistics was applied for the analysis of the data obtained. For all statistical analysis, a significant level (p-value) of less than 0.5 was considered.

RESULTS

A total of 130 *Bagrus bayad* were examined out of which 44(33.85%) were males and 86(66.15%) were females. The total number of parasites, percentage infection, prevalence and sites of infection is shown in Table 1. A total of 238 helminthes parasites belonging to five classes, the Cestoda, Nematoda and Trematoda, Acanthophela and monogenea were recovered from the stomach, liver, gills, and intestine respectively. The highest number of parasites was recovered from the intestine (149 parasites). This was followed by the stomach with 51 parasites followed by the gills with 26 parasites, and the least is the liver with 12 parasites. Thirty five fishes were infected with nematoda with a prevalence rate of 26.92%, eighteen fishes were infected with cestoda with a prevalence rate 13.84%, eight fishes were infected by the trematoda with the prevalence of 6.15%, six fishes were affected with acanthophela with the prevalence of 4.62%, while the monogenea infected ten fishes with the prevalence of 7.69%. The rate of infection of *Bagrus bayad* with parasites in relation to their standard length is presented in Table 2. Fishes with standard length between 21-30cm had the highest parasites load of 111(46.64%) with a prevalence of 19.23% and mean intensity of 4.44. This was followed by fishes of length range of between 11-20cm having a parasites load of 79(33.19%) with a prevalence rate of 18.46% as well as mean intensity of 3.29, followed by fishes within the length range between31-40 having a parasite load of 43(18.07%) with the prevalence rate 9.23% with the mean intensity of 3.58 , these was also followed by fishes with length range of 41-50 cm having a parasites load of 5(2.10%) with a prevalence rate of 0.76% as well as mean intensity of 5.10, The least was fishes within the range of 41-50cm with a parasites load of 5 representing 2.10% of the total parasites recovered with a prevalence rate of 0.76%. While those within the range of 51-60cm were not infected. The rate of infection in relation to body weight of fish with helminthes parasites is shown in Table 3.The fish with body weight range of between 1300-1699g considered as adult fish had no parasitic infection. Juvenile with body weight range between 0-99g was infected with a total of 26(10.92%) parasites and an intensity of 2.6. The highest infection of 182(76.47%) parasites was recorded in the adult fish with body weight range of 100-499g with an intensity of 4.04. Fishes with body weight of 500-899g were infected with 25(10.50%) parasites with intensity of 4.17. While, fishes with body weight range of 1700-2099g had the least infection of 5(2.10%) parasites and intensity of 5.00. The relationship between sex and rate of infection is shown in Table 4. Out of 130 fishes examined 44(33.85%) and 86(66.15%) were males and females respectively. Seventeen males were infected representing 38.64% of the total males sampled with a prevalence rate of 13.07% and mean intensity of 3.82. While, 45(52.33%) females fish were infected with a prevalence of 34.61% with an intensity of 3.84 throughout the study period.

Table 1: Prevalence of internal helminths parasite of *Bagrusbayad* in Kafinchiri dam.

Parasite	Number of fish infected	Prevalence%	Locations of parasite				Total number of parasite recovered
			stomach	liver	gills	Intestine	
Nematoda	35	26.92	32	0	0	88	120(50.42)
Procamallanuslaevionchus)	11	8.46	14			21	
Rhabdochonacongolensis	24	18.46	18			67	
Cestoda	18	13.85	19	0	0	28	47 (19.75)
Polyonchobothriumclariae	12	9.23	11			17	
Diphyllobothriumdendritium	6	4.61	8			11	
Trematoda	8	6.15	0	12	0	16	28 (11.76)
Heterophynusspp	8						
Acanthophela	6	4.62	0	0	0	17	17 (7.14)
Echinorhynchustruttae	6						
Monogenea	10	7.69	0	0	26	0	26 (10.92)
Gyroductylus	7	5.38			18		
Dactylus	3	2.30			8		
Total	**77**	**59.22**	**51**	**12**	**26**	**149**	**238**

Table 2: Rate of infection of *Bagrusbayad* with helminths in relation to standard length

Standard length(cm)	Number of fish examined	Number of fish infected	Total number of parasite recovered	prevalence%	Mean intensity of infected fish
1-10	0	0	0	0	0
11-20	59(45.38)	24(40.68)	79(33.19%)	18.46	3.29
21-30	49(37.69)	25(51.02)	111(46.64%)	19.23	4.44
31-40	20(15.38)	12(60.00)	43(18.07%)	9.23	3.58
41-50	1(0.77)	1(100.00)	5(2.10%)	0.76	5.00
51-60	1(0.77)	0	0	0	0.00
Total	**130**	**62**	**238**	**47.68**	**16.31**

Table 3: Helminths infection in relation to body weight in *Bagrus bayad* in Kafinchiri dam.

Body weight (g)	Number of fish examined	Number of fish infected	Total number of parasite recovered	Intensity
0-99	34(26.12)	10(29.41)	26(10.92%)	2.6
100-499	79(60.77)	45(56.96)	182(76.47%)	4.04
500-899	15(11.54)	6(40.00)	25(10.50%)	4.17
900-1299	0	0	0	0
1300-1699	1(0.77)	0	0	0
1700-2099	1(0.77)	1(100)	5(2.10%)	5.00
Total	**130**	**62**	**238**	**15.81**

Table 4: Sex specific rate of internal Helminthes infection in *Bagrusbayad*from Kafinchiri dam.

Sex	Number of fish examined	Number of fish infected	Total number of parasite recovered	Prevalence %	Intensity
Male	44(33.85%)	17(38.64%)	65	13.07	3.82
Female	86(66.15%)	45(52.33%)	173	34.61	3.84
Total	**130**	**62**	**238**	**47.68**	**7.66**

Table 5: Relationship between weight and number of parasites

Variable	r - value	P – value	Decision
Weight vs cestoda	0.072	0.416	NS
Weight vs Nematoda	0.211	0.016	S
Weight vs trematoda	0.028	0.750	NS
Weight vs monogenea	0.042	0.634	NS
Weight vs Acanthophela	0.053	0.547	NS

NS = It's not significant when P > 0. 05, S = It's significant when P < 0. 05

Table 6: Relationship between standard length of fish and number of parasites

Variables	V – value	P – value	Decision
Standard length vsCestoda	0.069	0.439	NS
Standard length vsNematoda	0.023	0. 794	NS
Standard length vsTrematoda	0.065	0.461	NS
Standard length vsMonogenea	0.19	0.030	S
Standard length vsAcanthophela	0.064	0.467	N

NS = It's not significant when P > 0. 05 S = It's significant when P < 0.05

DISCUSSION

The result of this work revealed that helminth parasites are prevalent in the *Bagrus bayad* sampled in kafinchiri dam, kano state. A prevalence rate of 47.68% parasitic infestation was observed in the present study. The higher prevalence of nematodes (26.92%) than cestode (13.84%) and trematodes (6.15%) revealed that nematodes were the commonest parasites of *Bagrus bayad*in kafinchiri. The result showed a prevalence of 13.07% for the male whereas the female was 34.61%. This is in conformity with other researchers, Dankishiya and Zakari (2007) identified the Cestodes, Nematode and Trematode, in wild *C. gariepinus* in Gwagwalada. Onwuliri and Mgbemena (1987), Oniye and Annune (1993) found the trematode (*Euclinostomum* spp.) in the intestine and digestive tracts of *Clarias gariepinus*. There was a statistical significant difference in the prevalence of helminth parasite infection in the sexes of fishes. It was also observed from the study that fishes of standard length range of 21-30cm (56.64%) were more infected than those with length of 31-40cm (18.07%) and longer fishes of 41-50cm (0.76%). The prevalence of infection was higher in short fishes than in long fishes. Akinsanya *et al*., (2007) attributed this to the random selection and low level of immunity in the small sized fish. Factors such as contaminated water and availability of the intermediate host harbouring the infective larval stage, predisposes both sexes to risk of acquiring the infection while feeding. Onwuliri and Mgbemena (1987) reported a prevalence of 63.00% in wild population of *C. gariepinus* while Oniye *et al*., (2004), reported a prevalence of 19.17% in Zaria, Kaduna State.

Difference in the prevalence of parasites in fish may be due to many factors. Williams and Jones (1994) suggested that parasitism differs in various aquatic ecosystems and this is determined by the interaction between biotic and abiotic factors. Fish species in good environmental conditions rarely come down with diseases (Oswald and Hulse, 1992). Reports have shown that helminths are generally found in all freshwater fishes, with their prevalence and intensity dependent on factors of parasite species and their biology, host and its feeding habits, physical factors and hygiene of the water body, and presence of intermediate hosts where necessary (Doreen *et al*., 2009; Shukerova *et al*., 2010; Hussen *et al*., 2012).

CONCLUSION

The present study shows the prevalence of internal helminths with heavy parasitic burden in *Bagrus bayad* in kafinchiri dam Kano state, this research also proves that nematoda is the most

prevalent parasite infecting Bagrus bayad in kafin chiri dam.

it is therefore recommended that, this present study serves as a baseline for further studies and the need for more research that is dedicated to clearly mapping out the prevalence, intensities and distribution of internal helminths in the fish of our local water bodies, Appropriate and ideal control measures should be formulated and put in place in the Lake so as to avoid infection of the fish; and the public should be sensitized through public awareness creation on the activities and zoonotic nature of fish parasites and the danger of consuming raw or undercooked fish

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