Available online at www.elixirpublishers.com (Elixir International Journal)

Applied Biology

Elixir Appl. Biology 65 (2013) 19982-19984

ISSN: 2229-712X

Intestinal parasites of *Synodontis clarias* from river dukku, North West Nigeria

Obaroh, I. O*, Danladi, Y. K Attah, D. D and Dauda, N

Department of Biological Sciences, Kebbi State University of Science and Technology Aliero, Nigeria.

ARTICLE INFO

Article history:

Received: 2 October 2013;

Received in revised form:

2 December 2013;

Accepted: 12 December 2013;

Keywords

Helminthes,
Infection,
Parasites,
River,
Prevalence.

ABSTRACT

The role of parasites in aquatic ecology and in fish culture can not be overemphasized. Increase number of parasites could affect health, growth and maturation of fish. Intestinal parasites in *Synodontis clarias* from River Dukku was investigated, a total of 200 fresh samples were randomly selected from the fish landing sites. They were immediately transported to the laboratory in an ice chest. Fishes were divided into three groups according to their sizes, their sexes were noted before they were subjected to parasitological examination. *S. clarias* was observed to have an overall infection of 68 %. Female fish species were observed to be more significantly ($p<0.05$) infected when compared with the male fish species. Fishes with the highest total weight value of 8.60-10.90 g were observed to have the highest prevalence rate of 75 % with a significant difference ($p<0.05$) when compared to the other groups. With respect to the number of parasite observed class Trematoda had the highest number of parasites, while class Cestoda was observed to be the least. This study infers that there is high prevalence of intestinal parasites in *S. clarias* captured from Dukku River.

Introduction

Consumption and demand for fish protein is on the increase this is because fish is cheap and widely acceptable, it has no religion or ethical barrier. Fish in the wild are constantly exposed to parasites which adversely affects their health, hygiene, growth and, maturation and metabolic pool (Paperna, 1996). Good quality fish most often are affected by parasitic diseases. African freshwater fishes had been reported to be infected with variety of adult helminth parasites these include; monogenean, digenean, cestodes, nematodes, acanthocephalans and aspidogastrean (Khalil and Polling 1997). Parasites usually do not kill their hosts, most often they become of biological and economical importance when they severely stress fish population or causes mortality. Fish are wakened by parasites as a result of their activity in the tissues, blood and cellular fluid and as a result of feeding on nutrient supply of the host, thus reducing their production by affecting the normal physiological functioning of the fish. Klinger and Floyd (2009) reported that pathological state of the fish as a result of parasitic infections by intestinal parasites usually leads to sever consequences particularly the nutritive devaluation of the fish. In Nigeria there has been some report on the prevalence of intestinal parasites in some fresh water fishes (Nmor *et al*., 2004; Akinsanya and Otunbanjo, 2006; Edema *et al*., 2008; Ogbeibu and Arazu 2009; Onyedineke *et al*., 2010) but no documented information on intestinal parasites of *S. clarias* from Dukku River. *Synodontis clarias* belongs to the family Mochokidae and has as African origin. *Synodontis clarias* is easily recognized by its distinct colour pattern and long dorsal spine. They are of average size reaching about 15 cm in standard length, they posses a strong bony cranium and a stout (Skelton and White 1990). *S. clarias* are bottom dwellers they sometimes swim upside down and communicate through electric and acoustic signals (Jubb, 1967). The genus *Synodontis clarias* has been reported by Holden and Reed (1972) to be the most abundance of the family Mochokidae. *S. clarias* is one of the most captured fish species in Dukku river, thus the need for this study.

Materials and methods

Sampling Area

Dukku River is situated in Birnin Kebbi, Kebbi State north western Nigeria, this river system is a dominant geographical feature in the state capital, and covering an area of 457.92 km^2 it flows east ward to Yauri where it joins Kainji River in Niger State. Dukku River play significant role in the history, culture and economic activities of the state, most towns and villages in the state capital are situated near the river system. The river serves as source of water for man, animals as well as for irrigation during the dry season. Birnin Kebbi is situated on latitude 10° 8' N and longitude 13° 15' N (www.wikipedia.com).

Sample Collection and Morphometric Measurement

Fresh fish samples were bought from the various fish landing sites along the river bank between the months of July – September 2012. The fish were caught by local fishermen using gill nets, and they were immediately transported to the laboratory. Identification of the fish was done according to Reed *et al*. (1967). Morphometric measurements (weight, total and standard length) of the fish samples were taken and recorded.

Sample Preparation and Identification of Parasites

Immediately fish samples were brought into the laboratory and morphometric measurement taken, they were decapitated and dissected from the anus to exposed the alimentary canal, the alimentary canals were removed and slit open to expose the intestinal content which were collected in petri dishes containing physiological saline. The wriggling helminth parasites were collected and counted. Detail examination and identification of the intestinal parasites were made using a light microscope (x4 and x10). Photomicrograph impressions were taken using a mounted digital camera, parasites were further grouped into classes by using the identification keys of Paperna (1996); Klinger and Floyed (2009). Chi square test was used to test for associations between the sexes, groups and parasite loads.

Tele: 2348036806479
E-mail addresses: obarohio@gmail.com

Results

Table 1 shows the morphometric measurement of *S. clarias*, the mean weight of the male fish species used for this study was 7.62±2.08 g, while the female was 8.61±1.39 g. A total of 49 male fish species out of 80 were infected with helminthes, while a total of 87 female fish species out of 120 were infected with helminthes, 68 % of fish samples examined were infected (Table 2). The prevalence of helminthes intestinal parasites with regard to body weight was observed to be high (75%) in the group of fish species with the highest body mean weight (8.60-10.90 g), while the least (64.29 %) was observed in the group of fish species with the lowest body mean weight (5.00 – 7.50 g) as shown in Table 3. Class Trematoda was the most prevalent intestinal helminth parasites, while class Nematoda was observed to be the least (Table 4). Statistical analysis showed significant difference ($p \leq 0.05$) when the number examined was compared with the number infected in each sex.

Table 1: Morphometric Measurement of *Synodontis clarias*

	Weight (g)		Total length (cm)		Standard length (cm)	
Sex	Range	Mean	Range	Mean	Range	Mean
Male	5.00-10.20	7.62±2.08	7.00-15.00	11.33±2.95	5.00-15.00	9.00±4.68
Female	7.70-10.90	8.61±1.39	10.00-26.00	16.25±6.74	5.00-18.00	10.30±5.22

Table 2: Prevalence of helminthes intestinal parasites in relation to sex

Sex	Number examined	Number infected	% infection	P-value
Male	80	49	61.25	0.005
Female	120	87	72.50	0.0001
Combined sex	200	136	68.00	

Table 3: Prevalence of helminth intestinal parasites in relation to the body weight

Body weight	Number Examined	Number Infected	% Infection
5.00-7.50	98	63	64.29
7.60-8.50	62	43	69.35
8.60-10.90	40	30	75.00

Table 4: Species of parasite observed in *S. clarias*

Class	Parasitic Intensity	Species
Nematoda	108±20.24	Camallanus spp, Camallanus spp, Spirocamillanus spp
Cestoda	36.50±5.25	Pterobothrium spp, Cephalobothrium spp, Polyonchlobotrium spp,
Trematoda	120±25.75	Acanthocolpus spp, Lecithocladium spp,, Clonorchi

Discussion

High prevalence of intestinal parasites was observed in both male and female *Synodontis clarias* this could be as a result of the early rainy season period during which this study was conducted, similar observation were made by Morenikeji and Adepeju (2009) and Ibiwoye *et al.* (2004) who reported that in the early rainy season, fishes are more susceptible to heavy infestation with parasites. Female fish species were observed to be highly infested with the intestinal parasites than the male fish species, this could be as a result of the hormonal changes in female fish species during breeding which occur most often during the rainy season. It has been reported that abundance of parasites are significantly influence by the sex and species of the fish species in favour of the female fish species (Thomas 2002; Ibiwoye *et al*., 2004) but in contrast Akinsanya *et al*. (2007) observed male to be higher than the female fish species studied. Larger fish species were observed to be more infected than the smaller size.

High prevalence of intestinal parasite recorded could also be as a result of some factors such as abundance of the intermediary host, availability of the host parasites and pollution as a result of human activities. Copepods an intermediary host of some parasites have been reported to be a major food constituent of the family Synodontis spp (Owolabi 2008). No alteration was observed in internal organs as a result of the high parasitic infection observed in *Synodontis clarias* from Dukku River.

Conclusion

The high prevalence of intestinal parasite observed in *S. clarias* from Dukku River could be as a result of abundance of intermediary host and possibly high organic content of the water body due to the high anthropogenic activities observed along the river bank, it could also be attributed to the rainy season during which the fish samples were collected. Although no physiological changes both in the external and internal structures of the fish species examined, there is need for further assessment of fish parasites from this river in order to put in place appropriate policy to check mate damages on fishes and human that could result from high occurrence of parasites in the wild.

References

Akinsanya, B. and Otunbanjo, O. A. (2006). Helminth parasites of *Clarias gariepinus* (Clariidae) in Lekki Lagoon, Lagos, Nigeria. *Rev. Biol. Trop*. 54: 93-99.

Akinsanya, B., Hassan, A. A. and Otunbanjo, O. A. (2007). A comparative study of the parasitic helminth fauna of *Gymnarchus niloticus* (Gymnarghidae) and *Heterotis niloticus* (Osteoglossidae) from Lekki Lagoon Lagos, Nigeria. *Pakistan Journal of Biological Sciences*. 10(3): 427-432.

Edema, C. U., Okaka, C. E., Oboh, I. P. and Okogub, B. O. (2008). A preliminary study of parasitic infections of some fishes feom Okuo River, Benin City, Nigeria. *Int. Journal of Biomedical and Health Sciences.* 4(3): 107-112.

Holden, C. and Reed, W. (1972). West African freshwater fish. Longman Group Ltd. Pp 67.

Jubb, R. A. (1967). Freshwater Fishes of Southern Africa. Ed A. A. balkema, Cape Town. Pp 248.

Khalil, C. F. and Polling, L. (1997). Checklist of the helminth of African freshwater fishes. University of the North Republic of South Africa, South Africa. Pp 161.

Klinger, R. and Floyed, R. F. (2009). Introduction to Freshwater Fish parasites. IFAS Extension, University of Florida. Pp 14. Available on http://edis.ifas.ufl.edu

Ibiwoye, T.I.I., Balogun, A.m., Ogunsusi, R.A. and Agbontale, J.J. (2004). Determination of theinfection densities of nematode *Eustrongylides* in mud fish Clarias gariepinus and Clarias angullaris from Bida flood plain of Nigeria. Journal of Applied Science and Environmental Management. 8(**2**):39 44.

Morenikeji, A.K and Adepeju, G.S (2009). Diurnal variations of physic-chemical factors and Planktonic organism in Jos Plateau (W. Africa) water reservoir. *Japanese Journal of Limnology*, 44 (**1**): 65-71.

Nmor, J. C., Egwunyenga, A. O. and Ake, J. E. G. (2004). Observation on the intestinal helminth parasites of Cichlids in the upper reaches of river Orogodo, A freshwater body in Delta

State. Southern Nigeria. *Tropical Freshwater Biology*. 12/13: 131-136.

Ogbeibu, A. E. and Arazu, V. N. (2009). Parasites of Clarias gariepinus obtained from culture and wild specimens of Onitsha urban stretch of River Niger, Anambra State, Nigeria. *Tropical Freshwater Biology*. 18(1): 15-26

Owolabi, O. O. (2008). The dietary habits of the upside-down catfish Synodontis membranaceus in Jeba Lake, Nigeria. Revista de Biologia. 52(2): 199-196

Paperna, I. (1996). Parasite infections and diseases of fishes in Africa- an update CIFA Technical Paper 31, pp 1-220.

Reed, W. (1967). Fish and Fisheries of Northern Nigeria. Published by Ministry of Agriculture, Northern Nigeria. Pp 44.

Skelton, P. H. and White, P. N. (1990). Two new species of Synodontis (Pices: Siluroidei, Mochokidae) from Southern Africa. *Ichthyol. Explor. Freshwater*. 1:277-287

Thomas, J.D. (2002). The ecology of fish parasites with particular reference to helminth parasites and their salmonid fish hosts in Welsh rivers: a review of some of the central questions. Adv. Parasitology. 52: 1-154.

www.wikipedia.com/birninkebbi.