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PREVALENCE OF GASTROINTESTINAL HELMINTH PARASITES OF *CLARIAS GARIEPINUS* AT RIVER GUDI, AKWANGA LOCAL GOVERNMENT AREA OF NASARAWA STATE, NIGERIA

K.V. Absalom[1], J.K. Makpo[2] A.J. Mustapha[2]

[1]Department of Zoology, University of Jos
[2]Department of Zoology, Nasarawa State University, Keffi.

ABSTRACT: *A total of 100 Clarias gariepinus (African Catfish) were purchased between April and June 2017 from Artisanal fishermen at River Gudi. Akwanga Local Government Area of Nasarawa State to determine the prevalence of gastrointestinal helminth parasites of Clarias gariepinus. The fish were subjected to parasitological study in Zoology Laboratory, Nasarawa State University Keffi.. Out of this 100 fish sample, 63 (63%) were infected and a total of 90 helminth parasites recovered. Three species of helminth parasites were isolated namely Camallanus (41%), Diphyllobothrium latum (29%) and Capillaria (20%).There is a significant different ($p>0.05$) in the infection rate of male and female fish. The highest fish organ infected was intestine (36%) follow by the stomach (33.3%), next was the oesophagus (23.3%) and finally Rectum (6.6%).There is a significant different in the gastrointestinal helminth parasites of Clarias gariepinus at different site of gastrointestinal tract ($P< 0.05$). The infection rate in relation to body length was highest 90.3% at 26- 30cm.There is a significant difference in the gastrointestinal helminth parasites of Clarias gariepinus in relation to body length ($p<0.05$) .Gastrointestinal helminth parasites probably capable of reducing the productivity of fish in River Gudi are hereby presented in the light of these findings.*

KEYWORDS: Helminth Parasites, Gastrointestinal, Clarias Gariepinus, River Gudi

INTRODUCTION

Fish is amongst the important sources of protein for humans and other animals in the tropics. According to Food and Agricultural Organization, (2003), fish accounts for more than 40% of the protein diet of two-thirds of the global population. Fish not only provides food for immediate

Consumption but people rely on fishing for economic gains and providing jobs. A well-processed fish product from the tropics has a ready market in developed countries and is therefore a good foreign earner (Imam and Dewu, 2010). Nigeria is among the largest fish consumers in the world with over 1.5million tonnes of fish consumed annually (Imam *etal.*, 2010).).

Parasitic diseases of fish are of particular importance in the tropics. Parasites usually exist in equilibrium with their host as a survival strategy. However, for instances where hosts are overcrowded such as in aquaria or in fish farms, parasitic diseases can spread very rapidly causing high mortality. Although, this is usually not the case in the wild natural aquatic environments, it occurs when the environment is disturbed by human activity and interference especially with populations which alter the natural distribution of their parasite communities (Imam *etal.*, 2010). Ayanda, (2009) reported Amonotaenia and Polyonchobothrium species of Cestodes; and Procamallanus species of nematodes and Neoechinorhynchus species of

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acanthocephalans in wild and cultured *Clariasgariepinus* in Ilorin, North central Nigeria; whileHussen,Tefara and Astrote, 2012) reported Capillaria, Contracaecum and Cestodes in Clarias gariepinus caught from Lake Hawassa, Ethiopia. As yet no epidemics of endoparasites have been reported in Nigeria, is likely that as fish culture becomes more intensive and widespread, fish parasites are likely to become a serious economic and health issues (Imam *etal.*, 2010).

MATERIALS AND METHOD

Study Area

This study was design to observe different types of parasites found in gastrointestinal tract of *clariasgariepinus* collected from River Gudi, Akwanga Local Government Area of Nasarawa State. Nasarawa State lies between latitude 7º 54' and 9º25' of the equator and between longitude 7º and 9º37. It shares boundaries with Kaduna State in the North, Plateau State in the East, Taraba and Benue in the South, while Kogi and Federal Capital Territory Abuja flank in the West. Being in the tropic the temperature of Nasarawa State is generally high (about 39$^{oc)}$

Collection of samples

A total of 100 Clarias *gariepinus* were purchased from Artisanal fishermen at River Gudi, Akwanga local government area of Nasarawa State. Between April and June, 2017.Samples were transported to Zoology Laboratory, Nasarawa State University, Keffi for parasitological analysis.

Sex identification and measurement of fish

The sex of the fish was determined by examination of the papillae which is long in males but rounded and redish in matured females.(Imam *etel*.,2010). In addition, the presence of gonads in males and ovaries in females comfirm their identity.The total length of each fish sample was obtained by placing the fish laterally on the dissecting board, using meter rule to measure from the mouth to the end of the tail, which is the total length while the standard length is from the tip of the mouth to the end of the caudal peduncle(Kariman, Shalloof, Hannan and Salama, 2008).Weight of each of the fish was determined using weighing balance and measured to the nearest 0.1 g (Biu and Arorede, 2013).

Examination of the Parasite

This was done according to **(Salawu *etal* 2013)** The fish were immobilized by cervical dislocation for easy handling prior to dissection on a dissecting board. The fish 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 gastrointestinal tract was isolated stretched out and grouped into Oesophagus, Stomach, Intestine and Rectum. Sections were place into four petri-dishes. Each section was slit longitudinal and washed with sodium chloride. The content of the various parts of the gastrointestinal tract was examined, using floatation and sedimentation techniques.(Kawe, Spower, Balarabe and Akaniru, 2016).

Statistical analysis

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Data obtained were analyzed using IBM SPSS version 16. Chi- square was used to calculate the prevalence of parasite in relation to different sites of gastrointestinal tract, sex and species abundance of *Clariasgariepinus* from River Gudi.

RESULTS

A total of 100 samples of C. gariepinus from River Gudi were investigated for helminth infection between April and June 2017. Out of this number, 63 (63%) were infected and a total of 90 parasites were recovered from the fish. Table 1 shows the prevalence of gastrointestinal helminthparasite of *Clarias gariepinus* in relation to sex. There are 63 male in the sample out of which 41 making 65.1% were discovered infected. 37 were females out of which 22 constituting 59.5% tend to be infected.

Table 2 shows the prevalence of gastrointestinal helminth parasite of *Clarias gariepinus* in relation to standard length. 50 fish with standard length between 20-25 were examined, out of which 22 tend to be infected making 44% among infected fish. 31 with standard length between 26-30 were examined and 28 were found to be infected making 90.3% among the infected. 9 with standard length between 31-35 were examined and 6 were found to be infected making 66.6% among infected. And 10 with standard length between 36-40 were examined and 7 were found to be infected making 70% among all the infected

Table 3 shows the prevalence of gastrointestinal helminth parasite of *Clarias gariepinus* in relation to site of gastrointestinal tract. There are four (4) gastrointestinal tracts – Oesophagus, Stomach, Intestine and Rectrum. 21 parasites of the Oesophagus were encountered making 23.3% of the total encountered. 30 of the stomach were encountered which constitute 33.3% of total encountered. 33 of the Intestine were encountered making 36.7% of the total encountered. And 6 of Rectrum were encountered making 6.6% among the total encountered.

Table 4 below shows the prevalence of gastrointestinal helminth parasite in *Clarias gariepinus* species specific. Out of 100 fish examine, three species of helminth comprising of two nematodes and one cestode were identified. The nematodes were *camallanus* 41(41%), *capillaria* 20 (20%). While the cestode was *Diphylobothrium latum* 29 (29%)

Table 1: Prevalence of gastrointestinal parasite of *Clarias gariepinus* in relation to sex

Sex	No examined	No. infected	percentage (%) infection
Male	63	41	65.1
Female	37	22	59.5
Total	**100**	**63**	**63%**

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Table 2: Prevalence of gastrointestinal helminth parasite of *Clarias gariepinus* in relation to standard length.

Body length (cm)	No examined	No infected	percentage (%) infection
20-25	50	22	44
26-30	31	28	90.3
31-35	9	6	66.6
36-45	10	7	70
Total	**100**	**63**	**63%**

Table 3: Prevalence of gastrointestinal helminth parasite of *Clarias gariepinus* in relation to site of gastrointestinal tract. (n= 100)

Gastrointestinal tract	No of parasites encountred	percentage (%)
. Oesophagus	21	23.3
Stomach	30	33.3
Intestine	33	36.7
Rectum	6	6.6
Total	90	90%

Where n is = number of the Fish sample

Table 4: Prevalence of gastrointestinal helminth parasite in *Clarias gariepinus* species specific *(*n=100)

Species identified	**taxonomic group**	**No of parasite**	**percentage (%) identified**
Cammallanus	Nematode	41	(41)
D.latum	Cestode	29	(29)
Capillaria	Nematode	20	(20)
Total		**90**	**90%**

D- Diphyllobothrium

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DISCUSSION

The presence of helminth parasites in 100 Clarias gariepinus (Catfish) from River Gudi was investigated and results showed that 63% were found infected by three (3) species of helminth parasites comprising of a two (2) Nematodes and one Cestode. The Nematodes were *Camallanus*, *Capillaria*, while the Cestode was *D. latum*.

Out of the helminth parasites recovered in C. *gariepinu* from River Gudi in this investigation, nematode had the highest occurrence in the intestine, followed by cestodes. This finding is in consonance with earliar reported work of (Abdel- Gaber *etal.*,2015).While cestodes parasites showed maximum prevalence in the intestine. In addition, (Eyo and Iyayi, 2000) observed that the higher infection of C. *gariepinus* by cestode parasites could be due to injestion of eggs, copepods and mulluscs(which serve as intermediate hosts of the larva stages of cestodes).

The recovery of such a high percentage of cestodes and nematodes in this study could equally have serious physiological consequences with regards to the absorption of food nutrients in the fish intestine. (Biu,Diyaware, Yakaka and Rita, 2014) stated that Cestodes and Nematodes could interfare with food intake.

This study has higher infection rates in large fish greater than 26cm as compared to the small fish, This finding comfirms the work of (Bichi and Dawaki, 2000) who observed that the condition of infection was age factor. These investigations argued that the higher infection rates in adult than the young may be due to the longer duration of time the older fish were exposed to agent of infection in the environment. To substantiate this (Robert, 2000) reported that larger fish show greater surface area for infection than younger ones: Oniye *et* al (2004), revealed that no parasitic infection of juveniles but higher in adult fish due to change in diet during adulthood, while (Bichi and Dawaki, 2000) stated that increase in the abundance of parasites is associated with host size.

The helminth parasites of this study were showed highest in the intestine (36.7%) and Stomach (33.3%) follow by Oesophagus (23.3%) while the rectum recorded the lowest (6.6%). This is in contrast with the findings of (Owolabi *etal*., 2008) who reported that the Oesophagus recorded the lowest endoparasitic helminths of Catfish.

Base on the findings from this study, *Clariasgariepinus* with prevalence of (65.1%) in male and (59.1%) in female shows that there is probably a shift in choice of food containing these parasites. This agrees with the study of Anambra River by Nwani *etal*., (2008) who reported that the mean abundance as well as prevalence of helminth was generally higher in male than female. This also agrees with that of Morenikeji and Adepuju, (2009) that males had higher percentage of parasitic infection than the female in polluted and unpolluted stations they also observed that the differences in parasitic infection and the sex of the fish hosts is not statistically significant ($p > 0.05$) and contrary to the study of Emere and Egwe, (2006) who reported that due to physiological state of the female, most gravid females could have a reduced resistance to parasitic infection by parasites. Emere (2006), observed that difference in the incidence of infestation between male and female fish may be due to differential feeding either by quantity or quality of food eaten or as a result of different degrees of resisstance to infection.

This study has also showed that, these gastrointestinal helminth parasite found in *Clariasgariepinus* from River Gudi could possibly cause zoonotic disease. Angera,(2008) noted that tapeworm which occur in fish can infect people and other fish- eating mammals if

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they swallowed living larvae by ingesting raw meat or insufficiently cooked meat as found in roasted beef.He also stated that tapeworm may live in the intestinal tract for several years and eggs and tapeworm segments (proglottids) can be found in human feaces.

CONCLUSION

Endoparasites especially the gastrointestinal parasites are among the important problems militating against fish production, because they have an indirect or sometimes direct effect on the productivity of fish from the wild and on human health.

Since most of the fry and fingerlings used for stocking of ponds are obtained from the wild it is most likely that they are exposed to different types of parasites, and there is no reason to doubt that the same parasites will not occur in culture fish, probably at high prevalence due to high stocking intensity.

The risk of infection with fish- borne parasites also presents a potential threat to the health of human consumers. Parasites like tapeworm species that occur in fish can infect people and other fish eating mammals if they swallow living larvae by ingesting raw meat or insufficiently cooked meat as in roasted beef (Hilderbrand *et* al., 2003 and Angera, 2008. As a result of this, an understanding of endoparasites in the wild (River Gudi) is essentially in order to find ways of avoiding zoonosis and excess loss in intensive aquaculture since it serves as a basis for information on the potential risk of disease expected under intensive aquaculture.

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