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Prevalence of Common Protozoan Parasites of African Catfish, *Clarias Gariepinus* (Burchell,1822) From Three Selected Fish Ponds In Ibadan North Local Government Area, Oyo State, Nigeria

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Abstract: *This study was carried out to identify common protozoan parasites associated with African catfish (Clarias gariepinus) from three different cultured ponds. All the fish parts from the three selected ponds in Ibadan North Local Government Area were infected with protozoan parasites. A total of forty five (45) Catfish (Clarias gariepinus) were examined for protozoan parasites infestation from three different ponds in Ibadan North Local Government Area of Oyo state. The parts of the fish that were examined are gills, skin, intestine and fins. In all, 6 different protozoan parasites were isolated from the fish samples examined. These were Ichthyobodo spp., Ichthyophthirius multifilis, Trichodina spp., Ambiphyta spp., Crytobian iubilans and Chilodonella spp. Ichthyobodo spp. and Ichthyophthirius multifilis were the most common protozoan parasites found in Pond A with each having a prevalence of 23.08%. Ichthyophthirius multifilis (23.08%) was the most common protozoan parasite found in Pond B. Similarly, Ichthyophthirius multifil,s (31.75%) Trichodina spp (20.63%) and Crytobian lubilans (19.05%) were the most common protozoan parasites found in fish in Pond C. Among the body parts of the sampled fishes in pond A, the gills had the highest percentage of parasites load 37(56.92%). However, in pond B, the fins of the catfish had the highest percentage of parasite load 20(30.77%). While In pond C, the skin had the highest percentage of parasite load 22(34.92%). Among the parasites found on the sampled fishes in pond A, Icthyobodo spp and. Ichthyophthirius multifilis had the highest abundance of the parasites (23.08%). In pond B, Ichthyobodo spp had the highest abundance of the parasites (23.08%) while in pond C, Ichthyophthirius multifilis had the highest abundance of the parasites (31.75%). Based on the results of the study it can be concluded that there is high prevalence of protozoan parasites in the study areas, therefore, adequate care should be taken in management of aquaculture.*

Keyword: *Protozoan, Parasites, Clarias gariepinus, fish pond, African.*

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I. Introduction

Fish is important to human populace in trade and economy; it is of importance in the diet of different countries especially in the tropics and subtropics where malnutrition is a major problem (Alume and Andrew, 1996). Fish are abundant in most bodies of water. They can be found in nearly all aquatic environments, from high mountain streams to the abyssal and even hadal depths of the deepest oceans (Bertucci *et al*., 2014). With 33,600 described species, fish exhibit greater species diversity than any other group of vertebrates (Fish base, 2017). Catfish are of considerable commercial importance; many of the larger species are farmed or fished for food ((Nelson and Joseph, 2006).

In recent times, there has been tremendous increase in the development of fish farming and culture attributable to the increased need for affordable animal protein especially in the tropics (Davies *et al*., 2006), therefore, catfishes of the family Clariidae are increasingly being used for fresh water aquaculture in Africa owing to several favourable cultural characteristics (Obiekezie and Ekanem, 1995). Parasitic infection and diseases are some of the factors hindering high productivity in fish farming (Kayis *et al*., 2009).

However protozoans are a vast assemblage of eukaryotic organisms and that most of the commonly encountered fish parasites are protozoans, which with practice, are the easiest to identify and control ((Panno, 2014; Bertrand *et al*., 2015). In general, protozoans are one of the major sectors of fish parasites that have been long neglected because of its inherent difficulty in studying compared to other larger parasites. Among protozoans, ecto and endoparasites occupy a very important sector as one of the hazardous threats to fish health. These parasites attack the fish, causing massive destruction of skin and gill epithelium. Even moderate infection

of these organisms on small fish may prove a fatal disease, since the infection may cause the fish to stop feeding (Enayat, 2011).

Parasites of fish can either be external or internal. Parasitic infections often give an indication of the quality of water, since parasites generally increase in abundance and diversity in more polluted waters (Avenant-Oldewage, 2002). Parasites are capable of causing harm to fish host notwithstanding the species, either through injury to the tissues or organs in the process of burrowing or consuming food or the removal of digested food in the gut of the fish as well as the secretion of proteolysis enzymes (Omeji *et al*., 2011).

Protozoan parasites cause serious losses in fishponds in Nigeria and their lesions render the fish unmarketable. Fish carrying protozoan parasites are capable of passing on the infective disease to man after its consumption (Omeji *et al*., 2011).

II. Research methodology

Description of the Study Site

Three private fish farms were surveyed for parasites. The farms were located in Agbowo, U. I., of Ibadan North Local Government Area.

Sample Collection/Preparation

Forty-five (45) live or freshly caught freshwater specimens of Catfish, *Clarias gariepinus* were collected with both sexes present, the fish total length ranged from 6 to 45cm and weight was from <1 to 150g. Smear from the fish parts examined was made by scrapping the mucus from the skin for ectoparasites. All the individual parasites observed were counted, fixed and sent to the department of Veterinary Medicine, University of Ibadan, Nigeria, for identification. The necropsy technique of parasitological examination of skin, fin, and gills was carried out for the presence of external parasites as suggested by catfishes Langton and Jones (2006). However, for endoparasites, the fish was immobilized to prevent it from struggling during dissection, and placed on dissection board. The fish was dissected for access to some selected organs that were examined such as the stomach/intestine. The organs were carefully sectioned into portions and each portion cut open, washed in petri dish with 0.1% sodium chloride solution and rinsed with 0.1% sodium bicarbonate to enhance parasite search (Paperna, 1996; Marcogliese, 2011). Each drop of the residue or smear was placed on the slide, stained with Giemsa stain and viewed under the microscope using X10 and X40 objective lens. The observed parasites were compared with the keys of fresh water fish parasites pictorial guide by Deborah *et al*, (2005) for identification.

Statistical Analysis

Simple descriptive statistical tool was used to analyse the data with aid of excel 2013.

III. Results and Discussions

Table 1 shows the protozoan parasites and their location in *C. gariepinus* from three (3) different cultured environments (ponds)

All the fish parts from the 3 selected ponds were infected with protozoan parasites. Among the parasites found on the parts of the sampled fishes in pond A, it was observed that the gill had the highest percentage of parasite infection 46.67% while the skin, stomach and fins accounted for 33.33%, 13.33%, and 6.66%, respectively. This is similar to the observation of Omeji *et al*., (2011), who also reported highest parasite load in the gills. The difference can be attributed to the fact that gills are the sight of gaseous exchange (Emere, 2006).

However, it was also observed in pond B, that the skin and gills had the highest percentage of parasite infection (33.33%), followed by fins (20.01%) and then the stomach (13.33%). This observation agrees with the reported work of Emere and Egbe, (2006), who reported highest load of protozoan parasites in the gills of *Synodontis clarias* and Nyaku *et al*., (2007) who also reported highest load of protozoan parasite in the gill of *Auchenoglanis ocidentalis*, *Oreochromis niloticus*, and *Bagrus bayad* in River Benue.

In pond C, it was observed that the fins have the highest percentage protozoan parasite infestation (40.00%) followed by skin (26.67%), gill (20.00%) and stomach (13.33%). Emere and Egbe, (2006) had reported the infection of the skin, fin and gills of fish that was infected by these protozoan parasites.

TABLE 1:- Protozoan parasites and their location in *C. gariepinus* from three(3) different cultured environment (ponds)

Pond	Protozoan parasite	No of fish Inf. By each parasite	Location of parasite	Parasite Infection per location (%)	Total parasite load in each location	Parasite load in each location (%)
A	Ichthyobodo sp	3	Gills		15	
	Trichodina sp	2	Gils	7(46.67)	12	37(56.92)
	I. multifilis	2	Gills		10	
	I. multifilis	2	Skin	5 (33.33)	5	17(26.15)
	Chilodonella sp	3	Skin		12	
	Cryptobian lubilans	2	Stomach/ intestine	2(13.33)	9	9(13.84)
	Ambiphyta sp	1	Fins	1(6.67)	2	2(3.07)
B	I. multifilis	3	Skin		10	
	Chilodonella sp	2	Skin	5(33.33)	8	18(27.69)
	Trichodina sp	1	Fins		10	
	Ambiphyta sp	2	Fins	3(20.01)	10	20(30.77)
	Cryptobian lubilans	2	Stomach/ intestine	2(13.33)	12	12(18.46)
	Ichthyobodo sp	5	Gills	5(33.33)	15	15(23.08)
C	I. multifilis	2	Skin		12	
	Chilodonella sp	2	Skin	4(26.67)	10	22(34.92)
	Trichodina sp	3	Fins		13	
	Ambiphyta sp	3	Fins	6(40.00)	8	21(33.33)
	I. multifilis	3	Gill	3(20.00)	8	8(12.70)
	Cryptobian lubilans	2	Stomach/ intestine	2(13.33)	12	12(19.05)

Keys- I = ichthyophthirius
sp = species
% = percentage
No = number
C. = Clarias
Inf.= infected

The Results of the percentage abundance of protozoan parasite of *Clarias gariepinus* from the three ponds used the study are as shown in Table 2.

Among the parasites found on the parts of the sampled fishes in pond A, *Ichthyobodo spp* and *I. multifilis* were the most abundant (23.08%) followed by *Trichodina spp*. and *Chilodonella spp* each recording 18.46% prevalence, *Crytobian iubilans* (13.85%) and then *Ambiphyta spp* (3.08%).

Similarly, in pond B, *Ichthyobodo spp*. was the most abundant (23.08%) followed by *Crytobian iubilans* (18.46%), *I. multifillis, Ambiphyta spp*. and *Trichodina spp*. have the same value (15.38%) and lastly *Chilodonella spp* (12.31%).

However, in pond C, *I. multifilis* was the most abundant (31.75%), followed by *Trichodina spp* (20.63%) then, *Cryptobian iubilans* (19.05%), *Chilodonella spp* (15.87%) and *Ambiphyta spp* (12.70%). *Ichthyophthirius multifilis* caused erosion of the epithelium and thickening of the gills, this could be attributed to inflammatory processes which occurred during infection with this parasitic ciliate as described by Sigh *et al.* (2004). Infection with *Trichodina* spp caused removal of the epithellium and excess mucus production so that the fin and gills of infected fishes is covered with layer of mucus (Obiekezie and Ekanem, 1995).

Table 2: Protozoan parasites and their percentage abundance in the three ponds

PONDS	PARASITES	PERCENTAGE ABUNDANCE (%)
A	*Ichthyobodo spp*	23.08
	I. multifiliis	23.08
	Trichodina spp	18.46
	Chilodonella	18.46
	Crytobian lubilans	13.85

	Ambiphyta spp	3.08
B	*Ichthyobodo spp*	23.08
	I. multifiliis	15.38
	Trichodina spp	15.38
	Chilodonella	12.31
	Crytobian lubilans	18.46
	Ambiphyta spp	15.38
C	*I. multifiliis*	31.75
	Trichodina spp	20.63
	Chilodonella	15.87
	Crytobian lubilans	19.05
	Ambiphyta spp	12.70

IV. Conclusion and Recommendation

The common protozoan parasites found in fish sampled from the three selected ponds were *Ichthyophthirius multifilis spp, Ambiphyta spp, Chilodonella spp, Cryptobian iubilans spp, Trichodina spp and Ichthyobodo spp.* The study showed high prevalence of common protozoan parasites in the study areas with ponds A and B having equal parasite load which was slightly higher than that of pond C. This could be as a result of higher nutrient load (more fertilized) pond area. Therefore the presence of these parasites might elicit some pathological effect on the fishes by reducing their growth performance, and even death. Fish parasitism constitutes a major threat to productivity; therefore adequate care should be taken in management of aquaculture because this is where the infections spread without any noticed as a result of poor handling condition. However *Clarias gariepinus* should be thoroughly cooked before consumption.

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