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PARASITIC INCIDENCE IN CULTURED *Clarias gariepinus*

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ABSTRACT

A sample of 27 fish was collected from the fish breeding centre of the Ministry of Agriculture and Natural Resources. Agodi, Ibadan. This sample was examined for parasitic incidence and the results showed 77.7 % parasitic prevalence while infection was not sex dependent (P > 0.05). Parasitic prevalence within the sample increases as length of fish increases. The prevalence of parasites encountered were Henneguya (3.7%), Dactylogyrus sp (11.1 %), Capillaria sp (7.4 %), unidentified larvae(7.4 %),unidentified cysts(40.7%), Dibothriocephalu sp (3.7 %), Argulus 7.4 %), Ichthophthirius (3.7 %) and Tricodina (3.7 %).

Keywords: Parasites, Prevalence, *Clarias gariepinus*, Infection

INTRODUCTION

Incidence of heavy parasitic infection in fish has been reported globally because fish serves as reservoir and intermediate host to most stages of parasites ranging from protozoan to metazoans (Hoffman and Meyer, 1967; Kabata, 1970; Pal and Ghosh, 1985). Several authors have worked on parasitic incidence of fish in Nigeria (Ukoli, 1963; Alfred-Ockiya, 1985; Awa, *et al,* 1988; Okaeme, 1991 and Adeyemo, *et al*, 2003) and discovered that in the natural environment healthy individuals co-exist with diseased ones and in most parasitic infections host may not be killed unless the parasitic burden is high. But usually, growth rate and market value of fish may be reduced while infection may also be of public health importance. For public health concerns, it is necessary to identify disease reservoirs in order to have adequate knowledge of the transmission mechanism. This will help to develop an effective method of preventing the access of pathogens and their reservoirs to healthy facilities or individuals.

One of the culturable fish species in Nigeria is *Clarias gariepinus;* it is widely accepted for consumption and rearing. The study of parasitic incidence on this species will further help to understand its adaptation for culture purpose. This study will also add to the current knowledge on parasitic infections of cultured fish in Nigeria.

MATERIALS AND METHODS

The parasitic investigation was carried out on *C. gariepinus* that were sampled from the Fish Breeding Centre of the Ministry of Agric and Natural Resources, Agodi, Ibadan. The centre is located between latitude $7^{o}25^{l}$ N and longitude 3^{o} 33^{1}W. Sampling was carried out using the method of Ossiander and Wedemeyer (1973). A total of 27 live fishes was collected during the raining season period between the months of May – July. They were examined for parasites using the identification outline of Amlacher (1966), and Pal and Ghosh (1985). The individual fish were demobilized by pithing, while the organs were carefully examined using hand lens. Scrapping from the skin and gills were placed in Petri dishes with 2 drops of normal saline for examination, while the squash preparations from the organs were also examined under the low power (X10) magnification of a binocular microscope.

Prevalence and intensity were calculated using the indices of Margolis *et al.* (1982). Length range frequency in relation to prevalence within the sample was analyzed. The dependence of infection on sex was statistically determined using chi^2 analysis. The condition factor (K) was calculated and defined as $K = 100w/L^3$ where w is the weight and L as total length in cm (Bakare, 1970).

RESULTS AND DISCUSSION

Parasitic prevalence of 3.7 % was recorded for *Henneguya sp* a sporozoan parasite, which was found, encysted on the air sac of *C. gariepinus* (Table I) .The parasite was discovered when the cyst was teased to release the content. Meanwhile, other unidentified cysts were also found at the prevalence rate of 40.7 % in the musculature, on the skin, ovary and kidney of the fish. These cysts could be explained to arise through connective tissue reaction to sporozoan infection and sometimes could be larvae of helminthes being encapsulated by connective tissue, which may eventually calcify. (Amlacher, 1966). The importance of these cysts lies in quarantine procedure, since after 3 – 4 weeks of quarantine, the cyst may burst to release the pathogenic exudates or helminthes. Prevalence rate of 11.1 % was recorded for *Dactylogyrus sp a* monogenetic trematode. This trematode was described by Hendrix (1994), to be cosmopolitan in nature and could be ecto or endoparasite. Awa, *et al.* (1988) also reported incidence of monogenetic worms on *Sarotherodon galileans* at the Ikoyi fish farm, Lagos.

Table I: Parasitic incidence on cultured *Clarias gariepinus*

Parasites Found	Number of fish examined	Number of Infected fish	Parasite Burden	Prevalence (%)	Intensity of infection	Site infected
Heneguya sp.	27	*1	High	3.7	High	Air Sac
Unidentified Cysts	27	*11	50	40.7	4.7	Muscles, Skin, body cavity, Ovary , kidney
Dactylogyrus sp	27	*3	8	11.1	2.6	Intestine
Dibothriocephalus sp	27	1	1	3.7	1	Intestine
Capillaria sp	27	2	3	7.4	1.5	Stomach, body cavity
Unidentified larvae	27	2	5	7.4	2.5	Body surface
Argulus sp	27	2	2	7.4	1	Body surface
Ichthophthirius sp	27	1	Low	3.7	Low	Skin body surface
Tricodina sp	27	1	3	3.7	3	Stomach

** Parasite was found in more than one fish examined*

Table 2: Sex ratio analysis of infected *Clarias gariepinus*

	Female	Male	Sex ratio
Number of fish examined	13	14	1:1.01
Number of fish infected	9	12	1:1.02
Prevalence	69	86	1:1.3

Table 3: Length-weight in relation to infection and condition factor (k)

Length Range (cm)	Weight average (gm)	No within the group	No of infected Fish	Prevalence Within the Group (%)	Condition Factor(k)
22-23.5	103.33	6	5	83	0.8
24-25.5	120.90	11	7	63	0.7
26-27.5	191.66	6	5	83	0.9
28-29.5	152.25	2	2	100	0.6
30-31.5	265.00	2	2	100	0.8
Total		27	21	77.7	

The dominant species among these worms are namely *Dactylogyrus* sp and G*yrodactylus sp.* D*actylogyrus vastator* had been known to cause heavy mortalities of fry and fingerlings (Sarig, 1971). The occurrence of fish mortality at Nagpur, India was found to be due to infection by cestode as reported by Pal and Ghosh (1985). This present study recorded the prevalence of *Dibothriocephalus sp* at 3.7 %, this tapeworm was described by Needham and Wooten (1978) as broad fish tapeworm of man, which is known to occur in a variety of fresh water fish species. It is also of public health importance, because tapeworm of *Diphyllobothrium* sp has been found to be of zoonotic relevance. (USDHEW, 1973).

The unidentified larvae, *Capillaria sp* and *Argulus sp* were found at 7.4% prevalence rate respectively. These were known to cause skin irritation, which favours secondary infections and may lead to transmission of bacterial hemorrhagic septicemia (Moore *et al,* 1984). The two common protozoan, *Ichthophthirius sp* and *Tricodina sp* were found from the skin scrapings and stomach contents respectively, but there was no lesions observed on any of the samples. The parasitic infection on *Clarias sp* in this centre was found not sex dependent ($P > 0.05$) because dependence on sex was not statistically significant using chi^2 analysis. Sex ratio analysis of infected fish and the infection prevalence according to sex is shown in Table 2. Prevalence of infection according to length increases within the sample as length of fish increases while the overall prevalence was 77.7 %, also the effect of infection on fish condition factor was low as shown in Table 3. The condition factor (K) measures the well being of the fish and is usually close to value 3 for a healthy fish, in this study the K values were below value 1 indicating that all specimens were not healthy considering the high (77.7 %) parasite prevalence at the center.

Conclusion: This report would not have succeeded in identifying all the parasites that may likely be found on cultured *Clarias species*. It however advocates for more work on diseases and parasites of fish especially culturable fish species. Since temperature regime in our ecological waters favours rapid multiplication and cycling of both fish and parasites. Meanwhile, aquaculture is developing progressively at a high rate in the country. Wild fish that are sometimes stocked or strayed into rearing ponds may bring about incidence of transferred infection, fish mortalities and consequent loss of production. It will also attract public health concern when infected fish are improperly prepared for consumption.

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