A SURVEY OF ECTOPARASITES OF *CLARIAS GARIEPINUS* CAUGHT FROM THE UNIVERSITY OF AGRICULTURE RESEARCH FISH FARM, MAKURDI.

BY

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ABSTRACT

Clarias gariepinus caught from University of Agriculture Research Fish Farm, Makurdi were examined for ectoparasites from October – December 2010. Of the one hundred and twenty (120) C. gariepinus examined, 40 (33.3%) were infested and were observed to harbour forty three (43) ectoparasites. Pisciola geometra accounted for 59.1% while Midge larvae accounted for 40.9%. These parasites were observed to occur only on the skin of the infested fish. There was significance difference (P>0.05) in infestation between the sexes of the fish, with male species having relatively higher percentage infection (65.12%) than the female (34.89%). Bigger fishes were observed to have higher ectoparasites than the smaller ones.

Key words: ***Ectoparasites, Clarias gariepinus, Research Fish Farm, University of Agriculture and Makurdi.***

INTRODUCTION

Fish serve as a good source of animal protein for man and his livestock (Osuigwe and Obiekezie, 2007 and Andrew and Alune 1996). A break down showed, fish accounts for more than forty percent of the protein diet of two ï third of the global population (Eyo, 1992 and FAO, 1999). Due to increase in human population, demand for fish as a source of protein is on the increase (Abolarin, 1996).

In recent times, there has been a tremendous increase in the development of fish farming due to increase need for animal protein. Disease is an important factor militating against fish production. Many diseases are closely linked to environmental deterioration and stress, once the environment is disturbed, the organisms under such culture systems are stressed (SEAFDEC, 1999).

In Nigeria the level of awareness of the impact of disease to aquaculture is lacking as revealed by numerous personal interactions and the report of Kolndadacha, *et al*, (2007). Parasitic diseases of fish are very common all over the world and are of particular importance in the tropics (Roberts and Janovy, 2000). Fish is the most parasitize of all vertebrate and the importance of parasitic infection on fish production has largely remained an issue of concern to fish farming industry.

Some parasites have been discovered to have zoonotic potential, thereby making them of public health importance (Ukoli, 1984). However, in instances where hosts are overcrowded such as in aquaria and fish farms, parasitic diseases can spread very rapidly causing gross mortalities (Paperna, 1996).

In fish farming or aquaculture, some parasites may be highly pathogenic and contribute to high fish mortalities and economic loss, while in natural systems they may threaten the abundance and diversity of indigenous fish species (Mashego, 2001). *C. gariepinus* is one of the most resistant and widely accepted and highly valued fish that is cultivated in Nigeria, therefore, t he need for documented research on parasites which might constitute problems on this fish cannot be over emphasized (Dankishiya and Zakari 2007). This study aimed at providing information on the ectoparasites of C. *gariepinus* from the University of Agriculture Research Fish Farm, Makurdi,

because of its economic importance and as a source of fish protein to the populace.

MATERIALS AND METHOD

Study Area

Makurdi, the capital of Benue State lies between longitude longitude 7º 43NJN and latitude 8º 32NJE (Kowal and Knabe 1972) and University of Agriculture, Makurdi Research Fish Farm is located at the South core of the University, adjacent to the University water treatment plant near River Benue.

Sample collection

One hundred and twenty (120) *C. geriepinus* were caught from Ten (10) different ponds in the University Research Fish Farm, Makurdi using drag net from October to December, 2010. Ten (10) samples of the species were collected from each pond weekly in plastic container. The total and standard lengths of each fish were measured in centimeters (cm) using measuring tape, while the weight of each fish was taken in grams (g) using a weighing balance. The sexes of the fish were determined by examination of the papillae on a sorting table.

Sample Analysis for Ectoparasites

External examination on the gills, fins and surfaces of the fish for ectoparasites was first carried out using hand lens for detection of parasitic manifestations. Later, skin smear was made using scalpel blade. The procedure was performed using a spatula by which the skin scrapings (smears) from the head to the tail were obtained, mucus mixed with epidermal cells. Thereafter, the scraped samples of mucus together with the tissues were placed on a Petri-dish containing 3mls of 0.9% saline solution and stirred using a mounted pin (Omeji, *et al* 2010, Bichi and Ibrahim, (2009) and Emere and Egbe, 2006*)*. Some drops of the mixed solution were collected using dropper, placed on a clean slide and examined under microscope.

Gills and Fins: Detection of parasites from the gills of the sampled fish was also made using the methods described by Omeji, *et al* (2010), Bichi and Ibrahim, (2009) and Emere and Egbe (2006*)*. Gills were cut by scissors, placed in a Petri-dish and gill filaments were dissected using anatomical needle and examined under the microscope. Gill scrapings were placed on few drops of water previously placed onto glass slides then covered with cover-slide and examined under the microscope. The parasites seen

were identified by making their sketches and compared with the pictoral guide on fish parasites by Pouder *et al*., (2005).

Results

Of the one hundred and twenty (120) *C. gariepinus* examined, 40 (33.3%) were infested and were observed to habour 43 ectoparasites belonging to Leech (*Pisciola geometra*) which accounted for 59.1% parasites and was more in abundant than the Midge larvae which accounted for 40.9% parasites. These parasites were seen to occur only on the skin of the infested fish.

The mean monthly distribution of identified ectoparasites of *C. gariepinus* in relation to the weight, standard length and total length of the fish is as shown in Table 1. Table 2 shows the Sex and parasites infestation of *C. gariepinus*. It was observed that male fish were more infested (65.12%) than the female counterparts (34.89%). Table 3 shows the Size distribution and parasitic infestation in *C. gariepinus*. It was observed that bigger fishes of total length between 37cm ï 48cm were more infested than smaller fishes (13cm ï 36cm total length).

Table 1: Mean Monthly distribution of ectoparasites of *C. gariepinus* from the University of Agriculture Research Fish Farm.

	Weight (kg)	Standard length (cm)	Total length (cm)	Total No. of Parasites	Leech	Midge larvae
Months						
October	0.337±0.011	31.92±1.40^{a}	35.09±1.44^{a}	1.00±0.061^{b}	1.000±0.053	1.000±0.035
November	0.279±0.013	23.86±1.70^{b}	26.86±1.26^{b}	1.43±0.093^{ab}	1.400±0.071	1.125±0.076
December	1.093±0.767	31.12±1.21^{a}	34.26±1.26^{a}	1.053±0.095^{a}	1.166±0.092	1.000±0.061
Sex						
Male	0.315±0.009	29.10±1.20	32.30±1.24^{a}	1.077±0.081	1.667±0.071	1.077±0.060^{a}
Female	0.824±0.512	28.84±1.34	31.83±1.37^{b}	1.000±0.055	1.000±0.049	1.000±0.033^{b}
Interactions						
Months x sex	NS	NS	NS	NS	NS	NS

Means±SE in the same column followed by different superscript differ significantly ($p<0.05$) while NS= Not Significant.

Table 2: Sex and parasites infestation of *Clarias gariepinus* from university of Agriculture Research Rish Farm.

Sex	No. of fish examined	No. of fish infested	No. of parasites	% infection
Male	60	26	28	65.12%
Female	60	14	15	34.89%
Total	**120**	**40 (33.3%)**	**43**	**100%**

Table 3: Size distribution and parasitic infestation in *C. gariepinus* from the University of Agriculture Research Fish Farm.

Range in (cm)	No. of fish examined	No. of fish infested	No. of parasites	intensity of infection
13 – 16	8	2	2	0.25
17 – 20	2	2	2	1.00
21 – 24	31	5	4	0.16
25 – 28	7	5	5	0.71
29 – 32	7	2	2	0.29

Discussion

The rate of ectoparasites infestation of *C. gariepinus* in the University Research Fish Farm was observed to be high. Two kinds of ectoparasites (leech and midge larvae) were observed to be present on the skin of *C. gariepinus*. This might be because the skin is easily accessible by these parasites due to their direct contact with the surrounding water. This agrees with the reported work of Iman and Dewu (2010), and Hines and Spira (1973).

Differences in the incidence of infestation observed between the 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 resistance and infestation. Similar observation has been made by Emere, (2000). The higher percentage parasitic infestation recorded by the male, 28 (65.12%) than the female

counterparts 15 (34.89%), might be due to the males being known to engage in more physical activities such as swimming and in addition, the males are believed to explore available food resources that might have been parasitized better than the females and this might have exposed them to more parasitic infestation than their female counterparts. This is contrary to the findings of Ayanda, (2009), who reported higher parasitic infestation in female *C. gariepinus* than the male as a result of their quest for survival, Omeji, *et al.,* (2010), Emere and Egbe, (2006) who reported that due to physiological state of the female, most gravid females could have reduced resistance to infestation by parasites.

There was significant difference ($p<0.05$) in ectoparasitic infestation between the sexes. This is in line with the finding of Iman and Dewu (2010) who reported significant difference in parasitic infestations between the sexes of *Clarias* species sold at Galadima Road of Fish Market, Kano Metropolis.

Bigger fishes were observed to have higher rate of parasites than the smaller ones. This could be due to the fact that bigger fishes cover wider areas in search of food than the smaller ones and as a result, they take in more food than the smaller ones and this could expose them more to infestation by parasites. This is in agreement with the reported works of Omeji, *et al.,* (2010) who reported higher rate of protozoan parasites in bigger C. *gariepinus* and *Heterobranchus longifilis* than the smaller ones and Emere and Egbe, (2006) who reported higher rate of protozoan parasites in bigger *Synodontis clarias* than the smaller ones.

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