A SURVEY OF ECTOPARASITES ASSOCIATED WITH 3 SPECIES OF FISH *AUCHENOGLANIS OCIDENTALIS, OREOCHROMIS NILOTICUS* AND *BAGRUS BAYAD*, IN RIVER BENUE, MAKURDI, BENUE STATE, NIERIA.

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ABSTRACT

A survey of ectoparasites of three species of fish (Oreochromisniloticus, Auchenoglanis occidentalis and Bagrus bayad) of River Benue was carried out for a period of three weeks. Samples were collected directly from fishermen, at the river side (River Benue) in a plastic bucket and were carried to the laboratory. A smear samples from the skin were taken., Fins were cuted and gills were dissected and examine individually in saline solution in a Petri dish and platyhelminthes parasites as the most common ectoparasites of threes three species (Oreochromis, Auchenoglanis, and Bagrus). A total number of five hundred and seventy two (572) parasites were observed .Result of this study reveales that the large number of parasites were found on the gills (65%) of the three fish species studied, compared to skin (16%) and fins (19%) of the total parasites observed; among the three fish species studied. O. niloticus carries 33% while A. occidentalis carries 41% and B. bayad carries 26% of the total parasites seen. There was negligible difference in the level of infestation in the sexes (i.e. male and female) of Oreochronis and Bagrus, however, a great significance difference in the level of infestation was found in the sexes of Auchenoglanis.

Key words: Ectoparasites, Fish, Comparison, River Benue

INTRODUCTION

Parasites can be defined as animals that live on or in another animal at the expenses of that animal, parasites are the most diverse and common diseases of fish, (Stephen et al. 1995). External parasites can be found on the skin, gills or fins of the fish, while internal parasites occupy areas such as the muscles or internal organs. The number of species of fish parasites already described is measured in thousands and many more remain to be discovered, very few, however, are seriously harmful to their host (Vicki, 1998).

These parasites are capable of causing damage to their hosts-involved mostly by injury to tissues, organs while burrowing, consuming food or sucking blood. Despite the ubiquitous distribution of parasites, infestation of a host is usually limited unless the host is subjected to increased stress. The damage done to the hosts will usually be directly proportional to the level of infestation (Susan, 1995). Most fish parasites would not develop in humans even if eaten raw. None is harmful to humans if the fish are thoroughly cooked. All report of people being infected with fish parasites was as a result of ingestion of raw fish or insufficiently cooked fish (FAO, 1996). Most fish especially in the wild or cultured are infested with parasites, but no significant harm to host was identified. However, there are few reports of parasites causing mortality or serious damage to fish population. Parasites in wild fish are usually only remarked upon when they are so obvious as to lead to rejection of fish by fishermen or consumers (Robert, 1995).

In culture fish population, on the other hand, parasites often cause serious out breaks of disease. The over crowded populations offish kept in particular environment may favour certain parasites so that the parasites population increases to a very high level. The number of parasites sufficient to cause harm to a fish, varies considerably with the species and size of the host and its health status. Many parasites are host-specific to some extent and are capable of infecting one or only a limited number of host species. Individual parasite species have varied effects from one host to another.

Host specific species are associated with a wide range of fish species from most families. Some common parasites of host specific to some extent include Ichthyobodo necator, chilodonella spp, Trichodina

Ambyphyrya and scopulata seyphidia are particularly common in juvenile cichlids and Carp (FAO 1996). The ubiquitous ectoprotozoans are cosmopolitan or trans-continentally dispersed via translocation of their cultured fish hosts (carp and tilapia in particular). Most Ectoparasites forms are readily detected in direct microscopic examination of skin and gill scrapings from live or freshly killed fish.

MATERIAL AND METHOD

A total of ninety (90) live fish specimens from three (3) families were sampled. Thirty (30) from each family, (*Bagrus bayad, Auchenoglanis occidentalis and Oreochromis niloticus*) were obtain from two sampling sites Wadata and Wurukum markets. The source of the fish is from river Benue. Specimen were transported to the laboratory in a plastic buckets. The fish were separated into male and female and were serially numbered. The total and standard length were measured by using a measuring rule, the weight of each fish was taken using electrical digital scale (Aculab model 333). The samplings were taken for the period of three weeks.

In the laboratory, the total and the standard length, weight, sexes were determined. Thorough examination of the individual fish was done for any parasite on the skin that can be seen with naked eyes, or any abnormalities. A scraping from the skin of the fish was taken and a smear was made mounted on a slide and washed in saline water, then examined for protozoa and other small parasite under a "ken-A-vision" Microscope (10x0.25). The caudal and dorsal fin were cut and placed in a Petri dish and view under the same Microscope. With the use of a dissecting kit the gills were removed and examined individually in saline solution in a Petri dish under dissecting microscope.

The parasites were identified accordingly using parasite pictorial Guide (Deborah et al., 2005).

RESULT

A total of ninety (90) life fish specimens were collected, thirty from each species (*A. occidentalis, O. niloticus and B. bayad*). Four out of the thirty *B. bayad*, one out of the thirty *A. occidentalis* and two out of the thirty *O. niloticus* were not infected by any type of parasites. A total of five hundred and seventy two (572) parasites belonging to the phylum protozoans and phylum platyhelminthes were the main parasites identified. These parasites were found on the skin, gills and fins. Thirteen parasites were not been identified.

One hundred and ninety four (194) parasite were found on the *O. niloticus*, a one hundred and twenty six (126) were found on the gills, thirty (30) on the skin and thirty eight (38) on the fins. For the *A. Occidentalis* a total of two hundred and thirty two (232) parasites were found. One hundred and fifty two (152) were observed on the gills, thirty seven (37) on the skin and forty three (43) on the fins. For the *B. bayad* a total of one hundred and forty six (146) parasites were observed, ninety (90) were found on the gills, twenty five (25) on the skin and thirty one (31) on the fins.

Table 1 shows the relationship between fish size and number of parasites found on each species of fish (*O. niloticus, A. occidentalis, B. bayad*).

Table 2 shows the total number of ectoparasite foun on the body parts of each fish sample. The result shows that *O. niloticus* have 33%, *A. occidentalis* have 41% and *B. bayad* have 26% of the total parasite discovered. The gills have 65%, skin 16% and fin 19% of the total number of parasite affecting the fish.

Table 1: Relationship between fish size and no. of parasite s found on each species

	NUMBER OF PARASITES		
Size of fish (g)	***O. niloticus***	***B. bayad***	***A. Occidentalis***
21-60	116	-	13
61-100	9	-	42
101-140	Not sampled	58	35
141-180	Not sampled	11	35
181-220	Not sampled	9	48
221-300	Not sampled	Not sampled	11
Sampled	Not sampled	Not sampled	6
301 - 340	Not sampled	Not sampled	7
Total	**125**	**78**	**197**

Table 2: Degree of infestation of ectoparasites of the 3 fish species.

Ectoparasites	***O. niloticus***	***B. bayad***	***A. Occidentalis***
Gyrodactylid	-	+	++
Piscimodinium	+++	++	++
Digenean	+++	++	++
Ambiphrya	-	-	+
Trichodina	+	-	+
Tetrahymena	++	++	+
Ichthyobodo	+	+	+
Dactylogyrid	-	-	+
Ichthypthinius multifillis	++		
Chilodanella	+		

+ = 1 2 parasites: light infestation

++ = 3-4 parasites: medium infestation

+++ = 5 above: heavy infestation

Table 3: Total no and the commonest parasite found on each of the body part.

Fish spp	Skin	Gill	Fin
Oreochromis niloticus	Piscimodium & digenean (3)	Icthypthirius, tetrahymena multifillia, & Piscinodium (126)	Piscinodium & Digenean (38) = 194.
Auchenoglanis occidentalis	Pisgnodiuam (37)	Gyrodactylid, Ichthyobodo and Tetrahymena (152)	Tetrahymena, piscinodium (42).
Bagrus bayad.	Chilodenella (25)	Ichthythiniis muctifillis and Digeneran (90)	Tetrahymena (31).
Total	92(16%)	368(65%)	111(19%)

DISCUSSION

The results of this study on *Auchenoglanis, Bagrus* and *Oreochromis*, shows that the occurrence of various parasites which can be grouped under various classes, they are: Phytomastigophora, Zoomastigophora, Oligohymenophorea, Kinetofragminophorea, Crustacea, Monogenea, Ddigenea and Myoxosporidea. These parasites were obtained from the gills, skin, and fins.

The gills were infected mainly by the protozoans and the ciliophora, while skin and fins were mainly dominated by protozoans and platyhelminthes. The gills were infected by 65% of the total parasite discovered, while skin was infected by 19% and fins 16% of the total parasites obtained as shown in table 3. Studies on parasites and disease of freshwater fishes of Lake Kainji area revealed that the protozoans constitute an important economic disease of cat fishes (Okaeme et al. 1988). Chilodonella Ichthyophthirius and Dactylogyrus species, affect the gills in large number and this has been described as problematic in carp in ponds and also causes congestion of the gills an death, in Salmond and ictaluris (Korting, 1984). The Piscinodinium and Digeneran were also found on the gills, skin and fins of the three species.

(*Auchenoglanis, Bagrus* and *Oreochromis*). Heavy infestation of this parasites have been reported to increase production of cuticular materials, frayed fins and skin ulcer. Dactylogyrushas been described as the most dangerous parasite of Carp fry (Bauer et al 1973) and parasites such as Sanguinicola (blood fluke) infect the young carp at about 2-3 weeks of age when they are not yet feeding on artificial feeds, so treatment is difficult. Heavy infections result in gill necrosis and change in other internal organs, Mortality rate may be up to 100% (Korting, 1984).

Batra (1984) reported a high rate of infection by monogeneans on Cichlids in Zambia.Other parasites that affected the gills belongs to the ciliated protozoans which include *Ichthyopthirius, Trichodina Trichophytra* etc and this conforms to the work done by Somerville (1984) that a large number of Crytobia protozoan have been noted on the external surface of culture rainbow trout in U.S.A. It was also observed by Hoffman *et al*, (1975) that fish are infected by free-living ciliated protozoans. *Caligus epidemicus* which has been reported infecting fingerling tilapia. It is a common parasite of low-salinity water in the coastal and estuarine zones of Western pacific; it has been reported from both wild and cultured fishes.

Recently, it was reported on the cultured tiger shrimp (*Penaeusmonodon fabricius*), from Chantaburi province Thailand. (Richard, 2003), and same parasite was noticed in Taiwan in March 1990 on the

Mozambique tilapia (*Oreochromis mossambicus*) being reared in the salt-water ponds at the Taiwan branch of the Fisheries Research Institute, the infestation was so severe that many fish died from the infestation.

Relationship between fish size and number of parasite found on each species is shown on table 1, *Oreochromis* species and Bagrus species it was observed that the prevalence of the number of parasite decreases with size, and the largest number of parasite were discovered on the smaller fishes, while *Auchenoglanis* species the prevalence of the parasite increases in weight, size and it maintains certain number and increase again. Although certain sizes were not sampled in *Oreochromis* and *Bagrus* species.

There is negligible significance difference observed on the type and number of parasite based on the sexes in *Oreochromis* species and *Bagrus* species while in auchenoglanis species there is a great significance difference observed on the number of parasite found. The study implies that all stages of fish development are liable to parasite infestation.

CONCLUSION

It has been observed that most of these parasites are common habitat of mud at the bottom of the ponds, streams and rivers of freshwater in all quarter of the globe (Marsh et al, 1972) and they required a period of potential in mud prior to the development of infestation where the height of the water table precludes seasonal drainage and desiccation of the water body.

The overall parasite infection rate of these three species, *Oreochromis* carries 33% while that of Auchenoglanis carries 41% and that of Bagrus species carries 26%. Research was carried out at the National Institute for Freshwater Fisheries Research (NIFFR) which reveals that disease problems and fish mortalities are more prevalent during the harmattan period of the year i.e. November February (Okaeme, 1985).

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