E-ISSN: 2347-5129
P-ISSN: 2394-0506
(ICV-Poland) Impact Value: 5.62
(GIF) Impact Factor: 0.549
IJFAS 2018; 6(6): 199-202

www.fisheriesjournal.com
Received: 29-09-2018
Accepted: 30-10-2018

Idoko AF
Department of Fisheries Technology, Bauchi State College of Agriculture, Bauchi State, Nigeria

Garba AM
Department of Fisheries Technology, Bauchi State College of Agriculture, Bauchi State, Nigeria

Mukhtar AH
Department of Fisheries Technology, Bauchi State College of Agriculture, Bauchi State, Nigeria

Correspondence
Idoko AF
Department of Fisheries Technology, Bauchi State College of Agriculture, Bauchi State, Nigeria

Determination of common external parasites of *Clarias gariepinus* and *Oreochromis niloticus* in Bauchi metropolis

Idoko AF, Garba AM and Mukhtar AH

Abstract
Present study was conducted to determine the common external parasite of fish species in three markets of Bauchi metropolis. A total of 120 fishes were used for the experiment. 20 *Clarias gariepinus* and 20 *Oreochromis niloticus* were collected from Yelwa Tudu, Wunti, and Muda lawal markets. Morphometric data as well as laboratory examination for common external parasites was conducted. Result obtained showed Yelwa market had the highest prevelent rate of infestation on both species. Wunti and Muda Lawal market recorded the lowest rate on *Clarias gariepinus* and *Oreochromis niloticus* respectively. *Trichodina* spp., *Epistylis* spp., *Ichthyophthirius multifiliis* and *Gyrodactylus* spp. were found on gills, fins and skin of the two fish species examined. Ichthyophthirius multifiliis had the highest prevalent rate of 14 and 11 in both species while *Gyrodactylus* spp. recorded the lowest prevalent rate of 5 and 8 respectively. There was no significant difference among the fish species examined.

Keywords: *Clarias gariepinus*, *Oreochromis niloticus*, parasite and fish

Introduction
Fish serves as important source of food and income to Nigerians and other countries in the Sub-Saharan Africa; where about 35 million people depend wholly on the fisheries sector for their livelihood [1]. Disease is an important factor in fish production, and this commercially important source of animal protein is susceptible to infection with various parasites [4]. According to [8], a parasite can be referred to as an animal (parasite) that lives in or on another animal (Host) at the expense of the animal (Host). [2] Reported that parasites are the most diverse and common disease of fish. External parasite are usually referred to as ectoparasite and are found on the skin, gills or fins of the fish while endoparasite are those found in the internal organs of the fish. Ectoparasites, including protozoa, are cited as the major problem in warm water pond fish culture where high temperature and organic content accelerate the life cycles of the parasites and promote their spread [7]. Bauchi is a north eastern State and falls under the Sudan savana climatic zone which is characterise with hot climate. According to [8]; most fishes are infested with parasite on the wild but no significant harm to host was identified. However, there are few reports of parasites causing mortality or serious damage to fish population. Parasitic infection on fish is only usually remarkable when they are so obvious as to lead to rejection of fish by fishermen or consumers [6]. In order to maximize fish productivity, farmers need to be aware of the factors that influence growth and performance such as nutrition, parasite, environmental stresses and pollutants [5].
Clarias gariepinus and *Oreochromis niloticus* are two important commercial fish species grown in some West African countries including Nigeria [2]. They are found in most of the major market around Nigeria including Muda Lawal, Wunti and Yelwa markets of Bauchi State and are usually sold by weighing in kilograms as life fishes to consumers. However, they may appear weightless and un-appealing to consumers when infested with parasites as observed in some of the Markets listed above. Therefore, this research work was designed to determine the external parasites infesting the two commercially important fish species in Nigeria namely; African catfish (*Clarias gariepinus)* and Tilapia fish (*Oreochromis niloticus*) sold in three important Markets found in Bauchi Metropolis namely, Mudal Lawal, Wunti and Yelwa Market respectively.

Materials and methods

A total of one hundred and twenty live fishes of two species namely: *Clarias gariepinus* and *Oreochromis niloticus* were bought from three markets within Bauchi metropolis. The *Clarias gariepinus* fishes had an average length of 32cm and average weight of 950gm, while *Oreochromis niloticus* had average length of 20cm and average weight of 500gm. Twenty fishes of each of the two species was bought from each of the three markets. The markets are, Yelwa, Wunti and Muda lawal. They were transported between 7:00am and 10:00am hours in the morning in a plastic container with water as recommended by [1] to Bauchi State College of Agriculture Fisheries Laboratory. The morphological data (Length and Weight) of each of the fish was collected and documented.

External examination

The fishes were laid on a clean work table surface and the external organs were observed for any physical injury.

Examination of gills

The gill cover was lifted up and the operculum cavity as well as the gills was observed with a hand lens for any macroscopic parasites or abnormalities, such as pale colour, excess mucus, and erosion of the gill filaments. A portion of the gill arch was carefully cut out using a small scissors. It was laid in a drop of water on a clean microscope slide, and then a cover slip was gently laid over the gill filaments. This was then placed under a compound microscope and observed for parasite.

Examination of fins

The fins was first of all examined for fraying, excess mucus, fungus, and haemorrhaging then a portion of the fin was clipped off and placed on a slide with water and a cover slip, and examined using a compound microscope.

Examination of skin surface

The skin was first observed for Lesions and scraping made from such areas to examine for bacteria and fungi. Samples were also collected from areas of discoloration and where scales are raised or sloughed then a small amount of mucus was gently scraped from the skin of the fish behind the pectoral fins and the base of the tail and from any lesions found on the body surface. The mucus was smeared onto a clean microscope slide and a drop of water was added after which a cover slip was placed over it and then it was observed under the microscope for parasite.

Identification of parasite

After each examination, a manual of parasite identification was used to identify the various parasites found on each of the fish samples examined. This was done according to [3].

Results

A total of 120 fishes from three markets were examined for external parasites. Out of this number, 55 fishes were infested with external parasites having a prevalence of 45.83%. This result indicated that the rate of prevalence of ectoparasite on the two species of fishes in the study areas is moderate. However, result obtained on table 1 and 2 showed that Yelwa market with 10(50%) and 12(60%) recorded the highest number of *Clarias gariepinus* and *Oreochromis niloticus* fishes infested with ectoparasite while Wunti market with 5(25%) and Muda Lawal markets with 10(50%) recorded the lowest number of *Clarias gariepinus* and *Oreochromis niloticus* fishes infested with parasite.

Table 1: Prevalence of ecto parasite on *Clarias gariepinus* in three markets

Market	No. of Fishes examined	No. of Fishes infected	Prevalence %
Yelwa	20	10	50
Wunti	20	5	25
Muda Lawal	20	7	35

Table 2: Prevalence of ecto parasite on *Oreochromis niloticus* in three markets

Market	No. of Fishes examined	No. of Fishes infected	Prevalence %
Yelwa	20	12	60
Wunti	20	11	55
Muda Lawal	20	10	50

The result on table 3, 4, 5 and 6 revealed a low level of significance in the prevalence of ectoparasite in relation to length and weight of *Clarias gariepinus* and *Oreochromis niloticus* examined in the three markets. However, the results of the research revealed three groups of ectoparasites on the gills, skins and fins of both fish species examined. Ciliatea, Oligohymenophorea and Dactylogyroidea were discovered to be the major groups of ectoparasites found on the two fish species examined in the three markets. The result on table 7 showed that a total of 13 *Trichodina spp* were found on the gills, skin and fins of 6 *Clarias gariepinus* fishes examined in the three markets, 7 *Epistylis spp. Were found on the gills and skin of 4 Clarias gariepinus fishes,* 14 *Ichthyophthirius multifiliis* were found on the gills and skin of 10 *Clarias gariepinus* and 5 *Gyrodactylus spp.* were found on the gills and skin of 2 *Clarias gariepinus* fishes respectively. 12 *Trichodina spp*. were found on the gills, skin and fins of 10 *Oreochromis niloticus* fishes. 9 *Epistylis spp.,* 11 *Ichthyophthirius multifiliis* and 8 *Gyrodactylus spp.* were found on the gills and skin of 8, 9 and 6 *Oreochromis niloticus* in the three markets examined.

Table 3: Prevalence of ectoparasite in relation to length of *Clarias gariepinus* examined in three markets (Yelwa, Wunti and Muda Lawal)

Length (cm)	Class interval	No. of fish examined	No. of fish infected	Prevalence (%)
13 – 18	15.5	8	2	25.00
19 – 24	21.5	11	6	54.55
25 – 30	27.5	23	8	34.78
31 – 36	33.5	18	6	33.33

Table 4: Prevalence of ectoparasite in relation to length of *Oreochromis niloticus* examined in the three markets (Yelwa, Wunti and Muda Lawal)

Length (cm)	Class interval	No. of fish examined	No. of fish infected	Prevalence (%)
5 – 9	7	20	12	60.00
10 – 14	12	24	9	37.50
15 – 19	17	9	5	55.56
20 – 24	22	7	7	100.00

Table 5: Prevalence of ectoparasite in relation to weight of *Clarias gariepinus* examined in three markets (Yelwa, Wunti and Muda Lawal)

Weight (g)	Class interval	No. of fish examined	No. of fish infected	Prevalence (%)
200-300	250	17	10	58.82
301-401	351	14	7	50.00
402-502	452	18	3	16.67
503-603	553	11	2	18.18

Table 6: Prevalence of ectoparasite in relation to weight of *Oreochromis niloticus* examined in three markets (Yelwa, Wunti and Muda Lawal)

Weight (g)	Class interval	No. of fish examined	No. of fish infected	Prevalence (%)
120-160	140	18	5	27.78
161-201	181	20	11	55.00
202-242	222	12	3	25.00
243-283	263	10	3	30.00

Table 7: Frequency distribution of Ecto parasite of *Clarias gariepinus* examined in three markets (Yelwa, Wunti and Muda Lawal)

Parasite	Group	No. of fishes examined	No. of fishes infected	Location	Number of Parasite found
Trichodina spp.	Ciliatea	60	6	Gills, skin and fins	13
Epistylis spp.	Ciliatea	60	4	Gill and Skin	7
Ichthyophthirius multifiliis	Oligohymenophorea	60	10	Gill and Skin	14
Gyrodactylus spp.	Dactylogyroidea	60	2	Gill and skin	5

Table 8: Frequency distribution of Ecto parasite of *Oreochromis niloticus* examined three markets (Yelwa, Wunti and Muda Lawal)

Parasite	Group	No. of fishes examined	No. of fishes infected	Location	Number of parasite found
Trichodina spp.	Ciliatea	60	10	Gill, skin and fins	12
Epistylis spp.	Ciliatea	60	8	Gill and Skin	9
Ichthyophthirius multifiliis	Oligohymenophorea	60	9	Gill and Skin	11
Gyrodactylus sp.	Dactylogyroidea	60	6	Gill and skin	8

Discussion

From the result obtained, it is evident that *Trichodina spp.* and *Ichthyophthirius multifiliis* are the most prevalent ectoparasite of the two fish species (*Clarias gariepinus* and *Orechromis niloticus)* found in the study area. *Gyrodactylus* and *Epistylis species* recorded the lowest number. This shows that they have low prevalent rate on fishes of the study area.

Parasitic infections can be devastating in farmed organisms than in wild populations because of stressful conditions linked to crowding and frequent water quality deterioration [3]. Reduction in production and even mortality can be occur when parasite attack the normal physiological function of fish {5}. In some cases infection of man and other invertebrates that consume such fishes. In the cause of the research it was observed that proper water management and hygiene is a major constraint facing both fish farmers and marketing. As though some of them felt that the practice of good hygiene in fish farming and marketing incurs additional cost. It is important to note that fishes carries out all its life activities in the water where they are kept and a poor water quality will definitely affect the fish health. More so, the transportation of table size fishes to the market an un-hygienic manner can expose the fishes to insect like flies that are carriers of parasite. Ectoparasites, including protozoa, are cited as the major problem in warm water pond fish culture where high temperature and organic content accelerate the life cycles of parasites and promote their spread [7]. However, it becomes obvious when parasitic attack on fish makes them unappealing leading to rejection of such fishes by consumers.

However, the high infestation of fishes in Yelwa (50% *Clarias gariepinus* and 60% *Oreochromis niloticus*) market may be as a result of poor hygiene both in water quality management, transportation and exposure.

[8, 2] reported that, ectoparasitic protozoa represent one of the most hazardous threats to fish health. These parasites attack the fish and cause massive destruction of the skin and gill epithelium making the fish to look unappealing to consumers. The result showed that, 13 *Trichodina spp*, 14 *Ichthyophthirius multifiliis* and 5 *Gyrodactylus spp.* were found on a total number of 22 *Clarias gariepinus* fishes infected. While 12 *Trichodina spp*, 9 *Epistylis spp.*, 11 *Ichthyophthirius multifiliis* and 8 *Gyrodactylus spp.* were found on a total number of 33 *Oreochromis niloticus* infected. The presence of *Ichthyophthirius multifiliis* (14) as the highest number of parasite found in all the fishes examined has shown that there is a high prevalence of this parasite in the study area. It is the largest known parasitic protozoan found on fishes. Adult organisms are oval to round and measure 0.5 to 1.0 mm in size. The adult is uniformly ciliated and contains a horseshoe-shaped nucleus which can be seen in older individuals.

Trichodina spp. (13) is the second highest number of parasite found. It was isolated from skin, fins and gills of the infested fishes. It is large with disc shaped body. The adhesive disc is saucer shaped. The parasite is provided with several rows of cilia at the circular periphery and the inner circle of toothed denticles. The macronucleus is horse shoe-shaped and micronucleus is small and difficult to be seen in some specimens [4].

Fish parasite is a major threat to the fisheries industry especially aquaculture [5]. It is responsible for fish disease (deviation of fish from normal state of wellbeing). However, previous research has shown that poor water quality, stress, contaminated feeds, and poor management among others are major causes of fish disease. The importance of fish in human nutrition cannot be over emphasize. It is only disastrous when the available fishes for human consumption are contaminated leading to ill health.

In conclusion, it is better to prevent fish disease than to initiate treatment when there is a parasitic attack on the fishes. However in the event of sickness resulting from parasitic attack, the only remedy is to treat sick fishes with required drugs. Most of the public water bodies are polluted thereby they carry lots of disease pathogens. Prevention of water contamination and good hygiene can be achieved by raising public awareness of the dangers of polluting recreational water bodies and other water bodies that serve as source of inlet for fish ponds. Implementation of basic sanitation is another measure that can rescue the situation. Fish farms should implement bio-security measures to prevent transmition of disease parasite from source to fish farms. History of water source for fish farming should be known and

water screened before use in fish farming. Also, people should be educated on the dangers of consuming raw fish or fish that is not properly cooked since raw fishes are known to carry some bacterial as well as anti-nutritional factors [3].

Table 9: A breakdown of the examination carried out on all three markets and parasites found

		Yelwa Market	**Wunti Market**		**Muda Lawal Market**	
	Clarias gariepinus	***Oreochromis niloticus***	***Clarias gariepinus***	***Oreochromis niloticus***	***Clarias gariepinus***	***Oreochromis niloticus***
Number of fishes examined	20	20	20	20	20	20
No. of fishes infected	10(50%)	12(60%)	5(25%)	11(55%)	7(35%)	10(50%)
Trichodina spp.	2(20%)	4(33.33%)	2(40%)	2(18.18%)	2(28.57%)	4(40%)
Epistylis spp.	2(20%)	2(16.67%)	1(20%)	3(27.27%)	1(14.29%)	3(30%)
I. multifiliis	4(40%)	3(25%)	2(40%)	4(36.36%)	4(57.14%)	2(20%)
Gyrodactylus sp.	2(20%)	3(25%)	-	2(18.18%)	-	1(10%)

References

1. Adebisi AA. The physico-chemical hydrology of a tropical seasonal River-ogun River. Hydrobiology. 1981; 7:157-167.
2. Ali M. Trichodinid ectoparasites (Ciliophora: Peritrichida) infecting the Nile cichlid fishes *Sarotherodon galilaeus* and *Tilapia zillii* at Dakahlia province, Egypt. Egypt J Zool. 2008; 51:199-219.
3. Bondad-Reantaso MG, Subasinghe RP, Arthur JR, Ogawa K, Chinabut S, Adlard R, *et al.* Disease and health management in Asian aquaculture. Vet. Parasitol. 2005; 132:249-272.
4. Emere MC. Parasitic infection of the Nile prech (Lates niloticus) in River Kaduna. Journal of Aquatic Sciences. 2000; 31: 34-45. 17.
5. Imam TS, Dewu RA. Survey of piscine ecto- and intestinal parasites of clarias species sold at Galadima Road fish market, Kano metropolis, Nigeria. Bioscience Research Communications. 2010; 22(4):209-214.
6. Roberts RJ. Fish pathology, 4th Edition, Wiley-Blackwell, 2012.
7. Sarig S. The status of information on fish diseases in Africa and possible means of their control. FAO/CIFA Symposium on Aquaculture in Africa, 1975.
8. Sterud E, Simolin P, Kvellestad A. Infection by *Parvicapsula* sp. (Myxozoa) is associated with mortality in sea caged *Atlantic salmon Salmo salar* in northern Norway. Diseases of Aquatic Organisms; 2003; 54(3):259-63. 10. Enayat SR, Mohamed, El-Naggar M, Nagwa, 2003.