

PRELIMINARY INVESTIGATION OF PARASITES ON FISH SPECIES CAPTURED FROM A RESERVOIR AT KURMI BOMO, ZARIA, KADUNA STATE

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Abstract

Knowledge of natural parasites on wild fish will give an insight into how to sustain the wild fisheries resources and how to manage such parasites in cultured fish. Thus, this study sampled fish species caught from a reservoir located at research field of Institute for Agricultural Research (IAR), Kurmi Bomo, Zaria. This preliminary investigation was for 12 weeks between May 2019 and August 2019, passive gears were set out every fortnight and 5% – 20% of the fish caught were sampled. Floatation method was used to examine the samples for parasites on skin, buccal cavity, opercular cavity, gills, eyes, body cavity, musculature and brain. A total of 23 samples were examined which were *Oreochromis niloticus* (22) and *Clarias galmaensis* (1). The *Oreochromis niloticus* caught were 45% females and 55% males, while the only *Clarias galmaensis* caught was a male. Parasites were observed in 50% of the female *Oreochromis niloticus* and these were found in the body cavity (*Ascaris* spp, *Trichodina*, oocysts of coccidia and ova of hookworm) and eyes (oocysts of coccidia and trophozoites of ichthyophthirius), 8% of males had parasites. The male *O. niloticus* had an average condition factor $K=1.67\pm0.34$ while the female *O. niloticus* had $K=1.37\pm0.24$. This study concludes that more female *Oreochromis niloticus* are infected by different parasites and consumers are enjoined to ensure proper washing and adequate cooking of fish captured from the reservoir before consumption. The information on condition factor of *Oreochromis niloticus* is important for the management of fisheries resources in the reservoir.

Keywords: parasite, tissue, *Oreochromis niloticus*, fisheries management, reservoir

Introduction

Accurate fisheries statistics in the river and its adjoining flood plains is vital for the formulation of a sound fisheries management programme in the water body (Abowei, 2010). Fish harbour external or internal parasites which cause a host of pathological debilities in them, these parasites live at the host's expense, and may harm their hosts in several ways and affect fish production. (Iyaji and Eyo, 2008). The number of species of fish parasites already described is measured in thousands, and many more remain to be discovered (Wotten, 2012). It is important to document parasites associated with fish species in the wild as this will aid the understanding and management of such parasites in cultured fish. To the best of our knowledge, the reservoir at the Institute for Agricultural Research (IAR) is prominent for irrigation activities and secondarily for fishing and for drinking by cattle but there is dearth of information about the fisheries resources of this reservoir. Thus, this study was aimed at identifying parasites that occur in fish species present in IAR reservoir located in Kurmi Bomo, Zaria.

Materials and methods

The reservoir is part of research field for Institute for Agricultural Research (IAR), Ahmadu bello University, Zaria. It is located at Kurmi Bomo, Zaria. Fish samples were collected fortnightly using passive gears. The fish were taken live to the helminthology and parasitology laboratory at the Department of Veterinary Parasitology, Ahmadu Bello University, Zaria. At the laboratory, the fish were identified using a field guide described by Olaosebikan and Raji (1998). The fish were measured (standard length and total length) and weighed, this was used to determine the condition factor $K = w/L^3$ (w=weight in grams and L is total length in cm) as reported by Ricker, (1975). Parasites present in the tissues were observed using floatation technique. Floatation media which makes the parasite to float was used. This was prepared from 400g Zinc Sulphate and 150g of sucrose which was dissolved in 1 litre of warm water after which a few crystals of thymol was added for preservation to avoid fungal growth. The floatation media and sample were then mixed and slipped into the test tube. Extra floatation media was added to the test tube, the test tube was covered with a cover slip and allowed

to stand for 10 minutes before being viewed under the microscope. All data obtained were managed using excel software and analyzed using descriptive statistics.

Results and Discussion

Data on fish species caught from the reservoir during the study and parasites found on them is presented in Table 1. The fish species observed during the study were *O niloticus* and *Clarias galmaensis*. The total number of fishes sampled was twenty-three (23) where *O niloticus* was twenty two (22) while only one (1) *C galmaensis* was caught.

Among the *O niloticus* sampled, males account for 55% while females account for 45%. Within the male population sampled, 8% had parasitic infection which was *Costia* spp while 50% of the female had parasitic infection which were *Ascaris* spp, *Trichodina*, oocysts of coccidia and ova of hookworm found in the body cavity while oocysts of coccidia and trophozoites of ichthyophthirius were found in the eyes.

Table 1. Fish species observed at IAR reservoir and parasites found on them

Species of fish caught during the study	Proportion (n)
<i>Oreochromis niloticus</i>	
Male	55% (10)
Female	45% (12)
<i>Clarias galmaensis</i>	
Male	100% (1)
Female	0% (0)
Incidence of parasites on <i>O niloticus</i>	
Male	8% <i>Costia</i> spp
Female	50% Oocysts of coccidia and trophozoites of ichthyophthirius, <i>Ascaris</i> spp, <i>Trichodina</i> spp, oocysts of coccidia and ova of hookworm
Tissues where parasites were investigated	Parasites observed
Buccal cavity	None
Opercular cavity	None
Gills	None
Eyes	Oocysts of coccidia and trophozoites of <i>Ichthyophthirius</i> spp.
Body cavity	<i>Ascaris</i> spp, <i>Trichodina</i> spp, oocysts of coccidia and ova of hookworm.
Musculature	None
Brain	None
Condition factor of fish (K)	
<i>Oreochromis niloticus</i> male	1.67±0.34 ^a
<i>Oreochromis niloticus</i> female	1.37±0.24 ^a

Costia parasite is cosmopolitan in its distribution and can practically affect any fresh-water fish (Wootton, 2012), so the incidence of costia parasite on a male *O. niloticus* in this study may not imply that it is specific to males. *Ichthyophthirius* spp observed in this study has also been reported to be cosmopolitan and reported in fishes and may even cause losses in wild fish on occasions (Clayton and Price, 1994). The observation of coccidia in the eyes of *O. niloticus* is in line with Wootton (2012) who reported that coccidians are common parasites of both marine and fresh-water fish and more often found extraintestinally in fish than in higher vertebrates and can be very pathogenic.

Trichodinid group of peritrichs, which includes *Trichodina*, *Trichodinella* and *Tripartiella*, have been reported as important ectoparasites of fresh-water and marine fish worldwide (Lom and Dykova 1992) and Eyo et al., (2018) has also reported the incidence of *Trichodina heterodentata* in cultured *Clarias gariepinus* in Nigeria. So identification of *Trichodina* spp in this study is in line with earlier reports. It is worth noting that *Trichodina* spp observed in this study was in the body cavity which implies it can also be an endoparasite. Higher infection of females by parasites as compared to males observed in this study is also in line with Eyo et al., (2018) who reported higher but not significant incidence of *Trichodina* in cultured *C. gariepinus*.

The male *O. niloticus* observed in this study had a higher but not significant condition factor. Higher condition factor value is higher it means that the fish has attained a better condition. The condition factor of fish can be affected by a number of factors such as stress, sex, season, availability of feeds, and other water quality parameters (Khallaf et al., 2003). This implies that there was no significant difference in condition of *O. niloticus* observed in the reservoir based on sex during the period of survey.

Conclusion

The incidence of parasites observed in this study is an indication that fish caught from the reservoir should be properly washed and cooked to prevent public health issues.

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