



ORIGINAL ARTICLE

Volume 1 · Issue 1 · 2026 | DOI: 10.67994/v8nkph83

Prevalence of Gastrointestinal Parasites of *Clarias gariepinus* and *Oreochromis niloticus* fishes in Suleja, Niger State, Nigeria.

Jegede, O.C*, Olayemi, D.O. and Kuye, O.P.

Department of Veterinary Parasitology and Entomology, Faculty of Veterinary Medicine,
P.M.B. 117, University of Abuja, Nigeria.

* Corresponding author: Professor O.C. Jegede Email: olorunfemi.jegede@uniabuja.edu.ng

ABSTRACT

This study investigated the prevalence of gastrointestinal parasites of *Clarias gariepinus* (African catfish) and *Oreochromis niloticus* (Tilapia) sampled from fish ponds and open rivers in Suleja, Niger State, Nigeria. A total number of 100 fish specimens comprising 50 each of *C. gariepinus* and *O. niloticus* was examined between August and October 2025, using direct smear, flotation, and sedimentation parasitological techniques. The present study observed that the fishes sampled from open rivers showed significantly higher infection rates of 60% and 76%, for *C. gariepinus* and *O. niloticus* respectively; however, fishes sampled from the ponds did not have parasitic infections. This study shows a prevalence of gastrointestinal parasites of 73% and 50% for male and female catfish respectively, compared to their counterpart in tilapia species, 89% and 69%. Based on age, adult and juvenile catfish fishes had prevalence rates of 70% and 20% respectively, in comparison with tilapia, 93% and 55%. Gastrointestinal infections associated with the open rivers were more observed in the adults (93% and 70% of *O. niloticus* and *C. gariepinus*, respectively) than in the juveniles. The parasites identified include *Camallanus* spp., *Contracaecum* spp., *Capillaria* spp., *Echinostoma cinetorchis*, and *Neascus* spp. Statistical analysis showed significant differences ($p < 0.05$) in parasite prevalence based on sex and age of the fish. These findings establish the importance of proper fish culture, aquacultural management, and regular parasitic screening in both cultured and wild fish populations.

Keywords: *Clarias gariepinus*, Gastrointestinal Parasites, *Oreochromis niloticus*, Prevalence, Suleja

ARTICLE INFORMATION

Article History

Received: 27 February 2026

Revised: 30 May 2026

Accepted: 30 June 2026

Published: 23 September 2026

How to Cite

Jegede et al. (2026).

Prevalence of Gastrointestinal Parasites of *Clarias gariepinus* and *Oreochromis niloticus* fishes in Suleja, Niger State, Nigeria. *African Journal of Veterinary Sciences*, 1(1), 12–16.

Copyright & Licence

© 2026 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability

Data supporting the findings are available from the corresponding author on reasonable request.

Introduction

Fish farming has been practiced for decades and it remains the fastest-growing farming business globally (FAO, 2024; Obiero *et al.*, 2019). In the tropics, there has been tremendous increase in the development of fish farming and this is attributable to the increased need for

affordable animal protein obtained from fishes (Ogbu *et al.*, 2019). In Nigeria, fish serve as a vital source of high-quality protein and contribute significantly to nutrition and economic development (Agricultural Gross Domestic Product) of the country (Obiero *et al.*, 2019).

Clarias gariepinus and *Oreochromis niloticus* are among the most commercially important fish species found both in the tropical and subtropical regions, widely cultivated in ponds and some harvested from the open rivers (Adeleke *et al.*, 2020; Food and Agriculture Organization, 2022). Fishes are prone to many infectious disease-causing agents including zoonotic parasites such as *Anisakis* (Bao *et al.*, 2019). In fish farming or aquaculture, some parasites may be highly pathogenic and contribute to fish morbidity, mortality leading to economic losses. This may be attributed to environmental degradation and stress predisposing fishes to pathogen infection risks. (Adikwu, 1999). Previous studies by Paperna (1996) and Roberts (2012) revealed that freshwater fish parasites belong to group of parasites such as protozoans, trematodes, nematodes, cestodes and acanthocephalan. These parasites are found to be a burden in different parts of the fishes depending on the age, sex and location of water body (Iyaji and Eyo, 2008). In fish farming, some parasites may be highly pathogenic and contribute to high fish mortalities, economic loss and are of public health importance (Olofintoye, 2006; Kayis *et al.*, 2009). Damages caused by parasites on fish are not only reflected in economic losses, but they could also affect growth factors of the fish as well as their fecundity, vulnerability to predation and loss of stocks during and after disease outbreak (Emere and Egbe 2006).

This study, therefore, investigated the prevalence of gastrointestinal parasites of catfish and tilapia across aqua environments in the study area.

Material and Methods

Study area

The study was conducted in Suleja Local Government Area of Niger State, Nigeria. Suleja is known for its fishing and aquacultural activities. The geographic coordinates of Suleja are 9.1806° North latitude and 7.1794° East longitude. It is situated at the foot of the Abuchi Hills on the Iku River, just North of Abuja, in central Nigeria. The climate is characterized by a distinct rainy season and high humidity.

Sample Collection and Laboratory Analysis

A total of 100 fishes were sampled (50 each of catfish, *Clarias gariepinus* and tilapia, *Oreochromis niloticus*)

from both fishponds and open rivers. The fishes were transported in water-filled containers to the Parasitology Laboratory, Faculty of Veterinary Medicine, Yakubu Gowon University, Abuja Nigeria. The fishes were then sorted out based on size and sex before the further gastrointestinal parasite screening.

The gastrointestinal tract of each fish was dissected longitudinally, and contents from the oesophagus, stomach and intestines were analysed using, the direct method, flotation and sedimentation techniques. In the direct method, a small quantity of intestinal content was smeared on a microscope slide and examined immediately. Flotation technique involved allowing a well-mixed gut sample with a saturated salt-sugar solution with specific gravity of 1.280 in a test tube with cover slip on to stand for about ten minutes as described by Manisha *et al.* (2024), after which the cover slip was examined. In the sedimentation method, the gut content mixed with water was centrifuged and the aliquot of the sediments on the microscope slide was examined (Manisha *et al.*, 2024). Microscopic examination was at x40 objectives to observe for helminth eggs majorly, which were confirm from the Atlas by Soulsby (1982); Zajac & Conboy (2012).

Data Analysis

Data obtained were statistically analysed using simple statistical method such as Chi-square. Values of $P < 0.05$ were considered statistically significant.

Results

This study showed that out of the 50 each of catfish and tilapia sampled, 15 (30%) and 19 (38%) respectively were positive for various parasites as shown tables 1 and 2 and their prevalences fishes sampled from the ponds had no infections.

Tables 3 and 4 shows the prevalence of gastrointestinal parasites based on the aqua environment of catfish and tilapia. While Tables 5 and 6 shows the prevalence of gastrointestinal parasites of catfish and tilapia species base on their age distribution, Tables 6 and 7 depicts the their prevalence based on the Class of the parasites involved. This is also true for Tables 9 and 10 which show the prevalence of gastrointestinal parasites based on their species.

Table 1: Prevalence of gastrointestinal parasites (GIP) of *Clarias gariepinus* (Catfish).

Source	No. of fish sampled n=50	No. of positive for GIP	Prevalence (%)
Fishpond	25	0 (0%)	0
Open river	25	15 (30%)	60

$$\chi^2 = 12.19, p = 0.0005$$

Table 2: Prevalence of gastrointestinal parasites of *Oreochromis niloticus* (Tilapia)

Source	No. of fish sampled	No. of positive for GIP	Prevalence (%)
Fishpond	25	0	0
Open river	25	19	76

$$\chi^2 = 14.90, p = 0.0001$$

Table 3: Prevalence of gastrointestinal parasites of *Clarias gariepinus* in both fish pond and open river according sex.

Source	Sex	Number of examined	Number of infected	Prevalence (%)
Fishpond	Male	17	0	0
	Female	8	0	0
Total		25	0	0
Open river	Male	11	8	73
	Female	14	7	50
Total		25	15	60

 $X^2 = 12.62, p = 0.0055$
Table 4: Prevalence of gastrointestinal parasites of *Oreochromis niloticus* in both fish pond and open river according sex.

Source	Sex	Number of examined	Number of infected	Prevalence (%)
Fishpond	Male	14	0	0
	Female	11	0	0
Total		25	0	0
Open river	Male	9	8	89
	Female	16	11	69
Total		25	19	76

 $X^2 = 21.82, p = 0.0001$
Table 5: Prevalence of gastrointestinal parasites of *Clarias gariepinus* in both fish pond and open river according to age variation.

Location	Sex	Number of examined	Number of infected	Prevalence (%)
Fish pond	Juvenile	21	0	0
	Adult	4	0	0
Total		25	0	0
Open river	Juvenile	5	1	20
	Adult	20	14	70
Total		25	15	60

 $X^2 = 13.91, p = 0.003.$
Table 6: Prevalence of gastrointestinal parasites of *Oreochromis niloticus* in both fish pond and open river according age variation.

Location	Sex	Number of examined	Number of infected	Prevalence (%)
Fish pond	Juvenile	19	0	0
	Adult	6	0	0
Total		25	0	0
Open river	Juvenile	11	6	55
	Adult	14	13	93

Total	25	19	76
--------------	-----------	-----------	-----------

$\chi^2 = 12.10, p = 0.0071$.

Table 7: Class distribution of gastrointestinal parasites in catfish (*Clarias gariepinus*) from open rivers.

Parasite	Number of parasites	% of infection
Nematode	13	86.67
Cestode	0	0
Trematode	2	13.33
Total	15	100

Table 8: Class distribution of gastrointestinal parasites in tilapia fish (*Oreochromis niloticus*) from open rivers.

Parasite	Number of parasites	% of infection
Nematode	16	84.21
Cestode	0	0
Trematode	3	15.79
Total	19	100

Table 9: Species distribution of gastrointestinal parasites in catfish (*Clarias gariepinus*) from open rivers.

Parasite	Number of parasites	% of infection
<i>Camallanus</i> spp.	5	33.33
<i>Echinostoma cinetorchis</i>	2	13.33
<i>Contracaecum</i> spp.	8	53.33
Total	15	99.99

Table 10: Species distribution of gastrointestinal parasites in tilapia fish (*Oreochromis niloticus*) from open rivers.

Parasite	Number of parasites	% of infection
<i>Contracaecum</i> spp.	5	26.32
<i>Neascus</i> spp.	2	10.53
<i>Capillaria</i> spp.	8	42.11
<i>Camallanus</i> spp.	4	21.05
Total	19	100.01

Discussion

This study showed a significantly higher ($p < 0.05$) prevalence of gastrointestinal parasites in fish (60% and 70% of catfish and tilapia respectively) sampled from open rivers to those sampled from the ponds. This disparity is similar to the previous findings of Akinsanya *et al.* (2018), who reported greater parasite prevalence in wild fish due to the lack of controlled environmental conditions. The absence of parasites in pond-raised fish suggests that closed environments limit exposure to intermediate hosts, reducing infection risks. Fishes in the ponds are sometimes given medical attention when the need arises (Biu *et al.*, 2014). The higher ($p < 0.05$) infection rates in adult fish could be due to longer exposure time and greater food intake, factors which increase their contact with parasitic stages as reported by Omeji *et al.* (2011). The sex-based variations observed in this study with the higher ($p < 0.05$) prevalence rates in male fishes, could be attributed to the hormonal and behavioural differences influencing the susceptibility of the host to gastrointestinal parasites (Akinsanya and

Otubanjo, 2006). Age significantly influences the prevalence of gastrointestinal parasites in *Clarias gariepinus* and *Oreochromis niloticus* (Tables 5 and 6). Adult *Clarias gariepinus* and *Oreochromis niloticus* are generally more susceptible to gastrointestinal parasite infections than juveniles because they have longer exposure periods to parasite-infested environments. As fish grow older, they encounter a wider range of intermediate hosts and contaminated feeding grounds, thereby increasing the probability of acquiring infections (Kawe *et al.*, 2016). Adult fishes also consume larger quantities of food and exhibit more diverse feeding habits compared to juveniles. This broad feeding spectrum exposes them to infective stages of helminths, protozoans, cestodes, and nematodes present in aquatic organisms such as mollusks, crustaceans, insect larvae, and smaller fishes (Afolabi *et al.*, 2020).

The gastrointestinal parasites recovered from *Clarias gariepinus* and *Oreochromis niloticus* in this research, possess veterinary and public health importance and vary in zoonotic significance and pathological effects. They

infect humans either directly or indirectly through the consumption of raw, undercooked, smoked, or improperly processed fish. Fish-borne zoonotic parasites have become a growing concern globally due to increased fish consumption, aquaculture intensification, and poor sanitary handling of fish products (Chai *et al.*, 2005; Paperna, (1996). Among the parasites commonly reported in these fishes are *Camallanus* spp., *Echinostoma* spp., *Clinostomum* spp., *Contracaecum* spp., *Neascus* spp., and *Capillaria* spp., each of which varies in zoonotic significance and pathological effects. This study showed the dominance and consistency of nematodes with the ecology of freshwater systems that makes nematode larvae thrive. Gastrointestinal species such as *Contracaecum* spp., is a potential zoonotic parasite of public health importance. Therefore, the need for public health awareness for this parasite is highly recommended to the consumers, emphasizing the need for safe fish handling and cooking practices.

Acknowledgement

We acknowledge the Laboratory scientists for their efforts in assisting with the identification of the fish parasites.

Conflict of interest

We state that there is no conflict of interest.

References

- Adeleke, B., Nwanna, L. C., & Faturoti, E. O. (2020). Growth performance and economic viability of *Clarias gariepinus* and *Oreochromis niloticus* in aquaculture systems. *Aquaculture Reports*, 17, 100–510.
- Adikwu, L. A. (1999). Aquaculture in Nigeria: Prospects and constraints. *Journal of Fisheries Technology*, 1(1), 15–16.
- Afolabi, O. J., Olususi, F. C., & Odeyemi, O. O. (2020). Comparative study of African catfish parasites from cultured and natural habitats. *Bulletin of the National Research Centre*, 44(163), 1–9.
- Akinsanya, B., & Otubanjo, O. A. (2006). Helminth parasites of *Clarias gariepinus* (Clariidae) in Lekki Lagoon, Lagos, Nigeria. *Revista de Biología Tropical*, 54(1), 93–99.
- Akinsanya, B., Hassan, A. A., & Adeogun, A. O. (2018). Gastrointestinal helminth parasites of the fish *Synodontis clarias* (Siluriformes: Mochokidae) from Lekki Lagoon, Lagos, Nigeria. *Revista de Biología Tropical*, 66(4), 1628–1640.
- Bao, M., Pierce, G. J., Strachan, N. J. C., Pascual, S., González-Muñoz, M., & Levsen, A. (2019). Human health, legislative and socioeconomic issues caused by the fish-borne zoonotic parasite *Anisakis*: Challenges in risk assessment. *Trends in Food Science & Technology*, 86(4), 298–310.
- Biu, A. A., Diyaware, M. Y., Yakaka, W., & Joseph, E. (2014). Incidence of parasites in fish of Lake Alau, Borno State, Nigeria. *Nigerian Journal of Fisheries and Aquaculture*, 2(1), 74–80.
- Chai, J. Y., Murrell, K. D., & Lymbery, A. J. (2005). Fish-borne parasitic zoonoses: Status and issues. *International Journal for Parasitology*, 35(11–12), 1233–1254.
- Emere, M. C., & Egbe, N. E. L. (2006). Protozoan parasites of *Synodontis clarias* (a freshwater fish) in River Kaduna. *The Best Journal*, 3(3), 58–64.
- Food and Agriculture Organization of the United Nations. (2024). *The state of world fisheries and aquaculture 2024*. Rome, Italy: FAO.
- Iyaji, F. O., & Eyo, J. E. (2008). Parasites and host site specificity among cichlids in a tropical freshwater river. *Animal Research International*, 5(1), 780–784.
- Kawe, S. M., God'spower, R. O., Balarabe, M. R., & Akaniru, R. I. (2016). Prevalence of gastrointestinal helminth parasites of *Clarias gariepinus* in Abuja, Nigeria. *Sokoto Journal of Veterinary Sciences*, 14(2), 26–33.
- Kayis, S., Ozcelep, T., Capkin, E., & Altinok, I. (2009). Protozoan and metazoan parasites of cultured fish in Turkey and their treatment. *Israeli Journal of Aquaculture-Bamidgeh*, 62(2), 93–102.
- Manisha, M., Gunyai, C., & Dasai, J. (2024). Principles and practices of canine and feline clinical parasitic disease. doi:10.1002/9781394158256.ch17
- Obiero, K., Meulenbroek, P., Drexler, S., Dagne, A., Akoll, P., Odong, R., & Waidbacher, H. (2019). The contribution of fish to food and nutrition security in Eastern Africa: Emerging trends and future outlooks. *Sustainability*, 11(6), 1636. doi:10.3390/su11061636
- Ogbu, U. M., Okorafor, U. P., Unigwe, C. R., & Odah, S. I. (2019). Prevalence of common protozoan parasites of *Clarias gariepinus* from fish ponds in Ibadan. *IOSR Journal of Agriculture and Veterinary Science*, 13(12), 26–30.
- Olofintoye, L. K. (2006). Parasitofauna in some freshwater fish species in Ekiti State, Nigeria. *Pakistan Journal of Nutrition*, 5(4), 359–362.
- Omeji, S., Solomon, S. G., & Idoga, E. S. (2011). A comparative study of the common protozoan parasites of *Clarias gariepinus* from the wild and cultured environments in Benue State, Nigeria. *Journal of Parasitology Research*, 4(2), 89–96.
- Paperna, I. (1996). *Parasites, infections and diseases of fishes in Africa: An update*. Rome, Italy: Food and Agriculture Organization.
- Roberts, R. J. (2012). *Fish pathology* (4th ed.). Chichester, England: Wiley-Blackwell.
- Shamsi, S., & Butcher, A. R. (2011). First report of *Contracaecum* sp. larvae (Nematoda: Anisakidae) in *Oreochromis mossambicus* (Peters) (Pisces: Cichlidae) in Australia. *Journal of Fish Diseases*, 34(11), 913–917.
- Soulsby, E. J. L. (1982). *Helminths, arthropods and protozoa of domesticated animals* (7th ed.). London, England: Baillière Tindall.
- Zajac, A. M., & Conboy, G. A. (2012). *Veterinary clinical parasitology* (8th ed.). Ames, IA: Wiley-Blackwell.