



HELMINTH PARASITES OF MOCHOKID *Synodontis resupinatus* IN A FRESHWATER ECOSYSTEM IN THE LOWER NIGER RIVER, KOGI STATE, NIGERIA

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Abstract

The isolation and identification of helminth parasites of *Synodontis resupinatus* and; Length – weight relationship of the fish in the lower Niger (Idah), Nigeria were carried out in order to describe the pattern of occurrence of the helminth and to establish the well-being of the host fish. 112 randomly fish samples were obtained from fishermen and transported to the Biological Science Laboratory, Kogi State University, Anyigba for analysis. Fish skin, fins, eyes, anus, intestinal organs, buccal and opercula cavities were cut open and placed in 0.9% physiological saline and examined under a dissection microscope. Helminthes recovered were counted and preserved in 0.9% saline solution and kept overnight in the refrigerator to enable them stretch and relax. Five genera of helminthes were isolated and identified namely, Capillaria (11.6%), Camallanus (17.7%), Contracaecum (11.6%) and Posthodiplostomum (59.1%) with prevalence rate of 26.4% respectively. The standard length and weight were taken to ascertain the general wellbeing of the fish in the water body. The length weight relationship of the fish revealed that the specie exhibit positive allometric growth. The need for seeds from the wild to be evaluated for the presence of helminth parasites prior to use and periodically during culture practice is also stressed.

Keywords: Isolation, Nematode, Trematode, Skin, Gills and Fins.

Introduction

Catfish is a common name for about 2,200 species of fishes that make up the order Siluriformes and class Actinopterygii (ray-finned fishes) (Chambers, 2007). These two families of the order Ariidae and Plotosidae are primarily marine while all other families are freshwater dwellers. Catfishes are a collection of scaleless, tenacious fish mostly nocturnal scavengers that have adapted to life in a variety of environments with some living near the bottom in shallow waters.

Fish, like all living organisms, are susceptible to infections with various parasites (Hilderbrand *et al.*, 2003). Chief among the parasites afflicting fish are the helminths. Helminths comprising nematodes, trematodes, cestodes and acanthocephalan commonly parasitize both wild and cultured fish with the former constituting heavier parasitic burden (Merck, 2006). Direct association of wild species with cultured fish farms has been established as a way of contaminating cultured fish by parasites (Okaeme and Olufemi, 1997). Use of wild fish as parent broodstock for most cultivated fish species in Africa is another way these parasites are introduced to commercial fish culture.

The wellbeing, robustness and degree of fatness of fish is a measure of its condition factor with respect to the same species taken from other water bodies or to other species of fish taken from the same water body (Pauly, 1983). It is expressed by relating length of fish to its weight. A plump or fat fish will give a higher condition factor than a lean and thin fish. Lower value means that the fish are in poor condition which may be a reflection of either over population or outbreak of diseases (Gupta and Gupta, 2006).

Materials and Methods

Study Area

The study area (Fig 1) is the lower Niger (Idah) area of Nigeria. Located on latitude 7° 06'N and longitude 6° 43'E of the Greenwich Meridian in the Guinea Savannah vegetation zones of Nigeria.

A total of 112 fish samples of *S. resupinatus* of different sizes caught by fishermen using gillnets, cast net and hook and line at Idah area of the lower Niger were identified, bought and transported alive to the Biological Science laboratory, Kogi State University, Anyigba between January and August 2008 for the study.

The skin, fins, eyes, anus, intestinal organs, buccal and opercula cavities of fish were cut open and placed in 0.9% physiological saline and examined under a dissecting microscope. Helminthes recovered were counted and placed in saline solution (0.9%) which was kept overnight in refrigerator to enable them stretch and relax. They were later fixed and preserved in 70% alcohol.

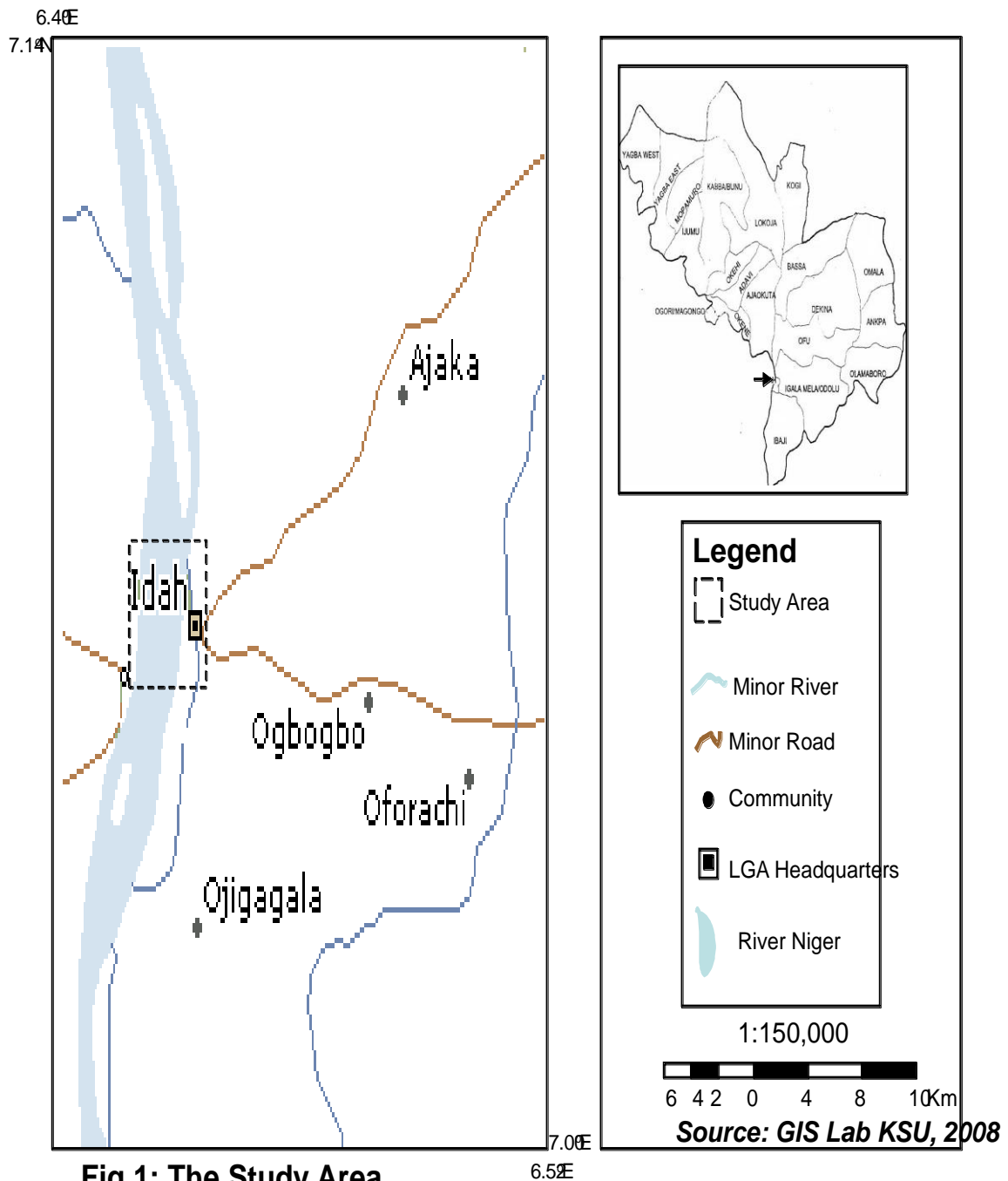


Fig.1: The Study Area

The helminths were stained over night with weak Erlich's haematoxylin; and dehydrated in graduated alcohol (30%, 50%, 70%, 90% and absolute) for 45 minutes, cleared in methyl - salicylate and mounted on a slide in Canada balsam. The occurrence (prevalence, mean intensity and abundance) of the helminths on the *Synodontis* fish hosts was determined by standard procedures described by Bush *et al.*, (1997) With the aid of a measuring board and sensitive Mettler weighing balance, the total length (cm), standard length (cm) and weight (g) of each fish sample was measured fresh to the nearest 0.1cm and 0.1g respectively. The length weight relationships were estimated from the allometric formula, $W = aL^b$, where W is total body weight (g), L the total length (cm), a and b are the coefficients of the functional regression between W and L (Ricker, 1973).

Result

Grouping of the fish into 6 categories according to standard length (SL) showed that every group had helminth infection but the group with highest parasitism was the 0.0 – 5.7 cm group as it had prevalence rate of 100%; this group had mean intensity and mean abundance of 18.0. Mean intensity was highest for the SL group 6.2 – 27.9 cm (Table 1). A total of 36 helminth parasites comprising Nematode, and trematode were isolated from four predilection sites of the sampled fish, the skin, gills, fins and small intestine. The types and pattern of helminth parasites isolated from *Synodontis resupinatus* species are Nematodes, 12 (40.9%) and Trematode, 24 (59.1%) respectively (Table 2).

The pattern of helminth parasites occurrence in relation to season of the year is as shown in table 3. Sixty six (66) fish were sampled for wet season, out of which 7 (21.1%) were infected, mean intensity 5.1 and mean abundance 0.6 of helminth parasites occurrence were recorded. In dry season, forty six (46) fish were sampled with no infection (Table 3).

Table 1: Pattern of helminth parasites occurrence in *Synodontis resupinatus* in relation to sex

Sex	Fish examined	Fish infected	Helminth recovered	Prevalence rate (%)	CI 95%	Mean intensity	Mean abundance
Female	71	4	23	5.63	5.58-5.68	5.8	0.3
Male	41	3	13	7.32	7.24-7.40	4.3	0.3
Combined	112	7	36	6.25	6.21-6.29	5.1	0.3

CI = Confidence Interval at 95% level of significance.

$CI = \pm Z \times \sqrt{P(1-P)/n}$ where P = Prevalence rate/100, $Z = 1.96$, n = no of fish examined.

Table 2: Pattern of helminth parasites occurrence in *Synodontis resupinatus* in relation to standard length .

Standard length	Fish examined	Fish infected	Helminth recovered	Prevalence rate (%)	CI 95%	Mean intensity	Mean abundance
5.0-9.9	95	5	24	5.26	5.22-5.30	4.8	0.3
10.0-14.9	14	1	1	7.14	7.01-7.27	1.0	14.0
15.0-19.9	2	1	11	50.0	49.31-50.69	11.0	5.5
20.0-24.9	-	-	-	-	-	-	-
25.0-29.9	1	-	-	-	-	-	-
Total	112	7	36	6.25	6.21-6.29	5.1	0.3

Table 3: Pattern of helminth parasites occurrence in *Synodontis resupinatus* in relation to weight.

Weight	Fish examined	Fish infected	Helminth recovered	Prevalence rate (%)	CI 95%	Mean intensity	Mean abundance
1-50	109	6	25	5.50	5.46-5.54	4.2	0.2
101-150	1	1	11	100.0	-	11.0	11.0
151-200	1	-	-	-	-	-	-
251-300	1	-	-	-	-	-	-
Total	112	7	36	6.25	6.21-6.29	5.1	0.3

Discussion and Recommendation

The result of this study revealed the occurrence of four helminth parasites in *Synodontis resupinatus* in the lower Niger (Idah) Nigeria. The four parasites belonged to Nematoda and Trematoda. The large number (36 worms) of helminth infection recorded indicated that helminths were considerable parasites of the *Synodontis* species studied. This agrees with the study of and Owolabi (2008).

The parasites recovered from the fish were *Capillaria*, *Camallanus*, *Contraceacum* and *Posthodiplostomum* species. According to the host parasite checklist on African freshwater fishes of Khalil and Polling (1997) and other relevant studies, the present work is the first scientific record of *Camallanus*, *Contraceacum* and *Posthodiplostomum* species in the *Synodontis* species examined.

The LWR of *S. resupinatus* revealed positive allometric growth with 'b' value of 3.25. Similar relationships have been reported for other fishes Olatunde, (1989) for *S. schall* and Fafioye and Oluajo (2005) for *Clarias gariepinus* and *Ilisha africana* respectively.

It is therefore recommended that fish seeds from the wild should be examined for the presence of helminth parasites prior to use and periodically during culture practice. Awareness should also be created on the socio – economic and human health implications of eating infected fish among the fisher folks and the general public.

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