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OCCURRENCE OF PARASITES IN *PSEUDOTOLITHUS ELONGATUS AND CYNOGLOSSUS SENEGLENSIS* IN CROSS RIVER ESTUARY, NIGERIA.

J. T. ABRAHAM and P. A. AKPAN

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ABSTRACT

Pseudotolithus elongatus and *Cynoglossus senegalensis* were examined for ectoparasites and endoparasites in dry and wet season months (November 2002 – April, 2003 and May-October 2003). 96% (76) out of 400 specimens of *Pseudotolithus elongatus* examined were found to be infected by *Capillaria sp, Acanthocephala sp* and *Diplostomum commutatum*. 37% (148) of *Cynoglossus Senegalensis* were also found to be infected by only *Diplostomum commutatum*. 17.5% (35), 2.5% (5) and 3.5% (7) of *Pseudotolithus elongatus* were infected by *Capillaria sp, Acanthocephala sp* and *Diplostomum commutatum* respectively during wet season months and 12.5% (25), 0.5% (1) and 3.5% (7) of these parasites respectively during dry season months. Prevalence of 23%, 3% and 5.5% respectively were recorded for these parasites in *Pseudotolithus elongatus*. Mature *Diplostomum commutatum* were isolated from *Cynoglossus Senegalensis* while only the metacercaria of the parasite were isolated from *Pseudotolithus elongatus*. The parasites isolated from the fish species examined are likely to be responsible for some fish borne infections.

KEYWORDS: Examined, Infected, Parasites, Prevalence, Isolated.

INTRODUCTION

Parasites are known to infect almost all known animals on earth. Parasites like Nematodes, Protozoa, Trematodes, Cestodes, and Crustacea groups are known to infect fish such as *Clarias, Hyppoglossus* and *Chrysicthys sp.* Sinderman (1966) included fish among the most parasitized vertebrate group. All organs system of fish can be infected by parasites:

Khan et al, (1991) isolated *Trypanosoma raiae*, *Trypanosoma nurmanensis* and *Haemohormidium delagei* from blood of benthic marine fishes. Also *Hyppoglossus hippoglossus* was found to accommodate helminthes like Cestodes, Acanthocephala and Nematodes in it's alimentary canal (Scoth and Bray, 1989 and Wilhelm and Kothekar, 1991). Prevalence of parasites in fish may be so high that almost the entire specimens obtained from a given body of water is infected. For instance Baker and John (1976) observed that all channel cat fish, *Ictalurus punctatus ratinesque* from island region of Western Lake Erie were infected by parasites.

The importance of fish protein in Calabar (Cross River State – Nigeria) cannot be overemphasized. There is hardly any home, daily without fish in meals. Fish is eaten without any information on the possibility of parasite infestation. A high rate of spread of infection would be recorded in a survey of disease spread through infected fish, especially fresh fish. Thus research into occurrence of parasites in fish and subsequent public information on findings obtained from such research will enhance consumer awareness which is a basic criteria for control of fish borne infections.

MATERIALS AND METHODS

A. **Collection of samples:**

A total of Two hundred (200) specimens of *Cynoglossus senegalensis* and Two hundred specimens of *Pseudotolithus elongatus* were collected from fishermen at Cross River Estuary during wet season months (May-October). Also Two hundred (200) specimens of each fish species were collected during dry season month (NOVEMBER – APRIL). All specimens were examined for ectoparasites and endoparasites.

A. 1 Length Measurement.

Length of fish was obtained by means of graduated board.

Length in centimeter were taken and recorded in intervals of 10 cm. Observations on relativity of fish length and number of parasites were recorded.

A. 2 Weight Measurement.

Fish weight was obtained by means of beam balance. Weight was recorded in grams. Observations were made on fish weight relative to infection.

B Examination Of Fish For parasites;

B. 1 Examination for Endoparasites.

Three organs namely gills, Intestine and stomach were examined for endosparasite using the method described by Fernando et al (1972)

B. 1.1. Examination of Gills.

The gill arches were excised into petri dish containing 4% formation solution: This allows the parasite to fix. The filament was scraped into another Petri dish containing 5% formalin and allowed to

J. T. ABRAHAM, Department of Biological Science, C.R. State University of Technology, P.M.B. 1115, Calabar - Nigeria
P. A. AKPAN, Department of Biological Science, C.R. State University of Technology, P.M.B. 1115, Calabar - Nigeria

sediment. The supernatant was decanted and sediment examined with the aid of microscope for parasites.

B. 1.2 Examination of Intestine and Stomach.

The intestine and stomach were separated. Each was cut open and placed in separate Petri dish containing 4% formalin. This enhanced the detachment of the parasites from the organs. The content of these organs were scrapped into water in separate test tube. Each test tube was shaken vigorously. The supernatant was decanted and the sediment examined for parasites with the aid of microscope.

B.2 Examination for Ectoparasite

The body of each specimen was thoroughly examined for adult ectoparasite with the aid of a hand lens. Each specimen was later gently scrapped into saline solution and centrifuge for 500 r.p.m for 5 minutes. The supernatant was decanted and the sediment examined for parasites with the aid of microscope

RESULTS

Capillaria sp, Acanthocephala sp and *Diplostomum commutatum* were isolated from the two fish species examined. However, prevalence of the parasites varied in the fish.

A. *Pseudotolithus elongatus*

1. Endoparasite

(Table 1) shows endoparasites recovered from *Pseudotolithus elongatus.* The gill of *Pseudotolithus elongatus* was found to be totally without any parasite. However, *Capillaria sp, Acanthocephala sp* and *Diplostomum commutatum* were isolated from the stomach and intestine of the fish. The first two parasites mentioned were isolated in adult form both in the stomach and intestine while only matacercaria of *Diplostomum commutatum* was found in the intestines.

Only 19% (76) of all specimens of *Pseudotolithus elongatus* examined were found to be

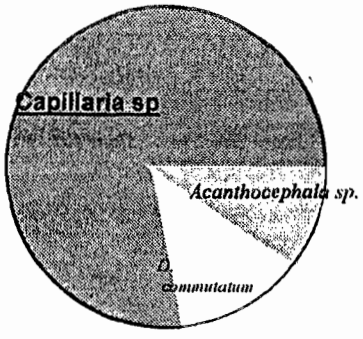

Figure 1: Number of *Pseudotolithus elongatus* infected by different parasite

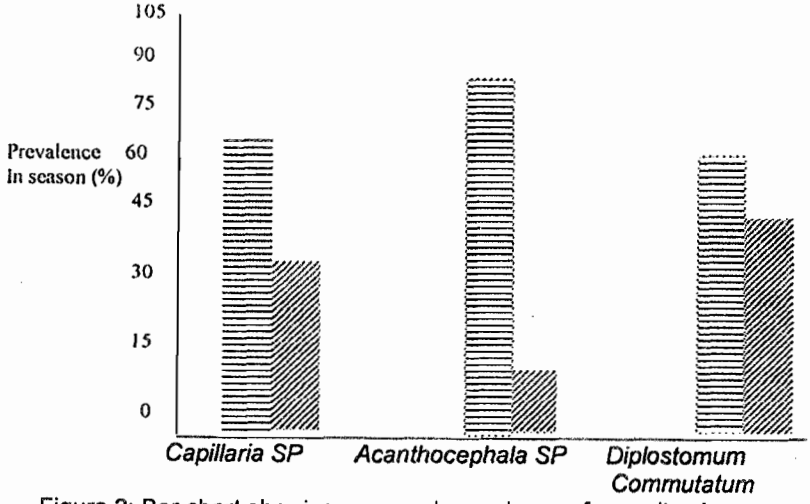

Figure 2: Bar chart showing seasonal prevalence of parasites in *Pseudotolithus elongatus*

Table 1 Endoparasites recovered from *Pseudotolithus elongatus*

FISH LENGTH (CM)	No of fish examined		*Capillaria sp*						*Acanthocephala sp*						*Diplostomum commutatum*					
			No of fish infected		No of parasite isolated		% infection		No of fish infected		No of parasite isolated		% infection		No of fish infected		No of parasite Isolated		% infection	
	W	D	W	D	W	D	W	D	W	D	W	D	W	D	W	D	W	D	W	D
1-10	40	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-20	40	40	12	7	21	13	30	17.5	2	-	4	-	5	-	4	3	6	10	10	7.5
21-30	40	40	10	9	13	9	25	22.5	3	1	7	1	1	2.5	1	-	2	-	2.5	-
31-40	40	40	6	6	14	4	15	15	-	-	-	-	7.5	-	1	-	2	-	2.5	-
41-50	40	40	7	3	19	8	17.5	7.5	-	-	-	-	-	-	1	-	2	-	2.5	-
													-	-			2	-	2.5	-
TOTAL	200	200	35	25	58	34			5	1	11	1			7	3	12	10		

infected. The number of the fish infected by different parasites is shown in figure 1. Fish length between 11cm and 20cm, were found to contribute 36.95% of total *Capillaria* warm recovered. 23.9% from 21cm and 30cm and 19.5% each from length 31cm and 40cm and 41cm and 50cm. Fish length between 21cm and 30cm recorded the highest occurrence of *Acanthocephala sp* (66.7%), while fish length between 11cm and 20cm had 33.3%. Fish above 30cm was not infected by *Acanthocephala sp*. 72.7% of metacercaria of *Diplostomum commutatum* were isolated from fish length between 11cm and 20cm. The remaining 27.3% were recovered from all other lengths. No parasite was recovered from fish below 11cm.

The number of fish infected and prevalence of all isolated parasites differed in wet and dry seasons. Seasonal prevalence of each parasite is shown in figure 2 while prevalence of each parasite is shown in figure 3

The percentage and number of specimens of *Pseudotolithus elongatus* infected by *capillaria sp*, *Acanthocephala sp* and *Diplostomum commutatum* were 17.5% (35), 2.5% (5) and 3.5% (7) respectively. These parasites recorded in dry season 12.5% (25), 0.5% (1) and 3.5% (7) Specimens respectively. *Capillaria* worm and *Acanthocephala* occurred together in 6.5% (13) specimen during wet season and 2.5% (5) specimen in dry season. *Diplostomum commutatum* was not found associated with any other parasite in any of the specimens

W = Wet Season

D = Dry Season

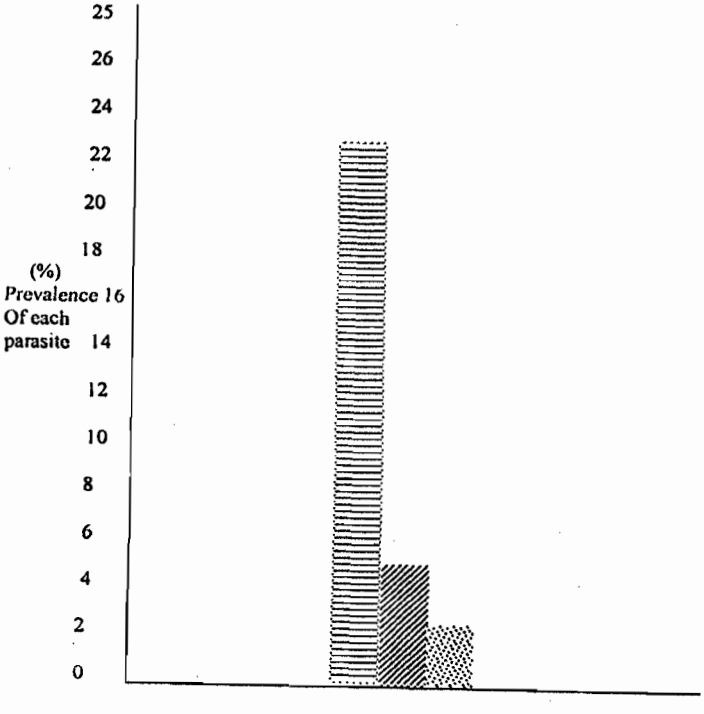

Figure 3: Prevalence of each parasite in *Pseudotolithus elongatus*

KEY

Capillaria sp

Diplostomum commutatum

Acanthocephala sp

2. Ectoparasite:

No. parasite was recovered from the body of *Pseudotolithus elongatus* and *Cynoglossus senegalensis*

B ***Cynoglossus senegalensis***

The only parasite isolated from *Cynoglossus senegalensis* was *Diplostomum commutatum*. However, while only metacercaria of the worm was recovered from *Pseudotolithus elongatus*, adult stage of this parasite was recovered from this fish. 37% (148) of all *Cynoglossus senegalensis* examined had this cestode only in the intestine. Samples obtained ranged between 35cm and 55cm and parasites were recovered from this length range.

Worm burden was observed not to be related to fish weight

DISCUSSION

The prevalence of parasites in *Pseudotolithus elongatus* and *Cynoglossus senegalensis* is low. However, this would not be reason to ignore future research because every epidemic advanced from sporadic conditions. Many people in Calabar may be carrying parasitic infection from fish, a source, which normally is overlooked.

The occurrence of *Capillaria* in *Pseudotolithus elongatus* agreed with Thieme (1964) who isolated this parasite not only in the intestine of the fish but also in the nostrils, and fins. However, while Wiko (2000) reported 27.3% prevalence of the parasite in *Pseudotolithus elongatus*, 23% was observed in this work with fish ranging in length between 11cm and 20cm having the highest occurrence. The differences in prevalence can be accounted for in terms of study area, time of study and dynamics of fishery which may change with time.

The work of Wilhelm and Kothekar (1991) on eel and perch incriminated *Acanthocephala* as one of the parasites in the intestine of *Hyppoglossus hippoglossus*. The location of the parasite in the host remain the same in *Pseudotolithus elongatus* which is here added as one of the definitive host. The prevalence of 3% observed, though very low, needs attention. This spiny headed worm is known to cause perforation of the gut wall and precipitate a fatal peritonitis (Chandler and Read 1961). The synergistic occurrence of *Capillaria sp* with *Acanthocephala sp* in *Pseudotolithus elongatus* shows in one part that these two worms can reach a stage of tolerance in the same host and also that *Pseudotolithus elongatus* offers a conducive definitive environment for their co-existence.

It may be suggested that *Diplostomum commutatum* use *Pseudotolithus elongatus* as intermediate host because only metacecaria of the fluke were isolated from the fish. Difficult to ascertain is whether the parasite was still in it's developmental stages. Moreso, the total absence of mature parasites make the former suggestion more remote. The case is different in *Cynoglossus senegalensis* where 37% of all specimens were found to host mature stage of *Diplostomum. commutatum* with prevalence of 45%. Evident from the stages of the parasite observed is possible transfer of stages of *Diplostomum commutatum* from *Pseudotolithus elongatus* to *Cynoglossus senegalensis* for attainment of reproduction

Fish between the length range of 21cm – 30cm were infected by all isolated parasite. Ikpeme (2002) suggested this length range as a distinct spawning age group. Spawning begins with migration to suitable reproductive sites. Migration exposes fish to water bodies with different biological, physical and chemical parameter all of which can promote survival and reproduction of parasites. Thus, the greatest parasite burden among this length group. Total absence of parasites in length group 1cm – 10cm suggest inability of the internal environment of the fish in this length group to support parasite growth or existence.

Length of fish have been converted to age. The longer the fish, the older is the fish (Lunghurst 1966). Older fish hardly come to water surface where mature parasites can possible thrive and sort for host. So larger fish have less parasite burden.

Fish abundance has little effect on parasite infection. This can be inferred from the fact that though *Pseudotolithus elongatus* has greatest abundance during dry season months of the year, more fish were infected during wet season (rainy season). Possibly rain water run off into rivers increase parasite prevalence during wet season by washing soil surface where parasites may be suspended into water.

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