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Parasitofauna in Some Freshwater Fish Species in Ekiti State, Nigeria

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Abstract: A total of 617 freshwater fishes comprising of 181 (29.3%), 211 (34.2%) and 225 (36.5%) of Tilapia zilli, Clarias anguillaris and *Clarias gariepinus* respectively were examined for helminth parasites. Out of these 386 62.6%, C.I =0.58 – 0.68 were infected. *Cuculanus* species (a nematode) accounted for the highest prevalence 249 (40.4%, C.I.=0.35-0.45) in the fish species examined. There were significant differences in the occurrence of *Monobothrium* (F=1.29; P<0.05 *P. Clariae* (F= 3.92; P<0.05) and *N. rutili* (F= 1.07; P < 0.05) in the Gastrointestinal tract of fish species examined. The prevalence of infection in the fish species examined increases with their standard length and body weight. The prevalence of infection in male and female fish species except *C. anguillaris* was statistically significant (P>0.05).

Key words: Parasitofauna, *Monobothrium*, fresh water fish

Introduction

The demand for freshwater fish species for protein consumption in Ekiti State is a signal to sreen for parasitic infections in these freshwater fish species. Although studies on the biology, nutrition, growth and management of *Tilapia zilli, Clarias anguillaris and Clarias gariepinus* have been carried out (Eyo and Olatunde, 2001 and Ovie and Ovie, 2002).

Van Dan Brock (1979) revealed that the pathological conditions arising from parasitic infections which lead to serious consequences especially the nutritive devaluation of the fish. In addition to this, allergic responses to toxic waste products of the parasites may be evident by the consumers of the infected fish (Ukoli, 1990).

However, myriad of parasites are associated with *Tilapia zilli, Clarias anguillaris and Clarias gariepinus* in their natural habitats, where they cause morbidity, mortality and economic losses in fish production in the world (Khalil and Thurstom, 1973; Subashinghe, 1995). Therefore, this study is aimed at screening the three common attainable freshwater fish species *Tilapia Zilli, Clarias anguillaris and Clarias gariepinus* for parasitic infections in Ekiti State.

Materials and Methods

A total of 617 freshwater fishes comprising of 181 (29.3%), 211 (34.2%) and 225 (36.5%) of *Tilapia zilli, Clarias anguillaris and Clarias gariepinus* respectively were purchased alive from fresh fish sellers in various centres in Ekiti State in 2005. The fish specimen were transported to the Laboratory for weight (g) and standard length (cm) measurements and sexes were also determined.

The parasites recovered from fish stomach, intestine, rectum and gill slits were fixed in hot 4% formaldehyde and cleared with glycerine for examination. After examination, the specimens were stored in vials with 70% ethanol. The parasites were identified using Yamaguti (1959 and 1961), Cheng (1973) and Paperna (1996). Analysis of variance (Anova) statistics and students t-test were used. Significance was taken at p< 0.05.

Results and Discussion

Out of the 617 fresh fish examined, 386 (62.6%, C.I = 0.58-0.68) were infected with helminth parasites. *Cuculanus* sp accounted for the highest prevalence 249 (40.4%, C.I. = 0.35-0.45) in the fish species examined and *Neochinorhynchus rutili* had the least prevalence 7(1.1%,C.I. = 0.001-0.02) (Table 1). The high prevalence of *Cuculanus* sp among other helminth species in T. zilli 33 (18.2%), C.I = 0.1-0.26), *C. anguillaris* 110 (52.1%) , C.I = 0.44-0.60) and *C. gariepinus* 106 (47.1%, C.I = 0.39-0.55) could suggest adaptive behaviour of nematode in relation to host specificity.

The overall prevalence of 62.6% of helminth parasites observed in this study compared well with the observation of Fagbuaro *et al.* (2004) Ugwuzor 1987 and Onwuliri and Mgbemena (1987) but higher than the observation of 34.6% prevalence of infection by Anosike *et al.* (1992). This suggests that the occurrence of parasitism varied from one habitat to the other which could be due to host - parasite relationship and abiotic factors (Anderson, 1992).

Table 2 shows that there were significant differences in the occurrence of *Monobothrium* (F= 1.29; P<0.05), P Clariae (F= 3.92; P<0.05) and *N. rutili* (F= 1.07; P<0.05) in the gastrointestinal tract of fish species examined. However, the occurrence of P. laevionchus and *Cuculanus* were not significant (F=29.72 and F= 26.54 at P <0.05) respectively. The affinity of nematode parasites *(P. laevionchus* and *Cuculanus*) and *Cestodes* (*Monobothrium* and *P. Clariae* to the intestinal region

Table 1: Prevalence of intestinal Helminth Parasites in fish species examined

Parasites	Taxonomic Group	*Tilapia zilli* n=181		Clarias *anguillaris* N=211		*Clarias gariepinus* N=225		Total no of fish N=617	
		No (%) of fish infected	C.I*	No (%) of fish infected	C.I*	No (%) of fish infected	C.I*	No (%) of fish infected	C.I*
Procamellanus Laevionchus	Nematoda	26 (14.4)	0.06-0.22	22(10.4)	0.05-0.15	32(14.2)	0.09-0.19	80(12.9)	0.10-0.16
Cuculanus sp	Nematoda	33(18.2)	0.1-0.26	110(52.1)	0.44-0.60	106(47.1)	0.39-0.55	24(40.4)	0.35-0.45
Monobothrium sp	Cestoda	3(1.7)	-0.01-0.05	9(4.3)	0.01-0.07	7(3.1)	0.0-0.06	19(3.1)	0.01-0.05
Polyonchobothrium Clariae	Cestoda	17(9.4)	0.03-0.15	2(0.9)	0.85-0.95	12(5.3)	0.02-0.08	31(5.1)	0.03-0.07
Neochinorhynchus ritili	Acanthocephala	3(1.7)	-0.01-0.05	0(0.0)	0.0-0.0	4(1.8)	0.0-0.04	7(1.1)	0.01-0.02
Total		82 (45.3)	0.34-0.56	143 (67.8)	0.60-0.76	161 (71.6)	0.65-0.79	386 (62.6)	0.58-0.68

C.I*=95% confidence interval

Table 2: The occurrence of *Monobothrium*, P Clariae and *N. rutili* in the gastrointestinal tract of fish species examined

Fish Species	*Procamellanus Laevionchus*				*Cucullanus Species*				*Monobothrium Species*				*Polyonchobothrium Clariae*				*Neochinorhynchus rutili*			
	S	I	R	G	S	I	R	G	S	I	R	G	S	I	R	G	S	I	R	G
T. zilli	0	71	0	0	7	94	0	0	21	10	0	0	20	23	0	0	20	8	0	1
C.anguillars	2	90	0	9	47	108	0	12	4	20	0	5	4	20	0	5	2	1	0	2
C.gariepinus	9	48	0	11	46	86	0	20	10	7	0	0	5	17	0	0	3	5	0	4
Total	11	209	0	20	100	288	0	32	35	37	0	5	29	60	0	5	25	14	0	7

S= Stomach. I= Intestinals. R=Rectum. G = Gill slits. The occurrence of *Monobothrium, P. clariae* and *N rutili* were significant (F=1.29; F=3.92 and F=1.07 at P<0.05> respectively and the occurrence of *P. laevionchus* and *Cuculanus* were not significant (F=29.72 and F= 26.54 at P<0.05) respectively.

Table 3: Prevalence (%) of intestinal Helminth infection in fish species collected in relation to their standard length

Standard length (cm)	*T. zilli* n=18			*C. anguillaris* n=211			*C. gariepinus* n=225		
	No(%) fish Examined	No (%) of fish infected	Total no (%) of parasites recovered	No (%) fish Examined	No (%) of fish infected	Total no % of parasite recovered	No (%) of fish Examined	No (%) of fish infected	Total no (%) of parasite recovered
10 – 19.9	8 (4.4)	(0.0)	(0.0)	4 (1.9)	(0.0)	(0.0)	8 (3.6)	(0.0)	(0.0)
20 – 29.9	34 (18.8)	2 (5.9)	10 (3.6)	11 (5.2)	(0.0)	(0.0)	14 (6.2)	(0.0)	(0.0)
30 – 39.9	101(55.8)	54 (53.5)	152(55.3)	51 (24.2)	32 (62.7)	41 (14.4)	50 (22.2)	31 (62.0)	67 (24.7)
40 - .49.9	25 (13.8)	17 (68.0)	77 (28.0)	95 (45.0)	71 (74.7)	161(56.7)	108(48.0)	92 (85.2)	148 (54.6)
50 – 59.9	13 (7.2)	9 (69.2)	36 (13.1)	50 (23.7)	40 (80.0)	82 (28.9)	45 (20.0)	39 (86.7)	56 (20.7)
Total	181 (100.0)	82 (45.3)	275(100.0)	211 (100.0)	143 (67.8)	284 (100.0)	225 (100.0)	162 (72.0)	271 (100.0)

Table 4: Prevalence of intestinal helminth infection in fish species collected in relation to body weight

Body weight (g)	*T zilli* n= 181			*C. anguillaris* n=211			*C. gariepinus* n=225		
	No(%) of fish Examined	No (%) of fish infected	Total no (%) of parasite recovered	No (%) of fish Examined	No (%) of fish infected	Total no (%) of parasite recovered	No (%) of fish Examined	No (%) of fish infected	Total no (%) of parasite recovered
70 – 119	5 (2.8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
120 – 169	23 (12.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
170 – 219	82 (45.3)	36 (43.9)	61(22.2)	1 (0.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
220 – 269	39 (21.5)	21 (53.8)	122 (44.4)	5 (2.4)	0 (0)	0 (0)	4 (1.7)	0 (0)	0 (0)
270 – 319	21 (11.6)	16 (76.2)	56 (20.4)	3 (1.4)	0 (0)	0 (0)	6 (2.60	0 (0)	0 (0)
320 – 369	11 (6.1)	9 (81.8)	36 (13.1)	25 (11.8)	13 (52.0)	24 (8.5)	36 (16.0)	23 (63.9)	46 (17.0)
370 – 419	0 (0)	0 (0)	0 (0)	52 (24.6)	36 (69.2)	64 (22.5)	26 (11.6)	21 (80.8)	39 (14.4)
420 – 469	0 (0)	0 (0)	0 (0)	31 (14.7)	25 (80.6)	43 (15.1)	92 (40.9)	57 (61.9)	70 (25.8)
470 – 519	0 (0)	0 (0)	0 (0)	72 (34.1)	52 (72.2)	82 (28.9)	42 (18.7)	34 (80.9)	71 (26.2
520 – 569	0 (0)	0 (0)	0 (0)	17 (8.1)	13 (76.5)	41 (14.4)	11 (4.9)	9 (81.8)	26 (9.6)
570 – 619	0 (0)	0 (0)	0 (0)	5 (2.4)	4 (80.0)	30 (10.6)	8 (3.6)	7 (87.5)	19 (7.0)
Total	181 (100.0)	82 (45.3)	275 (100.0)	211 (100.0)	143 (67.8)	284 (100.0)	225 (100.0)	151 (67.1)	271 (100.0)

Table 5: Prevalence of Gastrointestinal Helminth of the fish species examined in relation to sex

Fish species	Sex	No% of fish Examined	C.I*	No (5) of fish infected	C.I*	Total no (%) parasites recovered	C.I*
T. zilli	Male	121 (66.9)	0.60-0.74	61 (50.4)	0.39-0.61	181 (65.8)	0.60-0.72
	Female	60 (33.1)	0.01- 0.05	21 (35.0)	0.25- 0.45	94 (34.20)	0.28-0.40
	Total	181 (100.0)	0.00-0.00	82 (45.3)	0.35-0.56	275 (100.0)	0.0-0.0
C. anguillaris	Male	140(66.4)	0.60-0.72	94 (67.1)	0.59-0.75	201 (70.8)	0.66-0.76
	Female	71 (33.6)	0.28-0.40	49 (69.0)	0.61-0.77	83 (29.2)	0.25-0.35
	Total	211 (100.0)	0.00-0.00	143 (67.8)	0.60-0.76	284 (100.0)	0.0-0.0
C. gariepinus	Male	159 (70.7)	0.65-0.77	121 (76.1)	0.69-0.83	191 (70.5)	0.25-0.35
	Female	66 (29.3)	0.23-0.35	40 (60.6)	0.53-0.69	80 (29.5	0.65-0.75
	Total	225 (100.0)	0.0-0.0	161 (71.6)	0.65-0.79	271 (100.0)	0.0-0.0

C.I * = 95% confidence interval.

could result to mechanical pressure which may set up inflammation, cause the formation of connective tissue and rupture of host tissue. In other words the nutritive value of fish may be degraded through the activities of these parasites. (Noble and Noble, 1971 and Williams and Jones, 1994).

Table 3 reveals that the prevalence of intestinal helminth infection in fish species examined increases with their standard length from 0.0% prevalence of infection of 10.0-19.9 cm in standard length to 86.7% prevalence of infection of 50.0-59.9cm standard length. Similarly Table 4 shows that the prevalence of infection increases with the body weight of the fish species examined 0.0% prevalence infection of 70-119 body weight to 87.5% prevalence infection of 570-619 of body weight. The probable reason for differences in prevalence of infection between the juvenile and the adult fish as related to their standard length and body weigh may be due to change in diet from weeds, seeds, Phytoplanktons and Zooplanktons to insect larvae, snails, crustaceans, worms and fish in both juveniles and adulthood respectively (Read *et al.*, 1967).

Table 5 shows that the prevalence of infection in male and female of all the fish species examined except *C. anguillaris* was statistically significant P>0.05.

Conclusively, the fish species examined could have suffered malnutrition due to parasitic infections. This condition may result to a devaluation in protein content in the body of the fish. Invariably, protein deficiency impairs normal metabolism of the liver particularly in man. Therefore, the infected fish can transmit disease to man resulting to poor public health (Nwuba *et al.*, 1999).

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