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A SURVEY OF ECTO AND INTESTINAL PARASITES OF *TILAPIA ZILLII* (GERVIAS) IN TIGA LAKE, KANO, NORTHERN NIGERIA

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ABSTRACT
One thousand eight hundred specimens of Tilapia zillii (Gervias) from Tiga Lake, Kano, Northern Nigeria were examined using hand lens and microscope between July, 2007 and June 2008 for parasites , 782 (53.4%) of these were infected. Parasites recovered were, Clinostomum spp. 74(4.1%) Procamellanus spp. 111 (6.1%), and Protozoa Cyst 198 (11.0%). Adult fishes were more infected than the juvenile, females were significantly more infected (P <0.05). Infection increases with length and body weight. Physio-chemical parameter of the lake was good and infection rate was high wet season and low in dry season. The presence of these parasites might elicit some pathological effects on the fish by retarding their growth, causing tissue description and even death.

Keywords: Ectoparasites, Endoparasites, Tillapia zilli, Tiga, Kano

INTRODUCTION

Due to the importance of fish as one of the major source of obtaining cheap protein, studies on this aspect of biology, morphology and diseases of fish is very important. Fish culture provides a large reservoir of parasitic pathogen common to both wild and cultured fish. As yet no epidemic has been reported in Nigeria but it is likely that as the culture of fish becomes intensive and more widespread, parasites will be liable to become a menace (Yadav, 2000). Many phyla of the animal kingdom have representatives that are parasites of *T. zillii.* The helminthes are a major group of parasites involved in *T. zillii* parasitism in Kano and Nigeria in general (Ndifon and Jimeta, 1990; Awa *et al.,* 1996). The commonest infection are caused by trematodes *Clinostomum* sp., *Euclinostomum* sp and nematode *Procamellanus* sp. Earlier workers, Ukoli (1988) and Okaeme (1991) has subscribed to this observation.

Parasites disease of fish (and livestock) reduces the amount of food available to people around the globe. It is imperative therefore to investigate the relationship between the environmental factors as it affects the parasites that affect production and quality (Oniye and Annume 1993, Mando, 1999). This study was therefore conducted to provide information on the ecto and intestinal parasites of *Tilapia zilli* because of their importance in the artisanal fisheries of Kano and other inland States of Nigeria.

MATERIALS AND NETHODS

Study Area

Tiga Lake located about 80km, south of Kano city is about 800km^2 is size and was created by impounding River Duku and Kano to provide water for irrigation and hydroelectricity and to boost fish production in the area (Ndifon and Jimeta, 1990).

Fish Samples

Fish samples were bought fortnight for 12 months from local fishermen at the lake site as soon as they landed and transported to the laboratory in cool boxes containing ice block. In the laboratory, total length (cm) and weight (g) were measured, sex of the fish were determined by internal examination of testes and ovaries (Smyly, 1957).

Examination of Fish for Parasites

Using a hand lens skin smear of the fish was examined for parasites. The smear was made by scrapping of the skin and observed under the microscope at ×40 and ×1000 magnification. The gills were dissected and removed and examine under the microscope. The cavity of the fish was cut opened ventrally and the alimentary canal was also cut opened separately and the content wash in a little distilled water into peter-dishes. They were examined under the microscope for parasites to determine their number and distribution with a microscope, parasites collected were fixed in 4% formation and preserved in formal acetic acid, stain by haematoxylin and identified; (Paperna 1980, 1996) and (Khalil 1971).

Measurement of physico-chemical Paremeters

The parameters of the lake were measured with ordinary mercury thermometer. Dissolved oxygen concentration (DO) and Biological oxygen demand (BOD) were analyzed using winkler method. pH was taken using on electronic pH meter (metrohm 620 pH meter).

RESULTS

Out of 1800 specimens examined, 782 (43.4%) were found to be infected. The gills of the fish were observed to be more infected by parasites (Table 1). Adult fish were infected than the juvenile. The females were significantly more infected (X^2 >1 , P< 0.005)than males (Table 2). Table 3 show that the prevalence of parasites in *T.zillii* in relation to their total length (cm). At 5 -10cm total length 15% fish were infected and at 26-30cm 89.6% of the fish were infected. It is clear from the result in table 4 that the prevalence of parasites in *T. zillii* collected in relation to their body weight is higher in weight class 171-190g (84.6%) and lowers in weight class 10-30g (5.55). The dissolved oxygen (DO) ranged from 7.97mg /dm^3 to 8.74mg/dm^3 with a mean of 8.55mg/dm^3. The pH ranged from 6.3 to 8.4 with a mean of 7.4 and temperature ranged from 19.3^{0}C to 27.8^{0}C with a mean of 23.8^{0}c (Table 5). Figure 1 shows the peak infection rate was observed in wet season in August with a decline in the dry seaon in April.

Table 1: Distribution, locations and number ecto and intestinal parasites T. zillii recovered In Tiga lake,Kano.

Parasite	Taxonomic group	Location	No (%) fish infected	No of parasites	Range
Clinostomum spp	Tremada	Gills	399(21.2)	524	0-20
Euclinostomum spp	Tremada	Gills and skin	74(4.1)	3	0-2
Procamellamus spp	Nemotoda	Stomach	111(6.1)	16	0-3
Protozoa cyst	Potozoa	Intestine	198(11.0)	27	0-6
Total			**782(43.4)**	**570**	

Table 2: Observed frequency of infected and uninfected males and females juviniles *T.zillii* in Tiga, Kano.

Sex/size	No. infected	Uninfected Total	Total	% Infected	uninfected
Juviniles	47	106	153	6.01	10.41
Males	291	499	790	37.21	49.02
Females	444	413	857	56.78	40.57
Total	**782**	**1018**	**1800**	**100.00**	**100.00**

X2 >1, P< 0.05

Table 3 . Prevalence of ecto and intestinal parasite in *T. zillii* collected in relation to their total length in Tiga lake, Kano.

Total length (cm)	No. (%) examined	No.(%) infected	No. (%) of parasites recovered
5-10	160 (8.9)	24 (15.0)	49 (8.6)
11-15	680 (37.8)	118 (17.4)	102 (17.9)
16-20	200 (11.1)	104 (52.0)	100 (17.5)
21-25	200 (11.1)	303 (60.6)	199 (34.9)
26-30	260 (14.4)	233 (89.6)	120 (21.0)
Total	**1800 (100.00)**	**782 (43.4)**	**570 (100.00)**

Table 4: prevalence of ecto and intestinal parasites in *T. zillii* by their body weight in Tiga lake, Kano.

Body weigth (gram)	No. (%) examined	No. (%) infected	Total No. (%) of parasites recovered
10-30	182 (10.1)	10 (55)	22 (39)
31-50	100 (5.6)	30 (30.0)	36 (6.0)
51-70	200 (11.1)	20 (10.0)	49 (8.6)
71-90	119 (6.6)	50 (42.0)	76 (3.0)
91-110	200 (11.1)	98 (49.0)	91 (17.0)
111-130	199 (11.6)	100 (50.3)	79 (13.9)
131-150	250 (13.9)	104 (41.6)	56 (9.8)
151-170	300 (16.7)	160 (53.3)	72 (12.6)
171-190	250 (13.9)	210 (84.0)	89 (15.6)
Total	**1800 (100.0)**	**782 (43.4)**	**570 (100.0)**

Table 5: monthly values of physio-chemical parameters obtained at Tiga lake, Kano.

Month	Dissolved Oxygen (DO) mg/dm3	BODs mg/dm3	pH	Temperature
July	8.12	4.06	8.4	26.7
August	7.97	3.99	6.3	27.8
September	8.14	4.07	7.3	26.1
October	8.26	4.13	7.4	25.8
November	8.74	4.37	7.2	22.8
December	9.08	4.54	7.2	20.9
January	9.27	4.64	7.4	19.3
February	9.11	4.56	7.4	20.0
March	8.91	4.46	7.5	21.3
April	7.97	3.99	7.6	27.1
May	8.57	4.29	7.9	23.5
June	8.42	4.21	7.2	24.1
Mean	8.55	4.28	7.4	23.8

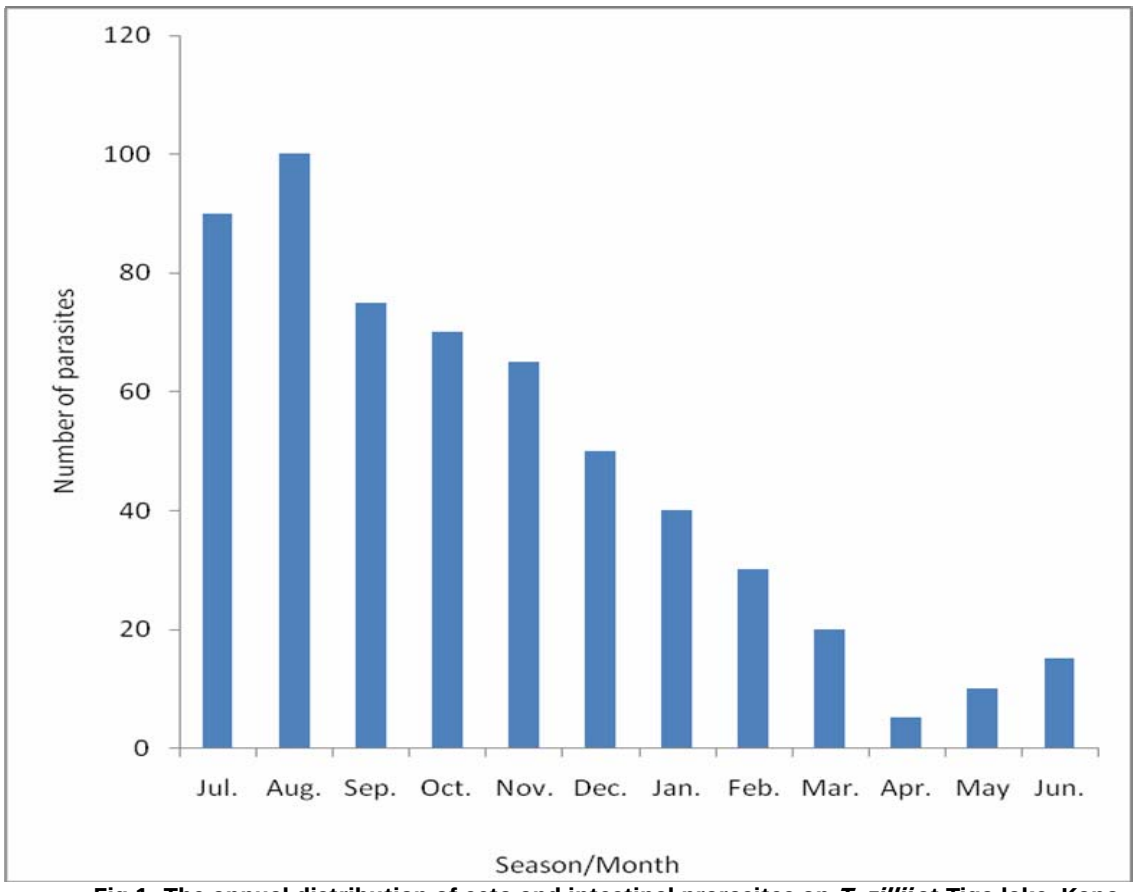

Fig 1: The annual distribution of ecto and intestinal prarasites on *T. zillii* at Tiga lake, Kano.

DISCUSSION AND CONCLUSION

The overall prevalence of 43.3% of parasites observed in the current study was lower than the observation of 60.23% prevalence of infection by Olofintoye (2006); suggesting the distribution of parasites varied from one habitat to the other which could be due to host parasite relationship and abiotic factors like dissolved oxygen, temperature and pH. (Anderson 1992). Infection rate was high on the gills. This might be attributed to fact that the gills are in great contact to the external water surrounding as a result of their respiratory activities (Robert 1978). Infection was significantly high in females than in males in the study this could be due to the difference of their physiological condition of the females especially gravids ones (Ugwuzor 1997). Juveniles' fish were less infected than adult. This could be attributed to accumulation of parasites year by year as explain by Nwuba (1999).

The differences in prevalence of infection between the juveniles and the adults as related to their length and weight may be due to changes in their diet from weeds, seeds, phytoplanktons and zooplankton to insect larvae,crustacean and worm in both juveniles and adult respectively. (Reed *et al* 1987).

The physio-chemical parameter of the lake was suitable for parasites growth and fish survival. The fact that parasite in the fish were low in despite the favourable condition recorded, suggest the fishes may have a high tolerance and/or resistance to parasitic infection (Bichi and Bizi 2002).peak infection was highest in rainy season in August, low in dry season in April, this observation agrees with Paperna's 1996 on the seasonal occurrence of parasite in Nungua dam South Ghana. The fishes have contributed to the biodiversity and development of Tiga Lake based on its level of tolerance and resistance to infection. It might be concluded that the environment is suitable for fish farming.

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