

FOOD AND FEEDING HABITS OF *TILAPIA ZILLI* (PISCES: CICHLIDAE) IN RIVER OTAMIRI SOUTH-EASTERN NIGERIA

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ABSTRACT

Dietary habits of *Tilapia zilli* (Gervais, 1848) was studied in River Otamiri, Imo State, Nigeria. Fish specimens were procured from Artisanal fishermen every two weeks. Specimens were usually injected 4% formalin at the fishing station prior to laboratory analysis. A total of 97 specimens were analyzed for gut contents using Numerical and frequency of occurrence methods. Data collected showed that *Tilapia zilli* is an Omnivorous fish with dietary preference for Algae (71.05% and 59.52%), vegetative matter (10.52% and 50.00%), detritus (0% and 11.90%) and aquatic invertebrates larvae such as *Chaoborus larvae* (52.63% and 47.61%) and *Chironomid larvae* (31.58% and 21.43%) for juveniles and adult Tilapia respectively.

Key words: Dietary habits, *Tilapia zilli*, River Otamiri, Omnivorous.

INTRODUCTION

Family Cichlidae comprising of *Tilapia* and *Hemichromis* species are endemic to Nigeria, it is widely distributed in Nigeria waters and second most abundant fish species at River Otamiri (Agbabiaka, 2010). Various researchers have investigated food and feeding habits of Cichlids and other commercially important fishes in Nigeria and Africa, such as Nile Tilapia at Ero reservoir in Ekiti (Osho *et al.*, 2006), *Oreochromis niloticus* at Opa reservoir Ile-Ife (Komolafe and Arawomo, 1998), *Sarotherodon galilaeus* at Ile-Ife (Komolafe and Arawomo, 1998; Oransaye and Nakpodia, 2005), *Heterobranchus bidorsalis* at Owena reservoir (Fagbenro, 1992), *Chrisichtys nigrodigitatus* at Oguta lake (Nwadiaro and Okorie, 1985), *Synodontis ocellifer* at River Adofi (Meye *et al.*, 2008), *Sarotherodon melanotheron* in Ghanna (Ofori-Danson and Grace, 2005) and *Protopterus*, *Gymnarchus*, *Mormyrus* and *Citharinus* at Kogi (Adeyemi *et al.*, 2009). The study of food and feeding habits of fishes is a continuous exercise because it provides information for successful fisheries Management. However, with paucity of information on food and feeding habits of *Tilapia zilli*, a commercially viable species at Otamiri. This study is aimed at providing baseline information on the dietary habit of *Tilapia Zilli* in Otamiri River, South Eastern, Nigeria.

MATERIALS AND METHODS

River Otamiri lies between latitude 5° 30' and 7° 30' North, and longitude 5° 39' and 5° 42' East. The entire study area is about 20km representing the Southern part of the River along Obinze-Umuagwo stretch in Imo State, Nigeria. Three sampling points were located namely Obinze, Mgbirichi, and Umuagwo which were about 7km intervals. A total of 97 fish specimens were collected between June and August, 2009 from fishermen operating on the fishery using various gears such as hooks and line, traps, gill-nets and cast nets of various mesh sizes ranging from 3.5cm, 4.5cm and 6cm. Caught specimens were injected 4% formalin at the fishing stations prior to laboratory analysis within 48hours to prevent post-mortem digestion. Specimens were grouped into juveniles and adults.

The standard lengths (SL) for juveniles (≤ 7 cm) and adult ($7.1 \leq 15$ cm) were recorded in centimeter using measuring board to determine if any, size variation influence on this study respectively. Individual fish specimen was dissected, gut content removed and emptied into a petri-dish for analysis. Individual gut contents were observed under a binocular microscope. Analysis of the gut contents were carried out using numerical and frequency of occurrence of methods (Hynes, 1950; Hyslop, 1980 and Ugwumba and Ugwumba, 2007).

$$\text{Numerical method (N}_m\text{)} = \frac{\text{Total number of particular food item}}{\text{Total number of all food items}} \times \frac{100}{1}$$

$$\text{Frequency of occurrence (FO)} = \frac{\text{Total number of stomach with particular food item}}{\text{Total number of stomach with food}} \times \frac{100}{1}$$

RESULTS AND DISCUSSION

Result of the gut analysis is shown in table 1. Data collected from this study with frequency of occurrence (FO) method revealed that the feed habit of *Tilapia zilli* juveniles comprised mainly of Algae (71.05%), larvae of aquatic invertebrate namely *Chaoborus* and *Chironomids* with values of 52.63 and 31.58% respectively. The least value of 2.63% was recorded for Nematode. These finding agrees with recent finding (Adeyemi *et al.*, 2009).

Nevertheless, the FO data on adults of this species were found to ingest more of vegetative matter, algae as well as larvae of aquatic invertebrates similar to observations in the juveniles with values of 59.52%, 50.00%, 47.61% and 21.43% respectively. The Nm data of adult tilapia (7.1 < 15cm) showed that vegetative matter ranked highest with value of 15.70%, followed by algae, invertebrate larvae, fish scales, plant seeds and annelids having values of 8.82, 11.76, 11.52, 10.52, and 7.89 percent respectively while *Chaoborus larvae* is prominent in the juveniles numerically scoring 16.60%. However, the presence of fish scales in the guts of adult *Tilapia zilli* is an evidence of overlapping in food and feeding to

avoid inter and intra-specific competition for available food items hence this fish species were found in the fishery all the year round (Ugwumba, 1988; Meye *et al.*, 2008 and Akinwunmi, 2003).

The presence of detritus and sand in few of the guts examined confirms the reports that *Tilapia* seldom browse on live benthic invertebrates and bacteria-laden detritus (Fagade and Olaniyan, 1972; Thomas and Micheal, 1999; Kuton and Kusemiju, 2000; Olufeagba *et al.*, 2002 and Osho *et al.*, 2006). *Tilapia zilli* preference for algae and vegetative matter may be attributed to its ability to secrete mucus from the gills that traps plankton; however, their ability to digest filamentous algae and aquatic macrophytes is through the mechanism of physical grinding of vegetative matter between the two pharyngeal plates of fine teeth and acidic nature (pH < 2) of the stomach which ruptures the cell walls of algae and bacteria (Ugwumba, 1988).

CONCLUSION

Based on the observations from this study, *Tilapia zilli* at river Otamiri may be described as an Omnivore feeding on varieties of both plants and animal species.

Table 1: Analysis of food items of *Tilapia zilli* from River Otamiri showing variation between size categories.

	Juveniles (≤ 7cm)		Adults (7.1 ≤ 15cm)	
No of Fish examined	42		55	
No of empty stomach	6		7	
	% FO	% N _m	%FO	%N _m
Detritus	-	-	11.90	-
Sand	-	-	11.90	-
Algae	71.05	-	59.52	8.82
Vegetative matter	10.52	-	50.00	15.7
Nematode	2.63	3.50	7.14	2.94
Annelids	-	-	9.52	7.89
<i>Chaoborus larvae</i>	52.63	16.60	47.61	11.76
<i>Chironomid larvae</i>	31.58	2.60	21.43	11.76
Fish scales	5.26	3.92	47.61	11.52
Tadpoles	-	-	-	-
Plant seeds	13.15	3.50	11.90	10.52
Unidentified items	10.52	3.52	7.14	2.30

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