

Fish Species Composition and Abundance of River Taraba in Bali Town, Taraba State, Nigeria

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Abstract: The fish species composition and abundance of River Taraba in Bali town was studied during dry and wet season from August 2018 to January 2019. Sampling was carried out bi-monthly using different fishing gears. A total of 1,527 fishes comprising nineteen (19) species, belonging to seventeen (17) genera and twelve (12) families were collected. *Tilapia zilli* from family Cichlidae was the most abundant fish species constituting 12.18% of the total catch. Fish abundance showed high catches during the dry season (57.43%) than the wet season (42.57%) with November having the highest catch 306(20.4%). However, there is no significant difference in the abundance of fish species in the sampling months ($P > 0.05$). Based on the catch composition in this study, the river has good potentials for fisheries and comparable with other Nigeria Rivers, lakes and ponds. Hence, it is pertinent to protect, harness and improve its fish fauna for sustainable fishing practices, continued existence of some fishes that might be on the verge of extinction and income generation in the area.

Keywords: Abundance, composition, fish species, River Taraba, season.

Date of Submission: 26-02-2019

Date of acceptance: 12-03-2019

I. Introduction

Nigeria is blessed with over 14 million hectares of reservoirs, lakes, ponds and major rivers that are capable of producing over 980,000 metric tonnes of fish annually [1]. The fresh water bodies of Nigeria, with over 270 fish species, are the richest in fish diversity in West Africa [2]. The term “fish” most precisely describes any non-tetrapod craniates that have gills throughout life and whose limbs, if any, are in the shape of fins [3]. Fish are important in that they contribute as much as 17% of the world's animal protein [4] and its consumption is highly desirable [5]. Thus over the years, the demand for fish in most parts of Nigeria has continuously outweighed supply [6].

Taraba State is well endowed with abundant surface water including ponds and rivers. These rivers include Benue, Taraba and Donga and their tributaries. Fish farming is gaining popularity and the business is attracting many people in the State where the average of 1,987 metric tonnes of fish is produced per annum. Fish represent about 40% of the total animal protein and the sub sector contributes greatly to the economy in income generation, provision of employment opportunity and food supply [7]. Although there are notable fishery studies carried out by researchers in most parts of the country including that of Warri River, Imo River and Lake Geriyo [8, 9, 10] but there is little or no published information available about the ichthyofauna present in River Taraba at Bali metropolis. However, a knowledge of the aquatic ecosystem of a River like that of Taraba in Bali will not only be useful in assessing its productivity but will also give a better understanding of the fishes in the lotic fresh water ecosystem of the town. Hence, this present study is designed to provide a baseline information on the fish species composition and abundance in River Taraba at the middle stream of Bali town during the wet and dry season for a sustainable management of its fishery resources.

II. Materials And Method

Description of the Study Area

The study was carried out at River Taraba in Bali town, Bali local Government Area of Taraba State, Nigeria. (Fig. 1).



Fig. 1: Researchers and the fishermen at the sampling site.

Bali local Government lies between latitude 7°46' N and 7°54' N of the equator and longitude 10°30' E and 11° 00' E of the prime meridian [11]. It is found in dry guinea savannah and the largest local Government in Taraba State, with an estimated land area of 11,540 km² and has some mountains like Gazabu, Dakka, Maihula, Bagoni, among others. Based on the results of the 2006 National Population Census, Bali local Government had a population of about 211,024 persons [12]. It has a tropical climate marked by two seasons; dry and rainy seasons. The rainy season starts around April and ends October occasionally, with 1350 – 1500mm rainfall annually. The dry season is from November to March. The major ethnic groups in the area include; Jibawa, Tiv, Chamba, Fulani, Hausa, Itchen, Mumuye etc. The major occupation of the inhabitants is farming, fishing and nomadism. In addition, Public servants, traders and artisans also inhabit the area. Their water sources for domestic and agricultural uses are River Taraba, Borehole, ponds and wells.

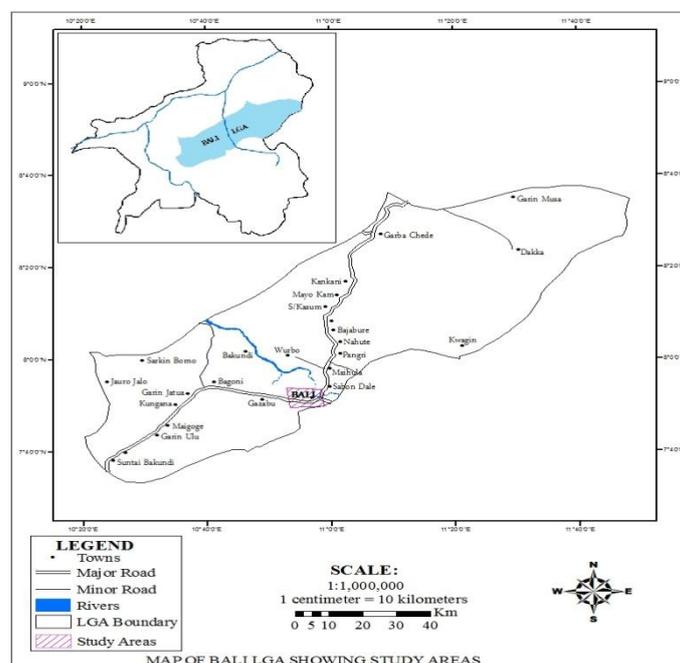


Fig. 2: Map of Bali local Government Area showing the study Area (Source: Bureau for land and survey Jalingo, Taraba State).

Sample collection/Identification

Fresh fish samples were obtained (bought) bi-monthly between the months of August, 2018 and January, 2019 from local fishermen who used different fishing gears including baited hooks and lines, gill net and cast net. The fishes were preserved immediately in a plastic cooler containing 10% formalin and transported to the laboratory for observation and identification. The preserved fishes were identified to species level on the basis of the shape of the body, colour pattern, specific marks or spots on the surface of the body, structure of various fins, shape of the head etc. This was done using standard taxonomic keys of [13, 14, 15, 16, 17, 18].

Statistical analysis

The data were presented in tables and analysis of variance (ANOVA) was used to analyze the data to determine the significant difference in the abundance of different species of fish in months at P=0.05

III. Results

Fish fauna in River Taraba at Bali town during the study period (August, 2018 - January, 2019) collected were nineteen (19) species, belonging to seventeen (17) genera and twelve (12) families (Table 1). It also shows that family Cyprinidae had the highest number of species (4), followed by Mormyridae with three (3) species while Alestidae and Cichlidae with two (2) species each. The remaining families (Bagridae, Citharinidae, Clariidae, Claroteidae, Distichodontidae, Malapteruridae, Mochokidae and Schilbeidae) had only one (1) species representing each of the families as presented in Table 1 while the representatives of fishes encountered during the study period are shown in Fig. 3 and 4.

Table 1: Fish species identified in River Taraba at Bali town (Aug. 2018 – Jan. 2019)

Families	Species identified
Alestidae <i>Hydrocynus vittatus</i>	<i>Brycinus nurse</i>
Bagridae	<i>Bagrus docmak</i>
Cichlidae <i>Tilapia zilli</i>	<i>Oreochromis niloticus</i>
Citharinidae	<i>Citharinus citharus</i>
Clariidae	<i>Clarias</i> sp.
Claroteidae	<i>Auchenoglanis occidentalis</i>
Cyprinidae <i>Labeo coubie</i> <i>Labeo senegalensis</i> <i>Raiamas senegalensis</i>	<i>Barbus occidentalis</i>
Distichodontidae	<i>Distichodus rostratus</i>
Malapteruridae	<i>Malapterurus electricus</i>
Mochokidae	<i>Synodontis budgetti</i>
Mormyridae <i>Mormyrus hasselquistii</i> <i>Campylomormyrus tamandua</i>	<i>Mormyrus rume</i>
Schilbeidae	<i>Schilbe mystus</i>

Table 2: Monthly distribution and abundance of fish species in River Taraba at Bali town (Aug. 2018 – Jan. 2019)

Species	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Total	
%Abundance								
<i>Hydrocynus vittatus</i>	13	15	20	18	16	19	101	6.61
<i>Brycinus nurse</i>	11	19	20	27	27	20	124	8.12
<i>Bagrus docmak</i>	4	6	5	10	16	10	51	3.34
<i>Oreochromis niloticus</i>	10	11	15	18	29	20	103	6.75
<i>Tilapia zilli</i>	20	15	29	52	39	31	186	12.18
<i>Citharinus citharus</i>	10	8	10	12	10	11	61	3.99
<i>Clarias</i> sp.	12	13	18	20	29	20	112	7.33
<i>Auchenoglanis occidentalis</i>	10	9	19	16	19	19	92	6.02
<i>Barbus occidentalis</i>	12	10	6	15	5	10	58	3.80

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<i>Labeo coubie</i>	15	14	20	13	9	13	84	5.50
<i>Labeo senegalensis</i>	21	18	21	22	12	21	115	7.53
<i>Raiamas senegalensis</i>	11	6	10	11	4	32	74	4.85
<i>Distichodus rostratus</i>	10	0	6	8	5	9	38	2.49
<i>Malapterurus electricus</i>	3	0	2	1	0	1	7	0.46
<i>Synodontis budgetti</i>	20	18	24	20	10	16	108	7.07
<i>Mormyrus rume</i>	4	8	11	13	15	12	63	4.13
<i>Mormyrus hasselquistii</i>	7	11	15	10	14	21	78	5.11
<i>Campylomormyrus tamandua</i>	3	0	3	8	4	0	18	1.18
<i>Schilbe mystus</i>	5	4	10	12	10	13	54	3.54
Total	201	185	264	306	273	298	1527	100

* * * * *

* No significant difference (F=1.93; df=113; P>0.05)



Brycinus nurse



Hydrocynus vittatus



Bagrus docmak



Tilapia zilli



Oreochromis niloticus



Auchenoglanis occidentalis



Clarias sp.



Barbus occidentalis



Labeo coubie



Raiamas senegalensis



Labeo senegalensis

Fig. 3: Representatives of fish species encountered during the study period (Source: Researchers)



Distichodus rostratus



Malapterurus electricus



Mormyrus rume



Citharinus citharus



Mormyrus hasselquistii



Schilbe mystus



Synodontis budgetti



Campylomormyrus tamandua

Fig.4: Representatives of fish species encountered during the study period (Source: Researchers)

Table 2 shows the monthly distribution and abundance of fish species in River Taraba at Bali town. The table reveals that a total of 1,527 fishes were sampled within the study period (wet and dry seasons) with November, 2018 having the highest catch of 306 fishes and the least was in the month of September, 2018 having 185 fishes. In terms of abundance of fish species identified in this study, *Tilapia zilli* of the family Cichlidae was the most abundant constituting 12.18% of the total catch followed by *Brycinus nurse* from family Alestidae with 8.12% while the least abundant was *Malapterurus electricus* of the family Malapteruridae having 0.46% (Table 2). Also, seasonal fish abundance was high in the dry season (57.43%) and low in the wet season (42.57%) as shown in Table 3. Analysis of variance (ANOVA) showed no significant difference ($P>0.05$) in the abundance of fish species in the sampling months ($F=1.93$; $df=113$; $P>0.05$).

Table 3: Seasonal fish abundance in River Taraba at Bali town (Aug. 2018-Jan. 2019)

Season	Total catch	% abundance
Wet	650	42.57
Dry	877	57.43
Total	1,527	100

IV. Discussion

The ichthyofauna of River Taraba at Bali town during the rainy and dry season with 19 species from 12 families appears to be richer than those of 9 species from 7 families reported by [19] in Lake Alu, Maiduguri in Borno State, Nigeria, 10 species belonging to 7 families in Agulu Lake in Anaocha Local Government of Anambra State, Nigeria[20]and 8 species from 7 families in Tagwai Lake Minna, Nigeria [21]. This study can be compared with 19fish species and 13 familiesin Iba-Oku stream, Ikpa River in Itu Local Government Area,

Akwa Ibom State, Nigeria[22], and 16 species belonging to 10 families reported in Ikwori Lake South-Eastern Nigeria [23]. However, the fish fauna recorded in this study is low when compared with 45 species from 24 families caught from Urie creek in Igbide, Niger Delter [6], 81 fish species from 27 families in Ovia River, Edo State Nigeria[24]and 47 species from 15 families in Kiri Reservoir, Shelleng Local Government Area of Adamawa State, Nigeria [25].

Higher dry season catches than wet season observed in this study is in consonant with the reports of [26] in Elechi creek, River State and [27] at River Uke in Nasarawa State but negates the findings of researchers at River Ovia [24] and [28] in Dadin Kowa Dam, Gombe State who reported higher wet season than dry season catches. The reasons for the higher fish catch in the dry season compared with wet season could be attributed to the large volume of water which contributes to the higher level of fish dispersal over a wider area of the River, thus makes fishing becomes more difficult during the wet season. Similarly, higher level of water in the rainy season favours reproductive activities of some fishes, hence they show some characteristic restricted movement thereby making them less vulnerable to catch [23].

The species abundance of 12.8% evident of *Tilapia zilli* from the family Cichlidae during the study period, agrees with the result of another researcher[19] who opined that *Tilapia* Sp. dominated the sample throughout the period of study. It has also been reported that *Tilapia* dominated the fish catches in stratum VII of the Volta Reservoir[29], and also as the most dominant fish species in Imo River, Abia State, Nigeria[9]. However, it disagrees with the findings at River Uke and at Lake Geriyo where *Clarias gariepinus* (18.44%) and *Oreochromis niloticus* (25.61%) were the most abundant species respectively[27, 10]. The abundant nature of *Tilapia zilli* of the family Cichlidae could be alluded to its prolific nature and spontaneous breeding habit of the species from this family [28,10] as they (cichlidae) are found to breed 3-4 times in a year [30].

V. Conclusion

The result of the present study revealed that River Taraba at Bali town like other Rivers in the country has potentials for fisheries, indicating that the fresh water body is reach and productive throughout the year. This justifies the availability of diverse fishes sold at Bali fish market located along Bali-Takum road which attract people of the community and other neighboring town such as Gazabu, Zaga, Garbabi, Mai-hula e.t.c who come to buy fresh, dried and smoked fish. However, concerted effort should be made by the relevant agencies to avoid over fishing and exploitation of juvenile fishes by the fishermen so as to ensure a continued existence. More so, fishery officials should be deployed to enforce fishing regulations/conservation policies and to monitor anthropogenic activities and other sources of pollution that may distort the ecosystem of the water body. Finally, similar study should be extended to other areas of the river covering upstream and lower downstream.

Acknowledgement

The authors are thankful to the Tertiary Education Trust Fund (Tetfund) for funding this research and the fishermen for their unreserved effort during fish sampling.

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IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) is UGC approved Journal with Sl. No. 5012, Journal no. 49063.

Elijah, M.I." Fish Species Composition and Abundance of River Taraba in Bali Town, Taraba State, Nigeria" IOSR Journal of Pharmacy and Biological Sciences (IOSR-JPBS) 14.1 (2019): 50-57.