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THE FIN FISH ASSEMBLAGE OF IKERE GORGE, OYO STATE NIGERIA

*** ADEOSUN F. I., OMONIYI I. T., SAMSONS Y. A. AND AGBON A. O.**
Department of Aquaculture & Fisheries Management, University of Agriculture, Abeokuta, Nigeria

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ABSTRACT

The fin fish assemblage of Ikere gorge was investigated. The fin fishes comprised a total of 34 species belonging to 13 families. Chrysicthys nigrodigitatus was most abundant and highest in biomass (69,198.33 kg) accounting for 34.65% of the catch. Synodontis nigrita, Malapterurus electricus, Marcusenius psittacus Gnathonemus sensgalensis and Gnathonemus cyprinoides were the least in number, while Phago loricatus was least in biomass (20.00 kg) accounting for 0.01%.The major aim was to assess the fish resources of the gorge and evaluate the water parameters as related to fish production. No significant difference was observed in dissolved oxygen, nitrate, phosphate, water temperature, conductivity, alkalinity, total dissolved solid and pH range value in the stations. The water quality parameters were favourable for fish production. Water level and temperature were observed to guarantee high fish yield in the gorge.

Keyword: Fin Fish, Checklist, Ikere gorge.

INTRODUCTION

Aquatic resources are important food and economic resources for many countries. Nigeria is blessed with various aquatic ecosystems, which provide adequate resources for fisheries development system. These ecosystems include rivers, lakes, lagoons and marine environment. Due to unguided management these systems have not been able to sufficiently supply the fish needed to feed the Nigerian populace, which was estimated at about 140million (NPC, 2004). The annual demand for fish in Nigeria is 1.5 million tons. This situation calls for serious and urgent action on how to increase and conserve fish resources to ensure sufficient and sustainable production. Even at global level, fish supply is becoming insufficient as a result of human pressure due to population increases (FAO, 1999). The transition to scarcity of fish cannot be prevented by more intensive fishing but rather could be ameliorated by better management of fisheries resources and interventions to improve equity of resources apart from aquacultural practices. FAO (1999) reported that out of 200,000 MT fish stock in all part of the world, more than a quarter is overexploited, depleted or recovering.

Artisanal fisheries in Nigeria represent over 85% of local fish production. In 2004, artisanal sector contributed more than 88% of the domestic fish production out of which artisanal inland water fishery contributed 38.5% (FDF, 2000). At present, there is no biological data for finfish species in Ikere gorge, Oyo State Nigeria. This study paper therefore examines the quantitative and qualitative connection between the catches and the physico-chemical features of Ikere gorge.

MATERIALS AND METHODS

Study Area

The study was carried out in Ikere gorge, 8 km east of Ikere village and 30 km north

east of Iseyin in Oyo state, Nigeria. The gorge covers all the land between longitude 8^{o} 10^{1} and 8^{o} 20^{1}E and latitude $3^{o}40^{1}$ and 3^{o} 50^{1}N with total area of 300,000 km^{2}.

The monthly rainfall of the gorge is between 0 - 213.7 mm per year (Adeosun, 2007). The dry season lasts from November to February with occasional rainfall. The depth and width of the river varies slightly at different sampling stations (Sikoki *et al* 1998). The minimum and maximum widths are 300 and 600 m respectively. Study area was stratified into four zones, using ecological, hydrological strata and intensity of fishing activity as criteria.

Fish Sampling

Data on fish species were collected on monthly basis using multi-fleet gillnet sampling techniques; four sampling stations were randomly selected. This technique involved sampling of each station for the fish composition and abundance using a fleet of eight graded experimental gillnets (mesh sizes from 25.4 to 177.8 mm) and Cast net (50.8 mm) of similar surface area, which were done simultaneously in the various sampling stations. Samples were taken in the first three days of the first week of every month covering eighteen calendar month of raining and dry season period of the year between July, 2004 to December, 2005. The first stage involved purposive selection of four hydrological locations in each station with substantial fishing activities.

However, fleets of gill nets were set at dusk and retrieved at dawn in all stations, the investigation were carried out from landings site. The nets were set in different ecological zones in open water, flooded bush patches and shallow bays. In addition, catches from long-lines, fish traps, and hollow cylinders made from bamboo and set hooks were assessed to provide a comprehensive picture of fish species in the lake.

The number and weight of fish in each station was measured. The weight of each fish was obtained by weighing samples on a digital mettle balance to the nearest 0.0 kg.

Sample fishes were counted, sorted out and identified using monographs, descriptions, checklist and keys prepared by Boulenger, (1916), Reed *et al.* (1967), Holden and Reed (1972) and Loveque *et al.* (1991).

Physico-chemical Parameters

Surface water temperature was measured two minutes after dipping mecury- in-glass thermometer at a depth of 5.0 cm below the surface water. Depth measurements were made using a graduated rope attached to a lead sinker, lowered from a canoe into the floor of the water. In each month, the average depths of ten pre-determined points were recorded as the water level. Conductivity was measured using a portable meter (Model WTW LF 90), while pH was measured using (Model WTW pH 90) meter. Total dissolved solids (TDS) were measure directly with the Lovibond Tintometer. The dissolved oxygen content was determined using Oxy-Guard Model Mk–11 field oxygen meter. Transparency was measured directly using a Secch disc. Salinity was measured with a Salinometer (Antergo, 28). In taking the salinity, a drop of the test water was placed on the lens of the instrument and allowed to remain for five minutes. The salinity of the water was then read through the eyepiece. The results of the field experiments were corroborated with the results of laboratory analysis of the physico-chemical parameter.

RESULTS

The results of the physico-chemical characteristics of Ikere gorge between July 2004 and December 2005 are presented in Table 1. There was no significant difference ($p>0.05$) in the physico-chemical factors of Ikere gorge in the four sampled stations in terms of dissolved

oxygen, nitrate, phosphate, temperature, alkalinity and total dissolved solids. However, the mean depth of station 1 was significantly higher ($p<0.05$) than all the other three stations.

Table 2 represents the fish species composition in Ikere gorge. A total of 34 species from 13 families were caught during the study period. *Chrysicthys nigrodigitatus* was in highest biomass (69,198 kg) accounting for 34.65% of the total fish caught. *Synodontis nigrita, Malapterurus electricus, Marcusenius psittacus Gnathonemus sensgalensis and Gnathonemus cyprinoides* were the least in number, while *Phago loricatus* was least in biomass (20.00 kg) accounting for 0.01% of the total number of fish caught.

DISCUSSION

Ikere gorge contained different kinds of fish species. Various sampling stations and fishing gear were used to ensure as comprehensive a sample of ichthyofauna as possible from the study area. From the study a total of 5,736 fish specimens were caught between July, 2004 to December, 2005. These were identified and classified into 34 species of fish representing 13 families were recorded. This species composition was lower than the results of other studies in other water bodies. Lowe-McConnell, (1964) encountered 44 species on the Rupennine River. Okereke (1990) in her study of Otamiri River Imo State recorded 46 species in 20 families. Other comparable study results include:Sydenham, 1979 of Ogun River (85 species), Reid and Sydenham (1978) of the lower Benue River, Victor and Tetteh (1988) 58 species from Ikpoba River, Imevbore and Okpo (1975) 70 species from River Niger.

The 34 species of fish encountered in this study was however higher than the number recorded by Nweke (1984) in Aba River (29 species). Sydenham (1975) in Odo-ona stream (13 species) and Ekeh (1990) in Nworie River (19 species).

The abundance of *Chrysichthys nigrodigitatus* and commonness of *Tilapia melanopleura* and *Marcuseinus isidori* in this study could be attributed to their ability to tolerate low levels of oxygen and inability to neither bury them nor burrow into the muds. The results of the study show Ikere gorge consists of numerous fish species.

The variation in number of species may be explained in three ways: Differences in the physico-chemical conditions cause variations in species composition. Low diversity is a function of low productivity which has been a common feature of small fresh water rivers (Welcomme, 1979). The hypothesis states that high diversity would indicate places of unpredictable hazards or places that would be short lived. Only time would prove how unpredictable nor short lived the lower Nun River would be The difference in the species composition in this study and others may be due to difference in abiotic factors such as temperature, pH, turbidity, dissolved oxygen, conductivity, salinity, alkalinity and nutritive salts. For instance surface water temperature exhibited seasonal variation. pH was neutral to slightly alkaline during the study period. Turbidity was high in the early rainy season and low during the late dry season due to increase in suspended particles in the river. Dissolved oxygen values are typical of fresh water systems. Conductivity, salinity and alkalinity values are all typical of fresh water systems.

The results from the study show that Ikere gorge consisted of fish species that compared favourably with other fresh water bodies. This information can be used for management decisions and formulation of resource development in the area in addition to the provision of a checklist for fisheries study. The variation in number of species may be explained in two ways: Differences in the physicochemical conditions cause variations in species composition. Low diversity is a function of low productivity which has been a

common feature of small fresh water rivers (Welcomme, 1979).

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Table 1: The mean values of the Physico-chemical characteristic of Ikere gorge between July 2004 and December 2005.

	Station 1	Station 2	Station 3	Station 4
PH	6.15-8.22	6.08-8.26	6.14-8.62	6.04-8.50
Dissolved Oxygen	7.05±0.22[a]	6.84±0.22[a]	6.86±0.23[a]	6.78±0.30[a]
Transparency	1.81±0.15[a]	1.38±0.10[b]	1.87±0.13[a]	1.75±0.17[ab]
Nitrate	0.41±0.04[a]	0.47±0.09[a]	0.51±0.14[a]	0.56±0.19[a]
Phosphate	0.31±0.04[a]	0.36±0.09[a]	0.42±0.14[a]	0.48±0.20[a]
Temperature	27.33±0.38[a]	27.44±0.45[a]	27.55±0.33[a]	28.04±0.35[a]
Conductivity	82.86±0.37[ab]	83.39±0.51[ab]	82.49±0.36[b]	84.24±0.69[a]
Alkalinity	125.33±6.45[a]	139.06±11.06[a]	128.50±5.99[a]	139.33±12.14[a]
Total Dissolved Solid	311.88±56.89[a]	298.00±58.25[a]	310.71±53.12[a]	324.83±66.05[a]
Depth	21.40±2.00[a]	1.93±0.28[b]	4.05±0.39[b]	4.73±0.60[b]

Table 2: Fish species caught and their Percentage Composition of fresh water reaches of Ikere gorge.

Family/Species	No of Fish specimen	% no of specimen	Wt.(kg) of specimen	%Wt. of specimen
BAGRIDAE				
Chrysicthys nigrodigitatus	1423	24.81	69,198.13	34.65
Bagrus docmac niger	46	0.80	1,520.21	0.76
CENTROPOMIDAE				
Lates niloticus	170	2.96	4,312.31	2.16
CHARACIDAE				
Brycinus chaperi	512	8.93	6,290.11	3.15
Brycinus macrolepidotus	30	0.52	2,597.01	1.30
CHANNIDAE				
Parachanna obscura	30	0.52	8,138.22	4.08
CICHLIDAE				
Hemichromis fasciatus	545	9.50	6,170.14	3.09
Sarotherodon galilaeus	432	7.53	20,720.31	10.38
Tilapia melanopleura	596	10.39	26,864.24	13.45
Tilapia zillii	38	0.66	1,449.10	0.73
Tilapia melanotheron	444	7.74	3,893.22	1.95
Tilapia mariae	17	0.30	1,565.14	0.78
Tilapia monody	4	0.06	88.03	0.04
Oreochromis niloticus	33	0.58	7,010.12	3.51
CLARIIDAE				
Clarias gariepinus	39	0.68	1,2611.21	6.32
Heterobranchus bidorsalis	6	0.10	1,254.10	0.63
CYPRINIDAE				
Labeo coubie	12	0.21	414.00	0.21
Barbus occidentalis	368	6.42	3,260.11	1.63
Gara water loti	3	0.05	156.00	0.08
Barilius senegalensis	4	0.07	133.33	0.07
Barilius loati	12	0.21	297.14	0.15
HEPSETIDAE				
Hepsetus odoe	41	0.71	4,777.03	2.39
ICTHYOBORIDAE				
Phago loricatus	2	0.03	20.00	0.01
MOCHOKIDAE				
Synodontis membranaceus	31	0.54	4,061.04	2.03
Synodontis nigrita	1	0.02	47.00	0.02
MALAPTERURIDAE				
Malapterurus electricus	1	0.02	256.00	0.13
MORMYRIDAE				

Mormyrus rume	6	0.10	1,221.01	0.61
Mormyrus deliciosus	23	0.40	544.00	0.27
Hyperopisus bebe occidentalis	21	0.37	4,551.01	0.23
Marcusenius isidori	779	13.58	8,999.23	4.51
Marcusenius psittacus	1	0.02	30.01	0.02
Gnathonemus senegalensis	1	0.02	30.02	0.02
Gnathonemus cyprinoids	1	0.02	55.00	0.03
SCHILBEDAE				
Schilbe mystus	64	1.11	3,463.12	1.73
Total	**5736**	**100**	**199687.65**	**100**