

The Fin Fish Assemblage of Lower Ogun river, Akomoje Ogun state Nigeria

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Target Audience: Fish Farmers, Nutritionists and Researchers

Abstract

The fin fish assemblage of lower ogun river was investigated, which comprised a total of 34 species belonging to 13 families. Chrysichthys nigrodigitatus was most abundant and highest in biomass (55,491.21kg) accounting for 27.58% of the catch. Gnatonemus senegalenses, Gnatonemus cyprinoides, Synodontis nigrita, Marcusenius psittacus and Malapterurus electricus were the least in number, while Phago loricatus was least in biomass (32.03kg) accounting for 0.02%. The major aim was to assess the fish resources of the lower Ogun River and evaluate the water parameters as related to fish production. Data on fish species were collected, using multi-fleet gillnet sampling techniques between May and October 2012. Three sampling stations were randomly selected for the investigation of the fin fish assemblage and abundance. No significant difference was observed in dissolved oxygen, nitrogen, phosphate, water temperature, conductivity, alkalinity, total dissolved solid and pH range values in the river. The water quality parameters were favourable for fish production. Water level and temperature were observed to guarantee high yield in Ogun River.

Keywords: Fin Fish, Check list, Ogun River.

Description of the Problem

Hunger and malnutrition remains the most devastating problems facing the poor in developing countries and there is a long way towards eliminating hunger.

Fish and fisheries can play an important role in addressing hunger and poverty. Fish are rich sources of protein, essential fatty acids, vitamins and minerals. (1) opined that fish flesh is about the best source of animal protein, better digested than beef and poultry, that contains mineral salts and its oil is mainly poly-

unsaturated fatty acids with anti-cholesterol factor. He concluded that regular consumption of fish is beneficial to human body. Some other authors noted that increased consumption of fish reduces the risks, abates rheumatoid arthritis, decreases the risk of bowel cancer and reduces insulin-resistance in skeletal muscles ((2) and (3)).

(4) reported that fish species in Ikere gorge are distributed in three ways, some preferred shallow, deep and some were

distributed all over the entire water body area of the water.

Studies on water quality will mostly centre on fish production and aquatic biotic integrity (5,6 and 7). The most notable and important physico-chemical parameters in water bodies are dissolved oxygen, temperature, transparency, phosphate, nitrate, alkalinity, suspended solids and dissolved ions (8) and (4).

(9) reported that differences in physicochemical conditions cause variations in species composition and low diversity which is a function of low productivity that has been a common feature of small fresh water rivers.

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.

The major aim was to assess the fish resources of lower Ogun River Akomoje and evaluate the water parameters as related to fish production.

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% (10).

Fin fish assemblage highlights the relative proportion and relative abundance of different fin fish species in

natural water bodies. It is a conservative measure which enables fisheries scientists to adopt best strategy or combination of strategies in restoring inland waters to productive state. This study sheds light on fin fish species that are dominating and species going into extinction in the lower Ogun River in Akomoje, Ogun State.

Materials and Methods

Study area

The study was carried out in Lower Ogun River in Akomoje Abeokuta, Ogun state. The River Ogun discharges into Lagos Lagoon, a perennial river which has a coordinate of $3^{\circ}28^1E$ and $8^{\circ}41^1N$ at its source in Oyo State and $3^{\circ}25^1E$ and $6^{\circ}35^1N$ in Lagos state where it empties into the Lagos Lagoon.

Ogun River catchment is located in South West Nigeria, bordered geographically by latitude $6^{\circ}26^1N$ and $9^{\circ}10^1N$ and longitude $2^{\circ}28^1E$ and $4^{\circ}4^1E$. The land is about 230 square meters. It has a low relief, with the gradient in the North-south direction. The River takes its source from the Igaran hills at an elevation of about 540m above the sea level and flows directly southward over a distance of 480km before it discharge into the Lagos Lagoon. The major tributaries of the river are Ofiki River and Opeji River.

Fish sampling

Data on fish species were collected between May to October 2012 using multi-fleet gillnet sampling techniques, Three sampling stations were randomly selected. This technique involved sampling of each station for the fin fish

assemblage and abundance using a fleet of eight graded experimental gillnets (mesh sizes from 25.4 to 177.8mm) and Cast net (50.8mm) of similar surface area, which were done simultaneously in the various sampling stations.

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 stations in open water, flooded bush patches and shallow area of the river. In addition, Fisher men 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 river.

Physico-chemical parameter

Water quality parameters were determined during the study period. Surface water temperature was measured two minutes after dipping mercury- in-glass thermometer at a depth of 5.0cm 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 depth 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 was corroborated with the results of laboratory analysis of the physico-chemical parameter.

Results and Discussion

Table 1 represents the fish species composition in Lower Ogun River Akomoje. A total of 34 species from 13 families were caught during the study period. *Chrysiethys nigrodigitatus* was highest in biomass (55,492kg) accounting for 27.58% of the total fish caught.

The results of the physico-chemical characteristics of Ogun River Akomoje between May 2012 and October 2012 are presented in Table 2. There was no significant difference ($p>0.05$) in the physico-chemical parameters of lower Ogun River in the three sampled stations in terms of dissolved oxygen, nitrate, phosphate, temperature, alkalinity total dissolved solids and depth.

Ogun River contained different kinds of fish species. Various sampling stations and fishing gear were used to ensure a comprehensive sample of ichthyofauna as possible from the study area. From the study a total of 5,805 fish specimens were caught between May 2012 to October 2012. These were identified and classified into 34 species of fish representing 13 families were recorded.

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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 themselves nor burrow into the muds.

Table 1: Fish species caught and their Percentage Composition in Lower Ogun River.

Family/Species	No of Fish specimen	% no of specimen	Wt.(kg) of specimen	%Wt. of specimen
BAGRIDAE				
<i>Chrysichthys nigrodigitatus</i>	1282	22.08	55,491.23	27.58
<i>Bagrus docmac niger</i>	52	0.90	1,940.44	0.97
CENTROPOMIDAE				
<i>Lates niloticus</i>	120	2.07	3,667.31	1.82
CHARACIDAE				
<i>Brycinus chaperi</i>	422	7.27	6,212.16	3.09
<i>Brycinus macrolepidotus</i>	26	0.45	2,413.69	1.20
CHANNIDAE				
<i>Parachanna obscura</i>	44	0.76	9,791.16	4.87
CICHLIDAE				
<i>Hemichromis fasciatus</i>	600	10.34	6,812.34	3.89
<i>Sarotherodon galilaeus</i>	520	9.0	27,411.61	13.63
<i>Tilapia melanopleura</i>	648	11.16	34,664.88	17.23
<i>Tilapia zill2</i>	40	0.69	1,742.71	0.87
<i>Tilapia melanotheron</i>	362	6.24	3,643.22	1.81
<i>Tilapia mariae</i>	18	0.31	1,565.26	0.78
<i>Tilapia monody</i>	5	0.09	69.53	0.04
<i>Oreochromis niloticus</i>	42	0.72	7,968.11	3.96
CLAR2DAE				
<i>Clarias gariepinus</i>	49	0.84	2,012.49	1.00
<i>Heterobranchus bidorsalis</i>	9	0.16	1,465.92	0.73
CYPRINIDAE				
<i>Labeo coubie</i>	14	0.24	512.38	0.26
<i>Barbus occidentalis</i>	392	6.72	3,401.21	1.69
<i>Gara water loti</i>	2	0.03	140.16	0.07
<i>Barilius senegalensis</i>	6	0.10	312.01	0.16
<i>Barilius loati</i>	16	0.28	413.20	0.21
HEPSETIDAE				
<i>Hepsetus odoe</i>	39	0.67	4,214.67	2.09
ICTHYOBORIDAE				
<i>Phago loricatus</i>	2	0.03	32.03	0.02
MOCHOKIDAE				
<i>Synodontis membranaceus</i>	35	0.60	4,622.04	2.30
<i>Synodontis nigrita</i>	1	0.02	62.27	0.03
MALAPTERURIDAE				
<i>Malapterurus electricus</i>	3	0.05	749.04	0.37
MORMYRIDAE				
<i>Mormyrus rume</i>	9	0.16	1,120.98	0.56
<i>Mormyrus deliciosus</i>	28	0.48	755.14	0.38
<i>Hyperopisus bebe occidentalis</i>	24	0.41	4,624.97	2.30
<i>Marcuseinus isidori</i>	920	15.85	9,155.61	4.55
<i>Marcuseinus psittacus</i>	2	0.03	71.49	0.04
<i>Gnathonemus senegalensis</i>	1	0.02	44.31	0.02
<i>Gnathonemus cyprinoids</i>	3	0.05	64.44	0.03
SCHILBEDAE				
<i>Schilbe mystus</i>	70	1.21	4,010.24	2.00
Total	5805	100	201187.34	100

Table 2. The mean values of the Physico-chemical characteristic of Ogun River Akomoje between May 2012 and October 2012.

	Station 1	Station 2	Station 3
PH	6.08-8.26	6.14-8.62	6.04-8.50
Dissolved Oxygen	6.84±0.22 ^a	6.86±0.23 ^a	6.78±0.30 ^a
Transparency	1.38±0.10 ^b	1.87±0.13 ^a	1.75±0.17 ^{ab}
Nitrate	0.47±0.09 ^a	0.51±0.14 ^a	0.56±0.19 ^a
Phosphate	0.36±0.09 ^a	0.42±0.14 ^a	0.48±0.20 ^a
Temperature	27.44±0.45 ^a	27.55±0.33 ^a	28.04±0.35 ^a
Conductivity	83.39±0.51 ^{ab}	82.49±0.36 ^b	84.24±0.69 ^a
Alkalinity	139.06±11.06 ^a	128.50±5.99 ^a	139.33±12.14 ^a
Total Dissolved Solid	298.00±58.25 ^a	310.71±53.12 ^a	324.83±66.05 ^a
Depth	1.93±0.28 ^b	4.05±0.39 ^b	4.73±0.60 ^b

The study shows Ogun River, Akomoje consists of numerous fish species. The variation in number of species may be explained in differences ways, the physico-chemical conditions cause variations in species composition. The difference in the species composition in this study and others may be due to difference in abiotic factors such as Dissolved oxygen values are typical of fresh water systems. Conductivity and alkalinity values are all typical of fresh water systems. Adeosun *et al.* (11) recorded 34 species belonging to 13 families in Ikere Gorge Oyo State, (12) encountered 44 species on the Rupennine River. This species assemblage was higher than some similar studies. Lawson and Olusanya (13) recorded 10 species in river Ore, (14) recorded 37 species in Badagry lagoon and (15) recorded 39 and 23 species from Cross River and Osun River respectively. However, the number

temperature, pH, turbidity, dissolved oxygen, Phosphate, Nitrate, conductivity and alkalinity. 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. encountered in the study is lower than the results of (16) who recorded 52 species in Anambra River, Nigeria. The difference in the species assemblage between this study and others may be due to difference in abiotic factors such as temperature, pH, turbidity, dissolved oxygen, electrical conductivity, alkalinity and nutritive salts.

Conclusion and application

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.

1. The variation in number of species may be explained in two ways: Differences in the physicochemical conditions cause variations in species composition.
2. *Chysichthys nigrodigitatus* was common because of its ability to feed on varieties of food items and *Brycinus macrolepidotus* was also common because of its abundant at the onset of raining season.
3. The large number of small fish species encountered may be due to down stream migration or fishing pressure or both. It could also due to the fact that the area is a breeding and nursery ground. More so, the rare species is an indication that these species were rare or threatened or near extinction.

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