African Journal of Sciences and Traditional Medicine

ISSN : 3434-6031

Index: Harvard, Boston, Sydney University, Dimensions, Lens, ResearchGet Scilit, Semantic, Google Scholar, Base etc

https://doi.org/10.58578/AJSTM.v1i1.3694

# Fish Composition of Kwanar Farakwai Reservoir Igabi, Kaduna State, Nigeria

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**Article Info:**

| Submitted: | Revised: | Accepted: | Published: |
|---|---|---|---|
| Aug 25, 2024 | Jul 11, 2024 | Jul 23, 2024 | Jul 31, 2024 |

**Abstract**

The research titled 'Determination of Physico-Chemical Characteristics and Fish Composition of Kwanar Farakwai Reservoir Igabi, kaduna State, Nigeria'was conducted between July 2019 to June 2020. Reservoirs are natural or artificial lakes that provide habitat and food for many species of fish and wildlife. They are of significant importance because they hold populations of diverse fish species. A total of 942 fish comprising fourteen species belonging to 7 families were caught using an experimental gill net. *Oreochromis niloticus* dominated the catches with 405(43%) followed by *Clarias gariepinus* with 221 (23.46%). Monthly abundance of all the fish species caught, showed the highest in the month of October with 206 (21.87%), While January recorded 159 (16.88%) and the lowest was in June, 20 (2.12%). Fourteen species of fish belonging to Seven families with Cichlidae (53.5%) and Clariidae (39.7%) as the dominant families in both number and weight in the reservoir were recorded.

**Keywords**: Fish, Species, Reservoir, Abundance, Season, Monthly and Habitat


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## INTRODUCTION

Reservoirs are natural or artificial lakes that provide habitats and foods for many species of fish and wildlife (Atobatele and Ugwumba, 2008). Freshwater ecosystems have been used for the investigation of factors controlling the abundance and distribution of aquatic organisms (Esenowo and Ugwumba, 2010). Nigeria has an estimated population of over 200 million people (FDF, 2020), and is blessed with about 853,600 hectares of freshwater capable of producing over 1.5 million metric tonnes of fish annually (FAO, 2009). Many of these reservoirs were built as a result of societal demand for drinking and industrial water supplies, irrigation, and hydroelectric power generation. With time however, most of these reservoirs have secondary functions such as navigation, industrial processing, flood protection, urban run-off control and tourism super imposed on them (Mustapha, 2011). They are of significant importance because they hold populations of diverse fish species.

## MATERIALS AND METHODS

### Study Area

Kwanar Farakwai is located between latitude 10° 50' 00" N and longitude 007° 35' 00' E ' of Igabi LGA Kaduna State, with the aim of providing water for irrigation for the surrounding communities. The Surface area of the reservoir is 150,000ha$^2$ while the depth is about 4.1 m with a total carrying capacity of 615,000m$^3$.

### Sampling Station

Three sampling stations were selected for this study as shown in Figure 3.1. Station A toward center from the west of the reservoir around muddy area. Station B was toward center to the Dam from south east around grassy area, while Station C is from north east of the reservoir around rocky area, where the embankment is located toward center of the reservoir. The distance between sample point A, B and C is about 1km,1.1km and 1.5k respectively.

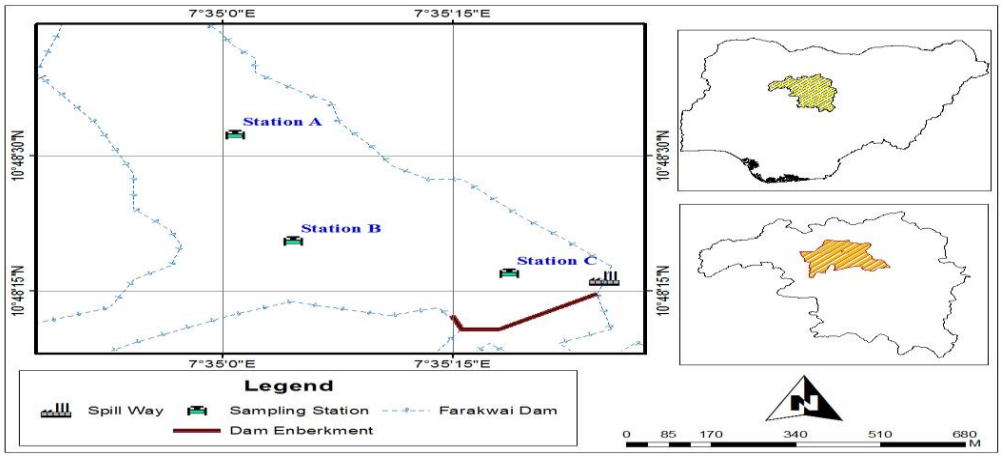


**Figure 1 Map of Study Area Showing Sampling Stations.**

Source: GIS Laboratory Department of Geography and Environmental Management A.B.U. Zaria. The first map representing Nigeria and the second map representing Kaduna

**Survey of Fish Species Composition**

The survey of the fishes in Kwanar Farakwai reservoir was conducted at three sampling stations a by employing experimental fish sampling procedure according to (Mustapha 2008). Sampling was carried out on monthly basis for a period of twelve (12) months ( July 2019 –June 2020).

**Experimental Fish Sampling:** A fleet of gill nets consisting of nine monofilament nets of 210d/1" (2.5cm), 210d/1.5" (3.75cm), 210d/2" (5.0cm), 210d/3" (7.5cm), 210d/3.5" (8.75cm), 210d/4" (10.0cm), 210d/5" (12.5cm), 210d/6" (15.0cm), and 210d/7" (17.5cm) with 210/3 twine used for the first eight meshes and 210/6 for the 17.5cm stretched meshes were used across the length of the water body. Each net measured 30m long and 3m deep and formed a curtain of netting hanging vertically in the water, with floats attached to the top and sinkers fixed to the bottom to keep the net in its position. The fish caught in each net were removed and transfered into labeled plastic bowls and sorted into different mesh sizes. There was a separate bowl for each net. Each fish was weighed (g) and measured for standard and total length (cm) using a measuring board. Fishes were identified using standard reference materials such as Olaosebikan and Raji (1998), Balogun (2006), Idodo-Umeh (2003), and Pauly *et al.* (2004).

Data Analysis

Data on morphometric were analyzed using descriptive statistics to determine mean and standard deviations. Means were separated using Duncan's Multiple range test. Difference

between dry and wet season were analyzed using T-test. Fish species composition were calculated in percentages. Data obtained were subjected to analysis of variance (ANOVA) using SAS V.9.2 (2007) and significant difference between means values was accepted at the0.05 level of probability.

## RESULT AND DISCUSSION

**Table 1: Fish species composition and their relative abundance In Kwanar Farakwai Rreservoir**

| Families/Species | No. | Relative abundance (RA) | Weight(gms) | Percentage(%) |
|---|---|---|---|---|
| **CICHLIDAE** | | | | . |
| *Oreochromis.niloticus* | 407 | 43.16 | 5131 | 27.12 |
| *Tilapia.zillii* | 95 | 10.1 | 2348 | 12.14 |
| *Hemichromis bimaculatus* | 4 | 0.4 | 200 | 1.06 |
| **CLARIIDAE** | | | | |
| *Claria gariepinus* | 210 | 22.4 | 5065 | 26.77 |
| *Clarias angullaris* | 91 | 9.7 | 3261 | 17.24 |
| *Clarias galmaensis* | 66 | 7.1 | 1061 | 5.61 |
| *Clarias Isheriensis* | 5 | 0.5 | 184 | 0.97 |
| ***SCHILBEIDAE*** | | | | |
| *Pareutropius buffei* | 32 | 3.4 | 1001 | 5.29 |
| *Schilbe mystus* | 12 | 1.3 | 214 | 1.1 |
| *Parailia pellucida* | 1 | 0.1 | 14 | 0.07 |
| **MOCHOKIDAE** | | | | |
| *Synodontis gambiensis* | 16 | 1.7 | 189 | 1.0 |
| **MORMYRIDAE** | | | | |
| *Marcusenius ihuysi* | 1 | 0.1 | 53 | 0.3 |
| **LATIDAE** | | | | |
| *Lates niloticus* | 2 | 0.2 | 160 | 0.9 |
| **CYPRINIDAE** | | | | |
| *Boraras maculatus* | 1 | 0.1 | 36 | 36 |
| **TOTAL** | 942 | 100 | 18917 | 137.97 |

Table 2: Monthly fish Distribution in Kwanar Farukwai Reservoir

| Species | Month | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Total |
| ***Boraras maculatus*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| ***Clarias angullaris*** | 5 | 5 | 17 | 4 | 5 | 21 | 0 | 9 | 12 | 2 | 0 | 11 | 91 |
| ***Clarias galmaensis*** | 0 | 7 | 10 | 9 | 9 | 13 | 6 | 0 | 6 | 2 | 1 | 3 | 66 |
| ***Clarias gariepinus*** | 14 | 29 | 31 | 25 | 11 | 17 | 19 | 13 | 14 | 13 | 0 | 23 | 210 |
| ***Larias isheriensis*** | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| ***Hemichromis bimacullatus*** | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| ***Lates niloticus*** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| ***Marcusenius ihuysi*** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| ***Oreochromis niloticus*** | 24 | 54 | 99 | 42 | 50 | 58 | 15 | 11 | 10 | 6 | 12 | 26 | 407 |
| ***Pareutropius buffei*** | 4 | 8 | 4 | 0 | 3 | 4 | 0 | 1 | 0 | 2 | 0 | 6 | 32 |
| ***Parailia pellucida*** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| ***Synodontis gambiensis*** | 0 | 7 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| ***Schilbe mystus*** | 1 | 0 | 0 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 2 | 12 |
| ***Tilapia zilli*** | 0 | 3 | 23 | 0 | 10 | 22 | 0 | 2 | 4 | 4 | 4 | 23 | 95 |
| **Total** | 48 | 113 | 202 | 80 | 88 | 146 | 41 | 37 | 46 | 29 | 18 | 94 | 943 |

Table 1 shows Fourteen fish species belonging to seven families were recorded in Kwanar Farukwai reservoir from July, 2019 to June, 2020 as shown in Table 4.2.1. The fish families recorded were Cichlidae, Clariidae, Schilbeidae, Mochokidae, Mormyridae, Latidae and Ciprinidae. Cichlidae was represented by three species, Clariidae by four species , Schilbeidae by three while the rest were represented by one species each. The family Cichlidae was represented by the following species; *Oreochromis niloticus*, *Tilapia zilli* and *Hemichromis bamiculatus,* family Mormyridae was represented by *Marcusenius ihuysi,* Clariidae was represented by *Clarias gariepinus*, *Clarias anguillaris,Clarias isheriensis* and *Clarias galmaensis,* Schilbeidae represented by *Pareutropius buffei,Parailia pelucida* and *Schilbe mystus* while Latidae, Mochokidae and Cyprinidae were represented by *Lates niloticus,Boraras maculatus and Synodontis gambiensis,* respectively.

Table 2 shows the highest number of fish catch was in October 202 (21.42%) followed by January146 (15.48%) while the least was recorded in June (18%). *Cichlidae and Clariidae* were present in all the months throughout the study period.

## CONCLUSION

Fourteen species of fish belonging to seven families with Cichlidae (53.5%) and Clariidae (39.7%) as the dominant families in both number and weight were recorded in the reservoir were recorded.

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