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# Preliminary investigation of fish species abundance of Otammiri River, Owerri, Nigeria

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**Abstract**

*A study of fish species abundance of Otammiri River, Owerri: Nigeria was conducted from April to August, 2012. Four hundred and three (403) fishes belonging to 10 families, 16 genera and 21 species were collected from artisanal fishers using various fishing gears. The fish samples were taken to laboratory identified, counted and their weights and lengths measured. The unnamed cichlid species ranked highest in percentage number and weight as well as Index of Preponderance (38.7%, 33.6% and 51.1 respectively), while the least were Polycentropis abbreviata, Hepsetus odoe, Synodontis omias, Chrysichthys aluensis and Chrysichthys furcatus each constituting 0.2% of the total number of fish collected. Among fish families, Cichlidae ranked highest in percentage number (82.63%) and weight (81.2%) followed by Hepsetidae(5.7% and 8.0%) and Anabantidae (4.47% and 2.8% respectively) The least were Characidae, Notopteridae and Mochokidae. The presence of an unnamed fish species in the river is an indication that there could be more unknown aquatic living resources with strong potential benefits to in the River. The information provided in this study reflects the potential of the fish resources of Otammiri. This will serve as invaluable baseline tool in fisheries management planning and policy formulations that will enhance the development of fisheries in the area.*

*Keywords: Index of Preponderance, fisheries management, Otammiri River.*

## Introduction

Fish and fishery products represent a very valuable source of protein and essential micronutrients for balanced nutrition and good health. In 2009, fish accounted for 16.6 percent of the world population's intake of animal protein and 6.5 percent of all protein consumed. Globally, fish provides about 3.0 billion people with almost 20 percent of their intake of animal protein, and 4.3 billion people with about 15 percent of such protein. (FAO, 2012).

Fish contain a good balance of essential amino acids and is highly digestible (87 – 90%) and compares favourably well with egg, milk and chicken meat (Ugwu, 1997). Fish is a good source of vitamins and minerals but with low carbohydrate content. About 40% of the animal protein consumed by the average Nigerian especially among the rural dwellers is derived from fish (Ugwu, 1997).

Unfortunately, many countries still encounter great difficulties in managing and funding the collection of inland capture fisheries statistics. For example, despite the fact that African lakes and rivers provide food to a large number of inhabitants and also revenues from fish exported outside Africa, it was necessary for FAO to estimate the 2004 inland total catch for only half of the African countries where inland fishing is known to take place (FAO, 2006).

FAO (2012) reported that total global capture production in inland waters has increased dramatically since the mid-2000s with reported and estimated total production at 11.2 million tons in 2010, an increase of 30 percent since 2004. Despite this growth, it may be that capture production in inland waters is seriously underestimated in some regions. Nevertheless, inland waters are considered as being overfished in many parts of the world, and human pressure and changes in the environmental conditions have seriously degraded important bodies of freshwater (e.g. the Aral Sea and Lake Chad).

The fish yield of most inland waters in Nigeria are generally on the decline for causes that may range from inadequate management of the fisheries to degradation of water bodies (Odo et al., 2009). Ude (2011) reported that detailed knowledge of the form and function of the river system and the responses of fish species are needed for effective fisheries management planning. Welcome and Halls (2001) reported that such detailed knowledge of individual system is generally lacking. There has been pockets of research efforts at different levels in attempt to bridge this gap. Ude (2010) investigated the ecology and

Itchthyofaunal diversity of lower Ebonyi River-Nigeria. Similarly Ude (2012) conducted taxonomy of fish species of Akpoha River-Nigeria. Both rivers and Otammiri are inland waters located in the South-Eastern Nigeria. There is therefore a need for information on the fish species of Otamiri River to facilitate its proper management to enhance fish production. This need is occasioned by the decline in capture fisheries globally (FAO, 2006) as a result of factors, most of which are man-made.

## Materials and Methods

Fish samples were obtained three times monthly at 10 days interval from April to August, 2012, from fishermen who used hook and line of sizes 13-18, gill nets and other fishing gears such as cast nets, bag nets and traps of diverse mesh sizes ranging from 50mm to 100mm, to catch the fish. The collected species were taken to the laboratory, sorted and identified to families, genera and species levels, using reference identification texts of Reed *et al.* (1967), Olaosebikan and Raji (2004) and Adesulu and Sydenham (2007). The Total Length (TL) of the fish was measured from the tip of the snout to the tip of the caudal fin using meter rule centimeter. Fish weight was measured using electronic weighing balance, to the nearest gram. The pooled data of catches by all gear types in the sampling stations (Figure 1) was used in assessing abundance by calculating the Index of Preponderance (IP), which was expressed as percentages of the total weight and number of the fish caught (Moses 1987).

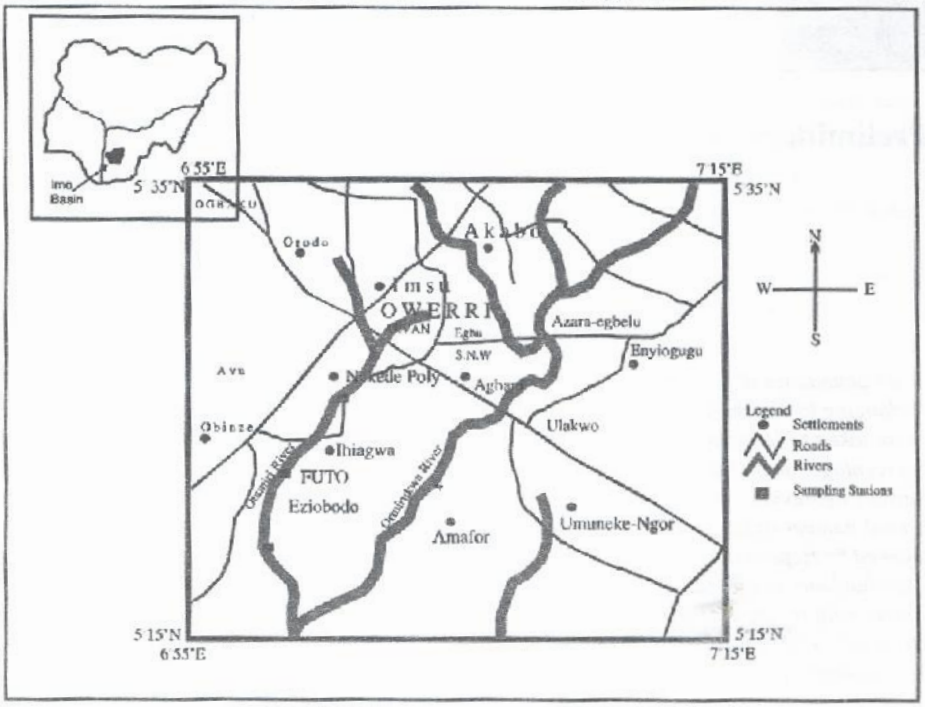


Fig. 1: Map showing sampling stations.

## Results and Discussion

The composition and abundance of fish species in Otammiri River during the study period are presented in Table 1. Four hundred and three (403) fishes belonging to 10 families, 16 genera and 21 species were collected. The unnamed cichlid species ranked highest in percentage number and weight as well as Index of IP (38.7%, 33.6% and 51.1 respectively), while the least were *Polycentropis abbreviata*, *Hepsetus odoe*, *Synodontis omias*, *Chrysichthys aluensis* and *Chrysichthys furcatus* each constituting 0.2% number of fish collected.

Table 2 shows the relative abundance of fish families of Otammiri River. Cichlidae ranked highest in percentage number (82.63%) and weight (81.2%), followed by Hepsetidae (5.7% and 8.0%) and Anabantidae (4.47% and 2.8% by number and weight respectively). The least abundant families were Characidae, Notopteridae and Mochokidae.

Table 1: Percentage fish species composition and abundance in Otamiri River

| Species | No. collected (N) | % N | % Weight | IP |
|---|---|---|---|---|
| Family Cichlidae | | | | |
| Unnamed species | 156 | 38.7 | 33.6 | 51.1 |
| *Chromidotilapia guntheri* (Sauvage,1882) | 3 | 0.7 | 0.6 | 0.02 |
| *Hemichromis fasciatus* (Peters, 1852) | 2 | 0.5 | 0.5 | 0.01 |
| *Oreochromis niloticus* (Linne, 1758) | 2 | 0.5 | 1.1 | 0.02 |
| *Palmatochromis pulcher* (Boulenger,1901) | 22 | 5.5 | 4.2 | 0.9 |
| *Tilapia mariae* (Boulenger,1899) | 125 | 31.0 | 37.2 | 45.3 |
| *Tilapia zilli* (Gervais, 1848) | 23 | 5.7 | 4.0 | 0.9 |
| Family Anabantidae | | | | |

| Species | No. collected (N) | % N | % Weight | IP |
|---|---|---|---|---|
| *Ctenopoma kingsleyae* (Gunther, 1896) | 18 | 4.4 | 2.8 | 0.5 |
| Family Nandidae | | | | |
| *Polycentropis abbreviata* (Boulenger,1901) | 1 | 0.2 | 0.03 | 0.3 |
| Family Characidae | | | | |
| *Alestes imberi* (Peters, 1852) | 6 | 1.5 | 0.4 | 0.02 |
| *Brycinus longipinnis* (Gunther, 1864) | 8 | 1.9 | 0.04 | 0.03 |
| Family Hepsetidae | | | | |
| *Hepsetus odoe*(Bloch, 1794) | 1 | 0.2 | 1.4 | 0.01 |
| Family Notopteridae | | | | |
| *Papyrocranus afer* (Gunther, 1868) | 10 | 2.4 | 6.4 | 0.6 |
| *Xenomystus nigri* (Gunther, 1896) | 13 | 3.2 | 1.6 | 0.2 |
| Family Malapteruridae | | | | |
| *Malapterurus electricus* (Gmelin, 1789) | 2 | 0.5 | 1.1 | 0.02 |
| Family Mochokidae | | | | |
| *Synodontis omias* (Gunther, 1864) | 1 | 0.2 | 0.6 | 0.01 |
| Family Channidae | | | | |
| *Channa obscura* (Myers & Shapovalor, 1932) | 4 | 0.9 | 2.3 | 0.1 |
| Family Bagridae | | | | |
| *Chrysichthys auratus* (Saint–Hilaire, 1808) | 2 | 0.5 | 0.4 | 0.01 |
| *Chrysichthys aluensis* (Risch. 1985) | 1 | 0.2 | 0.2 | 0.002 |
| *Chrysichthys nigrodigitatus* (Lacapede,1803) | 2 | 0.5 | 0.8 | 0.02 |
| *Chrysichthys furcatus* (Gunther, 1868) | 1 | 0.2 | 0.8 | 0.01 |

**Table 2: Relative abundance of Fish Families in Otamiri River**

| Family | No. collected (N) | % N | % Weight |
|---|---|---|---|
| Cichlidae | 333 | 82.63 | 81.2 |
| Anabantidae | 18 | 4.47 | 2.8 |
| Nandidae | 14 | 3.5 | 0.44 |
| Characidae | 1 | 0.24 | 0.03 |
| Hepsetidae | 23 | 5.7 | 8.0 |
| Notopteridae | 1 | 0.3 | 1.4 |
| Malapteruridae | 2 | 0.5 | 1.1 |
| Mochokidae | 1 | 0.3 | 0.6 |
| Channidae | 4 | 1.0 | 2.3 |
| Bagridae | 6 | 1.5 | 2.2 |

Fishes with Index of Preponderance values less than 0.50 are regarded as having relatively insignificant contribution, while those with IP values greater than 0.50 have significant contribution to the fisheries of a water body (Moses 1987). The unnamed cichlid species, *Tilapia mariae, Tilapia zilli, Ctenopoma kingslayae, Palmatochromis pulcher* and *Papyrocranus afer* had IP values showing relative significant contribution to Otammiri River fishery. This corroborates Ita (1993) who reported that the abundant species in most Nigerian inland waters under uncontrolled conditions are the cichlids and to some extent mochokids. The prolific breeding nature of the cichlids could be responsible for their preponderance. However, Shuka et al. (2001) reported that the relationship between habitat and fish abundance are influenced by the species of fish investigated as well as the spatial scale of investigation.

The identification of four hundred and three (403) fishes belonging to 10 families, 16 genera and 23 species in this work during wet season, when fishes are difficult to catch is an indication of the rich biodiversity and that there might be more fish species in Otammiri River than the number obtained within this period of research. The presence of an unnamed fish species in the river is also an indication that there could be much more unknown aquatic living resources with strong potential benefits to fisheries and aquaculture development within the vicinity of the River.

## Conclusion

Otammiri River appears to have rich assemblage of fish species, which if adequately harnessed through planned Fisheries management strategies could result in enhanced nutritional status of the dwellers within the vicinity. The diverse fish species of the river present an invaluable research resource for students of Fisheries Science in more than five tertiary institutions located within the area. It is therefore concluded that the information generated from this work will be invaluable as a baseline tool in fisheries management planning and policy formulations and will be a source of reference for further studies on fish species diversity of the river.

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