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**Ichthyofauna Diversity, Abundance and Distribution Oluwa River, Ilaje Local
Government Area, Ondo State, Nigeria.**

By

Olaniyan, Rotimi Francis Ph.D¹ and Okeke Obinna Innocent²

Department of Biology^{1&2}

Adeyemi Federal University of Education, Ondo, Ondo State.

Author's Email: olaniyan4real_06@yahoo.com

G.S.M NO:+2348060083658

ABSTRACT

Oluwa River is used for artisanal fishing, ferrying and domestic activities in Ilaje Local Government Area (ILGA), Ondo State. The river receives domestic and agricultural wastes, which could impact adversely on the water quality and resident biota. In spite of anthropogenic activities, there is dearth of information on the taxa composition of Ichthyofaunal of Oluwa River. Thus, assessment of the fish status, trends and changes in the health status of the ecosystem are very crucial in order to ensure conservation of the aquatic resources; hence, the need for the present study. Samplings in the river were done monthly for fish fauna from June, 2022 to December, 2023 to cover the main seasons (the rainy and dry seasons). Fish samples collected monthly from landing centre (terminus) of fishermen were identified using FAO identification keys and counted. Thirty-seven species belonging to eleven families were recorded during the study period, seven species of Cichlidae, four species of Clariidae, four species of Distichodontidae, two species of Bagridae, three species of Characidae, three species of Cyprinidae, two species of Channidae, seven species of Mormyridae, two species of Citharacidae, one species of Hepsetidae and Malapteruridae respectively. *Clarias gariepinus* and *Heterobranchus longifilis* (family: Clariidae) dominated the fish fauna accounting for 7.4% and

6.9% of relative abundance respectively. While the least abundant *Marcusenius brucii* (family: Mormyridae) found only 0.6%. Clariidae family recorded the highest percentage abundance (28%) followed by Cichlidae family (17%).while the least family was Bagridae (6%). Clariidae recorded the highest percentage for dry season value (400) and dry season value (270) respectively, while, Malapteridae family recorded the least (12) for dry season and Channidae recorded the least value (7) for the rainy season respectively. The prevailing conditions of higher fish abundance in dry season than rainy season revealed that Oluwa River is good for aquacultural purposes.

Keywords: Fish, Abundance, Diversity and Oluwa River,

Introduction

Fish play important roles in the diet of the people of developing nations (Akinwumi, 2011). It is a very rich source of cheap animal protein with low cholesterol content. The need for increase in locally available fish to satisfy a population of 176 million, growing at a rate of 3.1% yr-, is becoming expedient. Nigeria is blessed with abundant natural aquatic resources in marine, estuarine and fresh water environment. The fresh water bodies of Nigeria, with over 270 fish species, are the richest in fish diversity in West Africa (Babatunde, 2010). In spite of this endowment, Nigeria is the largest importer of frozen fish in the world, with a fish demand of between 106,200-128,052 metric tonnes year-1, out of which only 0.5MT is produced. The fish yields of most Nigeria inland waters are generally on the decline for causes that may range from inadequate management of the fisheries to degradation of the water bodies. Sustainable exploitation requires knowledge of the ichthyofaunal composition in the water bodies. There is also the need to harness every sources of fish production, of which this proposed reservoir could be one. According to Michaud (1991) reservoirs can provide significant contribution to global fisheries, but the effectiveness of their contribution depends largely, on adequate fish assemblage and proper management of the reservoir fisheries.

Justification.

Oluwa River is used for artisanal fishing, ferrying and domestic activities in Ilaje Local Government Area (ILGA), Ondo State. The river receives domestic and agricultural wastes, which could impact adversely on the water quality and resident biota. In spite of anthropogenic activities, there is dearth of information on the taxa composition of Ichthyofaunal of Oluwa River. Fishing activities are a major source of livelihood especially for artisanal fisher folks.

Thus, assessment of the fish status, trends and changes in the health status of the ecosystem are very crucial in order to ensure conservation of the aquatic resources; hence, the need for the present research.

Aims and Objectives

This research aims to investigate the Ichthyofauna diversity, abundance and distribution of Oluwa River, Ilaje Local Government Area, Ondo State.

The research will:

- help to provide necessary information on taxa composition of Oluwa River,
- determine the relationship between Ichthyofauna diversity.
- determine seasonal variations in the abundance, diversity and evenness of fish species

Materials and Method

Study Area

The study was conducted on Oluwa River at Ilaje Local Government Area (ILGA), Ondo State, Nigeria. The river lies on latitude $4^{\circ}.40' - 5^{\circ}.00'N$ and longitude $6^{\circ}.00' - 6^{\circ}.20'E$ (Figure 3.1). Ilaje Local Government Area is in south-south of Ondo State with a coastline of about 80km which runs in a northwest to southeast direction. The coastal area of Ondo State is largely found in ILGA with about 50 settlements scattered around the river tributaries that empty directly into the coast and an increasing population size of 2.2% annually (Adebowale *et al.*, 2008).

Babatunde (2010) avers that 80% of the population of the study area engages in fishing and that the area always records the bulk of fish produced in Ondo State.

Sampling stations

Fish specimens were from catches at the landing centre (terminus) of the local fishermen at Durogbe park.

Collection of samples and analyses

Samplings in the river were done monthly for fish fauna from June, 2022 to December, 2023 to cover the main seasons (the rainy and dry seasons) of the year. Fish specimens were from catches at the landing centre (terminus) of the local fishermen. The fishes were identified and analyses in the Fishery Laboratory, Obafemi Awolowo University, Ile-Ife, Osun State. Using the keys and guides of Reed *et al.* (1970), Olaosebikan and Raji (1998) and Idodo-Umeh (2003), and

counted. Pictures of some of the fishes were taken with a cyber shot DSC-W510 Digital camera of 12.5 mega pixel.

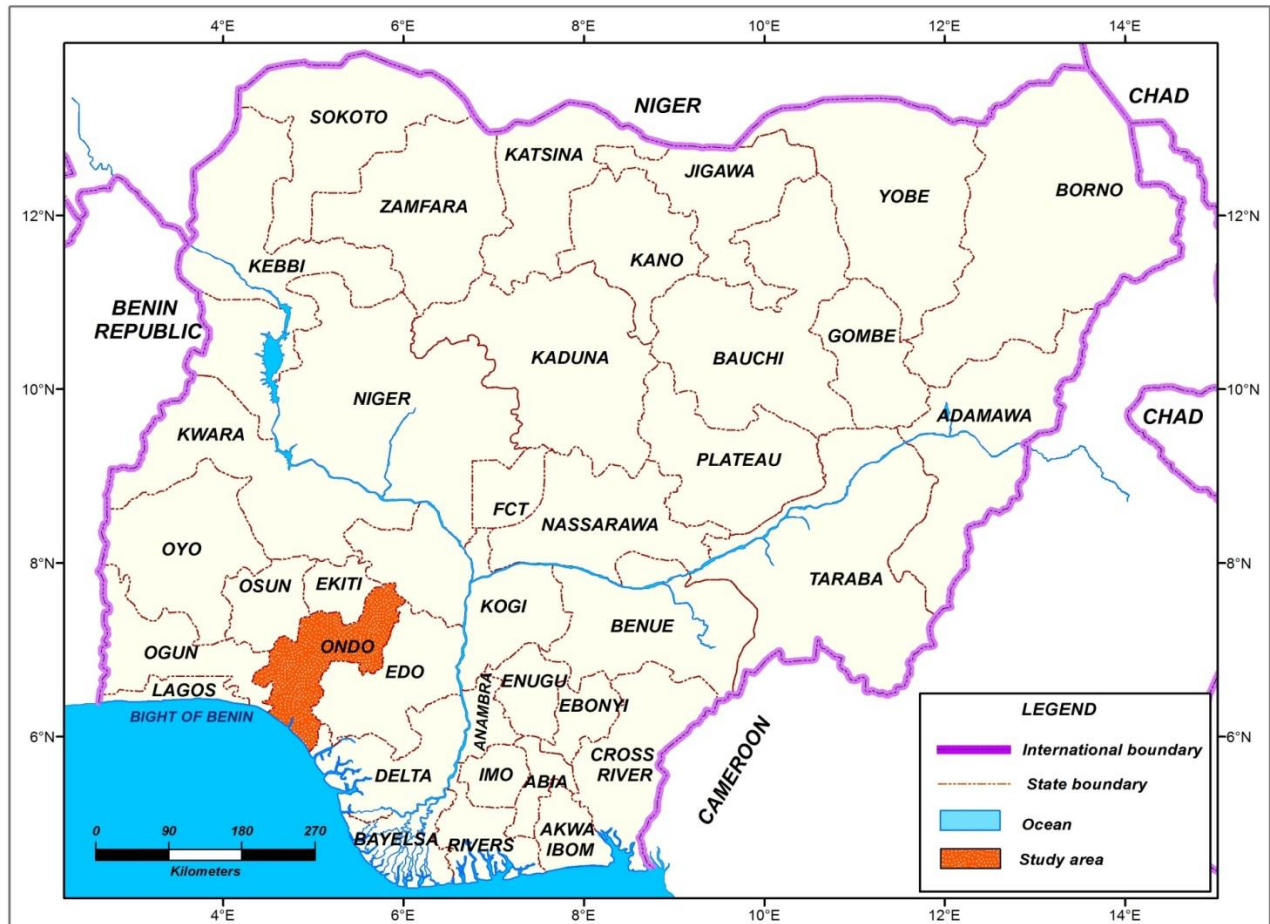


Fig. 1: Map of Nigeria showing Ondo State

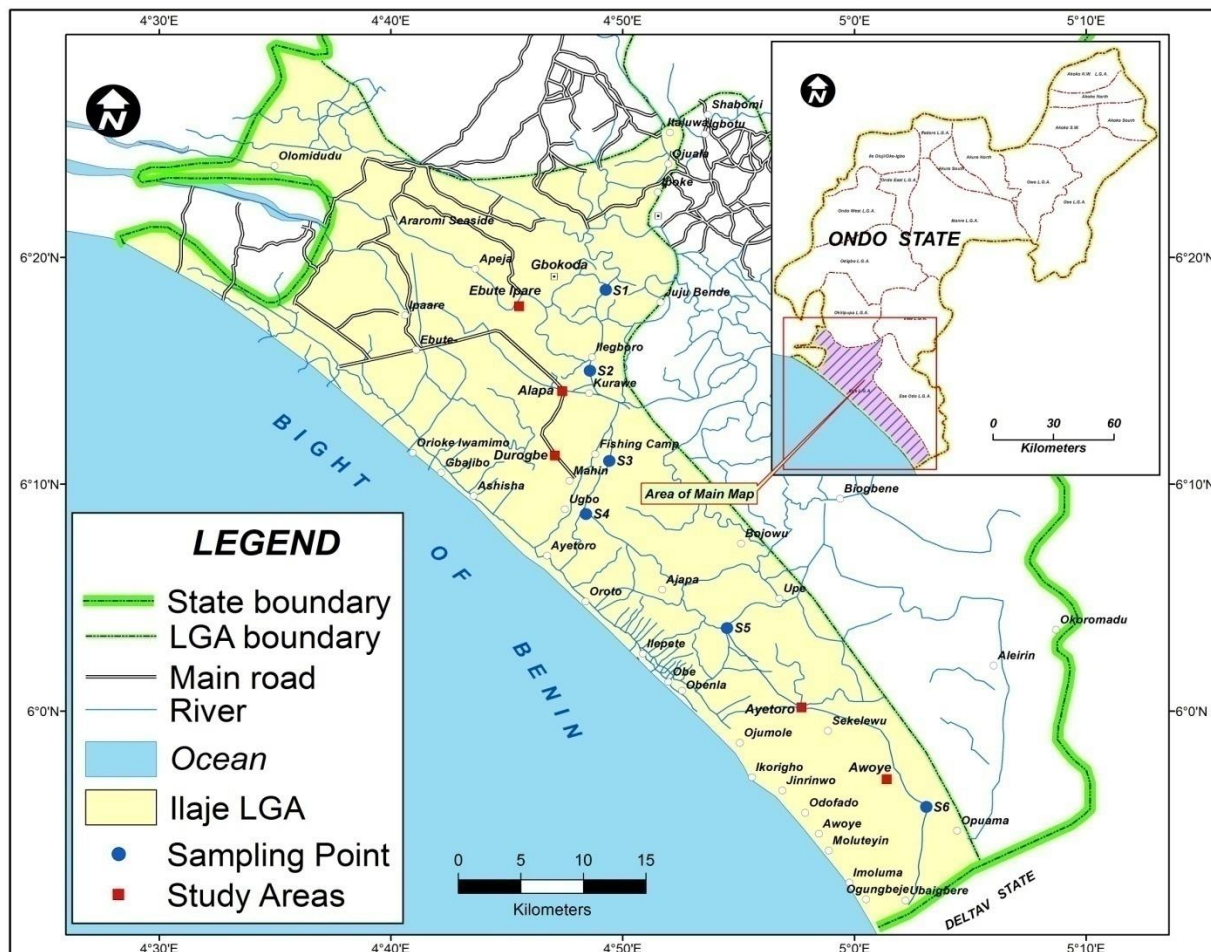


Fig 2: Map of Ilaje communities in Ondo State, Nigeria showing River Oluwa

Data Analysis

Microsoft Excel 2007 (Microsoft Corporation 1985-2007) was used for graphical illustrations. Data analyses were done using descriptive statistics methods and Factor analysis. Fish abundance was determined using the one-way Analysis of Variance (ANOVA) and Student’s t-test on SPSS software.

RESULTS AND DISCUSSION

Fish fauna

A checklist of the composition of fish species that were encountered during the study period is presented in Table 4.1. Some of the fish species identified during the study period are illustrated on Plate 1.

Thirty-seven species belonging to eleven families were recorded during the study period have been earlier reported to occur in Nigerian water bodies (Reed *et al.*, 1970; Idodo-Umeh, 2003; Olaniran, 2003; Obasohan and Oronsaye, 2006; Fapohunda and Godstates 2007 and Falaye *et al.*, 2015). Babatunde and Raji (1998) reported occurrence and distribution of most of these species in Ogun River. However, distribution and abundance of fish in tropical water bodies have been variously attributed to several factors but principally water depth (Chapman and Kimstach, 1992), water temperature (Agremier and Kar, 1983), water transparency seven species of Cichlidae, four species of Clariidae, four species of Distichodontidae, two species of Bagridae, three species of Characidae, three species of Cyprinidae, two species of Channidae, seven species of Mormyridae, two species of Citharacidae, one species of Hepsetidae and Malapteruridae respectively (Table 4.2).

Clarias gariepinus and *Heterobranchus longifilis* (family: Clariidae) dominated the fish fauna accounting for 7.4% and 6.9% of relative abundance respectively (Table 4.2), while the least abundant *Marcusenius brucii* (family: Mormyridae) found only 0.6%. Clariidae family recorded the highest percentage abundance (28%) followed by Cichlidae family (17%). while the least family was Bagridae (6%) Figure 4.3. Clariidae recorded the highest percentage for dry season value (400) and dry season value (270) respectively, while, Malapteridae family recorded the least (12) for dry season and Channidae recorded the least value (7) for the rainy season respectively Figure 4.2.

The fish in Oluwa River were more than 14 species reported by Fapohunda and Godstates (2007) in Owena River, nineteen species identified by Esenowo (2013) in Majidun River and thirty four in Igbokoda River, which the low number was attributed to sand-mining activities in the river because sand-mining degrades, destroys spawning, breeding, feeding or growth to maturity of fish Esenowo (2013). The dominance of the member of the families Clariidae and Cichlidae in Oluwa River was similar to the finding of Fapohunda and Godstates (2007), that Clariidae constituted the dominant fish families in the reservoir. This confirms that

Clariidae and Cichlidae dominated the fish under uncontrolled conditions in most Nigerian water (Ita and Balogun, 1983; Ita, 1993).

The higher abundance of the fish species during the dry season than the rainy in Oluwa River is similar to the report of Esenowo (2013) and Falaye *et al.* (2015) that the catch composition differed seasonally with highest number of fish obtained in the dry season, while the lowest was observed in rainy season. The percentage abundance of fish observed to be significantly higher in the dry season could be attributed to low water level during the dry season. Ayoola and Kuton (2009) and Esenowo (2013) found higher abundance of fish species at low level of water in Lagos Lagoon and Majidun River during the dry season.

Table 4.1: A checklist of Fish fauna recorded from Oluwa River from June, 2022 to December, 2023.

Bagridae

1. *Chrysichthys. nigroditatus*
2. *Auchenoglanis occidentalis*

Channidae

3. *Parachanna obscura*
4. *Parachanna africana*

Characidae

5. *Brycinus brevis*
6. *B. nurse*
7. *Micralestes occidentalis*

Cichlidae

8. *Hemichromis fasciatus*
9. *Oreochromis aureus*
10. *O. niloticus*
11. *Sarotherodon. galilaeus*
12. *S. melanotheron*
13. *Coptodon. guineensis*
14. *C. zillii*

Clariidae

15. *Clarias anguillaris*
16. *C. gariepinus*
17. *Heterobranchus bidorsalis*
18. *H. longifilis*

Cyprinidae

19. *Barbus bynni occidentalis*
20. *B. lagoensis*
21. *Labeo senegalensis*

Distichodontidae

22. *Distichodus rostratus*
23. *D. engycephalus*
24. *Nannocharax ansorgii*

2*5. *N. latifasciatus*

Hepsetidae

26. *Hepsetus odoe*

Malapteruridae

27. *Malapterurus electricus*

Mormyridae

28. *Mormyrus hasselquisti*

29. *M. macrophthalmus*

30. *M. rume*

31. *M. senegalensis*

32. *Marcusenius abadii*

33. *M. brucii*

34. *M. cyprinoidea*

CITHARACIDAE

35. *Citharinus citharus*

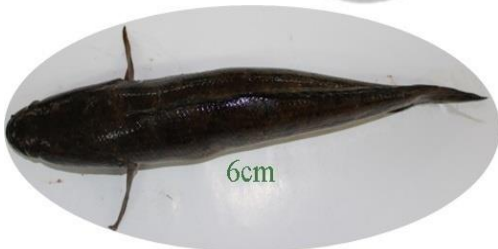
36. *Hydracynus forskali*



A



D



B



E



C



F

Keys:

- | | |
|------------------------------|---------------------------------|
| A. <i>Clarias gariepinus</i> | B. <i>Parachanna obscura</i> |
| C. <i>Mormyrus rume</i> | D. <i>Sarotherodon galileus</i> |
| E. <i>Hepsetus odoe</i> | F. <i>Tilapia zillii</i> |

Plates 1: Some finfishes in Oluwa River

Table 4.2: Relative Abundance of fish species in Oluwa River from June, 2022 to December, 2023

	TOTAL NO	RELATIVE ABUNDANCE (%)
Bagridae		
<i>Chrysichthys nigrodigitatus</i>	71	3.3
<i>Auchenoglaris occidentalis.</i>	47	2.2
SUB TOTAL	118	5.5
Channidae		
<i>Parachanna obscura</i>	38	1.8
<i>Parachanna africana</i>	29	1.3
SUB TOTAL	67	3.1
Characidae		
<i>Brycinus brevis</i>	27	1.2
<i>B. nurse</i>	35	1.6
<i>Micralestes occidentalis</i>	31	1.4
SUB TOTAL	93	4.2
Cichlidae		
<i>Hemichromis fasciatus</i>	31	1.4
<i>Oreochromis aureus</i>	51	2.4
<i>O. niloticus</i>	67	3.1
<i>Sarotherodon galilaeus</i>	73	3.4
<i>S. melanotheron</i>	57	2.7
<i>Coptodon guineensis</i>	34	1.6
<i>C. zillii</i>	49	2.3
SUB TOTAL	362	16.9
Clariidae		
<i>Clarias anguillaris</i>	139	6.6
<i>C. gariepinus</i>	156	7.4
<i>Heterobranchus bidorsalis</i>	140	6.6
<i>H. longifilis</i>	146	6.9

<i>SUB TOTAL</i>	581	27.5
Cyprinidae		
<i>Barbus bynni occidentalis</i>	56	2.6
<i>B. lagoensis</i>	77	3.6
<i>Labeo senegalensis</i>	79	3.7
<i>SUB TOTAL</i>	212	9.9
Distichodontidae		
<i>Distichodus rostratus</i>	46	2.1
<i>D. engycephalus</i>	42	2.0
<i>Nannocharax ansorgii</i>	43	2.0
<i>N. latifasciatus</i>	66	3.1
<i>SUB TOTAL</i>	197	9.2
Hepsetidae		
<i>Hepsetus odoe</i>	66	3.1
<i>SUB TOTAL</i>	66	3.1
Malapteruridae		
<i>Malapterurus electricus</i>	26	1.2
<i>SUB TOTAL</i>	26	1.2
Mormyridae		
<i>Mormyrus hasselquisti</i>	65	3.0
<i>M. macrophthalmus</i>	74	3.5
<i>M. rume</i>	86	4.0
<i>M. senegalensis</i>	59	2.8
<i>Marcusenius abadii</i>	17	0.8
<i>M. brucii</i>	13	0.6
<i>M. cyprinoidea</i>	19	0.9
<i>SUB TOTAL</i>	333	15.6
Citharacidae		
<i>Citharinus cithanus</i>	20	0.9
<i>Hydrocynus forskali</i>	25	1.1
<i>SUB TOTAL</i>	45	2.0
<i>GRAND TOTAL</i>	2,100	

Recommendations

The following measures are therefore recommended:

Public enlightenment

There should be enlightenment and awareness programmes organized through public workers for local residents and fish farmers about the potential ability of the River in supporting fish production in the area.

Adequate monitoring

There should be regular monitoring of the mesh size for fishing so that young fish will not be erroneously harvested using environmental agencies, such as, Nigeria Inland Water Ways Authority (NIWA). This will ensure compliance with the standard for mesh size for fishing and some other regulatory laws.

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