



Research Paper

## Ichthyofaunal Study of the River Nun Around Tombia Community, Niger Delta, Nigeria

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### ABSTRACT

A study on the ichthyofaunal diversity of the River Nun around Tombia community in the Niger Delta region of Nigeria was conducted for one year (January, 2020 to December, 2020). This was done to provide baseline data and checklist of the ichthyofauna of the river due to its exposure to anthropogenic activities particularly oil pollution which threatens the survival of various aquatic organisms, particularly fishes. The fish were collected monthly from four sampling sites of the River Nun with the help of local skilled artisanal fishermen. A wide range of fishing gear such as hooks and lines, cast nets, gill nets, and traps were used. Fish samples were identified using appropriate identification keys. Length and weight were measured using a tape and spring balance respectively. Specimens were stored in coolers containing ice, photographs taken and transported to the laboratory for further identification. Fishes brought to the laboratory were preserved in 10% formalin solution. A total of 25 species of fish belonging to 17 families were recorded during the study. They belong to the families *Begridae*, *Characidae*, *Clariidae*, *Gymnarchidae*, *Mormyridae*, *Cynoglossidae*, *Notopteridae*, *Tetraodontidae*, *Mochokidae*, *Claroteidae*, *Cichlidae*, *Schilbeidae*, *Protopteridae*, *Channidae*, *Citharinidae*, *Schlibeidae*, and *Arapaimidae*. The family *Mormyridae* had the highest number of species (5 species), followed by the families *Characidae*, *Mochokidae*, *Cichlidae*, and *Protopteridae* (which had 2 species each). The families *Bagridae*, *Gymnarchidae*, *Notopteridae*, *Tetraodontidae*, *Schilbeidae*, *Citharinidae*, *Clariidae*, *Schlibeidae*, and *Arapaimidae* had just one species each. The diversity of fish species in the river is similar to that of similar water bodies in the Niger Delta and Nigeria as a whole. It can be concluded that the River Nun around Tombia is not under severe environmental threat and therefore not a concern for fishers and all stakeholders in the area.

**Key words:** Ichthyofauna, Diversity, Tombia, River Nun, Niger Delta

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### I. INTRODUCTION

Ichthyology also known as “fish science”, is the branch of biology devoted to the study of fish. This field includes the study of fish growth, development, structure, characteristics, classification, geographical distribution, and the relationship of fish to their environment [1]. Fish are so diverse in both species and abundance that there are more species of fishes than the combined total of all other vertebrates: mammals, amphibians, reptiles and birds[2].

Fishes are found in water bodies that range from tiny pools to vast oceans and seas. They also range in diversity from the self-limiting lentic waters to the extensive rivers such as the River Nun.

The River Nun is considered the most extensive river network in Bayelsa State [3]. It flows through several communities in Bayelsa State, where it is used for different purposes and serves as an ecological asset to the Niger Delta. It is rich in biodiversity and is touted as the biggest pool of aquatic life in inland waters.

Sadly, estuaries, stream and rivers in the Niger Delta region of Nigeria are exposed to anthropogenic activities particularly oil pollution which threatens the survival of various aquatic organisms, particularly fishes, and therefore the source of livelihood of several fish folks. The inhabitants of Tombia community for instance use this river for various activities such as fishing, boating, bathing, washing of dishes and clothes, disposal of human excrement (toilet) and also as dump site for household waste (refuse). Fishes are so intricately attached to their environment, so much so that diversity is determined by environmental conditions such as salinity, temperature, dissolved and suspended substances and other dynamics that occur as a result anthropogenic

addition into it. In fact, the size, shape and morphological variations even in the same species are most often related to the varied environmental factors [4]. The amount of fish stocks and its diversity is of utmost importance to both fisher folks and the survival of the ecosystem. It is also used as a gauge of the ecological health of any aquatic ecosystem.

Therefore, as the River Nun around Tombia axis represents a significant portion of the synergy of river and human activities, there is an acute societal need to provide baseline data or take periodic inventory of the ichthyofauna of the area. This will give useful information about the status of the fishery and by implication, an idea of the environmental health of the river.

## II. MATERIALS AND METHODS

### 2.1 Description of Study Area

The River Nun is formed when the River Niger splits in two, forming the Nun and Forcados rivers upon emerging from its parent river, Niger [5]. The climate of the Niger Delta is characterized by a long-wet season from April through October, while the dry season starts from November to March. Precipitation increases from the north of the delta (with an average of 2,500 mm) to the coastal area where mean annual rainfall averages around 4,000mm [6]. River Nun around Tombia community is located on Latitude 5°00'08.4"N and Longitude 6°15'49.7"E. Tombia is in Yenagoa local Government Area (L.G.A) of Bayelsa state, Nigeria. The river has its channel or tributary from river Niger and passes through River state to Polaku, which link the river to Tombia, from where its distributary is channelled to Yenagoa then to the Ocean. This region is a city in Nigeria about 295 miles (475km) south of Abuja, the country's capital city [7]. The Nun River around Tombia has its upper reaches, that is, its source from Polaku River. The middle reaches are between the upper reaches and lower reaches, while the lower reaches are the part through which the river flows downstream to Yenagoa. There is observable unidirectional flow of the water at this station due to increase in the volume of water from the source of the river upstream. Current is high in the wet months, becoming slower in the dry months when the flood recedes. The bed of the river at this station is mud and sand. The vegetation of the River Nun is dominated by water hyacinth (*Eichhornia crassipes*) and elephant grass (*Pennisetum purpureum*). River Nun around Tombia community is a fresh water body or ecosystem.



Figure 1: A map showing the general view of the study area

Adapted from Google Map([www.google.com](http://www.google.com))

### 2.2 Sample Stations

#### 2.2.1 Station 1

Station 1 is situated around the School of Nursing, Tombia. It is at the extreme of the community. The water is highly turbid in the wet season and clear in the dry season. The vegetation fringing the river at the banks consists of water hyacinth (*Eichhornia crassipes*) and elephant grass (*Pennisetum purpureum*). Some organic wastes, garbage, and polythene bags were also seen in the area, which move into the river.

#### 2.2.2 Station 2 (Around Ayambiri)

Station 2 is around Ayambiri, in Tombia community which is located in the main settlement next to the school of nursing. The vegetation at the river bank is replaced by bare soil, consisting of peat, which is washed down the river by wave and rain, contributing to the water turbidity. *Eichhornia crassipes*, fringing the river bank is

obstructed from drifting with current by boats that have landed. The bed of the river at this station consists of sand and peat.

### 2.2.3 Station 3

Station 3 is situated around Agalabiri in Tombia which is located in the main settlement next to Ayambiri. There is no vegetation fringing the river at this station, no farmland was seen, but water hyacinth was seen drifting with the water current. The station was flooded from August to October with the flood receding from November to February. The bottom of the river at this station consists of sand and gravel of various sizes, the soil at the bank is mostly sand consisting of sandwiched polythene buried within the soil.

### 2.2.4 Station 4

Station 4 was established around the Government Secondary School, Tombia located at the extreme of Tombia. The fringes do not have vegetation. The water is clear and the bottom consists of small stones, and sand. The landed boats are used as public toilets which lead to discharge of human waste directly into the river.

## 2.3 Field Sampling /Collection of samples

The field sampling was conducted from January to December, 2015. Prior to the collection of samples, a reconnaissance survey was conducted to determine suitable sampling stations and to ascertain appropriate techniques and logistics to employ to collect and transport the samples. Four sampling stations were established in River Nun around Tombia.

Various fishing gears and sampling techniques were employed during the study. The fishing gears include caste net, hooks and lines, gill net, drift net, and traps etc. Fish samples were also collected from local fisher men. Pictures, measurement of weight and lengths were taken right in the field. Furthermore, interrogation on fish behaviour, time and season of best catch, and technique used were disclosed by artisanal fishers. Data were obtained in line with the method adopted by Pauly [8]. The commonest fishing method used in the study area was hook and line, drift net, gill net and cast net was also in general use. The hook and line constituted of a long line carrying up to 100 hooks baited with garri, white ants, red soaps or earthworms, sometime smaller fishes, were set for about three to four hours; scup net were used to capture the smaller fishes. The line with a single hook was attached to a slender bamboo stick baited and set as in long lines or a small floating object and tied to some length of the line being attached to the bamboo stick and set in the open water, the stick is held while watching the floating object which moves when a fish comes in contact with the bait and drawn up to capture the fish. They are mainly effective for capture of *Tilapia* and catfishes. Gill nets were 20-100 metres in length and about 3 metres in breadth. The mesh size ranged from 10.0mm to 100mm. Although small wooden floats could be used, the nets were usually floated by condemned floating slipper, which were tied at intervals to the headlines by lines of varying lengths. Gill net captures all fish except fry and fingerlings. The drift net was also commonly used. It is similar to the gill net but it was allowed to drift from one location to the other moving with water current. Dugout canoes propelled with paddles or engine were used to convey the team to the field, which the local fishermen in study area also use.

## 2.4 Identification of Fish Samples

Fish samples were identified with appropriate monographs and identification keys [9, 10].

## III. RESULT AND DISCUSSION

### 3.1 Results

The results of ichthyofauna (fishes) of the river are presented in Table 1 and Plates 1 to 25. A total of 25 species of fish belonging to 17 families were recorded during the study. They belong to the families Begridae, Characidae, Clariidae, Gymnarchidae, Mormyridae, Cynoglossidae, Notopteridae, Tetraodontidae, Mochokidae, Claroteidae, Cichlidae, Schilbeidae, Protopteridae, Channidae, Citharinidae, Schilbeidae, and Arapaimidae.

**Table 1: Checklist of Fishes of the River Nun around Tombia Community**

TAXON	Species	COMMON NAME	LOCAL NAME	STATUS
<b>Phylum: Chordata</b>				
<b>Class: Actinopterygii</b>				
<b>Families</b>				
<b>Bagridae</b>	<i>Bagrus bayad macropterus</i>		Oboro	+++
<b>Characidae</b>	<i>Alestes nurse</i>		Eli	+++
	<i>Brycinus nurse</i>	Nurse Tetra	Koloholo	+++
<b>Gymnarchidae</b>	<i>Gymnarchus niloticus</i>	Aba, Gefar	Aba	+++
<b>Mormyridae</b>	<i>Mormyrops deliciosus</i>		Ogboro	+++
	<i>Hyperopisus bebe</i>		Ubere	+++
	<i>Gnathonemus cyprinoides</i>			+++
	<i>Gnathonemus tamandua</i>		Ogboro	+++
	<i>Gnathonemus sp.</i>		Apeti	+++

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<b>Cynoglossidae</b>	<i>Cynoglossus senegalensis</i>	Sole Fish	Sakarabumo	+
<b>Notopteridae</b>	<i>Xenomystusnigri</i>		Pormo	+++
<b>Tetraodontidae</b>	<i>Tetraodon fahaka</i>	Pufer Fish	Obubu	+
<b>Mochokidae</b>	<i>Synodontisocellifer</i>	Synodontis	Ikpidi	++++
	<i>Synodontisnigrita</i>	Kerkarkabir	Aboro	++++
<b>Claroteidae</b>	<i>Chrysichthysnigrodigitatus</i>	African Forktail catfish	Ugwili	++
<b>Cichlidae</b>	<i>Tilapia zilli</i>	Redbelly tilapia	Atabala	+++
	<i>Hemichromisbimaculatus</i>	Jewelfish	Okubili	+
<b>Schilbeidae</b>	<i>Eutropiusniloticus</i>		Aye (Udersi)	+++
<b>Protopteridae</b>	<i>Protopterusannectens</i>	African lungfish	Ibieseni	++
	<i>Polypterusnegalus</i>	Gray Bichir	Akara	+++
<b>Channidae</b>	<i>Channa obscura</i>	African Snake head fish	Iyoro/ Edebu	++
<b>Citharinidae</b>	<i>Citharinusdistichodoides</i>			++
<b>Clariidae</b>	<i>Clariasbatrachus</i>	Walking catfish		++
<b>Schilbeidae</b>	<i>Schilbemytus</i>	African butter catfish	Ahi	+++
<b>Arapaimidae</b>	<i>Heterotisniloticus</i>	Heterotis		+++

+ Present, ++ Less Abundant, +++ Abundant, ++++ Most Abundant



Plate 1: *Brycinus nurse*  
3: *Gnathonemus* sp.  
Weight: 60g; Total length-16.5cm;  
Standard length-13.7cm;  
Fork length-15cm; Girth- 9.8cm  
11.3cm



Plate 2: *Alestes nurse*  
Weight- 15g; Total length- 11.18cm; Weight- 22.7g;  
Standard length- 9.14cm; Total length- 12.7cm;  
Fork length- 10.41cm; girth- 7cm Standard length-  
Fork length- 11.5cm;



Plate 4: *Gnathonemus cyprinoides*



Plate 5: *Gnathonemus tamandua*  
Weight-170g; Total length- 30cm;  
Standard length- 26.5cm;  
Fork length-27.5cm; Girth- 12.5cm



Plate 6: *Hyperopisus bebe*  
Weight-70g; Total length- 23.5cm;  
Standard length- 21.6cm;  
Fork length-22 cm; Girth - 6cm



Plate 7: *Mormyrops deliciosus*  
Total length- 32cm;  
Standard length- 27.7cm;  
Fork length-30.5cm; Girth - 13.5cm



Plate 8: *Cynoglossus senegalensis*  
Weight-120g, Total length- 34cm;  
Standard length- 30.7cm;  
Girth-12.5cm



Plate 9: *Xenomystus nigri*  
Weight-170g; Total length-31.5cm;  
Standard length-30cm;  
Girth-13.7cm



Plate 10: *Polypterus negalus*  
Weight-130g, total length-26.8cm;  
Standard length-23.7cm; Girth-8.5cm



Plate 11: *Tetraodon fahaka*.



Plate 12: *Gymnarchus niloticus*  
Total length -119cm,  
Girth length- 36cm





Plate 13: *Synodontisocellifer*;  
Plate 15: *Chrysichthys*

Weight-70g; Total length- 18cm;  
Standard length- 13cm;  
Fork length-14.5cm, Girth- 9cm

Weight-100g; Total length- 18.8cm;  
Standard length- 15cm;  
Fork length-16.5cm; Girth - 11cm



Plate 14: *Synodontisnigrita*;

*nigrodigitatus*;  
Weight-210g, total length- 30.5cm,  
Standard length- 24.5cm,  
Fork length-26.5cm, girth -

14.4cm



Plates 16: *Bagrusbayadmacropterus*  
Weight-310g; Total length- 41.5cm,  
Standard length- 29.5cm;  
Fork length-31.5cm, girth - 18cm



Plate 17: *Tilapiazillii*;  
Weight-20g; Total length- 10cm;  
Standard length- 8cm; girth- 6.5cm



Plate 18: *Hemichromis bimaculatus*



Plate 19: *Eutropiusniloticus*  
Weight- 22g; Total length-13.1cm,  
Standard length-11.3cm,  
Fork length-11.8cm, Girth- 6.7cm



Plate 20: *Schilbemytus*

Weight-90g; Total length- 32.2cm  
Standard length- 20.5cm,  
Fork length-21.5cm, Girth- 9.5cm



Plate 21: *Protopterusannectens*



Plate 22: *Channa obscura*  
Weight-120g, Total length- 26cm,  
Standard length- 22cm, girth - 10.1cm



Plate 23: *Clariasbatrachus*



Plate 24: *Citharinusdistichodoides*



Plate 25: *Heterotisniloticus*

### 3.2 Discussion

The ichthyofaunal study of Nun River around Tombia community indicates that the population and size of fish species varies seasonally. According to artisanal fishermen around Tombia community, the sizes of *Synodontisocellifer* and *Synodontisnigrita* being caught are always bigger during the wet season, when the water is rising, (June to July, and October). *Tetraodon fahakais* rarely caught in the river due to its low rate of abundance in the river. It is not eaten in most parts of the state and forbidden because of the poisonous nature of the skin and the head. According to some fishers, the head, skin and bile had to be removed before preparing it as food.

Most of the species of fish found around the study area were similar in form and structure to that of the fresh water fish of northern Nigeria [9]. From the study, 17 fish families were recorded. This was lower

than 29 families recorded by Abowei and Hart [11] in the lower River Nun, consisting of 11 communities which are Yeneka, Ikolo, Ikibiri, Anyianma, Oweikororgha, Angiama, Oporoma, Onyonma, Nengiama, Ekowe, and Peremabiri communities. One reason for the disparity in the observation of Abowei and Hart [11] with that of this study may be as a result of the number of communities studied. While this study was based only on the River Nun, they carried out theirs on both River Nun and local ponds in the forest. Furthermore, this study was done around just one community while theirs was done around various communities in the lower River Nun in the Niger Delta.

The result of this study was also in variance with the findings of Alagoa et al [12] where 72 species from 24 families were obtained from a six months survey of landed fish catch from the River Nun at the Amassoma axis of the river. The higher number of fish species obtained by Alagoa et al [12] as compared to this study, may be due to the multiplier effect of pollution over the past years. Fish stocks tend to deplete over time as the process of recruitment and emigration are greatly hindered by pollution and water quality distortions.

The collection of fish families during the study period include; Bagridae, Characidae, Clariidae, Gymnarcidae, Mormyridae, Cynoglossidae, Notopteridae, Tetraodontidae, Mochokidae, Claroteidae, Cichlidae, Schilbeidae, Protopteridae, Channidae, Citharinidae, Schilbeidae and Arapaimidae. This result is similar with the findings of Oguntade, et al [13] in their study along two rivers in the Niger Delta. They recorded a total of 18 families but a great difference is in the number of species which was 53 species, while this study recorded a total of 25 species. The family Mormyridae had the highest number of species (5 species) in this study while Oguntade, et al [13] reported that the family Cichlidae had the highest number of species, comprising of seven (7) species.

Except *Tetraodon fahaka* of the family tetraodontidae which is not eaten because of the poisonous nature of the skin, all the families of fishes found in this study are of economic importance as they are eaten as source of protein and other nutrients.

The fishes of the family Schilbeidae have short, broad heads, which are not heavily armoured, and also possess wide mouths. The anal fin is very long, in contrast to the dorsal fin, which is very short [9]. The same applies to the members of the family of Bagridae, with the exception of a large adipose tissue from the dorsal part extending to the caudal part of the fish. The Mochokidae with the commonest genus *synodontis* has short, stumpy bodies and a head shield. The family Claridae have broad flattened heads, which are rough and granular, and wide mouths [9]. There is a strong, barbed spine in front of each of the pectoral fins, but none precedes the dorsal fin.

#### IV. CONCLUSION AND RECOMMENDATIONS

The result of this study has shown that River Nun around Tombia community in Bayelsa State has high ichthyofaunal diversity that serve as a source of protein and income to the inhabitants of the area. However, the introduction of anthropogenic inputs and the growing population in the area may pose a problem in the future. Pollution can result in high fish mortality, while population explosion may result in over exploitation. Therefore, proper management of the water system and the fishery resources is of paramount importance for sustainability. Furthermore, environmental degradation due to crude oil pollution and indiscriminate dumping of wastes should be prohibited.

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