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FISH FAUNA IN LOWER RIVER NIGER AT IDAH IN KOGI STATE

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ABSTRACT

Fish stock assessment is an integral part of the conservation of aquatic biodiversity and a major key for planning, formulation and execution of fisheries policies and programmes especially in the artisanal sector, the rapidly declining catch from fish landing is a possible indication that the fish yields of most Nigerian inland waters are generally low for causes that may range from inadequate management of fisheries to degradation of water bodies. Fish fauna of lower river Niger at Idah in Kogi State was investigated in the present study. 250 fishes were obtained from contracted fishermen within five months, covering 13 families and 26 species with the *Mochokidae* having the highest dominance of 18.07%, followed by the *Cichlidae* (16.47%) and *Mormyrydae* (12.05%). However the dominant fish species observed during the study was *Synodontis budgetti* (12.05%) and preceded by *Tilpia zilli* (8.43%) and *Mormyrus rume (*8.03%).The least abundance fish species were *Clarotes macrocephalus* (1.2%), *Clarotes laticeps* (1.2%) and *Gymnachus niloticus* (0.8%) least condition factor of 0.5 were recorded for *Gymnarchus niloticus* while *Schilbe mystus* had the highest condition factor of 3.99. Conservation policies are urgently needed to protect some species from going into extinction.

INTRODUCTION

The global level of fish supply is becoming insufficient as a result of human pressure due to population increases (FAO, 1999). Nigerian populace, which was estimated at about 162.5 million in 2011 with an annual population growth rate of 2.1% is expected to be 257.8×10^6 by 2030 (UNDP 2010). Hence food supply is expected to triple to cater for this increase, however the currently demand for fish in Nigeria is 3.21 million tones (FDF 2007). Therefore the present situation calls for serious and urgent action on how to ensure sustainable and sufficient production. The transition to scarcity of fish cannot be prevented by only intensive fishing but rather could be ameliorated by better management of fisheries resources and interventions to improve equity of resources apart from aquacultural practices. FAO (1999) reported that out of 200,000MT fish stock in all part of the world, more than a quarter is overexploited, depleted or recovering. Biodiversity has become prominent in recent years as a result of a worldwide high rate of extinction of some species of animals including fish, Biodiversity is often ambiguously misused or overused to describe population dynamics of a location or community, but in a real sense it is a measure of the members of species that make up a biological community and is considered to be one of the most important aspects of community organization and structure. Diversity is a fundamental property of every living system manifest at every level of hierarchy from molecules to ecosystems (Solbrig, 1996), Species richness and relative abundance describe key elements of biodiversity; former is the number of different species in a given area and this is the fundamental unit in which to

assess the homogeneity of an environment and commonly used in conservation studies to determine the sensitivity of ecosystems and their resident species, while the latter describes how common or rare a species is relative to other species in a given community and are usually describe for a single trophic level (Lawson and Olusanya, 2010). Fish exhibits the greatest biodiversity amongst vertebrates, with approximately 25,000 species, comprising about half of all known vertebrate species (Ghaffar, 2007). This high biodiversity of fish is probably the main source of stability to many tropical fisheries and provides a strong argument for conservation (King, 1992). Nigeria is blessed with various aquatic ecosystems; these ecosystems include rivers, lakes, lagoons and marine environment. The fish yields of most Nigeria inland waters are generally on the decline (Jamu and Ayinia 2003) for reasons 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. Accurate fisheries statistics in rivers and its adjourning flood plains is a vital tool for the formulation of a sound fisheries management programme in water bodies and development plan in the fishing industry, therefore the fish fauna of Nigerian fresh water systems has been a focus of research for quite some time. Researchers have concentrated more on rivers however producing a variety of reports on Nigerian freshwater fishes. Boulenger and Welman (1916) identified 181 species of fish from the major river systems and Lake Chad including some estuarine and marine species which are frequent in the rivers.

Reed *et al*. (1967) reported about 160 species within the Northern region of Nigeria. Since then numerous studies have been undertaking in kainji lake and other freshwater bodies by researchers such as; Otobo, 1993, Ita and Medahili, 1997; Sikoki and Otobotekere, 1999; Ezekiel *et al*., 2002; Abowei and Ezekiel 2003; Abowei *et al*., 2007; Abowei and Davies 2009 and many others leading to the description of many species in Nigerian inland water ecosystem. One of the recent investigations into the fish diversity of the major rivers of Nigeria by (Ita, 1993) recorded 239 fish species. There are at least 18 of such freshwater species which are endangered. A drastic decline has recently been observed among the larger species such as *Gymnarchus niloticus. Lates niloticus, Heterobranchus bidorsalis and Protopterus annectus* (Obasohan and Oronsaye, 2006), hence the need for continuous data collection precisely on a yearly bases to checklist fish diversity for appropriate inland water management. The purpose of this study therefore is to assess the fish species diversity and abundance in river Niger in an attempt to contribute to previous studies and to serve as bases for continuous research so as to monitor the level depletion of species encountered. The study will also complement available information in the planning, formulation and execution of fisheries policies and programmes especially in the artisanal sector.

MATERIALS AND METHODS

Study Area

The study area is the lower river Niger at Idah L.G.A. of Kogi state, located on latitude 7°-04N and longitude 6^0S0E with temperature ranges from 22°C to 31°C. Idah has a tropical savannah climate with two clearly marked seasons of wet between (April and October) and dry between (November and March). River Niger serves as a boundary between Kogi and

Edo states and Idah the commercial nerve centre between the two states for fisheries and aquaculture is practiced.

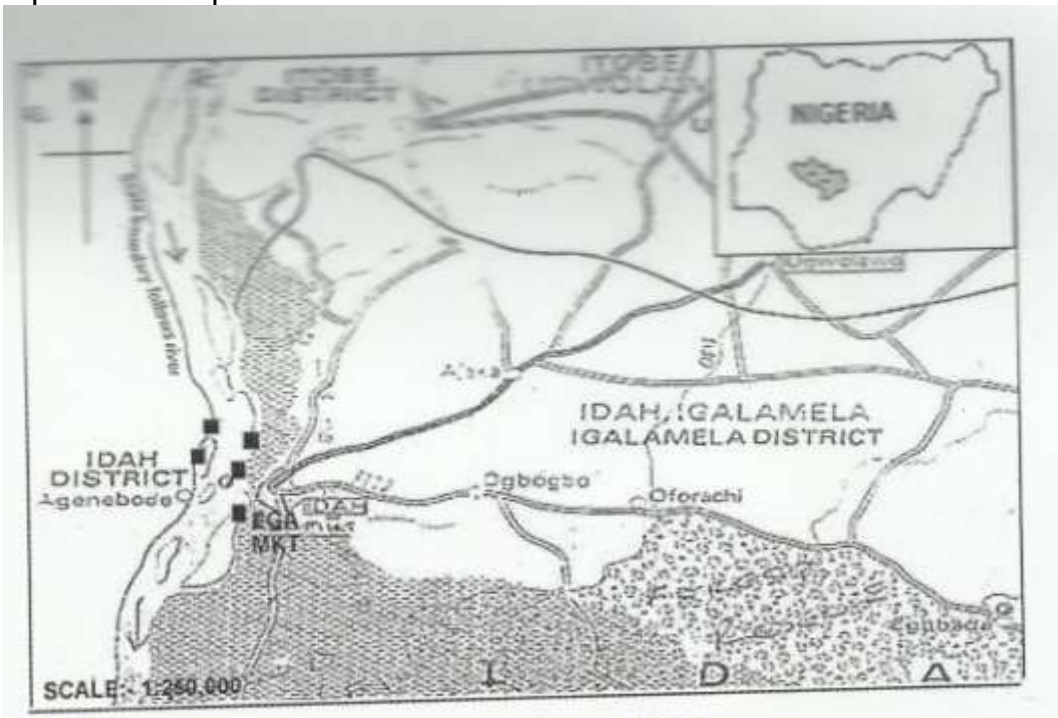

FIG 1:- MAP OF IDAH SHOWING SAMPLE SITES

SAMPLE COLLECTION

A total of about 250 fish samples were collected from 3 contracted fishermen catches using gill nets and Malian traps between April and August 2011. The dichotomous identification method of fish species determination by Boulenger (1916) were used to identify fish species. This was achieved by taking account of the meristic features of the various fishes. These features included dorsal, anal, caudal, pectoral, and ventral fin rays and spines. Total length (cm) and weight (g) were taken using meter rule and weighing balance. The total number of fish caught from the river was recorded also per species. The condition factor of fish was determined using the Fulton condition factor as described by Lecren 1951. The length-weight relationship of all species was determined using the relationship $W = aL^b$, where "W" is weight of fish (g), "L" is the standard length (cm), "a" is the regression constant and "b" is the regression coefficient.

RESULT AND DISCUSSION

Table 1 clearly summarise all the fish species encountered during the sampling period. A total of 13 families and 26 species where identified, Okereke (1990) recorded 46 fish species from 20 families in studies of Otamiri River, Abia State. Udoidiong (1991) reported on species composition of 3 streams in Akwa Ibom State as follow: in Udom stream 17 species representing 10 families; 19 fish species belonging to 12 families were recorded in Nung Oku stream while Mission stream had 22 species of 12 families. Onuoha *et al.*, (2010) recorded 26

fish species belonging to 7 families during the study of NtakInyang stream. Sikoki *et al*., (2008) investigating the fish assemblages of Onu-Iyi-Ukwu stream in South Eastern Nigeria recorded 17 species belonging to 15 genera and 11 families. In the present study, the Bagridae, were represented with 5 species, Mormyrydae had four species, Cichlidae represented by three species, while Distichodontidae, Schilbeidae, Mochokidae, and Characidae were represented with two species each, however, *Clarias gariepinus Gymnarchus niloticus, Labeo coubie, Malapterurus electricus, Protopterus annectens* and *Heterotis niloticus* were the only species observed for the Clariidae, Gymnarchidae, Cyprinidae, Malapteruridae, Protopteridae and Osteoglossidae respectively. Onuoha *et al.,* (2010) reported eleven cichlid with only *Tilapia zilli* been represented in cichlid identified in the present study. The occurrence of the pelvicachromine cichlids in shallow, upstream waters has been attributed to a predator– avoidance strategy, since their piscine predators rarely visit such shallow areas (Nwadiaro, 1984). However, Udoidiong and King (2000) noted that the rarity of the Cichlidae was probably linked to competitive disadvantage due to coexistence on the resource axis with the large cichlid relatives. Hence lesser species of Cichlid were recorded in the present study compared to those from streams. Mondal and Kaviraj (2009) reported 49 species belonging to 23 families dominated by Cyprinidae with 11 species in the study of the piscine assemblage of two floodplains Lakes of North 24-Parganas in West Bengal, India were as the present study reported just one Cyprinidae. Udoidiong and King (2000) reporting on the fish faunal assemblages of two first order, two second order and one third order streams in Akwa Ibom observed that seasonal variation occurred in the number of specimens sampled as more specimens were obtained during the rainy season than in the dry season. Therefore the observed differences in the ichthyofaunal assemblage as seen in the present study compared to others is greatly as a result of difference in research periods, sampling frequency as well as research media.

More so, it has been observed that there seems to be high biodiversity in second and third order streams than the first order streams (King, 1989; Udoidiong and King, 2000; Sikoki *et al*., 2008), due to the expanded living space and a mixture of species from the first order streams uniting to form subsequent orders in the stream hierarchy. As shown in Figure 1. *Synodontis budgetti* constituted 12.05% of the total catch followed by Tilapia *zilli* (8.43%) and *Mormyrus rume* (8.03%), while *Protopterus annectens* had 7.63%, *Oreochromis niloticus* 6.43%, and *Synodontis resupinatus* 6.02%. However *Clarotes macrocephalus Distichodus brevipinnus*, *Gymnarchus niloticus* were observed to be least aboundant (constitute 1.2%, 1.2%, 0.8% respectively of the total catch). Species dominance differ for different areas. Kouadio *et al*. (2006) observed Cyprinidae and Alestidae to dominate 20 families with 44 species identified belonging to 35 genera in Mé River, Alestidae were not represented in the present study as against Kouadio *et al*. (2006) report, however in line with the present study cichlidae dominated Kubanni Reservoir, Zaria among 9 species of fish comprising 4 families reported by Annune and Bako (1998). Udoidiong and King (2000) also reported Cichlidae as the most dominant species in Iba-Oku Stream while Onuoha *et al*. (2010) reported Characidae as the most abundant in terms of taxa, however *Malapterurus* and *Mormyrus* which were reported in the present study and some other important stream genera such as;

Papyrocranus, *Erpetoichthys*, and *Epiplatys* were missing in Ntak Inyang Stream, Akwa Ibom State. Some families such as Citharinidae, and Hepsetidae, which have been well reported in other studies (Udoidiong and King, 2000; Onuoha *et al*., 2010; King and Akpan, 2002; Nwosu *et al*., 2009) were conspicuously absent in this study however Schilbeidae, Distichodontidae were represented in line with the above referenced authors. Their absence may be explained by the short study period, methods of sampling, gear-types, the frequency and intensity of sampling. Seasonal variation occurred in the species and number of specimens sampled. Annune and Bako (1998) findings observed *H. fasciatus* as the thirds dominant cichlid (66) (13.80%) of the 466 specimens sampled while *O. niloticus* (287) (59.92%) was the highest.
Condition factor of the fishes encountered in the study area as shown in Table 1 differ with the different species, *Gymnarchus niloticus* had the least condition factor of 0.5 while *Schilbe mystus* had the highest condition factor of 3.99, however the values recorded for the different species differ from report of other researchers such as, Udoidiong and King, (2000); King and Akpan, (2002); Sikoki *et al*., (2008); Nwosu *et al*., (2009) and Onuoha *et al*., (2010).

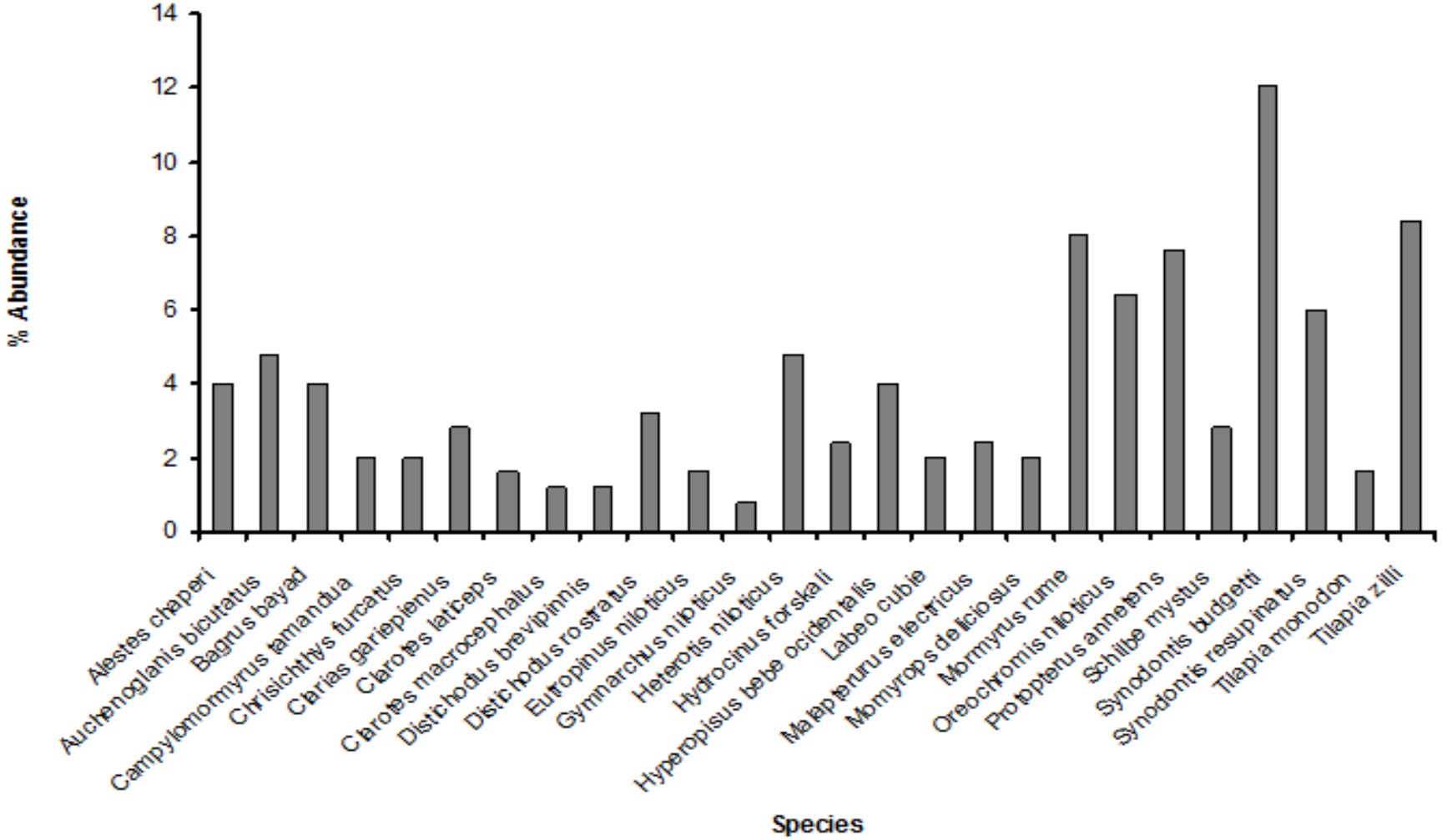

Figure 1: Percentage Abundance of Fish Species encountered in Lower River Niger at Idah, Kogi State.

Table 1: Species composition and Condition factor of the fish fauna in Lower River Niger Idah, Kogi State.

Family	**Species**	**Condition factor**
Clariidae	*Clarias gariepinus*	2.13+0.29
Mormyrydae	*Mormyropdeliciosus,*	1.72+0.34
	Campylomormyrustamandua	1.25+0.06
	Mormyrusrume	2.14+0.22
	Hyperopsisbebeoccidentalis	1.64+0.12
Gymnarchidae	*Gymnarchusniloticus*	0.50+0.11
Cyprinidae	*Labeocoubie*	3.25+0.13
Distichodontidae	*Distichodusrostratus*	1.27+0.18
	Distichodusbrevipinnis	1.08+0.07
Bagridae	*Bagrusbayad*	1.23+0.13
	Clarotesmacrocephalus	0.86+0.17
	Claroteslaticeps	1.63+0.25
	Auchenoglanisbiscutatus	3.50+0.25
	Chrysichthysfurcatus	1.69+0.07
Malapteruridae	*Malapteruruselectricus*	1.39+0.18
Schilbeidae	*Schilbe mystus*	3.99+0.92
	Eutropinusniloticus	2.21+0.28
Mochokidae	*Synodontisresupinatus*	3.00+0.35
	Synodontisbudgetti	2.69+0.19
Protopteridae	*Protopterusannectens*	0.83+0.09
Characidae	*Hydrocynusforskali*	2.53+0.14
	Alesteschaperi	1.17+0.51
Cichlidae	*Oreochromisniloticus*	2.71+0.49
	Tilapia zilli	2.65+0.27
	Tilapia monodon	2.76+0.6
Osteoglossidae	*Heterotisniloticus*	1.33+0.04

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