



RESEARCH ARTICLE

Identification of the Fish Fauna of Agulu Lake, Agulu, Anambra State

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ABSTRACT

The recording and identification of the fish fauna of Agulu Lake, was carried out between January and June, 1990. Eight families and fourteen species were identified: *Mormyridae-Mormyrus rume*; *Characidae-Alestes nurse* and *Hepsetus odoe*; *Bagridae-Chrysichthys coriscanus* and *Chrysichthys furcatus*; *Schilbeidae-Schilbe mystus*; *Clariidae-Clarias albopunctatus*; *Cyprinodontidae-Epiplatys sexfasciatus* and *Epiplatys bifasciatus*; *Cichlidae-Tilapia zillii*, *Tilapia mariae*, *Pelmatochromis guentheri* and *Hemichromis fasciatus*; and *Channidae-Channa obscura*. These fish species were caught more in site A than in any other site in the lake, followed by site G, which represents the main body of the lake. The diagnostic characters indicate that these fish species belong to the same population as their counterparts in other parts of the Niger-Benue ichthyofaunal zone. The results were discussed in the light of fish fauna components and their ecology in African lakes.

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INTRODUCTION

Fish is of great economic importance to the world. Principally, it is utilized as a source of basic food (proteins, vitamins, minerals, fats and oil). It provides subsistence, employment and revenue to the fisherman, his family and the nation at large. It is of fundamental importance in the balance of nature, because it subsists on many organisms, feeding on some, and being fed upon by others, especially in the aquatic ecosystems. As some of the food readily eaten by fish are vectors of important tropical diseases, fish, such as *Epiplatys sexfasciatus* (Inyang and Anozie, 1987) and *Clarias* spp. (Ezenwaji, 1989), have been implicated in their biological control. Finally, fish and fish products are utilized as raw materials in animal feeds, fertilizer production, iodine-containing fish oils and leather manufacturing industries (fish skins). Thus, owing largely to the great dietary value, proteo-vit amino composition and income earning nature of fishery resources the world-over, it has been virtually impossible for these aquatic fauna to be overlooked or neglected.

Agulu Lake is a large natural inland Water Lake located in Agulu, Anambra State and serves as a Natural Boundary between Agulu and parts of Nri. Agulu Lake is the largest lentic water body in Anambra State and arguably the most beautiful. Its tourism potentials (eco-as opposed to mass-tourism) for Anambra State, is excellent! It belongs to the Niger-Benue ichthyofaunal zone which contains the commonest and best known

fishes, not only of Nigeria, but also of West Africa. In fact, there are about two hundred species of these fishes in the diverse inland water habitats of West Africa (Holden and Reed, 1972). In spite of this, it is important to investigate the fish fauna of Agulu Lake with a view to ascertaining what is actually there at present and for the purpose of planning management strategies for the lake, especially in a world that is constantly throwing up opportunities and challenges.

At present, West Africa is very dependent upon imports of fish, whereas much of the demand could be met locally if the fisheries were better managed. A prerequisite to effective fish management is knowledge of the fish and fisheries of the inland water bodies.

Agulu Lake has an area of about 16,081m² and an average depth of about 5.2m. The deepest area which is about 11.2m is permanently stratified. The lake has six arms shaped like a star. The water is clear during the dry season and turbid, with a yellowish-brown colouration, during the rainy season, Anibueze (1988).

MATERIALS AND METHODS

Seven sampling areas were delineated and named A, B, C, D, E, F and G as shown in the figure (fig.1). Areas A, B and C represent the inlet. F represents the outlet whereas; the last section G represents the massive, middle, open water portion of the lake.

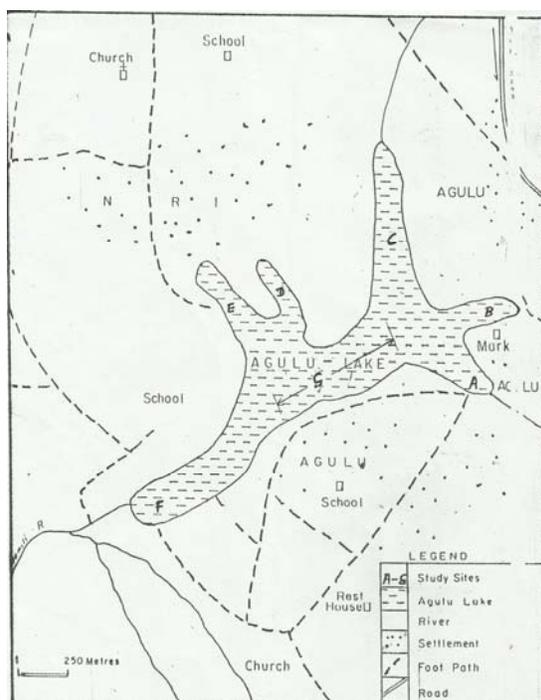


Fig. 1: Agulu Lake

Various types of fishing gear (cast nets, set gill nets, bamboo traps, hook and line, scoop nets) and methods were employed in catching the fishes and various habitats were thoroughly sampled. This was aimed at ensuring that all types of fish in the lake were cropped out.

Where ever possible, at least ten of each type of fish species were weighted, sexed, and morphometric measurements and meristic counts taken. The fish were weighted with a salter spring balance and sexed by gonad inspection after dissection. Morphometric measurements were made with a Meter measuring board and Vernier calipers. Gill raker and vertebrate counts were taken. For the gill rakers, the opercular plate were lifted, impurities therein washed off with water and the gill rakers counted. for vertebrae counts, a wide double slit is made on the side of the fish, the flesh in between is removed, exposing the vertebrae which are then counted.

The West African fresh water fish by Holden and Reed (1972); fishes and fisheries of Northern Nigeria, Reed *et al.* (1967), were useful in the identification of the fish species. The classification of fish by Lagler *et al.* (1962) was used.

RESULTS

The fish species identified in Agulu Lake are presented in Table 1 above. They are grouped in four orders and eight families. The orders are *Mormyriiformes*, *Cypriniformes*, *Cyprinodontiformes* and *Perciformes*. The *Cypriniformes* had the highest number of four families, *Perciformes* had two, *Mormyriiformes* and *Cyprinodontiformes* had one family each. In species number hierarchy, the family *cichlidae* had the highest number of four followed by the families *Bagridae*, *Characidae* and *Cyprinodontidae* which two each while the others, *Mormyridae*, *Schilbeidae*, *Clariidae* and *Channidae* were represented by one species each. Data on species represented at various sites sampled are summarized in Table 2. This table shows that site A had the highest number of eleven species, followed by site G (9) and site F (8).

DISCUSSION

Apart from *Epiplatys* Spp (family Cyprinodontidae) encountered in Agulu lake, all the other species are characteristic fish fauna of lakes (Ita, 1979, 1982; Ita and Balogun, 1982a) and other inland waters of West Africa; Holden and Reed, 1972). The lack of cyprinodonts in man-made lakes may be attributed to insufficiency of adequate habitats. In Agulu Lake, which is a large natural lake, the inlet head water areas appear to provide the clean habitat generally preferred by Cyprinodonts. Even though only two species of *Epiplatys* were caught, it is possible that more Cyprinodonts may be present in the lake, especially in site A, which is fed directly by a spring. Constraints of time prevented an extensive sampling to be made.

The predominance of Cichlids is consistent with the trend in other lacustrine environments. In Tiga, Goronyo and Volta (Ita, 1979; Balogun, 1982a) the cictilids contributed the highest number of species and formed a significant proportion of the species in lakes Kainji, Kariba and Nasser. In the great lakes of East Africa, many endemic species of cichlids are present. In Agulu Lake, observations indicate that *T. zillii* is very abundant. This may be due in part to the abundance of coarse plant materials, including wastes from the processing of fermented cassava and bread fruit which are deposited into the water. The lack of any mouth brooding Tilapine is surprising but could be due to early colonization by the highly fecund *T. zillii*.

Table 1: Comprehensive List of Fish Species

S/N	Order	Family	Genus/Species
1.	Mormyriiformes	Mormyridae	<i>Mormyrus rume</i> (cuvier) and Valenciennes
2.	Cypriniformes	(a) Characidae	<i>Alestes nurse</i> (Ruppel); <i>Hepsetus odoe</i> (Bloch)
		(b) Bagridae	<i>Chrysichthys coriscanus</i> (Gunther); <i>Chrysichthys furcatus</i> (Gunther)
		(c) Schilbeidae	<i>Schilbe mystus</i> (linne)
		(d) Clariidae	<i>Clarias albopunctatus</i> (Nichols & Lamonte)
3.	Cyprinodontiformes	Cyprinodontidae	<i>Epiplatys sexfasciatus</i> (Gill); <i>Epiplatys bifasciatus</i> (Steindachner)
4.	Perciformes	(a) Cichlidae	<i>Tilapia zillii</i> (Gervais); <i>Tilapia mariae</i> (Boulenger); <i>Pelmatochromis guentheri</i> (Sauvage)
		(b) Channidae	<i>Hemichromis fasciatus</i> (Peters)
		(Ophiocephalidae)	<i>Channa obscura</i> (Gunther)

Table 2: Fish Species Represented in Sites A, B, C, D, E, F & G

S/N	Family	Genus/Species	Intraspecie total/Site	A	B	C	D	E	F	G
1.	Mormyridae	<i>Mormyrus rume</i>	-	0	0	x	x	0	x	x
2.	Characidae	<i>Alestes nurse</i>	-	x	0	0	0	0	0	0
		<i>Hepsetus odoe</i>	-	0	0	x	0	0	x	x
3.	Bagridae	<i>Chrysichthys coriscanus</i>	-	x	x	x	x	x	x	x
		<i>Chrysichthys furcatus</i>	-	x	0	0	x	x	x	x
4.	Schilbeidae	<i>Schilbe mystus</i>	-	x	x	x	x	0	x	x
5.	Claridae	<i>Clarias albopunctatus</i>	-	0	0	0	x	0	0	0
6.	Cyprinodontidae	<i>Epiplatys sexfasciatus</i>	-	x	0	0	0	0	0	0
		<i>Epiplatys bifasciatus</i>	-	x	0	0	0	0	0	0
7.	Cichlidae	<i>Tilapia zillii</i>	-	x	x	x	x	x	x	x
		<i>Tilapia mariae</i>	-	x	x	x	x	x	x	x
		<i>Pelmatochromis guentheri</i>	-	x	0	x	0	x	0	0
		<i>Hemichromis fasciatus</i>	-	x	0	0	0	0	0	x
8.	Channidae	<i>Channa obscura</i>	-	x	0	0	0	x	x	x
		Interspecie Total/Site	-	11	4	7	7	6	8	9

Key: x indicates Presence; 0 indicates Absence

Table 3: Mean (x) of some measurement and meristic counts in *T.zillii*

Measurements	No		(10)	(10) (x)	(5) (x)	(%SL)	(10) (x)	(10)	(%SL)	(%SL)	(%SL)	
	Examined	10	(10)	T.mariae	P.guentheri	H.fasciatus	C.Cor	(x)	H.odoe	C.obs	C.albo	
	10	5	1	T.zillii				C.fur				
Snout to Pelvic Origin				42.4	48.7	41.6	43	54	58	55	42	44.4
Pelvic Length				41.6	41.4	30.6	40.4	21.1	20.7	16	17	13.9
Snout Length				15.5	14.8	20.8	17.5	12.4	14	14	11	8.9
Head Width				22.9	22.9	26	24	21.2	20.9	15	19	19.4
Head Length				37.3	37.2	43	36	27.4	28.8	28	36	24.4
Distance Fr. Head to dorsal fin origin				10.5	7.2	-	18	8.3	12.8	36	3	9.4
Body Depth				47.9	46.4	43.8	4	23.3	23.9	21	21	20.6
Interorbital Width				17.4	17.1	12.6	21	14.5	14.3	11	11	11.1
Pectoral length				41	41	33.6	43	24	25.1	19	20	13.9
Eye diameter				13.3	16.9	18.4	18	10.4	10.4	7	7	5.6
Caudal Peduncle Depth				19.5	22.1	15.4	23	11.8	12.5	11	9	11.7
Dorsal fin length				82	91.5	76.6	89	46.2	34	24	69	66.7
Anal fin length				42.7	55.8	47.6	47	22.5	21.6	21	48	58.3
Maxillary barbel length								27.5	25.2		4	36.7
Pectoral spine length								20.4	21.1			11.7
Counts												
Vertebrae				26.9	27.1	27.8	27	37.7	36.4			55
Gill rakers				13.4	16.5	20	21	21.5	21.3			16
Premaxillary Length												2.8
Premaxillary Width												11.1
Vomerine Length												2.8
Vomerine Width												9.4

The diagnostic character of the fish species are generally in agreement with those of; Holden and Reed (1972) and Ezenwaji (1989). *T. zillii* and *T. mariae* agree with those from Northern Nigeria inland waters especially in the dorsal and anal fin spines and rays, in the number of scales on the lateral line and in the number of vertebrae and gill-rakers. The *C. coriscatus* of Agulu Lake appears to be conspecific with those of *C. filamentosus* from Oguta Lake (Nwadiaro and Okorie 1985). Similarly, *C. albopunctatus* of the lake and those of the Anambra River System (Ezenwaji, 1989) appear to consist of the same population. This is not surprising because the Agulu Lake through its outlet, the Idemili River has connection with the River Niger to which the Anambra River also empties. Thus, it would appear that different fishes in the Niger-Benue Ichthyofaunal zone, through various tributaries and other connections, actually constitute definite populations as no barriers are present to make the development of new species possible.

It is possible as earlier indicated, that the number of species encountered in this work may not be exhaustive of the species in Agulu Lake. There are indications (Ezenwaji and Akpati pers comm.) that Clupeids and Schilbeids are fairly present, but the atalla lift net, which is the gear of choice in the exploitation of these small fishes, coupled with financial and logistic problems, all combined to prevent the use of this gear during the period of this study. It is therefore, suggested that further work must be carried out with a view to recording all the fish species in Agulu lake.

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