Distribution of Catfish Families in Agulu and Nawfia Lakes in Anambra State, Nigeria

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ABSTRACT

An evaluation of the distribution and abundance of catfish families in Agulu and Nawfia Lakes in Anambra State, Nigeria is the major aim of this research. The lakes located in the same basin were being gradually silted by gully erosion. They were sampled with fishing efforts of the artisanal fishermen. Bamboo traps, cast nets, hooks and line, long line with hooks and set nets were used during the sampling. A total of 4 catfish families were encountered. Individual species of the group were sorted out and enumerated according to families. The data were tabulated to reflect species and their families. Chi-square and correlation coefficient were used in analysis of the data. Highest percentage of bagrid fish was recorded in Agulu Lake. Nawfia Lake had the highest record of clariid fish. More Chrysichthyes species were collected at the open water than the shore habitat of Agulu Lake. In Nawfia Lake Clarias gariepinus ranked highest at the open water, while Chysichthyes furcatus ranked highest at the shore. The occurrence rate of the family Clariidae was lower in Agulu than Nawfia Lake, probably as a result of attack by Crocodylus cataphractus. The aquatic predators were visibly more abundant in Agulu than Nawfia Lake. Controlling their population would probably ensure high survival rate, and abundance of the clariid fish. Systematic control of erosion and some expansion work around Nawfia Lake, would enhance sustainable management of the fishery resources in the study area.
Keywords: Catfish, Distribution, Agulu, Nawfia, Lake

INTRODUCTION

In Africa, the inundation of flood plains with their numerous permanent and temporary lakes provides the environment for rich fisheries production (Awachie, 1982). Fish migration is rarely as great in lakes as in the streams, because of stability of the aquatic environment and the condition for fishing, which are less diversified. Resource evaluation by species or group of species, zone and season is essential for introduction of regulatory measures, to aid conservation and management of water bodies (Everett, 1994). Some aspects of the ecology, population dynamics and exploitation of the lakes have been studied (Igu, 1986, Akpaniteaku and Aguigwo 2003a, Akpaniteaku and Aguigwo, 2003b and Akpaniteaku and Nwuba, 2008). Roest (1975) reports that migration of fish families in a part of the lake might cause permanent changes, as well as reduction in abundance. Kibria and Ahmed (2005) report that catch ability of passive gears relied on movement or migration of fish through the area where they were set. There is need to study the abundance and distribution of various groups in the lakes particularly catfish. They are very important group in capture fishery, and most of the species are good for aquaculture purposes. Resource evaluation would enhance regulatory measures and conservation of the various species. The research

is therefore aimed at evaluating the distribution and abundance of various types of catfish families in Agulu and Nawfia Lakes in Anambra State of Nigeria.

MATERIALS AND METHOD

Agulu and Nawfia are located within the lake basin in the capital territory (Awka) of Anambra State. The lakes are endowed as shown on table 1.

Table 1: Attributes of Agulu and Nawfia Lakes

Characteristics	Agulu Lake	Nawfia Lake
Location	Longitude 6° 7-' north	Longitude 6°14-' north
	Latitude 7° 2-' east	Latitude 6° 58' 57'' east
Distance from Awka	11.5Km Southwest	6 Km West
Area	16,081m²	12,500m²
Depth	5.3m	6.0m

Source: Fieldwork, 2012

They were sampled with the fishing efforts of artisanal fishermen. There was no discrimination against fishing gears and legal methods used by the fishermen. Bamboo traps, cast nets, hooks and line, long line with hooks and set nets were used during the sampling. The gears were operated during the day, and some of the passive ones left over night. Active gears were operated twice daily, and samples collected in the morning. One of the six arms of Agulu Lake, located towards the bridge was used as sampling station. Activities of some fishermen could be observed from there. The entrance to Nawfia Lake, which sometimes served as sand collection and local food processing site, was also used as sampling station. Catch was first identified using the identification Key of Reed, Burchard, Hopson, Jannes and Yaro (1967), and Olaosebikan and Raji (1998). Individual species of the group were sorted out and enumerated according to families. The data were tabulated to reflect species and their families. Chi-square and correlation coefficient were used in analysis of the data.
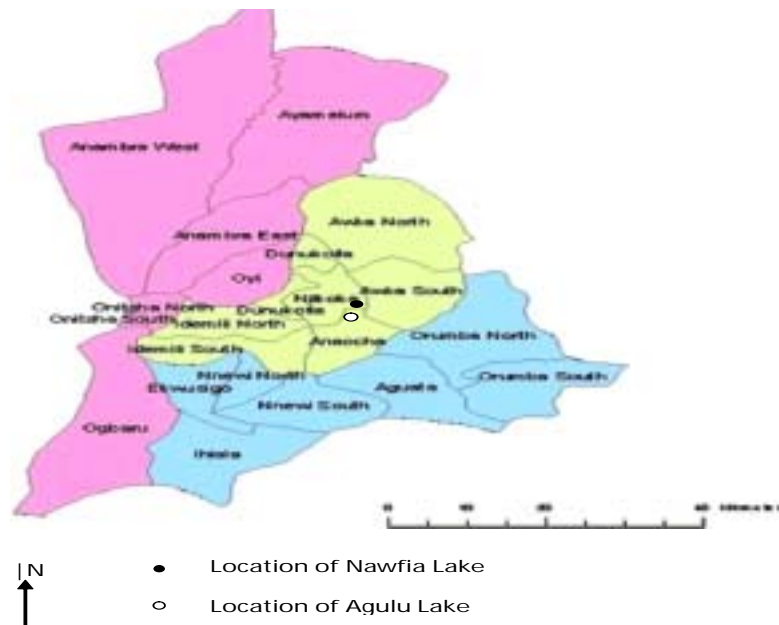

Fig. 1: Map of Anambra State Showing the Location of the study areas

RESULTS AND DISCUSSION

Catfish composition of Agulu and Nawfia Lakes are as follows: in Agulu Lake, family *bagridae* had the highest population (97%). In Nawfia Lake, family *clariidae* ranked highest representing 50% of the catfish families. The family *mochokidae* ranked second representing 2.4% of the catfish families in Agulu Lake. The bagrid fish ranked second in Nawfia Lake representing 27.4% of the catch. The least encountered catfish at Agulu and Nawfia were the *clariidae* and *malapteruridae* with 0.3% and 6.5% respectively. The composition of catfish species in the lakes is shown on table 2. *Chrysichthyes furcatus* had the highest number, representing 58.2% in Agulu Lake, followed by *C. longifilis* with 38.6%. *Clarias gariepinus* was the highest in number representing 40.3% in Nawfia Lake, followed by *Chrysichthyes furcatus* and *Synodontis membraneceus* – each representing 16.1% of the catch.

The least encountered species in Agulu Lake were *Heterobranchus longifilis* and *Malapterurus electricus,* and each of them represented 0.3% of the total catch. In Nawfia Lake the least encountered was M. electricus representing 6.4%. The abundance and distribution of catfish at the open water and shore zone of the lakes are shown on table 3. There were more *Chrysichthyes* at the open water than the shore habitat of Agulu Lake. *Chrysichthyes furcatus* accounted for 60% and 49% of the catch at the open water and shore respectively. The least were *H. longifilis* and *M. electricus* with 0.4% and 2.3% respectively. At the open water in Agulu Lake, *C. gariepinus, M. electricus* and *Synodontis clarias* were not encountered. At the shore zone, *H. longifilis* and *C. gariepinus* were not encountered. The *C. gariepinus* accounted for 80.6% of the catch at the open water in Nawfia Lake and *Chrysichthyes furcatus* represented 32.2% at the shore. The least encountered species at the open water and shore zones of the lake, were *H. longifilis* and *M. electricus,* representing 6% and 4% respectively.

Roest (1975) reports that migration of fish families in a part of lake might cause permanent changes, as well as reduction in abundance. Akpaniteaku and Aguigwo (2003a) submit that catch abundance might result from the ability of the fish species to occupy both open water and shore, or the type of gear used. Kibria and Ahmed (2005) observe that catch ability of passive gears relied on movement or migration of fish through the area where they were set. The abundance of bagrid fish especially *Chrysichthyes* species in the present research (Fig. 1 and Table 1), is in line with the observation of Akpaniteaku and Aguigwo (2003a). According to Akpaniteaku and Nwuba (2008), catch ability of set gill net at the open water was higher in Agulu than Nawfia Lake. This may also be the reason for the higher percentage of *Chrysichthyes* species obtained at the open water (table 2) than the shore habitat of the lake. As types of water body are diverse, so are the species that inhabit them (Kibria and Ahmed, 2005). Agulu Lake seems to be predominantly inhabited by the family bagridae. This may however result from the inability of the predatory *Crocodylus cataphractus* to select them. The predators may not be interested in the *Chrysichthyes* species due to their external morphology. The species are endowed with aggressively positioned dorsal fin with spine, that may prevent predators from attacking

them (Akpaniteaku, Pers. Obs). The rate of occurrence of *clariid* fish was low in Agulu Lake, probably as a result of attack by the *C. cataphractus.* Kibria and Ahmed (2005) report that natural and man- made changes could cause alarming decline in catch from inland waters. Moreover, Deka, Goswami and Kakati (2005) report that fish depletion could be caused by siltation, encroachment, anthropogenic activity, mesh size of fishing net, flood effect and fishing rules. The few number of catfish recorded in the present research could however be attributed to the natural changes in the lakes.

Table 2: Catfish Species of Agulu and Nawfia Lakes

Families/Species	Agulu Lake		Nawfia lake	
	Total No. Collected	% Occurrence (Composition Per Species)	Total No. Collected	% Occurrence (Composition Per Species)
Bagridae:				
Chrysichthyes longifilis	664	38.6	7	11.3
Chrysichthyes furcatus	1001	58.2	10	16.1
Clariidae:				
Clarias gariepinus	-	-	25	40.3
Heterobranchus longifilis	6	0.3	6	9.7
Malapteruridae:				
Malapterurus electricus	6	0.3	4	6.4
Mochokidae:				
Synodontis clarias	22	1.3	-	-
Synodontis membraneceus	19	1.1	10	16.1

Table 3: Distribution of Catfish at Open Water and Shore Zones of Agulu and Nawfia Lakes

Species	Agulu Lake				Nawfia lake			
	Open Water		Shore		Open Water		Shore	
	No.	%	No.	%	No.	%	No.	%
Chrysichthyes longifilis	569	39	95	37	-	-	7	22.6
Chrysichthyes furcatus	875	60	126	49	-	-	10	32.2
Clarias gariepinus	-	-	-	25	80.6	-	-	
Heterobranchus longifilis	6	0.4	-	-	6	19.4	-	-
Malapterurus electricus	-	-	6	2.3	-	-	4	13
Synodontis clarias -	-	22	8.5	-	-	-	-	
Synodontis membraneceus	10	0.7	9	3.9	-	-	10	32.2

CONCLUSION

Thes study aimed at evaluating the distribution and abundance of various types of catfish families in Agulu and Nawfia Lakes in Anambra State of Nigeria. Bamboo traps, cast nets, hooks and line, long line with hooks and set nets were used during the sampling. The gears were operated during the day, and some of the passive ones left over night. Active gears were operated twice daily, and samples collected in the morning. One of the six arms of Agulu Lake, located towards the bridge was used as sampling station. *Chrysichthyes* species were more abundant in Agulu Lake than Nawfia Lake, and *Clarias gariepinus* was more abundant in Nawfia Lake than Agulu Lake. Controlling the population of *C. cataphractus* at Agulu Lake would ensure high survival rate, and abundance of the *clariid* fish. Nawfia Lake was being silted as a result of erosion of adjacent land. Systematic control of erosion would enhance sustainable management of the fishery resources.

REFERENCES

Akpaniteaku, R. C. and **Aguigwo, J. N.** (2003a). Studies on distribution and abundance of fish in Agulu Lake, Anambra State, Nigeria. *Journal of Sustainable Tropical Agriculture Research* 6, 1 – 11.

Akpaniteaku, R. C. and **Aguigwo, J. N.** (2003b) . Seasonal variation in catch of tilapiines (Osteichthyes: Cichlidae) in Agulu and Nawfia Lakes, Anambra State, Nigeria. *Journal of Sustainable Tropical Agricultural Research* 6, 19 – 22.

Akpaniteaku, R. C. and **Nwuba, L. A.** (2008). Preliminary catch assessment and catch ability of fishing gears in Agulu Lake, Anambra State, Nigeria. *Journal of Applied Sciences.* 11 (2), 7808 -7814.

Awachie, J. B. E. (1982). Some general consideration on river basin in Africa and their management and development in relation to fisheries. *CIFA. Tech. Pap*. 8, 2 – 23.

Deka T. K, Goswami M. M. and **Kakati M.** (2005). Causes of fish depletion – A factor analysis approach. *NAGA, World Fish Center Newsletter* 28 (1 & 2), 37 – 42.

Everett, G. V. (1994). Promoting industrial fisheries in West Africa. FAO Fisheries Circular 857: 56p.

Iguh, G. O. (1986). A preliminary study of the incidence of Ecto and Endo parasites of fish in Agulu and Nawfia Lakes Anambra State B. Sc. Thesis. University of Nigeria, Nsukka, 78p.

Kibria, G. and **Ahmed, K. K. U.** (2005). Diversity of selective and non selective fishing gear and their impact on inland fisheries in Bangladesh. NAGA, World Fish Center Newsletter 28 (1 & 2), 43 – 48.

Olaosebikan, B. D. and **Raji, A.** (1998). *Field guide to Nigerian Freshwater fishes.* New Bussa: Federal College of Freshwater fisheries Technology.

Reed W., Burchard J., Hopson A.J., Jannes J. and **Yaro I.** (1967). *Fish and Fisheries of Northern Nigeria*. Min of Agric. Northern Nigeria, Zaria, 226p.

Roest, F. C. (1975). Evolution des population piscicoles de 1972 a 1975. Project ANUD/AVB/FAO – IVC 526, *Rapport Technique No. 32*