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Abundance and Distribution of Fish Species in Three Water Bodies in Asaba Metropolis, Delta State, Nigeria.

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Abstract

Fish abundance and distribution in Onah Lake, Anwai River and lower River Niger at cable point where studied. Sampling was conducted between July and December 2013 using gill nets, fish traps, and hooks. One thousand four hundred and eighty seven fish specimens were collected, sorted, and identified to species level. Twenty families were reported of which three namely (*Notopteridae*, *Dasyatidae* and *Mormyridae*) were found only in River Niger. Seven families (*Malapteruridae*, *Bagridae*, *Characidae*, *Cyprinidae*, *Hepsetidae*, *Mochokidae* and *Cichlidae*) were found in the three water bodies. Anwai River was the least diverse having only seven families while River Niger was the most diverse with twenty families and seven hundred and eighteen individuals. The most abundant family was *Mochokidae* with a total individuals of four hundred and forty one (29.65%) of the total specimens collected. The least abundant species were *Hemichromis bimaculatus* and *Auchenoglamus biscutatus* which had one individual each (0.0007%) of the total population sampled. The rich assemblage of fish species collected indicates that these water bodies have the potential for fish production if property managed.

Keywords: Fish species, Fauna, Diversity, Family, Fish exploitation

Introduction

Fisheries resources are fast reducing in Nigeria due to over exploitation and inadequate management of her coastal waters (Lawson and Olusanya, 2010). For sustainability of these resources, an adequate knowledge of species composition, relative abundance of her water bodies must be understood and actively pursued (Lawson and Olusanya, 2010). The fish fauna of the Nigerian freshwater system has been the focus of research for quite some time. Some of the researchers are Welman (1984); Banks et al., (1965); Akinyemi (1985); Idodo-umeh (1987) and Ita (1987). These studies concentrated more on rivers, with less attention on the lakes and wet lands yet they produced a variety of reports on the Nigerian Freshwater. Research so far on Nigerian freshwater system has concentrated more on larger water bodies such as River Niger Lake Chad etc. The lesser known water bodies are neglected, yet they contribute significantly to local fish supply. This study therefore seeks to identify the fish species and to ascertain their abundance and distribution in the three selected water bodies.

Materials and Methods

Study Area

Anwai River is a fast flowing river that transverses the Eastern border of Asaba Campus of Delta State University and it lies between latitude 5^0 -$5^0 15^1$N and longitude 6^0-$6^0 31^1$E. The river has a lot of fringing vegetation along its bank (Meterology service station, Asaba, 2002). Onah lake is a tropical freshwater lake, West of River Niger having its sources from a spring called Utho. It is located eight kilometers (8 km) from Asaba, Oshimili South Local Government Area of Delta State, Nigeria. It lies on latitude $5^0 53^1$E and longitude $6^0 11^1$N.

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The hydrology of the lake is conducive for the culture of *Oreochromis niloticus* due to its good water quality in terms of pH, dissolved oxygen and temperature (Ekelemu and Zelibe, 2006). Lower River Niger at cable point in Asaba, Oshimili South Local Government Area of Delta State lies on latitude $6^{0}43^{1}$E and longitude $6^{0}11^{1}$N of the equator (Metrology Service Station, Asaba, 2002).

Sampling

The vegetation around the river includes Azolla pinnata, Pistia stratiotes, some grasses and trees around the river. Sampling was conducted forthnightly from July-December, 2013 from three stations namely, Lake Onah, Anwai River and lower River Niger at cable point. Fish samples were collected using gill nets, traps, hook and lines which were set overnight prior to sampling day by fishermen. Fish samples collected were put in an Ice-chest container and transported to the laboratory for identification and counting. Fish species were identified from family to species level with the aid of identification key by Idodo-umeh (2003). Data collected were analyzed using percentage, frequency distribution, and pyramid of numbers.

Results

Results of the study are presented in Tables 1 to 3 and Figure 1

Table 1: Species composition of fishes caught in the three study stations

	Stations			
Species	**Onah lake**	**Cable point river**	**Anwai River**	**Total**
Malaptereus electricus	26	20	9	55
Bagrus bayad	14	30	2	46
Bagrus filamentosus	12	-	-	12
Achenoglamus biscutatus	-	-	1	1
Hydrocynus forskalis	12	-	-	12
Brycnus nurse	8	3	28	39
Alestes baremose	15	-	-	15
Hydrocynius lineatus	-	10	4	14
Brycinus leuciscus	-	-	7	7
Labeo senegalensis	8	14	8	30
Labeo couble ruppel	9	13	-	22
Citharinus citharius	17	15	-	32
Citharinus distichodoides	15	-	-	15
Schilbe uranoscopus	22	23	-	45
Schilbe mystus	-	3	-	3
Parachanna Africana	35	-	-	35
Parachanna obscura	33	-	-	33
Heterobranchus bidorsalis	8	-	-	8
Clarias angularis	18	-	-	18
Hetrobranchus longifilis	10	-	-	10
Lates niloticus	10	4	-	14
Gymnarchus niloticus	9	3	-	12
Heterotis niloticus	15	8	-	23
Hepsetus odoe	8	7	3	18
Phractolaemus ansorgei	5	3	-	8
Distichodus rostratus	15	-	-	15
Distichodus niloticus	21	11	-	32
Polypterus senegalus senegalus	18	10	-	28
Erpetoichthys calabaricus	12	10	-	22
Synondontis clarias	65	32	6	103
Synondontis oceilifer	30	74	-	104
Synondontis nigrita	18	56	17	91
Synondontis sorex	12	12	-	24
Synondontis vermiculatus	-	23	-	23
Synondontis budgeti	-	42	-	42

Tilapia zilli	18	85	10	103
Saretherodon galielius	36	-	-	36
Oreochromis niloticus	53	58	7	118
Tychronus jentinki	10	10	-	20
Oreochromis aureus	12	-	-	12
Hemichromis fasciatus	28	20	6	54
Tilapia dageti	-	15	-	15
Pelvicachromis taeniatus	-	5	-	5
Hemichromis bimaculatus	-	-	1	1
Ctenopoma kingsleyae	3	25	-	28
Dasytis garouensis	-	3	-	3
mormyrus rume	-	29	-	29
Mormyrus macrophthelmus	-	18	-	18
Mormyrus hasselquisti	-	5	-	5
Mormyrus bovei	-	9	-	9
Gnathonemus brevicandatus	-	10	-	10
Total species	**36**	**36**	**14**	
Total individual	**660**	**718**	**109**	**1,487**

Table 1 shows the species composition of fishes caught in the three stations (Onah Lake, Anwai river and Cable Point River). The highest contributing species in terms of station is Onah Lake and Cable Point River with 36 species while Anwai River had 12 species. The Station with the highest number of individual species is Cable point River, with 718 species followed by Onah Lake with 660 species and the least Anwai River with 109 species. The highest contributing species in terms of number is *Oreochromis niloticus* with 118 individuals, while the least contributing species are *Hemichromis bimaculatus* and *Aechenglamus biscutatus* with 1 individual each.

Table 2: Percentage distribution of fish caught during the study based on families.

	Onah lake	**%**	**Cable point**	**%**	**Anwai river**	**%**	**Total**	**%**
Malapteurinidae	26	3.93	20	2.63	9	8.26	55	3.69
Bagridae	26	3.93	30	3.95	3	2.74	59	3.97
Characidae	35	5.30	13	1.71	39	35.78	87	5.85
Cyprinidae	17	2.57	27	3.55	8	7.34	52	3.49
Citharinidae	32	4.84	38	5.00	-	-	70	4.71
Schilbeidae	22	3.33	26	3.42	-	-	48	3.23
Centropomidae	10	1.51	4	0.52	-	-	14	0.94
Gymnarchidae	9	1.36	3	0.39		-	12	0.81
Osteoglossidae	15	2.27	8	1.05	-	-	23	1.55
Hepsetidae	8	1.21	7	0.92	3	2.75	18	1.21
Anabantidae	3	0.45	25	3.29	-	-	28	1.88
Phractolaemidae	5	0.75	3	0.39	-	-	8	0.54
Distichondontidae	36	5.45	11	1.44	-	-	47	3.16
Polypteridae	30	4.54	20	2.63	-	-	50	3.36
Mochokidae	125	18.93	293	31.48	23	21.10	441	29.66
Cichlidae	157	23.78	193	25.42	24	22.02	374	25.15
Notopteridae	-	-	3	0.39	-	-	3	0.20
Dasyatidae	-	-	3	0.39	-	-	3	0.20
Mormyridae	-	-	86	11.33	-	-	86	5.78
Total family	17		19		7		43	2.89
Total individual	660		718	100.01	109		1,487	

Table 2 shows the distribution of fish caught during the study based on families encountered. The highest contributing station in terms of family is Cable Point with 19 families followed by Onah Lake with 17 families. while the least contributing Station is Anwai River with 7 families. The highest contributing Station in terms of in terms of individuals is Cable Point with 718 individuals, followed by Onah Lake with 660 individuals and the least is Anwai River with 109 individuals.

Table 3: Checklist of Fish Families with Species / Genus

Family	**Species**	**Genus**
Malapteurinidae	Malaptererus	electricus
Bagridae	Bagrus	filamentosus
	Bagrus	Bayad
Characidae	Aechenoglamus	Biscutatus
	Hydrocyinus	Forskalis
	Brycinus	Lineatus
	Brycinus	Nurse
	Alestes	Leuciscus
Cyprinidae	Labeo	Baremose
	Labeo	Senegalensis
	Labeo	couble reppel
Citharinidae	Citharinus	Citharus
	Citharinus	Distichodoides
Schilbidae	Schilbe	Uranoscopus
	Schilbe	Mystus
Channidae	Parachanna	Africana
	Parachanna	Obscura
Claridae	Heterobranchus	Bidorsalis
	Clarias	Longifilis
Centropomidae	Lates	Niloticus
Gymnarchidae	Gymnarchus	Niloticus
Osteoglossidae	Heterotis	Niloticus
Hepsetidae	Hepsetus	Odoe
Phractolaemidae	Phractolaemus	Ansorgei
Distichindontidae	Distichodus	Rostratus
	Distichodus	Niloticus
Polypteridae	Polypterus	senegalus senegalus
	Erpetoichthys	Calabaricus
Mochokidae	Synondontis	Clarias
	Synondontis	Oceilifer
	Synondontis	Nigrita
	Synondontis	Sorex
	Synondontis	Vermiculatus
	Synondontis	Budgeti
Cichlidae	Tilapia	Zilli
	Tilapia	Dageti
	Oreochromis	Niloticus
	Oreochromis	Aureus
	Henichromis	Fasciatus
	Hemichromis	Bimaculatus
	Tychromis	Jentinki
	Pelvichromis	Taeniatus
	Sarotherodon	Galielius
Anabantidae	Ctenopoma	Kingsleyae
Dasyatidae	Dasyatis	Garouenesis
Mormyridae	Mormyrus	Rume
	Mormyrus	Macrophthalmis
	Mormyrus	Hasselquisti
	Mormyrus	Caudatus
	Gnathonemis	Bovei

Table 3 shows fish family with Genus and species. The highest contributing family in terms of species is the *Cichlidae* with 9 species followed by *Mochokidae* with 6 species, while the least contributing are *Centropomidae, Gymnarchidae, Ostoglossidae, Hepsetidae, Phractolaemidae, Anabantidae* and *Dasyatide* with 1 species respectively.

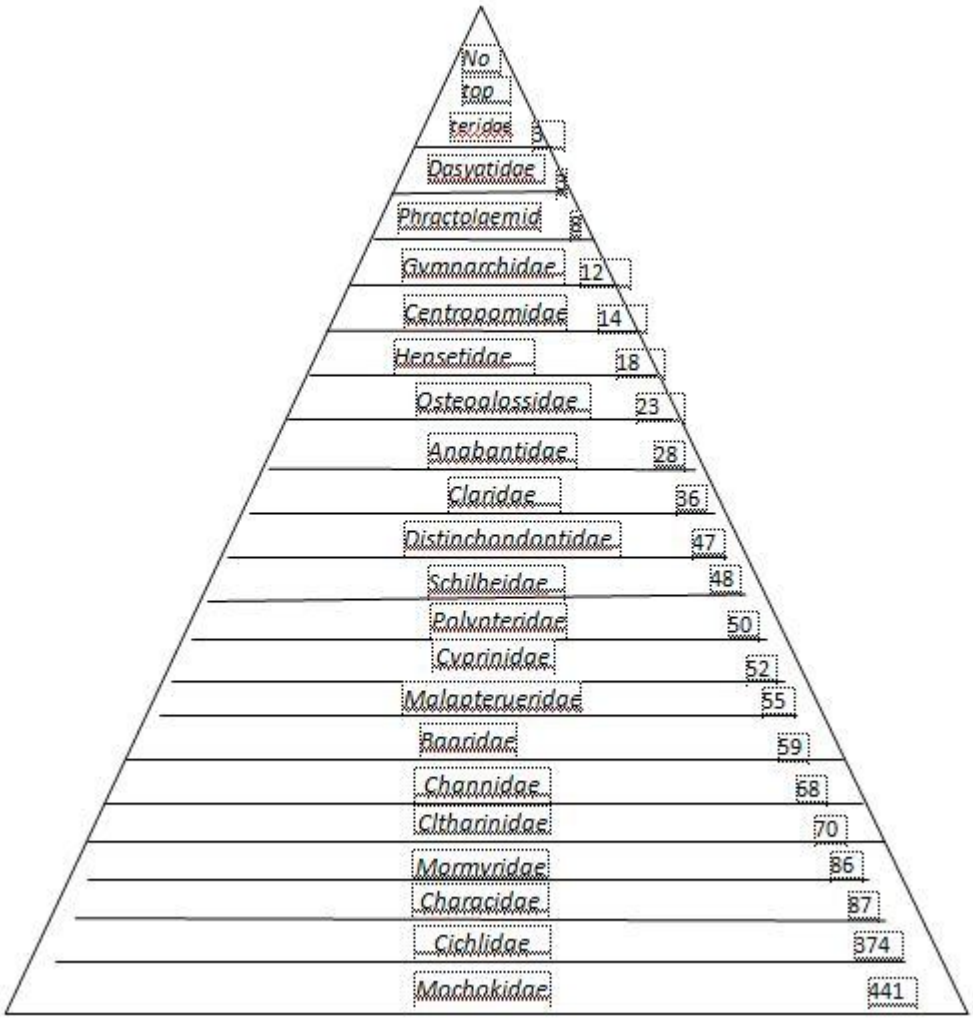

Fig 1: Pyramid of pooled number / family of fish collected in the three stations.

The pyramid of numbers shows the total number of individuals per family, sampled from the three Stations.

Discussion

During the period of study fifty one fish species belonging to twenty one families were identified in the three stations. Table 1 shows the list of species composition of fishes caught in the three sampling stations. Table 2 shows the fish distribution by number per family and their percentages (%). These fish families have been observed by many fisheries workers and researchers, who reported these fishes to constitute the major fisheries of the inland waters in Nigeria. This is due to their ability to adapt to various water conditions (Ita *et al*., 1986; Akinyemi, 1987). The fish with the highest species distribution and abundance in the three stations is the Mochokidae. The high occurrence of Mochokidae could be due to the environment in which it is found. The cichlid family was the next most abundant family. This is as a result of their ability to utilize a wide range of foods in the lower tropic level as herbivores as well as their fecundity and prolific nature (Akinyemi, 2002). The dominance of the Cichlids in the present study could be attributed to their prolific breeding pattern anh good parental care. This compares favourably with the works of Opa, Osinmo on African reservoir where Cichlids are known to dominate (Komolafe and Adewomo, 2003, 2008 and Balogun, 1986), The Cichlids were the most diversified (9-species) dominated by *Oreochromis niloticus*. This is in contrast with the work of Kamolefe and Arawomo (2008) on Osinmo Reservoir, Osun State that recorded Cichlids, as the most diversified in Kangimi Lake with 5-species representation. The family Notopteridae, Dasyatida Phractolaemidae and Gymnarchidae were pooly represented.

Most of these species requires high level of water to thrive well. Fig 1 shows the pyramid of pooled numbers per family of fish collected in the three sampling stations. Mochokidae and Cichlidae are shown as the most dominant families.

Conclusion and Recommendation

The rich assemblage of fish species collected (fishes) indicates that these waterbodies have the potential for fish production if properly managed. It is hoped that the information gathered will be useful for future planning and management of the fisheries resources of Onah lake, Anwai river and lower River Niger at Cable point.

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