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Full Length Research Paper

Temporal and seasonal abundance of fish species in Ikot Ebom, a tropical rainforest river, Nigeria

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Seasonal variations and monthly fish species composition of a tropical rainforest river was carried out for a period of twelve months using standard sampling procedures. The results showed a piscine composition of 8 orders, 16 families, 23 genera and 45 species. There were temporal and seasonal significant differences (P<0.05) between number and species of fish caught. Highest monthly abundance in terms of number of specimens was in June (81 specimens), this was followed by September (71 specimens) and then May (49 specimens); all portraying wet season abundance. The lowest was in March (7 specimens) during the dry season. The most abundant family in terms of number of species and specimens was Cichlidae (12 species) and (100 specimens) respectively and was followed by Bagridae and Clariidae (5 species each) and Anabantidae (63 specimens). The most abundant species in terms of number of specimens was *Erpetoichthys calabaricus* (60 specimens; 13.86%) while least were *Auchenoglanis akiri, A. fasciatus, Oreochromis niloticus, Clarias anguillaris, Heterobranchus longifilis, Mastacembelus nigromarginatus* and *Schilbe auritus* with one specimen only (0.23%). The status of these rich piscine compositions have remained unknown since the community is bound by laws which do not encourage utilization and development. Hence, this work serves as benchmark information and more ecological researches are needed.

Keywords: Abundance, monthly, seasonal, fish species, Ikot Ebom, Ikpa River

INTRODUCTION

Nigeria is blessed with abundant inland water resources and Ita (1994) reported that there are over 200 species of fish in Nigerian inland waters. There are 149,919 km^2 of inland waters made up of lakes, rivers, ponds, floodplains, mining and stagnant pools (Ita *et al*., 1985). Fish is a very highly preferred and traded edible aquatic resource all over the world. About 40% of the animal protein consumed by the average (Nigerian) African is derived from fish especially the rural dwellers (Ugwu, 1997). Njoku (1996) reported that it provides a direct source of employment for millions worldwide and a good numbers are seen in various sub-sectors of fishery, such as fishing, fish processing, marketing and other related activities.

Ikpa River at Ikot Ebom is utilized by its community as

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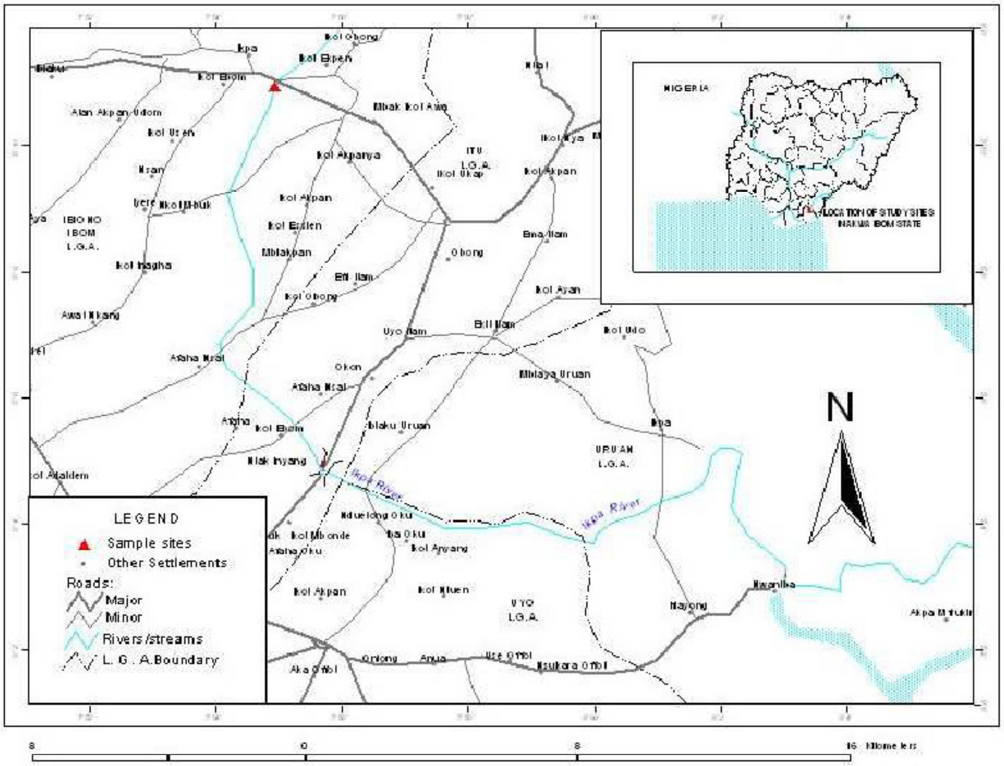

Fig. 1: Ikpa River showing sampling site at Ikot Ebom, Akwa Ibom State, Nigeria.

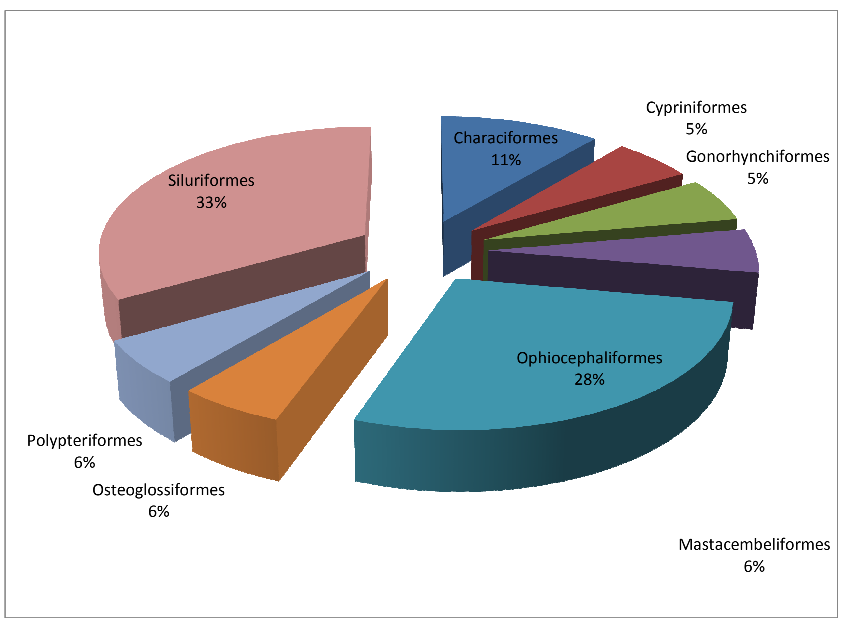

Figure 2. Percentage abundance of fish orders in Ikot Ebom (Ikpa River) Nigeria.

the only source of drinking water and for all other domestic purposes. It also serves for agricultural activities, especially the dry season farming. There is a large oil palm processing mill sited at the bank of the river. Thus, water from this river is used in all the mill processes. The effluent from the mill flows back to the stream (Ekpo *et al*., 2011; Onuoha *et al*., 2010). There are no artisanal activities carried out in this body of water, but at subsistence level. The people fish for family consumption using gear such as hook and line, traps and building of barriers. No boat has ever been used in the water and non-natives are not allowed into the water either. There is dearth of information on the checklist of fish species occurring there. This report will, therefore,

Table 1. Species composition, monthly and percentages abundance of fish specimens in Ikot Ebom (Ikpa River) Nigeria.

Family/Species	Months												FO	%F	N	%N
	M	A	M	J	J	A	S	O	N	D	J	F				
Anabantidae																
Ctenopoma kingslayae	-	-	1	1	2	3	5	3	2	-	4	2	9	6.52	23	5.31
C. nebulosum	-	-	3	-	1	3	9	3	1	-	-	1	7	5.07	21	4.85
C. petherici	-	-	-	-	1	8	7	-	-	1	-	2	5	3.62	19	4.39
Total Anabantidae	**-**	**-**	**4**	**1**	**4**	**14**	**21**	**6**	**3**	**1**	**4**	**5**	**21**	**15.22**	**63**	**14.55**
Bagridae																
Auchenoglanis akiri	-	-	-	-	1	-	-	-	-	-	-	-	1	0.72	1	0.23
A. biscutatus	-	-	-	-	-	-	5	1	7	-	-	1	4	2.90	14	3.23
A. fasciatus	-	-	-	-	-	-	-	-	-	1	-	-	1	0.72	1	0.23
A. monkei	-	-	-	-	-	-	5	1	3	-	-	1	4	2.90	10	2.31
A. occidentalis	-	-	-	-	1	-	3	-	2	-	-	2	4	2.90	8	1.85
Total Bagridae	**-**	**-**	**-**	**-**	**2**	**-**	**13**	**2**	**12**	**1**	**-**	**4**	**14**	**10.14**	**34**	**7.85**
Channidae																
Parachanna africana	-	-	-	-	-	-	2	8	1	1	-	-	4	2.90	12	2.77
P. obscura	-	-	-	-	1	5	1	-	1	1	-	2	6	4.35	11	2.54
Total Channidae	**-**	**-**	**-**	**-**	**1**	**5**	**3**	**8**	**2**	**2**	**-**	**2**	**10**	**7.25**	**23**	**5.31**
Characidae																
Brycinus intermedius	-	-	-	11	-	1	-	-	-	-	-	-	2	1.45	12	2.77
B. leuciscus	-	-	1	1	-	-	-	-	-	-	-	-	2	1.45	2	0.46
B. longipinnis	-	-	5	5	-	-	-	-	-	-	-	-	2	1.45	10	2.31
B. nurse	1	-	-	7	-	-	-	-	-	-	-	-	2	1.45	8	1.85
Total Characidae	**1**	**-**	**6**	**24**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**8**	**5.80**	**32**	**7.85**
Cichlidae																
Chromidotilapia guntheri	-	-	3	10	-	1	-	-	-	-	5	-	4	2.90	19	4.39
Hemichromis bimaculatus	-	1	1	-	-	1	-	1	-	-	-	-	4	2.90	4	0.92
H. fasciatus	2	3	-	3	2	3	-	1	-	1	-	-	7	5.07	15	3.46
Oreochromis niloticus	-	-	-	-	-	-	-	-	-	-	1	-	1	0.72	1	0.23
Pelvicachromis pulcher	-	-	6	3	-	-	-	-	-	-	-	-	2	1.45	9	2.08
P. taeniatus	-	-	4	9	-	-	-	-	-	-	-	-	2	1.45	13	3.00
Sarotherodon galilaeus	-	-	-	8	-	-	5	-	-	-	-	-	2	1.45	14	3.23
S. macrocephala	-	-	1	4	-	-	-	1	1	-	-	-	4	2.90	7	1.62
S. melanotherodon	2	-	-	-	-	-	-	-	-	-	-	-	1	0.72	2	0.46
Tilapia dageti	-	-	-	3	-	3	-	-	-	-	-	-	2	1.45	6	1.39
T. mariae	-	5	1	1	-	-	1	-	-	-	1	-	5	3.62	8	1.85
T. zillii	-	1	-	-	-	-	-	-	-	-	1	-	2	1.45	2	0.46
Total Cichlidae	**4**	**10**	**16**	**41**	**2**	**8**	**6**	**3**	**1**	**1**	**8**	**-**	**35**	**25.36**	**100**	**23.09**
Clariidae																
Clarias anguillaris	-	-	-	-	-	-	-	-	-	-	-	1	1	0.72	1	0.23
C. buthupogon	-	-	-	-	-	-	-	1	1	-	-	1	3	2.17	3	0.69
C. garienpinus	-	-	-	-	8	5	-	-	-	-	-	-	2	1.45	13	3.00
C. macromystax	-	-	-	-	-	-	-	-	1	1	-	1	3	2.17	3	0.69
Heterobranchus longifilis	-	-	-	-	1	-	-	-	-	-	-	-	1	0.72	1	0.23
Total Clariidae	**-**	**-**	**-**	**-**	**9**	**5**	**-**	**1**	**2**	**1**	**-**	**3**	**10**	**7.25**	**21**	**4.84**
Cyprinidae																
Barbus callipterus	-	-	18	9	-	-	-	-	-	-	2	-	3	2.17	29	6.70
Total Cyprinidae	**-**	**-**	**18**	**9**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**3**	**2.17**	**29**	**6.70**
Distichodontidae																
N. ansorgii	-	-	-	2	-	-	-	-	-	-	-	-	1	0.72	2	0.46
Total Distichodontidae	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**0.72**	**2**	**0.46**

Table continuation

Eleotridae																
Bostrychus africanus	-	-	-	-	-	-	-	-	2	1	-	-	2	1.45	3	0.69
Eleotris senegalensis	-	-	-	-	-	-	-	-	-	1	3	-	2	1.45	4	0.92
Total Eleotridae	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**2**	**3**	**-**	**4**	**2.90**	**7**	**1.61**
Gobiidae																
Chonophorus lateristriga	-	-	-	-	-	-	-	-	7	-	-	-	1	0.72	7	1.61
Total Gobiidae	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7**	**-**	**-**	**-**	**1**	**0.72**	**7**	**1.61**
Malapterinidae																
Malapterurus electricus	-	-	-	-	2	-	8	4	6	2	-	3	6	4.35	25	5.77
M. minjiriya	-	-	-	-	-	-	-	1	-	2	-	-	2	1.45	3	0.69
Total Malapterinidae	**-**	**-**	**-**	**-**	**2**	**-**	**8**	**5**	**6**	**4**	**-**	**3**	**8**	**5.80**	**28**	**6.46**
Mastacembelidae																
Mastacembelus nigromarginatus	-	-	-	-	1	-	-	-	-	-	-	-	1	0.72	1	0.23
Total Mastacembelidae	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**0.72**	**1**	**0.23**
Mochokidae																
Synodontis schall	-	-	1	1	-	-	-	-	-	-	-	-	2	1.45	2	0.46
Total Mochokidae	**-**	**-**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1.45**	**2**	**0.46**
Notopteridae																
Papyrocranus afer	1	1	-	3	-	2	5	-	-	1	-	-	6	4.35	13	3.00
Total Notopteridae	**1**	**1**	**-**	**3**	**-**	**2**	**5**	**-**	**-**	**1**	**-**	**-**	**6**	**4.35**	**13**	**3.00**
Polypteridae																
Erpetoichthys calabaricus	-	-	-	-	10	6	16	9	4	3	10	2	8	5.80	60	13.86
Total Polypteridae	**-**	**-**	**-**	**-**	**10**	**6**	**16**	**9**	**4**	**3**	**10**	**2**	**8**	**5.80**	**60**	**13.86**
Schilbeidae																
Schilbe intermedius	1	3	-	-	-	-	-	-	-	-	-	-	2	1.45	4	0.92
S. uranoscopus	-	1	4	-	-	-	-	-	-	-	-	1	3	2.17	6	1.39
S auritus	-	-	-	-	-	-	-	-	-	-	-	1	1	0.72	1	0.23
Total Schilbeidae	**1**	**4**	**4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**6**	**4.35**	**11**	**2.54**
GRAND TOTAL	**7**	**15**	**49**	**81**	**31**	**41**	**72**	**34**	**39**	**16**	**27**	**21**	**138**	**100**	**433**	**100**
Total Monthly % N	**1.63**	**3.47**	**11.32**	**18.71**	**7.16**	**9.47**	**16.23**	**7.85**	**9.01**	**3.70**	**6.24**	**4.85**				

- → **Absence; FO → Frequency of occurrence; N → Total number of specimens sampled**

provide baseline data of the fish species composition as well as their monthly and seasonal abundance. This will serve as background information or database for future management decision for sustainability of the resources, which will enhance resource consumption among the community dwellers.

MATERIALS AND METHODS

Study area

Ikpa River (Figure 1) is situated in Akwa Ibom State within the rainforest zone of southeastern Nigeria. It is a small perennial rainforest tributary stream located west of the lower reaches of the Cross River system. It drains a catchment area of 516.5 Km^2, 14.8% (76.5 Km^2) of which the downstream is prone to annual flooding. The stream has a main channel with total length of 53.5 Km between its source in Ikono Local Government Area and where it discharges into the Cross River creek close to Nwaniba in Uruan Local Government Area. At Ikot Ebom, it is considered as the upper zone of the river. The Easting and Northing of the sampling station is 379437.913mE and 572840.203mN respectively.

The lower reaches are susceptible to annual flooding of the fringing low land riparian zone during the rainy season due to siltation, which has led to the growth of dense population of aquatic macrophytes. Most part of the river is considerably shaded by overhanging canopy of riparian vegetation (mostly *Elaeis guineensis, Pandanus, Raphia hookeri, R. vinifera* and other tropical forest trees). The aquatic macrophytes are mainly *Diplazium sammati, Nymphaea lotus, Pistia stratiotes, Sagittaria guayanens, Salvinia nymphellula, Potamogeton octandrus, Leersia hexandra, Ludwigia abyssinica,* among others (Ekpo *et al.*, 2011). The climate of the area is typical of tropical rain forests: it comprises dry (November–March) and wet (April–October) seasons. The dry season is characterized by prevalence of dry tropical continental winds from the Sahara desert, and low mean monthly precipitation (3.5–

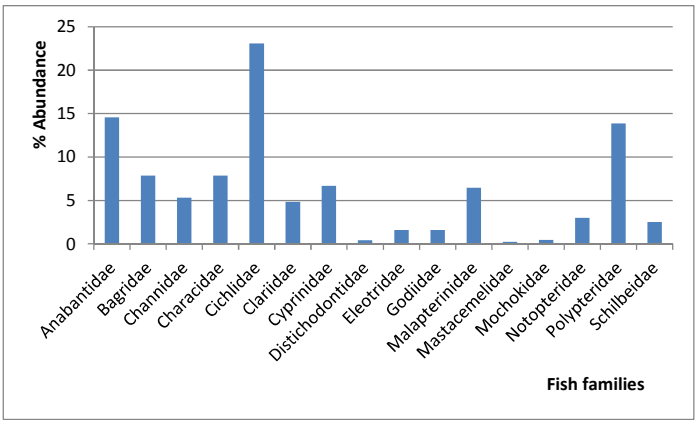

Figure 3. Percentage abundance of fish families in Ikot Ebom (Ikpa River) Nigeria

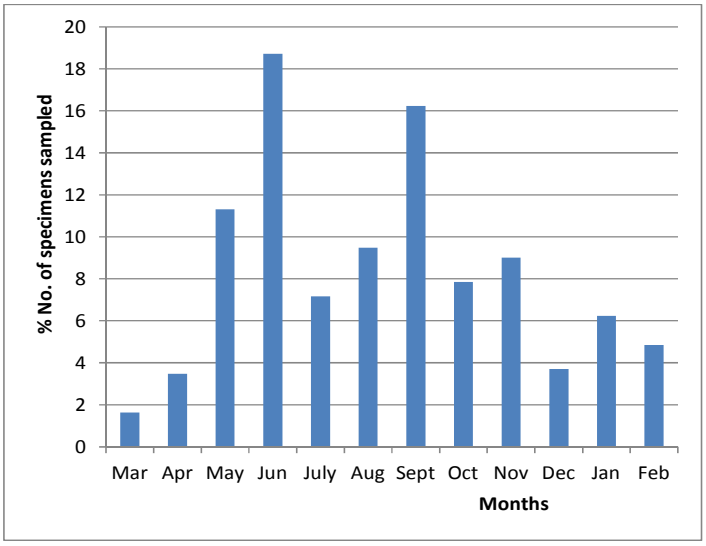

Figure 4. Monthly abundance in the number of specimens sampled in Ikot Ebom (Ikpa River) Nigeria

13.6cm). The wet season also is typified by moist tropical maritime winds from the Atlantic Ocean and high mean monthly rainfall (23.0–39.2cm; ±31.1cm) with a double maximum in July and September. The mean annual rainfall is 255.8cm. Hydrological observations revealed that fluctuations in stream level and flow rate (current velocity) are determined by intensity of precipitation and contribution from runoff from the riparian zone. These produce a cyclic hydrological regime, typified by high water level and flow rate during the rains and vice versa in the dry season. Its substrate is made up of fine sand, mud/sand organic debris (King, 1989; Teugel *et al*., 1992; Ekpo *et al*., 2011)).

Fish sampling, preservation and identification

A representative of the fish population was sampled by ensuring selective gears capable of sampling fish species in proportion to their relative abundance were chosen (Pinto and Araujo, 2007). Several fishing methods were used in a standardized manner to collect the maximum number of species and individuals in different sizes. Fishing equipment used were gill nets (with stretched mesh size of 10–30mm), hooks and traps during the day time. The unbaited gill nets and baited traps (using baits such as earthworms and palm fruits) were set mainly at the vegetated marginal regions of the river while hooks were used both in vegetated areas and in the open water.

Fish samples collected were preserved in 10% formaldehyde solution in well-labeled containers to reduce microbial digestion to the minimum (Fagade, 1983; Ekpo, 2013$_c$). All preserved samples were removed from the formaldehyde solution, rinsed in clean water and placed slanting with the mouth down to drain out excess fluid for about 5-10 minutes prior to identification.

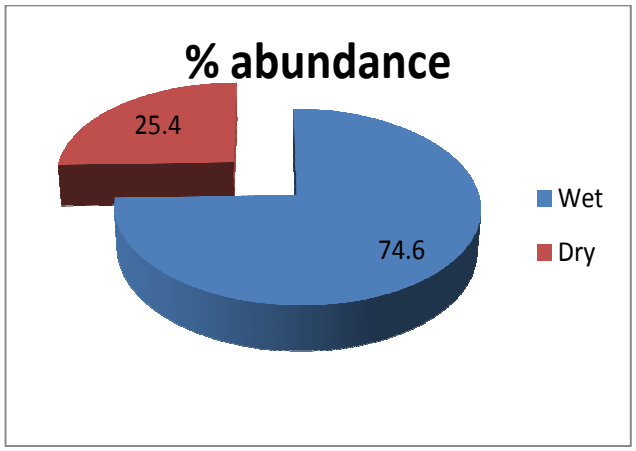

Figure 5. Seasonal abundance of fish specimens in Ikot Ebom (Ikpa River) Nigeria.

Specimens were identified from order to species levels with the aid of identification keys such as Olaosebikan and Raji (1988) and Idodo-Umeh (2005).

Statistical analyses

The data generated were subjected to one-way ANOVA at 5% level of probability to determine monthly significant differences. Means and percentage frequencies were calculated for the sampled specimens to determine their occurrence, abundance and temporal variations. The abundance of each fish species was computed as the percentage of the number of each individual fish over the total number of fish sampled as follows:

$FO = n/N \times 100$

Where,

FO = Frequency of occurrence
n = Number of individual fish species
N = Total number of all the fish species

RESULTS

The results revealed that there were temporal and seasonal significant differences ($P<0.05$) between number and species of fish caught. The results showed a piscine composition of 8 orders, 16 families, 23 genera and 45 species.

Fish Orders

The eight fish orders encountered were Characiformes, Cypriniformes, Gonorhynchiformes, Ophiocephaliformes, Osteoglossiformes, Mastacembeliformes, Polypteriformes and Siluriformes (Figure 2). The highest abundance was recorded in Siluriformes with six families (33.00%). This was followed by Ophiocephaliformes with five families (28.00%), and Characiformes with only two families (11.00%). Five orders: Cypriniformes, Gonorhynchiformes, Mastacembeliformes, Osteoglossiformes and Polypteriformes had only one family (6.00%) each.

Family abundance

The most abundant family in terms of number of species and specimens was Cichlidae (12 species; 26.67%) and (100 specimens; 23.09%) respectively and was followed by Bagridae (34 specimens; 7.85%) and Clariidae (21 specimens; 4.84%) having 5 species each (11.11%) and thirdly Anabantidae with 3 species (6.67%) and 63 specimens (14.55%) as shown in Table 1 and Fig. 2. The Cichlidae had the highest number of genera (6; 26.09%) followed by Clariidae and Eleotridae (2; 8.70%) while all others had only one genus (4.35%) each. Also, using frequency of occurrence Table 1 showed that the most occurring family was Cichlidae (35; 25.36%), followed by Anabantidae (21; 15.22%) and then Bagridae (14; 10.14%). The least occurring families were Distichodontidae, Gobiidae and Mastacembelidae, all occurring once (0.72%).

Species abundance

The most abundant species in terms of number of specimens was *E. calabaricus* (60 specimens; 13.86%) while the least were *Auchenoglanis akiri, A. fasciatus, Oreochromis niloticus, Clarias anguillaris, Heterobranchus longifilis, Mastacembelus nigromarginatus* and *Schilbe auritus* with only one

specimen (0.23%) as depicted in Table 1.

Seasonal abundance

Monthly species abundance was observed to be highest in the family Cichlidae in June (41 specimens; 9.47%) and was closely followed by Characidae (24 specimens; 5.54%) whereas absence of specimens were recorded across many families in many months (Table 1 and Fig. 3). For instance, in Anabantidae two months (March and April) were without specimens. Six months (March, April, May, June, August and January) lacked specimens in Bagridae while among the Channidae, five months (March, April, May, June and January) had no specimens. Among the Characidae, there was increase in the number of months (eight) without specimens (April, July, September, October, November, December, January and February). But in the family Cichlidae, only one month (February) completely lacked specimens. Four families (Gobiidae, Distichodontidae, Mastacembelidae and Mochokidae) had only one monthly occurrence; among others.

Highest monthly abundance in terms of number of specimens was in June (81 specimens; 18.71%), this was followed by September (72 specimens; 16.63%) and then May (49 specimens; 11.32%); all portraying wet season abundance (Table 1 and Fig. 4). The lowest was in March (7 specimens; 1.62%) during the dry season**. S**easonal abundance showed highest during the wet season (323 specimens; 74.60%) than during the dry season (110 specimens; 25.40%) as depicted in Fig. 5. Intra-family abundance among the Bagridae showed highest in September (13 specimens; 3.00%) whereas it occurred least in June (9 specimens; 2.08%) among the Clariidae. Then mono-species Polypteridae showed highest abundance in September (16 specimens; 3.70%) while the Cichlidae occurred highest in 9 specimens; 2.08%. Among the Characidae, intra-family abundance was observed in June with 24 specimens (75.00%) but in the family Anabantidae, highest abundance was revealed in September with 21 specimens (33.33%). April and May were the months of highest abundance (4 specimens; 0.92%) among the Schilbeidae.

DISCUSSION

Fish abundance in aquatic ecosystems especially streams and rivers is dependent on several factors, such as food organisms, embankment, nutrient levels, fringing macrophyte communities, hydrology, physical as well as chemical features. These factors are also dependent on other natural factors such as precipitation and anthropogenic activities such as pollution and open access. Ekpo and Essien-Ibok (2013_f) identified the open access property in which there is no restriction on entry into property because there is no property right to be the main problem of artisanal fisheries in Akwa Ibom State and Nigeria at large. Though the fishery at Ikot Ebom is not operated at artisanal level, the same is applicable to it.

The size of the sample of 433 specimens and 43 species from Ikpa River as revealed in this study, the productivity of the river is higher and / less than other similar ecosystems. For instance, in Iba Oku stream, Udo (2012) showed that a total sample size of 312 constituting 13 families and 19 species were sampled. However, Ekpo (2013_c) sampled 1027 specimens from Ikpa River, with 19 families and 38 species. Seventeen species comprising of 10 fish families were identified: ten of these species were referred to as being relatively abundant and the rarity of other species were considered on the basis of its percentage contribution to the overall catch in each stream (Udoidiong, 1999). Ogbeibu and Ezeunara (2005) encountered 14 families and 29 fish species from Ikpoba River, commenting that the findings were not equivalent to ichthyocoenosis because the description of any fish community is a biased image given by sampling a group of fish in a particular environment at a given time. However, the authors agreed with Ogbeibu and Ezeunara (2002) that such fish community structure was probably the result of urban disturbance synergistically interacting with the local habitat conditions.

The highest abundance in terms of number of specimens and total number of species was observed during the wet season than the dry season: to the ratio of 74.60% and 25.40% respectively. The low dry season abundance may be attributable to the difficulty encountered during the initial take-off of the work; apart from the fact that it is not possessing favourable environmental conditions. This is a season of growth when most plants and animals generally reproduce greatly due to abundance of food materials. The surface runoff carries along with it high nutrient loads and organic matter which induce primary productivity. The extended surface area occasioned by inundation of the fringing lands affords fish to enough feeding space. It also enables them to find good nursery grounds where they can spawn. Food items such as plankton (Nwani *et al*., 2008), insects (eggs, larvae and adults) (King, 1989), many species of worms, arachnids, crustaceans, molluscs, and other benthic invertebrates (Teugels *et al*., 1992), and others of plant components like seeds, flowers, leaves, roots and branches have been identified as gut contents of many riverine fish species (Welman 1948; Fagade and Olaniyan, 1973; Welcomme 1985 and Wetzel, 2001).

Monospecific polypterid, *E. calabaricus* (60 specimens; 13.86%) occurred most among the specimens. It is a stream species found in both muddy, sandy organic matter sediments. Such combined sediments properly describe this study area; which has favoured its flourishing and they were mostly caught with the traps.

Also, the shape of *E. calabaricus* permits it to wriggle itself through the weedy riverbed and banks. This observation differs from Ezenwaji (2004) where *Parailia pellucida* was the abundant species among the 40 species of fin fish caught in the lower Anambra River; Udo (2012) in which *M. electricus* (48 individuals) was the dominant species in Iba Oku and Ekpo (2012_b; $2013_{a,c}$) in which *Parailia pellucida* (577 specimens; 53.72%) was the dominant species in Ikpa River.

Abundance in terms of number of species was highest in the family Cichlidae (12 species; 26.67%) while seven others had only one genus (4.35%) each. Cichlidae, commonly referred to as tilapias, are known to spawn at very tender ages and sizes i.e. the mature quickly (Greenwood, 1981). Hence, they reproduce fast to populate any system. Commenting on the cichlid fishes, Edema and Ogbetuo (2010) reported that they are prolific and prodigious reproductive habits; considering them to be the world's second most consumed fish and is only surpassed by carps. The importance of fast -growing culturable cichlids as a source of animal protein has endeared many fish farmers into its production.

Family abundance showed highest in Cichlidae, which was followed by Bagridae and then Clariidae. Cichlidae is a multi-genera and multi-species family and findings in this work showed that there were six genera and twelve species respectively. Affirming this result, Victor and Tetteh (1988) showed that the cichlid fish were the most abundant fish among the fish communities of Ikpoba Reservoir. Disagreeing with this result, Udo (2012) reported that Malapterinidae (15.4%) was the dominant family in Iba Oku stream. Though distichodontids made an insignificant contribution in this research, Keke *et al*., (2008) reported that it constitutes the most important commercial fishery in Oguta Lake where hundreds of artisanal fishers depended on for livelihood. The family comprises as high as 56.01% by weight of the total gillnet fishery of Oguta Lake (Nwadiaro, 1989) and Njoku (1991) ranked it as 'Grade A' fish, based on high market price and table value of the composite species.

Monthly abundance of the fish species were recorded in June, seconded by September and thirdly in May; all the months during the wet season. The month of June divides the year into two equal parts. Moses (1987) reported that the popular silver catfish, *Chrysichthys nigrodigitatus* is caught and landed in large quantities in the lower Cross River during May/June. It was reported that during this time this fish moves by instinct upstream due to the increased water level where it lays eggs. This finding conflicts with that of Udo (2012) where higher monthly abundance was reported in March (71 specimens; 23.10%) during the dry season and a lower abundance in July (68 specimens; 21.79%) during the wet season. However, wet season abundance had been observed by other authors (Moses (1987); Ayotunde *et al*., (2013) and Offem *et al*., 2010; 2011) with peak breeding period between June and July.

Some notable important freshwater fish families, genera and species were not found among the samples. Such include *Hepsetus odoe*, *Epiplatys*, *Xenomystus nigri*, *Brienomyrus brachyistus, Polypterus annectens, mormyrids, Liza, Arius,* etc. Apart from the above stated facts, this can, however, be linked up with the selectivity of the gear used, methods of fishing, fishing intensity and duration. This report corroborates with the findings of Onuoha *et al*., (2010) and Sikoki *et al.,* (2008) but disagrees with Udo (2012) in which malapterinids was dominant, Giller and Malmqvist, (2002) and Pinto and Araujo, (2007) in which characids were dominant. The observed trends may be attributed to the biased already established by the fishers, gear selection, intensity and frequency of sampling.

Many months were without specimens as indicated by the empty boxes especially during the first two months of sampling (March and April) in Table 1. This high number of empty spaces is indicator of one of the many problems encountered in Ikot Ebom, Ikpa River. Since no visitor is allowed into this water for fear by the community that the water may be polluted or poisoned to start harming its users, one is forced to hire someone from there for sampling. Men hired to sample were also not reliable as sometimes they failed to keep fish in the fish containers. These men were not fulltime fishers but do it as a hobby or additional trade while carrying out their main businesses. Sometimes when fish of big sizes were caught, they either sell them out to make some money or take to their homes as food. Some of the nettings and traps bought for them to use in sampling were stolen by unknown persons. Throughout the research period, two different sets of 'organized fishers' were employed. Thus, there were several sampling outings where there were no samples collections.

The total number of specimens sampled was relatively very low and if examined in terms of productivity, it is poor. This can be linked up the problems encountered at the sampling station: low fishing intensity, poor fishing gear, high cost implications and unfaithfulness of the fishers. Apart from these, it is a smaller river, an upstream zone and there are many anthropogenic perturbations going on in the river. But, if this high species richness is developed, conserved, monitored and managed at maximum sustainable level of fishery, it can constitute a rich protein source for this community. Also, if the presence of the Government and other corporate bodies are felt, the people can be enlightened on how to develop and sustain these fisheries resources. Thus, these findings serve as benchmark information for other studies to be built-up or compared.

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