

FISH ASSEMBLAGES OF SELECTED TRADITIONAL FISHING TRAPS (MALIAN AND IKARA) IN THE UPPER NUN RIVER, NIGER DELTA, NIGERIA

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ABSTRACT

The Malian trap is relatively a new trap copied by Nigerian fishers from migratory Malian fishers compared to the indigenous Ikara trap. This study aimed at examining the fish assemblages of the two traditional fishing traps in the Upper Nun River, Niger Delta. Biweekly sampling was done along three (3) longitudinal stations in the Upper Nun River for twelve calendar months (January – December 2009). Four sets of traps were used, the small and large mesh sizes of Malian trap measuring 1.3cm by 1.3cm and 5cm by 5cm respectively and the small and large mesh sizes of Ikara trap having stretched mesh sizes of 3.5cm by 0.8cm and 5cm by 4 cm respectively. A total of thirty-one (31) species belonging to 13 families were recorded. The most abundant family in catch was Clariidae (19.69%) while the least was Centropomidae (1.11%). Malian trap with small mesh size 1.3cm by 1.3cm caught 29 species of fish with a Species Diversity Index (SDI) of 0.94, while Ikara trap with large mesh size 5cm by 5 cm caught the least number of species (24) with a Species Diversity Index of 0.77. Based on the results from the present study, the Malian trap is more efficient than the Ikara trap in terms of catch, quantity of fish catch and in the capture of the family Mochokidae. This study therefore suggests the use of the Malian trap for fisheries management.

KEYWORDS: Catch composition, fishing traps, Upper Nun River, Niger Delta.

INTRODUCTION

Fishing is one of the oldest ways by which people have fed themselves and their families and primitive trapping is probably the oldest form of fishing [1]. Fishing gear can be described as any kind of equipment used in harvesting, cropping or capturing fish from any water body [2, 3]. Trapping is a passive way to catch fish, shellfish, crustaceans (crabs, prawns, etc.) and cephalopods (octopus, squid, etc.) and it is different from active fishing methods such as dredging and trawling [4, 5, 1]. Brandt, [6] stated that, the methods to catch fish and other aquatic resources, with or without a gear, have always been practiced. And that, fishing methods have consequently evolved throughout recorded history. According to the author, fishing gear and methods used over time and their capture efficiency is obviously hardly comparable to that of prehistorical times. Traps are small or large structures fixed to the shore and are simple passive fishing gear that allows fish to enter and then make it hard for them (fishes) to escape. This is often achieved by putting chambers or valves in the trap that can be closed once the fish enters, having a funnel that make it difficult for the fish to escape [7, 1]. Gray *et al.* [1] also affirmed that, an advantage of trapping is that it allows some control over the species and sizes of the fish you catch. The trap entrance or funnel can be regulated to control the maximum size of fish that enter. To a large extent, the fish species that will be caught depend on the type, model and characteristics of the trap being used.

Malian trap is a basket type of trap which is one of the commonest types of gear used in rivers, Lagoons, lakes and estuaries [8, 9, 10, 11, 12]. Ikara trap is another type of basket trap. The Hausa word Suru is used to denote fish traps in general, as well as one particular type of single-chambered trap which in Izon is called Ikara; they are commonly used in most areas of Nigeria [13]. Ikara are made from a single rectangular piece of fish screen, by folding one end inside to form the funnel-shaped non-return valve, then doubling the piece of mat and attaching the sides. Part of the twine which fastens the edges together is tied in such away that it can easily be slipped undone to permit removal of fish. Ikara traps vary in size from about 60cm length (these are made from thin strips of raffia palm) to extremely strong traps measuring 1.5 metres square and made of lianas or cane up to 10mm diameter. Ikara traps are used either together with a variety of fish screens, fences and bunds; or they are set near grassy River banks during the period of rising water level. They are not baited. When used in the first described manner they catch all types of fish [13]. The Malian trap is relatively a new trap, reportedly copied by Nigerian fishers from migratory Malian fishers while the Ikara trap is indigenous [12]. Ipinjolu *et al.* [10] reported that the Malian and Ndurutu traps are the most widely used, in combination with other traditional and modern fishing gears.

Agbelege and Ipinjolu [8] found that 70% - 100% of the fishers sampled in Lake Chad, employed Ndurutu and Malian traps, respectively, in combination with other traps. A survey conducted along River Rima in Northwestern Nigeria also revealed that 30-50% and 30-90% of fishers used Malian and Ndurutu traps respectively, depending on the size and abundance of fish resources in the water bodies [14]. The findings from this research will as well serve as background information for people responsible for formulating management policies for the fisheries of the area. Therefore, this study is aimed at examining the catch composition of the two traditional fishing traps.

MATERIALS AND METHODS

Study Area

The study was carried out at the Upper Nun-River in the Niger Delta around Polaku. Town in Yenagoa Local Government Area of Bayelsa State. The area is situated between 5° 01' N; 6° 17' E and 5° 02' N; 6° 17' E along the Nun-River (Fig. 3 1). The Niger Delta basin covers all the land between latitude 4° 14' N and 50° 35' N and longitude 5°26' E and 7° 37' E with a total area of 70,000km². The area is economically important and rich in biodiversity. Numerous activities such as oil exploration and production and agricultural activities go on in the region. Most of Nigeria's oil and gas reserves and production, which account for over 80% federal government's revenue, is located within the Niger Delta region.

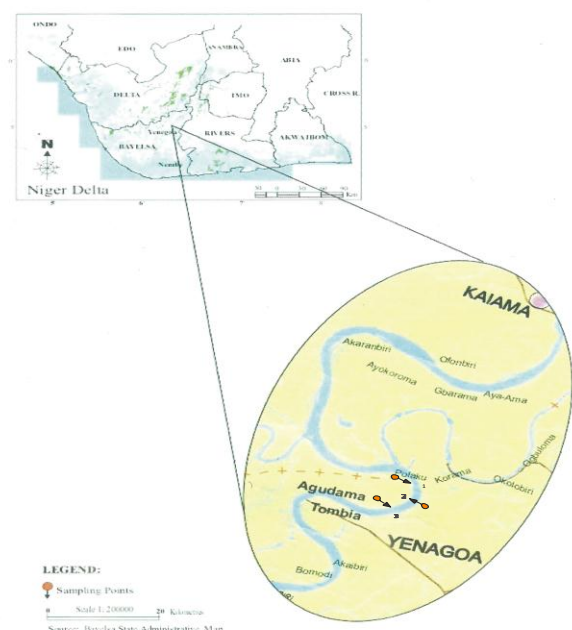


Figure 1. Map of Niger Delta showing Bayelsa and Upper Nun River the Study

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Sampling procedure

Sampling was done along longitudinal stations in the upper Nun River for twelve calendar months biweekly (January – December 2009). Three stations were chosen based on preliminary investigations. The stations were named NUN1, NUN2 and NUN3. Twelve traps comprising three each of the Malian (small and large mesh sizes) shown in Plate 1 and 2, old Ikara (Large mesh size) and the new Ikara (Small mesh size) traps shown in Plate 3 and 4 were used at each station. All the traps were anchored separately. They were tagged and randomly set forth-nightly at the littoral zone of the river on the same day at the same time (between 3:30 pm and 4:00 pm) for a period of twelve months. The traps were inspected and handled after 24 hours (between 6:30 am and 7:30 am). Specimens were identified into families and species and were counted based on the number of species caught for each trap. The Species Diversity Index (SDI) was obtained by dividing the number of species caught by each trap type by the total number of species caught by all the traps.



Plate 1. Small – sized mesh Malian trap

Plate 2. Large – sized mesh Malian trap

RESULTS

The traps fish catch composition of the traditional fishing traps with different mesh sizes is represented in Table 1. A total of 31 species belonging to 13 families was recorded. The most abundant family in catch was the family Clariidae, while the least was Centropomidae. The Mochokidae had the highest species representation of six, while four other families (Centropomidae, Cyprinidae, Malapteruridae and Osteoglossidae) had the least representation of one species each. Malian trap with small mesh size caught 29 species of fish with a Species Diversity Index (SDI) of 0.94, while Ikara trap with large mesh caught the least number of species (24) with a Species Diversity Index of 0.77. Out of the 13 families caught, three families namely Mochokidae (25.80%), Clariidae (19.69%) and Cichlidae (13.18%) constituted the dominant fish families in the upper Nun River. Among the Mochokidae, *Synodontis clarias*, *Synodontis flamentosus* and *Synodontis sorex* were the most abundant species while among the clariidae, *Heterobranchius bidosalis* and *Clarias gariepinus* were the most abundant species.

DISCUSSION

The number of fish families recorded in the trap catch was similar to those recorded in similar fishing pot traps in River Rima, Northwestern Nigeria [8]. However, the species number in this study was higher than those of Agbelege *et al.* [8] for River Rima and Adjarho and Ajao [5] for

Kainji Lake. Also, all the traps in this study had higher fish species diversity indices than those of the pot traps in River Rima. The possible reason could be the duration of study and the types of fishing gear used. In the lower Nun River, Sikoki *et al.* [15, 16] recorded 26 species in 16 families and 25 species in 14 families respectively while Okorie [17] reported 27 species for Oramiriukwa River and Oribhabor and Ogbeibu [18] recorded 25 species for Buguma Creek, Niger Delta, Nigeria using cast nets and hooks and lines. Nevertheless, the present study recorded lower number of fish species than other studies and this could be attributed to types of fishing gear, study area and availability of food [19]. Forty-six (46) species of fish was recorded in Otamiri River [20], more than 80 species reported in Ofonitorubuo Lake [21], 91 species of six common reef fish families along the Egyptian Coast of the Red Sea [22].

The difference in species number could be due to several reasons namely seasonal changes [23], length of rivers [17], variations in sampling methods and gear or even changes in the water quality [19, 24], and part of water body fished [25, 26]. The high number of species of the Mochokids and Clariids found in the upper Nun River around Polaku Community agreed with the reports of Egborge [27, 28], that those fresh water fish families important in species diversity included Clariidae, Cichlidae, Mochokidae, Cyprinidae and Mormyridae. The enter “single species in the family” (*Heterotis niloticus*, *Malapterurus electricus* and *Lates niloticus*) found this study qualify them for protection, as they are all included in the list of endangered fresh water fishes in Nigeria [27].



Plate 3. New Ikara Trap (Small Mesh size)

Plate 4. Old Ikara Trap (Large Mesh Size)

CONCLUSION

The study of the catch composition of two traditional fishing traps (Malian and Ikara) in the Upper Nun River between January and December revealed the presence of 31 species in 13 families. The two traps demonstrated the ability to trap fish species of different types of habits and habitats and also showed close ties in their effectiveness in fish trapping.

RECOMMENDATIONS

Based on the main thrust of this study which was to assess the catch composition with two traditional fishing traps and taking into consideration the quantity of fish catch, the use of the Malian trap is recommended. However, there is need to modify the mesh size used in constructing trap to prevent the trapping of under-sized and juvenile fish.

Table 1. Catch Composition of the Traditional fishing traps with different mesh sizes

Family	Species		Trap Type								
			Malian Trap				Ikara Trap				
			Small		Large		Small		Large		
No	%	No	%	No	%	No	%	No	%		
Characidae	53	7.35	<i>Alestes baremoze</i>	7	2.76	-	-	8	3.81	-	-
			<i>Alestes brevis</i>	7	2.76	6	3.85	4	1.90	-	-
			<i>Alestes nurse</i>	9	3.54	-	-	9	4.29	3	2.78
Bagridae	54	7.49	<i>Auchenoglanis occidentalis</i>	9	3.54	6	3.85	6	2.86	9	8.33
			<i>Bagrus bayad macropterus</i>	7	2.76	7	4.49	5	2.38	5	4.63
Centropomidae	8	1.11	<i>Lates niloticus</i>	2	0.79	3	1.92	-	-	3	3.78
Cichlidae	95	13.18	<i>Hemichromis fasciatus</i>	9	3.54	3	1.92	9	4.29	3	2.78
			<i>Oreochromis niloticus</i>	9	3.54	6	3.85	3	1.43	3	2.78
			<i>Tilapia niloticus</i>	7	2.76	3	1.92	7	3.33	2	1.85
			<i>Tilapia zilli</i>	15	5.91	9	5.77	11	5.24	3	2.78
Citharinidae	39	5.41	<i>Citharinus citharus</i>	4	1.57	6	3.85	5	2.38	6	5.56
			<i>Citharinus latus</i>	3	1.18	4	2.56	6	2.86	5	4.63
Clariidae	142	19.69	<i>Clarias gariepinus</i>	28	11.02	16	10.27	16	7.62	8	7.41
			<i>Heterobranchus bidorsalis</i>	27	10.63	13	8.33	26	12.38	8	7.41
Cyprinidae	12	1.66	<i>Labeo coubie</i>	-	-	3	1.92	6	2.86	3	2.78
Distichodontidae	15	7.07	<i>Distichodus brevipinus</i>	12	4.72	3	1.92	9	4.29	6	5.56
			<i>Distichodus rostratus</i>	6	2.36	9	5.77	6	2.86	-	-
Malapteruridae	12	1.66	<i>Malapterurus electricus</i>	5	1.97	3	1.92	4	1.90	-	-
Mochokidae	186	25.80	<i>Marcusenius cyprinoides</i>	4	1.57	3	1.92	3	1.43	3	2.78
			<i>Synodontis clarias</i>	18	7.09	11	7.05	18	8.57	6	5.56
			<i>Synodontis eupterus</i>	3	1.18	3	1.92	3	1.43	3	2.78
			<i>Synodontis filamentosus</i>	18	7.09	6	3.85	15	7.14	6	5.56
			<i>Synodontis membranaceus</i>	3	1.18	3	1.92	-	-	3	2.78
			<i>Synodontis sorex</i>	18	7.09	15	9.62	15	7.14	6	5.56
Mormyridae	39	5.41	<i>Gnathonemus pictus</i>	-	-	3	1.92	3	1.43	-	-
			<i>Hyperopisus bebe</i>	7	2.76	5	3.21	-	-	3	2.78
			<i>Mormyrus deliciosus</i>	3	1.18	-	-	-	-	-	-
			<i>Mormyrus rume</i>	3	1.18	3	1.92	6	2.86	3	2.78
Osteoglossidae	13	1.80	<i>Heterotis niloticus</i>	3	1.18	4	2.56	3	1.43	3	2.78
Schilbeidae	17	2.36	<i>Eutropius niloticus</i>	5	1.97	-	-	3	1.43	5	4.63
			<i>Schilbe mystus</i>	3	1.18	-	-	1	0.48	-	-
Total No of species				29		26		27		24	
Relative Diversity Index				0.94		0.84		0.87		0.77	

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