

EFFECT OF TWO FISHING BAITS ON THE CATCH COMPOSITION OF TWO TRADITIONAL FISHING TRAPS IN THE UPPER NUN RIVER, NIGER DELTA, NIGERIA.

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ABSTRACT

The effect of two fishing baits on the catch composition of two traditional fishing traps were investigated between January and December, 2011 in the Upper Nun Rivers, Niger Delta. The traps were set at the littoral zone of the river, baited with Groundnut-cake and fresh palm fruit. The Malian trap baited with Groundnut-cake caught the highest number (31) of fish species with Species Diversity Index of 1.00, while Ikara trap without bait caught the least number of fish species with Species Diversity Index of 0.32. The dominant species in the catches of the traps baited with Ground Nut-Cake were *Synodontis sorex* (15.45%), *Synodontis clarias* (10.57%), *Clarias gariepinus* (8.54%) and *Heterobranchus bidorsalis* (6.50%) in the small mesh sized Malian traps, while the large mesh sized Malian trap, *Synodontis sorex* (9.05%), *Synodontis clarias* (10.55%), *Clarias gariepinus* (6.03%) and *Distichodus brevifinis* (6.50%) were dominant. *Mormyrus deliciosus* was only caught in Malian trap. In both traps baited with fresh palm fruit, *Heterobranchus bidorsalis*, *Clarias gariepinus*, *Oreochromis niloticus* and *Tilapia zilli* dominated the catches. Traps not baited were dominated by *Clariids*. A significant difference was also observed in the weights of fish caught with different baits. The results from this study revealed that, ground-nut cake is more efficient than fresh palm fruit as bait in catching freshwater fish.

INTRODUCTION

Baits as food or luring substance made real or imitation are used to entice a prey especially a fish (Adjarho and Ajao, 2007). Baits, lures or attraction devices are often incorporated into some fishing gear in order to improve their efficiency. Such fishing gear include: traps, Longlines, trolling and handlines. Baits may include rotten meat, dead fish, palm nuts or corn. Traps are selective for size of the lower size ranges but will capture any sizes upward that will pass through the entrance (Welcomme, 2001). There are other fishing baits which are usually used in the Southern region of Nigeria. These baits include groundnut-cake, live fish, worm, baked garri mixed with palm oil, termite, soap and fresh palm fruit. A good trap and longline have to be attractive to the targeted fish (not to others) either chemically or visually able to induce the fish to ingest the bait and be tenacious, remaining on the hook for their entire duration of fishing or until a fish is caught (Lokkeborg and Bjordal, 1992). The effectiveness of a bait may be species-specific and probably changes with the season and availability of natural prey species on the fishing grounds. Baits as luring substances are used in the inland fisheries in many tropical countries in the world (Welcomme, 2001). In Nigeria today, different types of traditional fishing baits are widely been used by artisanal fishers. However, the literature available showed lack (dearth) of documented knowledge on these traditional fishing baits. The results of the study conducted by Adjarho and Ajao, (2007), showed the different fishing baits used by the fishers in Kainji Lake which include cooked corn bran, rice bran (in paste form), whole fish/chunk/stomach content, snail, termite hill, *ipomea aquatic* leaves etc. However, the relative effectiveness of these baits for trap fishing was not adequately documented. This study will also contribute meaningful information about baits to the world of literature which will be useful to research institutes and institutions of higher learning that may wish to carryout similar study. Therefore, this study is aimed at determining the effect of two fishing baits on the catches of Malian and Ikara traps and to make recommendation on the most efficient bait type (s) for trap fishing in the Upper Nun River.

MATERIALS AND METHODS

Study Area

The study was carried out in the Upper Nun River around Polaku Community in Yenagoa Local Government Area of Bayelsa State, Niger Delta, Nigeria. The area is located between 5° 01' N; 6° 17' E and 5° 02' N; 6° 17' E along the Nun-River. The Niger Delta basin covers all the land between latitude 4° 14' N and 5° 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% of the federal government's revenue, is located within the Niger Delta region.

SAMPLING PROCEDURE: Sampling was done for 12 calendar months biweekly from January – December, 2011 along the longitudinal stations in the Upper Nun River. The stations were named Nun 1, Nun 2, Nun 3. A total of

twelve traps were used comprising three each of Malian trap (small and Large mesh sizes) with stretched mesh sizes ranging from 1.3cm by 1.3cm and 5cm by 5cm shown in plate 1 and 2, Old Ikara (Large mesh size) and the new Ikara (small mesh size) measuring 3.5cm by 0.8cm and 5cm by 4cm shown in plate 3 and 4 at each station. The traps were all anchored, baited with groundnut cake and fresh palm fruit separately. They were tagged and randomly set fortnightly at the littoral zone of the river on the same day at the same time (between 3:30pm and 4:00pm) for a period of twelve months. The traps were inspected and hauled after 24 hours (between 6:30 am and 7:30 am).

Fish specimens were identified into families and species by using monographs of Holden and Reed (1972) and Olaosebikan and Raji (1998) and were counted based on the number of species caught in each trap by the different baits. The Species Diversity Index (SDI) was obtained by dividing the number of species caught by each bait type by the total number of species caught by all the traps

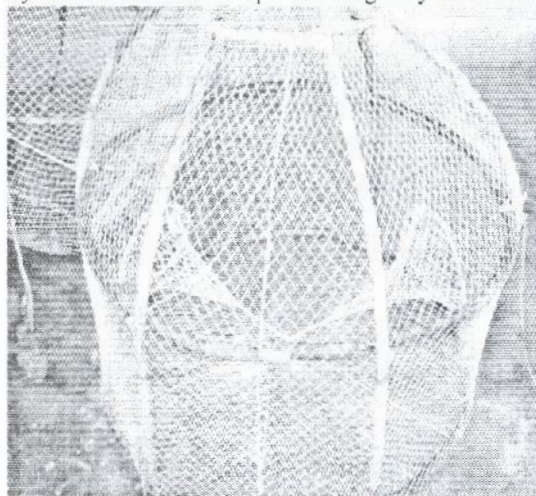


Plate 1: Small-Sized Mesh Malian Trap

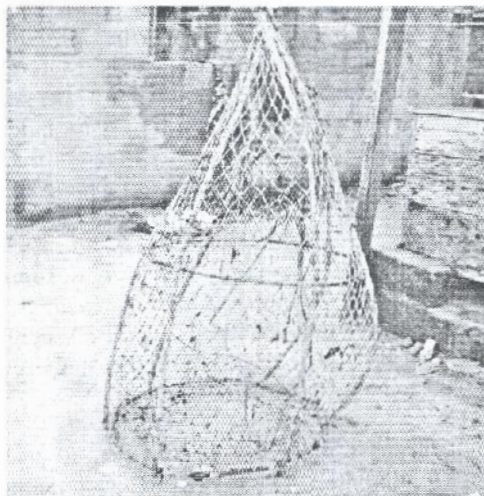


Plate 2: Large-Size Mesh Malian Trap

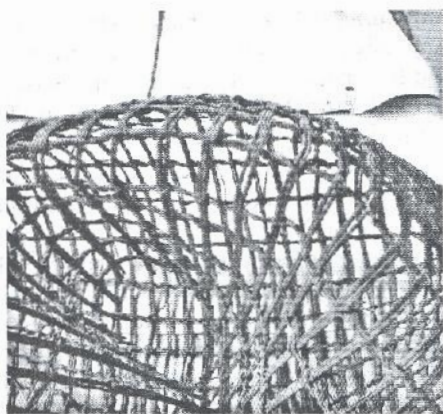


Plate 3: New Ikara Trap (Small Mesh Size)

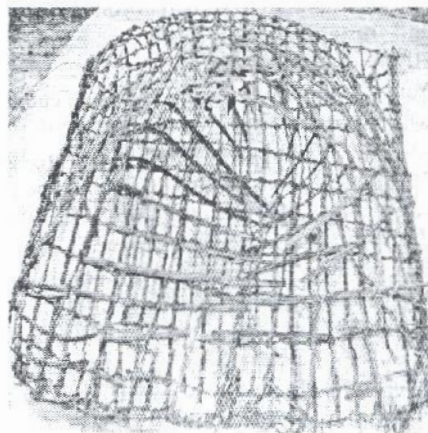


Plate 4: Old Ikara Trap (Large Mesh Size)

RESULTS

The results of the study showed that 31 different fish species belonging to 13 families were caught (Table 1). The Malian trap baited with Groundnut-cake (GNC) caught the highest number (31) of fish species with SDI of 1.00, while Ikara trap without bait (NBT) caught the least number of fish species with SDI of 0.32. The dominant species in the catches of the traps baited with GNC were *Synodontis sorex* (15.45%), *Synodontis clarias* (10.57%), *Clarias gariepinus* (8.54%) and *Heterobranchus bidorsalis* (6.50%) in the small mesh sized malian traps. In the large mesh sized Malian trap, *Synodontis sorex* (9.05%), *Synodontis clarias* (10.55%), *Clarias gariepinus* (6.03%) and *Distichodus brevipinis* (6.50%) were dominant. *Mormyrus delilicious* was only caught in the Malian trap. In both traps baited with fresh palm fruit, *Heterobranchus bidorsalis*, *Clarias gariepinus*, *Oreochromis niloticus* and *Tilapia zilli* dominated the catches. Traps not baited were dominated by the *Clariids*. A significant difference was also

observed between the weights of fish caught with different baits. The mean number of fish caught in all the traps was highest with groundnut-cake having 2.72 ± 0.10 , which was significantly different from trap without bait (1.98 ± 0.20) and Palm fruit (1.89 ± 0.16). However, there was no significant difference between trap with fresh palm fruit and trap without bait. The mean number of fish caught by the traditional traps is shown in Figure 1. The result shows that Malian trap with small mesh size baited with groundnut cake caught the highest number of fish (4.4 ± 0.16), while Ikara trap with large mesh size baited with fresh palm fruit caught the least (1.58 ± 0.39). However, there was no significant difference in the mean number of fish caught by the traps ($P > 0.05$).

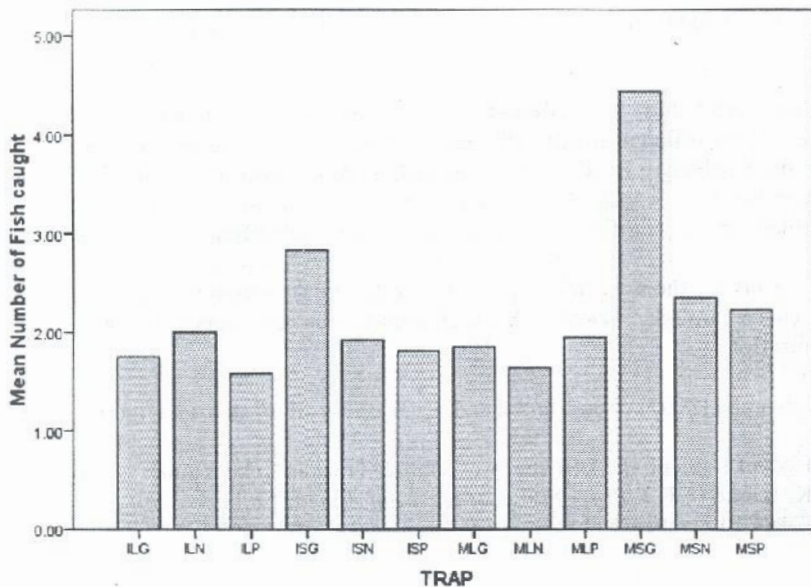


Figure 1: Mean Number of Fish caught by Traditional Traps

Key:

ILG: Ikara trap with large mesh baited with groundnut cake.

ILN: Ikara trap with large mesh with no bait.

ILP: Ikara trap with large mesh baited with palm fruit.

ISG: Ikara trap with small mesh baited with groundnut cake.

ISN: Ikara trap with small mesh with no bait.

ISP: Ikara trap with small mesh baited with palm fruit.

MLG: Malian trap with large mesh baited with groundnut cake.

MLN: Malian trap with large mesh with no bait.

MLP: Malian trap with large mesh baited with palm fruit.

MSG: Malian trap with small mesh baited with groundnut cake.

MSN: Malian trap with small mesh with no bait.

MSP: Malian trap with small mesh baited with palm fruit.

DISCUSSION

Traps baited with groundnut cake had the highest species number and species diversity indices indicating the attractiveness of groundnut cake to diverse fish species. Its attractiveness could be due to the fact that groundnut-cake has a good flavour and high protein content and these fish species have the ability to perceive odour more than their vision to detect colour. This is in line with the observation of Adiaha *et al.* (2007), who reported that stimuli perceived by the senses like smell, taste, sight and lateral line system control the momentary feeding act of fish. The trap baited with GNC was dominated by Mochokids and Clariids, an observation reported by Agbelege *et al.* (2005) indicating that these traps are selective for mainly the catfishes. The dominance of *Tilapia zilli*, *Oreochromis niloticus* and the Clariids in the catch of traps baited with fresh palm fruit is different from the *Distichodus rostratus* and *Alestes nurse* reported by Adjarho and Ajao (2007). The catches comprised the pelagic fishes such as *Tilapia*s and *Alestes* and bottom dwellers such as *Clarias gariepinus*, *Heterobranchus bidorsalis*, *Labeo Coubie*, the fishes also have different habits, ranging from planktivores or Plankton feeders (*Oreochromis niloticus*, *Synodontis*, *Alestes*), to herbivores (*Tilapia zilli*, *Distichodus*, *Synodontis*), to predators (*Lates niloticus*, *Mormyrids*,

Auchenoglanis occidentalis, *Eutropius niloticus*), to Omnivores (*Clarias gariepinus*, *Heterobranchus bidorsalis*, *Heterotis niloticus*) and detritivores: *Citharinus citharus*, *Citharinus latis*, *Labeo coubie* (Reed *et al.*, 1967; Fagada, 1971; Holden and Reed, 1972; Arawomo, 1976; Ajayi, 1987; Ayinla, 1988; Ugwumba, 1991; Fagenro, 1992; Ugwumba and Kusemiju, 1994).

The number of species obtained with the baits is similar to that recorded with similar fishing baits in Lake Kainji in Northern Nigeria (Ahmed, *et al.*, 2004). However, the number of families and species caught in this study is higher than those recorded by Ahmed *et al.* (2004). The possible reason why this study had higher number of families and species could be due to the fact that this study was carried out for 12 calendar months while the other was limited to few days or weeks. The many species caught may be attributed to the baits as well as the traps themselves since fish could also get into unbaited traps in the course of search for food.

The baited small mesh traps appeared not to be quite size selective for they were capable of trapping and retaining small size fishes, juveniles and adults.

CONCLUSION

The two fishing baits experimented in the present study had different effects on the composition and number of fish caught in the traps. The groundnut cake is more efficient than fresh palm fruit as baits for catching freshwater fish. The trap baited with groundnut cake is more selective for the cat-fishes such as *Mochokids* and *Clariids*. The trap baited with fresh palm fruit is selective for *Tilapia zilli*, *Oreochromis niloticus*, and the *Clariids*. The use of groundnut cake as bait is also recommended for trapping fish as a way of enhancing catch efficiency for fishers.

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Table 1: Catch Composition of the Traditional fishing traps with different baits

Family	Species	Ikara Trap						Malian Trap					
		GNC	%	FPE	%	NBT	%	GNC	%	FPE	%	NBT	%
Bagridae	<i>Auchenoglanis occidentalis</i>	6	2.44	3	3.13	6	8.82	7	3.52	5	7.35	3	6.82
	<i>Bagrus bayad macropterus</i>	6	2.44	3	3.13	5	7.35	3	1.51	3	4.41	4	9.09
Characidae	<i>Alestes baremoze</i>	3	1.22	3	3.13	1	1.47	3	1.51	3	4.41	2	4.55
	<i>Alestes brevis</i>	3	1.22	6	6.25	4	5.88	-	-	4	5.88	-	-
	<i>Alestes nurse</i>	6	2.44	3	3.13	-	-	9	4.52	3	4.41	-	-
Centropomidae	<i>Lates niloticus</i>	5	2.03	-	-	-	-	3	1.51	-	-	-	-
Cichlidae	<i>Hemichromis fasciatus</i>	6	2.24	6	6.25	-	-	9	4.52	3	4.41	-	-
	<i>Oreochromis niloticus</i>	3	1.22	12	12.50	-	-	6	3.02	-	-	-	-
	<i>Tilapia niloticus</i>	6	2.44	-	-	4	5.88	-	-	-	-	2	4.55
	<i>Tilapia zilli</i>	6	2.44	9	9.38	9	13.24	11	5.53	3	4.41	-	-
Citharinidae	<i>Citharinus citharus</i>	6	2.44	3	3.13	1	1.47	6	3.02	3	4.41	2	4.55
	<i>Citharinus latus</i>	3	1.22	3	3.13	1	1.47	-	-	6	8.82	5	11.36
Clariidae	<i>Clarias gariepinus</i>	21	8.54	9	9.38	14	20.59	12	6.03	5	7.35	7	15.91
	<i>Heterobranchus bidorsalis</i>	16	6.50	10	10.42	14	20.59	12	6.03	9	13.24	13	29.55
Cyprinidae	<i>Labeo coubie</i>	3	1.22	-	-	-	-	3	1.51	6	8.82	-	-
Distichodontidae	<i>Distichodus brevipinus</i>	9	3.67	3	3.13	3	4.41	12	6.03	-	-	3	6.82
	<i>Distichodus rostratus</i>	9	3.67	6	6.25	-	-	6	3.02	-	-	-	-
Malpteruridae	<i>Malapterurus electricus</i>	8	3.25	-	-	-	-	4	2.01	-	-	-	-
Mochokidae	<i>Marcusenius cyprinoides</i>	7	2.85	-	-	-	-	6	3.02	-	-	-	-
	<i>Synodontis clarias</i>	26	10.57	3	3.13	-	-	21	10.55	3	4.41	-	-
	<i>Synodontis eupterus</i>	4	1.63	2	-	-	-	6	3.02	-	-	-	-
	<i>Synodontis filamentosus</i>	18	7.35	6	6.25	-	-	15	7.54	3	4.41	3	6.82
	<i>Synodontis membranaceus</i>	6	2.44	-	-	-	-	3	1.51	-	-	-	-
Mormyridae	<i>Synodontis soxex</i>	38	15.45	-	-	-	-	18	9.05	3	4.41	-	-
	<i>Gnathonemus pictus</i>	3	1.22	-	-	-	-	3	1.51	-	-	-	-
	<i>Hyperopisus bebe</i>	5	2.03	4	4.17	3	4.41	3	1.51	-	-	-	-
	<i>Mormyrus deliciosus</i>	3	1.22	-	-	-	-	-	-	-	-	-	-
Osteoglossidae	<i>Mormyrus rume</i>	3	1.22	-	-	3	4.41	6	3.02	3	4.41	-	-
	<i>Heterotis niloticus</i>	7	2.85	-	-	-	-	6	3.02	-	-	-	-
Schilbeidae	<i>Europius niloticus</i>	3	1.22	2	2.08	-	-	5	2.51	3	4.41	-	-
	<i>Schilbe mystus</i>	3	1.22	-	-	-	-	1	0.50	-	-	-	-
Total No of Species		31	19	13	27	17	10						
Species Diversity Index		1.00	0.61	0.42	0.87	0.55	0.32						

Where, GNC = Groundnut cake

FPE = Fresh palm fruit

NBT = Without bait