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A Survey of Dried Fish Species sold in Ado Ekiti Markets, Ado-Ekiti, Ekiti State

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Abstract:

This study surveyed the types of dried fish species sold in five major markets in Ado-Ekiti. During the course of the survey, twenty-two species of fish were discovered which included: *Gymnachus niloticus, Clarias gariepinus, Coptodon zilli, Clarias anguillaris, Dasyatis americana, Cynoglossus browni, Phyraena piscatorum, Pseudotolithus elongates, Polypterus senegalus, Ethmalosa fimbriata* among others. These fishes belonged to different families and were found in different markets in Ado-Ekiti. These fish species were identified to the lowest taxonomic level using fish identification guide books. They were further classified using the International Union for Conservation of Nature (IUCN) Classification Scheme where it was found that only 4.5% was in the 'near threatened (NE)' status/class while there was none on the endangered list status.

Keywords: Dried fish, IUCN Status, Ado-Ekiti, fish diversity and availability

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Introduction

Fish is used extensively as food in Nigeria as in all other countries of the world. It is a primary source of protein and essential nutrients, and there is a growing recognition of its nutritional and healthpromoting qualities. Fish and fish-related products provide income and livelihoods for numerous communities across the world, contributing to food security and nutrition (HLPE, 2014). No other group of vertebrates is as diverse and serve man in so many forms as the fishes, either as food prepared in various ways, for recreation, serving as source of employment and income for many, for control of pests, in scientific work, in traditional medicine and ceremonies, as ornamentals, etc (Adesulu and Sydenham, 2007). Capture fisheries and aquaculture provide 3.0 billion people with almost 20 percent of their average per capita intake of animal protein, and a further 1.3 billion people with about 15 percent of their per capita intake. This share can exceed 60 percent in some coastal countries like Gambia, Bangladesh and small Island States like Maldives, where fisheries have historically been a central element in local economies (HLPE, 2014).

A fish market survey is the collection of information on catch being sold or traded through a fish market, stall or shop. The purpose of carrying out a market survey is to gather data on required information and it allows one to reach many participants, which ensures a more accurate sample from which to draw conclusions (SM 2011, Hamel 2019, Bhat, 2020).

Marketing is defined by Abbot and Makeham (1990) as a management process responsible for anticipating, identifying and then satisfying consumer wants and needs with a view of making profit. Agricultural marketing plays an important role in agribusiness because it acts as a link between production and consumption. It plays an important role not only in stimulating production and consumption, but in accelerating the pace of economic development (Showick, 2009) In

essence, this means that fish production would have been a stagnant process if there was no marketing. Marketing has a significant potential in fisheries economy therefore, fish production, when well managed and marketed, has a great possibility of increasing the gross domestic products of the nation.

Fish biodiversity is important for the availability and sustainability of aquatic resources. However, stresses due to overfishing, climate change, habitat loss, eutrophication and pollution pose threats to fish biodiversity. Fisheries sector is important for socio-economic development, nutrition supplementation, employment generation, poverty alleviation and foreign exchange earnings (Ali *et. al.*, 2017). Therefore, the present study was undertaken to identify/ assess the biodiversity and availability of fish species in Ado-Ekiti markets.

Many researchers have documented reports on fish diversity and availability in Nigeria (Welman, 1948, White, 1966, Reed *et. al.*, 1967, Fapohunda and

GodState, 2007, Adesulu and Sydenham, 2007, Obe and Jenyo-Oni, 2011, Olaosebikan, and Raji, 2013) but there is a dearth of information on the availability of these fishes in dried form, in Ado-Ekiti markets. Therefore, this study was conducted with the aim of supplying information on the diversity of dried fish species being sold in Ado-Ekiti markets.

Materials and Methods

The Study Area

The study was carried out in Ado – Ekiti, Ekiti State Nigeria. Ado-Ekiti is the capital city of Ekiti State, Nigeria. Ekiti State is located between longitudes 4 45' to 5 45' East of the Greenwich Meridian and latitudes 7 15' to 8 5' North of the Equator and situated at elevation 439 meters above sea level. Ado-Ekiti has a population of 479,674 (WPR, 2020) making it the biggest city in Ekiti State. It operates on the WAT time zone (Worldatlas, 2015).



Fig 1: Map of Ekiti State showing the study area (Ado - Ekiti).

Selection of Markets used for the Survey

The study was carried out for a period of 3 months from June to August, 2018 using participatory rural appraisals (PRA) (Adebayor, 2014) in five market purposively selected in Ado-Ekiti town. The markets selected for the survey include Oja-Oba, Awedele, Okesa, Bisi, and Mojere markets. These are the major markets in Ado-Ekiti where dried fish are sold in large quantity. Participatory rural appraisal (PRA) is a group of methods to gather information on a participatory basis from rural communities. PRA tool focus group discussion (FGD) was conducted among fish retailers to get an overview on fish that are brought to the market for sale in Ado-Ekiti. This involved visits to the locations during which selection of individuals on the basis of their recognized expertise was done, in collaboration with contact persons occupationally situated in these target markets. Women were specially included as they are the most active population involved in the fish sales and dispensing

Sites	Latitude	Longitude		
Oja-oba	7 ⁰ 37' 15.216" N	5.22244566 E		
Awedele	7.5039186 N	3.9008414 E		
Okesa	7.6271183333 N	5.218588333 E		
Bisi	7 ⁰ 37' 29.598" N	50 13'20.892"E		
Mojere	7 ⁰ 39' 18.5"N	5 ⁰ 13'46.746"E		

Table 1: GPS Location of some selected markets in Ado-Ekiti

Fish Enumeration and Identification

The local names of most of the fish found in the markets were supplied by the sellers. Fish identification were made to the lowest taxonomic level using identification guide book prepared by Adesulu and Sydenham (2007), Olaosebikan and Raji (2013) and the scientific and common names (English) were recorded.

Statistical Analysis

Data collected were analyzed using descriptive statistics such as frequency counts and percentages.

Results

Fish Identification and Taxonomy

Table 2 shows the fish species diversity of identified fish species in the five main markets in Ado-Ekiti. A total of twenty-two (22) dried fish species were identified with the highest (17) species diversity recorded at Okesa market, followed by Bisi and Oja Oba markets with 13 species each and the least diversity was recorded for Mojere with 9 species.

S/N	Fish specimen	Markets Surveyed				
	-	Bisi	Okesa	Mojere	Oja-Oba	Awedele
1	Eja-osan			Х	х	х
2	Aro					
3	Aso			х	х	х
4	Alabebe			Х		
5	Abo					
6	Kuta	х		Х		х
7	Pokun			х	х	
8	Epiya	Х	Х	х	х	
9	Adagba (Ilaje) / Elejo (Ekiti)	Х		х	х	
10	Agadagba	Х		х	х	х
11	Okodo	Х		х	х	х
12	Palamo		Х			х
13	Efolo					х
14	Epiya	х		Х		х
15	Ogidigbe		Х			
16	Obokun		Х			
17	Eja Oje	Х	х		х	
18	Shawa				х	
19	Opolo okun					
20	Dolajo			х		х
21	Podemi	х		х		х
22	Asan	х		х		х
	Total	13	17	9	13	11

Table 2: Fish species identified in va	arious Ado-Ekiti Markets
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= the fish species was identified in the market, x = the fish species was not identified in the market

Table 3 presents the Local, English, Scientific, Family names and IUCN status of identified fish in the Study Area. A total of nineteen (19) families were enumerated in the study area with Chiclidae, Clariidae and Polypteridae families having higher frequencies (2) each while other families have only one occurrence each

Some Fish Species Identified in Ado-Ekiti Markets



Fig. 2: Pokun (Pseudotolithus elongates)



Fig. 3: Nigeria tonguesole Cynoglossus browni



Fig. 4: African cat fish (Clarias gariepinus)

Table 4 shows the families of identified fish species in the Study Area. A total of nineteen (19) families were enumerated in the study area with Chiclidae, Clariidae and Polypteridae families having higher frequencies (2) each while other families have only one occurrence each.



Fig.5: Gray birchir (Polypterus senegalus)

SN	Local Name	English Name	Scientific Name	Family name	IUCN Status
1	Eja-osan	African Knife fish	Gymnachus niloticus	Gymnarchidae	LC
2	Aro	African cat fish	Clarias gariepinus	<u>Clariidae</u>	DD
3	Aso	African mud fish	Clarias anguillerus	<u>Clariidae</u>	LC
4	Alabebe	Sting ray	Dasyatis americana	Dasyatidae	DD
5	Abo	Nigeria tonguesole	Cynoglossus browni	Cynoglossidae	DD
6	Kuta	Barracuda	Phyraena piscatorum	Sphyraenidae	LC
7	Pokun	Croaker	Pseudotolithus elongates	Sciaenidae	LC
8	Epiya	Tilapia	Coptodon zilli	Cichlidae	LC
9	Adagba (Ilaje) / Elejo (Ekiti)	Gray birchir	Polypterus senegalus	Polypteridae	NE
10	Agadagba	Snake fish	Erpetoichthys calabaricus	Polypteridae	NT*
11	Okodo	Snake-head	Parachanna obscura	<u>Channidae</u>	LC
12	Palamo	Leaf fish	Polycentropsis abbreviata	Nandidae	LC
13	Efolo	Bonga shad	Ethmalosa fimbriata	Clupeidae	LC
14	Epiya	Tilapia fish	Sarotherodon galileaus	Cichlidae	NE
15	Ogidigbe	Hingemouth	Phractolaemus ansorgii	Phractolaemidae	LC
16	Obokun	Silver catfish	Chrysichthys nigrodigitatus	Claroteidae	LC
17	Eja Oje	Large head hair tail	Trichiurus lepturus	Trichiuridae	LC
18	Shawa	West Africa llisha	Ilisha africana	Pristigasteridae	LC
19	Opolo okun	Globe fish	Tetraodon lineatus	Tetraodontidae	DD
20	Dolajo	African knife fish	Xenomystue nigri	Notopteridae	LC
21	Podemi	West African	Protopterus annectens	Protopteridae	LC
22	Asan	West Africa pygmy-herring	S <u>i</u> luranodon auritus	Schilbeidae	LC
NE	= Not Evaluated, LC	= Least Concern, DD	= Data Deficient,	NT* = Near	Threatened

Table 3: Local, English, Scientific, Family names and IUCN status of identified fish

SN		Frequency	Percent
1	Channidae	1	4.5
2	Cichlidae	2	9.1
3	Clariidae	2	9.1
4	Claroteidae	1	4.5
5	Clupeidae	1	4.5
6	Cynoglossidae	1	4.5
7	Dasyatidae	1	4.5
8	Gymnarchidae	1	4.5
9	Nandidae	1	4.5
10	Notopteridae	1	4.5
11	Phractolaemidae	1	4.5
12	Polypteridae	2	9.1
13	Pristigasteridae	1	4.5
14	Protopteridae	1	4.5
15	Schilbeidae	1	4.5
16	Sciaenidae	1	4.5
17	Sphyraenidae	1	4.5
18	Tetraodontidae	1	4.5
19	Trichiuridae	1	4.5

Table 4: The families of identified dried fish species in the Study Area.

IUCN status of fish identified

Figure 6 shows the IUCN status of the dried fish identified in Ado-Ekiti metropolis. Among the fish identified in the markets, 68.2% (15) were of least concern (LC) status, 18.2% (4) were data deficient (DD) while 9.1% (2) were not evaluated (NE). 4.5% (1) was near threatened (NT) while there was none on the endangered list status.

Availability and Abundance of Dried Fish Species Identified in Ado-Ekiti Markets

Figure 7 shows the graphical representation of availability and abundance of dried fish species identified in the study area. Okesa Market shows the highest fish species available at the time of visit with 17 identified species, this is closesly followed by Bisi and Oja-Oba market while Mojere market recorded the least (9) identified fish species in the study area.



Figure 6: The IUCN status of the dried fish identified in the Study Area.



Figure 7: Availability and abundance of dried fish species identified in the Study Area

Discussion

The five-market surveyed are popular markets highly patronized by the inhabitants within Ado-Ekiti metropolis and it environments. Fish market is the place where people gather for buying and selling of fish. Fish availability in the market is a function of the demand and supply of fish to the markets for sale. A total number of twenty-two fish species were recorded during the study period in the five major markets surveyed. This number of fish species identified and documented is very low compared with major fish species being sold in Nigerian markets. FAO (1969) recorded 71 families comprising 157 species for Nigerian markets. However, this observation of scanty availability of dried fish species in the study area was contrary to the observation of Al-Hasan *et. al.*, (2011) that recorded 64 different fish species from three fish market of Barisal district in Southern Bangladesh.

This study revealed that dried fish species of the family Cichlidae, Clariidae and Polypteridae were the commonest species sold in all the markets visited. This observation was at variance with the report of Ejiamatu (1986) where he observed that families of Mochokidae, Characidae, Claroteidae and Mormyridae were the prominent fish families sold at Nawuni, Northern Region, Ghana.

Most of the identified fish species were on the list of least concern (LC) and data deficient (DD) with only one species in near threatened (NT) list. This observation may be as a result of few species of fish being sold within Ado-Ekiti metropolis. The implication of this is that most of the dried fish being consumed in Ado-Ekiti metropolis are of no ecological threat to fishery. This assertion is contrary to that of Black (2007) where he discovered that over a thousand fish species were being sold in the country's fish markets each year.

The result of this study of twenty-two species could be due to the fact that Ekiti State is a landlocked State. It is certain that many of the fishes available were brought in from neighboring States most especially Ondo State. This would increase the cost of the fishes and result in reduction of profit made by the marketers.

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Some of the problems encountered by the fish marketers as observed during this study were lack of credit facilities to purchase enough dried fish, poor storage facilities resulting in waste, high transportation cost and availability of stalls in strategic places within the market to display fish.

Conclusion

A total number of 22 fish species belonging to 19 families were available in the selected fish market in Ado-Ekiti metropolis. The highest number (17) of fish species was recorded at Okesa market and the lowest number of fish species (9) was recorded at Mojere market. Cichlidae, Clariidae and Polypteridae families had higher frequencies (2) each while other families have only one occurrence each with one species (*Erpetoichthys calabaricus*) in Polypteridae family classified by IUCN as Near Threatened (NT)

Recommendations

On the basis of the findings of the study, the following recommendations are made for the improvement of existing marketing of fishes:

- Encourage the fish marketers by giving them soft loan to increase their purchase of a diversity of fish species to be sold in the market
- Government should help in the provision of stalls where their products would be displayed for people for patronage
- The fish sellers should be encouraged to form cooperative groups so that it would be easy for the cooperative group to benefit from government's policies that will enhance their productivity.
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