PRELIMINARY STUDIES ON FOOD AND FEEDING HABITS OFPOLYPTERUS ENDLICHERI AND POLYPTERUS SENEGALUS IN LAKE CHAD

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ABSTRACT

The food and feeding habits of *Polypterus endlicheri* and *Polypterus senegalus* was carried out in the months of September to October.

The food of 33 *Polypterus endlicheri* as observed include *Tilapia* species (89.3%), *Eutropius niloticus* (28.6%), Mayfly nymph (39.3%), Dragon fly larva (56.6%) fish remains (21.4%) and detritus (7.1%). The food of 27 *Polypterus senegalus* as observed include *Tilapia sp* (88.4%), *Eutropius niloticus* (27.9%), may fly nymph (23.3%), Dragonfly nymph (34.9%) remains (21.1%) detritus (23.3%).

The percentage occurrence of food item found in the stomach of *Polypterus endlicheri* is 93.3% while that of *Polypterus senegalus* is 67.4%. The dominance of Tilapia sp was establish in the study, and there is no significant difference between the feeding habit of *Polypterus endlicheri* and *Polypterus senegalus.*

INTRODUCTION

Much of our current understanding of the autecology's production and ecological role of fish populations is derived from studies of the diet based on analysis of stomach contents. Feeding is one of the essential functions of any organisms, growth, development and reproduction all take place at the expense of energy, which is available in the organism derived from the food they eat.

It is an established fact that animals including fish perform differently on different types of food. Fish under the most favorable environmental conditions will function and grow well if they get right quality and quantity of food.

The type of food found in an area influences the distribution, abundance and rate of growth of the fish. Knowledge of the food of fish is very important not only for the understanding of the relationship between fish and its environment but also to provide answers to the practical problems, which arise in relation to human exploitation.

Considerable biological studies have been undertaken and documented on some wild but economically important tropical families in Lake Chad e.g.

No such detailed and studies have been carried out on Polypteridae.

The limited available biological information on Polypterus species in the wild by Holden (1963) was not enough. The aims and objectives of this project work are to determine the type of food taken by *Polypterus endlicheri* and *Polypterus senegalus* found in Lake Chad and also to study the degree of overlap in terms of food between the

two-sypatric species.

MATERIALS AND METHODS

A total number of sixty specimens of genera Polypterus were worked on from the catches of local fishermen with the use of Malian trap and longlines at the Dumba fishing village on the shore of the Lake Chad between the periods of September to October.

The fish were brought to the College Fish Processing Laboratory where the morphometric measurements were taken. They were then weighed individually with the aid of beam balance. The fish were dissected using dissecting sets, their gut length was measured and the stomach contents of the fish species were examined.

In analyzing the food, the abundance of various food items that were found in the stomach of these fish was studied. The condition factor was calculated according to Bagenal and Tesch, (1978).

$$K = \frac{100W}{L^3}$$

Where K = condition factor
W = weight in gramme
L = length in centimeter

DESCRIPTION OF THE STUDY AREA

Lake Chad present a large expanse of eutrophic water body with tremendous living aquatic resources that play significant roles in the socio-economic lives of the individuals and communities within and outside its immediate regions of location. The Lake lies within a semi arid environment between Lat. 12° 14° 20Ç N and long. 13° 15° 30ÇE where water constitutes the most limiting resource to development including food production. The Nigerian's share of the lake, situated in the extreme North-East zone of the country at a distance of about 230km from Maiduguri, the Borno State capital city, lies between Lat. 12018Ç - 13048Ç N and Long. 13°18Ç E 14°48Ç E, covering about 6660km^2 when the lake stabilizes at normal size of the lake has been greatly subject to the influence of rainfall and volume of water flowing the major rivers that feed the basin (but it is believed that the hydrological condition of the lake has improved within the past one decade).

Lake Chad is among the richest fishing grounds in the world and the Chad fisheries (comprising also the lower reaches of the Chari and the Logone with their flood plains as well as minor rivers flowing into the lake) constitute one of the most important inland fisheries in Africa.

There have been considerable studies on many aspects of the fisheries of Lake Chad as an entity or parts in the four countries (Chad, Nigeria, Cameroon and Niger) that share the Lake. Neiland (1990) presents a considerable review of the available research materials on the fisheries of the lake from pre 1960 to 1989. He revealed that out of the 194 research works within the period, 26% were on the biology of the specific fish species, 14% each were on general works and fish resources and production while 12, 9, 8 and 1% were on fisheries ecology, fishing practices and technology processing and post harvest and sociology/anthropology, respectively. Details of some of these works are also contained in the publication of Neiland (1991).

RESULTS AND DISCUSSION

A total of 60 fish comprising of 33 specimens of *Polypterus endlicheri* and 27 *Polypterus senegalus* were examined. Appendix 1 and 2 show the weight of fish in grams, the length in centimeter, and the condition factor (k).

The average weight of *Polypterus endlicheri* is 255.67g while that of *Polypterus senegalus* is 38.22g and the average condition factor of *Polypterus senegalus* is 0.96 while that of *Polypterus senegalus* is 0.79 and condition factor is higher in *Polypterus senegalus*, this might be as a result of the bigger size of *Polypterus endlicheri*. When the condition factor is 1 or nearer to 1, it means that the fish are in good condition.

Table 1 shows that list of food items found in the stomach of *Polypterus endlicheri*. Out of 33 specimens of *Polypterus endlicheri* only 3 have empty stomach.

The various food items found in the stomach of *Polypterus endlicheri*, in terms of number are Tilapia constituting the highest food item encountered in stomach 89.3% followed by dragonfly nymp 53.6%, mayfly nymph 39.3%, *Eutropius niloticus* 28.6%, fish remains 21.4% and detritus 7.1%.

However, a subjective observation in terms of weight shows that Tilapia constitute the highest followed by *Eutropius*, fish remain, dragonfly nymph, mayfly nymph and detritus.

Table 2 shows the various food items found in the stomach of *Polypterus senegalus* in terms of number; these are *Tilapia* 88.4%, dragonfly nymph 34.9%. *Eutrolpius* 27.9%, mayfly nymph 23.3%mayfly nymph 23.3%, Detritus 23.3% and fish remains 21.1%.

From the result above, it can be seen that Tilapia from the main food item of *Polypterus endlicheri* in Lake Chad, whereas the work of Shotter and Medaiyedu (1977) on the same fish in River Galma, Zaria reported that Barbus species forms the highest food items followed by *Schilbe mystus*, *Tilapia* species, *Hemichromis bimacutalus* and *Syndontis* species respectively.

These differences in food preferences may be due to habitat, that is Lake and River, availability of certain type of food in the habitat. However, the *Polypterus endlicheri* seem to share the preference for Synodontis with *Polypterus birchir lapradei* as reported by Holden (1963) in Sokoto River.

Comparing the food of *Polypterus endlicheri* and *Polypterus senegalus*, it can be seen that they have the same food preferences, which mean there should be competition between them since they are sympatric.

However, the account of the fishermen that catches the fish indicates that *Polypterus senegalus* are found close to the shore while *Polypterus endlicheri* are caught mainly offshore, thus utilizing the food in different zones of the lakes.

CONCLUSION

Preliminary studies on food and feeding habits of Polypterus species was examined. Thirty-three specimens of *Polypterus endlicheri* with average weight of 255.67g and 27 *Polypterus senegalus* with average weight of 38.22g were worked on.

These fish species were observed to be carnivorous predators feeding mainly on other fish species like Tilapia and Eutrolpius niloticus insect larvae and detritus respectively.
Polypterus endlicheri found in Lake Chad feed

chiefly on *Tilapia sp* while those found in the River feed mainly on *Barbus sp.*

Even though, *Polypterus endlicheri* and *Polypterus senegalus* found in Lake Chad feed on the same type of food, there is no competition between them because *Polypterus senegalus* are found close to the shore and *Polypterus endlicheri* are found offshore.

Table 1: The type and frequency of occurrence of the identifiable food items found on the stomach of *Polypterus endlicheri* from Lake Chad.

% = Percentage of total number of stomachs with identifiable food items

ITEMS	TOTAL NO. OF FOOD ITEM FOUND	% TOTAL NO. FOUND
FISH SPECIES TILAPIA	25	33.78
Eutropius niloticus	8	10.81
INSECTS dragonfly nymph	15	20.27
Mayfly nymph	11	14.86
OTHER ITEMS fish remains	6	8.10
Detritus	2	2.70

Table 2: The type and frequency of the identifiable food items found in the stomach of Polypterus senegalus from Lake Chad.

% = Percentage of total number of stomachs with identifiable food items.

ITEMS	TOTAL NO. OF FOOD ITEM FOUND	% TOTAL NO. FOUND
Tilapia	38	47.50
Eutropius niloticus	12	15
INSECTS dragonfly nymph	15	18.75
Mayfly nymph	10	12.5
OTHER ITEMS fish remains	10	12.5
Detritus	0	

Table 3: Mean, weight, mean length and mean condition factor of Polypterus endlicheri and Polypterus senegalus.

Polypterus endlicheri	
Mean weight	255.67g
Mean length	29.2cm
Mean condition factor (K)	0.96

Polypterus senegalus	38.22g
Mean weight	16.9cm
Mean length	0.79
Mean condition factor (K)	

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APPENDIX 1

MORPHOMETRIC MEASUERMENT AND CONDITION FACTOR OF POLYPTERUS ENDLICHERI

SPECIMEN NO.	STANDARD LENGTH (CM)	WEIGHT (GM)	GUT LENGTH	CONDITION FACTOR (K)
1.	29.6	247.6	23.3	0.9
2.	28.8	210.7	23.2	0.88
3.	30.0	290	24.2	1.01
4.	31.w	350	28.4	1.11
5.	30.0	240	24.1	0.88
6.	31.2	320	24.3	1.01
7.	26.5	250	21.5	1.31
8.	26.2	200	21.5	0.12
9.	29.8	240	23.4	0.9
10.	30.4	250	24.2	0.88
11.	33.5	390	30.0	1.03
12.	30.5	300	25.2	1.05
13.	31.5	390	286	1.2
14.	25.6	170	20.1	1.01
15.	29.2	270	23.1	1.08
16.	24.5	200	19.2	1.35
17.	28.0	280	21.3	1.27
18.	29.5	280	23.2	1.09
19.	30.5	340	24.4	1.19
20.	30.0	250	24.2	0.92
21.	28.3	220	21.4	0.97
22.	28.5	250	22.1	1.07
23.	31.5	260	24.8	0.83
24.	35.5	400	29.4	0.89
25.	28.1	190	23.0	0.85
26.	27.3	190	22.3	0.76
27.	27.0	150	22.0	0.76
28.	27.6	160	22.5	0.95
29.	27.6	201.8	22.5	0.76
30.	28.2	180	22.4	0.95
31.	28.0	210.6	21.4	0.8
32.	30.0	250	24.2	1.07
33.	30.5	300	25.2	1.05
AVERAGE	**255.67g**	**29.2cm**		**0.96**

APPENDIX 2

MORPHOMETRIC MEASUREMENT AND CONDITION FACTOR OF POLYPTERUS SENEGALUS

S/NO.	STANDARD LENGTH (cm)	WEIGHT (gm)	GUT LENGTH	CONDITION FACTOR (k)
1.	16.6	34.2	11.7	0.74
2.	20.9	73.7	19.5	0.80
3.	17.2	46.6	12.1	0.91
4.	15.2	36.5	10.0	1.03
5.	17.5	34.7	12.4	0.64
6.	14.8	23.0	9.2	0.70
7.	18.0	41.5	13.0	0.71
8.	18.1	44.4	13.1	0.74
9.	17.8	42.4	12.6	0.75
10.	17.0	44.1	12.0	0.89
11.	17.2	40.9	12.1	0.80
12.	17.4	35.0	12.3	0.66
13.	16.2	33.5	11.5	0.28
14.	15.4	27.3	10.1	0.76
15.	16.1	34.8	11.5	0.81
16.	16.5	26.9	10.2	0.73
17.	17.5	30.8	11.3	0.73
18.	14.7	38.9	11.6	0.86
19.	15.3	37.5	12.4	0.69
20.	17.4	22.1	9.1	0.69
21.	18.0	24.9	10.1	0.69
22.	19.1	46.3	12.1	0.87
23.	18.9	42.6	13.1	0.73
24.	17.4	49.5	14.2	0.71
25.	17.8	45.1	13.8	0.66
26.	17.4	37.2	12.2	0.70
27.	17.8	43.4	12.5	0.76
Average	**38.22g**	**16.5cm**		**0.79**

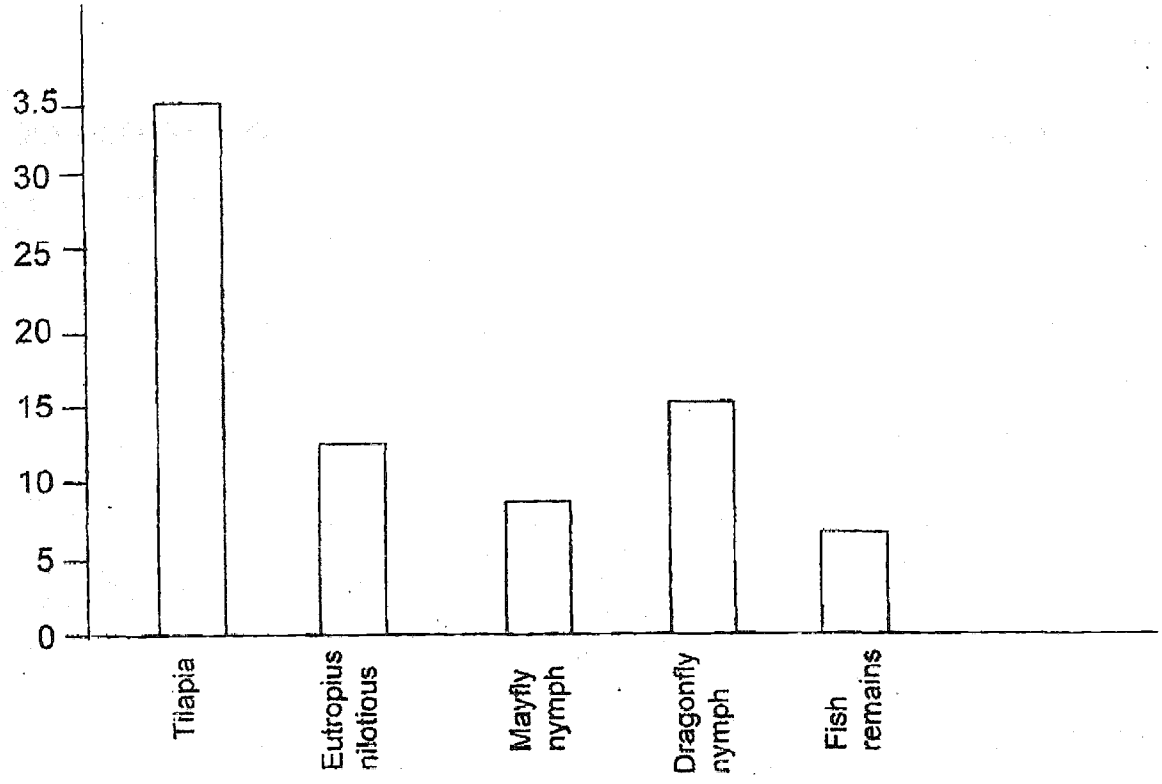

Fig. 1. Relative abundance of various food found in the stomach of polypterus endlicheri from Lake Chad

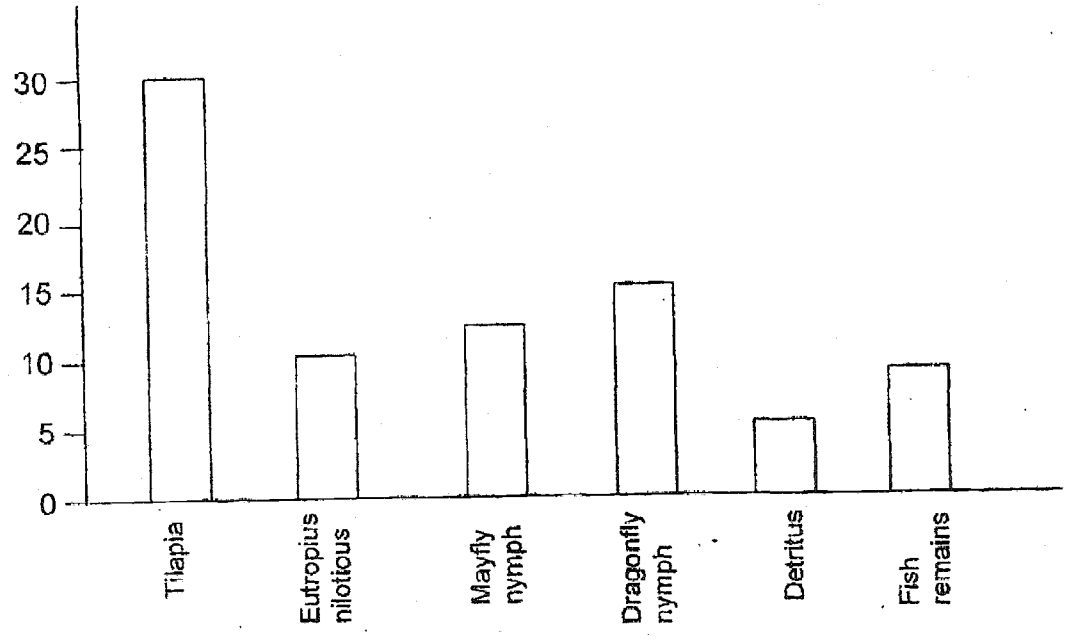

Fig. 1. Relative abundance of various food found in the stomach of polypterus senegalus from Lake Chad

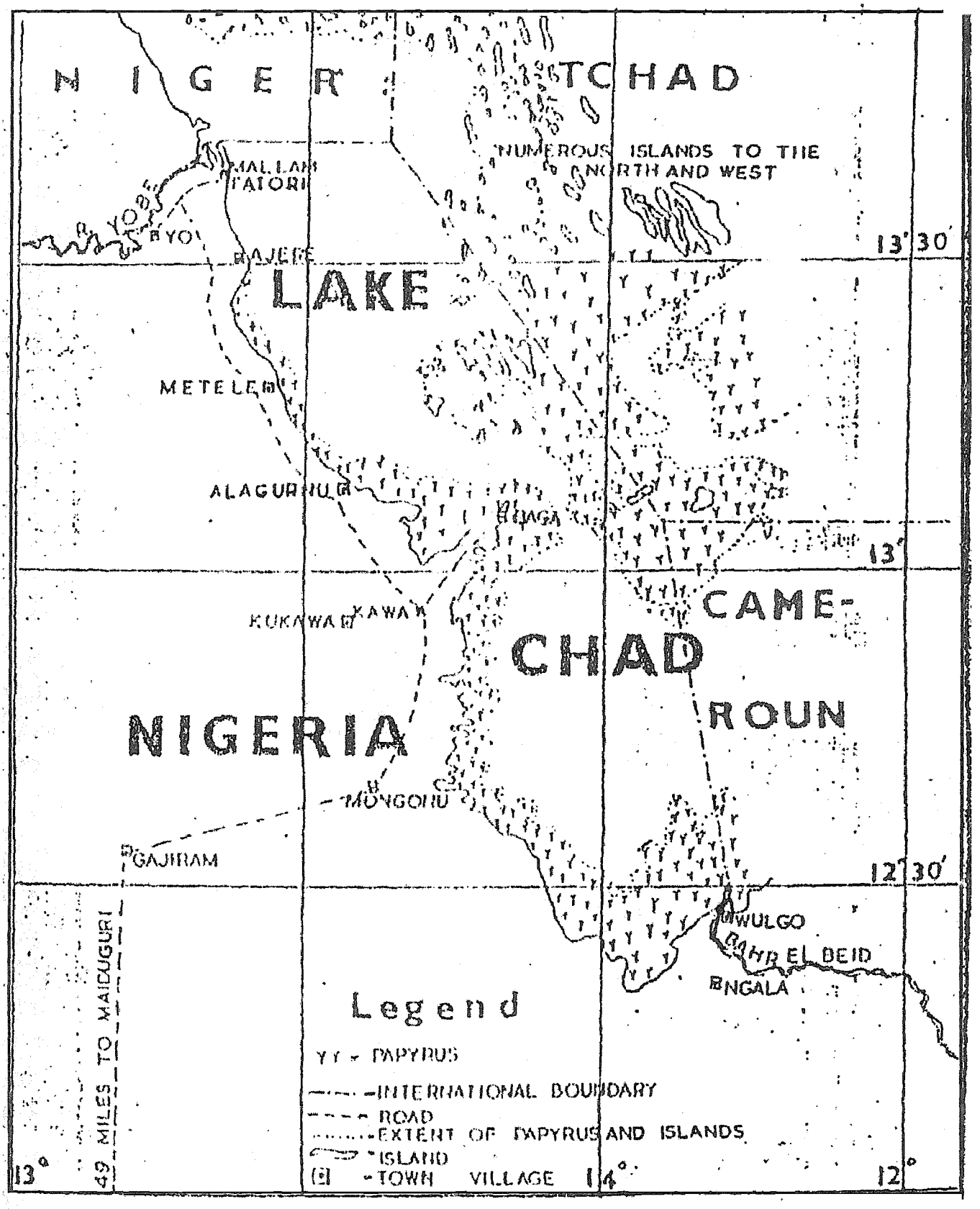

Fig. 205. The Nigerian part of Lake Chad