

ABUNDANCE OF *PSEUDOTOLITHUS ELONGATUS* IN THE NIGER DELTA AREA-A CASE STUDY IN THE CROSS RIVER ESTUARY

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ABSTRACT

A study on the abundance of *Pseudotolithus elongatus* was carried out in the Cross River estuary. A total of 3113 *Pseudotolithus elongatus* weighing 143.6kg were sampled. These values represented 56.17 percent of total catch of fish sample which weighed 255.66kg. The remaining 112.06kg or 43.83 percent were contributed by *Callinectes sp.*, *Chrysichthys nigrodigitatus*, *Polydactylus sp* and *Ethmalosa fimbriata*. Total length of *Pseudotolithus elongatus* sampled range between 4cm and 38cm. Sample were made up of mostly juveniles. The mean catch-per-unit effort of 40 individuals per boat and 1.8kg per boat were obtained for *Pseudotolithus elongatus* during the period under survey. The highest monthly catch -per-unit effort of 80.66 individuals per boat or 3.63kg per boat were obtained in the dry season. The yield for a given effort was generally low. *Pseudotolithus elongatus* is more abundant during the dry season months of the year than in the wet season.

KEYWORDS: Abundance, *P. elongatus*, Niger Delta, Sampled, Juveniles

INTRODUCTION

Sciaenids

Fish of the family Sciaenidae are bony fishes. They belong mostly to marine communities, but Longhurst (1966) suggested estuarine residents. Sciaenids include croakers, drums and meagers.

Pseudotolithus elongatus, a croaker, popularly known in local parlance as "Oniok" is caught in association with other fishes in the Cross River estuary. The major fishing gear are gill net, hooks of variable sizes, traps and scoop nets.

Fishers

Fishers along the Cross River estuary settle in small groups or in few large fishing ports. A typical fishing settlement accommodates families whose members are either permanent or seasonal settlers from nearby urban areas. There are also fish traders who buy and sell harvested fish on daily basis. The artisanal fisher which inhabits the bank and coastal areas of the estuary make one or two fishing trips daily.

The Cross River Estuary

Cross River estuary supports many fish species. These include in addition to *Pseudotolithus elongatus*, *Chrysichthys nigrodigitatus*, *Ethmalosa fimbriata* and *Cynoglossus senegalensis*. (Uwa Basse 1988).

Fishery development in Nigeria is still in its early stage and knowledge of the population dynamics of many species remains relatively inadequate. The need to assess different fish stocks in Nigeria is informed by apparent uncontrolled exploitation and the necessity to make fish protein available to the increasing Nigeria population. According to Nigeria Television Authority, News monitored on 5th May, 1998 and Ita (1998), there is fear of over exploitation at Kainji due to too many effort directed at the lake.

Objective of the Study

(a) The study was carried out to estimate seasonal abundance of *Pseudotolithus elongatus*.

(b) To estimate length (Size) and weight composition of *Pseudotolithus elongatus*

MATERIALS AND METHOD

To estimate catch abundance of *Pseudotolithus elongatus* in Cross River estuary, Ine Efik an important fishing village where the main catch is *Pseudotolithus elongatus* was chosen (see map or study area; fig 1) Sampling was done twice a week (Mondays and Fridays) for 13 months (April, 1997-April, 1998).

Gillnet Mesh Components

The gillnets used were usually of variable sizes and length. Length of nets ranged from 70-250 metres while depth ranged from two to four metres with mesh sizes of 2.5cm to 4.0cm (25mm-40mm). Suspension ropes for floaters placed at 90cm intervals varied from 3-9 metres.

Morphometrics

Total length (in centimeter) of fish in the catches were obtained using graduated board. Specimens were measured to centimeter below. Weight of samples were taken using spring balance.

Catch-Per-unit Effort

Effort can be expressed in terms of number of boats, number of set net, time out for fishing, number of men per boat and so on (FAO, 1980). In this study catch-per-unit is defined as catch (kg) per boat. Catch per-unit effort equals abundance (Cushing and Walsh, 1975). The number of individuals caught and catch per-unit effort of the individuals were obtained for analysis (see table 1)

RESULT

Total Catch

Total Catch (*Pseudotolithus elongatus*) and other fish sampled at Ine Efik between April, 1997 and April, 1998 weighed 255.66kg. A total of 3113 specimens of *Pseudotolithus elongatus* were measured weighing 153.9kg, representing 56.17 percent of total catch. The remaining 43.83kg percent were contributed by-catch. Table 1 shows monthly distribution of catch (*Pseudotolithus elongatus*) for the period under survey.

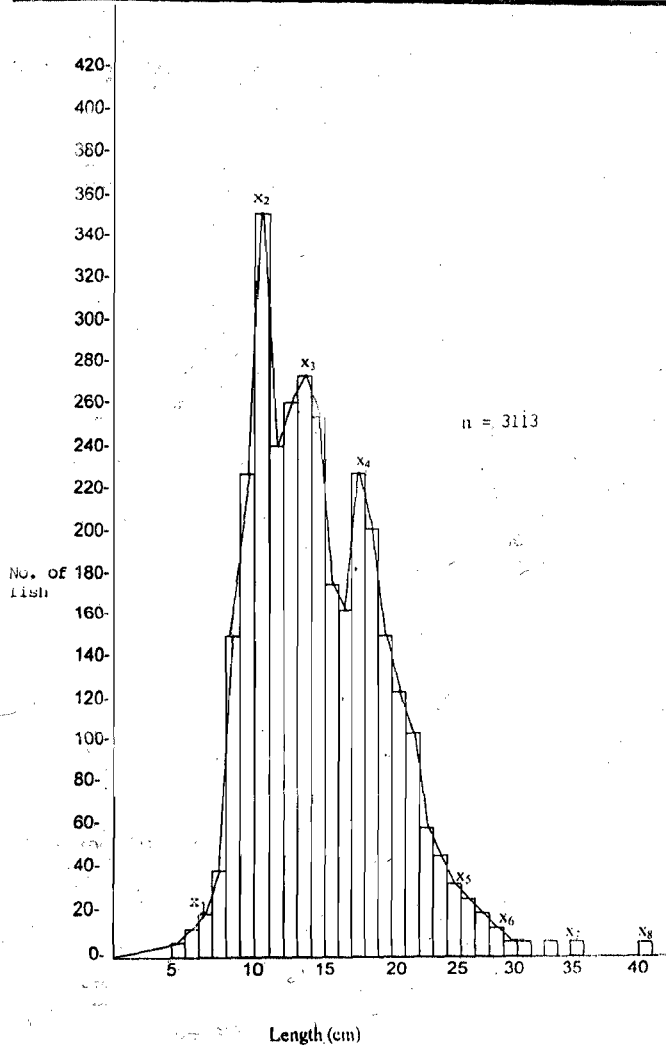


FIGURE 1 ANNUAL LENGTH FREQUENCY FOR *Pseudotolithus elongatus*

Length Variation

Fish measuring 10cm in length were the most abundant, with a total of 434 individuals. This represents 11.0 percent of the total catch. The 13cm length consisted of 272 individual (about 8.7% of the total catch), 12cm, length consisted of 216 individual (8.4% of total catch) and 14cm length consisted of 256 individuals (about 8.2% of the total catch). A total of 426 individuals representing 13.7 percent of the total catch were below 10 cm length while 2446 individuals of the total catch representing 75.4 percent were above 10cm length. Mean monthly length frequency for *pseudotolithus*

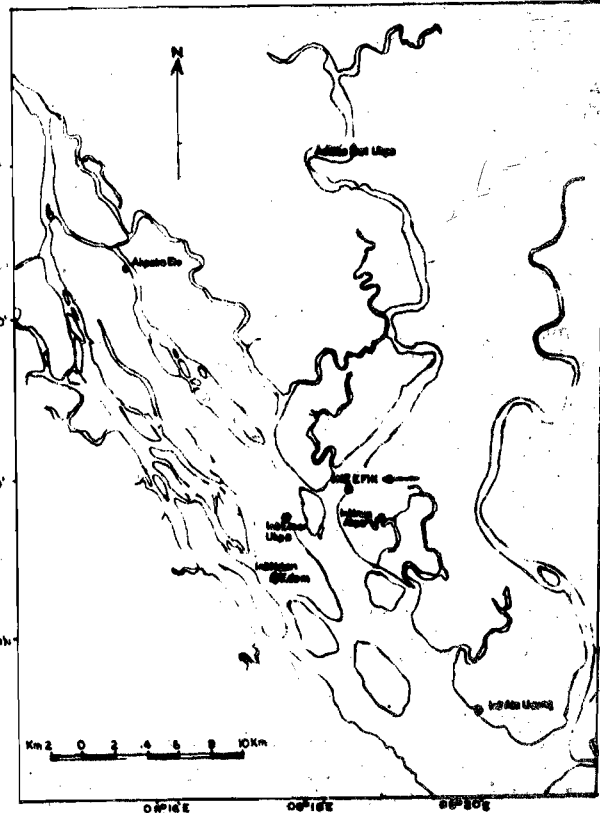


FIG. 2: MAP OF STUDY AREA
KEY: ARROW SHOWS STUDY AREA

elongatus range between 9cm and 19cm, as shown in the catch curve (Fig 2).

Analysis of catch and Effort Data

The total number of *Pseudotolithus elongatus* caught and measured was 3, 113 individuals which weighed 143.60kg. total effort was 72 boats Mean Catch per Unit effort (cpue) defined here as catch- per boat for the period surveyed was 40 individuals per boat and 1.8kg per boat. The highest catch - per-unit effort (cpue) of 80.66 individuals Per - boat and 3.63kg per boat occurred in January 1998 (Table 1)

Table 1: Monthly catch (individual and weight and respective catch per trip for *pseudotolithus elongatus*)

Month	Monthly catch	Weight (Kg)	Effort (Boat)	Catch-Per-Boat	CPUE (WEIGHT)
April 97	325	11.2	5	65.00	2.24
May	20	2.3	2	10.00	1.15
June	97	5.8	4	24.25	1.45
July	57	5.2	6	9.50	0.86
August	36	2.0	4	9.00	0.56
September	124	4.6	5	24.80	0.92
October	277	8.4	6	46.16	1.40
November	309	10.2	7	44.14	1.46
December	480	23.0	8	60.00	2.88
January '98	484	21.8	6	80.66	3.63
February	424	19.7	8	53.00	2.46
March	302	15.9	7	43.14	2.27
April	178	13.5	4	44.50	2.38
Total	3, 113	143.6	72	X=39.55=40	X=1.8

DISCUSSION

Several efforts have been geared to really ascertain fish production in Cross River estuary. Uwe-Bassey (1988) determined catch structure of the artisanal gill net fishery of lower Cross River. About 81 percent of the values for monthly catch-per-unit effort (cpue) averages was contributed by *Pseudotolithus elongatus*, *Chrysichthys nigrodigitatus*, *Ethmalosa fimbriata* and *cynoglossus senegaleusis*. All of the above, except *cynoglossus senegalensis* were recorded in this work.

It is known that only 1% of *Pseudotolithus elongatus* in the Sierra Leone is mature, with a length of 19.0cm, 10 percent at 2.0m and 50 percent at 32.6cm. (Longhurst, 1996). Since this condition is applicable, in the Niger Delta, which include the Cross River estuary, most of *Pseudotolithus elongatus* caught are premature. This is informed by occurrence of fish with length 10cm being the most abundant. It can be suggested that only 18.02 percent of *Pseudotolithus elongatus* were mature while 81.98 percent of total individuals caught were 1m mature. Harvesting of fish before maturity means reduction of fish increase by reproduction. The length distributions of *Pseudotolithus elongatus* showed 2 to 3 peaks. Each peak suggest a spawning group. Ajayi (1981) reported Lmax for *Pseudotolithus elongatus* to be 56.5cm. Uwe-Bassey (1988) reported 56.5cm and 64cm respectively. The maximum length of *Pseudotolithus elongatus* observed during the present study was 38cm. specimens from the sea must have been included in samples, which had Lmax of 56.5cm.

SUMMARY AND CONCLUSION

Cross River estuary supports manu fish fauna. These include *Cynoglossus senegalensis*, *Chrysichthys nigrodigitatus*, *Pseudotolithus elongatus* and *Ethmalosa fimbriata* etc. (Uwe-Bassey 1988) Extensive studies on these fish species are needed.

In this work the abundance of *Pseudotolithus elongatus* in Cross River estuary is surveyed. Ine Efik. One of the fishing ports located along the bank of the estuary, was chosen for sample collection because of its representativeness in terms of size and location.

Some of the fish species such as *Pseudotolithus elongatus* and *Cynoglossus senegalensis* are marine and estuarine communities of *Pseudotolithus elongatus* contribute to the abundance of the fish in Cross River State estuary

Stock analysis involves estimation such indices as abundance or productivity, mortality, effort and catch-per-unit effort (Cushing and Walsh, 1976). Estimates of abundance or productivity of fish stock were derived form analysis of data from commercial fishery. An essential step in this study is the determination of the amount of fishing or fishing effort. If this is properly measured, the fishing mortality, fraction of the stock that is caught per unit time, will be proportional to the abundance (Southwood, 1978).

Pseudotolithus elongatus numbering 3113 and weighing 153.6kg were sampled. Total catch weighted 255.66kg. (*Pseudotolithus elongatus* weighed 153.60kg while by catch weighed 112.06) representing 56.17 percent and 43.83 percent respectively by proportion. By-catch was match up of *Callinectes sp.*, *Chrysichthys nigrodigitatus*, *Polydactylus sp.* And *Ethmalosa fimbriata*.

Mean catch-per-unit effort of 3.55kg per boat or 40 individuals per boat obtained for *Pseudotolithus elongatus* is low. This may be due to uncontrolled exploitation and too many efforts in the estuary. Dry season months (October-April) recorded higher catch-per-unit effort than wet season months (May -September). The highest catch-per-unit effort of 3.63kg per boat was obtained in January. Thus *Pseudotolithus*

elongatus is more abundant during the dry season months of the year.

Catch were mostly made of small and immature fish. There is need to control exploitation in the estuary to ensure greater catch-per-unit effort.

REFERENCES

- Ajayi, F. O., 1981. Age, Von Bertalanffy. Parameters and Mortality rate of *Pseudotolithus* (*Fenticulus*) (Bodwich, 1825) Sciaendae: Pieces off Lagos, Nigeria. *Bull. De l'I. F. A. N.T 43 Ser A (1-2)*
- Cushing D. H and Walsh, J. J. (ed), 1975. *The Ecology of the Seas*. Black Wall Scientific Publication. London. Pp 292-298.
- FAO., 1980. The Collection of Catch and Effort Statistics. *FAO Fish Cir* (738). Pp. 62-63.
- Ita E. O., 1988. The Current Status of Catch of Fish Stock and Fisheries in Kainji Lake 1992 *Nigerian-German (GTZ) Kainji Lake Fisheries Promotion Project*. Pp. 3-32
- Longhurst, A. R., 1965. A Survey of the Fish Resources of the Eastern Gulf of Gunea. *J. CONS Perm. Int explor. Mar*, 2: 302 -334.
- Longhurst, A. R., 1966. Synopsis of Biological Data on West Africa Croakers (*P. typus*, *P. Senegalensis* and *P. elongatus*), *F. A. O. Fish Synopsis 35*, p. 45. Nigerian Television Authority (NTA) Network News (5th May, 1998).
- Southwood, T. R. E., 1978. 2nd Ed. *Ecological Methods*. Chapman and Hall, New York. Pp. 236.
- Uwe-Bassey, B. U., 1988. The Catch Structure of the Artisanal Gillnet Fishery of Lower Cross River. *MSC Thesis. University of Calabar*. PP. 2-5