

# Length Frequency Distribution of (*Chrysichthys nigrodigitatus*) (Lecepede, 1803) (Chrysichthys, Bagridae) from Itu Head Brigde, in Akwa Ibom State, Nigeria

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**Abstract:** The length frequency distribution of (*Chrysichthys nigrodigitatus*) was investigated using 496 specimens between June, 2012 to January, 2013 and these specimens were obtained from the artisanal catches landed at Itu Head Brigde, Cross River System. The highest frequency distribution occurrence 38 (Number) throughout the study period was recorded in the month of September, 2012. The length-frequency distribution throughout the study period shows a prominent peak with a preponderance total length range of 40-49cm over others except for January, 2013 which the prominent peak with a prepondence total length range of 50-59cm over others. During the study period, it was observed that the length distribution of (*Chrysichthys nigrodigitatus*) could have management implication for resource sustainability. However, further research is needed in this area using selective gears to determine and establish the true picture of the length frequency distribution of (*Chrysichthys nigrodigitatus*) in Itu Head Bridge, Cross River system.

**Keywords:** Growth, Maturity, Spawning, Feeding ground, Cross River System

## 1. Introduction

(*Chrysichthys nigrodigitatus*) (Lacepede 1802) is a common silver coloured African catfish occurring in Nigeria and several West African countries. It is a highly valuable fish species amongst the indigenous African populations. Considerations for the culture of the fish have resulted in several biological studies on the growth and fecundity of the fish species [1]. The emanating need to culture fishes for protein consumption for the teeming rapidly growing populations in the developing countries have made it necessary to intensify studies on the length frequency fauna of the African freshwater fishes [1]. (*Chrysichthys nigrodigitatus*) is important both in ecological and economical terms, playing salient role in determining the dynamics and structure of aquatic ecosystem and is valued as food for man; serving as delicacy for many low income earners as it is cherished for its taste and affordable price [2]. Some documented studies on various aspects of (*Chrysichthys nigrodigitatus*) in Nigeria and worldwide are works done by [3], [4], [5], [6], [7], [8], [9], [10], [11] for *Mugil cephalus* in bonny estuary, Nigeria. [12] for mullet in New Calabar River, for Nigerian coastal waters and [13] reported on *Chrysichthys* species from the Southern-most part of the river Nile, Egypt. Length frequency distribution measurements are fundamental to many aspects of fisheries science. The required precision of length sample depends on the purpose of the sampling. But regardless of the type of assessment that is used, the shape of the length frequency is of interest, rather than simple summary of statistics such as mean or variance [14]. Length frequency distribution of any fish is important to know the status of the size structure of that fish population in nature. It is the first step to evaluate gear selectivity of catches made by different kinds of gear fished in the same water [15]. One of the most commonly

used methods in the analysis of Fisheries data is length-weight relationship [16]. Length frequency distribution data for fresh water and brackish water fish resources of Nigeria are limited and the present contribution is aimed at compensating for this. Also, the fact that these fish species (*Chrysichthys nigrodigitatus*) is in high demand in the country, the use of length frequency distribution for assessment of their maturity, growth and production is important. The fishery resource in the Itu Head Bridge, Cross River System is exploited in a subsistent artisanal manner, being characterized by the use of different types of traditional fishing gear such as pipe and drum traps (elongated cylindrical metal that is completely sealed at one end with a valve like cap at the other end), gill and cast nets, while the craft in use is an unmotorized dugout canoe and paddle [17]. Itu Head Bridge, Cross River System artisanal fisheries dependent on the fish resource of (*Chrysichthys nigrodigitatus*) which is their major resource. The livelihood of artisanal fisherman therefore depends on the continual availability of the river resources [17]. The purpose of this research work was to investigate the length frequency distribution of (*Chrysichthys nigrodigitatus*) in the Itu Head Bridge, Cross River System with the view of obtaining information required for scientific management of this resource.

## 2. Materials and Methods

This study was carried out at in Itu Head Bridge between Cross River State and Akwa Ibom State between latitude 5°14'30"N and longitude 8°06'0"E. It is very close to Ayadehe located in Itu Local Government. It is a distance of about 57km from Calabar, Cross River State. The vegetation is rain forest which comprises of amphibious mangrove system such as a (*Rhizophora racemose*). The mangrove

system serves as a spawning and feeding ground for Shrimps and (*Chrysichthys nigrodigitatus*). Climate of the study area is defined by dry season and wet season, the wet season (April-October) is characterized by high precipitation. While dry season (November-March) is marked low precipitation. Fishing, aggregate mining, petty trading and farming have remained the traditional occupation of the people.

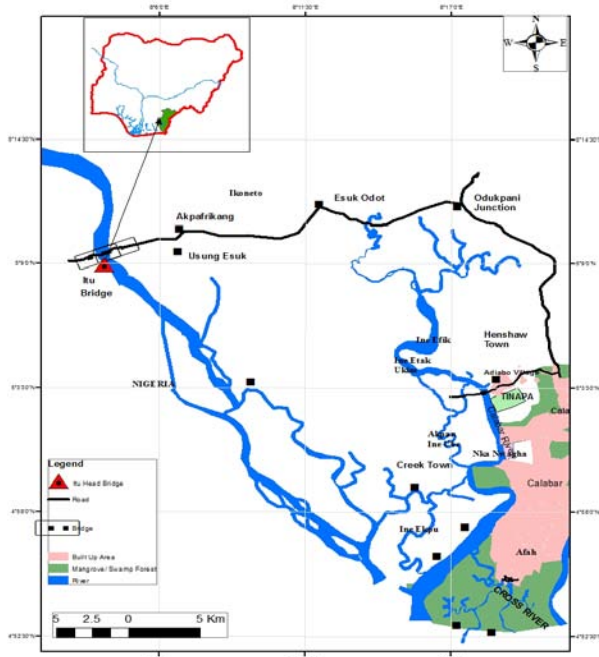


Figure 1: Map of Study Area

Fish samples for this study were collected from month of June, 2012 to the month of January, 2013, from the fish depot at Ayadehe community located in Itu Head Bridge Akwa Ibom State. These samples were always brought from the artisanal fishermen early in the morning between 7am and 8am. As the landed from their fishing ground samples collected includes lives as well as dead but fresh individuals. Identification of fish species (*Chrysichthys nigrodigitatus*) was done insitu using identification guide of Fresh water fishes of Nigeria [18]. Measurement of length was taken to the nearest 0.1cm using a fish measuring board. The total length of the fish (TL) is measured as the distance from the tip of the snout of the fish, with the mouth closed, to the tip of the longest caudal fin ray while the standard length (SL) is taken as the distance from the tip of the snout of the fish, with the mouth closed, to the end of the caudal peduncle [9]. The data from samplings were grouped into length classes of 10cm interval for subsequent analysis. A graph of Bar Chart were plotted using Microsoft excel to show the variation of length frequency distribution of (*Chrysichthys nigrodigitatus*) in each of the months throughout the study period.

3. Results

The length frequency distribution of (*Chrysichthys nigrodigitatus*) throughout the Study period is shown in Figure, 2. The total length throughout the Study period range from 9.0-109.0cm. Grouped data show variation of length in the month of June, 2012 between 9.0-109.0cm with the highest frequency occurrence of 22 (40-49cm) and lower frequency occurrence of 0 (0-9cm) (Figure 2). Grouped data show variation of length in the month of August, 2012 between 9.0-109.0cm, with the highest frequency occurrence

of 22 (60-69cm) and lower frequency occurrence of 0 (0-9; 10-19; 20-29cm) respectively (Figure, 2). Grouped data show variation of length in the month of September, 2012 between 9.0-109.0cm, with the highest frequency occurrence of 38 (40-49cm) and lower frequency occurrence of 0 (0-9; 10-19cm; 20-29; 100-109cm) respectively (Figure, 2). Grouped data show variation of length in the month of October, 2012 between 9.0-109.0cm, with the highest frequency occurrence of 15 (30-39; 40-49cm) respectively and lower frequency occurrence of 0 (0-9; 10-19cm; 20-29; 100-109cm) respectively (Figure, 2). Grouped data show variation of length in the month of November, 2012 between 9.0-109.0cm, with the highest frequency occurrence of 15 (40-49cm) and lower frequency occurrence of 0 (0-9; 10-19cm; 100-109cm) respectively (Figure, 2). Grouped data show variation of length in the month of December, 2012 between 9.0-109.0cm, with the highest frequency occurrence of 15 (40-49cm) and lower frequency occurrence of 0 (0-9; 10-19cm; 100-109cm) respectively (Figure, 2). Grouped data show variation of length in the month of January, 2013 between 9.0-109.0cm, with the highest frequency occurrence of 5 (50-59cm) and lower frequency occurrence of 0 (0-9; 10-19cm; 100-109cm) respectively (Figure, 2). The highest frequency distribution occurrence 38 (Number) throughout the study period was recorded in the month of September, 2012. The length-frequency distribution throughout the study period shows a prominent peak with a preponderance total length range of 40-49cm over others (Figure, 2), except for January which the prominent peak with a preponderance total length range of 50-59cm over others (Figure 2).

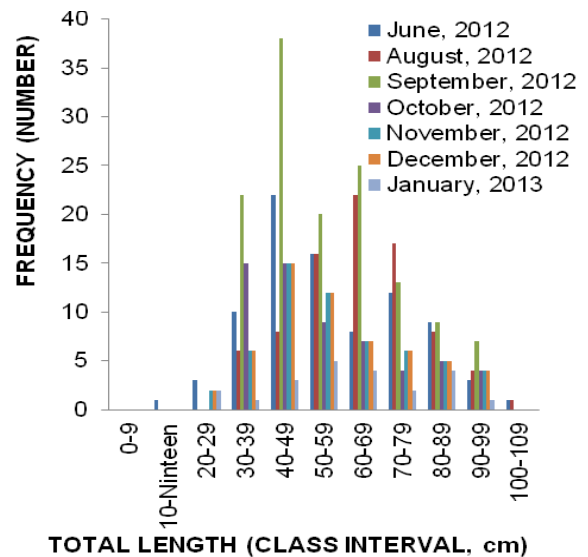


Figure 2: Length frequency distribution of (*Chrysichthys nigrodigitatus*) of Itu Head Bridge, Cross River System during the study period.

4. Discussion

The length frequency distribution is useful in the determination of age and growth. The length composition of a population often exhibits modes among fishes with short spawning season and a rapid and uniform growth, from which the modal length of the first few age groups can be easily determined [15]. (*Chrysichthys nigrodigitatus*) though has short spawning season [19]. The result obtained for length-frequency distribution did not give any tangible

information since the modes were not pronounced among the young ones. This is expected since out of 496 specimens used in this study, only 187 specimens were below 20cm total length and this may be explained as being due to the fishing gears used in collecting the specimens which may be said to be biased particularly for fish above 20cm total length. These showed that even though there were corresponding increase in length, at certain stages of the fish growth, increase in length were no longer directly proportional to the length frequency distribution as served in some fish species, this finding was also observed by [20].

## 5. Conclusion

It could be concluded that during the study period, it was observed that the length distribution of (*Chrysichthys nigrodigitatus*) could have management implication for resource sustainability. However, further research is needed in this area using selective gears to determine and establish the true picture of the length frequency distribution of (*Chrysichthys nigrodigitatus*) in Itu Head Bridge, Cross River system.

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