

# Some Aspects of Ecology of *Chrysichthys nigrodigitatus* (Lacepede) in River Niger, Nigeria

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**Abstract:** A study on the food and feeding habit of *Chrysichthys nigrodigitatus* (Lacepede) was conducted in River Niger within the region of Oshimili local government area of Delta State Nigeria. A total of 90 specimens were collected with the help of fishermen using gill net, cast net and traps. The fish samples were immediately taken to the laboratory for analysis. Morphometric characteristics such as weight, length, condition factor, egg weight, Gonado Somatic Index (GSI) and sex ratio were determined. The stomach content was analyzed using numerical method to determine the food content. The total length of the fish sampled ranged from 14.40-44.60 cm, while the standard length varied from 11.00 cm to 47.00 cm and the fish body weight ranged between 19.00 g to 503.20 g. Sex ratio 1 female to 1 male was observed. The mean condition factor for both male and female obtained was 1.67. Of all the 90 fishes sampled, none had empty gut representing 100%. The major food items were phytoplankton, plant part and *Detritus*. Out of 41 females sampled, only 17 had eggs and the eggs were matured at stage IV.

**Key words:** morphometric, numerical method, phytoplankton, sampling and condition factor

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## Introduction

Nature offers a great diversity of organism that is used as food by individuals these differ in size and taxonomy group. Food is simply referred to as any rested material that can be digested, assimilated and utilized for energy production. The study of food and feeding habit has being used by researchers to know the food requirements of potential aquaculture candidate and the productivity of the water body because fishes only eat best next important food in the absent of their preferred diets (Omondi, 2013; Lawson and Aguda, 2010; Abd El-Rahman, 2005). Food is composed of different chemical substance macro-nutrients and micro-nutrients present in relatively

large amount, such as proteins, waste roughages (dietary fiber) and vitamins. It is a major source of energy for reproduction, growth and excretion of waste. Reproduction in fishes is one of the basic biological features enabling survival and continuation of species. It may also have divisive effects on their population sizes because of the diversity of the aquatic environment (Holden and Raitt, 1974). Knowledge of fecundity is important in stock size estimation and stock discrimination (Soyinka and Ayo-Olalusi, 2009). *Chrysichthys nigrodigitatus* is a highly valued fish in Nigeria and other west African countries, such as Senegal, Gambia, Ivory Coast, Liberia, Zaria and Gabon. They are highly valued food fishes in these native African waters and are among the dominants fishes of commercial catches. Studies carried out by

researchers like Ikomi and Odum (1998) and Manon and Hossain (2011) on the food and feeding habits of *Chrysichthys auratus* and *Cyprinus carpio* gives an insight on the type of food consumed in captivities. It is also important to know the biology of *Chrysichthys nigrodigitatus* for best management and sustainable utilization of stocks. For this reason, biological assessment had been carried out by authors including Olele *et al.* (2013) and Ezenwa (1982) to determine the quality of population of the species in different water bodies in Nigeria. The study fish (*Chrysichthys nigrodigitatus*) population has been on the decline in Nigeria, because of the over exploitative nature of indigenous fishers that destroy the habitats of the species. Efforts also have been geared towards the conservation of these species through fishery regulation. The study of the food and feeding behavior is useful in determining the population level, in as much as the numbers of individual fish on the population depends on the amount of food available. It also determines the growth rate of fish species as well as revealing the states of foraging fish species and provides an insight into possibility use in aquaculture management.

## Materials and Methods

### Description of study area

Lower River Niger is stretch of the Niger River lying between Okwe and foot of the Niger Bridge at Oko Campus, Asaba. The area is located in south-south zone of Nigeria with forest vegetation. It is found in Oshimili South Local Government Area of Delta State with longitude and latitude 5°46' and 6°35' North East.

### Collection of samples

Collection of samples was from July to December, 2014 from Oko Campus in Lower Niger River. Fifteen fish samples were collected each for the period of 6 months of sampling giving a total of 90 fish. Fish of different sizes were collected with the help of fishermen using gill net cast net and traps. Fishes

collected were washed and transported in ice container to the wet Laboratory of Fisheries Department Delta State University, Abraka, Asaba Campus, Nigeria. Samples were examined in fresh condition. A total number of 90 specimens of *Chrysichthys nigrodigitatus* were used.

### Stomach content analysis

The collected samples stored in the refrigerator were allowed to thaw and excess water were mopped, the sexes were determined and fish specimens were measured to the nearest 0.1 cm using a metre rule and weighed to the nearest 0.5 g using a triple beam balance, respectively. Each specimen was dissected and the stomach cut open in order to identify the stomach content. The stomach content was transferred into 4% formalin in a universal bottle. Numerical method was used to analyze the stomach content of the specimens. The content was measured in electric beam balance transferring.

### Condition factor

The condition factor was determined using the following relationship (Abowei, 2010):

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

Where,  $K$  was condition factor,  $W$  was weight (g), and  $L$  was length (cm).

### Length weight relationship

The total length (cm) and standard length of each specimen was measured to the nearest 0.1 cm on the measuring board, while the whole body weight ( $w$ ) was taken to the nearest 0.5 g using a triple beam these measurements were used to calculate the condition factor.

### Fecundity analysis

The ripe female fish were used for fecundity estimation; ovaries were carefully excised from the body cavity of each fish and preserved in 4% formalin. It was weighed in electric beam balance before pre-

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