THE FOOD AND FEEDING HABITS OF *PARACHANNA OBSCURA* (GUNTHER) AND ITS AQUACIUETURAE BENEFITS

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Abstract

The food and feeding habits of **Parachanna obscura** (Gunther) was studied in the Ossiomo river. Delta State. Fish specimens were collected with the help of hired fishermen using cast nets, fish trap and fish fence. The fishes were chilled with ice blocks in a heat-insulated cooler and transported to the laboratory at the University of Benin for analysis. Three methods were used for stomach content analysis; namely frequency of occurrence, stomach fullness and volumetric method. Also aspects of the water quality that would be usefull to an aquaculturist, such as water temperature, dissolved oxygen (DO) and hydrogen ion concentration (pH) were determined. Results show that **P. obscura is** a piscivorous fish, very hardy (survives in low oxygen condition of 4.3mgL") easily available in most freshwater rivers and can be used to control over-crowding fish in tilapia fish pond.

Keywords: Food and Feeding habits, **Parachanna obscura.** aquacultural benefit.

Introduction

Studies on food and feeding habits of fish species attract the interest of aquaculturist worldwide. This is because such studies constitute the basis for the development of successful capture and culture fisheries management. Available records showed that Boulenger (1916), started intensive investigation into the fish species in Africa and produced a catalogue of the freshwater fishes. Reed, Burchard, Hopson, Jaimes and Yaro (1967), carried out a comprehensive work on fish and fisheries of Northern Nigeria, giving information on their ecology and fishing methods. Imevbore and Bakare (1970), studied the food and feeding habits of non-cichild fishes of the river Niger in Kainji reservoir area. Fagade & Olaniyan (1973), investigated into the food and feeding relationships of fishes in the Lagos lagoon (Western Nigeria), while Adebisi (1981), studied the stomach content of pivseivorous fishes in the upper Ogun river. Other studies on the food and feeding habits include those of; Ikomi and Sikoki (2001), in river Jamieson (Southern Nigeria), Durr & Gonzalez (2002) at the Canary Island, Oboh, Helena and Tongo (2003) in river Jamieson, Methratta and Link (2004), at the North Eastern continental shelf and Oronsaye & Nakpodia (2005), in the Ethiope river (Delta Slate).

A search on the Internet shows that no work has been published on the fishes of Ossiomo river (Della State) especially the **Parachanna obscura** species. This paper therefore, provides information on the food and feeding habits of Parachanna obscura and its aquacultural benefits.

Materials and Methods
Study Area
   The Ossiomo river is located between lat 5° 57-6°()5N and long. 5°24-5°35E (Fig. 1). It is a tributary of the Benin river, and lies within the tropical rain forest zone. The rainy season lasts from April to November and the dry season from December to March.

Procedure
   The sampling zone extends from Soho at A' Ala (fig. 1). Fish specimens were collected with the help of hired fishermen from Korobe who use cast nets, fish traps, and fish fence. Fish samples were collected from May to November 2006. A total of 100 fish specimens were used for food and feeding habits analysis. The fish specimens were chilled with ice-blocks in a heat-insulated cooler and transported to the laboratory at University of Benin for analysis. Identification of the fish species was made using works and identification guides of the following authors; Boulenger (1916), Reed, Burchard, Hopson, Jannes and Yaro (1967), Holden and Reed (1972) and Robert (1975). Each fish specimen was weighed on a top-loading balance (Metier E200) after mopping off excess water with a filter paper. Standard and total length of each fish was measured to an accuracy of 1.0mm (Lagler, 1964). The stomach (i.e. from the esophagus to the pyloris) of each fish was dissected out and preserved in 5% buffered formalin. Three methods were employed in the analysis of the stomach content namely; Frequency of occurrence method, fullness method and volumetric method. Also aspects of the water quality that would be useful to an aquaculturist such as; water temperature, dissolved oxygen (DO) and Hydrogen ion concentration (pH) were determined. Water temperature was measured in-situ with centigrade Thermometer by Gallcnkamp. Dissolved oxygen was determined by the Winkler's method and Hydrogen ion concentration (pH) was measured with the pH-meter.
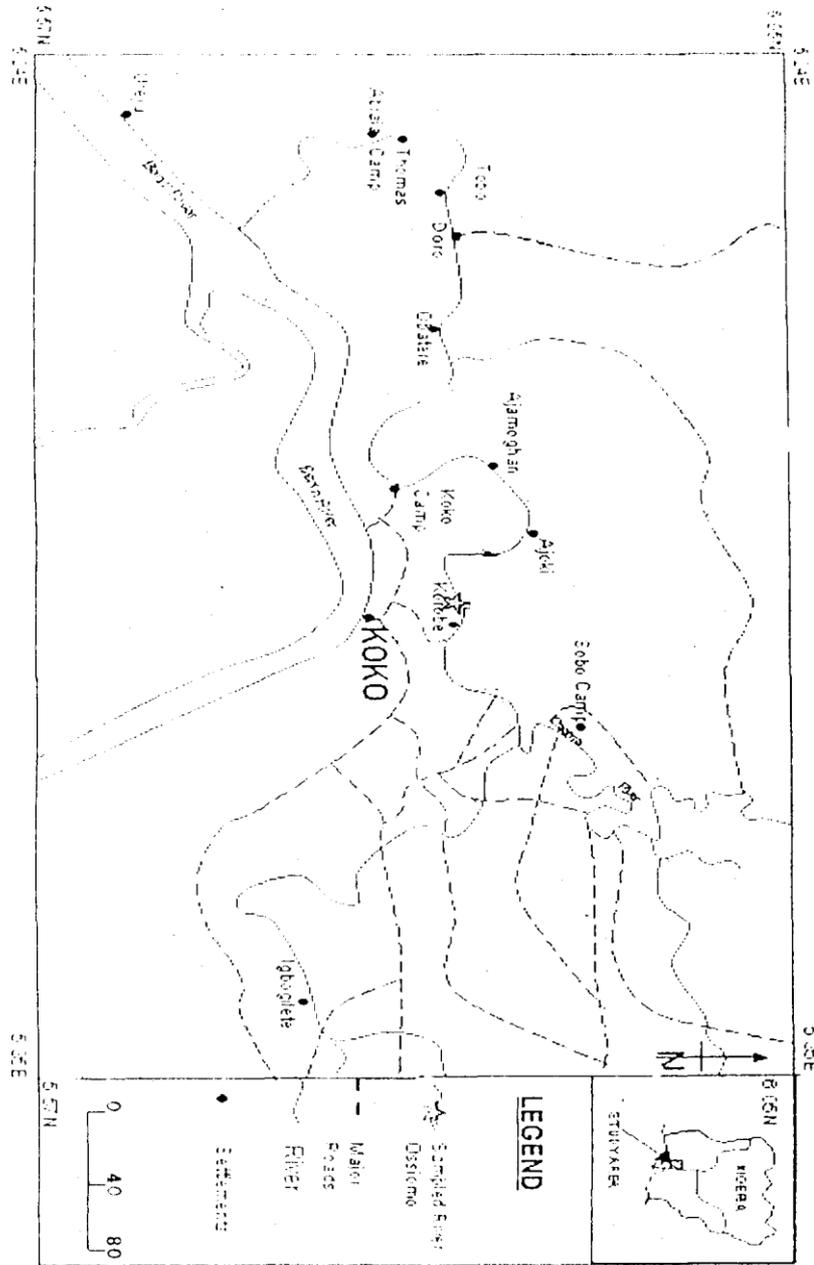
FIG . 1: MAP OF STUDY AREA SHOWING THE SAMPLED RIVER OSSIOMO

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Fullness Method

The process is an assessment of how full the stomach is by ranking. Full stomach is ranked (4/4); three-quarter full (3/4), half full (1/2), one-quarter (1/4) and empty stomach (o). This method has also been used by Ugwumba and Mbu- Oben (1990), Oboh, Edema and Tongo (2003).

Frequency of Occurrence Method

Each of the fish stomach was slit open and its content emptied into a Petri-dish for analysis in order to establish the diet of the fish. The number of stomachs of each fish species in which each type of food item occurred was recorded and expressed as a percentage of the total number of stomachs of that species examined in order to determine the proportion of the fish population that fed on a particular food item (Hynes, 1950).

Volumetric Method

The results of the various analysis and determinations are shown in the Tables below:

Table 1: Water Quality Determinations

Months of the Year	Water Temp. (°C)	Dissolve Oxygen (mgl/^{1})	Hydrogen ion Concentration (pH)
May	25.5	4.6	5.1
June	26.0	4.5	5.5
July	26.0	4.3	5.6
Aug.	26.5	4.4	5.9
Sept	26.0	5.0	6.0
Oct.	26.5	5.2	6.2
Nov.	27.0	5.8	6.4
SD±	0.49	0.54	0.45

The volume of the stomach and its food content for each fish specimen was determined by the application of Archimedes Principle (i.e. displacement of water) using a measuring cylinder. The volume of the stomach content of each fish specimen is then expressed as percentage (%) of the total volume.

Condition Factor

In order to ascertain the state of well being of the fish, the condition factor was determined using the equation;

KF = W x 100
　　　　V

Where; **K.F** = condition factor
　　　　W = weight of the fish L =
　　　　standard length of the fish.

Results

The table shows that the fish survives well in low oxygen conditions (4.3mgL"), slightly acidic range of pH values (5.1 - 6.4) and warm temperature range (25.5°C - 27.0°C). These water quality values would be very useful to the aquaculturists.

Table 2: Stomach Content Analysis Using Frequency of Occurrence Method

Food Items	Percentage Frequency of Concurrency
Fish scales	72
Fish remains	78
Sand grains	10
Shrimps	41
Mud particles	12
Plant parts	24
Unidentified	10

The Table reveals the definite food items the fish feeds upon.78% of fish remains and 72% offish scale show a piscivorous nature.

Table 3: Stomach Content Analysis Using Fullness and Volumetric Method

S/N of Fish Categories	Fullness Method		Volumetric method	
	Stomach Fullness Ranks	Number of Stomach	Percentage (%) Stomach Content Volumes	Number of Stomach
1	Empty (o)	10	22.0 - 36.9	33
. 2	One-quarter (1/4)	30	37.0 - 49.9	28
3	Half (1/2)	38	50.0 - 63.9	12
4	Three-quarter (3/4)	12	64.0 - 76.9	10
5	Full (4/4)	10	77.0-90.9	07

Note: Volumetric analysis was not performed on the 10 empty stomachs; The Table gives a picture of stomach fullness of the fish specimens.

Table 4: Standard Lengths and Weights of the Fish

Standard Length (cm) Class Intervals	Number of Fish	Weight (g) Class Intervals	Number of Fish
17.0-20.9	30	101.0- 158.9	30
21.0-24.9	42	159.0-215.9	26
25.0- 28.9	12	216.0-272.9	23
29.0-32.9	10	273.0-329.9	11
33.0- 36.9	06	330.0- 386.6	10

The table gives the standard length and weight of the fish specimens, from which the condition factor was computed.

Condition Factor Result

The condition factor for the fish specimens were computed and the mean value gave; 1.76. This shows that the fish is in very good state of well being with regards to the water quality conditions and the food items available to it.

Discussion

A close observation of the fish shows the presence of canine - like teeth. According to Lagler (1964), such dentition suggests a carnivorous feeding habit. The presence of 78% of fish remains in the stomach content also confirms its carnivorous feeding habit. Adebisi (1981), while analyzing the stomach contents of piscivorous fishes from Ogun river in Southern Nigeria recorded that; fish parts, prawns and aquatic insects were the main food items in this fish species. The result of condition factor of the f ish which gave a value of 1.76 shows that the fish is in a very good state of well being because according to Nikolsky (1987), "a fish is said to be in good condition when the condition factor is more than 1.0".

Aquacultural Benefits

By virtue of the fact that the fish is piscivorous, it can be of aquacultural benefit. The fish can be used to control over - crowding in Tilapia fish ponds by stocking it at a ratio of 1/500 adult *Tilapia* species. Idodo - Umeh (2003), recorded that this fish species, is very commonly seen in most freshwater rivers unlike the *Tates niloticus* which is not commonly seen. The *Tates ni/oticus* is another piscivorous fish that can be used to control over - crowding in Tilapia fish pond. 1 thus, do recommend that aquaculturists should take advantage of *P. obscura* which is a hardly fish (because it can survive in low oxygen conditions) and commonly available in most freshwater rivers, to control over-crowding of *Tilapia* species in their fish ponds.

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