EVALUATION OF CONDITION FACTORS WITH STOMACH CONTENT OF *Clarias gariepinus* IN RIVER GWALLAGA, BAUCHI STATE

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ABSTRACT

This study was aimed at investigating some biological aspects of *Clarias gariepinus* Cought in River Gwallaga Bauchi state. The river was divided into four stations: head water (Jamaa), upper middle (Rafin Shaa), and lower middle (Maleka) and tail water (Jamjale) as stations A, B, C and D respectively. Ten (10) *Clarias gariepinus* were caught fortnightly from each station during the dry season (February - April 2019) and wet season (May – August 2019). A total of 480 fish were collected during the period of the research. Morphometric indices of the fish were measured. The fish were dissected, gut length and stomach weight were measured and stomach content were identified. The data obtained were used to determine morphometric relationships through correlation and regression analysis, using Microsoft Excel 2007 version. The stomach content analysis of *C. gariepinus* revealed Plant Parts had the highest importance index of 50.37 in the dry season and 28.81 in the Wet season out of the five feed items found in the stomach. Chi-square (X^2 =29.27; df = 12 P> 0.05) (X^2 18.20; df = 9; P> 0.05) showed that there was association between stomach repletion of the fish and the stations from which they were caught in wet and dry Seasons respectively. The average condition factor (K) of fish from station A (K = 0.6818), B (k = 0.5458), C (K = 0.8132) and D (k = 0.5510) for dry season and wet season: A (K = 0.526758), B (k = 0.589765), C (K = 0.738035) and D (k = 0.725151). All the K-value were less than 1; It can be concluded that *C. gariepinus* caught in River Gwallaga were not in good physiological condition and association between fish stomach repletion level and station from which they were caught; shows that feed items in the fish stomach was inadequate. Therefore, it is recommended that fertilization and some form of supplementary feeding practice should be carried out particularly in the dry season.

INTRODUCTION

Fisheries management and research often require the use of biometric relationship in order to transform data collected in the field into appropriate indices (Ecoutin and Albarel, 2003). Length and Weight Relationships (LWR) of fishes are important in fisheries and fish biology because they allow the estimation of the average weight of the fish of a given length group by establishing a mathematical relation between them (Sarka *et al*., 2008; and Mir *et al*., 2012). Length–weight relationship (LWR) is an important expression and plays paramount role in fishery biology as it serves several purposes. Like any other morphometric characteristics, the LWR can be used as character for differentiations of taxonomic unit on the relationship changes with various developmental events in life, such as metamorphosis at onset of maturity (Thomas *et al.,* 2003). Fishes exhibited growth in length and the increments in weight, both this developmental activities during it lifetime. It is very important to have information on the food and feeding habits of fish in fresh water bodies especially River Gwallaga that is located within Bauchi metropolis. The River is exposed to various sources of pollutants and effluence from residential areas surrounding it.

MATERIALS AND METHOD

SAMPLING TECHNIQUES AND STOMACH CONTENT ANALYSIS

Field visit were carried out fortnightly. Two (2) out of four station (4) (A, B, C and D) were randomlyvisited twice a week. Ten (10) *C. gariepinus* was collected with the help of local fishers using traditional fishing gear (Traps and Long Lines). A total of 480 *C. gariepinus* species were collected from the four stations within the period of wet and dry seasons during (Three months per seasons). Total Length of sample fish was measured to the nearest 0.1cm using measuring tape.

A total of ten (10) *Clarias gariepinus* were dissected from each station per visit. The gut were removed and measured, stomach content were placed in a petri dish and were assessed with hand magnifying lens, the feed items consumed by *Clarias gariepinus* were identified in dry season (February, 2019 to April, 2019) and wet season (May, 2019 August, 2019). Stomach repletion were indicated as 0% for empty, 1, 2, 3 and 4 for 25%, 50%, 75% and 100% respectively.

Volumetric index, Gravimetric index, Frequency of occurrence importance index and condition factor (K)

Mi = Σ [stomach score * (1/number of feed item in the stomach)/(total number of analysedstomach)

VI = 25 x M 01

Where Mi average point of each feed item identifiedGravimetric

index formula:

GI = wi/w x 100 02

Where wi is cumulative weight of individual feed items and w is the total weight of all thefeed items.

Wi = is cumulative weight of individual feed items.W = is total

weight of all the feed items.

Frequency of occurrence formula (F):

F = ni/n x100 03

Where ni is the number of stomach were each feed items is found and n is the total number of stomach where feed items were found.

Importance Index (AI):

AI = (F x VI x GI)/ 1000. 04

Condition Factor (K)

The condition factor will be calculated using the formula:

Condition factor (K) = $100W/L^3$ (Pauly, 1984) 05

Where

W = Weight of fish (g)

L = Total body length of fish (cm)

Statistical Analysis

Correlation and regression analysis were carried out using Microsoft Excel 2007 version to determinethe LWR of *Clarias gariepinus* in River Gwallaga.

Results and discussion

Table 1: Stomach content analysis of *C. gariepinus* in (Dry Season) (February – April, 2019)

Feed Items	Frequency of occurrence (F)	Volumetric index (V)	Gravimetric Index (GI)	Importance index (AI=(F,V,GI)/1000)	RANKING
Plant Parts	58.47	17.50	49.23	50.37	1
Insect/Insect Parts	33.98	7.75	19.23	5.06	2
Fish/Fish Parts	10.68	4.75	24.24	1.22	3
Water	6.31	1.50	3.32	0.03	4
Unidentified	3.88	1.25	3.95	0.01	5

Table 1 shows that Plant Part had the highest importance index with the value of (50.37) while unidentified had least importance index with the value of (0.01) foods items.

Table 2: Condition Factors of *C. gariepinus* in Dry Season (February – April, 2019)

S/No	Sampling Stations	Condition Factor (k) Values Minimum	Maximum	Average
1.	Jamaa (A)	0.2840	2.2263	0.6818
2.	Maleka (B)	0.2171	0.9985	0.5458
3.	Rafin Shaa (C)	0.2166	2.3900	0.8132
4.	Jamjale (D)	0.2462	1.1425	0.5510

Table 2 shows that *C. gariepinus* obtained in Rafin Shaa (C) had the highest value of (0.8132),followed by Jamaa (A) and the least value of (0.5458) was in Jamjale (D) dry season.

Stomach content analysis of *C. gariepinus* in River Gwallaga in dry and wet season indicated that the fish species feeds on Plant Part, Insect/Insect Part, Fish/Fish Part, Water and unidentified feed materials. Plant Part had the highest importance index with the value of (50.37) while unidentified hadleast importance index with the value of (0.01) foods items (table 1).

Condition factor (K) *C. gariepinus* obtained in Rafin Shaa (C) had the highest value of (0.8132), followed by Jamaa (A) and the least value of (0.5458) was in Jamjale (D) dry season (table 2). Reported that the study of condition factor is important for understanding the life cycle of fish species and it contribute adequately to management of species which will lead to achieving equilibrium in the ecosystem Lizama *et al.* (2002).

CONCLUSIONS

Based on the research the morphometric indices relationships shows a negative allometric growth pattern in the fish species. The food items consumed by *C. gariepinus* in River Gwallaga were identified as plant parts, insect/insect parts, fish/fish part, water and unidentified. The condition factor of the fish species in River Gwallaga being less than 1 indicated that they were in poor condition.

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