
THE FOOD AND FEEDING HABITS OF *AUCHEONOGLANIS OCCIDENTALIS* (VALENCIENNES, 1840) INHABITING SEBORE RESERVOIR, MAYO - BELWA, ADAMAWA STATE

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ABSTRACT

*Sebore Reservoir is blessed with many commercial and potential aquaculture species but there is paucity of published information on their food and feeding habits especially *Aucheonoglanis occidentalis*. This study aimed at providing information on the food and feeding habits of *A. occidentalis* found in the reservoir. A total of 144 samples of *A. occidentalis*, were collected monthly for a period of one year. Fishing was done using gill nets and canoe. The fish specimens were washed with clean water and preserved in ice chest to minimize any post-mortem changes. The stomach contents of each of the *A. occidentalis* sample were identified and analysis was done using the numerical and frequency of occurrence methods. The results recorded from the 144 samples of *A. occidentalis* elucidated that 84 samples of *A. occidentalis* representing 58.33% have their stomach full with food, 51 (35.42%) were having a half-filled stomach and 9 (6.25%) were having an empty stomach. The higher number of *A. occidentalis* samples recorded with full stomach than the *A. occidentalis* samples with half - filled and empty stomach in the study area indicated that there was constant availability of food for the fish. Findings from this study indicated that the *A. occidentalis* from Sebore reservoir of Adamawa State is an Omnivore, which fed on both plant and animal materials, though it feeds mostly on animal materials (Insect parts, fish parts and unidentified worms) than on plants. The different varieties of food items observed in the gut make it a potential candidate for aquaculture.*

Key words: Sebore Reservoir, *Aucheonoglanis occidentalis*, Stomach Contents Analysis, Omnivore

INTRODUCTION

The study of the food and feeding habits of freshwater fish species is a subject of continuous research, because it plays a basic integral part in the development of a successful fisheries management programme in fish capture and culture (Akongyuure, 2020). The food and feeding habitat of fish may be an important characteristic of the life-history strategy of a species to know the foremost necessary functional role of the fish inside their living ecosystems (Kuebutornye *et al.*, 2019). Hence most studies which are aimed at obtaining such information are based on the analysis of gut contents of organisms caught from their natural habitat (Chukwuemeka *et al.*, 2019). The predictive power of mathematical models as applied to fisheries science cannot be overemphasized (Abdulkarim *et al.*, 2018). Various researches has been conducted into the food and feeding habits of fish in order to assess the dietary composition and food habits of fish aimed at a sound fisheries management programme on fish rearing in captivity (Ikongbeh *et al.*, 2012; Abdulkarim *et al.*, 2018). *Aucheonoglanis occidentalis* (Valenciennes, 1840) belongs to the family Claroteida and genus *Aucheonoglanis* (Olaosebikan and Raji, 2013). Only two species of the genus *Aucheonoglanis*, which are *biscutatus* and *occidentalis* have been reported in Nigeria, one of the major distinctive features between the two species is that *A. biscutatus* has an angular posteriorly adipose fin while *A. occidentalis* possess a rounded adipose fin (Idodo - Umeh, 2003). *A. occidentalis* is widely distributed in the freshwater lakes, reservoirs, rivers, streams and swamps of Nigeria (Idodo - Umeh, 2003). It contributes significantly to the animal protein sources within many freshwater bodies and also made up of a portion of the inland fisheries in Nigeria due the fact that it's flesh is rich and oily; the

carbohydrate, lipid and protein contents are in the ratio of 1:3:4, the moisture content is high (74.6 - 78.04g/100g net weight), and the mineral content is dominated by calcium (Onimisi *et al.*, 2009). Sebore reservoir is blessed with many commercial and potential aquaculture species but there is paucity of published information on their food and feeding habits especially *A. occidentalis*. The objectives of this study therefore aims at providing information on the food and feeding habits of *A. occidentalis* from Sebore Reservoir.

MATERIALS AND METHODS

Study Area

Sebore reservoir is located at Mayo - Belwa Local Government Area (LGA), Adamawa State Nigeria. Mayo – Belwa LGA lies within Latitude 9° 3' 0" North and Longitude 12° 3' 0" East. It covers an area of 1768km² (682.63 sq m) and is 75 km away from Yola, the capital city.

Sample Collection

A total of 144 samples of *A. occidentalis*, were sampled monthly for a period of one year, from December 2021 to November 2022. Fishing was done using gill nets as the fishing gear and canoe was used as fishing craft. The fish specimens were washed with clean water and preserved in ice chest to minimize any post-mortem changes and taken to the laboratory at the Department of Fisheries Modibbo Adama University, Yola for analysis of the food contents.

Laboratory Analysis of Sample

The total length of the *A. occidentalis* samples were measured using a meter rule (measuring board) in centimetres (cm) and weighed using an accurate digital scale in grams (g). The *A. occidentalis* body cavity were opened using scalpels, beginning ventrally from the anus to the mouth, the entire visceral and intestinal organs such as the liver, fat and other organs attached to the intestine and stomach were gently removed and emptied into a plastic dish, the length and weight of the stomach were measured and recorded. Thereafter, the *A. occidentalis* were kept in formalin solution of about four percent (4%) to avoid any form of deterioration and contamination of the stomach contents. The stomach contents were opened using a pair of scissors and the complete stomach contents were emptied into petri - dish for examination and identification based on the work of Ikongbeh *et al.* (2012). The random samples of the stomach contents were taken and dropped on a slide (counting chamber) with the aid of a dropping pipette which serve as the dropper and viewed under a light microscope. The general views were made with a binocular dissecting microscope stereo zoom total magnification of 100x; the stomach contents were studied and recorded. The stomach contents of each of the *A. occidentalis* samples were analysed using the numerical and frequency of occurrence methods as described by Balogun (2006).

In the numerical method (NM), the number of individuals in each food category was expressed as a percentage of the total individuals in all food categories:

$$NM (\%) = \frac{\text{Total no. of a particular food item}}{\text{Total no. of all the food items}} \times 100$$

In the frequency of occurrence method (FO), all stomach containing food were recorded and expressed as the percentage of the total number of stomach examined:

$$FO (\%) = \frac{\text{No. of stomach with a particular food item}}{\text{Total no. of fish examine with food in the stomach}} \times 100$$

Statistical Analysis

All data obtained were analysed using descriptive statistics.

RESULTS

The results recorded from the 144 samples of *A. occidentalis* collected from the Sebore reservoir, 84 samples of *A. occidentalis* representing 58.33% have their stomach full with food, while 51 *A. occidentalis* representing 35.42% were having a half-filled stomach and 9 *A. occidentalis* representing 6.25% were having an empty stomach (Table 1).

Table 1: Stomach Fullness of *A. occidentalis* from Sebore Reservoir

No. of Stomach	Full Percentage of Full Stomach	No. of Stomach	Half Percentage of Half Stomach	No. of Stomach	Empty Percentage of Empty Stomach
84	58.33	51	35.42	9	6.25

The higher number of *A. occidentalis* samples recorded with full stomach than the *A. occidentalis* samples with half - filled and empty stomach in the study area indicated that there was constant availability of food for the fish year round. The summary of the stomach contents of *A. occidentalis* from Sebore reservoir is given in Table 2.

Table 2: Stomach Contents of *A. occidentalis* from Sebore Reservoir

Food items	Numerical method		Frequency of occurrence method	
	Number of Items	Percentage (%)	Number of stomachs	Percentage (%)
Bottom organisms:				
Detritus	1,237	13.63	98	72.59
Fish parts				
Bones	21	0.23	5	3.76
Scales	13	0.14	9	6.67
Insects:				
<i>Anax spp.</i> Nymph	187	2.06	13	9.63
<i>Chaoburus spp.</i> larvae	1,473	16.23	79	58.52
<i>Chaoburus spp.</i> Pupae	487	5.37	34	25.19
<i>Chironomus spp.</i> larvae	872	9.61	58	42.96
<i>Chironomus spp.</i> pupae	361	3.98	47	34.81
<i>Culicoides spp.</i> larvae	963	10.61	62	45.93
<i>Culicoides spp.</i> Pupae	279	3.07	36	26.67
Remains of insects	1,031	11.36	91	67.41
Other materials:				
Sand particles	-	-	46	34.07
Unidentified worms	641	7.06	49	36.30
Plant Materials:				
Remains of plants	1,132	12.48	61	45.19
Phytoplankton:				
<i>Chlorella spp.</i>	11	0.12	3	2.22
<i>Diatomella spp.</i>	13	0.14	9	6.67
<i>Oscillatoria spp.</i>	16	0.18	7	5.19
<i>Phacus spp.</i>	14	0.15	5	3.70
Zooplankton:				
<i>Arcella spp.</i>	37	0.41	13	9.63
<i>Centropyxis spp.</i>	41	0.45	21	15.56
<i>Daphnia spp.</i>	39	0.43	17	12.59
<i>Diaptomus spp.</i>	51	0.56	24	17.78
<i>Moina spp.</i>	48	0.53	19	14.07
<i>Nauplius spp.</i>	57	0.63	25	18.52
<i>Rotaria spp.</i>	50	0.55	23	17.04

DISCUSSION

The results for the food and feeding habits of *A. occidentalis* from Sebore Reservoir recorded from this study indicated that the fish species has a broad spectrum of food ranging from bottom organism mainly detritus, fish, insects, other materials such as sand particles and unidentified worms, plant materials, phytoplanktons and zooplanktons which were in agreement with the findings of Chukwuemeka *et al.* (2019) who reported same for *A. occidentalis* from Tagwai lake, Minna, Nigeria and Hassan (2015) for *A. biscutatus* in Kiri reservoir, Adamawa State, Nigeria.. The broad food spectrum of this fish indicated that they feed both in surface water column and even near the substratum. However, *A. occidentalis* appears to be basically a bottom feeder as evident from the significant contributions of the bottom-dwelling food items such as insect's larvae and pupae, detritus and insect remains to its total diet. The sand grains, which contributed substantially to the stomach content, might have been accidentally ingested along with food, but their contribution to the nutrition

of the species is not clear. The discovery of sand in the gut of *Auchenoglanis* species was reported by Onimisi *et al.* (2009) and Hassan (2015). *A. occidentalis* consumed both plant and animal materials with insect, fish and sand dominating its food. Similar result was reported by Idodo - Umeh (2003). Food items of animal origin contributed significantly to the diet, which was dominated principally by bottom dwelling immature insects (*Chaoborus spp.* larvae and *Cullicoides spp.* larvae) and the remains of other insects. In addition, plant materials contributed significantly to the stomach content of the fish. It may therefore be justifiable to classify *A. occidentalis* as an omnivore, which was in agreements with the findings of Onimisi *et al.* (2009) on the same species in Zaria, Nigeria.

CONCLUSION AND RECOMMENDATION

In conclusion, findings from this study indicated that the *A. occidentalis* from Sebare reservoir of Adamawa State is an Omnivore, which fed on both plant and animal materials, though it feeds mostly on animal materials (Insect parts, fish parts and unidentified worms) than on plants. The different varieties of food items observed in the gut make it a potential candidate for aquaculture like *Clarias gariepinus* which is omnivore; hence, it is recommended that further research should be carried out to investigate the ability of the fish to reproduce in captivity naturally or artificially.

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