

Length GroupWise Gut Content Analysis of Food and Feeding Habits in *Gobius biocellatus* From Kayadhu River Near Hingoli (M.S) India.

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Abstract

Food is an important factor in the biology of fishes to the extent of governing their growth, feeding and migratory movements. The basic function of an organism is its growth, development and reproduction and it takes place at the expense of energy which enters the organism in the form of its food. *Gobius biocellatus* is a teleost fish, one of the species of the genus *Gobius* and it is distributed in fresh waters throughout the plains of India. In the present study analysis of the gut content of adult *G.biocellatus* was carried out to study the percentage composition and percentage of prevalence of different food items. In order to find out whether the growth had any correlation with the food and feeding habits, the analysis has been made in relation to different length groups.

Key words: *Gobius biocellatus*, length groups, food and feeding habits

1. Introduction

The problem of nutrition of the fish has in recent year received considerable attention by the workers in all countries of the world, due to the fact that the successful development of the fisheries. The investigation on the food and feeding habits of the fish is one of the most important factors in the fishery biology to the extent of governing their distribution growth, migratory habits, spawning behavior and nutritive values.

Nikolsky [1] states that "during the process of development of fish changes takes place in its food, which are connected with changes in its structure, corresponding to the changes in the

composition of the food, ontogenetic changes also takes place in the structure of the feeding and digestive organs. Hence, a correct knowledge of relationship between the fishes and food organisms is essential for the prediction and exploitation of the fish stock".

In the present study analysis of the gut content of adult *G.biocellatus* was carried out to study the percentage composition and percentage of prevalence of different food items. In order to find out whether the growth had any correlation with the food and feeding habits, the analysis has been made in relation to different length groups also.

During the present investigation it was impossible to study the food and feeding habits of Juveniles as they were few in catches.

2. Materials and Method

The study of food and feeding habits of *G. biocellatus* involved examination of 487 specimens during the period of twelve months, from January 2003 to December 2003. The material was collected from river Kayadhu near Hingoli. The specimens were brought to the laboratory, measured for total length, weighed accurately and then cut open. Various methods have been adopted by the different workers for the study of percentage composition of different food items present in the gut. This study was based on the method suggested by Hynes [2] and Pillay [3] i.e., numerical method.

For studying the percentage prevalence of different food items, the usual method as described by Hynes [2] was followed. Number of guts containing a particular food component was determined in each month as well in each 20 mm size group.

Food and feeding habits of adult *G.biocellatus*

The nature of gut contents in *G.biocellatus* revealed that this species is voracious and omnivorous having more tendencies towards carnivorous habits. The food of *G.biocellatus* consists of mainly phytoplanktons, aquatic

plants, zooplanktons, insect larvae and semi digested part of prawns and fishes. This species being predatory feeds on prawns and fishes. Even cannibalism has been observed in *G.biocellatus*. The following are the main food items which occurred in the guts of *G.biocellatus*.

Algae: Spirogyra, Ulothrix.

Remains of aquatic plants: Pieces of root, leaf and grasses (semidigested).

Insect larvae: The larvae of anophales and culex and naids pupae.

Copepods: Cyclops and Napuluis.

Cladocerans: Dephnia, Barmina, Moina.

Prawns & Prawn remains: Palamonid group i.e., - potamysis and macropsis.

Fishes & Fish remains: Fishes like *Barbus ticto*, *Rasobra daniconius*, *Danio Spinosus*, and fish remains like scales, fins & vertebrae of fishes.

3. Results and Discussion

Length group wise changes in the percentage composition of different food items taken by adult *G.biocellatus* are given in Table 1.

Algae: During the peak spawning season the total absence of algae in the gut content was noted.

As the fish grows the percentage of algae was gradually decreased. The consumption of algae was more in younger fishes as compared to the older fishes. The percentage composition was found to be varying from 8.83 (in 200-219 mm size group) to 25.95 (in 80-99 mm size group).

Remains of aquatic plants: Aquatic plants were also consumed by the fishes in the form of pieces of roots, stem and leaves. This food item was not found in all size groups and their percentage composition was found to be varying from 2.10 (in 160-179 mm size group) to 7.86 (in 200-219 mm size group) indicating that this food item was consumed by fishes may be due to the non-availability of food.

Table 1: Percentage composition of different food items consumed by adult *G.biocellatus* in each 20 mm size group.

Length group	Algae	Remains of aquatic plants	Copepods	Cladocerans	Insect larvae	Prawns & prawn remains	Fishes & fish remains
80-89	25.95	.....	18.46	14.95	20.4	4.26	15.95
100-119	24.84	.....	15.96	13.35	19.4	7.56	18.93
120-139	22.33	6.55	16.65	14.21	15.1	4.15	21.24
140-159	20.05	.....	11.17	12.83	19.9	5.95	30.07
160-179	17.95	2.10	10.05	10.02	17	5.15	37.71
180-199	11.01	5.03	9.11	13.18	15.1	4.47	42.09
200-219	8.83	7.86	8.09	14.05	14.6	3.43	43.11

Prawns & prawn remains: Prawn formed a considerable part of the food adult *G.biocellatus*. This food item was consumed by the fishes of all size groups. Their percentage composition varied from 3.43 (in 200-219 mm size group) to 7.56 (in 100-119 mm size group).

Copepods : The copepods were consumed in more or less similar percentage by the species in all most all size groups except older fishes. The percentage of copepods was found to be low (8.09) where as in younger fishes high (18.96).

Cladocerans: Cladocerans were consumed by all most all size groups. The percentage composition is maximum in younger fishes 14.95 (in 80-99 mm size group) where as it was found decreasing in the older fishes 10.02 (in 160-179 mm size group).

Insect larvae: Insect larvae is consumed ranges between 14.63 (in 200-219 mm size group) to 20.43 (in 80-99 mm size group).

Fishes & fish remains: As this fish shows more tendencies towards the predatory nature as well as cannibalism. In younger fishes the percentage composition is low 15.95 (in 80-99 mm size group) where as it is high in older fishes 43.11 (in 200-219 mm size group) indicating that the predatory nature of the fishes increased with the increasing size.

Length group wise fluctuations in percentage of prevalence are given in Table 2

After observing the variations in percentage composition of various food items. It would be interesting to study in detail the prevalence of these components. The preference given to them by the fish. The study of percentage of prevalence in relation to different size groups shows the change in feeding habits due to growth.

Algae: The percentage of prevalence of algae in the guts of *G.biocellatus* appeared to be fairly high in the younger fishes. It was found that the algae decreased

Table 2 : Percentage of prevalence of main food items consumed by adult *G.biocellatus* in each 20 mm size group.

Length Group	Algae	Remains of aquatic plants	Copepods	Cladocerans	Insect Larvae	Prawns & Prawn remain	Fishes & Fish remains
80-99	18.00	--	38	22	66	14	22
100-119	18.33	--	33.33	31.66	58.33	6.66	21.66
120-139	18.57	2.85	32.85	12.85	32.85	2.85	28.57
140-159	11.39		36.7	17.72	37.97	5.06	32.91
160-179	14.11	5.88	35.29	9.41	31.76	23.52	48.23
180-199	9.09	4.54	31.81	9.09	59.09	37.5	60.22
200-219	10.00	16.66	23.33	6.66	76.66	56.66	76.66

with the increasing size of the fishes and their percentage prevalence ranged between 9.09(in 180-199 mm size group) to 18.57(in 120-139 mm size group).

Remains of Aquatic Plants: The older fishes except 120-139 mm size group consumed this food item. The percentage of this food item varied between 2.85 (in 120-139 mm size group) to 16.66 (in 200-219 mm size group).

Copepods: The percentage prevalence in the older fishes show very less affinity towards this food item 23.33 (in 200-219 mm size group) where as in younger fishes it was 38.00 (in 80-99 mm size group) showing a fairly high affinity towards this food item.

Cladocerans: The older fishes shows very less affinity as compared to the younger ones and their percentage prevalence varied between 6.66 (in 200-219 mm size group) and 31.66 (in 100-119 mm size group).

Prawans & prawn remains: Fishes 140-159 mm in length showed marked increase in the percentage of prevalence and the highest being 56.66 (in 200-219 mm size group) towards this food item.

Insect larvae: All the size group specimens consumed insect larvae and their percentage of prevalence ranged between 31.76(in 160-179 mm size group) and 76.66 (in 200-219 mm size group).

Fishes & fish remains: According to size, the percentage of prevalence of this food increases 21.66 (in 100-119 mm size group) and 16.66 (in 200-219 mm size group).The predatory nature of the fishes increase with the increasing size of the fishes for consumption of this type food item.

From the foregoing discussion it can be inferred that *G.biocellatus* is omnivorous fish showing more tendency towards carnivorous habits and the gut content analysis made throughout the year showed significant variation in the percentage composition and percentage of prevalence of various food items in relation to the growth. *G.biocellatus* consumed insects' larvae prawns and prawn remains and fish remains throughout the

year in fairly high percentage. The carnivorous tendency of this fish increases with the increasing size of the fish. The tendency of cannibalism increases with the increasing size of the fish.

Mookerjee *et al.*, [4] have given a note on the food of *Glossogobius giuris* that this species mainly feeds on animals. According to their studies the ratio of animal and plant food in adult is about 70:30. Bhowmick [5] in his study on some aspects of biology of *Glossogobius giuris* mentioned that this species is voracious and the feeding habits change with the size of the fishes. Foods of the important commercial species of Indian major carps have been studied by Alikunhi [6] and Yusuf kamal [7].

Conflict of interest

No conflict of interest influenced in this research.

4. References

1. Nikolsky GY. The ecology of fishes. Academic press, London & New York. 1963.
2. Hynes HBN. The food of fresh water stickle backs (*Gastrosteus aculeatus*) & (*Pugeosteuspungitius*) with a review of methods used in studies of food of fishes. *J.Anim.Ecoll.*,1950 ;19 (I) : 35-38.
3. Pillay TVR. The biology of the gray mullet, Mugil tadeForsk, with notes on its fishery in Bengal. *Proc. Nat. Inst. Sci. India*, 1954 ; 20 : 187-217.
4. Mookerjee HK. On the some food of *Glossogobiusgiuris* (Ham). *Science& culture*, 1947 ; XIII, 162-163.
5. Bhowmick. Some aspects the biology of the *Glossogobiusgiuris* from Hooglyeustary. *Proc. Indo-Pacific fish Coun*, 1965, 11 (II): 99-115.
6. Alikunhi KH. On the food of young carp fry. *J.zool.Soc.India*, 1952 ; 4(1):77-84.
7. Yusuf Kamal K. Food and alimentary canal of *Catlacatla*. *Indian J. Fish.*, 1964 ; 11: 449-464.