

VARIATION IN THE MINERAL CONTENT IN MUSCLES OF *Gobijs Biocellatus* FROM KAYADHU RIVER NEAR HINGOLI (M.S).

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Abstract :

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 (Day, F. 1878). This study evaluates the monthly changes in Mineral content of Muscles (tissue) in both the sexes of *G. biocellatus* from Kayadhu river near Hingoli and was studied over a period of twelve months from January 2003- December 2003. In the present study the analysis of mineral namely calcium, phosphorus and iron have been carried out from the muscles of *G.biocellatus*. The minimum and maximum occurrence of these minerals was observed.

Keywords: Mineral content, muscles, *G.biocellatus*.

Introduction:

Fish is an important food item and supplies animal proteins, otherwise lacking in Indian dietaries. The nutritive values in different species and in a species itself .The variations in the chemical constituents such as water, fat, protein, ash and minerals of any fish are attributed to the changes in growth, size, maturity, sex and locality. Fish being a good protein food, it is also necessary to have the knowledge of its chemical composition so that the fish fauna can be utilized as food in the regular diet to meet the protein deficiency. It is also considered worthwhile to determine how far the type of fish normally consumed by the poor class people comes up to the requirements as a first class protein food. *G.biocellatus* is one such fish, which is eaten, in large quantities by the poor sections. Investigation on the nutritive value of various food fishes has been carried out abroad by a good number of workers. First record of analysis of fishes was published by Atwater (1888).

Siddhiqui (1966) made a comparative study on the biochemical constituent in different tissues of some fresh water teleosts. Some work on the chemical composition of the common carp, *Cirrhina mrigala* and fresh water murrel, *Ophiocephalus punctatus* was carried out by Jafri (1968) and Jafri & Khawaja (1968). Bapat (1971) investigated the nutritive value of some fishes of Marathwada. Madalasure (1973) study the chemical composition of *Barbus ticto*.

G.biocellatus being abundant in river, ponds and estuaries of India and being very much relished by people for its taste, has a good demand in the market. The present work deals with only adults showing variations in mineral content in muscles.

MATERIALS AND METHODS:

The material was collected every month for period from January 2003 to December 2003 from Kayadhu River near Hingoli. The adult male and female specimens of *G.biocellatus* were taken in equal numbers and analyzed separately. The muscles were removed free from skin and bones and weighed accurately. The samples of muscles dried at 100°C were ignited in a silica crucible to a constant weight at 500 - 600°C in muffle furnace to give ash.

The ash was dissolved in concentrated HCL with 2 drops of concentrated HNO₃. The solution was diluted to 50 ml and filtered through a filter paper No.1. This extracts of ash was subsequently used for the estimation of minerals.

Calcium:-For the estimation of calcium, method of Clark and Collip (1995) was adopted. Calcium was precipitated as its oxalate. The precipitate was filtered on an ash free filter paper and washed with cold distilled water. The precipitate of calcium oxalate solution was heated at 60°C and titrated against 0.01 N potassium permanganate solutions until the first drop gave pink colour, which persisted at least for 15 seconds.

Phosphorus:-For the determination of inorganic phosphorus, the method of Fiske and Subbarow (1925) was adopted. Ammonium molybdate solution was added to the ash solution, after adding 1,2,4 - aminonaphtholsulphonic acid reagent. Phosphate reacts with molybdic acid to form phosphomolybdic acid, on treatment with 1,2,4- aminonaphtholsulphonic acid, phosphomolybdic acid is selectively reduced to produce a deep blue colour (molybdenum blue). This colour was then read on a Erma colorimeter at 660 to 770 μ and compared with a suitable standard phosphate solution treated in the same way.

Iron (Fe⁺⁺):-Iron was estimated by colorimetric method by Elehjam (1930). Potassium thiocyanate solution was added to the ash solution and the red colour developed due to the reaction of potassium thiocyanate with iron in ferric state was extracted with iso-amyl alcohol. The colour was read on colorimeter using 490 μ. The iron content was calculated with the help of standard graph for iron.

RESULT AND DISCUSSION:

Fishes were good sources of different minerals. The review of literature shows that very little work has been done on the mineral content in fishes. Variations of the calcium, and phosphorus ratio in some marine fishes have been reported by De clearq (1933 & 1934). Calcium and phosphorus contents in fresh water fishes of Bengal were studied by Saha & Guha (1939 & 1940). Airan (1950) made similar observation in some fresh water fishes from Kolhapur. In the present study the analysis of mineral namely calcium, phosphorus and iron have been carried out from the muscles of *G.biocellatus*. The average values for these minerals have been calculated and presented in Table No. 01.

The minimum and maximum occurrence of these mineral can be tabulated as follows:-

	Male			Female		
	Calcium	Phosphorus	Iron (Fe ⁺⁺)	Calcium	Phosphorus	Iron (Fe ⁺⁺)
Minimum	130	635	3.20	115	743	3.21
	June	March	May	May	April	Sept.
Maximum	469	1464	15.45	436	1769	13.43
	April	April	Dec.	July	Dec.	Nov.

Low calcium content was found during June, July & November, and December in males and March, May, August to October in females. The high values of calcium were observed during April in males and July in Females. The low values Phosphorus was found in March in males and April in females. The high values of Phosphorus were found in January, February, April, May, July, October and December in males where as in females during February, March, June to October and December respectively. The low values of iron were found from January to May and July to October in males and from January, February, April to May and July to October in females and high values of iron were found during June, November, and December in males and in females during March, June, November and December.

Adewumi et al. (2014) reported that microbiological activities in the aquatic environment, feeding habits and age of fish have also been found to determine elemental concentrations in fish and even within a species of fish, mineral retention depends mainly on the feed and the feeding rate and interaction with the water environment.

Pirestani et al. (2009) reported that amount of several elements analyzed from different fish species collected from different areas were significantly different.

Table No.1: Monthly Variation in % of Mineral Content of muscles

Month	Male			Female		
	Calcium	Phos.	Iron	Calcium	Phos.	Iron
January	258	1305	9.79	387	829	8.31
February	385	1089	7.85	267	1468	5.09
March	333	635	8.76	180	1287	12.19
April	469	1464	5.15	346	743	9.65
May	210	1275	3.20	115	911	6.59
June	130	985	10.23	295	1261	11.1
July	162	1180	9.56	436	1532	4.89
August	223	786	6.15	165	1769	3.62
September	237	835	5.75	189	1342	3.21
October	205	1103	4.36	163	1720	7.18
November	185	769	11.1	274	909	13.43
December	193	1165	15.45	319	1129	10.09

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