

Seasonal variation in the water and fat content of liver of *Gobius biocellatus*.

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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). The variation in the fat and water content of liver tissue in both the sexes of *G.biocellatus* was studied over a period of twelve months from January 2003- December 2003. The percentage of water in liver of both the sex has comparatively higher during September to December and in January and June and that of peak spawning season. The fat values in liver were seen slightly higher during peak spawning season as compared to other months of the year. The present study is the first to describe the variation in the fat and water content of liver of *G. biocellatus* from Kayadhu river near Hingoli.

Keywords: *G.biocellatus* -male and female, water and fat variations and liver tissue.

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).

Venkataraman and Chari (1951) observed the variations in fat contents of mackerel, *Rastrelliger canagurta*. Ramaswamy (1953) studied the carbohydrates and fat contents of fishes. Vasvan *et.al.*, (1960) studied the seasonal variation in fat content of Indian oil sardine, *Sardinella longiceps*. 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. Madalpure (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 review of literature shows that the chemical composition of *G.biocellatus* has not been studied so far and hence the present investigation was undertaken to study the variations of their chemical compositions in relation to breeding cycle. As the present work deals with only adults showing seasonal variations of their chemical composition in relation to breeding cycle.

Material 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 analysed separately. The liver was dissected out, freed from body fluid and blood by means of blotting paper and weighed accurately. Liver tissue was analyzed for the determination of water and fat in males and females

separately. The water content was estimated by drying the fresh samples in an oven maintained at 100°C to a constant weight usually for 24 to 48 hours. A known weight of sample was extracted with solvent ether in a Soxhlet apparatus for at least 6 to 8 hours. The receiver flask which was weighed accurately before the experiment was again weighed with the fat after evaporating the ether first on a water bath and finally in a current of hot air then cooling properly. The increase in weight gave the amount of the fat extracted from the known weight of the sample.

Result and Discussion :

It is known that water is one of the important constituents, which contributes maximum to the chemical composition in all the tissues showing high degree of variations. This variation can be precisely correlated with spawning activities. The variation in the fat and water in both the sexes of *G.biocellatus* are shown in Table No. 01 and 02. It can be seen that in Liver, the fat and the water in different show more or less inverse relationship

The percentage of water in liver varies from 34.02 (Aug.) to 38.20 (Dec.) in males (Table No.01) and 35.15 (Sept.) to 42.20 (Jan.) in females (Table No.02). The fat percentage varied between 40.81 (Jan.) to 44.10 (April) in males and 36.19 (Jan.) to 43.64 (Sept.) in females respectively. The percentage of water in both the sex has comparatively higher during September to December and in January and June and that of peak spawning season. It can be seen from the Table No. 01 and 02 that percentage of water is slightly higher in females than males. The fat values in liver were seen slightly higher during peak spawning season (Monsoon) as compared to other months of the year.

The rise in the liver fat indicates re-storage of fat in liver. The highest value of liver fat in peak ripeness and decreasing with onset of spawning has been noted by Jafri and Khawaja (1968). As it is already recorded that *G.biocellatus* spawns throughout the year therefore it is impossible to observe the high fat values in liver during specific months. It can be inferred that in order to fulfill the increasing energy demand of gonads during development, the mobilization in muscle fat is not sufficient; therefore, the liver fat also has to undergo similar changes.

Table No.01:

Monthly variations in the percentage of Water and Fat in the Liver of male *G.biocellatus*.

Month	Water	Fat
January	36.8	40.81
February	35.43	43.3
March	35.7	42.89
April	34.3	44.1
May	35.1	41.33
June	36.92	41.28
July	34.81	42.63
August	34.02	42.49
September	35.91	44
October	36.65	40.95

November	37.11	42.02
December	38.2	41.61

Table No.02:

Monthly variations in the percentage of Water and Fat in the Liver of female *G.biocellatus*.

Month	Water	Fat
January	42.2	36.19
February	41.55	37.8
March	39.95	38.3
April	38.79	40.8
May	39.75	37.05
June	38.05	39.5
July	38.35	41.18
August	38.39	38.56
September	35.15	43.64
October	38.91	39.5
November	38.75	40.87
December	40.1	38.7

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