



Variations in Total Protein Contents of Freshwater Fishes from Godavari River, Nanded, Maharashtra, India

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ABSTRACT

Protein being an importance constituent of animal tissues, has a main role in cell metabolism. Many species of fish are consumed as food in virtually all regions around the world. Fish has been an important source of protein and other nutrient's for humans throughout history. Intermediate technology publication published in 1992 states that "Fish provides a good source of high quality protein and contains many vitamins and minerals." Animal proteins which include milk, fish, meat and egg are essentially required for nutritionally balanced diet's which are available from diverse food commodities. More than two third of the protein supply in fish was contributed by freshwater fishes. Three different fish species are selected for the study of protein from local fish market for the present estimation. There is significant difference in total protein content of body muscles of *Notopterus notopterus*, *Cyprinus carpio* and *Mystus seenghala*.

Keyword: Fresh water fishes, Protein, Lowry's Method.

INTRODUCTION

Protein being an importance constituent of animal tissues, has a main role in cell metabolism. Fish is an important source of food for mankind all over the world from the times immemorial. The importance of fish as source of high quality, balanced and easily digestible protein, vitamins and poly saturated fatty acids is well understood now. Fishes are valuable sources of high grade protein and other organic products. They are most important source of animal protein and have been widely accepted as a good source of protein and other elements for the maintenance of healthy body (Andrele, 2001). To ensure access to the nutritionally adequate food for the improvement in the quality of diet of a poor person in the society, fish is the only medium which can serve the purpose. They have the ability to reduce blood lipid level, particularly serum triglycerides and also have a good source for human nutrition due to their therapeutic role in reducing certain cardio vascular disorders. Fish is the constituting the only animal protein source among rural poor households. Protein are the most important characteristics of living matter and are also the principal constituent's of protoplasm which

from the material basis of life (Jain and Singh, 1981). Besides this fishes are good source which possess immense antimicrobial peptide in defending against dreadful human pathogens (Ravichandran *et al.*, 2011).

They have significant role in nutrition, income employment and foreign exchange earning of the country. Fish and shellfish are the primary sources of animal protein and valuable in the diet because they provide a good quality (usually 70% or more) or protein of high biological value, particularly Sulphur containing amino acids (Latham, 1997).

Fish flesh contains varying proportion of water, protein, fat, ash, carbohydrate and other important mineral and vitamins. The aim of this study is to examine the estimation of protein from fish muscles.

MATERIAL AND METHODS

The *Notopterus notopterus*, *Cyprinus carpio* and *Mystus seenghala* fish species were selected for the present study to estimate protein content from the local fish market Nanded. The selected fish species were brought to the laboratory, washed thoroughly and analyzed. The specimen's of similar size were selected. Lowry's Method is used to calculate the protein value in muscle sample of selected fishes, Lowery *et al.*, (1951).

The estimation of protein content was done by the method of Lowry *et al.*, (1956) using crystalline bovine serum albumin (BSA) as the standard. The values were calculated from standard graph of protein. The obtained results were compared with the animals maintained in the control set. The obtained values are

plotted in graph and discussed in detail. The total protein content is expressed as mg/gm wet wt. of tissue.

RESULTS AND DISCUSSION

Proteins are "building blocks of life". They are found everywhere in an organism which are of vital importance to the survival of living things. The proteins are formed without any defects organization in the cell. Proteins constitute a large part of the structure of cells and are present in all tissues which are composed from chain of amino acids. They are vital components of every cell in the living organism. They play an important role in physiological functions viz. structural components of cell membranes enzymes, proteins in blood (plasma proteins and hemoglobin), hormones, nucleoproteins and antibodies (Albert Lehninger *et al.*).

Protein being an importance constituent of animal tissues, has a main role in cell metabolism. A marked variation was found in protein content of these fishes Niamke *et al.*, (2005) reported the Lowry method to be unreliable in the acidic and increasing vitamin C rich medium. It was suggested to evaporate organic solvents (compounds) when they are used to extract protein prior to protein measurement the Lowry method. The influence of phenolic compounds on the Lowry's method was found to be governed by the structure of their molecules while Ammonium Sulphate was a major agent used in the enzyme purification process. Ashashree *et al.*, (2013) reported the protein levels of muscle in male catfish *Mystus cavasius* varied from 0.42 to 5.27, highest in December and lowest in July.

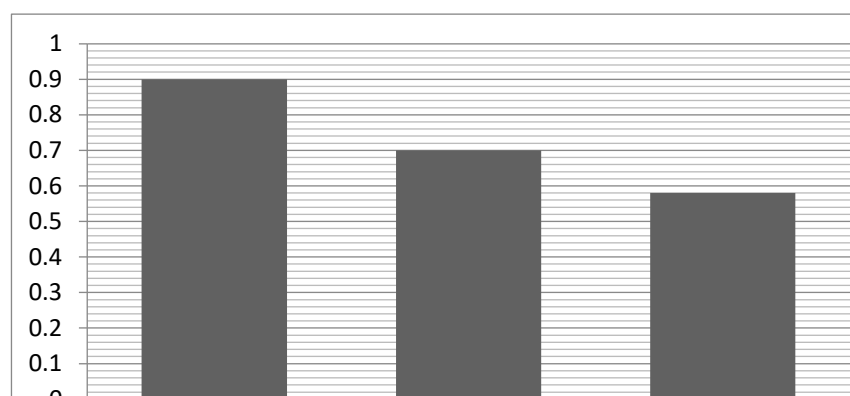


Figure 1: Graphical Representation Showing Concentration of Protein in Muscle Tissue from *Notopterus notopterus*, *Cyprinus carpio* and *Mystus Seenghala*.

Saranya *et al.*, (2014) studied the biochemical composition of cultural and natural fishes *Catla catla*, *Labeo rohita* and *Cirrhinus mrigala*. The concentration muscle protein was maximum in March 19.920 gm, 20.021 gm, 19.560 gm in natural fishes. But in Cultural fishes, maximum protein concentration in muscle was 18.516 gm in *Catla catla*, 19.210 in *Labeo rohita* and 18.27 gm in *Cirrhinus mrigala*. While, lipid concentration in muscles of *Catla catla* 3.961 gm, *Labeo rohita* 4.231 gm *Cirrhinus mrigala* 3.731 gm, in natural fishes. In cultured fishes, it was 2.967 gm in *Catla catla*, 3.160 gm in *Labeo rohita*, and 2.532 gm in *Cirrhinus mrigala*.

Yeganeh *et al.*, (2012) reported that protein content of *Cyprinus carpio* decreased from summer to spring season 17.6 – 15.9% in the farmed carp samples and 18.2 – 17.9% in the wild carp samples and lipid content also decreased from summer to spring season 5.1 – 1.5% in farmed carp and 3.8 – 2.8% in wild carp. Muzumder *et al.*, (2008) analyzed protein in *Amblypharyngo donmola* (18.46%), *Gundusia chapra* (15.23%), *Puntius chola* (14.08%), *Chanda nama* (18.26%), *Pseudeutropinus atherinoides* (15.84%), and in *Ailia coila* (16.99%). Whereas, fat protein content was observed highest in *Gundusia chapra* (5.41%) and lower in *Amblypharyngo donmola* (4.10%) and 3.05% in *Puntius chola*, 1.53% *Chanda mama*, 2.24% in *Pseudeutropinus atherinoides*, 3.53% in *Ailia coila*.

Debnath *et al.*, (2014) was reported the highest protein content in *Labeo bata* (75.43%) and lowest in *Catla catla* (39.37%) Shi *et al.*, (2013) reported the protein contents of bighead carp (*Aristichthys nobilis*) muscle were slightly higher than those of Paddlefish (*Polydons pathula*). However, the amount of fat content in paddlefish was significantly higher than that of bighead carp.

Shillewar *et al.* (2018) suggested that the protein content of fish greatly varies during the different season. It may be due to the physiological condition and Environmental condition that is spawning breeding, migration & heavy feeding.

The total protein content in various tissues in fishes were investigated by various authors and correlated their results with different factors like seasons, habitat differences, processing methods, sex differences, breeding seasons and non-breeding seasons, size and age differences etc. There are very few reports on the

variations in the total protein content in the fish tissues with difference in the habitat of fish.

The total protein content is higher in *Notopterus notopterus* than *Cyprinus carpio* and *Mystus seenghala*. Total protein content in body muscles of *Notopterus notopterus* 0.9 mg. Total proteins content in Pancreas of *Cyprinus carpio*. Lower total protein content in body muscles of and *Mystus seenghala*. There is significant difference in total protein content of body muscles of *Notopterus notopterus*, *Cyprinus carpio* and *Mystus seenghala*.

Conflict of Interest

The author declares that there is no conflict of interest.

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