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Variations of Protein Content in Commercially Important Fishes Channa Striata and Labeo Rohita

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Abstract: *Fish has been honored as an excellent food source for human beings for centuries throughout the globe. For the present study, Channa striata and Labeo rohita were selected. Fish store the protein in various organs; particularly in muscles and liver. A great amount of these protein is transferred to different parts of the body to be used for various physiological actions. Present study was carried out to find the protein content of two economically precious fishes. Results showed that these fishes are a source of high-quality protein. This quantitative variation of protein content in muscle was discussed with respect to the stages of reproduction.*

Keywords: Channa striata, Labeo rohita, muscle and protein

I. INTRODUCTION

Fish is the cheapest source of animal protein for some communities including those who don't consume red meat, the glutted, immunocompromised, pregnant women, and nursing maters. Several species of fish have been part of the diet of some ethnical groups in all mainland's for a long time. Fishing makes the widest donation to grope meat; marketable fish husbandry is limited. Due to its high protein content, fish is generally used as relish. Fish have a high profitable value deduced through operation of fisheries and monoculture which give employment, recreation, trade, and profitable well- being for those involved in the trade. Products from fishing are an important part of transnational trade, presently worth further than US$ 50 billion (V. Venugopal, 2002).

Water constituents about 71% of the earth's surface and has always been an important actual and potential source of food. There is an increasing demand for aquatic resources and fish products as dietary protein source around the World. (Feldhusen, 2000). Fish has been honored as an excellent food source for human beings for centuries throughout the globe. Fishery products are veritably important for food security, furnishing further than 15 of total beast protein inventories (FAO 2005). This sector is also pivotal not only as a main source of beast protein to ensure food security (Sheikh and Sheikh 2004) but also to ameliorate employment and income for poverty elimination in developing countries including India

Monoculture assiduity gradationally developed in the world as well as in India. Fishes are the major factors of submarine fauna, which are the principal source of proteins. Fishes are relatively different from the other beast food sources, because they've high- position proteins, which contain all essential amino acids and form salutary nutrition sources (Weatherley and Gill, 1998).

Biochemistry is the wisdom concerned with colorful motes and their chemical responses that do in living cells and organisms. In general, the biochemical composition of the whole body indicates the fish quality. thus, the proximate biochemical composition of a species helps to assess its nutritive and comestible value in terms of energy units compared to other species. A variation of the biochemical composition of fish meat may also do within the same species depending upon the fishing ground, fishing season, age and coitus of the individual and reproductive status. The spawning cycle and food force are the main factors responsible for this variation Love (1980).

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II. MATERIAL AND METHODS

For the present study, *Channa striata* and *Labeo rohita* were selected. *Channa striata* is commonly known as murrel or snakeheaded fish due to the presence of large scales over flattened head, cylindrical and elongated body. Due to its air breathing habit and hardy nature, it is found quite frequently in shallow or deep parts of rivers, lake etc. with or without aquatic vegetation throughout India. It is reported to have high nutritional content (70% protein, 1% fat), amino acids and micronutrients such as zinc, selenium and iron.

Labeo rohita is a popular Indian major carp species in carp polyculture practice. It's known as water column confluent which feeds on plankton. High growth eventuality and comity coupled with high consumer preference, have established rohu as one of the most popular and succulent brackish fish dressed in India, Bangladesh and other conterminous countries in the region. It serves as an important nutritive source of protein and n- 3 PUFA fatty acids.

Collection and Maintenance of fish

Mature fishes of *C. striata* and *L. rohita were* collected from available resources in and around Nagpur city. All the fishes were transported alive to the laboratory in plastic containers and kept in glass aquaria. The body weight of the fishes ranged between 600gm to 2kg.After sacrificing the fish muscle was removed and the muscle was used for analysis of protein. Tissue proteins were estimated by Lowry *et al*., (1951) method with minor modification.

III. RESULT AND DISCUSSION

Proteins are substantially involved in the armature of the cell. Fish proteins contain all the essential amino acids. Sea and brackish fishes which constitute the maturity of water products make up an important part of animal food sources for mortal. Fishes are relatively different from the other animal food sources, because they give low energy and have high- position proteins, which contain all essential amino acids. So, they're salutary nutrition sources (Weatherley and Gill, 1998).

Seasonal changes in various biochemical constituents of muscle, liver and gonads were studied in the catfish, *Wallago attu* (Jafri, 1968). Seasonal fluctuation in protein is less pronounced in muscles and liver while in ovaries, it is fairly well defined. Protein values in all the tissues are generally low during the winter.

Muscles form the largest tissue component of the fish body and constitute about 40% of the total body weight and are the edible portion. All physical functions of the body involve muscle activity such as skeletal movements, contraction of the heart, contraction of the blood vessels, peristalsis in the gut and many more. Muscles are also responsible for giving shape to the body.

The cyclic changes in the gonadal cycle of *C. striata* and *L. rohita* are determined by calculating the gonadosomatic indices (GSI) and histological details of the gonads and on this basis, both are found to be annual breeders. The cycle is divided into five phases: resting phase, preparatory phase, prespawning phase, spawning phase and postspawning phase.

In resting phase, protein content is relatively high in muscle (40.29mg/gm for *C. striata* and 38.39 mg/gm for *L. rohita*). In the preparatory and prespawning phase, there is gradual decrease protein content (34.15 mg/gm and 29.43 mg/gm respectively for *C. striata* and 32.45 mg/gm and 28.39 mg/gm respectively for*L. rohita*). In spawning phase it is decreases sharply (24.84 mg/gm for *C. striata* and 22.36 mg/gm for *L. rohita*) and in postspawning phase it increases(31.54 mg/gm for *C. striata* and 28.64 mg/gm for *L. rohita*).

Present study was carried out to find the protein content of two economically precious fishes. Results showed that these fishes are a source of high-quality protein. This study also delivers precious information on variations in protein content of fish species studied. Biochemical studies of fish towel are of considerable interest for their particularity in relation to the food values of the fish and for the evaluation of their physiological requirements at different ages of life. Muscles have highest content of proteins in resting period which subsequently are utilized as oogenesis and spermatogenesis progresses and are reduced in the preparatory phase and as the vitellogenesis commences in the prespawning period, they fall to the lowest levels. This is due to partitioning of energy between the somatic components and reproductive component during breeding. Muscle protein is minimum during spawning season confirming our observations of partitioning of energy between muscles and reproductive components according to the breeding cycle.

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Table 1: Variations in total protein and fatty acids contents of muscles of *C. striata* (Values in mg/gm wet weight of tissue)

Phases	Protein
1. Resting phase (Control)	40.29 ± 1.577
2. Preparatory phase.	34.15 ± 0.629 P‹ 0.05
3. Prespawning phase.	29.43 ± 0.650 P‹ 0.001
4. Spawning phase.	24.84 ± 0.137 P‹ 0.0001
5. Postspawning phase.	31.54 ± 2.203 P‹ 0.0001

NS-Non-significant

Table 2: Variations in total protein and fatty acids contents of muscles of *L.rohita* (Values in mg/gm wet weight of tissue)

Phases	Protein
1. Resting phase (Control)	38.39 ± 0.685
2. Preparatory phase.	32.45 ± 0.285 P‹ 0.001
3. Prespawning phase.	28.39 ± 0.940 P‹ 0.0001
4. Spawning phase.	22.36 ± 1.325 P‹ 0.0001
5. Postspawning phase.	28.64 ± 0.805 P‹ 0.05

NS- Non-Significant

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