

Short Communication

Fish muscle protein highest source of energy

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The proximate biochemical composition and seasonal variation in proteins of small indigenous fish species such as *Salmostoma sardinella*, *Cirrinus reba*, *Garra mullya*, *Rasbora daniconius* and *Puntinus conchoniensis* were analyzed. The proximate composition was found to vary among the species. Protein was estimated in *S. sardinella* (25.64%), *C. reba* (24.19 %), *G. mullya* (28.69%), *R. daniconius* (32.79%) and *P. conchoniensis* (27.10%). The present findings revealed that the highest protein content was recorded in *R. daniconius* fish. The results indicate that *R. daniconius* shows more protein content as compared to the other fishes. These results showed that in all these fishes, a good quantity of protein is present just like the commercial fishes, so they can be safely used in food to supplement protein. It also indicates that the proximate composition of fish depends on season and also to a great extent on reaction to size, age, sex, reproducing cycle, breeding season and region of catch.

Key words: Protein, indigenous fish species, sex variation.

INTRODUCTION

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 polysaturated 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 (Andrew, 2001). The consumption of fish and fish products is recommended as a means of preventing cardiovascular and other diseases and greatly increased over recent decades in many European countries (Cahu et al., 2004). Besides, these 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 quantity (usually 70% or more) of protein of high biological value, particularly sulphur containing amino acids (Latham, 1997). Next to meat, fish is the only protein source that contains all the essential amino acids in right proportion and called complete protein. Consumption of fish provides important nutrients to a large number of people in the world and makes a very significant contribution to nutrition.

Small indigenous fish species are valuable sources of macro and micronutrients and play an important role to provide essential nutrient to the people. They provide a major protein of animal protein. Hence it is essential to know proximate composition of fish to report their nutrient composition from public health point of view. The composition of biochemical constituents of any organism varies with the variation of environmental changes. The composition in different fish species and in individuals of single species has been reported in relation to

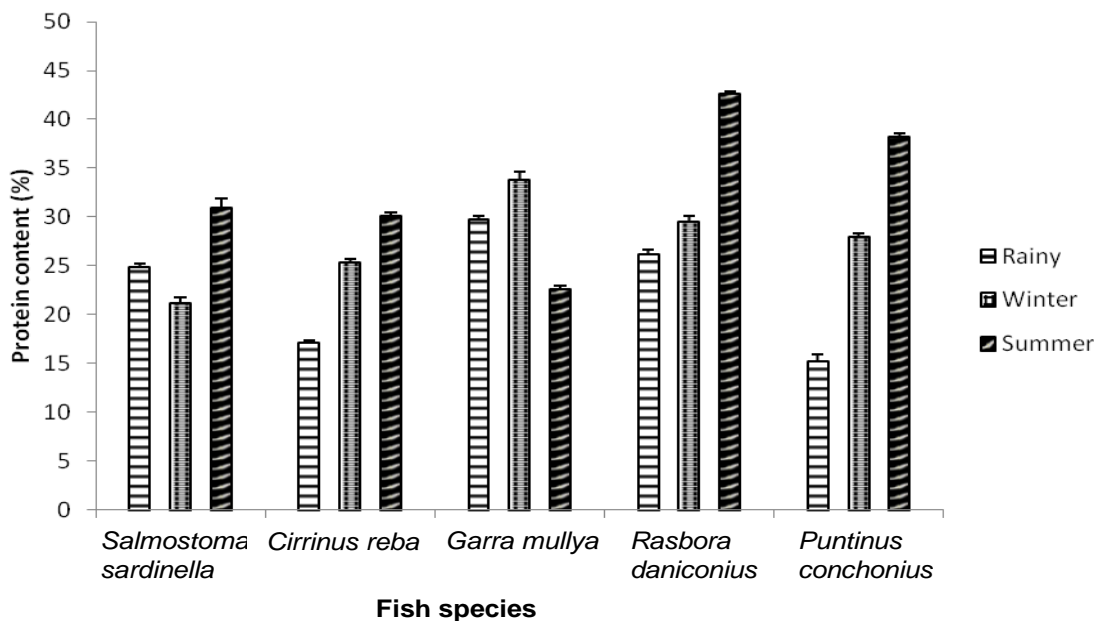


Figure 1. Seasonal changes in the levels of protein in muscles of fish species 2008-09 (mg/g).

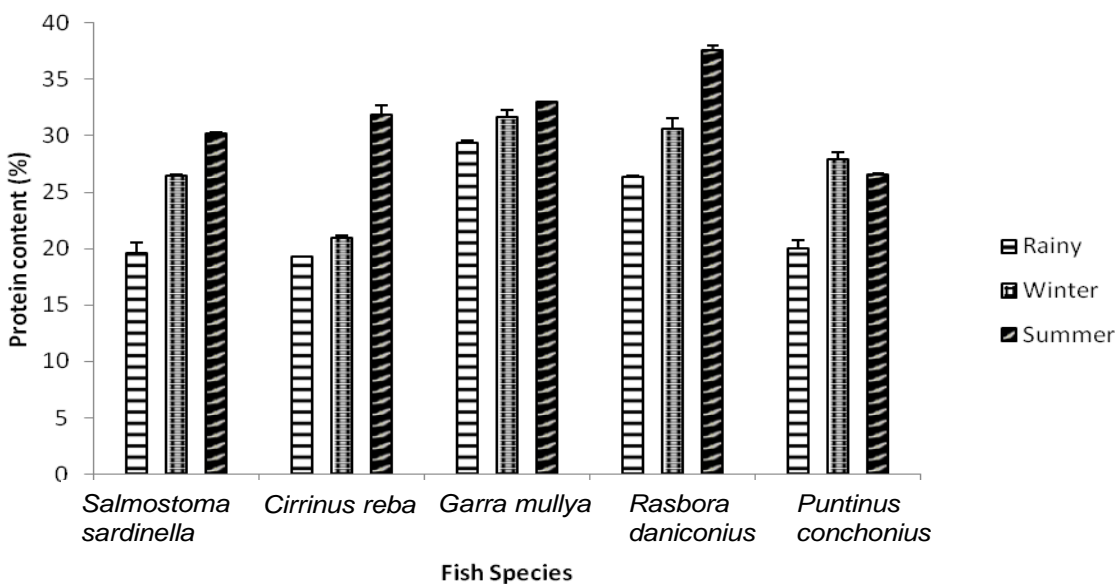


Figure 2. Seasonal changes in the levels of protein in muscles of fish species 2009-10 (mg/g) (Mean ± S.D.).

Kanher Dam is a medium irrigation project constructed by Irrigation Department, Government of Maharashtra on Venna River near Kanher of Satara district. It is situated on latitude 17°44" 16°02"N and longitude 73°53" 43°10" E (Google Earth, 2009). The dam has a capacity to store 286 million cubic mt. of water. The water from dam is used for drinking, domestic purpose and irrigation and fishing practices (culture and capture fishery) are carried out under fishery development office, Satara (Kanher).

In the present investigation, five indigenous fish spe-

cies from fresh water habitat, Kanher dam: *Salmostoma sardinella* (Ham.), *Cirrinus reba* (Ham.), *Garra mullya* (Skyles.), *Rasbora daniconius* (Ham.) and *Puntinus conchoniuis* (Ham.) (Figures 1 and 2) were selected to evaluate not only their nutritive value but also helps in quality assessment and optimum utilization of this natural resources (Rodriguez-Gonzalez et al., 2006). The major proximate biochemical composition such as protein, lipids, carbohydrate, glycogen and free amino acids of these species is not determined. Therefore, the aim of the

the present study was to determine the composition of these fish species in relation to their food value.

MATERIALS AND METHODS

The current research was been carried out in two years, from 2008-2010. Specimens were brought to the laboratory, washed thoroughly and analyzed. The specimens were identified by referring to standard literature of Datta and Srivastava (1968), Jayaram (1985) and Talwar and Jhingran (1991) and protein was analyzed using the method of Lowery et al. (1951).

RESULTS AND DISCUSSION

A marked variation was found in protein content of these fishes. It ranged from 15.19 to 42.59%. Many workers have reported macro and micro amount of nutrient content of fish throughout the world. Stansby (1954) has established that information on the chemical composition of fish in respect to the nutritive value is important to compare with other source of animal protein, food such as meat and poultry products. Kamaluddin et al. (1997) and Rubbi et al. (1987) mentioned proximate composition of some commercial species of fresh water fish. Naser et al. (2007) stated the proximate composition of prawns and shrimps in Bangladesh.

The present investigation deals with proximate composition and seasonal variation in protein values in muscles of five fresh water fishes such as *S. sardinella*, *C. reba*, *G. mullya*, *R. daniconius* and *P. conchoniis* recorded in 24 months. These results showed that in all these fishes, a good quantity of protein is present just like the commercial fishes, so they can be safely used in food to supplement protein. The results indicate that proximate composition of fish depends on season, sex and reproductive cycle. It is evident that these results were in good agreement with the work of Khuda et al. (1964), Somvanshi et al. (1983), Jafri (1968), Rubi et al. (1987), Chamundeshwari and Vijayaragahwan (2001) and Shaikh and Prakash (2011).

Conclusion

The study clearly indicated a marked fluctuation of protein in the three seasons both in male and female fish species.

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