

# Variance of protein content in fresh water and marine water edible fishes from Pimpri Chinchwad region, Maharashtra

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## ABSTRACT

Fish proteins contain 15 to 20% of the live body weight which includes all essential amino acids in required proportion and have high nutritive value. A portion of fish provides one third of one's protein requirement as it contains all the eight essential amino acids. Consumption of both fresh water and marine water fishes is encouraged because of its nutritional significance. The aim of the present study is to determine protein content of selected fish species available from Pimpri Chinchwad area. Comparative study was made between fresh water fish *Labeo rohita* and *Catla catla*, marine water fish *Rastelliger kanagurta* and exotic fish *Orichromis mossambicus*. Protein content was estimated from muscle tissues of selected fish species by Lowry's method. The three replicates were subjected for statistical analysis for comparison of mean of protein content between four fishes. The present investigation provides information about protein profile of fish food available in Pimpri Chinchwad area.

**Keywords:** Pimpri-Chinchwad, edible fish species, muscle proteins.

## INTRODUCTION:

Fish as food consumed in almost all parts of the world. Proteins are complex molecules range from less than 5000 to several thousand Daltons. Fish is an important source of quality protein and it has been reported that fish protein has greater satiety effect than other sources of animal protein like beef and chicken (Uhe, 1992). Fish in this context can play a vital role as it is an important and cheaper source of quality proteins, have wide choice of fish affordability in tropical countries (Mohanty, 2011). Fish protein has high digestibility. The nutrition value has been proven through the nutritional study in children under five years of age (Johnson, 1962). Millions of people are suffering from malnutrition and 80% of them are children of developing countries (FAO, 2013).

Comparative study was made between fresh water fish *Labeo rohita* (Hamilton-Buchanan) and *Catla catla* (Hamilton-Buchanan) marine water fish *Rastelliger kanagurta* and exotic fish *Orichromis mossambicus* (Peters) available in Pimpri Chinchwad region. Protein content was estimated from muscle tissues of selected species. Several investigators such as, Patil and Muley (2009), Siddique et.al., (2010), Mohanty, et.al, (2012) and Shingada (2013) analysed protein in various fish species. Fish protein profile is affected by various environmental factors. Present study is carried out to know protein content present in fresh water as well as marine fish species available in Pimpri Chinchwad area.

## METHODOLOGY:

(A) **Selection of fish species;** The common edible fish species available in Pimpri Chinchwad fish market are selected for present work.

Fresh water fishes: *Labeo rohita* (Hamilton-Buchanan) and *Catla catla* (Hamilton-Buchanan),

Marine water fish: *Rastelliger kanagurta* (Cuvier)

Exotic fish: *Orichromis mossambicus* (Peters).

(B) Estimation of Protein content:

Fish species purchased from local markets of Pimpri-Chinchwad Municipal Corporation, Pune. The fish samples were brought to the laboratory in iced condition in insulated boxes. Homogenous mixture of fish muscles was prepared. Total protein content from the selected species was done by Lowry's (1951) method. The analysis was carried out in triplicates.

(C) Statistical Analysis: Statistical analysis of protein values obtained from triplicates of the species sample was carried out. Mean, standard deviation and analysis of variance was calculated.

RESULTS

Table 1. Analysis of variance of total proteins with in e selected fish species (mg/100mg)

Sample No	<i>Rastelliger kanagurta</i>	<i>Labeo rohita</i>	<i>Orichromis mossambicus</i>	<i>Catla catla</i>
1	31.95	26.24	20.94	18.53
2	30.54	24.32	21.55	19.24
3	29.35	27.25	23.63	18.31
MEAN	30.61	25.94	22.04	18.69

Figure 1. Protein content in selected fish species(mg/100mg)

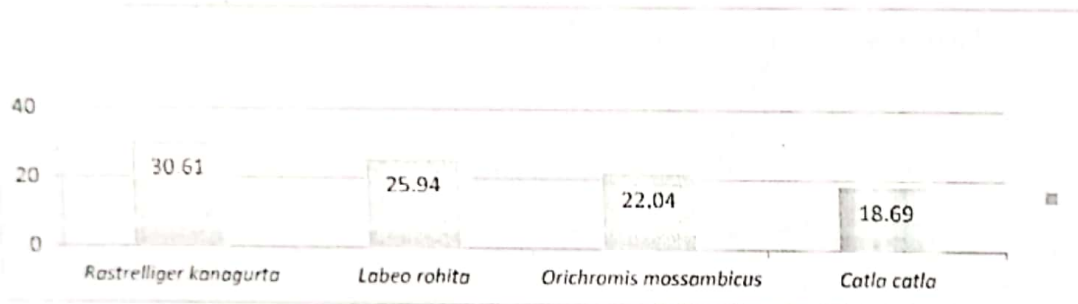


Figure 2. Standard deviation of protein contents in selected fish species (mg/100mg).

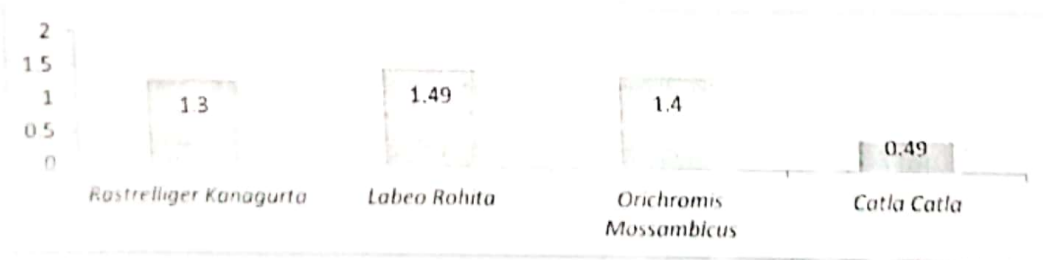


Table 2. Analysis of variance of protein content in fish species in mg/100mg

Anova: Single Factor				
Fish species	Sample Count	Sum	Average	Variance
<i>Rastelliger kanagurta</i>	4	122.45	30.61	1.13
<i>Labeo rohita</i>	4	103.75	25.94	1.48
<i>Orichromis mossambicus</i>	4	88.16	22.04	1.33
<i>Catla catla</i>	4	74.77	18.69	0.16

Table 3. Analysis of significance difference in protein content in mg/100mg

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	316.32	6.00	52.72	38.67	0.0000631	3.37
Within Groups	12.27	9.00	1.36			
Total	328.59	15.00				

As per Table 1 highest protein content was obtained in *Rastelliger kanagurta* (30.61%), followed by *Labeo rohita* (25.94%), *Orichromis mossambicus* (22.04%) and lowest protein content in *Catla catla* (18.69%). Marine water fish contain more protein as compared to fresh water fish *Labeo rohita*. Exotic fish *Orichromis mossambicus* has more protein content as compared to fresh water fish *Catla catla*. There is no significant difference between protein content of all four selected fish species ( $P < 0.05$ ) as given in table 3.

## DISCUSSION

As given in table 3 there are significant difference in protein content among four fish species. The total protein content was estimated by various biologists from fish species and their results were correlated with present investigation. A study done by Islam (2005) protein content in *Glissogobius giuris* ranged from 14.09% in February and 16.03% in August. Siddiqui et. al, (2010) estimated the protein levels of *Mystus tengra*, *Mystus cavasius*, *Mystus gulio* at fresh conditions were 16.26%, 15.52 % and 14.80%, then after twenty days of freezing protein level decreased as 14.97%, 13.91%, 13.43%. The reduction protein content is related with denaturation of fish protein because of freezing. Singhadia (2013) reported that the total protein in muscle tissues of *Harpondon nehereus* ranged from 15 gm % in September 37% in March. Patil and Mulley (2009) reported decreasing protein content in the fish species due to industrial pollution in Pauna river. In present work low protein content in *Catla catla* is correlated with work of Jha in 1999 and reported that loss of total protein may be associated with intensive proteolysis and inhibition of protein synthesis. Saranya et.al. studied biochemical composition of muscle protein in *Catla catla* and *Labeo rohita* muscle protein concentration was 18.21gm/100gm and 19.21 respectively. The protein content of fish species is affected by various factors as discussed above.

## CONCLUSION:

The highest protein content was obtained in *Rastelliger kanagurta* (30.61%), followed by *Labeo rohita* (25.94%), *Orichromis mossambicus* (22.04%) and lowest protein content in *Catla catla* (18.69%). Significant difference in protein percentage was found among all four fish species studied.

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