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# Studies on Biochemical Analysis of Fishes at Karadkhed dam, Tq. Degloor Dist. Nanded, Maharashtra, (India)

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## Abstract

Healthy fish with good amount of Nutritional value has become demand of population. In general the good quality of fish indicates biochemical composition of fish body. Nutritional value of fish can be described by its analysis as fish is good source of carbohydrate, proteins, vitamins, lipids and India has rich and diverse fisheries resources which ranges from deep seas to lakes, rivers etc. For present research we have selected Karadkhed dam of Taluka Degloor district Nanded. It is an earthfill dam on local river. It is 93Km away from Nanded district headquarters. It is constructed in year 1978 for irrigation purpose where fish farming is also observed. The storage capacity of Dam is 12,000.00Km<sup>3</sup>. The dam is used for cultivation of fishes. The people living in Degloor and around area demands fish for eating purpose. In this dam fish farming is done with help of Chinese hatchery which ensures high hatching success.

Now-a-days increasing malnutrition has become main problem of country and fishes are considered important in overcoming such problem as fishes have good amount of protein and carbohydrate. The present investigation is carried out for biochemical analysis of fresh water fishes Catla, Rohu, Mrigala. The amount of protein reported in catla, rohu mrigala was 13.41mg/g, 16.4mg/g and 14.7mg/g respectively; the carbohydrate content as 1.93mg/g in Catla, 1.78mg/g in Rohu and 2.12mg/g in Mrigala. In the present investigation the amount of carbohydrate was observed high in Mrigala compare with Catla and Labeo. The high amount of protein was observed in the freshwater fish Labeo rohita followed by the mrigal and Catla.

**Keywords:** Biochemical Analysis, Catla, Rohu, Mrigala, Protein, Carbohydrate, Lipid.

## Introduction

Now-a-days increasing awareness of healthy food has increased intake of fish. Now fishes are used as a good source of nutrition, they have become good source of animal protein it also increased fish production. As fish also contain good amount of carbohydrate along with protein. So because of this nutritional value many nutritionist recommend fish and fishery product. But along with this nutritional benefits early perishability is also fact, as fishes are easily perishable in quality. It affects the biochemical contain of fishes. The protein, carbohydrate, fats level will be affected by this kind of factor. So it lowers the nutritional value i.e., quality and quantity of protein, carbohydrate, fats, vitamins get affected. So now researchers have been focused on observing nutritional level in different fish species.

According to Mohanty, [2015] fishes have high nutritional value fishes contain micro and macro-nutrients in which protein, carbohydrates, fats are considered as macronutrients. Fish is good source of protein [Chilima, 2006]. Globally fish accounted for animal protein [Mba et al., 2011] result of world's demand for aquatic food, gradually fish is becoming medical food of this country. Fish has become important not only as food source, it also provide good quality of protein and other nutrient which are helpful for healthy body [Andrew, 2001; Agusa 2007].

According to Bhuiyan et al. [1993] besides being good source of protein, carbohydrate fishes are also provided with good amount of vitamins, minerals naturally [Qyvind et al. 1994]. As for use of fish in human diet concerned, fish has become one of main food constituent in human diet as it provides essential Fatty acids and some vitamins, minerals in sufficient amount for healthy living [Borgstrom 1961]. This nutritional level suggest that fish should be an integral component of diet as it also helps to recover problem like malnutrition. According WHO, people facing problem like HIV can live longer life with good, balanced diet which include fishes also. So it is evident that fish can contribute more to peoples diet. Ackman and Takeuchi [1986] reported the importance of fat and Fatty acids compositions of some food fishes. As Gatlin reported that the fish fat provides much of energy to body. The term fat or oil is often used to represent similar component.

As another researcher reported that fish oil is also important source of PUFA ie. Polyunsaturated fatty acids which is useful for human health [Rafflenbeus, 2001, Saoud. Et.al. 2008]. Fish also contain significant amount of all amino acids which are relatively poor in cereals as result it improve protein quality of diet [FAO 2005].

Yashodhara et. al. 2009 mentioned that carps have immense source of lipid, protein, fatty acids and n-3, n-6, PUFA that enhances its nutritional value for human beings. Meat of fresh fish provides 90-95% of fish protein to consumer which make it important part of human diet [Memonetal, 2011]. Fishes nutritional value changes according to changes in their biochemical composition ie. Presence of factor like, percentage of protein, carbohydrate, fats. This chemical composition many time varies with age, sex, season [Muraleedharan et al.,1996]. In the present study Catla, Rohu, Mrigala are selected for their biochemical analysis. As for fresh water fish farming the species like catla, rohu, mrigala contribute 87% water production [Khillare Y K 2012]. Because of potential growth rate of catla, rohu, mrigala are highly preferred fish in all over world including India [Memon and Sadhu-2020]. From the above study it is need to assess the nutritive value of the freshwater Indian major carps. The protein and carbohydrate percentage will be observed in present study, nutritional level of this fishes will be analysed.

### Materials and Methods

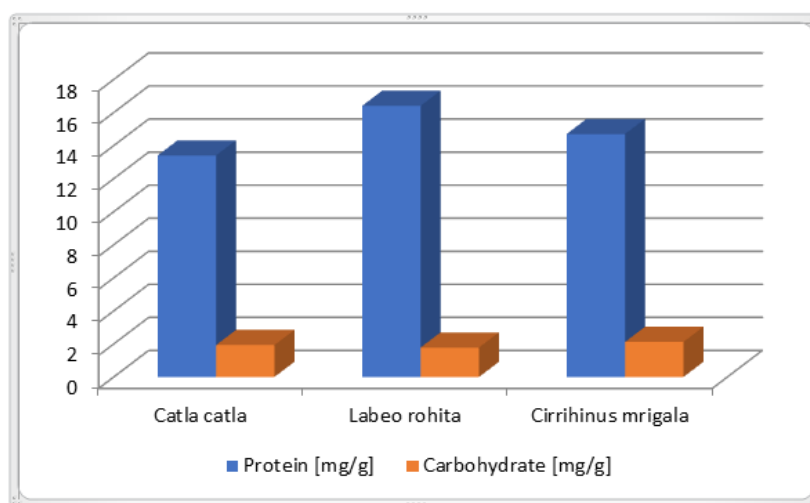
**Study Area:** The fishes were collected from Karadkhed dam near Degloor Taluka which was mainly constructed for the purpose of irrigation but now often used for fish farming. The collected fish were cleaned with water and flesh was grinded by mortal pestle and sample material is prepared which further used for estimation process. Protein is estimated by Lowery's method [Lowery, et al. 1951] and glycogen estimation is carried by Anthrone reagent method [Anthon, Seifer, et al. 1950]. The standard concentrations are taken and result is concluded.

### Result and Discussion

Protein and carbohydrate are the chief nutrients of animals foods, providing quality food for increasing human population is highly important and fishes are considered as high in nutritious [Adeyey, 2008 and Onyia 2010]. The present investigation analyse the chemical constituent of selected fishes. This biochemical analysis is carried out by standard estimation process. In present study protein estimation is done by Lowery's method and carbohydrate estimation is done by Anthrone reagent method. The amount of protein estimated in Catla, Rohu and Mrigala species are 13.41mg/g, 16.4mg/g and 14.7mg/g respectively. The percentage of Protein and Carbohydrates are represented in Table No. 1 and graphically represented in figure No. 1. The present research shows how Rohu is rich in protein amount followed by other two fishes. Whereas according to Arati Tidme ,et al., research the amount of protein found in Rohu and Mrigala are 9.406mg/g and 6.90mg/g respectively. This shows fluctuation in protein amount. It may be caused by poor health of fish species or may be poor quality of habitat, unfavourable environment is reason of such result. But according to Saranya et.al., [2014], Rohu has high amount of protein, which was 20.02mg/g. The result is not supported by the result of Aasma Shaikh and Sudha Bansode, they performed protein estimation on Catla and they have reported that protein content of Catla is 21.91mg/g which is considered as highest amount, they have estimated carbohydrate also which is 1.979mg/g. This result notify rich amount of protein in Catla species. Actually protein and carbohydrate are large biomolecules which decides nutritional level of fish food. These chemical molecules helps to balance energy levels but their values varies with age, sex, habitat, seasons [Saha and Guha 1940].

**Table No.1** Biochemical composition of Indian Major Carps

Species	<i>Catla catla</i>	<i>Labeo rohita</i>	<i>Cirrihinus mrigala</i>
Protein [mg/g]	13.4	16.4	14.7
Carbohydrate [mg/g]	1.93	1.78	2.12



**Fig. No.1** Biochemical Composition of Indian Major Carps

The carbohydrate values observed in present research are 1.93 mg/g in Catla, 1.78mg/g in Rohu and 2.12mg/g in Mrigala [Table no.1]. Even carbohydrate and protein are chief nutrients and after breakdown of carbohydrate into glucose it supplies energy in form of ATP molecules and content in fish is easily digestible then also sometimes fishes have been given importance only for their protein value. According to our study the protein content among Indian major carp was found wome what similar in all species. This result is also supported with another researcher [B.N.Paul et. al.] they have observed protein content in Indian mojar carp and found that there was less significant difference in protein, fat in catla, rohu, mrigala their research reports that the protein content in Indian major carp is normally ranged from 13.41-17.43. So in present investigation the average amount of protein was found, it can be improved that is highest nutritional level can be achieved if the fishes are provided with good supplementary food in the form of soyabean, rice cake or other artificial fish food available in market.

The study done by Sujatha et.al., [2013], suggested that fish provides 30 percent of animal protein eaten by 60 percent of people in many developing countries. The investigation done by Arati Tidme and et.al., on biochemical composition, estimated carbohydrate amount was 0.258mg/g in Rohu and 3.151mg/g in Mrigala. The estimation shows how Mrigala species are rich in carbohydrate amount. According to B.N. Paul study he observed that moisture content in Indian major carp normally ranges from 72.69 to 78.47% irrespective of their weight. Rohu and mrigala had higher moisture content than catla. B.N. Paul reported that there was no significant difference in protein, fat, content of rohu, catla, mrigala. According to research of Prakash and Verma [2018] stress can be one of the reason of this difference as along with the factor age, sex, season, stress is also important factor which can cause depletion of carbohydrate in fish species. The Love [1980] suggested that biochemical constitution in fishes varies greatly from species to species this is also supported by FAO [2002]. According to Sankar et.al. 2001 the big sized rohu and mrigala had higher moisture content than catla, they also reported that chemical value increases with the size of carps. This nutritional level also depend upon physico-chemical parameter of water body has to be analysed for improvement. This difference in chemical constituent of fish species can be easily nullify if good care is taken. If water body is regularly cleaned at regular interval and maintained transparency, turbidity, pH like factor of water it increase the productivity of pond as different parameters of water. They affect the growth rate of fish which result in fluctuation in nutritional level of fish.

### Conclusion

Generally biochemical composition of fish indicates fish quality. The present studies result indicates variation in biochemical constituents in fish species. The research is helpful as it facilitates the selection of most appropriate species having higher protein contents for human consumption. The need for analyzing fish is becoming increasingly important because proximate analysis is used as an indicator of nutritional value of fish food material.

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### Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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