

Comparative Studies of Protein Estimation in Different Fresh Water Fishes

Soumyashree Rath¹, Siba Prasad Parida²

Department of Zoology, School of Applied Sciences, Centurion University of Technology and Management, Bhubaneswar, Odisha, India

Abstract: Study of proximate composition in different fresh water fishes is important to know the nutritional status of fishes. In the present study biochemical composition like protein was estimated from this study. It was estimated that the species *Claria sbatrachus* contains more protein. The species that are experimented for protein conc. are *Cirrhinus reba*, *Mystus vittatus*, *Puntius denisonii*, *Clarias batrachus* and the results obtain are 2.167 ± 0.01 , 1.856 ± 0.094 , 2.254 ± 0.094 , 1.454 ± 0.440 respectively.

Keywords: *Cirrhinus reba*, *Mystus vittatus*, *Puntius denisonii*, *Clarias batrachus* protein content

1. Introduction

Fish and all sea food products have a rich nutritional value. They have more amount of proteins lipid and carbohydrate as well as much micronutrients (Tacon and Metian, 2013). Fish and sea foods also provides vitamins, iron and zinc to human body (Lund, 2013). In pre-agricultural times, some other foods are consumed by humans are like fruits, vegetables, nuts that containing higher amount of n-3 PUFA and lower amounts of n-6 PUFA than the modern foods (Simopoulos, 2003). An increasing amount of evidences suggest that due to its high connect of polyunsaturated fatty acid (PUFA) fish flesh and fish oil are beneficial in reducing the serum cholesterol (Huynh *et al.*, 2007). Fishes contains good quality, balanced and digestible protein (Mohanty *et al.*, 2012). Fresh fish meat provides good source of human diet, about 90 to 95% of fish protein is assimilated by human (Memon *et al.*, 2011). Aquatic animal foods have a lower caloric density, and have a high content of omega 3 long chain polyunsaturated fatty acids as compared to land living animals (Tacon and Metian, 2013). Fish protein considered as a high nutritional value (Sargent, 1997). In the last decades some research has been done and it concluded that the fish protein have a very beneficial result in human nutrition (Rudkowska *et al.*, 2010). Some other amino acid like taurine play an important role in the beneficial values of fish proteins specially in oily fish including sardines (Madani *et al.*, 2019). Also the Ash and mineral composition are similar to the protein content, but some other micronutrients can be influenced (Baker, 2001). Odisha is dominated flood plains and rivers which are rich ecosystems for diverse fresh water fauna. In total 186 species of the fishes belonging to 11 orders, 33 families and 96 genera were recorded from various freshwater bodies of Odisha. In the world, the millions of people have been suffering from malnutrition and protein deficiency especially in the developing countries. Protein deficiency may minimize to some extent by making available fish and shell fish items, which are available to local communities. Fish are known to be highly nutritious and an important component of diet and an excellent source of protein (Fawote *et al.*, 2007). *Clarias batrachus* is a potamodromous and both fresh and brackish water species widely distributed from Pakistan, Thailand, India, Srilanka country (Sen 2000 and Khan, 1985). *C. batrachus* has an elongated body with long dorsal and anal fin. Upper jaw is a little projectile

like structure (Taki, 1974). *Cirrhinus reba* has been reported as vulnerable in both India (CAMP, 1998) and Bangladesh (IUCN Bangladesh, 2000). It is mainly called as rebar carp. *Puntius denisonii* is a herbivorous fish is found to live in the filamentous algae, this species is related with the *Cyprinidae* family in fresh water ecosystem. (Radhakrishnan and Kurup, 2002a, 2002b). *Mystus vittatus* is commonly known as Asian striped dwarf catfish. It is a fresh water fish species. This species is commonly found in the water bodies of India, Thailand, Srilanka etc. (Talwar, 1991; Daniels 2002; Chattopadhyay 2014). This species is small and also contains high amount of nutrition like protein, minerals, micronutrients etc (Hossain, 2006 and Ross, 2003).

2. Materials and Methods

Study Area

Fresh water fishes are *Clarias batrachus*, *Cirrhinus reba*, *Puntius denisonii*, and the *Mystus vittatus* were collected from River Mahanadi, Cuttack district. The experiment was carried out in Zoology laboratory of Centurion University, BBSR. Fishes were washed, measured and the flesh was grinded by the help of mortar pestle then the weight was measured in weighing machine. It was then stored in the oven for 24 hours at 100 degree Celsius. Then the flesh was ground to form a powder by the help of mortar pestle. Here the protein estimation was done by the Lowry's method. The Lowry Assay: protein by Folin Reaction (Lowry *et al.*, 1951) has been the most widely method to estimate the protein amounts in different biological samples. The most accurate method of determining protein concentration is the Lowry's method. The Lowry's method is not very different but its sensitivity is moderately constant from protein to protein, and it used so widely that Lowry protein estimations are a completely acceptable alternative to an absolute determination in almost all circumstances where protein mixture and any other substances are involved.

3. Result and Discussion

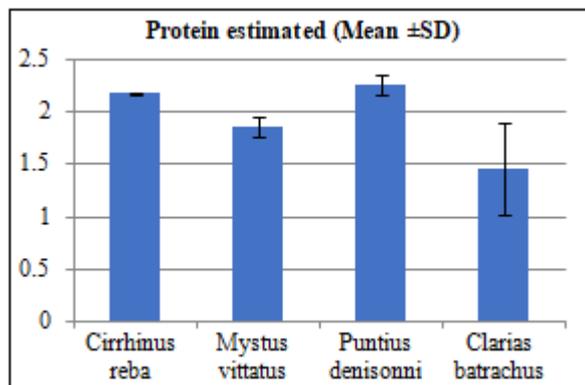


Figure 1: Showing the comparison of protein estimated (Mean±SD) in different fish species

The estimation of total protein in the muscles of fishes was carried out inside the 0.5gm of each sample were taken separately and the protein conc. From each sample was determined by using Lowry's method.

The protein content on the species *Cirrhinusreba* was 2.167 ± 0.01 where as protein content on the same species was 19.74% found by (Osibona, 2006 and Mridha2005).similarly, the protein content on the species *Mystusvittatus* was recorded as 1.856 ± 0.094 whereas according to Paul and Chanda, the content was recorded as 14.94 ± 0.20 . The calcium content was also maximum in *M.vittatus* and followed by *O. bimaculatus*, *W.attu*. The recorded protein content in the species *Puntius denisonii* was 2.254 ± 0.094 which is accordance to the current research. Similarly in the species *C.batrachus* the protein recorded as 1.454 ± 0.440 where as the protein content was obtain as $14.57\pm 0.5g/100g$ (Yesmin and Khanum, 2019). The protein content was slightly higher in *C.batrachus*. The lowest protein content was observed in *Cirrhinusreba* among this four species. From the data it was observed that the protein content is maximum in the species *Cirrhinusreba* and *Clariasbatrachus*.

Providing quality food for ever increasing human population is highly important for growth survival, development and maintaining good health throughout the life. Also the developing countries are more serious as there is widespread protein malnutrition. Fish are considered to be highly nutritious (Adeyeye, 2008 and Onyia,2010).

The protein performs a wide range of functions and provides energy. The protein requirement varies with many factors like age, body ability lactating women, the individuals like during infections and illness or stress.

Fishes serves as a good source of nutritionally important biochemical constituents like carbohydrate, proteins and lipids. The protein content varies according to sex, size, food availability and seasonal maturity etc. Fish protein has since long been considered having high nutritional value (Sargent, 1997). Nonetheless, only in the last decade, research has also focused on the beneficial health effects of fish protein in human nutrition (Rudkowska *et al.*, 2010; Pilon *et al.*, 2011). Furthermore, fish protein hydrolysates are considered as superior from a nutritional point of view due to the excellent amino acid composition and easily digestible proteins.

4. Conclusion

These results indicate that fish consumption has a positive effect on human health due to the biochemical composition like lipid carbohydrade and protein. Many of the mechanisms are not fully explored and more research is still needed to completely understand the effect of fish protein. It is concluded that the excellent and healthier part is the fish muscle to fulfill the protein deficiency in human body.

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