



## RESEARCH ARTICLE

### ESTIMATION OF SOLUBLE PROTEIN CONTENT PRESENT IN *TRICHOGASTER FASCIATUS*, *CHANNA STRIATA*, *ANABUS TESTUDINEUS* OF UTRA LAKE, MANIPUR

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#### ABSTRACT

The present paper reveals the estimation of soluble protein content present in *Trichogaster fasciatus* locally called as Ngapema (Schneider), *Channa striata* locally called as porom (Bloch) and *Anabus testudineus* locally called as ukabi (Bloch). The soluble protein contents were expressed as mg/g using Lowry's method. Protein content was highest in *Trichogaster fasciatus* (145.83mg/g) and lowest in *Channa striata* (17.9mg/g). This research work shows that these indigenous fishes contain high amount of soluble protein.

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## INTRODUCTION

Fishes are valuable sources of high grade protein and other organic products. Next to meat fish is the only protein that contains all the essential amino acids in about right proportion and as such called complete protein. Generally animal protein is better than plant protein in respect of qualities and it is particularly valuable for providing protein of high quality comparable of those of meat, milk and egg (McCance, 1960). Fish is generally appreciated as one of the healthiest and cheapest source of protein and it has amino acid compositions that are higher in cysteine than most other source of protein (Duffus, 1980). Several findings showed that eating fish is good for human health.

Fresh fish consumption is recommended for children because of less percentage of crude fibre which is responsible for its faster digestibility compared to that of dry fish (Oldadipo, 2013). Because of its greater digestibility; fish is usually recommended to patients with digestive disorders such as ulcers (Eyo, 2001). Among the fish protein, 85-95% is digestible part which contains all dietary essential amino acid (Nikolsky, 1963). Consumption of fish has been linked to health benefits as the long chain PUFA has gained attention because of the prevention of human coronary artery disease (Ward OP), improvement of retina and brain development (Crawford), decrease incidence of breast cancer, Rheumatoid Arthritis, multiple sclerosis, asthma, psoriasis, inflammatory bowel disease (Simopoulos, (2002) and regulation of prostaglandin synthesis. The man who eat fish more than once a week had a 50% lower incidence of late-stage muscular degeneration than those who eat fish less than once per month (Wayne et al., 2000). Protein composition of tissues of fishes are related to many factors such as feeding, growth maturation and spawning (Jafri, 1968) and metabolism, mobility of fishes

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and geographical area (Stansby, 1962). The protein and lipid value of the endemic fishes of Manipur was found to be higher than other freshwater fishes of India (Vishwanath and Sarojnalini, 1988). Nutritional value of endemic fishes of Manipur was higher than that of other country (Bijayalakshmi et al., 2014a, 2014b). In India, incidence of low birth weight is major child health issue and maternal health needs to be taken care. Therefore, the main objective of this research work is to estimate the soluble protein content present in fishes. Various methods have been used for determination protein. Lowry method was used and the soluble protein content was expressed in mg/g.

## MATERIALS AND METHODS

These three fresh indigenous fishes namely *Trichogaster fasciatus*, *Channa striata* and *Anabus testudineus* of Utra Lake were collected from fish market, Nambol, Bishnupur District and brought to the Fish Disease and Biotechnology Research Laboratory, Department of Zoology, Thambal Marik College, Oinam, Manipur.

### Sample preparation

The fishes were washed with running tap water and blotted with blotting paper. The length and weight would be measured and recorded. The fishes were descaled with sharp blade. The dorso-lateral portion muscle were collected and bones were removed from fish muscle. Then the muscle were dried in an oven and ground into fine powder.

### Soluble Protein content

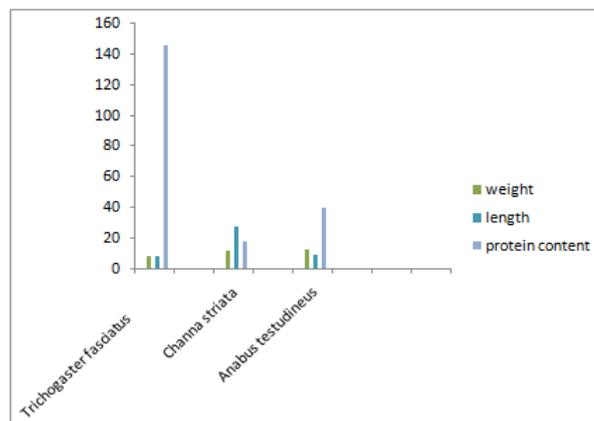
Estimation of soluble protein content was done by Lowry method. 100mg of sample was homogenized in 10ml of phosphate buffer (pH-7). After homogenization it was centrifuged at 5000 r.p.m for 10mins and the supernatant was collected in a test tube. 0.2 ml of supernatant was taken and the volume was made up to 1ml with distilled water. All the analysis were done in triplicates by sampling from the homogenates. Then 5ml of alkaline copper reagent was added and kept for 10 mins, after that 0.5ml Folin –Ciocalteu reagent (FCR) was added and mixed thoroughly. The test mixtures were incubated at room temperature in dark for 30 mins. The absorbance was taken at 660nm against a reagent blank using biospectrophotometer. Then the protein content was calculated and expressed as mg/g using a standard curve prepared from Bovine Serum albumin.

## RESULTS AND DISCUSSION

Table no.1 shows the length, weight and soluble protein content of *Trichogaster fasciatus*, *Channa striata* and *Anabus testudineus* with standard deviation.

**Table No.1. showing the length, weight and soluble protein content(mean  $\pm$ std.dev)**

S.No.	Name of the fish	Length (cm)	Weight (gm)	Soluble protein content(mg/g)
1.	<i>Trichogaster fasciatus</i>	7.73 $\pm$ 0.71	8.30 $\pm$ 1.88	145.83 $\pm$ 2.08
2.	<i>Channa striata</i>	27.18 $\pm$ 11.02	11 $\pm$ 4.92	17.9 $\pm$ 0.6
3.	<i>Anabus testudineus</i>	8.84 $\pm$ 2.01	11.93 $\pm$ 6.65	39.45 $\pm$ 1.66



**Graph 1. Length, Weight and Soluble protein content**

Among these three species, *Trichogaster fasciatus* consists of highest soluble protein content (145.83 mg/g). In case of *Channa striata* and *Anabus testudineus*, the soluble protein content was found to be 17.9 and 39.45 mg/g respectively. This variation in protein content may be due to variation in size, sex, season, age and feeding habit of fish. During periods of heavy feeding, the protein content of muscle tissue increases slightly at first and then the fat content might show a marked and rapid increase. On the other hand, fish may have starvation periods for natural or physiological reasons (spawning or migration) or because of external factors such as shortage of food (Huss, 1995). Most of the people use to take fish without knowing the nutritional value of fishes but fish is essential for the prevention of the life threatening diseases as well as growth and development of human health.

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