A STUDY ON BIOCHEMICAL APPRAISAL FROM THE FLESH OF INDIAN RIVER EEL *(Anguilla bengalensis)*

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ABSTRACT

Fish are limbless vertebrate animals having gills and fins living wholly in water. Fishes are engross to humans owing to many reasons, the most significant being their relationship with and dependence on the environment.Fish are resides in shallow thermal spring at temperature slightly above 42°C (100°F), other in cold arctic seas a few degree below 0°C(32°F) or in cold deep water more than 4000 meters (13,100feet) beneath the ocean surface. This present study deals with investigated of Biochemical content from the flesh of Indian River eel which collected from local market unit IV, BBSR. The Indian Rivereel. *A.bengalensis*is in a high demand as a food due to its high nutritional value. Most important is the mucous of fish *A. bengalensis* taken as medicine by mixing it with wheat and flour for the treatment of arthritis which is beneficial for arthritis patients as they can curable naturally.

KEYWORD: Fish, Indian River eel, Biochemical analysis, Protein, Carbohydrate, Minerals.

INTRODUCTION

Odisha is one of the coastal states lying in the eastern margin of the Indian Peninsula that shares 480km of the coast line with Bay of Bengal (Beura,2009). The human body needs nutrients like protein, carbohydrate, water, minerals and vitamins to enable it function effectively and live a healthy life. As an affordable animal source of nutrient in some of the poorest countries, fish is the primary source. Many species of fish are consumed as food in vertically all regions around the world because a portion of 150g of fish provides about 50 to 60% of a human daily protein requirement.The higher concentration of proximate composition was found during monsoon season and lesser nutrient in summer season due to the availability of the food.

Fish is the most important animal source food in the diets of more than one billion people(Tacon and Metian,2009). The consumption of fish and fish product is recommended as a means of preventing cardiovascular and other disease (Cahu *et al.*, 2004).

The specimen taken for the experiment was identified as Indian mottled eel, *Anguilla bengalensis* (Gray, 1831) of family Anguillidae.The fish *A. bengalensis* also known as Indian Rivereel which is a demersal, catadromous eel (McClelland, 1884). (Eels are an important source of food in many parts of the world because of the numerous health benefits that they have. Eels are having low carbohydrates and high amount of protein when compared to other food fishes like mackeral, ribbon fish, tuna (Ali, 2012). Eels are good source of

several vitamins such as, vit-C, vit-E, niacin. They are good source of minerals like calcium,phosphorus, potassium. Therefore, Biochemical analysis from the flesh of Indian River eel helps to access its nutritional value as the flesh contains all types of elements of biomolecules and electrolytes.

MATERIALS AND METHODS

Collection of Sample

The specimen of *A. bengalensis* weighing 120gms was collected from the local fish market unit-iv, BBSR. Then sample was put in ice insulated container and brought to the CUTM laboratory for further analysis.

Figure-1 Collection of sample from the local market

Preparation of the Sample

The specimen was placed on a dissecting tray and morphology measurements were taken by using Vernier caliper (length is 30cm and width 3cm).Then it was taken prior to dissection. The exoskeleton (scales) was removed by the help of scalpel and then fresh muscle tissue cut into small pieces by the help of scalpel, scissor. The extracted muscle was again weighed in the weighing machine as it was found to be 27.52 gm. Then the muscle was placed in a petridish was dried in oven at 100°C to 110°C for 24 hours to dry out the moisture content completely. After 24 hours when it got utterly desiccated then it was crushed by the help of the motor and pistol to obtain fine powdered form. The powdered was again weighed and stored in an air tight container for further use.

Figure-2 Weighing of the muscle extraction from the specimen and the powder form of the muscle extraction after the muscle get parched.

BIOCHEMICAL ESTIMATION

According to Lowry *et al.,* (1951) methods, protein estimation was carried out and 630nm (OD) absorbance was recorded by the spectrophotometer.

Similarly carbohydrate estimated following Hedge and Hofreiter (1962) method. Then optical density was measured in a spectrophotometer at 620nm. Then draw a standard graph by plotting concentration of the standard on the x axis versus absorbance on the y axis.

Minerals

Minerals were estimated by the XRF method (X- ray fluorescence) which is an analytical technique used to determine the elemental composition of materials. XRF is based on the principle that individual atoms when excited by an external energy source emit X- Ray photons of a characteristic energy or wavelength. XRF analyzer determine the chemistry of a sample by measuring the fluorescent, X ray emitted from sample when it is excited by primary X ray source.

RESULTS AND DISCUSSION

Protein is an integral part of the human body, so that every cell in our body contains it. Fish is the best dietary source of animal protein because it gives a healthy amount of protein with less saturated fat than meat. In present work the proximate protein of *A. bengalensis* was recorded 0.889mg/ml.

As fish *A. bengalensis* contain protein approximately near to the egg albumin and less amount of carbohydrate, so it can be taken by each and every individual to maintain a proper diet. Carbohydrate responsible for increase of blood sugar, so it will be beneficial for taking fish which have low carbohydrate value like *A. bengalensis* 0.189mg/ml.

Minerals is one of the most important part of human body as it plays enzymatic biochemical activities in our body. In the fish *A. bengalensis,* most of the minerals are present which is beneficial for human body like calcium, copper, ZnO, phosphorus, TiO_2, etc. Phosphorus helps to build teeth strong and helps to repair tissue

and cells. Calcium makes the bones strong and helps in releasing hormone. Cupper with the iron enables the body to form RBC. ZnO helps in controlling diabetes and hyperglycemia. TiO_2 helps to protect a person's skin by blocking absorption of the sun's UV light which causes skin cancer.

Table-1. Protein and Carbohydrate estimation of collected sample.

Sample	Protein estimation(mg/ml)	Carbohydrate estimation (mg/ml)
01	0.889	0.189
02	0.890	0.190
03	0.899	0.189
04	0.880	0.193
05	0.878	0.185
Mean±SD	0.8872±0.0075	0.1892±0.0025

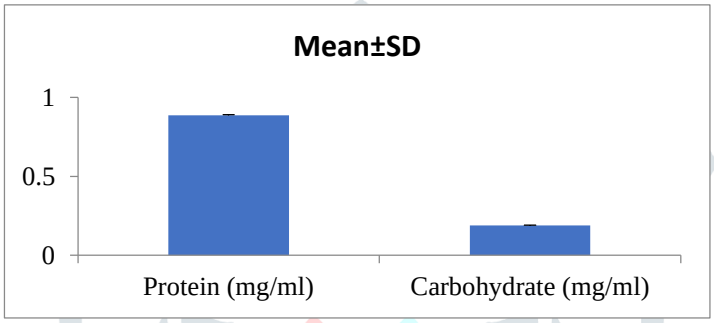

Figure-3 The graph shows the estimated mean result of protein and carbohydrate estimation.

Table-2. Data obtained from the sample by XRF method.

Compound	Percentage (%)	PPM (parts per million)
SiO_2	0.583	5830
P_2O_5	14.701	147,010
SO_3	26.724	267,240
Cl	5.108	5108
K_2O	39.792	397,920
CaO	11.912	119,120
TiO_2	0.070	701.9
MnO	0.020	203.3
Fe_2O_3	0.721	7210
CuO	0.037	377.9
ZnO	0.213	2130
Br	0.034	345.6
Rb_2O	0.041	415.0
SrO	0.012	121.9
SnO_2	0.027	279.8
CO_2	0	0.0

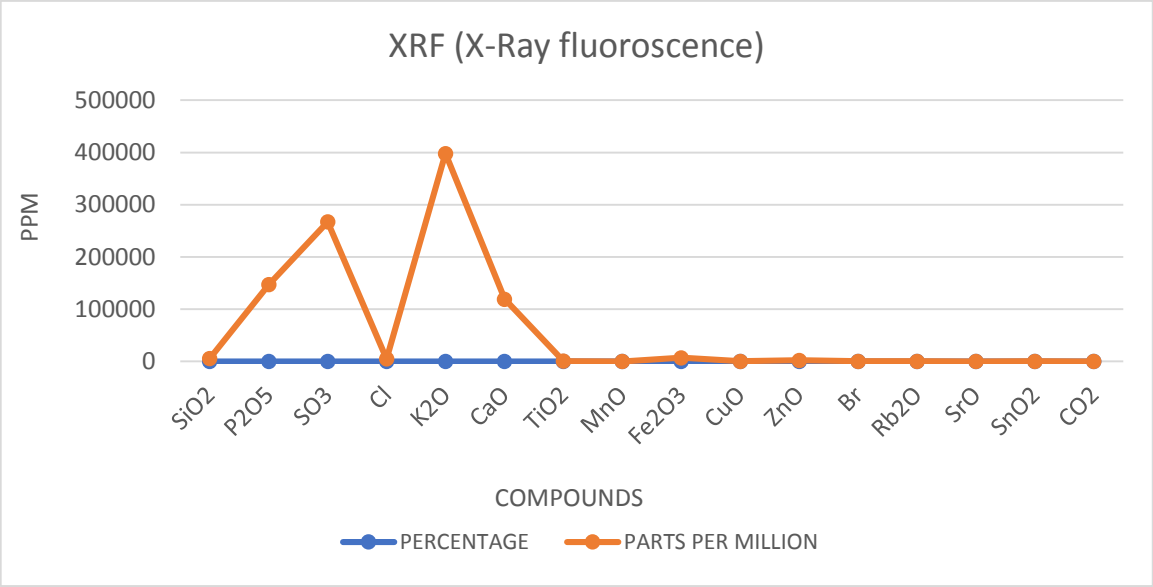

Figure-4 The graphical representation shows the compounds present in the sample obtained by the XRF method.

Similar to present study, The two river eel available in India, *Mastacembelus armatus* and *Anguilla bengalensis* showed the lipid content of both the species was quite low in comparison to European or Japanese eel, the protein content was appreciably high, and the value was quite similar in both species (~24)(Pal and Ghosh,2012). The marine fish *Pseudotolithus typus*(Bleeker,1863) and *Pseudotolithus elongates*(Bowdich,1825)were good sources of proteins with 16.17% and 13.4% respectively and also having sufficient amount of minerals with low amount of carbohydrate (Njinkoue *et al.*, 2016). Protein content in the fish *A.bicolar* from the west java was17.68%(Widyasari *et al.*,2014). In *Labeo rohita*the protein, carbohydrates are high when moisture content was low. (Shekhar *et al.*,2004).Sutharshiny and Sivashanthini(2011) investigated biochemical composition of three species of *Scomberoides* fish, *S.lysan, S.tol, S.commersonianus.* They estimated carbohydrate content was low in all the species and protein content were 19.47±0.16%, 18.99±0.52% and 21.68±0.65% in *S.lysan, S.tol, S.commersonianus* respectively.

CONCLUSION

The biochemical content of fish *A. bengalensis* provide the exact nutritional value due to which it can be included in the daily diet of an individual as it has large amount of protein, less amount of carbohydrate with proper amount of minerals as required for human body. Not only taste, size and freshness are to be taken under consideration for marketing and consumption of fish, but also proper biochemical composition also plays a vital role in the selection of edible fish.

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