Analysis of nutritional value and mineral contents of three different parts of body of *Cirrhinus reba*

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Abstract----The comparative analysis of the proximate compositions mineral contents of *Cirrhinus reba* were examined. The sample was collected from Chawlonbil, Rajshahi. Parameters of proximate composition analyzed were moisture, protein, fat, ash carbohydrate and energy.All experiments were carried in the laboratory. The proximate composition of head 13.89 % protein, 11.94 %fat, 4.36% ash, 65.97% moisture, 3.84 %Carbohydrate, 0.70 Mg, 0.85 Fe, 123.34 Ca, only flesh contain 16.70 % protein, 3.04 % fat, 0.89% ash, 77.37% moisture, 2.00 %Carbohydrate, 0.63Mg, 0.15 Fe, 22.28 Ca, and flesh with bone contain 19.89 % protein, 5.66 % fat, 3.60% ash, 71.76% moisture, 0 % (nil) Carbohydrate, 0.52 Mg, 3.09Fe, 126.83 Ca. Thus tatkini constitute a high source of protein and low fatty acid, as well as an ideal dietetic fish food for human consumption.

Index Terms ---- *Cirrhinus reba*, nutritional value, mineral content, flesh, flesh with bone, head, morphometric Characteristics.

INTRODUCTION

Bangladesh is a south Asian country located in between latitude 20°34' and 26°39' north and longitude 80°00' and 90°41' east. The country is crisscrossed with hundreds of rivers. The climate of this country is very suitable for fish breeding and growing. In 2010-11 the total fish production is 30.62 lakh Metric Ton (MT). Average annual growth rate of fish production in last 3 years is 6.11%. The Production from closed water bodies is increasing very sharply due to dissemination of adaptive technologies and need-based extension services rendered by Department of fisheries [1].

The people of Bangladesh meet up their 58 % animal protein by consuming fish; its rate is currently 18.94 kg/person/year where as the demand of fish is 20.44kg/year/person [2]. Fisheries sector contributed 4.43% to national GDP and 22.21% to the agricultural GDP and 2.73% to foreign exchange earnings by exporting fish products in 2010-11. Fish provides 60% of national animal protein consumption. Fisheries sector also plays an important role in rural employment generation and poverty alleviation [1].

Source of Fish Production

There are three categories of major fisheries resources, these are-

1. Inland Capture (34%)
2. Inland Culture (48%)
3. Marine Capture (18%) [1]

Proteins are composed of amino acids and the amino acid composition of protein from different sources varies widely [3]. Containing large amount of protein, beside it, fish contains important minerals such as Phosphorus, Calcium, Magnesium etc [4, 5], polyunsaturated fatty acid, which plays important role in reducing the cholesterol level in human blood [6].

The study of proximate composition of fish is a very common phenomena but my research is finding a comparative comparison of various parameter of different three parts (head, flesh and flesh with bone) *Cirrhinus reba* and finding a co-relation of them. In our country prospect, tatkini is a common indigenous fish. All classes of people like it very much for delicious taste. People can buy this fish for it's availability and reasonable price.

MATERIALS AND METHODS

Cirrhinus reba, local name Tatkini were collected from fresh water of Chawlonbil, Rajshahi in their highest level of freshness and taken to Fish Technology Laboratory, Institute of Food Science and Technology (IFST), BCSIR to analyze it's nutritional value of Different parts comparing among them (only muscle, Head & bone with muscle).

Sample Preparation

The fishes were measured for total length, head length, tail length and only body length. Then the sample was separated into three parts from whole fish. Then, those three parts are mincing separately and weighed for determine different parameters. The sample was ready for analyzing.

Methods:

The following observations were made for assessing the quality of tatkini (Cirrhinus *reba)* ----

1. AOAC method (1975) is using for determine moisture and ash [7].
2. Micro-Kjieldal method is used to determine protein content (Pearson, 1999) [8].
3. Fat content was calculated by Bligh and Dryer method (Bligh and Dryer 1959) [9].
4. TVN was determined by using Conway micro-diffusion technique (Conway and Byrne, 1993) to study chemical changes of fish.

Result

Morphometric Characteristics of *Cirrhinus reba*

The morphormetric characteristics of *Cirrhinus reba* is total length 9½", tail 2", head 1½", only body length 6" and weight 172gm.

Table: 1 Analysis of head of *Cirrhinus reba*

The proximate composition analysis for moisture, ash, protein, fat, TVN, carbohydrate and energy and minerals Mg, Ca, Fe in the head are shown in table -1

Parameters	Percentage (%)
Moisture	65.97
Ash	4.36
Protein	13.89
Fat	11.94
TVN	18.5
Carbohydrate	3.84
Energy	181.35
Mg	0.70
Ca	123.34
Fe (mg)	0.85

Table: 2 Analysis of flesh of *Cirrhinus reba*

The proximate composition analysis for moisture, ash, protein, fat, pH, carbohydrate and energy and minerals Mg, Ca, Fe in the flesh are shown in table -2

Parameters	Percentage (%)
Moisture	77.37
Ash	0.89
Protein	16.70
Fat	3.04
TVN	13.07
Carbohydrate	2.00
Energy	104.33
Mg	0.63
Ca	22.28
Fe(mg)	0.15

Table: 3 Analysis of flesh with bone of *Cirrhinus reba*

The proximate composition analysis for moisture, ash, protein, fat, pH, carbohydrate and energy and minerals Mg, Ca, Fe in the flesh with bone are shown in table -3

Parameters	Percentage (%)
Moisture	71.76
Ash	3.60
Protein	19.89
Fat	5.66
TVN	12.00
Carbohydrate	Nil
Energy	133.06
Mg	0.52
Ca	126.83
Fe	3.09

Table: 4 Comparison of proximate composition among three parts

Name of parts	Moisture	Ash	Protein	Fat	Carbohydrate	Energy	TVN
Head	65.97	4.36	13.89	11.94	3.84	181.35	18.5
Flesh	77.37	0.89	16.70	3.04	2.00	104.33	13.07
Flesh with bone	71.76	3.60	19.89	5.66	Nil	133.06	12.00

Table: 5 Comparison of mineral content among three parts

Name of parts	Mg	Ca	Fe
Head	0.70	123.34	0.85
Flesh	0.63	22.28	0.15
Flesh with bone	0.52	126.83	3.09

DISCUSSION

A close analysis of data shows a significant distinction among head, flesh and flesh with bone of tatkini (local name).this difference is well reflected in the higher caloric value of head however this higher caloric content of fish is highly variable factor owing to the seasonal changes in fat content of fish [10]. The moisture content of flesh is comparatively higher than others. Protein content is gradually decreases flesh with bone then only flesh and head. But all three parts contain good amount of protein.

Table: 5 lists the mineral composition of three parts. Ash content is significantly high in head. The mineral composition showed no significant difference among head, flesh and flesh with bone. Here also flesh with bone shows higher value for iron and calcium. Only flesh content very small amount of iron and calcium than other two parts.

Total volatile nitrogen (TVN), a chemical index is used to understand the fish quality. According to earson and Muslemuddin, TVN has been widely used as an indexfor freshness of fish [11]. Higher TVN value indicates quality of fish decreases. Total volatile nitrogen of flesh and flesh with bone is almost similar. The TVN of flesh and flesh with bone values are 13.07 mg/g and 12.00 mg/g respectively. Head's TVN is slightly higher (18.50 mg/g) than other two parts.

There is no measure difference among three parts of tatkini in nutritional composition and mineral contents. The present analysis revealed that *Cirrhinus reba* are good source of protein energy and calcium.

Locally tatkini fish is very much available to our country people because it's low cost. That's why people can easily buy it to meet up their nutritional value. It could be a good food item to all over the country and many parts of the world.

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