

Short communication

Estimation of Mineral Ca, Mg, Fe, Cu and Zn Content in Common Fish of Bangladesh

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Abstract

The present article reports the content of mineral content (Ca, Mg, Fe, Cu and Zn), and moisture in some indigenous fishes. Mineral contents were determined by Atomic Absorption Spectrophotometer (AA-6800) after appropriate digestion of the fish samples, and moisture was determined by AOAC method. Calcium and magnesium content were found to be highest in Mola (*Amblypharyngodon mola*) followed by Ketchki (*Coria soborna*), the iron, copper and zinc amounts were higher in Ketchki (*Coria soborna*) than the Mola (*Amblypharyngodon mola*) fish. The other fishes contained little amounts of these minerals compared to the Mola and ketchki. Moisture content was in a range of 71.90 g % in Pangas to 80.73 g % in Ketchki. The Mola and ketchki are very rich in mineral contents (Ca, Mg, Fe, Cu and Zn), regular intake of which would certainly fill up the mineral deficiency of the people.

Key words: Minerals, Indigenous fish, Rich mineral source

Introduction

Bangladesh is an agriculture-fishery based country, which is one of the world's most important inland fishing nations¹. It is blessed with plenty of inland water in the form of pond, canal, ditches, flat plain haors (natural depression), boars (oxbow lake), rivers, estuaries etc covering an area of 43.10 million hectares, which is an excellent ecological condition for the propagation of fish. About 63% of animal protein is supplied from different small indigenous fishes² like koi, taki, veda, pabda, mola, ketchi, puti, shing, maguretcare, which are abundant in almost all the fresh water of Bangladesh. These indigenous fishes are nutritious containing protein, minerals and also vitamins, particularly vitamin A³, which are available in the markets, and are consumed by all classes of people in Bangladesh.

In Bangladesh, fish provides the major and to some extent the cheapest source of animal protein in the diet of people. The minimum per capita per day

protein requirement in Bangladesh has been estimated at 45.30 g, of which 15g should be of animal origin. Fish contributes about eighty percent (80 %) of the total animal protein intake⁴. Fish protein contains all essential amino acids and fish fat has polyunsaturated fatty acids (PUFAs) such as EPA and DHA, which are essential for growth of children and prevents CVDs⁵. There are about 150-200 fish species that contribute enormously to the supply of essential nutrients in the diet of people; the mola, dhela and ketchki are rich in vitamin A⁶. The fresh water fish are more available in the market than marine fish in Bangladesh⁵. Thus, fish is a well-accepted food item in traditional Bengali diet, and fish intake could address the protein and mineral deficiencies. The present study aimed to analyse five minerals in eight indigenous fishes.

Materials and Methods

Eight varieties of fresh indigenous fish (table 1) were purchased from 3 different local markets in the

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Dhaka city, which were prioritized on their consumption by the people. Each type of fish were collected from 3 different markets were mixed together to make a composite sample, triplicate samples were analysed. The fish samples were processed, and, subjected to analysis for moisture and the minerals Ca, Mg, Fe, Cu and Zn.

Moisture content was estimated by the amount of water removed from the processed sample using direct heating in an air oven at 100-105°C to constant weight (AOAC, 1998)⁷. Amount of minerals in the fish were determined by Atomic absorption spectrophotometry (AA-6800, Shimadzu, Tokyo, Japan) as reported by Hossain et al⁸. The processed fish samples were wet digested with nitric acid and perchloric acid at 325°C to release the minerals in the samples. A standard calibration curve was made 3 for each of the mineral using respective standard obtained from Sigma Chemical Co. USA.

Results and Discussion

The moisture content in the fish samples ranged from 71.90 g % in pangas to 80.73 g % in ketchki (table 1), which was equivalent to the reported value⁹. The ketchki fish contained a higher amount of moisture; it might be because of its little content of fat. The fish samples included in this study were shown to have rich content of Ca, Mg, Fe, Cu and Zn, particularly, in the mola and ketchki (table 1). These minerals were found to be much higher than those reported for other local fishes^{5,9}.

This article suggests indigenous fish, particularly the small mola and ketchki fish would be a prime source of minerals deficiency.

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Conflict of interest

Authors declared no conflict of interest in this work.

Table-1: Mineral and moisture content in indigenous fresh water fish

Fish investigated		Mineral Content, mg %)				Moisture, g %	
Local name	Scientific name	Calcium	Magnesium	Iron	Copper	Zinc	Moisture
Ketchki	Coria soborna*	502.88±0.37	221.80±1.98	3.02±0.29	4.42±0.06	5.21±0.01	80.73±0.09
Mola	Amblypharyngodonmola*	912.77±2.8)	229.32±1.58	2.50±0.11	2.78±0.07	3.00±0.05	76.29±0.48
Poah	Panna microdon [¥]	32.10±0.68	29.15±1.22	0.25±0.01	0.02±0.02	0.62±0.03	77.69±0.42
Tilapia	Oreochromis mossambic [§]	5.54±0.05	23.89±0.10	0.23±0.05	8.10±0.10	0.63±0.03	74.92±2.00
Silvercarp	Hypohthalmichthys molitrix*	11.82±1.66	28.75±1.39	0.30±0.01	0.34±0.06	0.97±0.02	77.44±0.20
Ruhi	Labeorohita*	26.94±1.39	28.47±1.30	1.480±0.03	0.15±0.02	1.17±0.05	75.63±0.66
Taki	Channa punctatus [£]	147.39±1.12	115.02±0.11	0.39±0.01	0.16± 0.06	1.15±0.06	79.70±0.04
Pangas	Pangasius pangasius*	7.61±0.27	20.75±0.54	0.5±0.01	12.37±0.40	0.62±0.07	71.90±1.63

Value expressed in Mean ± SD

* Hamilton-Buchanan, 1822 ¥Bleeker, 1842 §Peter, 1852 £Bloch&Schneider, 1801

^Moisture content of selected fish species in g per 100g edible portions.

^Mineral content of selected fish species in mg per 100g edible portions.

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