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Study on mineral composition of mud Crab *Scylla serrata*

D. Vijaya Lakshmi
Department of Microbiology, Yogi Vemana University, Kadapa-516005, A.P., India

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Abstract

In the present investigation the macro and micro elements composition was studied in commercially important edible crab *Scylla serrata.* The percentage proportion of various minerals in both the species as follows. Calcium contributes the highest percentage (34.20 mg/100g) than remaining minerals. Sodium values ranged from 23.99 mg/100g to 26.85 mg/100g. Potassium values ranged from 19.39 mg/100g to 29.54 mg/100g. Phosphorus values ranged from 24.99 mg/100g to 25.84 mg/100g. Iron values ranged from 2.44 mg/100g to 3.69 mg/100g. Copper values ranged from 0.61 mg/100g to 0.89 mg/100g. Zinc values ranged from 8.9 mg/100g to 9.2 mg/100g.Out of seven minerals studied in the present study, the highest percentage of Calcium, sodium, potassium, iron and zinc were observed in male crabs, whereas the percentage of phosphorus and copper was highest in female crabs.

Keywords: *Scylla serrata*, minerals, muscle tissues.

***Corresponding Author**
D. Vijaya Lakshmi

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Introduction

In Asia, particularly in South-East Asian Nations, the mud crab *S. serrata* is one of the most popular and expensive sea foods. Due to its delicious flavour and high nutritional value, the crab meat is gained importance in both domestic and international markets. Amino acids, unsaturated fatty acids, proteins, and minerals like calcium, iron, phosphorus, zinc, and potassium are rich in crab meat [1]. Crab has long been valued for its high calcium content. According to a previous study from Parangipettai, India, crabs have a total calcium content of 4798,0 mg/kg, with a meat calcium content of 2452 mg/kg and a shell calcium content of 2346 mg/kg [2]. Another important work conducted by Rekha*et al.*,[3] from Kovalam region, Tamil Nadu reported that the major essential minerals such as Zinc, iron and calcium were abundantly found in male and female crab species of *Scylla serrata*. Calcium plays a crucial role in human muscle contraction, nerve transmission, and blood clotting. Fe is necessary for many proteins and enzymes that maintain good health, transport oxygen throughout the body, and enable the liver to function properly [4]. Zinc (Zn) is a component of numerous enzymes and is necessary for the proper functioning of various biochemical reactions. Nucleic acid metabolism and structural stability are dependent on zinc. Zn has been linked to a wide range of bodily functions, including wound healing, growth, and glucose acceptance in the body's maintenance [5]. Keeping in view of the above points, in the present study mineral composition was performed in mud crab *Scylla serrata*.

Materials and Methods

Sample collection

The present study was mainly focused to assess the mineral composition such as Calcium, Sodium, Potassium, Phosphorus, Iron, Copper and Zinc in *Scylla serrata*both male and female. The male and female *Scylla serrta* were procured from the fishermen at Nellore Landing Center. Soon after procurement the samples were stored in insulated containers and brought to the laboratory of Department of Microbiology, Yogi Vemana University for further analysis.

Sample processing Procedure

The samples which are collected from fishermen thoroughly cleaned with deionized water, followed by double distilled water to remove adherent particles and other debris. The crabs' carapaces were opened, and sharp sterile forceps were used to remove the muscle tissues required for the experimentation. Using a mortar and pestle, the removed muscle tissues were homogenized. After that, the grounded muscles were powdered and freeze-dried, and they were finally kept in the refrigerator for further analysis.

Sample digestion Procedure

Usually sample digestion was done at 30^0C. A mixture of hydrochloric acid, nitric acid, and perchloric acid in the ratio of 10:5:1 was added to the 5 grams of crab tissue samples. The elements were measured by atomic absorption spectrophotometry. According to Guzman and Jimeneza[6], the obtained values were expressed in mg/100g.

Results and Discussion

Table 1.Mineral composition in male and female crab *Scylla serrata*

S/N	Minerals	Male	Female
1	Calcium	34.20 mg/100g	29.34 mg/100g
2	Sodium	26.85 mg/100g	23.99 mg/100g
3	Potassium	29.54 mg/100g	19.39 mg/100g
4	Phosphorus	24.99 mg/100g	25.84 mg/100g
5	Iron	3.69 mg/100g	2.44 mg/100g
6	Copper	0.61mg/100g	0.89 mg/100g
7	Zinc	9.2mg/100g	8.9mg/100g

In this study total of seven essential minerals were studied. The maximum percentage of available mineral is Calcium which is recorded as 34.20 mg/100g, 29.34 mg/100g in male and female crabs respectively. Maximum sodium was recorded in male crab whereas minimum was recorded in female crab. Similarly the highest percentage of potassium was recorded in male crab than female crab. There is no much difference in the levels of phosphorus in both the species. Highest percentage of iron was seen in male crabs than female. Maximum copper was found in female crabs than male. There is no much difference in the levels of zinc in both the species. The results reported in the present investigation is following to trends of results reported by Rekhaet al. [3].According to them the percentage of the above mentioned seven minerals are superior in male than female crabs. In contrary to this in the present study the phosphorus and copper are slightly superior in female than male crabs.

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