# PROTEIN PROFILING OF MUD CRAB *Scylla serrata* IN COASTAL AREAS OF KENDAPARA,ODISHA

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**ABSTRACT**-The biochemical constituents of different species have been studied in different season, size and temperature. Here the aim of the study to determine the proximate composition likes protein in adult crab. It is important to know the nutritional value of mud crab present in local area. In the present study protein was estimated from different mud crabs (*Scylla serrata)*. The protein was analysed from various parts of the body like muscle extracts from different parts of the body, shell waste and haemolymph. From this study it was estimated that shell waste contains more protein than haemolymph and muscle extracts. This study will provide valuable information about the nutritional supplement and will reduce the prevalence of malnutrition.

Key words: mud crab, *Scylla serrata*,protein,nutrition.

## I.INTRODUCTION

The mud crab Scylla is widely distributed in the brackish and coastal mangrove area of Indo-West-Pacific region. It is famous for their meat, flavour and texture as well as supports significantly the commercial indigenous fisheries both locally and internationally. Global mud crab production is about 38000t in 2014. Owing their ability to tolerate a wide range of temperature (16–35 °C) and salinity (1–56 ppt), mud crabs are highly adaptable to different environments due to their ability to tolerate broad ranges of temperature and salinity [1].

The crustaceans, particularly shrimps and crabs are harvested in huge quantities annually and are being used largely for human consumption. The global estimates of the described species of crustaceans is 40,000 of which 2934 species have been reported in India, amongst 705 species are brachyuran crabs [2]. The common edible crabs are *Portunus pelagicus*, *P. sanguinolentus, Podopthalmus vigil, Charybdis charybdis, C. cruciata, C. lucifera, Ocypoda ceratopthalmia, Matutalunaris, Thalamita crenata* and *Scylla serrata*. Along Indian coasts, *P. pelagicus, P. sanguinolentus* and *S. serrata* are commercially important crabs. Usually crabs are exported in the form of live crabs, frozen whole crabs, chilled whole crabs, frozen cut-leg crabs and crab meat products. The mud crab, *S. serrata* is one of the popular economically important crustaceans for its larger size, quality meat and rich nutrition. Due to high price of crab and ready export market, there is a difficulty in catching large quantities of crabs. The mud crabs are also cultured. *Scylla serrata* appear to be the largest known crab species from the near shore and brackish water habitat of India [3].

*Scylla serrata* is considered as one most popular expensive sea food in Asia. Due to nutritional richness, this species are the most important and high demand coastal aquatic species in the international market. Crabs are good source of protein as well as the potential food source for their delicacy. The nutritional value of different species of fish and shell fish depend on their biochemical composition such as carbohydrates, proteins,lipids, mineralsetc. Crabs are the good source of protein. The meat of crab is highly nutritive as compared to chicken mutton etc. The nutritional value of crab includes essential amino acids, proteins, unsaturated fatty acids and minerals like iron, zinc, calcium etc. Biochemical parameters vary according to sex, size and season [4]. In this article, estimation of protein was aimed from various body part of mud crab to know the nutritional in local area of Kendrapara.

## II.MATERIALS AND METHODS:

**Collection of Specimens:**

Adult fresh water crab (*Scylla serrata)* were chosen from the paddy fields near pathasala river of Gupti (20°38'N, 86°53'E) Rajnagar, Kendrapara. It belongs to Kingdom-Animalia,Phylum-Arthropoda,Sub phylum-crustacea,Order-Decapoda,Genus-*Scylla* and Species-*serrata.*These crabs are then brought to the laboratory. They were maintained in a plastic bucket containing a little amount of dechlorinated tap water. The experiment was carried out in zoology laboratory of Centurion University of Technology and Management, Bhubaneswar, Odisha.

**Preparation of shell waste:** The shell wastes of crab were collected, and then the shells were subjected to tap water for the removal of connective tissues and other impurities. The shells were then dried in the oven for a period of 24 hours. The shells are then ground finely using mortar and pestle. Then the dried shell powder was stored at room temperature in an air tight container.

**Preparation of muscle extract:** The animal was anesthetized in ice cold water for 5 minutes, the muscles were dissected out. The muscles are then dried in the oven for a period of 24hours.The muscles are then ground finely using mortarand pestle. Then the grinded muscle was kept in an air tight container.

**Preparation of haemolymph sample:** Haemolymph samples were obtained from the ventral part of abdominal segment from the crab. The fresh water crabs were selected and anesthetized using ice water for 5 minutes and the hemolymph was extracted by the help of a syringe and collected in 2ml of EDTAvial. The collected hemolymph was centrifuged at 2000 rpm for 15 minutes. Then the supernatants were collected by pipette. The collected supernatants were stored at $4^0$C for further experimental analysis[5].

Total protein present in sample of mud crab extract like muscles, shell waste and haemolymph were estimated according to Lowry's method by using UV visible spectrophotometer [6]. The following reagents were used during the protein analysis by Lowry's method. Folin ciocalteau reagent(Reagent D), The reagent should have no greenish 20%sodium carbonate in 0.1N sodium hydroxide (reagent A).Reagent B was prepared with 0.5% copper sulphate in 1%pottassium sodiumtartrate. Then Alkaline copper solution (Reagent C) was prepared by mixing of 50ml of reagent A and one ml of reagent before use. The day before experiment, stock solution need to be prepared by mixing of ten milliliter albumin added with 10 ml of distilled water. Standard solution was prepared by 10ml stock solution added with 50ml distilled water.The amount of protein present in haemolymph was measured using a calibration curve prepared with different concentrations albumin as standard. In a series of test tubes different aliquots of standard protein solution were pipetted out. Extraction is usually carried out with buffers used for the enzymatic activity. Weigh 500mg of the sample were crushed well with a pestle and mortar in 5-10ml of the buffer. For protein analysis, supernatant were collected after centrifugation. Centrifuge tubes were taken and Pipette out 0.2, 0.4, 0.6, 0.8 and 1.0ml of the working standard into a series of test tubes. All tubes were made up of volume up to one milliliter. Then 5 ml of reagents were added to each test tube and mixed thoroughly. After ten minutes 0.5ml of reagent D was added in each tube. These tubes were mixed immediately after each steps of addition and placed at $37^0$C for 30 minutes. Purple blue colour was developed and readings were taken in spectrophotometer at 650 nm.A standard graph was drawn to calculate the amount of protein present in respective sample in the sample.

## III. RESULT AND DISCUSSION:

The estimation of total protein present in the muscle, shell and hemolymph extract of adult crab was carried out inside the lab. 0.5g of each sample (muscle, shell and hemolymph) were taken separately and the protein conc. From each sample was determined by using Lowry's method.

**Table-1 Comparative assessment of protein from different body parts by spectrophotometer**

| No of tubes | Volume in Test-tubes | Muscle extracts | Haemolymph | Shell waste |
|---|---|---|---|---|
| **1** | 0.2ml | 0.144 | 0.145 | 0.116 |
| **2** | 0.4ml | 0.154 | 0.276 | 0.212 |
| **3** | 0.6ml | 0.172 | 0.342 | 0.362 |
| **4** | 0.8ml | 0.173 | 0.534 | 1.337 |
| **5** | 1.0 ml | 0.556 | 0.696 | 1.465 |

From the data it was observed that the protein content is maximum in shell extract of crab than muscle and hemolymph extract as mentioned in table-1.

Providing quality food for ever increasing human population is highly imperative for survival, growth, development, reproduction and maintaining good health throughout the life. Also, the developing countries are more serious as there is widespread protein malnutrition. To meet the protein requirement, it

is necessary to supply food from no conventional resources of aquatic ecosystem. Generally, fish and shell fish meat are considered to be highly nutritious [7].

The protein performs a wide range of functions and provides energy. The recommended dietary allowance for protein is 1g/kg body weight (adults). The protein requirement varies with age physiological status and stress. More proteins are utilized by growing infants, pregnant women, lactating women and individuals during infections and illness or stress [8].

## CONCLUSION

Crabs serve as a good source of nutritionally important biochemical constituents like carbohydrates, proteins and lipids. The biochemical composition varies according to sex, size, food availability and seasonal maturity etc. The present study on different body part of crab like muscle, shell and hemolymph brought to light that more amount of protein content present in shell extract than muscles and hemolymph. The finding of the current study suggests that the crab (*Scylla serrata*) contains greater number of proteins and it can be recommended as a candidate species for human consumption.

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