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Proximate Composition of Mud Crabs *Scylla serrata* and *Scylla olivacea* from the Coast of Visakhapatnam, Andhra Pradesh, India

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ABSTRACT
In the present study the proximate composition of two mud crab species Scylla serrata and Scylla olivacea was determined. Twenty crab samples of different sizes were used in this study (male and female ratio-10:10). The protein content was maximum in female S. serrata (22.14±1.25) and minimum was also recorded in the same species of male S. serrata (18.02±1.05). The carbohydrate content was maximum in female S. olivacea (4.97±0.47%) and minimum was also recorded in the same species of male S. olivacea (3.89±0.25). The lipid content was maximum in female S. olivacea(2.69±0.11%) and minimum was recorded in male S. serrata (1.75±0.20). The ash content was maximum in male S. olivacea (2.46±0.25%) and minimum was recorded in female S. serrata (1.69±0.16). The moisture content was maximum in male S. serrata (73.51±1.15%) and minimum was also recorded in the same species of female S. serrata (69.01±1.42).
Keywords: *Mud crabs, proximate composition, lipids.*

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INTRODUCTION

The mud crabs *S. serrata* and *S. olivacea* are considered as one of the most prominent and expensive sea food in the Asian Countries, especially in South East Asian Countries. The crab meat has excellent demand in both national and international markets due to their delicacy and nutritional content. The nutrient substances which includes amino acids, unsaturated fatty acids, proteins and minerals such as calcium, iron, phosphorus, zinc and potassium [1]. Very good reports are available from India with special emphasis on the biochemical composition of crustacean species. Soundarapandian *et al.,*[2] reported on the proximate composition of *P.vigil*. Harinath [3] investigated on the biochemical constituents of *M. rosenbergii* and *M. malcomsonii*. Ludiya Podili Rani [4] studied on the proximate composition of *P. indicus.*Little emphasis was focused on the biochemical composition of the commercially important crab species i.e. *Scylla serrata* and *Scylla olivacea.* Hence the purpose of the present study is to estimate the biochemical constituents of the said species from the coastal waters of Visakhapatnam.

MATERIAL AND METHODS

Sample Collection

Healthy *Scylla serrata* and *Scylla olivacea* crabs were procured from the Visakhapatnam fishing harbor (17.6958°N, 83.3025° E). The collected samples were immediately transferred to the laboratory of ICAR-Central Institute of Fisheries Technology. Then the samples were cleaned thoroughly under running tap water to remove any unwanted materials on the crab surface and were dried with filter paper. The carapace of the crabs was carefully removed and muscle tissues were separated.Later the samples were oven dried at 50-60^{0}C. The dried samples were weighed and the powdered samples were stored in refrigeration until further analysis.

Biochemical Analysis

Total nitrogen was estimated by following the standard Kjeldahl method [5]. Protein content in the sample was calculated by the following equation. % protein = % total nitrogen x 6.25 (empirical factor).

The glycogen content of the *Scylla serrata* and *Scylla olivacea* were performed by following the method of Anthrone [6]. Total lipid content was determined by the Soxhlet extraction method [7]. The ash content was determined by igniting the previously dried tissue sample in muffle furnace at 550^{0}C for 6h. The moisture content of the sample was analyzed by drying the samples in a hot air oven at 100^{0}C for 16h. All determinations were done in triplicates.

RESULTS AND DISCUSSION

The proximate compositions of the male and female crabs of *Scylla serrata*, *Scylla olivacea* are presented in figure 1 and 2. Values are presented in (%) on dry weight basis, except moisture.

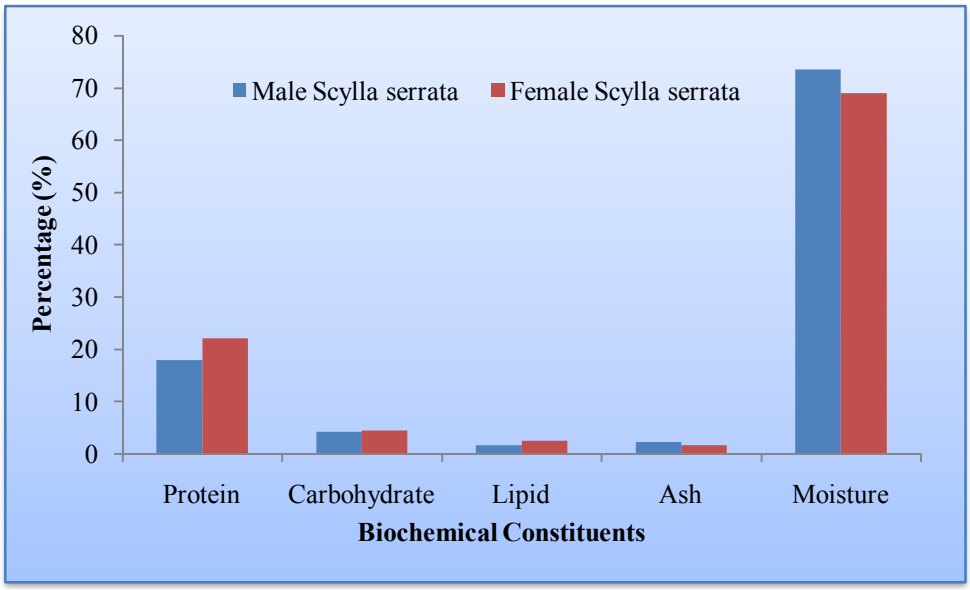

Figure 1. Proximate composition of the muscle tissues of male and female *Scylla serrata* (n=10)

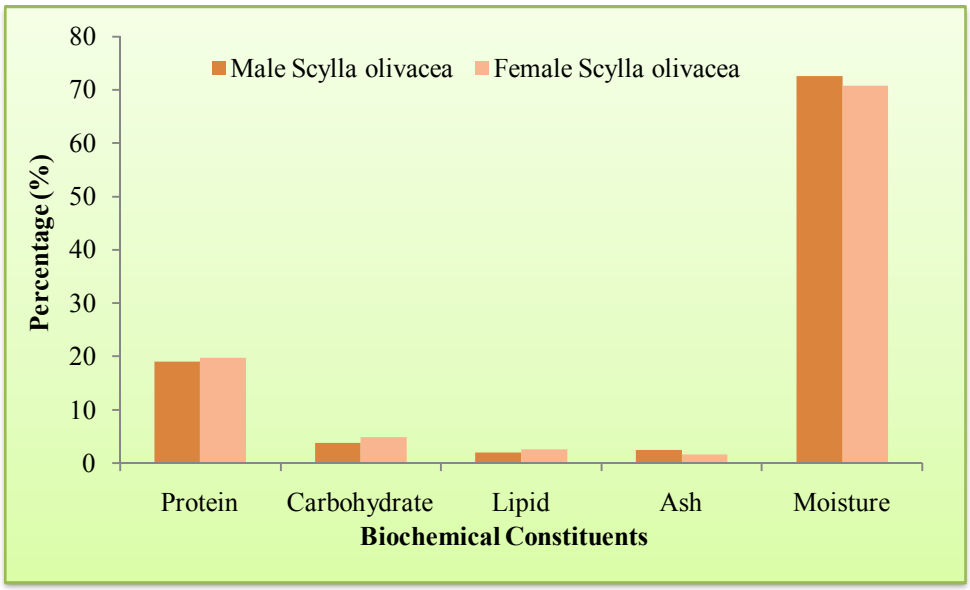

Figure 2. Proximate composition of the muscle tissues of male and female *Scylla olivacea* (n=10)

In the present study, the protein content in muscle tissue was varied from 18.02±1.05 to 22.14±1.25. Sarower *et al.,*[8] reported the protein content in *Scylla serrata*, which was ranged from 16.60% to 24.54 %. George and Gopakumar [9] recorded the protein content of 20.92% in meat of *S. serrata.* Similar observations were made in different body parts of the *Scylla serrata* by George *et al.,*[10] who recorded the protein content which was ranged from 14.43 to 18.96%.

In the present study, the carbohydrate content in muscle tissue was varied from 3.89±0.25 to 4.97±0.47. Soundarapandian *et al.,* [2] reported the carbohydrate content in *P. vigil* which was significantly higher in berried females (2.76%) than males (2.09 %) and females (2.06%). The present study results are slightly higher than the findings of Murugesan *et al.,*[11], Sudhakar *et al.,* [12] and Soundarapandian *et al.,* [2].

In the present study, the lipid content in muscle tissue was varied from 1.75±0.20 to 2.69±0.11. Soundarapandian *et al.,* [2] reported the lipid content in *P. vigil* which was significantly higher in females (1.09%) than berried females (1.05%) and males (0.32%). Radhakrishnan and Natarajan[13] reported the lipid contents in muscle tissues of *P. vigil*were ranged from 5.13 to 9.73%. The present study results are slightly higher than the findings of Soundarapandian *et al.,* [2].

In the present study, the ash content in muscle tissue was varied from 1.69±0.16 to 2.46±0.25. Sarower *et al.,*[8] reported the ash content in *Scylla serrata*, which was ranged from 1.09% % to 7.65% %. Soundarapandian *et al.,* [2] reported maximum ash content in females (0.99%) followed by berried females (0.98%) and males (0.31%). The present study results are slightly higher than the findings of Soundarapandian *et al.,* [2].

In the present study, the moisture content in muscle tissue was varied from 69.01±1.42 to 73.51±1.15**.** The present study observations are slightly higher than the findings of Ali *et al.,*[14]. According to them, the moisture content of some of the fish species namely *Labeo rohita, Cyprinus carpio, Cirrhinus mrigala* and *Catla catla* was recorded as 72.10, 65.60, 65.60, 69.50 and 68.84, respectively. The present study findings are well in agreement with the results of Soundarapandian *et al.,* [2]. In their study they have reported the moisture content of *Podophthalmus vigil* was 75.0±0.18, 74.0±0.23, 79.0±0.23 for male, female and berried females respectively.

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