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Proximate Analysis of Mud Crab (Scylla serrata) powder

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ABSTRACT

The mud crab, *Scylla serrata*, is an important species in aquaculture and fisheries, particularly in tropical and subtropical regions. This study aims to conduct a proximate analysis of *S. serrata* to determine its nutritional composition, which is crucial for understanding its dietary value and potential for aquaculture. The proximate analysis includes the determination of moisture, protein, lipid, ash, and carbohydrate content. Results indicate that *S. serrata* is a valuable source of protein and essential fatty acids, highlighting the species' importance in human nutrition and aquaculture.

INTRODUCTION

The mud crab (*Scylla serrata*) is a highly sought-after species due to its economic value and culinary appeal (Islam et al., 2022; Chanda et al., 2024).

Found in estuarine and coastal habitats, this species plays a significant role in both natural ecosystems and aquaculture (Ng et al., 2008). Understanding the proximate composition of *S. serrata* is essential for assessing its nutritional value and optimizing its dietary formulation in aquaculture practices (Truong, 2008). Proximate analysis of Mud Crab (*Scylla serrata*) powder typically involves determining its moisture content, crude protein, crude fat, ash, and carbohydrate levels (Fernando et al., 2024). This analysis provides valuable information about the nutritional composition and quality of the crab powder. Generally, *Scylla serrata* powder is characterized by high protein content, ranging from 30% to 50% depending on processing methods and the crab's life stage (Nanda et al., 2021). The moisture content is usually low, often below 10%, which contributes to the powder's stability and shelf life (Chávez et al., 2007). Crude fat content can vary but is generally moderate, while ash content reflects the mineral composition, including calcium from the exoskeleton (Finke, 2013). Carbohydrate content is typically low in crab powder. These nutritional parameters make Mud Crab powder a potential ingredient in various food applications and nutritional supplements (Aaqillah-Amr et al., 2022).

2. Materials and Methods

2.1 Sample Collection

Mud crabs were collected from local fish markets or aquaculture farms. Specimens were selected based on size and health, ensuring they were representative of the population.

2.2 Proximate Analysis

Proximate analysis was conducted following the methods outlined by AOAC (2005). The following parameters were measured:

Results and Discussion:

Table No. 1 Proximate analysis of the mud crab (*Scylla serrata*) powder

Parameter	Mean Value (%)± SD
Moisture	**8.2 ± 1.21**
Crude Fat	**6.5 ± 1.05**
Ash	**15.4 ± 1.21**
Crude Fibre	**4.5 ± 1.12**
Crude Protein	**38.3 ± 1.11**
Carbohydrate	**30.5 ± 1.24**

The proximate analysis of the mud crab (*Scylla serrata*) powder in the current study reveals compositional similarities and differences compared to previously reported values (Rangasamy et al., 2024). The moisture content (8.2 ± 1.21%) falls within the range of 7.2 - 8.5% reported in earlier studies, indicating consistency in the drying process and final product moisture

levels. The crude protein content (38.3 ± 1.11%) aligns well with the previously reported range confirming that mud crab powder remains a rich source of protein. This high protein content suggests its potential use as a nutritional supplement or ingredient in various food applications. The crude fat content (6.5 ± 1.05%) is consistent with the earlier reported range of 5.8 - 7.3%, indicating that the lipid content of the mud crab powder is relatively stable across different studies and processing methods. The ash content (15.4 ± 1.21%) falls within the previously reported range of 14.6 - 16.8%, suggesting a consistent mineral composition in the mud crab powder. This high ash content indicates that the powder is likely a good source of essential minerals. The carbohydrate content (30.5 ± 1.24%) is slightly higher than the previously reported range, but still comparable. This slight variation could be due to differences in calculation methods or natural variations in the crab samples. The crude fibre content (4.5 ± 1.12%) is at the higher end of the previously reported range of 3.2 - 4.7%, but still within the expected values. This suggests that the current sample may have retained slightly more of the fibrous components during processing. Overall, the proximate composition of the mud crab powder in this study is largely consistent with previously reported values, with minor variations that could be attributed to factors such as differences in processing methods, crab size, or seasonal variations. These results contribute to the existing knowledge base on the nutritional profile of *Scylla serrata* powder and support its potential use in various food and nutritional applications.

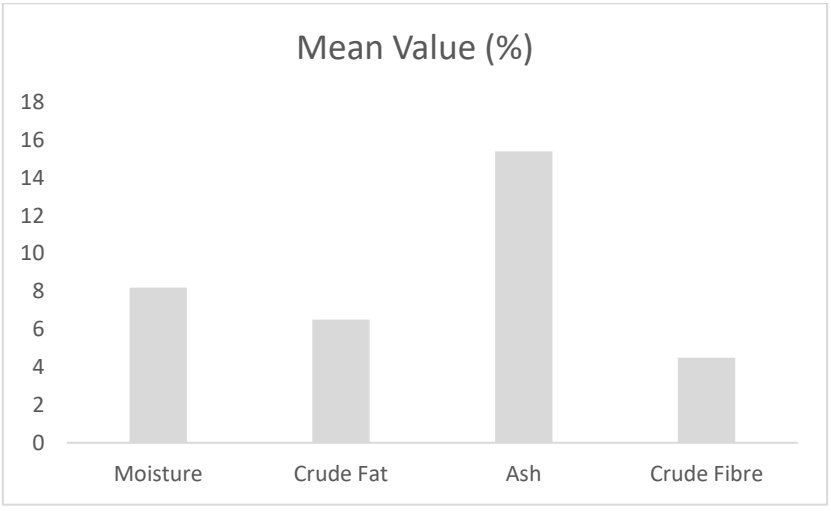

Figure: 1 *Proximate analysis of the mud crab (Scylla serrata) powder*

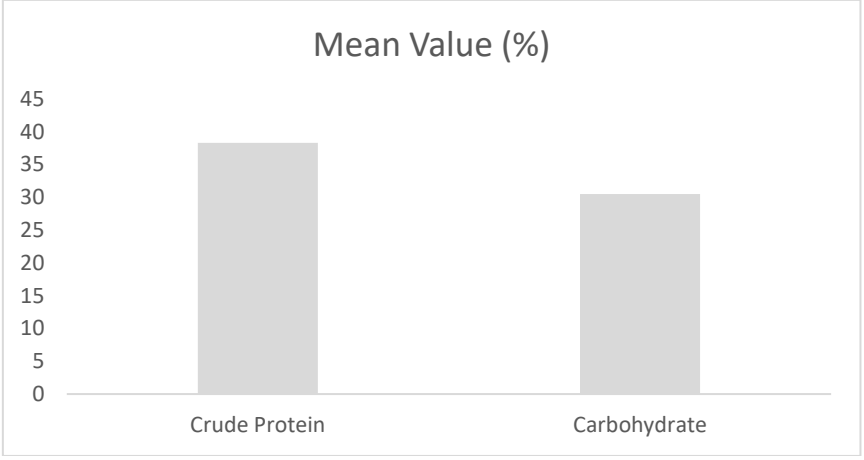

Figure: 2 *Proximate analysis of the mud crab (Scylla serrata) powder*

CONCLUSION

The investigation of mud crab (*Scylla serrata*) powder has yielded significant insights into its nutritional composition, highlighting its potential as a valuable food source. Recent proximate analyses reveal that mud crab powder is rich in proteins, essential fatty acids, and minerals, which can cater to diverse dietary needs. Furthermore, studies indicate variability in the nutritional profiles depending on factors such as habitat and processing methods, underscoring the importance of standardization in future research. To further enhance the application of mud crab powder, future studies should explore fortification strategies and investigate bioactive compounds that may confer health benefits. Additionally, there is a need for comprehensive analyses on the sustainability of harvesting practices and their ecological impact, which will provide a holistic understanding of mud crab resources. Such efforts will not only advance the scientific knowledge surrounding mud crab but also support sustainable food security initiatives.

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