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### Research Article

### Zoology

#### EVALUATION OF PROXIMATE COMPOSITION OF MARINE CRAB *Portunus pelagicus* AND FRESHWATER CRAB *Oziotelphusa ravi*

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#### ABSTRACT

Crabs are crustaceans, most usually found in the ocean, that are eaten in many countries around the world. Crab is also a natural source of omega-3 fatty acids, which can help to improve memory, decrease the chances of having a heart attack, decrease risk of cancer and possibly help to improve depression and anxiety. The nutritive value of crustaceans depend on their biological constituents such as proteins, carbohydrates, lipids, amino acids, vitamins and minerals. In the present study was to investigate the proximate composition of marine crab *Portunus pelagicus* and freshwater crab *Oziotelphusa ravi*. The proximate composition such as Protein, carbohydrate and lipids of marine and freshwater crab were significant difference while amino acids was non-significant. Among the two crabs, marine crab has rich content of nutrition properties as compared with fresh water crab. This study suggested that use of this crab may use for malnutrition for healthy life.

**Keywords:** *Portunus pelagicus*, *Oziotelphusa ravi*, Proximate composition, Crab.

#### INTRODUCTION

The nutritive values of crustaceans depend upon their biochemical composition, such as protein, amino acids, lipid, fatty acids, carbohydrate, vitamins and minerals. Being very cheap freshwater crabs constitute a great food potential for human in India. A large part of these shell fish species from cultivated farms. So there is growing need for information about the biochemical composition of these shell fishes. For the cultivation of these shellfishes some important characteristics, such as nutritional properties, biochemical structure and growth conditions need to be identified. The marine food consumption of human resources has increased rapidly in world-wide. As a whole, seafood products, including crustacean, shellfish have been acclaimed for their health promoting characteristics. Marine crabs are one of the valuable seafood items of great

demand both in the domestic market and the export industry of India.

Human consumption of freshwater crabs has been recorded from various parts of Africa, including *Sudanonautes aubryi* in Ivory Coast (Bertrand, 1979) and *S. africanus* and *S. kagoroensis* in Nigeria (Cumberlidge, 1991). In Liberia, the dwarf river crab *Liberonautes nanoides* is caught in large numbers during the dry season using basket traps, and sold in local markets for human consumption. In Nigeria, *Sudanonautes africanus* is commonly sold in markets and roadside stalls, either fresh or smoked (Okafor, 1988). Crab consumption in this region tends to increase when economic decline reduces the availability of other protein sources (Udonzi, 1987); economic austerity will therefore lead to increased prevalence of paragonimiasis among susceptible human populations. Recently in

India few works were done on freshwater crabs. In the present study evaluation of proximate composition of marine crab *Portunus pelagicus* and freshwater crab *Oziotelphusa ravi*

**MATERIALS AND METHODS**

**Collection of experimental Crab**

Marine crab (*Portunus pelagicus*) was collected in Fish market Thanjavur and freshwater crab (*Oziotelphusa ravi*) was collected in crop cultivated land from Tittai (Thanjavur district) in August 2021, Tamil Nadu, India.

**Preparation of tissue homogenate**

The crab (*Portunus pelagicus* and *Oziotelphusa ravi*) were collected lively and transported immediately to the laboratory for the analysis. The digestive system was removed edible portions were taken separately and the tissues samples was dissected out, washed with ice-cold physiological saline. The 1g tissues was weighed and homogenized using a Teflon homogenizer. Tissue homogenate was prepared in 0.1 M Tris Hcl buffer (pH 7.4) and used for the estimation of various proximate composition parameters.

**Proximate composition analysis**

Protein was estimated by the method of Lowry *et al.* (1951). Total lipids in tissues were estimated by the method of Folch *et al.* (1957). To estimate the amount of carbohydrate present in the given sample by using Anthrone method and Amino acid in tissues were estimated by the method of Rosen *et al.*, (1959).

**Statistical analysis**

Values are expressed as Mean ± SD for triplicate. Data was calculated by student t-Test (Independent sample, P value two tail) using MS-excel ver. 2013. Statistically significant level 0.05.

**RESULTS AND DISCUSSION**

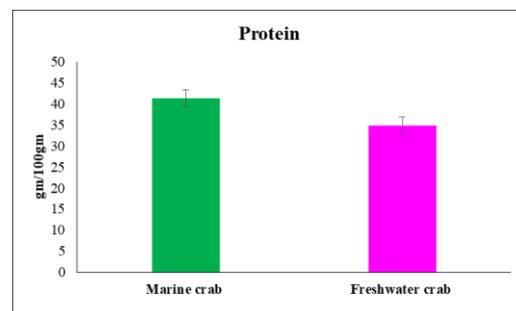
Figure 1, 2, 3 and 4 shows the Proximate content of protein, carbohydrate, lipids and amino acids were Marine and freshwater crabs estimated. The protein content of marine crab was 41.26±2.49 gm/100mg and freshwater crab was 34.89±2.15gm/100mg respectively. Significant difference in marine crab and freshwater crab were observed. The protein content was higher in marine crab as compared with freshwater crab.

In carbohydrate content of marine crab was 7.91±0.23gm/100gm and freshwater

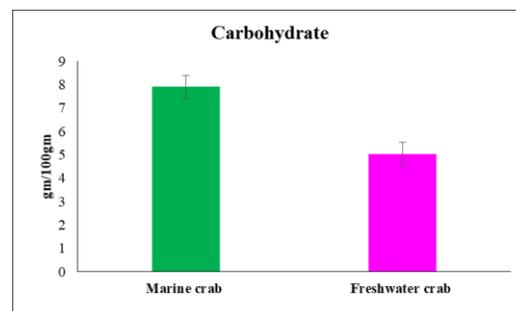
crab was 5.04±0.25gm/100gm respectively. Significant difference in marine crab and freshwater crab were observed. The carbohydrate content was higher in marine crab as compared with freshwater crab.

In lipids content of marine crab was 19.46±1.47gm/100gm and freshwater crab was 15.32±1.39gm/100gm respectively. Significant difference in marine crab and freshwater crab were observed. The lipids content was higher in marine crab as compared with freshwater crab.

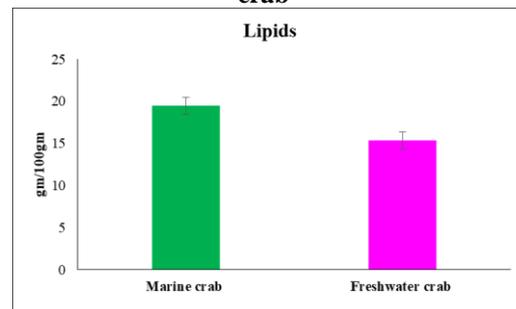
In total amino acids content of marine crab was 25.31±2.89mg/100gm and freshwater crab was 23.95±2.71mg/100gm respectively. Significant non-difference in marine crab and freshwater crab were observed. The amino acids content was higher in marine crab as compared with freshwater crab.



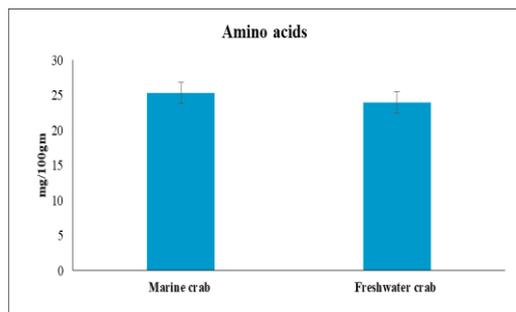
**Figure 1: Proximate composition (Protein) of Marine and freshwater crab**



**Figure 2: Proximate composition (Carbohydrate) of Marine and freshwater crab**



**Figure 3: Proximate composition (lipids) of Marine and freshwater crab**



**Figure 4: Proximate composition (Amino acids) of Marine and freshwater crab**

The nutritional value of edible tissues of any marine invertebrate is influenced by their nutritional habits, age, sex, season, seawater temperature and salinity (Oliveira *et al.*, 2007). The high amount of protein content recorded in *C. lucifera* (37.96%) than the other three crabs in the study. The amount of protein was higher when comparing with the studies of *Portunus sanguinolentus* (Soundrapandiyan *et al.*, 2009), *Maja brachydactyla* (Antonio Marques *et al.*, 2010) and *Podophthalmus vigil* (Sudhakar *et al.*, 2011). Protein is essential for the sustenance of life and accordingly exists as the largest quantity of all nutrients as a component of the human body (Okuzumi and Fujii, 2000). Similarly present study was carried on protein content of marine crab was 41.26 ± 2.49 gm/100mg and freshwater crab was 34.89 ± 2.15 gm/100mg significantly difference.

Carbohydrate content highest in *C. lucifera* and lowest in *C. feriata*. The previous studies suggest that carbohydrate content in *P. vigil*, (Sudhakar *et al.*, 2011), in hard and soft shell of *P. sanguinolentus* (Soundrapandiyan *et al.*, 2009) were 1.57%; 1.17 and 0.68% respectively. Carbohydrates constitute only a minor percentage of total nutrition composition in all the species and in fishery products contain no dietary fiber but only glucides, the majority of which consist of glycogen (Okuzumi and Fujii, 2000). Present study evaluate on *Portunus pelagicus* carbohydrate content of marine crab was 7.91 ± 0.23 gm/100gm and freshwater crab was 5.04 ± 0.25 gm/100gm significantly difference.

Lipids are highly efficient sources of energy and they contain more than twice the energy of carbohydrates and proteins (Okuzumi and Fujii, 2000). *C. feriata* and *C. reversendersoni* had higher amount of lipid (2.75 and 2.10 g/100g). This value suggests that it is good source of low fat seafood comparing with other species. The result showed a higher level than *Portunus pelagicus* (Yongxu cheng *et al.*, 2010), *Maja*

*brachydactyla* (Antonio marques *et al.*, 2010) and lower level than the *Carcinus mediterraneus* claw meat (Slim Cherif *et al.*, 2008). The present study of lipids content in marine crab (19.46 ± 1.47 gm/100gm) and freshwater crab (15.32 ± 1.39 gm/100gm) were significantly difference.

Food and tissue proteins contain 20 different amino acids of nutritional importance. From the present study, the amino acid compositions of marine crab was 25.31 ± 2.89 mg/100gm and freshwater crab was 23.95 ± 2.71 mg/100gm significantly non-difference. In additionally leucine in *C. reversendersoni* observed higher amount (1.47 g/100g) than the others. Isoleucine and leucine helps to promote healing of muscle tissue, skin and bones. Leucine is recommended for those recovering from surgery, carbohydrate and lipid metabolism and growth hormone production (Shen and Wang, 1990). In *C. natator*, histidine was lower (0.03 g/100g) when comparing other crabs. This value was lower than the previous studies in *Maja brachydactyla* (Antonio marques *et al.*, 2010) and *Callinectes sapidus* (Kucukgulmez and Celik, 2008).

The human health aspects of eating seafood have primarily been linked to marine lipids because epidemiological studies have evidenced that seafood consumption has a potential protective role against coronary heart diseases, mainly attributed to the effects of long-chain polyunsaturated fatty acids and their cardio protective action (Kris-Etherton *et al.*, 2002). The present result showed the overall higher than the studies in marine crab *Portunus pelagicus* compare with freshwater carb *Portunus pelagicus*.

## CONCLUSION

The nutritive value of crustaceans depend on their biological constituents such as proteins, carbohydrates, lipids and amino acids. The present study concluded that the both marine crab and fresh water crab contain various nutritional content. Among the two crabs, marine crab has rich content of nutrition properties as compared with fresh water crab. This study suggested that use of this crab may use for malnutrition for healthy life.

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