

# Proximate and mineral composition of a freshwater prawn, *Macrobrachium dayanum* available in the water bodies of Jammu region of J&K (India).

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**Abstract:** Prawns are an excellent source of high quality protein, and also rich in minerals. The present investigation was therefore carried out to study the proximate and mineral composition of the shell of *Macrobrachium dayanum*, a local fresh water prawn. The annual average protein content was recorded to be. Likewise the lipid and moisture content were observed to be and respectively. Totally 5 minerals were reported in the present studies. In the present investigation, Calcium content dominated the pool followed by potassium and the least recorded was iron content.

**Key words:** Proximate, *Macrobrachium*, Protein, Mineral

## Introduction:

Among shellfish, crustaceans like prawn and crabs are a good source of organic and inorganic constituents which are required for the maintenance and growth of human body (Dong, 2001). India is blessed with a rich fauna of edible crustaceans, including as many as 117 shrimps and prawns. Apart from this these serve as an important source of minerals like zinc, selenium, copper, magnesium and phosphorous. These minerals serve as essential nutrients that our body needs to thrive. Minerals are essentials in shrimp nutrition. Aside from playing important role in osmotic regulation and moulting, minerals ions are also components of many biological compounds such as enzymes, hormones and high energy compounds. Nevertheless, dietary requirements of important mineral elements are known for selected species of shrimp such as *Penaeus japonicas* (Deshimaru and Yone, 1978), *P. aztecus* (Hysmith *et al.*, 1972; Sick *et al.*, 1972, and *P. vannamei* (Davis *et al.*, 1993). Keeping these facts in view, present study has been designed to generate the data regarding its nutritional status and the variation in the proximate composition which will help to establish the present species as a potential culturable candidate. When compared to marine decapods crustaceans, little attention has been paid on the biochemical changes in relation to reproductive cycle in decapod crustacean in India, especially on the

freshwater crabs. The aim of this study was thus to generate data on the biochemical changes in the muscle of the crab during the course of reproductive cycle.

### Materials and methods:

**Proximate body composition:** The organic body constituents of each component were determined by standard methods such as total proteins (Lowry *et al.*, 1951); lipid (Folch *et al.*, 1957); moisture and ash (Standard method of AOAC, 1999). The results were expressed on dry weight basis.

**Statistical analysis:** The data was analyzed on personnel computer to calculate correlation by Pearson's correlation method, ANOVA to test the level of significance with the help of Microsoft Excel 2003 and SPSS (12.0 Version, Chicago, USA) and mean compared by using Duncan's multiple range test taking ( $p < 0.05$ ) as level of significance (Duncan, 1955).

### Results and Discussion:

**Protein content:** Inquisitive study of tables-1 revealed that in prawns, annual average was recorded to be  $45.70 \pm 0.52$ . Our results are therefore in conformity with the findings of Jyoti and Kailoo, 1985; Samyal, 2007; Bakhtiyar, 2008; Manhas, 2012; Gupta, 2012 and Bandral, 2015.

**Lipid content:** Thorough investigations revealed that the lipid content fluctuated from  $2.22 \pm 0.24\%$  to  $3.69 \pm 0.18\%$  with an annual average of  $2.79 \pm 0.31\%$ . Similar results have been reported by Jonsson and Jonsson (2005), Nargis (2006), Samyal (2007), Bakhtiyar (2008), Manhas (2012).

**Moisture content:** Perusal of table-1 revealed that the moisture content in the male crabs fluctuated from  $73.01 \pm 0.68\%$  to  $78.94 \pm 0.86\%$  with an annual average was recorded to be  $75.20 \pm 1.01\%$ . The moisture content observed its maxima in winters and summers. Similar fluctuations of moisture content in response to reproductive cycle has been observed by Tagore (1990) during Monsoon months as well as by Samyal (2007) in *M. dayanum*.

**Mineral Composition:** The mineral level of the *M. dayanum* are shown in (Table-1). The annual averages of potassium content were recorded to be  $3.12 \pm 0.74$ . Potassium was found to be between  $4.44 \pm 0.32$  to  $9.84 \pm 0.24$ . High values were also recorded for calcium ( $13.84 \pm 0.50$ ) and magnesium fluctuated from  $0.71 \pm 0.15$  to  $2.50 \pm 0.28$  for the year 2012-13. Iron content in the muscles of *M. dayanum* fluctuated from  $0.12 \pm 0.02$  to  $0.32 \pm 0.04$  with an annual average of  $0.19 \pm 0.03$ . Higher values of the mineral content have been reported during

their breeding period while the minimum values were recorded during non-spawning period in the investigated species (Fig. a). The increase in the mineral content i.e. Ca, Mg, K and Na during the breeding season can therefore, be attributed to the fact that these minerals are in higher demand during this period for carrying out the metabolic and physiological activities (Quayum, 1984; Koda *et al.*, 1995; Abdullahi and Abolude, 2005; Abdullahi and Abolude, 2000 and Abdulkarim *et al.*, 2015) which are definitely at their peak due to obvious reasons.

**Conclusion:** The present shellfishes stand at par with their marine counterparts in terms of nutritional status. They are the highest sources of protein, one of the most important nutrients especially for growing children to make them stronger and taller. It also keeps hair, nails and skin healthy. The presence of minerals in the muscles of the investigating species also recommends its use in the therapeutic purposes.

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Table1: proximate and mineral composition in the muscles of *M.dayanum*

S.No	Parameter	Annual average
1.	Protein	45.70±0.52
2.	Lipid	2.79±0.31
3.	Moisture	75.20±1.01
4.	Calcium	12.15±1.15
5.	Magnesium	1.71±0.63
6.	Sodium	3.12±0.74
7.	Potassium	7.47±1.86
8.	Iron	0.19±0.03

Data presented above is the mean of three readings i.e. Mean±S.D

