



Research Article

SEASONAL CHANGES IN PROTEIN CONTENT IN MARINE PRAWN *PENAEUS MONODON* AND FRESH WATER PRAWN *MACROBRACHIUM ROSENBERGII*-A COMPARATIVE STUDY

¹G. Krishna and ^{2*}T. Raj Kumar

¹Department of Zoology, Government Degree College, Atmakur, Andhra Pradesh, 524322.

²Department of Zoology, Rayalaseema University, Kurnool, Andhra Pradesh, 518007.

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ABSTRACT

The present study was the amount of protein content in different tissues of the marine shrimp *Panaeus monodon* and the freshwater prawn *Macrobrachium rosenbergii* was determined. Shrimp culture ponds in Kavali, Nellore District, Andhra Pradesh, India, provided the test specimens. Protein content was determined in several tissues. *P. monodon* muscle (148.00 0.03 mg/g) and gills (88 0.04 mg/g) protein levels were compared to *Macrobrachium rosenbergii* muscle (135 0.02 mg/gm) and gills (81 0.03 mg/gm). *P. monodon* has the highest protein concentration compared to *Macrobrachium rosenbergii*.

Keywords: *Panaeus monodon*, *Macrobrachium rosenbergii*, Tissue protein, Nutritive values.

INTRODUCTION

The species of Prawns *Panaeus monodon* and *Macrobrachium rosenbergii* constitute the important fishery resource in India. The harvest of aquatic animals has been reported to be increasing tremendously. Aquatic animals excel as a source of nutrition and commerce. Because of their worldwide demand and the escalating increase in price of aquatic species many countries including India turned into Aquaculture practices or increasing the production of fishery products. The demand for human intake of animal protein is growing. It is mostly met by animals that are raised on land. Because of its high protein content, low fat, great taste, and market demand in both the domestic and foreign markets, marine shrimp culture has seen a significant expansion. Many economically important marine prawns (such as *Panaeus monodon*, *P. vannamei*, and the freshwater prawn *Macrobrachium* species) have been identified and employed as aquaculture species in India (Chwang *et al.*, 1986). In shrimp farming, feed is one of the most critical and necessary supplies. The dietary need of marine and freshwater prawns increases dramatically during their

growth, and if they do not obtain enough food, they will have poor survival and production (Bautista and Subosa, 1997). Feed is the most expensive part of prawn farming, hence every effort should be made to maximize feed use (Forkjaer, 1994). An optimal level of dietary protein is required for maximal growth. *P. monodon* has a gross protein demand of 38 to 46 percent while *Macrobrachium rosenbergii* has a gross protein need of 35 to 40 percent. *M. rosenbergii* and *P. monodon* are known to be the most efficient diets for us (Gornall *et al.*, 1949 and Shakir *et al.*, 1994). The amino acids that marine prawns cannot generate in their bodies are deemed essential and must be provided in sufficient quantities in their diet (Glencross *et al.*, 2002). A few researchers looked into shrimp feeding behavior and stomach contents (Hyslop, 1980). The biochemical makeup of protein, carbohydrate, and lipid in the tissues of individual penaeid prawns has been documented by a number of authors (Watanabe, 1982; Barrat and Mantano, 1986 and Whiteford, 2005). The goal of this study was to look into the differences in protein content between a kind of marine prawns (*P. monodon*) and freshwater prawns (*Macrobrachium rosenbergii*).

*Corresponding Author: Dr.T. Raj Kumar, Department of Zoology, Rayalaseema University, Kurnool, Email: trkvsu@gmail.com, Mobile: +91 9948548642.

MATERIAL AND METHODS

P. monodon, a marine prawn, and *Macrobrachium rosenbergii*, a freshwater prawn, were taken from shrimp production ponds in Kavali, SPSR Nellore District, Andhra Pradesh, India, between February 2020 and January 2021. The muscles and gills of various prawn species were extracted and weighed with precision. Lowry *et al* (1951) was used to determine the protein content of the tissues.

Statistical Analysis

Using SPSS statistical software, the mean and standard deviation were used to estimate the significance of

differences in the mean value of protein content (SPSS, 1990).

RESULTS AND DISCUSSION

Table 1 shows the protein composition of the muscles and gills of *P. Monodon* and *Macrobrachium rosenbergii*. The total protein composition of various tissues was discovered to vary depending on the season. *Monodon Panaeus* Protein concentration in muscle tissue was highest (148.00 mg/g) in May 2020 and lowest (110 mg/g) in January 2021. The protein concentration of gill tissue was highest (88 mg/g) in April 2020 and lowest (60 mg/g) in February 2020.

Table 1. Seasonal changes of total protein content of shrimps *P. monodon* and *M. rosenbergii* (Each value is Mean $\pm$ Standard Deviation and expressed in mg/gm).

Month & Year	<i>Penaeus monodon</i>		<i>Macrobrachium rosenbergii</i>	
	Muscle	Gill	Muscle	Gill
Feb, 2020	123.2 $\pm$ 1.02	60 $\pm$ 1.04	116 $\pm$ 0.02	60 $\pm$ 0.03
March, 2020	112 $\pm$ 1.03	74 $\pm$ 1.04	112 $\pm$ 0.03	76 $\pm$ 0.02
April 2020	138 $\pm$ 1.02	88 $\pm$ 1.04	135 $\pm$ 0.02	81 $\pm$ 0.03
May 2020	148 $\pm$ 1.03	87 $\pm$ 1.03	134 $\pm$ 0.02	80 $\pm$ 0.02
June 2020	147 $\pm$ 1.02	87 $\pm$ 1.03	130 $\pm$ 0.03	78 $\pm$ 0.03
July 2020	142 $\pm$ 1.04	84 $\pm$ 1.03	128 $\pm$ 0.02	76 $\pm$ 0.02
August 2020	145 $\pm$ 1.03	84 $\pm$ 1.04	122 $\pm$ 0.03	70 $\pm$ 0.02
September, 2020	147 $\pm$ 1.02	80 $\pm$ 1.02	125 $\pm$ 0.02	73 $\pm$ 0.03
October, 2020	117 $\pm$ 1.01	76 $\pm$ 1.04	93 $\pm$ 0.02	74 $\pm$ 0.03
November, 2020	123 $\pm$ 1.02	73 $\pm$ 1.03	115 $\pm$ 0.02	61 $\pm$ 0.02
December, 2020	112 $\pm$ 1.02	76 $\pm$ 1.02	116 $\pm$ 0.03	61 $\pm$ 0.02
January, 2021	110 $\pm$ 1.03	67 $\pm$ 1.03	120 $\pm$ 0.03	61 $\pm$ 0.03

The muscle protein content of *Macrobrachium rosenbergii* was highest (135 mg/g) in April 2020 and lowest (93 mg/g) in October 2020. The largest gill protein concentration (81 mg/g) was measured in April 2020, and the lowest (60 mg/g) was reported in February 2020. According to Kutty and Parulekar, the highest concentration of protein was found in *Panaeus* Prawn muscle tissue (1984). Season, animal size, stage of maturation, food availability, temperature, and other factors are known to affect biochemical makeup (Sriraman and Reddy, 1977). Smith and Chisholm (2001) found a low level of protein in a Prawn species' gill sample. Protein differences were found in the tissues of *P. monodon* and *Macrobrachium rosenbergii* by Fenucci *et al.* (1980) and Ali *et al.* (2006). The findings of this investigation corroborate previous findings (Ketalo, 1982; Dominy and Ako, 1988 and Shakir *et al.*, 1994).

CONCLUSION

P. monodon, *Macrobrachium rosenbergii* tissues have high-quality protein, according to this study. As a result,

P. monodon and *M. rosenbergii* are considered aquaculture candidate species.

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