

BIOCHEMICAL STUDIES OF THE GREEN MUSSEL *PERNA VIRIDIS* FROM MANDVI SHORE OF RATNAGIRI DISTRICT OF MAHARASHTRA STATE.**Bhagde Rupendra Vinayak.**Department of Zoology, S. N. Arts, D. J. M. Commerce and B. N. S. Science College, Sangamner ,
Dist. Ahmednager, Maharashtra , India 422605**ABSTRACT**

The green mussel *Perna viridis* from Mandvi shore of Ratnagiri district in Maharashtra state were collected and lengthwise grouped as small, medium and large. The water content percentage and the biochemical constituents i.e. protein, lipid and glycogen from different sized groups of the mussels were estimated. The small sized mussels stored higher amount of glycogen than medium and large sized mussels. The medium sized mussels showed higher amount of protein than small and large sized mussels and the large sized mussels showed higher amount of lipid than small and medium sized mussels.

KEY WORDS: *Perna viridis*, biochemical estimation**INTRODUCTION**

The green mussel *Perna viridis* (Kuriakose, 1980;) is used by the fishermen communities themselves for the food and as bait. In Ratnagiri, Goa, South Canara and in few other coastal places these mussels are regularly fished and marketed. Now a days people in various coastal towns in India are also using them with relish. Day by day its popularity as seafood is increasing. In various sea food festivals organized by some hotels it is preferred by the customers even in Mega cities like Mumbai and Pune in Maharashtra. The high customer demand and market value has led to its commercial exploitation. To fulfill the demand regularly and guaranteed supply of the mussels having good quality, need to culture them arises. Besides meeting part of the requirement of the people of the country, it offers scope for foreign exchange earning. Mussel culturing have employment potential in the coastal areas and presently under utilized areas can be used effectively for better production. The experiments on mussel culture were carried out by Central Marine Fisheries Research Institute, Cochin at various costal places in India and they were successful (Silas, 1980); Qasim *et al.*, 1077). Now days the mussel farming practices are going on the west coast of India at many places even in Ratnagiri.

Size and quantity of various biochemical contents especially protein, lipid and glycogen is of special interest to the aqua culturists and the marine biologists for determining the best time of harvesting. Perusal of literature showed that much work has n been done on biochemical estimation of various bivalve species, Nagabhushanam and Mane (1978), Nagabhushanam and Dhamane (1977), Ansari (1981). Due to lack of detail information about biochemical constituents of *P. Viridis* from Maharashtra state present study was undertaken. *P. viridis* from Mandvi shore of Ratnagiri district of Maharashtra state in India were collected and their biochemical estimations viz. glycogen, protein and lipid were made to understand the distribution of body reserves in these populations. In Mandvi the mussels always gets exposed to air during low tides and the mussels are generally found in rock crevices and sheltered areas.

MATERIALS AND METHODS

The mussels were collected during low tide from Mandvi shore at Ratnagiri. The mussels from Mandvi shore were grouped as 92-100mm for small, 103-109mm as medium and 115-131mm as large sized mussels. Their wet weight and dry weights were calculated to estimate water content percentage and biochemical contents were analyzed from each individual animal used in the study. Protein was analyzed as per Lowry *et.al* (1951), while lipid was estimated according to Barnes and Blackstock (1973) and glycogen as described by Dezwan and Zandee (1972). The samples in triplicate were used and the mean values were drawn.

RESULTS AND DISCUSION

The wet weights and dry weights of the individuals from each group of the mussels from Mandvi shore were measured and water contents as percentage were also calculated. The biochemical contents viz. glycogen ,Protein and lipid were also calculated (Table 1)The wet weights of the individual from these respective groups ranged between 12.13 and 17.63, 19.84 and 30.75, from 28.98 and 36.1gm, while their dry weights ranged from 2.02 to 3.0, 3.7 to 5.3 and 5.23 to 7.1 gm respectively. The water content as percentage ranged from 80.5 to 83.25, 79.94 to 83.84 and 78.1 to 83.74 for

the above respective groups. In these respective groups glycogen content was in the range of 1.6 to 2.0, 1.18 to 1.78 and 0.9 to 1.66mg/100mg on wet weight basis, while on dry weight basis for the above respective groups it was 8.83 to 11.9, 7.92 to 9.6 and 5.51 to 7.86mg/100mg. Protein content was in the range of 2.6 to 4.39, 3.15 to 4.43 and 2.69 to 4.15mg/100mg on wet weight basis and 15.62 to 23.78, 17.1 to 27.55 and 12.78 to 22.96 mg/100gm on dry weight basis for small, medium and large sized mussels respectively. Lipid content ranged from 0.77 to 0.95, 1.02 to 1.37 and 2.0mg/100mg on wet weight basis and from 4.24 to 5.45, 6.21 to 7.52 and 8.28 to 9.99 mg/100mg on dry weight basis for the small, medium and large sized mussels respectively. The small sized mussels stored higher amount of glycogen than medium and large sized mussels. The medium sized mussels showed higher amount of protein than small and large sized mussels and the large sized mussels showed higher amount of lipid than small and medium sized mussels.

Table 1 : Showing details of weights, water contents and biochemical contents from the whole body of *Perna viridis* from Mandvi shore

Size in Length (mm)	Whole body weight		Percent Water Content	Glycogen mg/100mg		Protein mg/100mg		Lipid mg/100mg	
	Wet (gm)	Dry (gm)		Wet (gm)	Dry (gm)	Wet (gm)	Dry (gm)	Wet (gm)	Dry (gm)
92 - 100 (97.14)	12.13 - 17.63 (14.88)	2.02 - 3.00 (2.62)	80.51 - 83.35 (81.69)	1.60 - 2.00 (1.88)	8.83 - 11.90 (10.36)	2.60 - 4.39 (3.65)	15.62 - 23.78 (18.88)	0.77 - 0.95 (0.89)	4.24 - 5.45 (4.40)
103 - 109 (105.86)	19.84 - 30.75 (26.49)	3.70 - 5.30 (4.18)	79.94 - 83.84 (82.18)	1.18 - 1.78 (1.49)	7.92 - 9.60 (8.88)	3.15 - 4.34 (3.80)	17.10 - 27.55 (21.88)	1.02 - 1.37 (1.22)	6.21 - 7.52 (6.31)
115 - 131 (124.78)	27.98 - 36.10 (31.98)	5.23 - 7.10 (6.14)	78.91 - 83.74 (81.98)	0.90 - 1.66 (1.08)	5.51 - 7.86 (6.57)	2.69 - 4.15 (3.39)	12.78 - 22.96 (17.90)	1.57 - 2.00 (1.68)	8.25 - 9.99 (8.86)

(Bracket values are mean values)

Fluctuations in percentage edibility condition indices in bivalve mollusks from Indian coast have been shown to follow distinct cycle correlated to the sexual cycle, especially in Oysters (Durve, 1964). Nair and Nair (1987) while studying the condition index and percentage edibility of *Crassostrea madrasensis* from Cochin harbor found that during built of stage of gonads in sexually intermediate forms oysters accumulates large amount of carbohydrates. In the present results its observed that there is variation in biochemical constituents in different sized groups of the mussels. These variations are probably due to differences in utilization of biochemicals for somatic and reproductive growth. Such type of variation may be responsible for variation in the quality of the meat and the taste of the mussels.

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REFERENCES

- Ansari Z. A., Parulekar A. H. and Matondkar S. G. (1981).** Seasonal changes in meat weight and biochemical composition in the back clam *Villorita cyprinoids*(Grey). *Indian J. Mar. Sci.* 10:128-131.
- Barnes H. and Blackstock (1973)** : Estimation of lipids in marine animals and tissue. Detailed investigation of the sulphosphovanillin method for total lipids. *J. Exp. Mar. Biol. Ecol.* 12 (1): 103-118.
- De Zwan A. and Zandee D. I. (1972).** Body distribution and seasonal changes in the glycogen content of the common sea mussel *Mytilus edulis*. *Comp. Biochem. Physiol.* A, 43: 53-58.
- Durve V. S. (1964).** On the percentage edibility and the index condition of the oyster, *Crassostrea gryphoids* (Schlotheim). *J. Mar. Biol. Ass. India.* 6:128-135.
- Kuriakose P.S. (1980).** Mussels (Mytilidae : genus *Perna*) of the Indian coast. Coastal Aquaculture : Mussel Farming-progress and Prospects, CMFRI Bulletin, Cochin, India. 29:1-5.
- Lowry O. H., Rosenburangh N. J. Farr M. A. L. and Randall R.J. (1955).** Protein measurement with Folin phenol reagent. *J. Biol. Chem.* 193: 265-275.

- Nagabhushanam R. and Dhamane K. P. (1977).** Seasonal variation in biochemical constituents of the clam, *Paphia laterisulca*. *Hydrobiologia*. 54(3): 209-214.
- Nagabhushanam and Mane U. H. (1978).** Seasonal variation in the biochemical composition of *Mytilus edulis* at Ratnagiri on the west coast of India. *Hydrobiologia*. 57:69 -72.
- Nair V.N. and Nair, B.N. (1987).** Condition index and percentage edibility of *Crassostrea madrasensis* (Preston) inhabiting the Cochin Hharbour. *Fish. Technol.* 24:14-21.
- Qasim S. Z., Parulekar A. H., Harkantra S. N., Ansari Z. A. and Nair A. (1977).** Aquaculture of green mussels, *Mytilus viridis* L. cultivation on ropes from floating rafts. *Indian Mar. Sci.* 6:15-25
- Silas E.G. (1980)** .Mussel culture in India constrains and prospects. CMFRI bulletin 29, Coastal Aquaculture: Mussels Farming Progress and Prospects, pp-51-56.