

Changes in the protein content of *Lamellidens marginalis* from Jayakwadi dam at paithan during different seasons (M.S) India

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Abstract

In the present study, variation in the protein content in soft body tissues of *Lamellidens marginalis* were collected from Jayakwadi dam, at Paithan near Aurangabad was observed during different seasons. As variation in the environmental conditions, it shown an effect on protein contents in the tissues like, mantle, hepatopancreas, gonad and foot. Protein content maximum found in gonads throughout all the three seasons, whereas mantle shows minimum values of protein. There are great fluctuations in the values of protein during different seasons.

Keywords: *Lamellidens marginalis*, protein, different seasons, Jayakwadi dam.

INTRODUCTION

The freshwater mollusk, are suspensory feeder on primary stage of food chains, hence they notably influences the organization and fluctuating of ecosystems. Also they perform efficient role in transformation of energy in food chains coupled with their sessile made of life. Seasonal variation in biochemical composition have been reported many workers. Gabbott and Bayne (1973) [1] determined seasonal changes in biochemical composition of adductor muscle, mantle, siphon and foot in *Merecenaria merecenaria* and *Mytilus edulis* from India, relatively very few in vestigators such as Dhamne (1975) [2] on *Paphialaterisuca*, Nagabhushanam and Mane (1975) [3] and Nagabhushanam and Mane (1978) [4] on *Mytilus viridis*, have reported changes the biochemical composition correlating with annual reproductive cycle of bivalves. Protein is a versatile, complex and fragile macromolecule with high molecular weight. It served as fuel to yield energy and also play a vital role in every aspect of the structural and functional characteristics of the organisms. Vedpathak (1989) [5] and Jadhav (2011) [6] observed fortnightly and monthly changes in biochemical composition in freshwater bivalve mollusks. The review literature shows that there is in adequate information about freshwater bivalve mollusk, *Lamellidens marginalis* from different dam of Maharashtra. Hence, the present study has carried out to understand the fluctuations biochemical composition through regular collection of animal from Jayakwadi dam in Maharashtra.

MATERIALS AND METHODS

The freshwater bivalve mollusk, *Lamellidens marginalis* were

collected from Jayakwadi dam, 49 km away from Aurangabad city, during monsoon (August to September), winter (December to January) and summer (April to May) over a period one year were selected for laboratory experiments. Immediately after bringing to laboratory, the shells of these bivalve were brushed and washed with fresh and clean water to remove algal biomass, mud and other waste material. The cleaned animals were then kept for depuration for 12hrs in laboratory conditions under constant aeration. For biochemical analysis, animals were dissected and soft body tissues like mantle, hepatopancreas, gonad and foot were removed. 100mg of each wet tissues were taken for biochemical analysis. Protein was determined by the method proposed by Lowry's et al; (1951) [7]. Using Bovine serum Albumin (BSA) as standard. The results are expressed as milligram content per 100 mg wet tissue. Triplicate values of each biochemical constituents were subjected for statistical confirmation using student 't' test. Standard deviations were calculated during different seasons.

RESULTS

The protein contents observed during the experimental work has been given in table-1. The protein content maximum found in gonad throughout all the three seasons. During monsoon seasons, the contents from mantle and hepatopancreas are nearly constant in the month of July and August. Similarly, the protein contents maximum showed from gonad (8.166 ± 0.272) on August and minimum (8.122 ± 0.233) on July and August. During winter seasons, the protein content shows maximum from mantle (5.112 ± 0.140) on December and minimum shows (4.220 ± 0.123) on November. Similarly, the protein contents from hepatopancreas are nearly same in the month of November and December. While, the protein contents maximum found from gonad (6.587 ± 0.243) on November and minimum shows (6.117 ± 0.222) on December and the protein contents from foot (5.349 ± 0.214) on December and minimum shows (5.290 ± 0.2790) on November. During summer season, the protein contents maximum showed from mantle (6.889 ± 0.178) on May and minimum shows (6.778 ± 0.166) on April. Similar pattern to observed for protein contents from hepatopancreas on April and May. Similarly, the protein contents maximum showed from gonad (11.728 ± 0.0244)

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and minimum shows (11.456 ± 0.387) on April. While, the protein contents maximum showed from foot (8.992 ± 0.309) on April and minimum shows (8.825 ± 0.411) on May. While also the protein observed maximum from gonad and foot during summer as

compared to monsoon and winter seasons. While the protein is also observed maximum from foot during summer as compared to monsoon and winter seasons.

Table 1. Changes in the protein contents of *Lamellidens marginalis* from Jayakwadi dam, during different seasons

Tissues	Monsoon		Winter		Summer	
	July	August	November	December	April	May
Mantle	5.122±0.199	5.999±0.122	4.220±0.123	5.112±0.140	6.778 ±0.166	6.889±0.178
Hepatopancreas	5.891±0.124	5.222±0.166	4.249±0.127	4.588±0.131	6.389±0.188	6.241±0.172
Gonad	8.122±0.233	8.166±0.272	6.587±0.243	6.117±0.222	11.456±0.387	11.728±0.444
Foot	8.376±0.384	7.992±0.211	5.290±0.279	5.349±0.214	8.992±0.309	8.825±0.401

DISCUSSION

In the present study, *Lamellidens marginalis* were collected from Jayakwadi dam at Pithan near Aurangabad. There is significant changes in the protein content in different body tissues according to seasonal variations. Organic constituents like protein act as key substances for different metabolic activities. The protein main organic nutrient used to build up different body tissues. It is observed that protein contents during monsoon season, which is correlated with highest body activities of animal during this season. All the body organs show minimum protein values during winter season, which may be due to sedentary life without much activities. The amount of protein present in different tissues is closely linked with food availability and gonadal development this is due to increase inflow and turbidity of water and to cope up with new environmental changes. Similar results are observed by Pandit (2005) [8] by *Lamellidens marginalis* of Godavari river at Kaigaon due to exposure of mantle and foot to high temperature.

The study revealed that in term of energy conservation. The organic would be exported to make compensatory adjustments to both the components of energy gain and energy loss fate of changes in the environmental conditions (Vedpathak, 1989) [5]. Thus, in the present study of *Lamellidens marginalis* it is observed that organic constituents present in different soft body tissues shows seasonal fluctuations and are correlated with fluctuations in the environmental conditions along with developments of reproductive cycle.

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REFERENCES

- [1] Gabbott, P.A, and Bayne, B.L.1973. Biochemical effect of temperature and nutritive stress on *Mytilus edulis* (L). *J.Mar. Biol.Assoc.* 53: 269-286.
- [2] Dhamane, K.P. 1975. Biochemical studies of clam, *Paphialaterisulca*, Ph.D Thesis Marathwada University, Aurangabad, India. Pp-1-241.
- [3] Nagabhushanam, R. and Mane U.H. 1975. Reproduction in the mussel, *Mytilusviridis* at Ratnagiri. *Bull. Dept. Mar.Sci.Uni.Cochin.* 7: 377-387.
- [4] Nagabhushanam, R. and Mane, U.H.1978. Seasonal variation in the biochemical composition of *Mytilusviridis* at Ratnagiri on the west coast of India. *Hydrobiol.* 57: 69-72.
- [5] Vedpathak, A.N. 1989. Reproductive Endocrinology of some Lamellibranch mollusk with special reference to environmental stress. Ph.D Thesis Marathwada University, Aurangabad, India. Pp. 1-280.
- [6] Jadhav, M.R.2011. Reproductive physiology of freshwater lamellidens mollusk, *Lamellidens marginalis* from Godavari river at Paithan: As a function of effect of neuroendocrine manipulations. Ph.D Thesis Dr. Babasahb Ambaekar Marathwada University, Aurangabad, India. Pp-1-261.
- [7] Lowry, O.H., Rosenbrough, H.J.; Farr, A.L. and Randall, R.J.1951. Protein measurement with the Follin Phenol reagent. *J.Biol.Chem.* 193: 265-275.
- [8] Pandit, S.V. (2005): Seasonal variation in the biochemical of the freshwater bivalve mollusks, *Lamellidens marginalis*(L) from Godavari river at Kaigaon, near Aurangabad. Ph.D Thesis Dr. Babasahb Ambaekar Marathwada University, Aurangabad, India. Pp- 1-213.