

## Changes in the lipid contents of freshwater bivalve, *Lamellidens marginalis* from godavari river during different seasons (M.S)

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### Abstract

Changes in the lipid contents different soft body tissues of *Lamellidens marginalis* (70-77 mm in shell length) were collected from Godavari river at Paithan 49 km away from Aurangabad city. The lipid content maximum found in foot during summer and maximum showed in gonad during monsoon and winter season. The freshwater bivalve shows maximum changes in the lipid contents from gonad, as it undergoes different stages like development, maturation and spawning during different seasons.

**Keywords:** Freshwater bivalve, *Lamellidens marginalis*, lipid, Godavari river.

### INTRODUCTION

Freshwater bivalves are performing efficient role in transformation and reserved of energy in food chains coupled with their sessile mode of life. Lipid is the most efficient organic reserves of most of the bivalve and other animals [1]. Seasonal variation in biochemical composition have been reported many workers. Ansell [2] and Gabbott and Bayne [10] determined seasonal changes in lipid composition of adductor muscle, mantle, siphon and foot in *Merecenaria merecenaria* and *Mytilus edulis* from India, relatively very few investigators such as [8,15,16] on *Mytilus viridis*, have been reported changes with annual reproductive cycle of freshwater bivalve. Lipid is responsible for variety of function in organisms. The lipid composition in different tissues have been reported by Trumen and Pekkarinen [21] on *Macoma balthica*. Observed fortnightly and monthly changes in lipid composition of freshwater bivalve [13,23] on *Lamellidens marginalis*. In the present investigations on the physiological response of bivalve to environmental agents have been expanded significantly. Seasonal variation in reproductive and gross biochemical composition of adult clam *Tapes decussates* and *Tapes philippinarum* was reported by Peter and Albert in 2003. Solaskar and Nayak [20] have reported biochemical constituents on *Crassostrea madrasensis* and *Perna viridis* from Kali estuary, Karnataka. 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* (70-77 mm in shell length) were collected from Godavari river at Paithan, 49 km away from Aurangabad city. During monsoon (July to August), winter (December to January) and summer (April to May) were selected for laboratory experiments. Immediately after bringing to laboratory, hard shells of these freshwater bivalves 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 lipid analysis, animals were dissected and soft body tissues like mantle, hepatopancreas, gonad and foot were removed. 100mg of each wet tissues were taken for lipid analysis. Lipid was determined by the method proposed by Barnes and Blackstock in 1973. 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's 't' test [9]. Standard deviations were calculated during different seasons.

### RESULTS

The lipid analysis observed during the experimental work has been given in table-1. During monsoon, the gonad shows maximum amount of lipid content ( $10.399 \pm 0.233$ ) on August, whereas it is minimum from mantle ( $4.109 \pm 0.122$ ) on August. During winter, the lipid contents it was maximum shows from gonad ( $8.337 \pm 0.318$ ) on December and minimum from mantle ( $4.423 \pm 0.125$ ) on December. During summer, the lipid content maximum found from mantle and foot during summer season. The values of lipid observed from mantle ( $9.388 \pm 0.221$ ) on May and ( $9.277 \pm 0.223$ ) on April. Whereas, the lipid contents from foot shows values ( $10.512 \pm 0.218$ ) on April and ( $10.911 \pm 0.102$ ) on May. The lipid contents from mantle and foot shows large decrease during monsoon and winter seasons.

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Table 1. Changes in the lipid contents of *Lamellidens marginalis* from Godavari river at Paithan, during different seasons.

Tissues	Monsoon		Winter		Summer	
	July	August	December	January	April	May
Mantle	4.550±0.279	4.109±0.122	4.423±0.125	4.889±0.249	9.277±0.233	9.388±0.221
Hepatopancreas	4.430±0.144	4.985±0.135	5.666±0.124	5.778±0.112	6.278±0.213	6.799±0.205
Gonad	9.800±0.249	10.399±0.233	8.337±0.318	7.897±0.237	7.534±0.301	7.895±0.269
Foot	7.388±0.238	6.711±0.277	6.219±0.319	5.423±0.149	10.512±0.218	10.911±0.102

## Discussion

In the present study, freshwater bivalve, *Lamellidens marginalis* (70-77 mm in shell length) were collected from Godavari river at Paithan. There is a significant variation in the lipid composition in different soft body tissues according to different seasons. It is observed that lipid content is significantly accumulated in mantle and foot during summer season. All the tissues shows constant lipid content during monsoon, which is correlated with highest body organs shows minimum lipid content during winter season. This is due to cope up to increase inflow and turbidity of water results were are observed by Pandit [17] by *Lamellidens marginalis* of Godavari river at Kaigaon lipid found more in mantle and foot during summer season. Similar results have been studied by Shiah [19] the lipid molecules may be deposited in large amount of these tissues and seasonal biochemical changes in different soft body tissues of *Lamellidens marginalis* from Pravara river in Maharashtra. During monsoon season, gonad show maximum amount of lipid, which is correlated with the maturation of gonadal follicle and time of spawning Hongwei [12], observed lipid content increased in razor clam, *Sinonovacula constricta*. 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 [23]. It is therefore essential to study the effect of environmental variables on the the lipid contents. A high lipid contents was observed of the gonad at the time of active gametogenesis in *Pismo clam*, *Tivela stultorum* [11]. The Major organic reserves, glycogen and lipid, declined in the hepatopancreas of *Scylla serrata* during the period of reproductive activity while inclined in ovary during the same period [14]. One of the reasons for lipid increase as inhibition of lipase activity after transfer from reserves in the hepatopancreas to female gonad [3,4,6,22]. Thus, in the present study of *Lamellidens marginalis* it is observed that lipid composition 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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