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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 made 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 tssues 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 grass biochemical compositon 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.

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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, mid 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 statically confirmation using student'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±0.233) on August, whereas it is minimum from mantle (4.109±0.122) on August. During winter, the lipid contents it was maximum shows from gonad (8.337±0.318) on December and minimum from mantle (4.423±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±0.221) on May and (9.277±0.223) on April. Whereas, the lipid contents from foot shows values (10.512±0.218) on April and (10.911±0.102) on May. The lipid contents from mantle and foot shows large decrease during monsoon and winter seasons.

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 Shiakh [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 gametogenisis 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 mare correlated with fluctuations in the environmental conditions along with developments of reproductive cycle.

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REFERENCES

[1] Anderson, P.d and Webber, L.J. (1977): the toxicity to aquatic populations of mixtures containing heavy metals. *Proc. Int. Conf. Heavy. Environ; Toranto, Ontario Canada*, 2: 933-955

[2] Ansell, A.D. Loosmore, F.A and Lander, K.F (1964): Studies on the hard shell clam, *Mercenaria mecernaria,* In British water: seasonal cycle in condition and biochemical composition. *J.Appl. Ecol.* 1:83-95

[3] Barber, B.J, Blake, N. J.(1985a): Intra organ biochemical transformations associated with oogenesis in the bay scallop *Argopecten irradians concentricus* (say as indicated 14C incorporation, *Biol. Bull* (Woods Hole) 168-3949.

[4] Barber, B.J, Blake, N. J.(1985b): Substrate catabolism related to reproduction, in the bay scallop *Argopecten irradians concentricus* as determined by O/N and RQ physiological indexes, *Mar. Biol.* 187-1381.

[5] Barnes, H and Blackstock, J. (1973): Estimation of lipid in marine animals and tissues: Detailed investigation of Sulpho-Phospho-Vanilline method for total lipid *J .Expt. Mar. Biol. Ecol*. 12(1):103-118

[6] Baumbler, W and H.S. Salama (1976): Some biochemical changes induced by dimilin in the gypsy moth *Porthretia dispar L.Z. Ang* . Ent.81:304-310.

[7] Bidarkar, D.S. (1975): Some aspect of biology of Indian oyster *Crassostrea culullata Ph.D Thesis Marathwada University, Aurangabad, India pp* 1-226.

[8] Dhamane, K. P (1975): Biochemical studies of clam, *Paphia laterisulca*, *Ph.D Thesis Marathwada University, Aurangabad, India.* Pp. 1-241

[9] Dowdeswell, W.H (1957): Practical Animal Ecology Methum and Co.Ltd, London.

[10] Gabbott, P.A, and Bayne, B.L, (1973): Biochemical effect of temperature and nutritive stress on *Mytilus edulis (L) J.Mar. Biol.Assoc.* U.K 53: 269-286.

[11] Giese, A. C and Hart, M.a (1967): Seasonal changes in components indices and chemical composition in *Katharina tunicata . J. Expt. Marine. Biol. Ecol*. 1-34

[12] Hongwei Yan, Qi Li, Wenguang Liu, Ruihai Yu and Lingfeng Kong (2009): Seasonal changes in reproductive activity and biochemical composition of the razor clam *Sinonovacula constricta Marine Biology Reseasrch* 6 (1): 78-88

[13] Jadhav, M.R. (2011): Reproductive physiology of freshwater lamellidens mollusk, *Lamellidens marginali* from Godavari river at Paithan: As a function of effect of neuroendocrine manipulations *Ph.D Thesis Dr. Babasahb Ambaedkar Marathwada University, Aurangabad, India* Pp. 1-261

[14] Nagabhushanam, R. and Farooqui, U.M (1982): Mobilization of protein, glycogen and lipid during ovarian maturation in marine

crab, *Scylla serrata Forskal. Indian. J. of Mar. Sci.* (11): 184-186.

[15] Nagabhushanam, R. and Mane U.H. (1975): Reproduction in the mussel, *Mytilus viridis* at Ratnagiri. *Bull. Dept. Mar.Sci.Uni.Cochin, India*, 7: 377-387

[16] Nagabhushanam, R. and Mane U.H. (1978): Seasonal variation in the biochemical composition of *Mytilus viridis* at Ratnagiri on the west cost of India. *Hydrobiol.* 57: 69-72.

[17] 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 Ambaedkar Marathwada University, Aurangabad, India* pp. 1-213.

[18] Peter, G.B. and Albert, L (2003): Seasonal variation in condition; reproductive activity and gross biochemical composition of two species of adults clam record in a common habitat: *Tapes decussates* and *Tapes philippinarum J.Expt .Mar.Biol and Ecol.* Science -direct online.

[19] Shaikh, M.J. (2011): Seasonal variation in biochemical constituents in different body tissues of freshwater bivalve mollusk, Lamellidens marginalis (Lamark) from Pravara river in Maharashtra. *The Bioscan* 6(2):297-299.

[20] Solaskar, G.M and Nayak, V.N (2011): Nutritional quality of bivalves, *Crassostrea madrasensis* and Perna viridis in the Kali estuary Karnataka, India *Rec Res Sci & Tech* 3 (4): 6-11

[21] Trumen, S. and Pekkarinen, M (1990): Fatty acid profile of the digestive gland and mantle in the bivalve, *Macoma balthica. Comp. Biochem. Physiol*. 97 (2): 269-274

[22] Vassallo, M.T. (1973): Lipid storage and transfer in the Scollap chymlys hericia Gould. Comp. Biochem. Physiol. 44:1169-1175.

[23] 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.