

ENVIRONMENTAL EFFECT ON REPRODUCTION OF BIVALVE *LAMELLIDIENS MARGINALIS*

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ABSTRACT

Due to the commercial importance and edibility value of number of species of bivalves the aspect of energy metabolism has been reported by a number of workers but the relative influence of gonad development on the distribution in different body parts has been examined in only a few cases. The present investigation to study evaluate the effect of homeopathic drugs on lipid content of Bivales *Lamellidiens marginalis*.

KEY WORDS: bivalves, lipids, *Lamellidiens marginalis*.

INTRODUCTION

The Environmental constituents shown cyclic changes in reproduction due to great amount of energy to be canalized to the gonad during reproduction (Muley, 1988). This is reflected in the deposition of depletion of the nutrients with the advent or departure of Reproductive period (Lambert and Dehnel, 1974). Bivalves can be considered to be polysaccharide oriented. On bio-chemical changes in bivalves mollusca particularly with reference to the carbohydrates metabolism. Kulkarni *et.al.* (2005) reported that the no significant change in total lipid content in foot for each exposure period was observed when compared with control and no significant changes in total lipid content in hepatopancreas also at each exposure period was control and same results was observed in gills. Hence in the present investigation to study evaluate the effect of homeopathic drugs on lipid content of Bivales *Lamellidiens marginalis*.

MATERIALS AND METHODS

The fresh water bivalve molluscs Bivales *Lamellidiens marginalis* 65-70 mm in size collected from Godavari river 8km away from Gangapur, Aurangabad Maharashtra. All the collected animals were brought in to laboratory and washed to remove fouling biomass and acclimatize. After 24 hours of acclimatization animals were numbered in four sets, containing 10 animals first set is served as control and remaining 3 are experimental for respiration studied. *Lamellidiens marginalis*. In control group animals were while experimental in 2, 3 and 4th sets. Animal from control and experimented groups also sacrificed for estimation of glycogen from different soft body parts. The body parts of 10 animals from each group were used and mantle gills, hepatopancreas. Every time samples were pooled from 5 different animals for each group to estimate lipid by using gravimetric method according to Bila and Dyer, 1959 and percentage differences were also calculated between control and experimental groups in every season. The estimations were done on 1st day and 15th day of experiment. All the bivalves of each biochemical content of each tissue were subjected to statistical analysis for significant difference among the control and experimental groups.

RESULTS AND DISCUSSION

The seasonal variation of lipid content in *Lamellidiens marginalis* are expressed in table No. 1, 2 and 3. In the present investigation on 1st Day Lipid content in mantle, in summer decreased in both the groups compared to control. In I set decreased (non-significant) by 8.72 % (10.22±0.25) and in II nd set significantly by 2.36 % (9.18±1.07), there was 8.31 % decreased in content of control group (non-significant). In Monsoon also the content showed significant decreased trend in both the the content increased by 31.59 % (12.15±1.2) and in 0.2ppm by 23.38 % (13.94±1.64) compared to control. Thus there was 20.60 % increase in the content in 0.5ppm (14.45±1.38). In winter also the content significantly decreased in both there was 19.37 % (12.2±0.2) and in II nd 27.00 % (12.98±1.81) decrease I st content giving 29.3 % (10.25±0.4). On 15th day the Lipid content in mantle, in summer decreased in both the groups compared to control. In I set it decreased (non-significant) by 8.82 (10.88 ±1.49) and in II nd significantly by 5.94% (11.51 ±0.58), there was 79.7 % decreased in content of 05ppm compared to control group (non-significant). In Monsoon also the content showed significant decreased trend in both the content increased by 5.79 % (14.17 ±8.86) and in 2nd set by 2.88 % (13.78 ±0.53) compared to control. Thus there was 9.74 % increase in the content in IIIrd (14.70 ±1.02). In winter also the content significantly decreased in both compared to control there was 20.40 % (12.85 ±0.59) and in 16.22 % (12.40 ±10.72) decrease in content giving 11.9 % (10.66 ±0.87).

In the present investigation the lipid content on 1st Day the Lipid content in Hepaopancreas, in summer decreased in both the groups compared to control. In first set it decreased (non-significant) by 13.33 % (7.28 ±0.70) and in 0.2ppm

Table 1. Effect Environment on the Lipid content of *Lamellidens marginalis* during Monsoon Season. (Bracket Values represent percentage differences)

	On 1 st set				On 15 th			
	Control	Ist	IInd	IIIRD	Control	Ist	IInd	IIIRD
Mantle	9.40 ±0.8	10.22 ±0.25 (-8.7230) -1.694	9.1833 ±1.075 (2.3653) 0.2809	10.8400 ±1.0759 (-) 8.3191) - 0.74095	10.8833 ±0.5943	10.8833 ±1.4972 (-8.824) -0.440	11.513 ±0.58711 (-5.9421) -1.325	10.84 ±1.103 (0.3978) 0.82627
Hepato Pancreas	8.40 ±0.9	7.28 ±0.700 (13.33) 7.701	6.24 ±0.93 (25.714) 2.8908	9.2 ±0.9300 (9.090) +1.3432	8.81 ±0.5458	7.9166 ±0.5697 (10.415) 2.02770	6.8433 ±1.50878 (22.587) 2.0270	9.15 ±0.97015 (-3.5062) -3.1369
Gonad	9.12 ±0.25	9.22 ±1.12 (-) 1.31868) -0.7150	8.28 ±0.76 (9.0198) 1.8185	10.2366 ±1.3510	10.85 ±0.5884 (-6.0606) 0.895227	10.2 ±0.98015 (0.29325) 0.04446	10.2033 ±0.9890056 (0.26099) 0.19605	10.2033 ±0.9890056 (0.26099) 0.19605
Gill	3.1 ±0.3	2.25 ±0.5339 (27.4193) 2.4039	2.30 ±0.53 (25.8064) 2.2752	3.10 ±0.15 (0) 0	3.5 ±0.3464	2.96 ±0.49 (-) 15.5862) 1.55862	3.24 ±0.4435 (7.4285) 0.80157	3.81 ±8.5714

Table 2. Effect of Environment on the Lipid content of *Lamelliderns marginalis*, during Monsoon Season. (Bracket Values represent percentage differences)

	On 1 st				On 15 th			
	Control	Ist	IInd	IIIRD	Control	Ist	IInd	IIIRD
Mantle	10.22 ±0.4	12.2 ±0.22 (-19.375) -7.523	12.98 ±1.81 (-27.0058) -2.578	10.25 ±0.4 (-0.2935) -0.29939	10.6761 ±0.7001	12.85 ±0.5919 (-20.409) -4.195	12.40 ±10.7252 (-16.225) -2988	10.6633 ±0.87386 (0.11989) 82612
Hepato Pancreas	11.26 ±0.44	10.12 ±0.92 (13.574) 1.93671	12.40 ±0.5715 (6.1518) -273490	10.20 ±0.25311 (39.92) -20043	11.6966 ±0.4800	9.6366 ±0.3992 (17.61436) 5.78467	11.4566 ±0.922 (2.0242) 0.39490	10.89 ±0.3637 (-9.43531) -3.31346
Gonad	15.83 ±0.56	13.43 ±0.885 (-13.574) 3.3413	14.34 ±0.36 (6.1518) 2.4456	9.18 ±0.37 (39.9214)	14.60 ±0.4972	14.2533 ±0.96027 (2.39671) 1.033413	15.19 ±1.00 (-40117) 0.905600)	9.606 ±0.69787 (34.21624) -1.7730
Gill	4.2 ±0.4	3.1 ±0.3 (26.1906) -3.1141	3.2 ±0.7 (23.8095) -2.1483	3.4 ±0.9 (19.047) -0.2247	4.0 ±0.4	3.5 ±0.2 (12.5) 1.93648	3.5 ±0.3 (12.5) 1.93648	3.6 ±0.11 (10) -7.8087

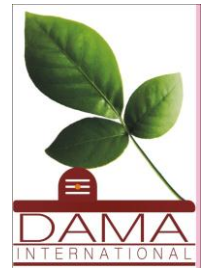
significantly by 25.71 % (6.24 ±0.93) , there was 9.09 % decreased in content compared to control group (non-significant) . In Monsoon also the content showed significant decreased trend in both the Ist & IInd. In Ist the content increased by 13.50 % (12.30 ±0.4) and in 0.2ppm by 5.41 % (13.45 ±0.7) compared to control. Thus there was 21.09 % increase in the content in I st set (14.25 ±1.75). In winter also the content significantly decreased in both compared to control. In Ist set there was 13.57 % (10.12 ±0.92) and in IInd set 6.15 A% (12.40 ±0.57) decrease in content giving 39.92 % (10.20 ±0.25). On 15th day the Lipid content in Hepatopancreas, in summer decreased in both the group compared to control. In 0.1ppm it decreased (non-significant)by 10.44 % (7.91 ±0.56) and in IInd significantly by 22.58 A% (6.84 ±1.50), there was 3.50 % decreased in content of IIIrd compared to control group (non-significant). In monsoon also the content showed significant decreased trend in both the the content increase by 9.87 %A (12.49 ±0.97) and in II set by 11.31 % (15.41 ±0.70) compared to control. Thus there was 5.36 % increased in the content in IIIrd (13.10 ±0.84). In winter also the content significantly decreased in both compared to control. In ist set there was 17.61 % (9.63 ±0.39) and in 0.2ppm 2.02 % (11.45 ±0.92) decrease in content giving 9.43 % (10.89 ±0.36) .

Table 3. Effect of Environment on theLipid content of *Lamelliderns marginalis*, during Monsoon Season. (Bracket Values represent percentage differences)

	On 1 st				On 15 th			
	Control	Ist	IInd	IIIrd	Control	Ist	IInd	IIIrd
Mantle	13.10 ±1.05	12.45 ±1.245 (-31.5934) 5.82322	13.9433 ±1.6460 (23.3884)	14.45 ±1.38 (20.6044)	13.4 ±1.132	14.1776 ±0.8630 (-57955) 0.5827	13.786 ±0.5398 (-2.88059) -2.9763	14.706 ±1.0250 (-974826) 0.82627
Hepato Pancreas	14.22 ±0.6	12.30 ±0.4 (13.502) 4.61167	13.45 ±0.7 (5.4149) -2.7376	14.25 ±1.75 (-0.2109) -3.66621	13.85 ±1.6139	12.49 ±0.9727 (9.8794) 0.98445	15.4166 ±0.7015 (-11.3119) 39434	13.1066 ±0.8457 (5.3675) 31394
Gonad	16.22 ±0.92	14.20 ±0.5 (12.45) 3.3413	15.20 ±0.47 (2.44560)	13.48 ±0.56 (-2.0430) 16.8917	16.21 ±1.01	15.32 ±0.5631 (4.2560) 1.0330	16.1860 ±1.0052 (0.14435) -0.90991	13.22 ±0.9951 (18.4454) -2.1322
Gill	2.22 ±0.42	3.00 ±0.2 (-35.135) 2.9041884	2.9 ±1.73 (-30.630)	2.5 ±0.67 (-12.6/12) 0.227485	2.773 ±0.563	2.153 ±0.1418 (-85.719) -1.78922	2.93 ±0.8265 (-5.6617) 1.73204	1.9266 ±0.6621 (30.4002) 1.604832

In the present study the lipid content on 1st day in Gonad, it is decreased in summer in both the groups compared to control. In Ist it decreased in both the groups compared to control. In Ist it decreased (non-significant) by 1.31 % (9.22 ±1.12) and in 0.2ppm significantly by 9.01 % (8.28 ±0.76) , there was 21.9 % decreased in content of IIIrd set compared to control group (non-significant). In monsoon also the content showed significant decreased trend in both the 0.ppm & Ist. in the content increased by 12.45 % (14.20 ±0.5) and in IInd by 2.44 % (15.20 ±0.47) compared to control. Thus there was 2.04% increase in content in 0.5ppm (13.48 +- 0.6). in winter also the content significantly decreased in both Ist & II nd compared to control. In Ist there was 13.57 % (13.43 ±0.88) and in IInd 6.15 % (14.34 ± 0.36) decrease in content giving 39.92 % (9.18±0.37). On 15th day the Lipid content in Gonad, in summer decreased in both the groups compared to control. In Ist decreased (non-significant) by 6.06 % (10.85 ±0.58) and in IInd significantly by 2.93 % (10.2 ±0.98), there was 26.09 % decreased in content IIIrd compared to control group (non-significant). In monsoon also the content showed significant decreased trend in both the. In Ist content increased by 4.25 % (15.32 ±0.56) and in IInd content increased by 4.25 % (15.32 ±0.56) and in 0.2ppm by 1.44 % (16.18 ±1.00) compared to control. Thus there was 18.44 % increased in the content in IIIrd (13.22 ±0.99). In winter also the content significantly decreased in both compared to control. In 0.1ppm there was 2.39 % (14.25 ±0.96) and in 0.2ppm 40.11 % (15.19 ±1.00) decrease in content giving 34.21 % ± 0.69).

On 1st Day the Lipid content in Gill, in summer decreased in both the groups compared to control. In Ist it decreased (non-significant) by 27.41 % (2.25 ±0.53) and in II nd by 25.80 % (2.30 ±0.53) , there was 0 % decreased in content of



0.5ppm compared to control group(non-significant). In Monsoon also the content showed significant decreased trend in both the by 30.63 % (2.9 ± 1.73) compared to control. Thus there was 12.60 % increase in the content in IIIrd (205 ± 0.67). In winter also the content significantly decreased in both 0.1ppm & 0.2ppm compared to control. In Ist there was 26.19 % (3.1 ± 0.3) and in 0.2ppm 23.80 % (3.2 ± 0.7) decrease in content giving 19.01 % (3.4 ± 0.9). On 15th day the Lipid content in Gill, in summer decreased in both the groups compared to control. In Ist it decreased (non-significant) by 15.58 % (2.96 ± 0.49) and in 0.2ppm significantly by 7.42 % (3.24 ± 0.44), there was 10.5 % decreased in content of IIIrd compared to control groups (non-significant). In monsoon also the content showed significant decreased trend in both the. In Ist content increased by 85.71 % (2.15 ± 0.14) and in IIInd set 5.66 % (2.93 ± 0.82) compared to control. Thus there was 30.40 % increase in the content significantly decreased in both I & II compared to control. In Ist there was 12.5 % (3.5 ± 0.29) and in IIInd 12.5 % (3.5 ± 0.2) decrease in content giving 10.0 % ($3. \pm 0.11$). In the present investigation the effect of homeopathic drugs on content of lipid in hepatopancrease lipid content was high in summer and monsoon and low in winter. Similar observation were made by Sastry (1970), Sastry and Blake (1971), Kulkarni, *et.al.*, (2005), Vedpathak *et.al.* (1987) and Mane and Talikhedkar (1976).

CONCLUSION

In the present investigation the bio-chemical analysis were made for lipid content in different soft body parts like from mantle, hepato-pancreases, gonad and gill due to the effect of environment is occur in lipid in winter increases in caused due to decreased during summer than monsoon and winter.

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REFERENCES

- Bayne B.L. (1976).** Marine Mussels, their ecology and physiology, Cambridge University Press, Cambridge, London, New York, Melbourne. 1 – 495.
- Blig E.G. and Dyar W.J. (1959).** A rapid method of lipid extraction and purification. *Can. J. Biochem. Physiol.* 37: 911-927.
- Dezween A. (1983).** Carbohydrate catabolism in bivalves. In : The Mollusca, *Series in Marine Biology*, (M.K. RubliW. ed) " New York, London, Vol., 1 : 137-175.
- Gabbott P.A. (1976).** Energy metabolism. In "Marine mussels" (Ed. Bayne, B.D.), Cambridge University Press, London, New York.
- Lambert P. and Dahnel P.A. (1974).** Seasonal variations in biochemical composition during the reproductive cycle of the intertidal gastropod, *Thais lamellosa* (Gastropoda, Prosobranchia). *Can. J. Zool.* 52 : 305-318.
- Mane U.H. and Talikhedkar P.M. (1976).** Respiration of the wedge clam, *Donax cuneatus*. *Indian J. Mar Sci.* 5: 243-246.
- Martin A. (1961).** The carbohydrate metabolism in Hetero thermic animals (Ed. By martin). University of Washington Press Scatle 35-64.
- Martin A. and Goddard C. (1966).** Carbohydrate metabolism in physiology of mollusca (Ed. By Wilbur K. and Young c) Academic press, New York, 2 : 275-308.
- Kulkarni A.N., Kamble S.N. and Keshvan R. (2005).** Studies on impact of hidden on bio-chemical constituents in the freshwater mussel, *L. carrianus*. *J. Aqua. Biol.* 20 (1): 101-104.
- Mane U.H. (1975).** Oxygen consumption of the clam, *Katelsysia opima* in relation to environmental conditions. *Broteria.* 60(1-2) : 33-38.
- Muley S.D. (1988).** Reproductive physiology of Lamellibranch molluscs from Maharashtra state. Ph.D. Thesis, Marathwada University, 1 - 292.
- Sastry A.N. (1979).** Petecypoda (excluding ostreidea) : In : Reproduction of marine invertebrates (Eds. Giese & A.C. and Pearse, J. S.), Academic Press, New York, Vol. 5 : 113-1295.
- Vedpathak A.N., Mulyand S.D. and Mane U.H. (1987).** Effect of temperature on respiration biochemical composition in a freshwater bivalve, *Indonaia caeruleusi* (Prashad, 1918). *Proc. Nat. Con. Env. Impact Biosystem.*