

**BIOCHEMICAL COMPONENTS IN ANTERIOR ADDUCTOR MUSCLES IN FRESHWATER BIVALVE MOLLUSCS, *Lamellidens corrianus*.**

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**Abstract:** Bivalves molluscs are very diverse animals which make a major contribution and had a significant role to play in freshwater ecosystem. Biochemical composition in *Lamelliden corrianus* , the freshwater species collected from Nanadrabad Pond near Khultabad, Aurangabad District, varied seasonally . An inversely correlation with the protein and lipid constituents was observed during the summer and winter season. The fluctuation in biochemical content might be due to the impact on the endogenous and exogenous factors and the triggering role of cerebral ganglion ablation.

**Keywords:** Biochemical, *Lamelliden corrianus*, Cerebralectomy, Protein and Lipid content.

## Introduction

Bivalves amongst the aquatic organisms of the commercial important mussel constituents a remarkable component in the littoral ecosystem and generate considerable research interest by virtue of their wide spread distribution and specific ecological adaptation and edible value. Seasonal changes in biochemical composition (protein, glycogen, and lipid content) may be of great importance in relation to energy metabolism necessary to growth and reproduction (Jayabal & Kalyani 1986, and Lodeiros *et al.* 2001).

Any change in environment is known to have effects on the nervous system which in turn induce alteration in biochemical processes, especially those concerning carbohydrate metabolism, (Prosser, 1984). Seasonal changes in biochemical have been reported by, many workers, Ansell *et.al* (1964), De Zwann and Zandee (1972), Gabbott and Bayne (1973) , Sangeeta Dongre , *et al* (2014 )determine seasonal changes in biochemical composition of adductor muscle ,mantle, siphon, and foot in *Mercenarid mercenarid* and *Mytilus edulis*.,

From India relatively few investigator, Nagabhusanam and Mane (1975, 1978), *Mytilus viridis* ,Vedpathak (1989), *Lamellidens corrianus* Sangeeta .B.Dongre., *et.al* (2014), have correlated with annual reproductive cycle of bivalves. In recent times, investigations on physiology and biochemical responses of the molluscs to environmental agents have been expanded significantly. Therefore attempts have been made in the present investigation to understand the

impact of seasons and cerebralectomy on protein and Lipid content in different body tissues in freshwater mussel *Lamellidens corrianus* from nandrabad pond near Aurangabad.

## Material and Methods

The freshwater bivalve molluscs, *Lamellidens corrianus* inhabits in the Nandrabad pond situated in Khultabad taluka 19km away from Aurangabad. During summer and winter season the collection of 15 individuals of the shell length 95-110 mm were selected and were acclimatized to laboratory condition for 24h. Surgical operations were performed so as to remove cerebral ganglia unilaterally and bilaterally within 30 seconds after lapse of 2 to 3 hours in the laboratory condition. The animals were divided into 3 groups non- operated served as control and other two were experimental. In each group 5 animals were selected and after lapse of 7 days the animals were sacrificed and the anterior adductor muscle and hepatopancreas were dissected and dried in the oven to prepare the powder for estimation of Lipids using standard method Vanillin reagent method of Barnes et al. [1973] and proteins were estimated by using Lowry's method 1953 . The value of estimate was subjected to statistical analysis.

## Result and Discussion

Lipid and protein contents were determined in dry samples of anterior adductor muscles and hepatopancreas, in each individual. The results of the experiments were shown in. Fig,1. The physico-chemical parameters of the water used in the experiments during different season were also studied temperature was in between 33<sup>0</sup>C to 22<sup>0</sup>C; pH 7.4 to 7.6; hardness 240 to 100 mg/L and Oxygen content 4.40 to 9.67mg/L/ h. Impacts of cerebralectomy were studied to determine the biochemical lipid content in adductor muscle and hepatopancreas of freshwater bivalve mussel, *Lamellidens corrianus*. The mussel anterior adductor muscles were analyzed to observe the effect of cerebralectomy unilaterally and bilaterally respectively. The data were exposed to various statically analysis. Student's T,' test was used to find out significance. The level of significance was used in the present study (p<0.001, p<0.01 and p<0.05) respectively.

**Lipids:** In the anterior adductor muscles of control mussel, the Lipid level was observed in summer was showed a significant increase  $3.57 \pm 0.11$ mg as compared to experimental mussels. In unilateral group mussel the content was  $3.08 \pm 0.04$ mg and in bilaterally cerebralectomized mussel the anterior adductor muscle content  $3.54 \pm 0.09$  mg was respectively.

**The Proteins** content in adductor muscle of control mussel, the protein level was observed in summer had shown a significant increase in control  $1.18 \pm 0.11$ mg/g as compared to experimental mussels. In unilateral group mussel the content was  $0.83 \pm 0.01$ mg/g and in bilaterally cerebralectomized mussel the anterior adductor muscle content  $0.93 \pm 0.01$  mg was respectively. Whereas, in winters, the content in, anterior adductor muscle in control,  $20.24 \pm 0.22$ ,  $14.00 \pm 0.19$  and  $16.57 \pm 0.19$ mg/g and experimental respectively.

Lipids: In the hepatopancreas tissue of control mussel, the Lipid level was observed in summer was showed a significant increase  $3.57 \pm 0.11$ mg as compared to experimental mussels. In unilateral group mussel the content was  $3.08 \pm 0.04$ mg and in bilaterally cerebralectomized mussel the hepatopancreas content  $3.54 \pm 0.09$ mg was respectively. The Proteins content in hepatopancreas of control mussel, the protein level was observed in summer was showed a significant increase  $0.85 \pm 0.05$  mg as compared to experimental mussels. In unilateral group mussel the content was  $0.63 \pm 0.03$  mg and in bilaterally cerebralectomized mussel the hepatopancreas content  $0.66 \pm 0.04$ mg was respectively. Whereas in winters the content in hepatopancreas in control, UCEL and BCEL.,  $19.46 \pm 0.99$ ,  $16.65 \pm 0.22$  and  $18.83 \pm 0.22$  groups respectively

Lipid is an important dietary constituent, serve as reserve energy when food supply is scanty. In stressful environmental conditions, after glycogen lipid is use as energy source (Shigmatas and Takeshita, 1959). In the present study the lipid content decline in winter indicate that at the time of fully maturity of gonads the other biochemical content increased and lipid content lower and increased in post- monsoon due to the ripening and matured released of gametes.

Lipid composition and storage strategy in molluscs, particularly of bivalves and gastropods have been studied since lipids constitute a major fraction of molluscan tissues (Voogt, 1983). Almost concern the entire organism and only a few reports on the tissue distribution of fatty acids are available (Hagar and Dietz, 1986; Wenne and Polak, 1989). Proteins content are vital role in reproductive events like spawning and maturation of gametes and the processes of gametogenesis Ansell et.al 1964.

Nutritional state can vary both seasonally and annually .Freshwater and marine water bivalve's display marked seasonal variations in weight and biochemical content of the soft tissue. (Zandee et al., 1980, Williams and McMahon 1989), Among the known studies, only some of the freshwater bivalves, *Carunculina texasensis* Hagar and Dietz, 1986), *Diplodom patagonicus* (Pollero et al., 1981), *Ligumiasubrostrata* (Dietz and Graves, 1981) *Diplodondelodontus* (Pollero et al., 1983), *Dreissenapolyomorpha* and *Unio* sp. (Dembitsky et al., 1992) and *Dreissena siouffi* (Ekin et al., 2008) have been reported , but very few literature is available on impact of cerebralectomy ,hence the study was undertaken , thus it might be concluded that the impact of removal of cerebral ganglia unilaterally and bilaterally has a inhibitory effect in lipid and protein content metabolism.

**Conclusion:** 1. Thus, it can be concluded that cerebral ganglia may plays an important role mostly inhibitory one, in regulation of metabolic rate and organic reserve from different body component.

2. In general experiment showed that the effect was pronounced in unilaterally cerebralectomized group animals, these biochemical content can be utilized for freshwater aquaculture to develop at commercial purpose in provision of adequate nutrition for growing population.

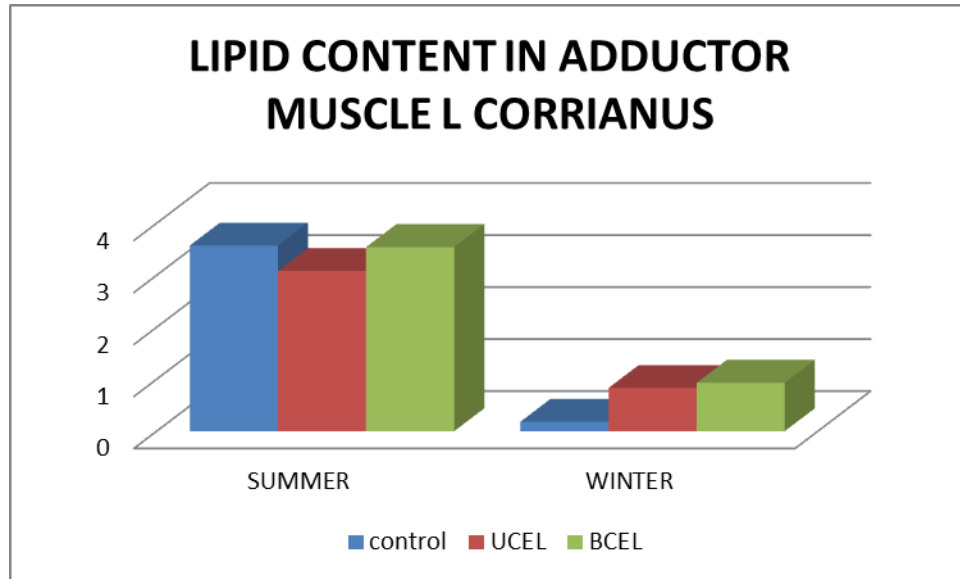
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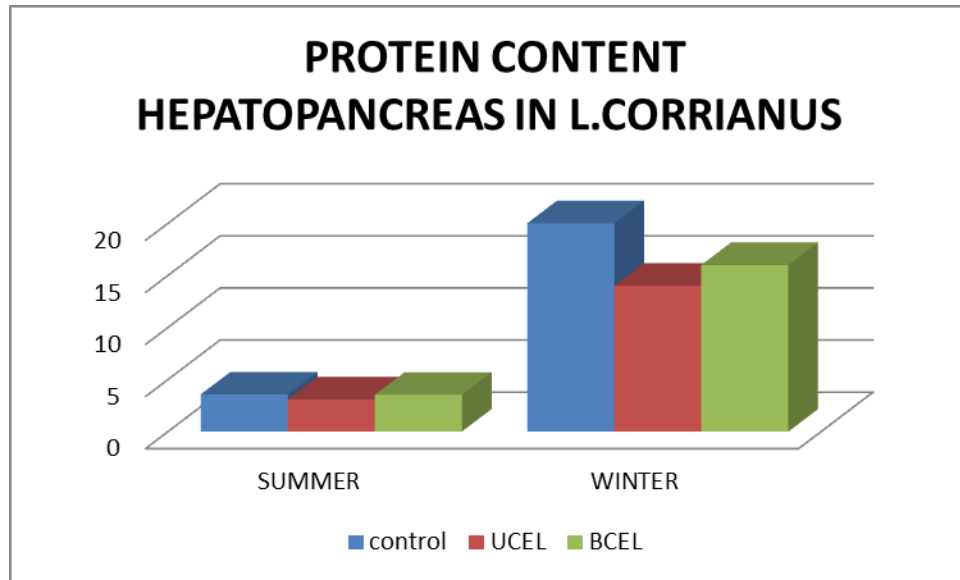


FIG 5 & FIG.6.,. LIPID AND PROTEIN CONTENT IN ADDUCTOR MUSCLE AND HEPATOPANCREAS IN *L. CORRIANUS*.

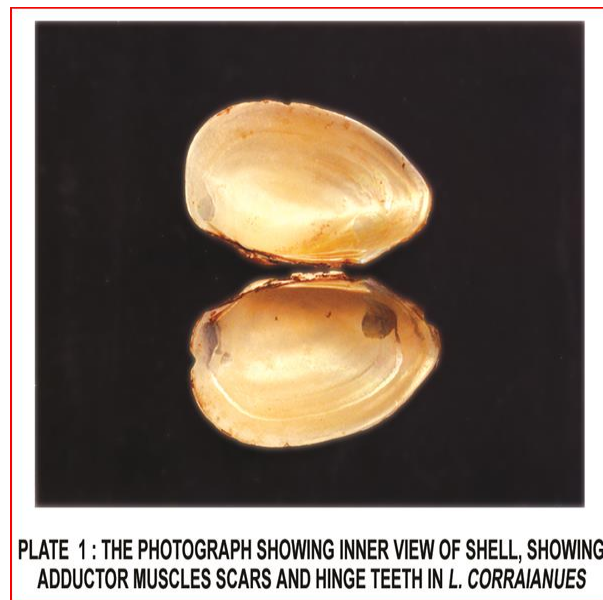
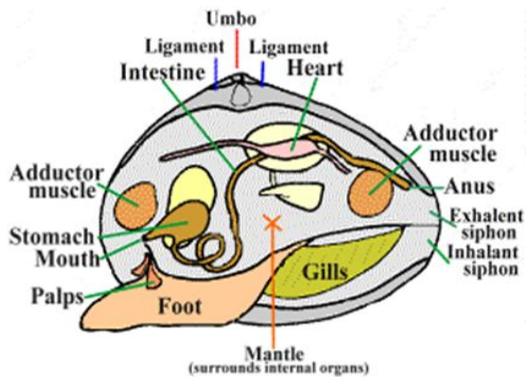


Fig.2 Different Body Soft Tissues



Fig 3 Maharashtra State



Fig.4 Nandrabad Pond