



**LIPID COMPOSITION IN GONADS OF *BARYTELPHUSA CUNICULARIS* DURING DIFFERENT SEASONS**

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**ABSTRACT**

The knowledge of biochemical compositions of any edible organism is extremely important. Since the nutritive value is reflected in its biochemical content. Lipid storage is advantageous to organisms since it can deliver eight times more calories per unit weight of energy to that from carbohydrates. During reproductive seasons lipids along with glycogen are channelled towards the gonads to meet the cost of active gametogenesis in crustaceans. The present study shows that the lipid content of *Barytelphusa cunicularis* to be more in gonads during winter (gonadal growth stage) and least during summer (spent stage).

**KEY WORDS:** Lipid, crustaceans, freshwater crab, *Barytelphusa cunicularis*, gonads, seasonality.



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## INTRODUCTION

The high lipid content is an important source of energy for the crustaceans. Due to distinctive feeding habitat and digestive physiology, determination of nutrient digestibility is more demanding with crustacean fish species. Lipids are nutritionally significant in crustaceans. In crabs, the hepatopancreas is generally regarded as a major lipid storage organ analogous to the fat body in insect and adipose tissue and liver in invertebrates. The stored lipid is transported to some organs and tissues during a certain period such as premolt stage. In case of female crustaceans, ovaries also contain higher levels of lipid than other organs (Ando et al.) and this suggests that lipid is important for maturation of crustacean ovaries. The lipid concentration of ovaries and hepatopancreas varied markedly with that of ovarian maturation (Ravichandran et al. 2009a and 2009 b). The ovarian lipid concentration of *Penaeus japonicus* increased during the slightly matured and yellow ovarian periods remained, at roughly constant levels during the subsequent ovarian period to spawning and then decreased to low levels at the spent ovarian period (Teshima et al. 1983). This implies large quantities of lipids are necessary for development of ovaries. However little information is available for lipid content in the gonads of crab *Barytelphusa cunicularis* during different seasons. Hence, the current study was designed to clarify the variations in lipid content of the gonads of the above experimental crab.

## MATERIALS AND METHODS

*Barytelphusa cunicularis* is a fresh water crab was collected from the Godavari river at Paithan near Aurangabad. During the period of Summer, Monsoon and Winter, crab of both sexes were used in this study. Gonads were dissected out from these crab and used for analyses. The tissues were separated from

animals were taken into a petri dish and kept in a hot air oven maintained at 60 °C for a period of 48- 72 hrs. Lipids were estimated from this tissue.

### CHEMICAL ANALYSIS

The total lipid content of tissues was estimated by the chloroform: methanol methods of Barnes and Bradstock (1973) using Erma photo- electric colorimeters with 530μ filters. The results are expressed in mg/gm dry tissue weight.

### STATISTICAL TREATMENT OF DATA

The experimental data was analyzed statistically by adopting valid statistical methods (Pillai and Sinha, 1968). Standard deviation (SD) was calculated using the following formula.

$$SD = \sqrt{\frac{\sum X^2 - (\sum X/n)^2}{n - 1}}$$

Where, X = individual observations.

n = total no. of observations.

The experiments were repeated three times. The data so obtained was statistically evaluated using student 't' test.

## RESULTS

### Seasonal change in lipid content of gonad of crab *Barytelphusa cunicularis*.

Seasonal analysis of lipids content of gonads are depicted in table-1 for *Barytelphusa cunicularis*. The total fat contains (mg/gm dry weight of tissue) in the ovary of *Barytelphusa cunicularis* were found to vary from 3.773±0.889(monsoon) 6.5712 ±0.231(winter) to 6.587± 0.244 (summer) whereas in testis is varied from 3.985± 0.694(monsoon) to 4.603± 0.369(winter) 6.914 ±0.694(summer). It was observed the change in the metabolite levels was tissue specific and reflected differential sensitivity of different tissue of seasonal fluctuations.

**SEASONAL VARIATION IN THE LIPID CONTENT IN THE GONADS OF *Barytelphusa cunicularis***

seasons	Testis(mg/gm dry wt)±S.D.	Ovaries(mg/gm dry wt)±S.D.
Summer	3.773 0.889	3.985 0.673
Monsoon	6.587 0.244	6.914 0.694
Winter	6.571 0.231	4.603 0.364

**DISCUSSION**

Reproduction is known to dominate all other physiological process it is an essential biological need of animals for the continuity of its type and its species(Vernberg and Vernberg 1972)so the reproductive phenomenon is important for anatomical, physiological and behavioural point of view of an organisms. Lipids provide energy for almost all endergonic process and are of upmost importance in maintaining the structural and physiological integrity of cellular and sub cellular structure. O'Connor and Gilbert (1968) have reported that glycogen and lipid are major organic reserves in crustaceans. In crustaceans hepatopancreas is generally is regarded as a major lipid storage organ. The amount of the lipid content of the ovary and testis are shown in table -1. The studies conducted by the (Kang.et.al ,2006) suggested that both ovaries

and hepatopancreas are capable of synthesizing vitellogenin. It may be the main reason that the accumulation of lipid is more in hepatopancreas than in other issue therefore, it was concluded that hepatopancreas is the extra ovarian site for vitellogenin synthesis. In the present investigation the maximum lipid condition was noticed in the winter season where there is rapid secondary vitellogenesis which results in rapid increase in oocyte size leading to oviposition.It is evident from the present results that the lipid content increased in the testis and ovaries of the experimental crab, during the peak period of gonadal activity ,i.e.,in Winter.where the organic reserves are utilized and used it as a raw material to build up sperms and eggs,and also supply energy needed for the success of reproduction

**REFERENCES**

1. Ando,t.,A.Knazawa and s.Teshima,19977:- Variation in the lipids of tissues dring the molting cycle of prawn.Bul. Jap.Soc.Sci.Fish,43;1445-1449.
2. Barnes ,h.,Bradstock,J.(1973):Estimation of lipid in marine animal tissue;detailed investigation of the phosphovanillin method for total lipids. J.Exp.Mar.Biol.Ecol.12:103-118
3. Ravichandran,S.,G.Rameshkumar.S.Velankanni and G.Keliyavarthan,2009a:Variation in fatty acid composition of the crab, *Portunus sanguinolentus*. In different developmental stages, Nat,Aca.Sci.Litt;32123-128.
4. O'Connor,J.D., and Gilbert,L.I.(1968):- Aspects of lipid metabolism in crustaceans. Am.Zoologist.8:529-539.
5. Ravichandran,S.,G.Rameshkumar.S.Velankanni and T.T.Ajithkumar,2009 b ;variation in lipid concentration of the crab *Portunus sanguinolentus*. At different developmental stages.M id.East. J.Sci.Res.4(3);175-179.
6. Teshima,S. and A. Kanazawa,1983:Variation in lipid composition during the ovarian maturation of the prawn .Bull.Jap.Soc.Sci.Fish, 49:957-962.
7. Kang.L.,Liqiao,Z.,Z.Zhonbang,L.Erchao,Z.Xiaoqin and G.Hui.2006;The site of vitellogenin synthesis in Chinese mitten-handed crab, *Eriocheir sinensis*, Comp. Biochem and Physiol and Mol.Biol., 143:453-458.
8. Vernberg,W.B., and Vernberg,F.J.1972:- The synergetic effects of temperatures and salinity and mercury on survival and metabolism on adult *Uca. Pugilator* fiddler crab,. U.S.Fish.Wild.Sewlv.Fish.Bull.70:415-420.