

Protein Content of Ovary and Hepatopancreas during Annual Reproductive Cycle in Fresh Water Female Prawn *Macrobrachium Rosenbergii*

A.K.Sonawane,

P. G. Department of Zoology,
M.S.G.College Malegaon,
Dist.Nashik, India.

ABSTRACT

Protein content of ovary and hepatopancreas in Macrobrachium rosenbergii were estimated during annual reproductive cycle. Highest protein level in the ovary was observed in the month of August (52 ± 0.24). Low value (24 ± 0.81) in February. Highest hepatopancreatic protein content was noticed in the month of February (33 ± 0.51) and low in August (10 ± 0.85). Observations for protein content revealed that there was inverse relationship between hepatopancreas and ovary.

Keywords: *Macrobrachium rosenbergii*, Biochemical, Ovary, Hepatopancreas, protein.

INTRODUCTION:

Biochemical changes during maturation and reproduction in gonads and hepatopancreas have been examined for a number of crustacean species (Read and Caulton, 1980; Rosa and Nunes, 2003). In invertebrates, the gonadal growth during maturation involves active mobilization and synthesis of organic substances (Giese, 1958). Kyomo (1988) analysed the relationship between gonad and hepatopancreas in females and males of the crab, *Sesarma intermedia* with reference to reproduction. Biochemical variation in the gonad and hepatopancreas in correlation with reproductive cycle have been studied in crustaceans like *Paratelphusa hydrodromous* (Adiyodi and Adiyodi, 1970), and in *Penaeus monodon* (Tseng *et al.*, 2001). Since a great deal of energy is required to the gonads for the vast number of gamete production, biochemical constituents are channelised from various tissues to the gonads (Quackenbush, 1986). To understand the importance of quantitative variation of the protein, in the tissue of ovary and hepatopancreas during annual reproductive cycle, This kind of research may provide useful information for application of management programs for commercially important crustacean species.

MATERIALS AND METHODS:

Freshwater female prawns, *Macrobrachium rosenbergii* were collected monthly from the "Girna Dam", Tq. Malegaon Dist. Nasik, Maharashtra State, From the collection, only healthy female prawns were selected and were brought to the laboratory and immediately sacrificed.. The biochemical changes were recorded on monthly basis of the ovary and hepatopancreas.. Protein, levels were calculated on dry weight basis and expressed as % mg..Protein level was estimated by the method of Lowry *et al.*, (1951) using Folin phenol reagent method.

RESULTS AND OBSERVATIONS:

Highest protein level in the ovary of *Macrobrachium rosenbergii* was observed in the month of August (52 ± 0.24). Low value (24 ± 0.81) was noticed in the month of February (Table and Fig.). Highest

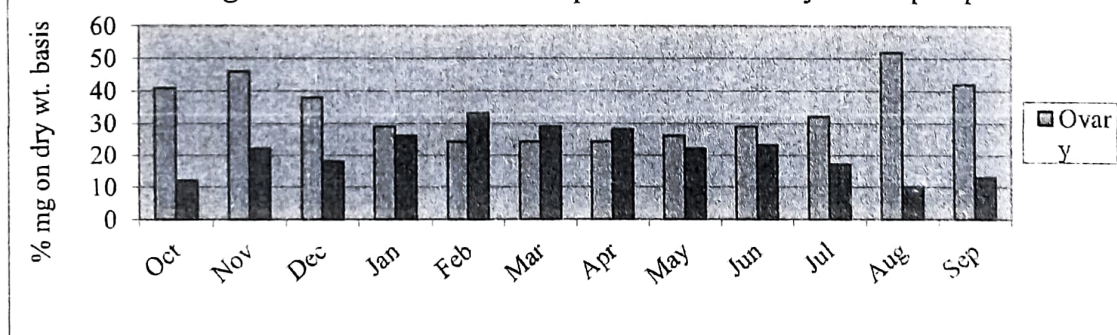
hepatopancreatic protein content was noticed in the month of February (33 ± 0.51) and low August (10 ± 0.85). Highest protein level in ovary was recorded in the month of August, which coincides with high breeding activity, and lowest in the month of February, which correlated with low breeding activity. Highest protein level in hepatopancreas was recorded in February, which coincides with low breeding activity, and lowest in August, which correlated with higher breeding activity. Observations for variations in protein level showed that there was inverse relationship between hepatopancreas and ovary.

Table: Variation in the levels of protein in the ovary and hepatopancreas during annual reproductive cycle of female prawn, *Macrobrachium rosenbergii* (% mg on dry weight basis)

Month	Ovary % mg	Hepatopancreas % mg
Oct-05	41 ± 0.07	12 ± 0.45
Nov-05	46 ± 0.12	22 ± 0.35
Dec-05	38 ± 0.09	18 ± 0.43
Jan-06	29 ± 0.21	26 ± 0.39
Feb-06	24 ± 0.81	33 ± 0.51
Mar-06	24 ± 0.25	29 ± 0.25
Apr-06	24 ± 0.19	28 ± 0.19
May-06	26 ± 0.23	22 ± 0.32
June-06	29 ± 0.29	23 ± 0.39
July-06	32 ± 0.15	17 ± 0.45
Aug-06	52 ± 0.24	10 ± 0.85
Sept-06	42 ± 0.22	13 ± 0.35

± S.D. – Standard Deviation

fig :Variation in the levels of protein in the ovary and hepatopancreas



DISCUSSION AND CONCLUSIONS:

The biochemical fluctuations are always related with the reproductive cycle and seasonal changes in environment. The biochemical changes during maturation, moulting and reproduction in the gonads; hepatopancreas have been examined for a number of crustacean species (Read and Caulton, 1980; Marangoset *al.*, 1988; Castille and Lawrence, 1989). In the present study, an attempt has been made to detect the quantitative variations in proteins of ovary and hepatopancreas during reproductive cycle of *Macrobrachium rosenbergii*, and to correlate the associated biochemical changes between ovary and hepatopancreas during annual reproductive cycle. The protein content in *M. rosenbergii*, showed significant rise during gonad maturation and after which declined in the protein level which maintained constant during the rest of the reproductive cycle. The protein level was highest in August (52 ± 0.24), when the gonads were at the highest breeding activity. The protein level decline to minimum level in the month of February during the early mature stage of ovary. From March, onwards

the level of protein was increased until the maturation of gonads. Hepatopancreas show an inverse relationship in the protein levels during gonad development and maturation. This confirms the earlier observations of Pillay and Nair (1973) in the crab, *Portunus pelagicus* increase in the protein content in the gonad during ovarian maturation. Nagabhushanamet al., (1984) noticed increased protein level in the ovary of *Caridina weberi* during stage I to stage III of ovary maturation.. In recent years, similar types of reports were available which was in agreement with the results obtained in *M. rosenbergii*. Ramadeviet al., (1990) reported that the protein of the ovary increased as the ovary attained maturity. variations of protein content in, ovary and hepatopancreas during ovarian cycle revealed that a considerable amount of energy is transformed from hepatopancreas to the ovary during vitellogenesis.. From the present findings and literature cited it is concluded that organic constituents of the hepatopancreas were mobilized for the maturation of ovary.

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