9. SUMMARY

Molluscs especially the bivalves are the important group of marine organisms next to fin fishes in providing rich nutritional source of seafood for mankind. The natural production of fishes appear to be declining year by year and there is an urgent need for conserving and managing them properly for the future in addition to popularize and utilize molluscs for edible purposes. For this purpose detailed studied on the biology of marine molluscs become inevitable. The present investigation deals with the introduction, review of literature, taxonomy, ecology, reproduction, age and growth, length weight relationship and biochemical composition of venerid clam *Grafrarium pectinatum* and *Grafrarium divaricatum* collected from Thondi coast-Palk strait-south east coast of India.

In the present study, a regular survey was conducted at Thondi coast in Palk Bay area from Jan2006- Dec2006 (Lat 9° and10° and Long 79° and 80°). The Intertidal area of Thondi coast may provide sample diversity of Venerid clams and the shells were collected manually. Collected samples were transferred to the laboratory for identification and the specimens were stored in 10% formalin and the colored of the shells were recorded. The species of *Grafrarium pectinatum* and *Grafrarium divaricatum* were identified and recorded. Identification is mainly based on the external morphology of the shell. Classification followed by Subba Rao and Dey (2000) and Ramakrishna and Dey (2010)

The range of water temperature in the present study is comparable with the earlier records in this area. Among this study area, the lowest (30.0°C) and highest temperature (34.0°C) was recorded at Thondi. The distributions of salinity are more prominent in the Palk strait region. The significant positive correlations of water temperature with DO during summer in contrast with the significant negative correlations of the water temperature with DO during monsoon clearly defines the critical role of temperature controlling the water chemistry that increases and decreases
DO levels in monsoon and summer seasons, respectively. Salinity levels in this area were identical in all the seasons. High salinity, (35.4‰) values recorded during summer seasons and low (31.8‰) values obtained during monsoon seasons. In the present study, pH showed minimum during monsoon and maximum during summer. High variations in pH observed specifically during monsoon and summer indicate that the water is often alkaline. During the study period the maximum concentration of Phosphate was observed 1.76µM/l in Thondi during monsoon season. The maximum nitrite value 2.45µM/l and nitrate value (2.52µM/l) was recorded during pre monsoon seasons in Thondi. In the study area, silicate recorded maximum during monsoon season. The silicate content was higher than that of the other nutrients and the recorded high monsoon values may be due to heavy inflow of monsoonal fresh water derived from land drainage carrying silicate leach out from rocks.

The present study in both species of *Gafrarium pectinatum* and *Gafrarium divaricatum* clearly indicated the availability of spent specimens along with different stages of maturity indicating year round breeding of this species when conditions are favourable. However, the lowest percentage of late maturing clams along with the highest percentage of spent clams during November, it may be concluded that this represents the peak period of spawning in this region. A secondary peak in April was also observed when considerable percentage of clams is found to be in spent stage.

Age and growth of *Gafrarium pectinatum* and *Gafrarium divaricatum* were calculated using FISAT -1 software (Gayaniolo et al. 1996). Growth was modeled following von Bertalanffy’s growth function (VBGF). An initial estimate of $L_\alpha$ was obtained using Powell Whetheall plot. Then this length frequency data was run on ELEFAN – 1 sub package available in FISAT using the automatic search routine, response surface analysis and scan of K values, the best fitting curve was estimated. The results showed more or less similar growth for the males and females during the study period.
The length – weight data for *Gafrarium pectinatum* and *Gafraium divaricatum* were analyzed separately for males and females. The ‘b’ values for both sexes varied between 0.0407 and 0.0450 in *Gafrarium pectinatum* and in *Gafraium divaricatum* it was 0.0392 and 0.0535 for males and females respectively. The results obtained in the present study on *Gafrarium pectinatum* and *Gafraium divaricatum* showed that the positive correlation coefficient indicated that an increase in the value of X variable results in an increase in the value of Y variable.

In the present study, the protein, carbohydrate and lipid contents in Gonads of male and female of both species Gafrarium showed higher values than other organs. Thus the gonad seems to serve as a storage organ of protein, carbohydrate and lipid in *Gafrarium pectinatum* and *Gafraium divaricatum*. The higher values of protein, carbohydrate and lipid were observed in summer could be due to intense proliferation of gonad and in monsoon the low values may be due to spawning activity. The present investigation provides the base line information on the reproductive biology of this *Gafrarium* species, which will be of immense use in exploiting the clam from wild and in increasing the production through aquaculture. The reproductive biology of the species is mainly used for developing management strategies for the development of sustainable fisheries.