

## **M.S.63. SILAS EBENEZAR, A—Studies on the Ecology and productivity of Saline lagoon—1986—Dr. P. Parameswaran Pillai.**

A shallow lagoon at Mandapam Peninsula known as Pillaimadam Lagoon (09°17'N to 09°17'48' 'N and 79°5'E to 79°8'24' 'E), having an area of ca 300 ha and situated along the Palk Bay Coast, was selected for the present study.

1. The pertinent literature on the subject is reviewed and the lacuna in our knowledge on the ecology and productivity of the coastal direlict saline lagoons of India presented.
2. The study was undertaken from July-1982 to June-1984. Five stations were selected for regular ecological and primary productivity sampling in the Pillaimadam Lagoon and one in the Palk Bay.
3. Meteorological data pertaining to monthly mean minimum and maximum temperature, relative humidity and wind velocity of this region have been collected, analysed and presented.
4. Information on the air temperature, water temperature, water depth, dissolved oxygen, salinity, pH, soluble reactive phosphate, nitrate, nitrite, ammonia and hydrogen sulphide of water was collected every week during the period of observation and the results obtained have been analysed and presented.
5. Sediment samples were analysed fortnightly for estimating the organic carbon, total phosphorous, Kjeldhal nitrogen and total sulphide contents. The results are presented and discussed.

6. The rate of gross primary production and net primary production were studied at fortnightly intervals. The results are analysed and discussed.
7. The correlation between ecological aspects and primary productivity parameters for each station is calculated and the significance of correlations highlighted.
8. The quantitative and qualitative distribution of zooplankton during the period November-1983 to March-1984 in the lagoon has been worked out.
9. The macrobenthos of the lagoon are analysed qualitatively and quantitatively and the results presented and discussed.
10. Studies on the grain-size distribution were undertaken for the pre-monsoon, monsoon and post-monsoon period of 1982 and 1983, and the results of analyses were discussed in relation to sediment chemistry.
11. Studies on the vertical profile of the sediment were undertaken at bimonthly intervals and analysed for organic carbon, total phosphorous and Kjeldhal nitrogen contents. Results of the analyses are presented and discussed.
12. Coastal flora of lagoon are collected and the common species identified.
13. In order to understand the diurnal variation of hydrological parameters in the environment, diurnal study was undertaken during the pre-monsoon, monsoon and post-monsoon seasons of 1983-'84, covering one new moon and one full moon phase in each season. Four stations were selected for this study and observations were made on the distribution of dissolved oxygen, surface and bottom salinity, soluble reactive phosphate, nitrate, nitrite and ammonia concentrations at every three hours starting from 0900 h of the day of sampling to 0600 h of the successive day.
14. To delineate the effect of fertilization on the primary productivity of the lagoon, enrichment experiments were conducted from February-1984 to May-1984. Four sets of enrichment experiments, under *in situ* and *in vitro* conditions were performed. Fertilizers such as 17:17:17 N:P:K-Complex, organic mixture, urea, superphosphate, potash, potassium nitrate, sodium phosphate and d-glucose were used under different concentrations and applications to assess their effect on primary production.
15. After enrichment with nutrients, the water was analysed for dissolved oxygen, salinity, pH, soluble reactive phosphate, nitrate, ammonia, gross primary production and net primary production and the results are discussed.
16. The suitability of the lagoon for mariculture practice is assessed based on the results obtained from the ecological, productivity and nutrient enrichment studies.
17. The data on the above aspects, wherever necessary are presented in tabular and graphical forms for effective understanding.
18. A detailed literature on the subject matter of the thesis is presented at the end.