M.S.109. CLARA MARGRET KATTICARAN–Studies on the biology of the clam, sunetta scripta (linne) from the sub-tidal waters of Cochin–1989–Dr. K.Y. Mohamed Salih

The clam *Sunetta scripta* (Linne) is the dominant species of the benthic community of Cochin barmouth area. *S.scripta* has been reported from Madras, but to date there has been no formal report of the species from Cochin, not has there been any attempt to study its biology. *S.scripta* is consumed by the fishing community, but it is in greater demand for the lime content of its thick shells which support flourishing cement industries. The meat which is discarded by these industries can be used as a cheap food source. The demand for shells has led to indiscriminate fishing which together with other environmental stress factors can result in a decimation of the breeding population.

For the past decade bivalve mollusc have come to be recognised as biological monitors of aquatic metal pollution. Heavy metals, rank second only to pesticide and related compounds as potential hazards particularly in estuaries and neritic zones. The clam beds of *S.scripta* at the barmouth are ideally located for the sampling of waters which contain discharges from urban sources, industries and the harbour. The high tolerance capacity for trace metals, copper and mercury, by *S.scripta* as revealed by earlier studies is intriguing. The commercial and scientific importance of this clam, therefore, warrants a detailed investigation of its biology and biochemistry.

The thesis is presented on eight chapters. The first chapter introduces the topic of study and contains a review of similar work done in other bivalves, in the sub-continent as well as abroad.

The second chapter describes the species, its habitat preferences and its distribution in the bar-mouth and adjoining region. Possible reasons for its recent appearance and dominance in the benthos are discussed in the light of environmental perturbances in the bar-mouth.

The third chapter describes gametogenesis in *S.scripta*. The development of the gonads from early stage to maturity is traced and documented. The size of the clam at first maturity is also determined. The development of the gonad is correlated with environmental parameters to discover the effect of a triggering factor.

The fourth chapter deals with the biochemical consititution of *S.scripta*. Levels of moisture, total protein, total carbohydrate and lipid are estimated in whole male, female and clams of indeterminate sex and separate organs through a period of two years. Calorific values of whole male, female and indeterminate clam tissues was also estimated through the study period. A relationship is established between seasonal changes in biochemical levels and gonadal development in the clam.

The fifth chapter investigates temporal variations in trace metal of *S.scripta*. Ash level of the whole male, female and when available indeterminate clam was estimated. Levels of copper, chromium, nickel, cobalt, manganese and arsenic were determined. Correlations between metals and between sexes were calculated and tested for significance.

The sixth chapter describes a study of the bio-chemical effects of sub-lethal copper toxicity in *S.scripta*. An experiment is described whereby 0_2 consumption

of *S.scripta* and lactic acid accummulation under toxicant induced functional hypoxia is estimated. The experiment was designed to study these factors over seven days of exposure and seven days of consecutive depuration.

The seventh chapter discusses changes in glycogen and total protein under the experimental conditions described above, in the light of the knowledge that lamellibranch molluscs do not generally follow the classic Embeden-Meyerhof pathway of glycolysis under hypoxia.