M.S.84. ELIZABETH JOSEPH–Studies on the historical and biochemical changes during spermatogenesis in Mugil Cephalus Linnaeus and related species–1987–
Dr. P. Vedavyasa Rao

The study aims to understand organisation of the tests, the pattern of spermatogenesis, spermatology and certain aspects of reprodductive physiology

of the selected species as the information forms an essential pre-requisite for evolving successful breeding programmes, artificial fertilization and gamete preservation.

Mugil cephalus, the largest and the most important of the cultivated species of mullets was selected as the candidate species for investigation, and *Liza parsia*, one of the smaller varieties found abundantly in the Cochin Backwaters was chosen as the second species.

The structural organisation of the male reproductive system in the two species is described. On the basis of the morphological characters of the testes, a six stage maturity scale, comprising of immature, early maturing, late maturing, mature, oozing and spent stages was distinguished and adopted to describe the maturation process of the testes. The internal organisation and the distribution of the various cell types at each stage of maturity was studied by histological preparations. The results showed that the testes of both the species belonged to the lobular type with unrestricted spermatogonial distribution, as encountered in most teleosts.

The environmental factors such as salinity, temperature and dissolved oxygen of the surface waters of Cochin Barmouth, from where the material was collected, were monitored regularly and correlated with the condition factor and the gonado-somatic index (GSI) of the fish, to understand the influence of these environmental parameters on the reproductive cycle.

The sequential changes taking place in the testes during spermatogenesis and ultrastructure of each cell type namely, the primordial germ cell, spermatogonium, primary spermatocyte, secondary spermatocyte, spermatid and sperm were studied with the help of transmission electron microscopy.

The biochemical parameters such as protein, carbohydrate, lipid and cholesterol were estimated in the blood, muscle, liver and gonad at each maturity stage. The flucturations in biochemical composition of these tissues were found to closely relate to the stage of maturation of the gonad.

The histochemical characteristics of the testes at various stages of maturity were studied through qualitative histochemical tests. The role of the specific types of proteins , carbohydrates and lipids that accumulated and depleted from the testes from time to time, during the process of spermatogenesis is discussed.

A preliminary study on the cryopreseravation of the milt of *M. Cephalus* and *L. parsia* was conducted during the present investigation. The mean sperm count in *M. cephalus* and *L. parsia* were estimated and the motility of sperms in the fresh and cryopreserved samples of milt was assessed by using a six point scale. Marine fish Ringer solution was used as the major extending medium with glycerine and dimethyl sulfoxide (DMSO) as cryoprotectants.