ABSTRACT

The Azhikode Estuary and the adjoining brackish water *kayals* of Kodungallur are situated at the northern most end of the Vembanad Lake and the Cochin estuarine system. Ten sites from three biotopes were selected for the study. These comprised of one station from the estuarine region, six from backwaters and three from a coastal canal. The sites were selected to assess the seasonal and spatial variations in the physicochemical parameters, primary productivity and the impact of anthropogenic interference in the form of retting, sewage input and slaughterhouse wastes on the diversity of the flora.

Qualitative and quantitative analysis of phytoplankton, enumeration of macrophytic algae, vegetation analysis of the aquatic and semi-aquatic flora including those of mangroves and their associates, alien, endemic and medicinal plants were carried out.

The physico-chemical factors such as temperature, turbidity, pH, total alkalinity, total hardness, salinity, electrical conductivity, dissolved oxygen, nitrates, phosphates, silicate, biological oxygen demand, chlorophyll *a* and productivity were estimated. The investigations revealed that there are seasonal and spatial variations in the parameters studied.

During the current investigation a total of 399 plant species were recorded. Of these, 272 were phytoplankton species, which belonged to freshwater, estuarine and euryhaline habitats. 23 species of these algae were pollution indicators. Six
macrophytic algae were recorded. A hundred and twenty one species of aquatic and semi-aquatic vascular macrophytes were also enumerated.

The study shows that the aquatic ecosystem has undergone eutrophication and the estuary is experiencing stress as indicated by the flora. The analysis of the macrophytic flora indicates that the Kodungallur area lacks diversity of mangroves, though 23 mangrove associates reported from various parts of Kerala are found here. Based on the growth forms study, it is observed that wetland plants were the most common growth forms present, associated with the biotopes selected for the study.

**Key words:** Phytoplankton, productivity, aquatic and semi-aquatic macrophytes, mangrove, mangrove associates, retting, pollution indicators, eutrophication.