SUMMARY

The backwaters of Kerala support as much biological productivity and diversity as the tropical rain forests. They are responsible for the rich fisheries potential of Kerala. Bottom trawling is a widely employed fishing method in the inshore waters of Kerala for almost ten months of the year. The present investigation “Impact of Trawlers on the Microalgae of the Aquatic ecosystem” encompasses the effect of experimental trawling on the physico-chemical as well as biological parameters of the water system, at four stations along the Vembanad Lake to the Arabian Sea namely Aroor (Station I), Fishing Harbour, Thoppumpady (Station II), Cochin bar mouth (Station III) and The Arabian Sea (Station IV), for a
period of two years from January 1998 to December 1999. Bottom trawling operations were carried out using a commercial trawler of ske 30–40 OAL. The various parameters that had been analyzed for assessing the impact of trawling, were temperature, pH, transparency, dissolved oxygen (DO), salinity, nitrates, phosphates, silicates, total dissolved solids (TDS), free carbon dioxide, biochemical oxygen demand (BOD), oil and grease, photosynthetic pigments, primary productivity, phytoplankton and zooplankton abundance in the surface and bottom waters before and after trawling operations.

The water temperature ranged from 24.5°C to 31.2°C and 24.2°C to 30.6°C at surface and bottom waters respectively. Variations in temperature were detected both at surface and bottom waters after the experimental trawling. The pH showed a range of 6.15 - 8.31 and 6.08 - 8.31 at surface as well as bottom water samples. The pH at the surface remained the same while that at the bottom revealed a very little increase after the experimental trawling. The Secchi disc measurements, after trawling showed less transparency at the euphotic zone due to increase in the turbidity, with station II during the second year and station I during the first year showing maximum light extinction coefficient. The dissolved oxygen and salinity were generally high during the pre monsoon period. A
negligible decrease in the dissolved oxygen and a slight increase in the bottom salinity were recorded in the water samples collected after trawling.

Typical seasonal variations in the distribution of nutrients were observed with high values of nitrates, phosphates, silicates and total dissolved solids during the monsoon and post monsoon periods at all stations. Peak values of nitrates were registered during the months of July and October, while phosphates and silicates recorded a primary peak during monsoon (May, June and July). Trawling activities induced a remarkable increase in the concentration of nutrients with a two fold enhancement in the level of phosphates and nitrates during the pre monsoon and post monsoon period. The increase in silicate concentration was manifested only in the bottom waters after trawling.

Free Carbon dioxide was occasionally absent but an increase of upto two fold was noted in the trawled waters. An increasing trend down the water column was observed in the biochemical oxygen demand which recorded the highest values at stations II and III, and its increase in the after trawling samples was more pronounced in the bottom water. Oil and grease were occasionally reported at stations II, III and IV and it showed a decreasing trend in the trawled waters.
Primary production was high during the monsoon as well as the post monsoon period. Trawling exerted a promotory effect on the primary production. Among the photosynthetic pigments chlorophyll $a$ was the most dominant followed by chlorophyll $c$ and carotenoids. Peak values were registered during the monsoon as well as the post monsoon periods. Chlorophyll $a$, $c$ and carotenoids were found to be elevated, while Chlorophyll $b$ showed a decrease after trawling in the surface waters.

Pre monsoon recorded the peak value in the distribution of zooplankton while the post monsoon revealed abundance of phytoplankton in the areas studied. Trawling activities brought forth increase in the density of the plankton which was more pronounced in the bottom waters. The increased phytoplankton recorded in the after trawling water samples indicated that bottom disturbance paved the way for the dispersion of microalgae from the sediments. This release of plankton during bottom trawling may eventually reduce the benthic production in a long term period thus causing disturbance in the food chain. In conclusion unscrupulous and unscientific exploitation of the coastal waters by bottom trawlers can cause tremendous irremediable annoyance in the marine ecosystem.