

Theme 7: Lakes, rivers, estuaries: water quality, biotic resources, sustainable management

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ECOLOGICAL INDICES AS A TOOL FOR ASSESSING POLLUTION IN HOLY MAHAMAHAM TANK IN KUMBAKONAM, THANJAVUR DT. TAMIL NADU

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Statistical analyses of data concerning the phytoplankton standing crop and biomass were applied as a tool for assessing pollution in Mahamaham Tank. Univariate and multivariate analysis showed a succession of three clusters associated with salinity and temperature variations. The first and third clusters comprised mainly Diatoms and Desmids. The second cluster, richer in species, was dominated by Cyanophytes, Chlorophytes and Euglenophytes. The diversity index ranged from 0.16 to 1.82. A high diversity was associated with high evenness, reflecting the multi-dominance pattern of cluster (2). On the other hand, multiple correlations between salinity and standing crop, richness and evenness, were negative and significant, but positive with the diversity index. The k-dominance curve for numerical abundance extends above that for the biomass when clusters 1 and 3 are dominant. Both curves coincide more or less for another segment of the curve but when cluster 2 becomes dominant the numerical abundance curve runs below that of the biomass. Such a pattern may indicate less polluted or moderate to heavily polluted conditions of the tank. The present study reveals that the combination of univariate and multivariate analysis with the k-dominance curve provides a promising tool for the characterization of phytoplankton dynamics under stress conditions. On the other hand, the phytoplankton community in the tank is stressed not by the inflow of water. This is indicated by the higher diversity and evenness and by the k-dominance curve during the dominance of cluster.

Keywords: Phytoplankton, Diversity indices, k-dominance curve