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

T7_Oral_14

BIO-MONITORING APPROACHES FOR WATER QUALITY ASSESSMENT OF MAHAMAHAM TANK AT KUMBAKONAM, THANJAVUR DT. IN TAMIL NADU, INDIA

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The level of degradation of water resources can be quantified by bio -monitoring technology more than conventional chemical methods. The present study deals with the role of biological parameters especially phytoplankton community and its trophic status to assess the water quality of Mahamaham Tank. Pollution status of the tank was assessed on the basis of the Palmer's Pollution Index, Shannon Wiener Index and physicochemical factors. A total 54 genera belonging to 4 groups of phytoplankton were identified in the tank. Different patterns of dominance and sub-dominance of indicator phytoplankton community and species along with physicochemical quality observed, confirm the pollution status of the holy tank. In this present investigation, phytoplankton community had been considered along with the various physicochemical factors like water temperature, pH, alkalinity, free CO2, dissolved oxygen, nitrate, phosphate and calcium for the assessments of water quality in the holy tank at Kumbakonam from April 2009 to March 2010. From the basic biological data, various pollution indices like Saprobic index, Nyggard's index, Palmers algal pollution index, biological index and Shannon-Weiner index were calculated to quantify the water quality of the water bodies. Results showed that the bio-monitoring approaches with the chemical analysis for a 12 months period in water body produced many significant correlations indicating 32 of the 40 comparisons between biological pollution indices (5 kinds) and chemical analysis (8 parameters) were statistically significant ($r > 0.316$; $p = 0.05$). The Nyggard's index and biological index were significantly correlated with all physicochemical parameters ($r>0.285$; $p = 0.05$). Shannon - Weiner index was significantly ($r > 0.615$ and 0.327) associated with phytoplankton population density in all combinations. Considering all the parameters and biotic indices, it was clearly shown that the water body was polluted to moderately polluted in different seasons. The bio-monitoring approach was not static. This can be further modified to suit our area to monitor the quality of water in its natural condition for the particular usage of water.