

Distribution pattern of dissolved inorganic nutrients and phytoplankton diversity in river estuary, Kota Kinabalu Sabah, Malaysia

ABSTRACT

Nutrients are influenced by anthropogenic activities and consequently change the diversity and density of phytoplankton. The spatial distribution of dissolved inorganic nutrients and phytoplankton diversity and density were determined in river estuary, Kota Kinabalu, Sabah, Malaysia. Samples of water and phytoplankton were collected from six locations of river estuary during the month of May 2019 to October 2019. The highest abundances of 86% diatoms were determined during the study period. This was followed by 13% and 1% of dinoflagellates and Cyanobacteria respectively. The most dominance species of *Skeletonema costatum*, with density of 1186.69×10^3 cells/L and *Thalassiosira* sp. (938.01×10^3 cells/L) were recorded from Station 1 (upstream) and Station 5 (mangrove area) respectively. The *Chaetoceros* sp. (84.25×10^3 cells/L) was the dominated in Station 6 (control site). Station 4 (residential area) accounted the highest diversity of species such as *Skeletonema costatum*, *Thalassiosira* sp., *Peridinium* sp., *Gonyaulax* sp., and *Cylindrotheca* sp. with total cell density of 142.98×10^3 cells/L. The high diversity index of 5.2 to 7.09 and evenness index of 1.81 to 2.87 were determined from this river estuary. Very poor relationship was observed with the cell density and dissolved inorganic nutrients, phosphate ($R^2 = 0.2437$), ammonium ($R^2 = 0.301$) and nitrate ($R^2 = 0.406$). The diversity and abundance of phytoplankton in this river estuary not only depend on nutrients, but might be associated with other environmental factors, tidal fluctuations and rate of discharge of nutrient inputs from surrounding areas. This study suggests that long term monitoring not only the nutrients, but discharges and flushing of nutrient during rainfall and tidal fluctuation together with environmental factors should be considered in order to conclude status on the diversity and abundance of phytoplankton in river estuary.