PHYTOPLANKTON & NUTRIENT INTERACTION TOWARDS PRIMARY PRODUCTION IN THE NORTH WESTERN REEF ECOSYSTEMS IN SRI LANKA

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ABSTRACT

Phytoplankton biomass and composition is governed by nutrient enrichment of coastal waters and directly link with the fisheries and the biodiversity. Bar Reef Marine Sanctuary is such coastal ecosystem which is always affected by seasonal fresh water inputs and wind driven circulation. This study aims influence of physico-chemical parameters on the phytoplankton.

Water samples were collected at six locations covering Bar reef and Puttalam lagoon once in a month from May–July, 2013 and analyzed for nutrients, TSS and phytoplankton as ex situ measurements. In situ measurements of physical properties (temperature, salinity, visibility and dissolved oxygen) were measured using Digital multi parameter.

Daytime_mean sea surface temperature at sampling locations was varied from 28.1 to 29.1 ^{o}C, while salinity varied from 30-37 ppt and visibility of the area was changed from 0.5–7.0 m. Though there is no spatial variation of mean dissolve oxygen was recorded, the values were fluctuated from 4.85-7.25 mgl^{-1}. pH was varied from 6.52 to 7.67 with slight deduction in reef sites. Highest phosphate (0.91 mgl^{-1}), silicate (2.65 mgl^{-1}), TSS (106.1 mgl^{-1}) and chlorophyll-*a* (1.03 mgl^{-1}) values were observed in lagoon sites compared to the reef sites. No distinctive difference in nitrate or nitrite for both lagoon and the reef. Highest average abundance of phytoplankton (119000 individuals l^{-1}) was recorded from the lagoon water samples for entire study period and 28 phytoplankton groups were recorded while diatoms are the governing group of the phytoplankton guild.

The highest phosphate, silicate, chlorophyll-*a* and TSS values are confirmed that the highest abundance of phytoplankton or primary productivity is directly related to fresh water inputs and highest diatom population is recorded as a result of high silicates. The results would be important to monitor quality, health and ecological status of the aquatic environment and also measure the effectiveness of management programmes or regulatory actions.

Keywords: **Abundance, Diatoms, physico-chemical properties, phytoplankton population, Puttalam Lagoon**