

Impact of nutrient availability on phytoplankton during Southwest monsoon at Bar reef marine sanctuary, Sri Lanka

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

Water samples were collected from six locations covering the Bar reef and the Puttalam lagoon once a month from May–July, 2013 and the nutrients, TSS and phytoplankton were analyzed. In situ measurements of physical properties (temperature, salinity, visibility and dissolved oxygen) were measured using a Digital multi parameter. Daytime mean sea surface temperature at sampling locations varied from 28.1 to 29.1°C, while salinity varied from 30-37 ppt and the visibility of the area changed from 0.5 – 7.0 m. Though no spatial variation of mean dissolve oxygen was recorded, the values fluctuated from 4.85-7.25 mg l⁻¹. pH varied from 6.52 to 7.67 with slight decreases in reef sites. Highest phosphate (0.91mg l⁻¹), silicate (1.15 mg l⁻¹), TSS (106.1 mg l⁻¹) and chlorophyll- *a* (1.03 mg l⁻¹) values were observed in the lagoon sites compared to the reef sites. No distinctive differences were observed in nitrate or nitrite, in both; the lagoon and the reef. Highest average abundance of phytoplankton (119,000 individuals l⁻¹) was recorded from the lagoon water samples during the entire study period and 28 phytoplankton groups were recorded while diatoms are the governing group in the phytoplankton guild.

The highest phosphate, silicate, chlorophyll-*a* and TSS values confirmed that the highest abundance or the primary productivity is directly related with the fresh water nutrient inputs and the highest diatom population recorded was a result of high silicates.

Keywords: abundance, Puttalam lagoon, physico-chemical properties, phytoplankton population

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