

Study of the temporal variation of nutrients in Southern coastal waters of Sri Lanka during the Southwest monsoon

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Sri Lanka is a tropical island, which is influenced by annual reversing monsoonal cycle. This monsoonal cycle is consisted of Southwest (summer) monsoon and Northeast (winter) monsoon periods, which extend from June to September and from December to March, respectively and as well as two transitional inter monsoon periods (May and November). These monsoonal changes may alter the chemistry and the productivity of the ocean. Therefore, this study was carried out to verify the temporal variability of physico-chemical characteristics including nutrients in Southern coastal waters of Sri Lanka. Four sampling points were investigated along the coastal belt near to Gin River mouth for six months period (June, 2017 to November, 2017). The concentration of NO_3^- , NO_2^- , PO_4^{3-} and SiO_4^{4-} in seawater were analyzed while DO, TDS, temperature, pH and salinity values were recorded in-situ at each point. In this study, the lowest monthly average phosphate concentration was recorded as $0.1 \pm 0.03 \mu\text{mol/L}$ in November, 2017. This value was lower than the production limiting level ($0.3 \mu\text{mol/L}$). Therefore, phosphate can be the limiting nutrient, which affect the productivity in this coastal water. Highest concentrations of phosphate ($1.09 \pm 0.67 \mu\text{mol/L}$), nitrate ($26.11 \pm 10.89 \mu\text{mol/L}$) and nitrite ($0.63 \pm 0.03 \mu\text{mol/L}$) were recorded in August and September, when the Southwest monsoon was peaked. This denoted the presence of Southern coastal upwelling as Southwest Monsoonal Current prevailed near the Southern coast of the island during this period. Furthermore, this incident can be further evident by lower sea surface temperature ($\sim 26^\circ\text{C}$) and higher average chlorophyll-a ($\sim 1 \text{ mg m}^{-3}$) distributions, shown by satellite images retrieved from this region. Based on the results, this study confirms that nutrients in the Southern coastal waters of Sri Lanka temporally vary during the southwest monsoon.

Keywords: Southwest monsoon, nutrients, coastal upwelling, Southwest monsoonal current, Southern coastal waters

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