Abstract No: 181 ***Earth and Environmental Science***

DIVERSITY AND ABUNDANCE OF MARINE PLANKTON AND HYDROGRAPHY IN SOUTHERN BAY OF BENGAL

Y.P. Kumara[1*], H.B. Jayasiri[2], G.W.A.R. Fernando[3]

[1]Marine Environment Protection Authority, Colombo, Sri Lanka
[2] National Aquatic Resources Research and Development Agency, Colombo, Sri Lanka
[3]Department of Physics, The Open University of Sri Lanka, Nawala, Nugegoda, Sri Lanka

Plankton are microscopic plants and animals that float or drift along with the water currents, unable to swim against the currents. The abundance of plankton are significantly related with existing water quality conditions. The main objective of this study was to evaluate the community structure of marine plankton and to study the hydrography in southern Bay of Bengal, outside the Exclusive Economic Zone (EEZ) of Sri Lanka. Hydrography, planktonic flora and fauna were evaluated at seven sites by using R/V Roger Revelle in the southern Bay of Bengal (BOB) during the period of two weeks (03rd to 16th August 2015). Vertical profiles of salinity, temperature, DO and density was made using Conductivity Temperature Depth profiler. Water samples were collected using Rosette Sampler. For the analysis of phytoplankton composition 250 ml of water sample was preserved by Lugol's solution. Zooplankton samples were collected by using WP-2 plankton net (180 µm) by vertically towing from 50 m to the surface and preserved by 5% formalin. Zooplankton and phytoplankton were counted and identified under the Sedgwick rafter cell using a light microscope. Water samples were analyzed for chlorophyll-*a* using spectrophotometer. Mixed layer depth of the study area varied widely from 35.45-96.86 m and salinity of the mixed layer varied from 34.0836 ± 0.0054-34.7091 ± 0.0120 psu. The depth of the thermocline varied from 10.2340-76.7544 m. The highest chlorophyll-*a* level of 0.63 µg/l was found at 25 m depth in the study area. The Phytoplankton analysis showed that the abundances are generally low and the highest abundance of 1578 cells/l was found at 25 m depth. A total of 32 phytoplankton taxa were reported from the area. Six species of phytoplankton taxa in the western side of southern Bay of Bengal (WBOB) is reported as dominant species: *Leptocylindricus* sp. (22.87%), *Guinardia* sp. (16.58%), *Coscinodiscus* sp. (16.28%), *Fragilaria* sp. (10.37%), *Triceratium* sp. (8.45%) and *Rhizosolenia* sp. (6.19%). In the eastern side of southern Bay of Bengal (EBOB), seven species were identified as dominant species: *Leptocylindricus* sp. (15.91%), *Coscinodiscus* sp. (15.81%), *Guinardia* sp. (15.10%), *Fragilaria* sp. (13.14%), *Triceratium* sp. (9.20%), *Rhizosolenia* sp. (7.06%), *Navicula* sp. (6.05%). One-Way ANOVA revealed that phytoplankton abundance at different depths and zooplankton abundance did not vary significantly between WBOB and EBOB at p=0.05. Zooplankton abundance varied from 2.38 to 8.36 indivi./l of with a mean of 4.6 ± 0.87 indivi./l in the study area. Mean zooplankton abundance in the southern BOB was 7 ± 0.86 indivi./l. The copepods (Order Calanoida, Harpacticoida and Cyclopoida) were the most abundant taxon at all sites. They contributed 48% to the total zooplankton density in southern BOB. Phytoplankton abundance had significant positive correlation with chlorophyll-*a* at p=0.01. This study provides information on primary and secondary producers in relation to physical oceanographic parameters in the southern BOB.

Keywords: Bay of Bengal, Phytoplankton, Thermocline, Zooplankton