Author version: J. Mar. Syst.: 77(1-2); 2009; 137-147

Seasonal and spatial distribution of particulate organic matter in the Bay of Bengal

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Abstract

In this paper, we have assessed the temporal, spatial and depth related variation of suspended particulate organic matter (POM) in the Bay of Bengal. For this purpose, suspended particulate matter (SPM) samples were collected from eight depths (2 to 1000 m) at 9 locations in the Bay of Bengal during July/August 2001 (Southwest monsoon, SWM), September/October 2002 (Fall Inter-monsoon, FIM), and March/April 2003 (Spring Inter-monsoon, SPIM). The SPM samples were analyzed for chlorophyll *a* (Chl *a*), particulate organic carbon (POC) and total particulate nitrogen (TPN). The surface concentrations of POC varied from 4.3 to 11.1 µM C, 3.1 to 10.9 µM C, and 4.3 to 9.0 µM C during SWM, FIM, and SPIM, respectively. The levels of SPM, and the concentrations of Chl *a,* and POC were relatively higher in the offshore compared to the near shore stations, especially during SWM. The POC concentration and its contribution to the SPM were higher in the surface waters, and both decreased with increasing water column depth at most of the stations. The observed decrease with depth of POC indicates heterotrophic uptake and/or dilution by inorganic material, poor in POC. This was also reflected in the C/N ratio which generally increased with water column depth. The relatively low C/N and POC/Chl *a* ratios, and high Chl *a* and % POC during the SWM and FIM indicate the presence of relatively fresh POM in the Bay during these two seasons. The observed seasonal differences in the quality of POM appears to be governed by river run-off and the physical forces such as eddies which pump nutrients into the surface waters thereby enhancing biological production.

Keywords: Suspended particulate matter; Particulate organic carbon; C/N ratios; Seasonal variations; Bay of Bengal.