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Short time series of phytoplankton, nutrient and chlorophyll-a in winter period in the Dardanelles (Çanakkale Strait, Turkey)

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Abstract

This study was carried out to determine the short time series of phytoplankton density, bio-volume and chlorophyll-a in relation to nutrients and other environmental parameters (CTD) in surface waters of the Dardanelles in period of 01 December 2004 and 07 March 2005. CTD parameters, nutrient and chlorophyll-a were measured by using YSI 556 MPS, Technicon Model Two Channel Autoanalizor and Jasco V-530 UV/VIS spectrophotometer, respectively. Average temperature, salinity, pH, specific conductivity, TDS, DO, TSS, NO^{-}_{2}+NO^{-}_{3}, PO^{-3}_{4}, SiO_4 and chlorophyll-a were found to be 9.47 °C, 27.5 ppt, 8.12, 42.86 mS/cm, 27.86 g L^{-1}, 9.23 mg L^{-1}, 27.1 mg L^{-1}, 0.43 µM, 0.23 µM, 2.91µM, 1.97 µg L^{-1}, respectively. Average N:P and S:P rates were calculated as values of 1.78 and 14.9, respectively. Total phytoplankton cell density varied between $8.25x10^4$ and $4.71x10^6$ cell L^{-1}. Since surface waters of the Dardanelles are originated of Black Sea, rational contribution of Bacillariophyceae (%48.8) to total phytoplankton cell density was lower than total contributions of Dinophyceae (%30.9) and other taxonomic groups (%20.3) during the winter period. Short time seried distrribution of phytoplankton in winter period in the Dardanelles showed that there were 7-9 population growing slope of phytoplankton between 01 December 2004 and 07 March 2005. According to this result, life cycles of phytoplankton species are completed in period of 1-2 week in winter period in the Dardanelles. While the biggest contributions to Dinophyceae cell density were from *Prorocentrum* spp., the biggest contributions to Bacillariophyceae bio-volume were from *Pseudonitzschia pungens, Rhizosolenia fragilissima, Chaetoceros spp., Thalassionema nitzschioides*. Except Dinophyceae and Bacillariophyceae, the biggest contributions to other taxonomic groups were from coccolitophorid *Emiliania huxleyi*, *Silicoflagellat Dictyocha* spp. and coccoid Cyanophyceae forms.

Keywords: Dardanelles, winter, phytoplankton, nutrient, chlorophyll-a, CTD Probe Data