SPATIOTEMPORAL VARIABILITY OF BACTERIOPLANKTON IN ESTUARINE HABITATS WITH DIFFERENT RIVERINE LOADING

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Bacterioplankton growth and abundance were determined with high frequency sampling simultaneously at three habitats with different loading of freshwater in the Gulf of Bothnia. The spatiotemporal variability was most marked at a shallow coastal station while it was lowest at the northernmost open sea station. The period of highest cell production occurred in May at the southern open sea station and August at the northern. Highest growth rates (3.4 x 10^8 cells/liter x day) were observed in the trophogenic layer at the coastal station. Lowest growth rates (< 0.2 x 108 cells/liter x day) occurred below 40 m depth at the southernmost station in November, when the lowest rates at the other stations with higher riverine loading also occurred. Episodes of high bacterial growth was observed at both offshore stations in January and February, possibly promoted by artificially high river discharge due to water power regulation. Also, growth rates at the coastal station below 10 m during winter was comparable to those in the surface water of the northernmost station during summer. Riverine loading, primarily in regulated drainage areas, may promote a higher bacterioplankton growth during periods with low phytoplankton carbon fixation, with the potential to influence survival strategies of bacterial populations and the species composition of the bacterioplankton community.

ENHANCEMENT OF PRIMARY PRODUCTION AND CHANGES IN ELEMENTAL COMPOSITION OF PHYTOPLANKTON IN A COLD CORE EDDY IN THE EASTERN MEDITERRANEAN

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Quasi-permanent cyclonic Rhodes Gyre located in the NE Mediterranean is the major source of nutrients for the oligotrofic surface waters. In the core of eddy and its peripheries, elemental compositions of biogenic particulate matter in the productive layer (~100m) have been studied with simultaneous measurements of primary production (Pp), Chl-a, light penetration and inorganic nutrients. When the surface water cooling prolonged (e.g. in 1992, 1993 and 1995 winters), the nutrient concentrations displayed vertically uniform profiles down to >1000m. During bloom of these years, Pp and biomass were as high as 0.5gC/m^2/d and 3 mg/m^3 (0.2 g/m^2) in terms of Chl-a respectively; which are similar to those reported for the Western Mediterranean and the Black Sea where the majority of land-based inputs reach. The prominent DCM nearly dissappeared and vertically uniform Chl-a profiles were formed in such winters. However, in mild winters (1991, 1994), the deep water ascended up to only the base of the euphotic zone, resulting in a limited Pp and thus biomass in the nutrient depleted euphotic zone. The chemical compostion (C:N:P ratios) of POM in the euphotic zone, which were very similar to the classical Redfield values under the P-limited conditions, were nearly 100:10:1 under the nutrient unlimited winter production; the anamous C:N and N:P ratios in nutrient enriched waters might be the result of either less inorganic nitrogen assimilation during photosynthesis with respect to phosphate or selective excretion of org-nitrogen from POM.

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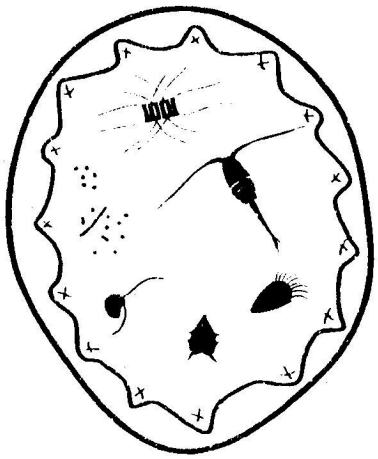

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