Editorial

Satellite imagery has made us familiar with the surface distribution of chlorophyll in the world oceans. Large marine areas, particularly in tropical and subtropical regions, appear as phytoplankton-poor. However, in oligotrophic situations, a substantial part of the phytoplankton biomass may be concentrated in a deep maximum, below the reach of the ocean colour remote sensors. Knowledge of the spatio-temporal variability of the distribution of phytoplankton in the water column and of the contribution of different size fractions to biomass and primary production is crucial in order to understand the interplay between phytoplankton community structure and carbon fluxes in the pelagic ecosystem. Obtaining information on these topics is still dependent on in situ observations, but large-scale studies in open ocean regions are scarce.

Among a range of interesting contributions, the featured article in this volume of *Scientia Marina* is a study by Moreno-Ostos *et al*. (Moreno-Ostos, E., A. Fernández, M. Huete-Ortega, B. Mouriño-Carballido, A. Calvo-Díaz, X.A.G. Morán and E. Marañón, 2011. Size-fractionated phytoplankton biomass and production in the tropical Atlantic. *Sci. Mar.*, 75(2): 379-389). It provides information on the spatial variability of total and size-fractionated chlorophyll *a* (chl*a*) (picophytoplankton and phytoplankton >2 µm) and primary production (P) along two meridional transects spanning more than 6000 km in the tropical and subtropical Atlantic Ocean and covering three biogeographic provinces: the North Atlantic Tropical Drift, the Western Tropical Atlantic (WTRA) and the South Atlantic Tropical Gyre (SATG). The paper reports that the mean contribution of the deep-chlorophyll maximum (DCM) to total integrated primary production ranged from 19% in the WTRA to a substantial 30-31% in the subtropical gyres. The highest picophytoplankton contribution to total primary production was found at the DCM, while phytoplankton >2 µm was the main contributor in the upper mixed layer and made a higher contribution to chlorophyll *a* ratios (P/chl*a*) than picophytoplankton. The higher (P/chl*a*) of phytoplankton >2 µm is a rather unexpected result, as many experiments have found that picophytoplankton shows higher photosynthetic efficiency than larger cells. In agreement with some previous findings, Moreno-Ostos *et al*. suggest that the contrasting dynamics of the <2 µm and >2 µm size classes is due to a stronger negative impact of solar radiation on picophytoplankton, which has less potential to accommodate photoprotective substances than phytoplankton >2 µm. This differential effect could have important implications for carbon cycling in open ocean ecosystems and deserves further research.

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