Author: Mar Nieto-Cid, *Investigadora científica* (Instituto Español de Oceanografía)

Designation:

Description:

Dissolved organic matter (DOM) plays a major role in the recycling, export and sequestration of biogenic organic carbon, being a key component of ocean biogeochemical cycles and of the biological and microbial carbon pumps. Microbial degradation of DOM not only produces CO 2 but also generates dissolved molecules of decreasing bioavailability that can accumulate in the oceans for hundreds to thousands of years. The size-reactivity continuum (SRC) model is the conceptual framework to explain the DOM reactivity on a size basis, although field tests are still scarce and some of the pieces of this puzzle remain unclear. Taking advantage of the FLUXES-I cruise in the Cape Verde Frontal Zone (CVFZ), we have studied the size-fractionated reactivity of the high (HMW; >1 KDa) and low (LMW; <1 KDa) molecular weight fractions of the DOM from surface down to 4000 m, using a high-efficiency and low-concentration-factor ultrafiltration cell. The wide ageing range covered by the water masses of the CVFZ makes it an excellent site to test the SRC model. Regarding the bulk C and N pools, the water masses with higher oxygen utilization were more depleted in HMW molecules, with a significant preference for the degradation of large N-containing compounds. Accordingly, preferential degradation of HMW fluorescent protein-like compounds was observed. In parallel, fluorescent humic-like compounds of both HMW and LMW were generated as by-product of the degradation of HMW organic compounds, and the remineralization of the DOM increases the aromaticy of both fractions, but especially the LMW one.

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Full list of Authors

- Mar Nieto-Cid (Instituto Español de Oceanografía)
- Ester Jerusalén-Lleó (Consejo Superior de Investigaciones Científicas)
- Bieito Fernández-Castro (University of Southampton)
- X. Antón Álvarez-Salgado (Consejo Superior de Investigaciones Científicas)

SIZE-REACTIVITY OF DISSOLVED ORGANIC MATTER IN THE CAPE VERDE FRONTAL ZONE

Category

Scientific Program Abstract > Special Sessions > SS42 The biogeochemistry of dissolved organic matter

Preference: Oral