DEGRADATION OF HIGH MOLECULAR WEIGHT DISSOLVED ORGANIC MATTER BY DEEP-SEA PROKARYOTES ON PAP SITE (NORTHEASTERN ATLANTIC OCEAN)

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Abstract
The aim of this work is to evaluate the capacity of deep-sea prokaryotes to degrade HMWDOM on the Porcupine Abyssal Plain site (Northeastern Atlantic) under in situ conditions.
Keywords: Bacteria, Deep Sea Ecology, Organic Matter

Deep oceans represent one of the largest reservoirs of organic carbon on the biosphere, mainly in the form of dissolved organic matter (DOM). DOM can be divided in high molecular weight (HMW-DOM > 1000Da, representing between 15 and 35% of total DOM) and low molecular weight (LMW-DOM < 1000Da) size classes. Study of the biogeochemical cycle of DOM must be improved in order to understand the interactions between marine prokaryotes (Archaea and Bacteria) and marine organic matter, since they play a central role in aquatic carbon cycle.

We synthesized tritiated exopolysaccharides (^{3}H-EPS) [1] and incubated them with natural deep-sea prokaryotes (2000m) at *in situ* pressure and temperature conditions. We also examined the assimilation of ^{3}H-Glucose and measured Prokaryotic Heterotrophic Production (PHP, with ^{3}H-Leucine). The number of cells taking up tritiated Leucine, EPS and Glucose were determined using microautoradiography combined with catalyzed reporter deposition fluorescence in situ hybridization (MICRO-CARD-FISH).

The first results shown that deep-sea prokaryotes are able to degrade ^{3}H-EPS, assimilation rates being at the same range than in surface waters (assimilation measured between 1.6 and 2.81 pmol.L^{-1} h^{-1}). Using our high-pressure retaining system [2], we found significant differences in assimilation rates for all the substrates used between *in situ* and atmospheric pressure conditions. In fact, assimilation rates of EPS, Glucose and Leucine were, respectively, 3.6, 3.4 and 2.3 times higher on samples under *in situ* pressure conditions than decompressed one, confirming previous results obtained in Mediterranean Sea.

References
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