

# **Biomarkers and their $\delta^{13}\text{C}$ signature in suspended particles in the open ocean water column: the case of BONUS-GoodHope expedition (Southern Ocean)**

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Improving our understanding about the functioning of the biological carbon pump is necessary for a proper assessment of the ocean's CO<sub>2</sub> sequestration capacity. The biological pump efficiency depends on the phytoplankton community structure and its activity in the upper mixed layer as well as on the composition and activity of zooplankton and prokaryotes consuming the sinking flux of organic matter. The relative importance of different microbial and zooplankton components, as well as the variable composition of the C-export flux in the water column can be resolved by studying the occurrence and spatial variability (depth and latitude) of specific compounds or biomarkers in suspended matter. During the BONUS-GOODHOPE expedition (Feb.-March 2008, R/V Marion Dufresne), particulate organic matter was sampled along the Greenwich Meridian using large volume in-situ filtration systems. Five stations were selected on the basis of their zonal characteristics: S1 (36°S, 13°E) and S2 (42°S, 8°E) in the Subtropical Zone, S3 (47°S, 4°E) in the Subantarctic Zone, S4 (51°S, °E) in the Polar Front Zone and S5 (57°S, 0°E) in the Weddell Gyre (Antarctic Zone). For surface waters, two size fractions were separated ( $\text{Ø}1 > 53 \mu\text{m}$  and  $53 > \text{Ø}2 > 1 \mu\text{m}$ ), while from the mesopelagic layer to the deep ocean we sampled the  $53 > \text{Ø}2 > 1 \mu\text{m}$  particles. The aim was to characterize the different lipid classes: neutral, glycolipidic and polar. Lipids were extracted following the modified Bligh and Dyer method and the three classes fractionated on silica gel as a function of their polarity. Neutral lipids were silylated and polar lipids were methylated prior to analysis. Samples (neutral and polar lipids) were analyzed on GC-MS for compound identification and GC-c-IRMS for carbon isotopic composition and relative quantification. Here, we discuss the variability of individual compound concentrations and their carbon isotopic composition with depth and in the different oceanic regions defined by the major fronts.