

VARIATIONS IN ORGANIC MATTER COMPOSITION IN SEDIMENTS FROM IODP SITE U1302

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Various paleo-techniques have been used to reconstruct climatic and environmental changes of the North Atlantic Ocean (NAO) area. However, only few studies report organic matter composition at the molecular level (biomarkers). Here we present preliminary data on lipid biomarkers in 185 samples from an IODP core from the NAO area extending back to approximately one million years ago. *n*-Alkanes, *n*-alkanols, branched alkanes with quaternary carbon centers, cycloalkylalkanes and diagenetic aromatic hydrocarbons dominate the solvent extractable lipids (Figure 1), while fatty acids, sterols, diols, terpenoids (diterpenoids and triterpenoids), hopanes and long chain alkenones were detected in only some of the samples. In addition, lignin CuO oxidation products i.e., syringyl (S), Vanillyl (V) and Cinnamyl (C), are also identified to assess the amounts and sources of terrestrial OM contributions to marine sediments in the NAO.

The biomarker results suggest the importance of terrestrial OM components, reflected by relatively high concentrations of long chain *n*-alkanes and *n*-alkanols, and CuO lignin products. This lipid biomarker distribution agrees well with the existence of abundant ice-rafted detritus (IRD), which are believed to originate from the North American continent and Greenland. Long-chain alkenones, a proxy of sea surface temperature, are below the detection limits in most samples, suggesting extremely low primary productivity of haptophytes under the high latitude area. The variations in values of lignin derived indicators (C/V, S/V and LPVI), and abundant ratio of diterpenoid /triterpenoids, likely reflects shifts in vegetation types (angiosperm vs. gymnosperm). High abundances and diversity of branched alkanes with quaternary carbon centers in NAO sediments were observed and are believed to be derived from sulfur bacteria or archaea, although their sources are not clearly defined in the literature.

The biomarker distribution with core depth (and age) will be presented in detail. Additionally one- and two-dimensional solution-state NMR experiments of the alkali-soluble (humic material) fraction of the sedimentary organic matter will be analyzed and provide further insight into chemical nature of organic matter in the North Atlantic ridge.

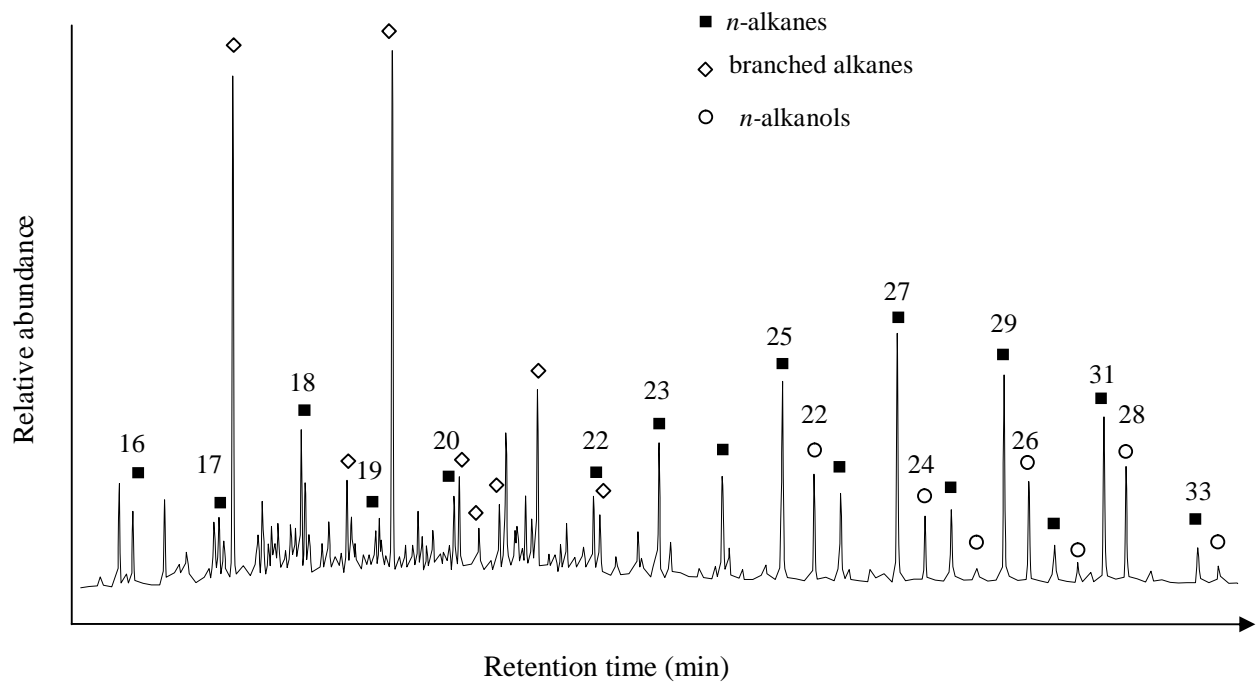


Figure1. Representative GC/MS chromatogram (m/z 57) from the total solvent extract of a sediment from IODP site U1302 core