

Biosignatures in precipitates and altered rocks at hydrothermal systems of the MidAtlantic Ridge: organic geochemistry, microbiology and petrography

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The proposed study aims to gain insight into the chemolithoautotrophic life associated to hydrothermal precipitates and rocks by combining the information from detailed organic-geochemical, microbiological, and mineralogical/petrographical investigations on identical samples. Three goals are in focus (i) to describe the composition and specific biomarker inventory of the microbial community present in hydrothermal precipitates and altered rocks (ii) to relate these findings to the characteristics of the substrate (mineral assemblage, geochemistry, porosity) (iii) to obtain insight into the metabolism of rock associates and their possible effect on precipitation – alteration - weathering. It is envisaged to develop an inventory of lipid biomarkers characteristic for the distinct groups of microbiota by investigation of field samples from a variety of hydrothermal areas along the MAR and invitro cultures. Thus, a tool is to be established allowing for a qualitative and semi-quantitative estimation of microbial associations in hydrothermal rocks by lipid biomarker investigation combined with compound specific analysis of stable isotope signatures.