



Factors that regulate seepage activity, related microbial anaerobic methanotrophy and carbonate precipitation: the Sorokin Trough (NE Black Sea) vs the Gulf of Cadiz (NE Atlantic)

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The Sorokin Trough (NE Black Sea) and the Gulf of Cadiz (NE Atlantic) are both mud volcano (MV) provinces characterized by the presence of gas hydrates, methane-related carbonates, and chemosynthetic biota but possess differences in geological history, tectonics, composition of sedimentary cover, and water column conditions. In this presentation, we will provide a multifaceted view on how processes and products of seep activity may portray distinct eruptive dynamics of MVs, reveal possible sources of emitted gases and sediments and how these gases, especially methane, interplay with benthic ecosystems at and beneath the seafloor. To achieve this, a wide variety of geochemical, biogeochemical and molecular ecological techniques was used in combination with geological and sedimentological studies. The experimental techniques applied included a combination of methods for the qualitative, quantitative, and compound specific carbon isotope analysis for lipid biomarkers and hydrocarbon gases, molecular ecology using 16S rRNA gene sequence analysis and mineralogy together with stable carbon and oxygen isotope analysis of carbonates. We compare the geological and biogeochemical processes taking place within the Sorokin Trough and the Gulf of Cadiz, explaining possible relationship between geological and biogeochemical regulatory mechanisms of the fluid venting and mud volcanism as well as factors controlling the occurrence, distribution and activity of methane-dependent microbial

populations and related carbonate fabrics in both areas