Geophysical Research Abstracts
Vol. 20, EGU2018-18888, 2018
EGU General Assembly 2018

Bacterial recycling of archaeal biomass as a new strategy for extreme life in the Dead Sea deep sediment

Camille Thomas (1), Vincent Grossi (2), Ingrid Antheaume (2), and Daniel Ariztegui (1)

(1) Department of Earth Sciences, University of Geneva, Geneva, Switzerland (camille.thomas@unige.ch), (2) Geology laboratory of Lyon, University of Lyon 1, Lyon, France (vincent.grossi@univ-lyon1.fr)

Subsurface environments are challenging to life sustainment as they often lack the elements necessary for biological development. The heterotrophic microbial communities commonly inhabiting deep sedimentary environments need for example to find available carbon sources enabling the least energy expenses for a maximized yield. Specific communities are known to be adapted to these low energy environments, but much remains to be understood regarding their development strategies. In a study developed in the framework of the ICDP Dead Sea Deep Drilling Project, we report biomarker evidence for the recycling of archaeal membrane lipids by Bacteria in extreme facies of the Dead Sea deep sediments. Isoprenoid wax esters derived from the recombination of hydrolyzed products of archaeal cell wall constituents were retrieved in gypsum and/or halite deep sedimentary deposits down to 250 m below the lake floor. They suggest the reutilization of dead archaeal biomass by halophilic heterotrophic bacteria. Such integration of exogenous material from one domain of life in another is a newly observed strategy for coping with extreme energy-limiting environments and allows bacterial communities of the Dead Sea subsurface to build carbon stocks and produce water in this extreme environment.