

**life influence on the deep dead
sea sedimentary archive :
insights from fe-s minerals and
organic matter recycling**

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The Dead Sea Deep Drilling Project (DSDDP) is an ICDP-sponsored multi-disciplinary initiative to reconstruct the paleoenvironments and paleoclimates over the Dead Sea Basin during the two last glacial-interglacial cycles. Our investigations have focused on understanding the role of microbial communities in the biogeochemical cycles of this extreme hypersaline environment. Furthermore, we aimed to identify their influence on the sedimentary record. Organic matter (lipids) and DNA extraction have been realized along the 456 m-long core retrieved from the ICDP drilling. They revealed microbial assemblages influenced by climatic and limnologic regimes during sedimentation. Very little information are available on the activity of such microbes. A comparison with processes undergoing in a microbial mat with similar chemical conditions allowed identifying signatures characteristic of microbial processes. In particular, the imaging and chemical identification of authigenic iron-sulfur minerals have revealed the presence of an active sulfur cycle in the sediment. Their morphology and Fe/S ratios are coherent with incomplete sulfate reduction, limited by organic matter quality. The latter often results in the preservation of greigite that modifies the magnetic properties of the sediment, in particular during interglacial intervals. In glacial periods, the accumulation/preservation of labile organic matter allows complete sulfate reduction resulting in full pyritization. The DSDDP core provides a unique opportunity to investigate deep diagenetic processes and to assess the role of microbial activity in these hypersaline sediments. Our study shows that microbial activity influences carbon and sulfur phases, as well as magnetic fractions, affecting proxies used in paleoclimatic reconstructions.