Geophysical Research Abstracts,
Vol. 10, EGU2008-A-09416, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-09416
EGU General Assembly 2008

Impact of *in situ* microbial diagenesis on carbonate-evaporite sequences

J.A. McKenzie, T. Bontognali, S. Templer and C. Vasconcelos
ETH-Zürich, Geological Institute, 8092 Zürich, Switzerland (sediment@erdw.ethz.ch)

Numerous geochemical studies of pore waters and associated authigenic carbonates have effectively implied the importance of microbial metabolism in early diagenetic processes, but, in these studies, the actual microbiology is underrepresented or ignored. With the discovery of viable microbial populations at variable, but significant depths in marine and lacustrine environments during research drilling, the recognition of an important *in situ* microbial factor in the early diagenesis of sedimentary sequences under anoxic conditions has been further enhanced. Whether occurring at shallow depths beneath coastal environments or a few to 10's of m beneath the seafloor, the flux of sulfate ions appears to be an essential aspect controlling the zone of active microbial diagenesis. Basically, to maintain the metabolic activity of sulfate reducing bacteria mediating the production of carbonate, a source of sulfate ions from overlying waters, internal recycling via sulfide oxidation or a nearby evaporite deposits is required. The type of reduced carbon source present in the system, whether deposited organic matter or generated methane, may be an additional determining factor controlling the early diagenesis. Furthermore, recent research in modern hypersaline coastal lagoons and sabkhas has documented the utmost importance of specific microbial processes and populations for dolomite precipitation. Examples of microbial diagenetic studies from several modern environments will be presented to highlight our evolving understanding of these biosphere-geosphere interactions in carbonate-evaporite systems. Finally, the long recognized association of evaporite deposits with sedimentary dolomite, which has led to designating the latter an evaporite mineral, will be reevaluated in a geomicrobiological context, emphasizing halophilic extremophiles who can survive and even flourish under moderately saline to hypersaline conditions.