# MICROBIAL DOLOMITE PRECIPITATION IN SHALLOW LAGOONS AND DEEP-SEA SEDIMENTS

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The importance of microbial processes in deep-sea sediments has been long recognized. The microbes that live in this extreme environment buried beneath the sea floor at high pressures and/or temperatures undoubtedly play an important role in the in situ formation and diagenesis of minerals. To understand the elemental cycles and the processes of early diagenesis and authigenic mineral formation in deep-sea sediments, microbial activity must be included in any evaluation as an important mediation factor. Many studies of authigenic carbonate minerals (calcite, dolomite and siderite) found in deep-sea sediments provide indisputable evidence of this microbial mediation. For example, based on carbon isotopic evidence, as well as pore-water geochemistry, numerous studies have confirmed that dolomite precipitation occurs in deep-sea sediments under anoxic conditions in association with bacterial sufate reduction and/or methanogenesis. Recent research, conducted in a coastal lagoonal, organic carbon-rich environment, Lagoa Vermelha, Rio de Janeiro, Brazil, provides an excellent modern analogue for processes related to carbonate mineral precipitation in anoxic deep-sea sediments, particularly for the mineral dolomite. Understanding the microbial processes mediating dolomite precipitation in the lagoonal system furnishes information about the biogeochemical processes responsible for the precipitation of carbonate minerals in any anoxic environment. Such processes can be extrapolated to deep-sea sediments because the formation of similar minerals may be related to the same processes. Additionally, to better evaluate the major biogeochemical processes responsible for carbonate mineral precipitation under anoxic conditions, as well as the micro-organisms involved, laboratory and in situ geomicrobiological experiments have been conducted under variable conditions.