

Annual cycles of detritus in halite and presence of highly-soluble salts during extremely low stage of the last interglacial Dead Sea

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Exposed last interglacial (e.g. MIS 5, Lake Samra) sediments in the Dead Sea basin are scarce and discontinuous. The ICDP Dead Sea core offers undisturbed sampling of this climatic interval and adds crucial information on interglacial conditions in the Levant and eastern Mediterranean region. This interval in the core is characterized by thick authigenic halite sequences with occasional intercalations of clastics associated with evaporitic gypsum and minor amounts of aragonite. The halite sequences, probably indicating a low lake level that are indirectly represented in exposures as possible hiatus, are primarily comprised of alternating laminae of (a) white pure halite with thickness range between 0.5 and 3cm, (b) brown mixed gypsum aragonite and clay with thickness range of ~0.25 to 0.4mm and (c) black layers of clay settling in between halite cumulates with a common thickness of 0.5mm.

We focused our efforts on high resolution characterization and analyses of these laminated sequences by using μ XRF, polarized light microscope, and SEM. We propose that the laminations represent annual deposition and possibly seasonal cycles; the white and brown layers formed in summers and winters, respectively. The black laminae represent dust storms. The thickness of a series of white laminae reveal annual cycles of 7-8 years. Recent SEM findings show some K and Mg rich salts associated with the brown layer. Some of them with dissolution texture which suggests extreme low lake level just before a fresher water input.