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Eustatic Overprints on the Diagenetic Evolution of Mesozoic Platform Carbonates from the Arabian Plate

Eustatic, climatic and tectonic factors contributed significantly to the configuration of the early diagenetic evolution of the Mesozoic platform carbonates of the Arabian Plate. These processes are investigated within the context of six major settings resulted from the combination of Milankovitch low to high amplitude eustatic sea level and climatic changes. The resultant settings include early diagenesis associated to either arid or humid climatic changes and attributed to low, medium or high amplitude sea level changes.

Early diagenesis associated with arid climatic conditions and low amplitude sea level changes can be traced in meter-sized evaporite-carbonate cycles of the Upper Triassic of northern Iraq and northeastern Syria and the Upper Jurassic Arab Formation of eastern Arabia. These sediments might be contrasted to the Lower Cretaceous cycles of the Yamama Formation in southern Iraq, which were developed under humid climatic conditions and low amplitude sea level changes. High amplitude sea level changes associated with humid climatic changes may be noticed within the Upper Cretaceous Hartha-Shiranish and Simsima Formations.

Processes also include evaporite dissolution in the Jawan evaporitic facies in the northern parts of the Arabian Plate and Hith anhydrite in eastern Arabia. Pedogenesis associated with regional erosion such as the development of caliche horizon between the Triassic Kurra Chine and the Upper Cretaceous Hartha Formation in the Western Desert of Iraq, and the development of paleokarst associated with regional unconformities as in the Najmah Formation and the widespread cementation and regional dolomitization fronts as in the Albian Mauddud Formation.