

Contrasting Depositional Style of Mixed Carbonates-Siliciclastics-Evaporites Bearing Neogene Sequence of Three Distinct Sedimentary Sub-Basins of Gulf of Iskenderun, Eastern Mediterranean Region, Se Turkey

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Three distinct sedimentary sub-basins of Osmaniye- Bahce (OB), Iskenderun-Arsuz (IA) and Hatay-Samandag (HS) are located near the triple junction of Aegean-Anatolian Microplate, Syrian-African Microplate and African Plate in the eastern most part of the Mediterranean region, Gulf of Iskenderun SE Turkey. These three sub-basins are surrounded by two major tectonic elements as: North Anatolian Transform Fault (NAT) and East Anatolian Transform Fault (EAT). The most important controlling factors for the Neogene sedimentation in the area are antecedent topography, clastic input, sea level and environmental changes and syn-sedimentary tectonics. The Neogene sedimentation in the three subbasins started with lower Miocene continental fluvial sequence that is mainly composed of red coloured conglomerates of continental origin which unconformably overlie the Pre-Miocene basement rocks. The first marine transgression took place in the Middle Miocene time (Serravalian) that resulted in the deposition of reefal carbonates of Horu Formation in the OB and IA sub-basins and Sofular Formation in the HS sub-basin. Shallow shelf areas over the topographic highs provided a suitable hard substratum for the colonization of corals and other reef builders. The coral patch reefs are of different sizes and dimensions with more commonly forming reef core and flanks. The reef cores are characterized by massive and lenticular bodies and comprised of corals in insitu growth positions while reef flanks are comprised of bedded limestone with mainly reworked corals blocks, coralline algae, bryozoa, crinoides, benthic foraminifera (e.g Milliolid, Borallia, Miogypsina, Heterostegina etc.) mixed with planktonic constituents. In the beginning of the Late Miocene the reefs gradually prograded across the entire shelf margin due to lowering of sea level and then they were replaced by deltaic sediments of Kizildere formation in the OB and IA sub-basins. However, an earlier phase of deltaic deposition is represented by pelagic and hemipelagic carbonate turbidites of Tepehan Formation in IA and HS sub-basins and siliciclastic dominated shelf sediments of Nurzeytin formation in the HS sub-basin. The OB sub-basin was uplifted and eroded during the Messinian period; as a result no evaporite bearing sediments were deposited in this basin. However, in contrast thick Messinian evaporites deposited in the IA and HS sub-basins as Haymaseki Member and Vakifli Member respectively. These evaporites are in the latter phase of sedimentation vertically and laterly replaced by lacustrine carbonates and siliciclastics which are represented by Aktepe formation and Samandag formation in the respective sedimentary sub-basins. In the last phase of basin fill, thick fluvial dominated sediments of the Erzin Formation cover the entire sedimentary sequence during the early Pliocene time. The last period of OB sub-basin is marked by an intensive volcanic activity of Late Pliocene age which erupted along the fractures driven by tectonics. The last unit consisting of lava flows and volcanoclastics discordantly lies on the Erzin formation. In contrast no volcanic activity happened in the IA and HS subbasins.