



Intra-basin salt regime and its thin-skinned tectonism into delta sedimentation of the Cilicia-Adana Basin, The NE-Mediterranean

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Seismic reflection profiles collected between the years of 1972-1977 by R/V Shackleton from the Cilicia Basin, the NE-corner of the Mediterranean, were interpreted to investigate structural development and dynamic evolution of the Cilicia salt tectonic and evaporitic back-arc basin.

The flat-bottomed Neogene Cilicia trough between Cyprus and Turkey is a small peripheral, arcuate and inter-mountain basin of the E-Mediterranean, representing the W-extension of the adjacent Adana basin. Its southern boundary is characterized by the steep normal faults off N-Cyprus, controlled by the neotectonic regime of the Cyprian Arc (e.g., Kyrenian-Misis active belt) and its northern boundary by the slope failure and downwarping processes of the unstable-shelf margin tectonism. The basin, which appears to be a down-faulted area by the extensional block faulting during the Late Tertiary, is probably bounded on its northern edge by either faults or a possible tectonic hinge-line with markedly steepening dips. The basin is being infilled with the asymmetric supply of deltaic sediments from Turkey. Its northeastern corner has been completely filled to form the Adana Basin that lies beneath the plains of the Seyhan delta during the Pliocene.

Basin-wide rapid graben subsidence by lithostatic loading of the Plio-Quaternary overburden produces a major seaward flexure along the NNE-delta margins. Tectonically downlifted block structure of basin plain provides important evidences as to the constitution, mobilization, perturbation and migration of the widespread evaporite de-

posits and having led to the flowage of the underlying plastic material to the S-SW. The flowage of Messinian evaporites resulted from basement tectonics (laterally away from the N-NE depocenters and diapirically in the basin centre axes) reaches both the depositional and also mechanical stability to form upward vertical salt transport in the central abyssal zone across the basin. Thus, the salt flow combined with listric faulting and diapirism within and along the margins of the basin has resulted in the production of a distinct series of halokinetic features along the central abyssal zone. In which, approximately halfway between Cyprus and Turkey, a thick sequence of the gently warped, well-stratified sediments and uniformly deposited flat-lying sediments form the platform-style depositional patterns basinward as the huge Plio-Quaternary depocenter. They did not undergo any important deformation since the early Pliocene, passing into a zone, where is entirely characterized by the seismic architectures of an extensively salt diapirism, and the southward tightening salt-cored folds. A radical change in the structural patterns of the basin occurs in this area, where the effects of graben subsidence by delta overloading from the NNE delta-tectonic hinge line are clearly reflected by listric normal fault-bounded Plio-Quaternary overburden, within which salt deformation has densely taken place, shifted toward the south due to salt withdrawing. The fact that the Plio-Quaternary sequence is strongly deformed by salt-related structures provides the setting for the secondary products by halokinesis driven by salt tectonism. This twofold activity is continually vertically sourced by pre-Messinian “the mother-salt bed” or “the main salt-stock” below discordance “M” at basement depths and fed back laterally by inter-diapir relations within intra-basin salt regime across the region.

Salt migration from the NNE to the SSW accompanied by marginal growth fault systems along the existing weakness planes has an seismic appearance of the vertical and horizontal low density mass transport of the extensive salt flow in the circum-Cilicia-Adana Basin and resulted in the production of dome-like elevations (salt upwelling) with the NE-SW trend line and of a distinct series of morpho-tectonic zones along the delta margins of the basin. During the Plio-Quaternary episode, seismic reflection data exhibited that the intra-basin salt regime, depending on the overburden gradient of delta-margin platform, basement tectonics and upward salt pumping (feed back) process, is a function of thin-skinned extensional tectonism as a major trigger force for shallow-seated youngest diapirism above discordance “M”. However, deep-seated older diapirism below discordance “M” driven by basement tectonics indicates that widespread and large-scale graben subsidence has played a major role since the earlier Pliocene and salt-related thin-skinned upward diffuse regime, nowadays, that’s still active.