



A Model of Carbonate Platform Evolution; Soğucak Formation (Thrace Basin), Northwestern Anatolia, Turkey

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Thrace Cenozoic Basin is located in the most northwestern part (European side) of Turkey. The triangular-shaped basin has a NW-SE trend and resulted from an extensional tectonics. The Thrace Basin lies across a geodynamically complex area characterized by three juxtaposed lithospheric blocks with different lithology, structural configuration, and geological evolution. These are the Rhodope–Strandja crystalline massif, the İstanbul Zone, and the Sakarya Zone. Southern margin of the basin is now covered by the Marmara Sea. The basin was deformed by the North Anatolian Fault (NAF) or the northern branch of the North Anatolian Fault that acted as a right-lateral strike-slip fault. The basin consists of continental and mainly marine deposits, ranging in time from Early/Middle Eocene (Lutetian) to Early Oligocene. The marine units have been subjected to comprehensive studies due to producing oil and gas. The Middle Eocene-Early Oligocene aged limestone named Soğucak Formation was transgressed on the paleotopography of the Rhodope-Strandja Massif. The initial tectonics and antecedent topography simultaneously could influence on the basinal configuration that involved the formation of independent carbonate environments such reef /bank, back-reef /lagoon, high and low energy bioclastic carbonate shores, redalgal mounds, free-living coralline algae (Rhodolites) and storm dominated carbonate ramp, jointly settled in the inner and outer platform with irregular coastline and enclosed restricted embayment. Moreover coastal morphology, basin-margin bedrock composition and carbonate-producing factory collectively constrained the local facies heterogeneities. All the environmental diversities were supported by differences of the faunal associations and sedimentary structures. According the data, it can be indicated that three events were important agency on the evolution of the Soğucak Formation “Platform” divided as pre-platform, platform and post-platform in ascending order. Eocene transgression initiated local siliciclastic beach deposition (Koyunbaba Formation) on the basement, upward grades into siliciclastic mixed carbonate shore (early/pre Platform stage). After that, very rich faunal assemblages such as benthic and encrusting foraminifers (Acervulinid), corals, coralline red algae, bryozoan, echinoidea with syntaxial overgrowth, pelecypods were flourished in the shallow environment formed a vast carbonate platform (Soğucak Formation). The platform gradually underwent deepening produced storm dominated local ramp and pelagic environment. The final event is recorded by turnover and fracturing coral organisms and resedimentation of a great amount carbonate mud towards to the bioclastic carbonate shore. Subsequently, tuff material was transported from land to the depositional environment. The deepening and tufaceous contributions concurred with the siliciclastic deposition that induced demise of the carbonate platform at the end of the Early Oligocene time (Post Platform event).

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