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Sequence Stratigraphic Modelling of Outcrop Cretaceous Sedimentary Successions; A Linkage to the Subsurface Hydrocarbon Exploration, Cauvery Basin, South India

Raghavendra Murthy Nagendra^{1*}, A.N. Reddy² and Harry Gilbert³

¹Department of Geology, Anna University, India

²Chief Geologist (Rtd), ONGC, India

³Regional Geoscience Laboratories, ONGC, India

Exposed Albian-Maastrichtian marine rocks of the Ariyalur area in the Cauvery Basin have been comprehensively studied based on biostratigraphy and paleobathymetric interpretation conceded using vertical and lateral relationships of rock facies, macro and micro fossil assemblages, textural characteristics and diagenetic changes of the lithologic units. The lithological contact between the Archaean basement and basement conglomerates forms sequence boundary-1 (SB1) and the upper contact with the Barremian (?) - Terani Formation forms SB2, based on lithofacies and sedimentary environments. The surface separating the Teranigrity ferruginous Sandstone of the Terani Formation represents SB3, which separates marine from non marine facies. SB3 merges with the transgressive surface, which marks the first marine transgression at the basin margin and coincides with Aptian/Albian boundary. The para-conformable contact lies between the Terani Formation and the Coral algal limestone (CAL) Member of the Dalmiapuram Formation. The abrupt termination of CAL is in fact the drowning surface. The upper surface of the Karai Formation has an unconformable relationship with the overlying Garudamangalam Formation and represents the upper SB4, representing hiatus of about 2.10 MA that developed as a result of basin uplift caused by the rising Marion Hot Mantle Plume during Late Turonian. The Garudamangalam Formation spans between SB4 and SB5. The relative sea level fall during the Late Santonian produced fluvial channel deposits (as HST) represented by the Saturbhugam Sandstone, and the erosion surface at the top of this sandstone marks SB5. The base of the Kallar Conglomerate delineates an unconformity surface and forms sequence boundary SB6. The base of the Ferruginous Limestone is a transgressive surface marked by the presence of smaller benthic foraminifera, indicating marine flooding at the base of the Kallankurichchi Formation. The transgressive system tract consists of the Ferruginous Limestone, Lower Arenaceous Limestone and Gryphaea Limestone. Macro and micro fossil assemblages and the frequencies and preservation of micro fossil test indicate upward increasing water depth. The Gryphaea limestone Member, which is very rich in macro fossils, represents one of the best developed maximum flooding surfaces. High silica content and reduced micro- and macro fossil abundance suggest shallowing towards the top of the Upper Arenaceous Limestone, which presents HST. The shallowing trend continues into the Ottakovil Formation, which marks the end of the marine phase, which terminated due to major sea-level fall caused by the eastward tilt of the basin. The top of the Ottakovil Formation is interpreted as sequence boundary-7 (SB7). The integration of these data reveals four transgressive-regressive cycles. The major sea level changes during the Late Turonian and Late Maastrichtian in the Ariyalur successions correlate with global sea level changes. Based on biostratigraphy, stratigraphic patterns and their relationship, the Late Cretaceous succession of the Ariyalur area is thus subdivided into four 2nd/3rd order sequences.

Biography:

Raghavendra Murthy Nagendra is currently working as a Professor at Anna University, India carried out the extensive studies on integrated stratigraphy of Cretaceous Basin. Published 30 research articles on Cretaceous Geology of Cauvery Basin.