Palynostratigraphy and Depositional Environment of Cambay and Olpad Formations in Nawagam - Asmali Area, Cambay Basin, India

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The area of present study covers Nawagam, Naika, Mahelaj, Dholka and Asmali fields in the Ahmedabad Block of Cambay Basin. A number of hydrocarbon discoveries in this block hold promise for exploration of pay sands of Olpad and Cambay formations. The wells have been drilled to explore the hydrocarbon prospects of Deccan Trap, Olpad and Cambay formations.

Palynological studies were carried out on the subsurface samples to bring out the palynostratigraphy and paleodepositional environments.The detailed studies enabled mapping of the variations in palynofloral content and demarcating the age boundary between Paleocene/Early Eocene. The palynofloral assemblage is dominated by angiospermous pollen, pteridophytic spores and marine phytoplankton. The palynofloral yield in general is moderate to rich. The stratigraphic ranges, appearance and disappearance levels of various marker taxa have been used for dating and correlation of the sediments in different wells.

Two palynozones have been recognized in all the studied wells. Palynozone-I corresponds to Paleocene age while Palynozone-II to Early Eocene age. The palynofloral assemblages recorded belong to eight floral ecological complexes, namely, inland, freshwater, fern, fungal, palm, low salinity water plant complex, mangrove and marine phytoplankton. The subsurface sedimentary sequence has been studied in detail and paleoenvironment at micro level has been deciphered.

Recognition of paleoenvironments in the subsurface sequence is a pre-requisite for understanding the depositional set up of any given basin for hydrocarbon exploration. At the same time correlation of equivalent units with age relationship is also important in a sequence stratigraphic framework using zonations based on microfossils. Palynological studies have been carried out on the subsurface samples to bring out the variation in palynofloral content as well as precisely mark the age boundaries between Middle Eocene/Early Eocene and Early Eocene/Paleocene. In order to achieve these objectives five wells viz., Nawagam#A, Naika#B, Dholka#C, Mahelaj#D, and Asmali#E were taken up for study.

The material used for this study consists of 300 samples of cores and cuttings were collected and studied in detail. The samples show various lithologies, such as claystone, siltstone, clay, shale and sandstone. These samples were processed by using standard processing techniques adopted by various laboratories in ONGC.