

NEW SEISMIC NEOGENE CLAY DIAPIRS AND HYDROCARBON IMPLICATIONS IN THE NORTH-EASTERN AFRICAN MARGIN OF TUNISIA

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Subsurface and surface geologic and geophysical studies conducted on the Neogene series in the northern and oriental regions of Tunisia had permitted to highlight the basin structuring and evolution. Neogene sequence deposits are distributed across graben, half graben, platforms, folds and syncline basins. Miocene, Pliocene and Quaternary series are composed by several thousands meters of mainly thick clay and sandstone packages. Clay and mud diapirs were recognized in small scale in the Miocene outcrops of the North Atlassic and Sahel regions and in the gulf of Hammamet where they are well developed in subsurface and visible in seismic scale. Claykinesis is induced by the lithostatic pression of Plio-Quaternary thick deposits and by the transtensive and transpressive movements of North-South Grombalia-Enfidha-El Jem and East-West Hammamet-Maamoura, Kuriat and Boumerdès-Mahdia flower fault corridors. The occurrence of diapirs is fossilized on their flanks by synsedimentary Miocene, Pliocene and Quaternary high angle subsiding graben and syncline basins accompanied by downlap prograding turbiditic sequences overlapped by aggrading and retrograding system tracts and pinch outs. Structural and stratigraphic unconformities are located on the flank diapirs. The clay diapirism accompanied right and left lateral formation of basins and subsidence migration along strike slip fault corridors. The tops of diapir structures are marked by toplap erosional surfaces of Upper Miocene, Pliocene or Quaternary sequences. Basin modeling is presented to visualize the structuring, the mechanisms and the distribution of clay diapirs around basin and tectonic structures. These Neogene diapirs were recognized and described for the first time in Tunisia in 1997. The existence of mud diapirism in the Miocene oil field area of the gulf of Hammamet permits to precise a new geodynamic model comprising important petroleum implications in terms of structuration, system tracts, migration fluids, traps and seals.