



Isolated Carbonate Platform Growth and Gradual Establishment of a Ramp Setting in the Persian Gulf Foreland Basin: Evidence from the Oligo-Miocene Asmari Formation in the Dezful Embayment of Southwest Iran

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Abstract

The Oligo-Miocene Asmari Formation, the most prolific petroleum reservoir of Iran, was formed in the NW-SE trending Persian Gulf Foreland Basin. The basin was formed as a result of the Late Cretaceous continental collision between Eurasian (Central Iran) and Persian Plates. In this research the Asmari Formation has been studied in two surface and sub-surface stratigraphic sections to determine its facies and paleoenvironments. Aliened roughly perpendicular to the strike of the basin, these sections include Gachsaran well no. 1 (Gachsaran Field) and Kuh-e-Mish (10 kilometers east of Gachsaran) surface section that are located in the Dezful Embayment of Khozestan Province. In the study area, the Asmari Formation consists of carbonate rocks and the middle evaporites/siliciclastics are absent. Its lower contact with that of the Pabdeh Formation is gradational, but its contact with the overlying Gachsaran Formation is disconformable.

Detailed field and petrographic investigations of the Asmari Formation resulted in recognition of several facies related to arid tidal-flat, back barrier lagoon, barrier (reef/grainstone), shallow and deep open marine (pelagic and calciturbidite facies) facies belts. The presence of numerous calciturbidite beds that are interbedded with pelagic facies and the absence of siliciclastic components in the lower and middle parts of the Asmari Formation indicate the existence of an isolated platform, similar to the Bahamian Platform, during their deposition. Siliciclastic grains are present in carbonate facies of the upper part of the Asmari Formation, which indicate platform growth, gradual filling of the basinal setting and development of a ramp type platform (similar to present day Persian Gulf) near the end of deposition of the Asmari Formation (Burdigalian).