



Stratigraphy, microfacies and sedimentary environments of Asmari Formation at Tang-e-Bolhayat, north of Kazerun, Fars Province, Iran.

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The Oligo-Miocene Asmari Formation is the most important petroleum reservoir in the Folded Zagros Zone (FZZ). The FZZ is one of the tectono-sedimentary provinces of Iran, situated to the SW of the country and is recognized as the southwesterly boundary of the Zagros Orogen near the Persian Gulf. This area is easily recognised by the NW-SE trending parallel anticlines that verge to the SW in a 6-12 km cover sequence. As mentioned above, this area is home to some of the world largest oil reservoirs, and was the location of initial continental collision between the Arabian and Eurasian Plates. The Asmari Formation includes Kalhur (evaporates) and Ahwaz (sandstone) Members, measured in Lorestan and Khuzestan Provinces, respectively. The Asmari Formation is present throughout the Zagros Basin but it is best developed in Dezful Embayment. Most studies of the formation in this basin are related to subsurface data, while this study is focused on an outcrop. In the type section, which was measured at Kuh-e-Asmari (Asmari Mountain), SE of Masjed-e-Soleiman (a town in Khuzestan Province, SW of Iran), the formation comprises 314 m resistant, severely fractured, cream to brown limestones, with the occurrence of thin bedded shales. The lower contact with Pabdeh Formation and the upper contact with Gachsaran Formation are gradual and conformable. In the study area, from the viewpoint of lithology, the Asmari Formation consists up to 430 meters of thin to massive bedded limestone, dolomitic limestone, argillaceous limestone and occasionally marl. According to petrography and field observations and analysis of larger benthic foraminifera assemblages and microfacies features 4 major depositional environments were identified. These include open marine, barrier, lagoon and tidal flat. These environments are represented by 10 microfacies. A carbonate ramp platform is suggested for the depositional environment of the Asmari Formation. The inner ramp facies are characterized by wackstone-packstone, dominated by various taxa of imperforate foraminifera, the middle ramp facies are characterized by packstone-grainstone with diverse assemblage of larger hyaline foraminifera. The outer ramp is dominated by argillaceous wackstone and mudstone, characterized by hyaline foraminifera.

On a sequence stratigraphic framework, the Lower Asmari is marly in character near the base, overlain by foraminiferal limestone, and deposited in HST stage, wears TST started during the deposition of underlying Pabdeh Formation and transgression reached to highest level Just in the boundary of Asmari and Pabdeh formations. The Middle Asmari is marked as late HST sediments composed of lagoonal facies (miliolidae wackstones). This sequence comprises one stage of HST, one LST and one TST. The Upper Asmari which is existed in the Dezful Embayment very well, comprises two HST and two TST; the latter began with echinoderm wackstone microfacies. Two third- order sequences are identified based on deepening and shallowing patterns in microfacies, stacking patterns and the distribution of foraminifera. Sequence boundary is type 2 and no evidence of exposure was observed.

Keywords: Stratigraphy, Microfacies, Sedimentary Environments, Kazerun, Iran.