

The Myth of Rudist Reefs in Saiwan, Central Oman

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ABSTRACT

In the use of analogue data for carbonate geometries for static modelling input, in-situ rudist accumulations have always been an enigma. Reviews of fossil reefs routinely cast rudists in the role of reef builders for most of the Cretaceous, which was based on the analogue with recent coral/algal reefs. As a result, static models for the North-Oman rudist reservoirs are too often being populated accordingly, with rudist mounds/reefs as facies bodies. The Samhan Formation in the Saiwan area (Central Oman) represents the beginning of the Early-Campanian transgression over the Haushi-Huqf Massif. It has not never been buried deep and is hardly tectonised. It is recognised as one of the best preserved rudist outcrops in the world and hence offers a great opportunity to learn from. Mapping of the facies geometries in these magnificent outcrops shows rudist factories as thin, extensive layers, rather than laterally restricted vertical mounds. Two consistent, in-situ Vaccinites layers 0.5 – 1m thick could be traced over the entire outcropping area of 5 by 20 km. These rudists don't build frameworks. Instead they form flat biostromes, growing on a rather fine-grained, shallow-water substratum, being vulnerable to reworking and redistribution by waves and currents. Thick rudist units from subsurface data in North Oman previously interpreted as reefs, are most probably rather stacked cyclic layers, separated by thin, muddy intervals, as seen in cores. So, besides the huge difference in lateral continuity, the reservoir Kv/Kh is likely to be considerably lower than in a framework reef model. Interestingly, despite previous attempts to shift the rudist reef paradigm (i.e. Ross & Skelton (1993), the reef analogue model has persisted and static models are still too often populated as laterally confined vertical frameworks. Mapping of the facies geometries in Saiwan highlights once again the flat, extensive geometries of rudist factories, the absence of frameworks and the vulnerability to reworking. Given the well-preserved state of rudist factories exposed in Saiwan, it would be a shame to stick to old dogma's and ignore these outcrop data when making static modes of Cretaceous rudist reservoirs in the Middle East.