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Microbial activity in Lower Triassic Kangan Formation, Southern Persian Gulf

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The Lower Triassic Kangan (Upper Khuff) Formation is one of the most important hydrocarbon reservoirs located in Middle East area. Thickness of Kangan formation in southern Persian Gulf is nearly 124 meters which consists mainly of limestone, dolomitic limestone dolomite and evaporite with a significant presence of microbial features. Microfacies analysis shows that this carbonate reservoir was deposited in shallow marine ramp system including: sabkha, restricted lagoon, shoal and open marine environments. Microbial activity is represented through three main facies, including stromatolite boundstone, thrombolite boundstone and dense micrite fabric (leiolites). Stromatolite boundstone facies is characterised by a dark laminated fabric which was formed by calciomicrobes activities. Thrombolite facies is dominated in the base of Kangan and revealed important features of end- Permian mass extinction in this area(Insalaco et al., 2006). The facies has a dark clotted fabric, probably formed by micritization of skeletal grains. Dense micrite is distinguished by fine grain bounded peloids and their fabric is between thrombolite and stromatolite without any distinctive texture. Furthermore, there is some indication of microbial signature widely recognized in some parts, like intensely micritization of ooid grains. This process has lead to formation of grapstone and aggregate grains and suggests that microbial activity has a great impact on early stabilization of carbonate sediments. It seems that these microbial facies and feature were formed by calcified cyanbacteria. This type of algae is abundant in shallow subtidal to upper intertidal zones, where the low-energy condition is dominated. Therefore, the microbial facies deposited in shallow, low-energy and restricted lagoon environment where the sediment input was less and the condition was suitable for microbial activity.

Insalaco, E., Virgone, A., Courme, B., Gaillot, J., Kamali, M. R., Moallemi, S. A., Lotfpour, M. and Monibi, S., 2006. Upper Dalan Member and Kangan Formation between the Zagros Mountains and offshore Fars, Iran: depositional system, biostratigraphy and stratigraphic architecture. GeoArabia, 11, (2), 75-176.