
“Microbial Mound” Play from the Oxfordian-Kimmeridgian in the Tampico-Misantla Basin, Mexico

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ABSTRACT

During the development of the Mesozoic Plays Study “Tampico-Misantla North,” located to the north of Tampico city, the “Microbial Mound” Play from the Upper Jurassic Oxfordian-Kimmeridgian, consisting of stromatolite mounds and laminated bio-sedimentary structures (CaCO₃ mainly), was studied. The stromatolite mounds are attached to the substrate as a result of metabolic activity of cyanobacterias and algae, where the organic variety depends on the environment in which they grow: subtidal, intertidal, and hypersaline. The cyanobacteria are the main organism in the construction of “microbial crusts” and are important in the production of carbonate sediments; some of these cyanobacteria have been classified as *Girvanellas*, a blue-green algae, which generate laminated calcified structures.

Regarding its oil potential, in the onshore side of the Tampico region, the Tordo-2 well has had production of light oil in a bafflestone coral facies; likewise the offshore Lobina 101 well has a range of 15 meters of saturated net thickness, where the petrophysical evaluation shows a good oil saturation. This saturated segment corresponds to a coral and algae rudstone and floatstone facies. This interval was not tested, but has good potential to produce hydrocarbons.

An analog well in Poza Rica area, specifically in the San Andres Field, also has a production history within coral bafflestone, rudstone, and floatstone facies, with the following accumulated productions. The San Andrés 251 well during 1964–2004 period contributed 190 mbl and 4.5 mmpe from rudstone/floatstone facies; the San Andrés 71 well accumulated 290 mbl and 2.5 mmpe in the same facies; the San Andrés 371 well, during 1983–2003 period, had a 400 mbl and 36mmpe accumulated production in coral bafflestone facies; the San Andrés 348 well during 1980–2005 contributed with 1500 mbl and 50 mmpe in coral rudstone facies; and finally, the San Andrés 346 well accumulated 800 mbl and 32.5 mmpe in coral bafflestone facies, during the 1980–2007 period.

In the Mississippi Interior Salt Basin, the Smackover Formation of Oxfordian-Kimmeridgian age, in stromatolite (algae), *Tubiphytes*, serpulid, and siliceous sponge facies, also has brought oil production in the Appleton, Blacksher, and Vocation fields, whose accumulated productions are of 2700 mbl, 2400 mbl, and 2260 mbl, respectively.

As a result of this study, we identified 13 offshore and 11 onshore opportunities, all with “microbial mound” features.