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Study on the interaction mechanism between the special geological environment and their extreme geo-microbes in Dagang Oilfield by combined methods

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Geo-microbes and their function were widespread ever since life appeared on the earth. Geo-microbiological process has left a rich and colorful material record in the geological body of earth, the most critical record of which is all sorts of organic hieroglyph and various forms of organic matter derived from bio-organisms, and oil field is the most ideal geological location to preserve these organic matters. It have already produced or might produce petroleum and natural gas sedimentary rocks under natural conditions, also known as olefiant (gas) rock or the parent rock, which is the product of the interaction between the life-system and earth environmental system in the specific geological conditions and integrate the whole microbial ecosystem in the geological time. The microbial community under extreme geological environment of Dagang Oilfield is relatively simple, therefore it is quite easy to investigate the special relationship between geo-microbes and biogeochemistry. We have mastered a large number of information related with the geological condition and biological species of Dagang Oilfield; what's more we also have isolated a number of archimycetes strains with different extremophiles capacity from the core samples collected in the Dagang oil field. At present, we are to proceed with the cooperative research at Environment School of Yale University and Institute of the Earth's biosphere using these strains. In the future, we will work together to carry out geological surveys in the field using international first-class equipment and methods and study the geological environment of Dagang Oilfield utilizing isotope techniques and mineral phase analysis method. Meanwhile we are going to undertake the on-line monitoring of the overall microbial activity of these collected geological samples, the specific metabolic activity of these extreme strains of microorganisms and the biomarkers produced during their metabolic processes under laboratory conditions. According to these research work listed above, we can reveal the mechanism of interaction between the special geological environment of Dagang Oilfield and the extreme geo-microbes, so as to clarify the effects of oil field environment on the extreme geo-microbes and especially the adverse effect of these geo-microbes to the geological environment, which may provide a practical foundation of theoretical basis for the reasons why the Dagang Oilfield can produce oil.

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