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Isolation, selection and molecular identification of biosurfactant-producing extremophilic bacteria from crude oil polluted soil

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Abstract

© 2016, International Journal of Pharmacy and Technology. All rights reserved. Ten bacterial strains with hydrocarbon degrading capacity were isolated from a soil sample that had been polluted with crude oil from the area of Surgut in Russian Federation. This area is characterized by its long winters, with an annual average temperature of -1.7°C . The isolated bacterial strains live and thrive at a very low temperature, which makes them ideal to be used in unfavorable environmental conditions for the majority of surfactants. In order to evaluate the biosurfactant production of these strains, the following methods were used: surface tension measurements, drop dispersion, hemolytic capacities assay and emulsification rate assay. These analyses showed that two of the strains, *Bacillus subtilis* and *Klebsiella oxytoca*, were efficient biosurfactant producers. The surface tension decrease when using *B. subtilis* and *K. oxytoca* was 64.3% and 57.1% respectively. Drop dispersion was 33mm with *B. subtilis* and 28mm with *K. oxytoca*. The emulsification rate when using *B. subtilis* and *K. oxytoca* was 78.4% and 59.2% respectively. Our research has prospects to be applied both for microbial enhanced oil recovery (MEOR) and for bioremediation.

Keywords

Biosurfactant, Extremophilic bacteria, Hydrocarbon degrading bacteria, MEOR, Soil pollution