

Título: EVALUATION OF CRUDE OIL BIODEGRADATION BY BACTERIAL STRAINS ISOLATED FROM INDUSTRIAL OILY WASTEWATER

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Resumo:

In oily wastewater of industrial origin, due to selective pressure imposed by the successive deposition of contaminants, it is common the presence of microorganisms with metabolic pathways that allow them to survive and degrade different petroleum hydrocarbons. Therefore, the sampling, isolation and identification of microorganisms from these environments make possible to obtain isolates with degradative potential, capable of being applied in different biological treatments. The aim of this study is to identify and evaluate bacterial strains isolated from oily wastewater from an Industrial Wastewater Treatment Station (IWTS) for growth and crude oil degradation. The isolation of microorganisms was carried out by enrichment technique, inoculating the effluent in bacteria mineral medium (BMM) supplemented with crude oil (CO), or recovered oil (RO) of IWTS, which were incubated for 30 days. After this period, aliquots of the cultures were plated on BHI or BMM supplemented with the same compounds. A total of 112 isolates were obtained and subsequently cultured in BMM supplemented with 2% (v/v) CO. After 18 days the cultures were evaluated for growth by optical density readings at 600 nm (OD₆₀₀). The 10 isolates that showed the best growth results were molecularly identified by genomic DNA extraction and amplification of the 16S rRNA gene. In addition, these isolates were evaluated according to the percentage of oil removal at a concentration of 1% (v/v) in BMM by gravimetric technique, comparing the results obtained by the isolates with those obtained by the uninoculated controls. All isolates were capable of degrading a proportion of oil in this test, but only 6 of them in substantial amounts (above 30%), which were identified as belonging to genus *Stenotrophomonas*, *Acinetobacter* and *Alcaligenes*. Among of them, an isolated identified as *Acinetobacter junii* LAPM 30 was able to remove more than 90% of crude oil. The results indicate that the isolation process was able to select bacterias capable of degrading higher concentrations of crude oil, with potential for use in various industrial and environmental applications, including the bioremediation of contaminated environments with petroleum derivatives.

Palavras-chaves: microbial prospecting, oily wastewater, oil degradation, bioremediation

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