Don't Cry Over Spilled Oil!

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Water pollution is an important problem that the world is currently facing, where chemical pollutants not only affect the equilibrium of the water source, but also, marine life. The main instigators of water pollution are oil spills and the most common method of removing them is via chemical detergents. These products are efficient, though they produce harmful by-products that impact marine life. It is for this reason that scientists are looking into a new solution known as bacterial bioremediation, which is both effective and non-evasive. This method involves microorganisms producing biosurfactants capable of remediating the oil layer. In this project, soil samples were collected from Montreal and screened for Pseudomonas sp.. Using this, various experiments were conducted to test for efficient biosurfactant activities. Such tests included the surface tension (drop-collapse) test and the oil-spray test to perceive extracellular lipid (biosurfactant) formations. The results showed that there were 3 efficient biosurfactant-producing Pseudomonas strains: NB1, NB4, and NB5. The fastest strain to collapse in the drop-collapse was NB1, followed by NB5, and NB4. A PCR amplification of the 16srDNA region and electrophoresis of these NB strains demonstrated that they belonged to the Pseudomonas genus. Furthermore, to increase the yield of biosurfactant production, a random transposon mutagenesis of NB1 was performed multiple times. Currently, the biosurfactant levels of the modified strains are equivalent to the wild type. To conclude, the three Pseudomonas strains (NB1, NB5, NB4) and their genetic variants will undoubtedly be valuable in the future of bioremediation of oil spills.

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