

Crude Oil: Can Microbes Eat It?

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Purpose: Some microorganisms can degrade toxic hydrocarbons in crude oils and petroleum based products by bioremediation. In this process, microbial strains with unusual metabolic pathways were used to degrade toxic compounds. Oil spills can be seeded with oil-degrading microorganisms and inorganic nutrients to enhance their growth in contaminated environments to break down long-chain hydrocarbons in to carbon dioxide and water. Oil degradation is an aerobic process. Therefore, oxygen must be provided to the contaminated site to stimulate bioremediation. **Method:** Tetrazolium is an indicator dye that is colorless in its oxidized form, but pink when reduced. When microorganisms metabolize carbon compounds they make waste products that serve as reducing agents/electron donors and reduce tetrazolium, turning it pink. This was used as a measure for microbial metabolism and their ability to degrade oil samples. Microbial degradation of oil samples was simulated by a variety of bacteria, sand, soil, and oceanic-water samples in comparison with drain cleaners as the positive controls. This was used as a measure for microbial metabolism and their ability to degrade crude oil. **Results:** It was observed that *Pseudomonas fluorescens* had the greatest ability to degrade different types of crude oil, corn oil, and canola oil, gasoline, biodiesel, and diesel samples. Biodegrading organisms were also found in sand, soil, and ocean-water samples. **Conclusion:** This experiment indicated that there are a variety of bacteria that are found naturally, or can be added individually, or in combination to oil spills, to clean up pollution in the environment by the process of bioremediation.

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