

Vermitea Remediation of Hydrocarbon Contaminated Soil

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ABSTRACT

Due to the global need for oil production and distribution, surrounding ecosystems have been negatively affected by oil spill externalities in individual health and community diversity. Conventional land remediation techniques run the risk of leaving chemical residues, and interacting with metals in the soil. The objective of this study was to test worm compost tea, also known as vermitea, as a bioremediation method to replace current techniques used on oil contaminated soils. To test the conditions that contributed to the efficacy of the teas, I examined different teas that looked into the mode and length of pollutant exposure. I examined oil emulsification activity, presence of biosurfactant-producing bacteria colonies, microbial diversity and abundance, and applicability of the teas to artificially contaminated soils. Overall, I found that the long-term direct oil tea had a 7.42% significant increase in biosurfactant producing microbes in comparison to the control tea. However, the long-term crude soil vermitea was found to be the best type of pollutant degrading tea in terms of emulsifying activity and general applicability towards reducing oil concentrations in the soil. These results will help broaden the scientific understanding towards stimulated microbial degradation of pollution, and broaden the approaches that can be taken in restoring polluted ecosystems.

KEYWORDS

bioremediation, microbial populations, biosurfactant, emulsification, soil pollution