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## IMPACT OF BIOSTIMULATION AND BIOAUGMENTATION AS BIOREMEDIATION SYSTEMS ON DIESEL CONTAMINATED SOILS

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### Abstract

This paper analyzes and compares the effects of bioremediation on total petroleum hydrocarbon (TPH) degradation using composting techniques as well as biostimulation and bioaugmentation approaches. Compost and sludge were added as organic amendments with the dual purpose of providing both nutrients and microorganisms to the contaminated soil. In addition, the effect of inoculation with white-rot fungus *Trametes versicolor* was assessed. Two different types of soils were considered: a poor soil with low organic matter content and an enriched organic soil. The use of compost and sludge for soil bioremediation through composting techniques was effective for TPH removal. The amount of organic matter present in the soil played an important role in TPH removal due to the adsorption phenomenon of the pollutants in the organic fraction of the solid material. When the contaminated soil was rich in organic matter, the use of sludge provided better results than compost (22% of degradation occurred in the first 15 days for sludge compared to 5% for compost). However, no differences between compost and sludge were observed in poor soil. Inoculation with the ligninolytic fungus *T. versicolor* enhanced the TPH removal process, thus increasing the degradation rate and reducing the process time. However, periodical reinoculation was required.

*Key words:* bioaugmentation, bioremediation, contaminated soil, total petroleum hydrocarbons, *Trametes versicolor*

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