

# Biodegrader Metabolic Expansion during Polyaromatic Hydrocarbons Rhizoremediation

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Root-microbe interactions are considered to be the primary process of polyaromatic hydrocarbon (PAH) phytoremediation, since bacterial degradation has been shown to be the dominant pathway for environmental PAH dissipation. However, the precise mechanisms driving PAH rhizostimulation symbiosis remain largely unresolved. In this study, we assessed PAH degrading bacterial abundance in contaminated soils planted with 18 different native Michigan plant species. Phenanthrene metabolism assays suggested that each plant species differentially influenced the relative abundance of PAH biodegraders, though they generally were observed to increase heterotrophic and biodegradative cell numbers relative to unplanted soils. Further study of > 1800 phenanthrene degrading isolates indicated that most of the tested plant species stimulated biodegradation of a broader range of PAH compounds relative to the unplanted soil bacterial consortia. These observations suggest that a principal contribution of planted systems for PAH bioremediation may be via expanded metabolic range of the rhizosphere bacterial community.

*Key words:* Rhizostimulation Symbiosis, Phenanthrene Degradation