

# **Structural dynamics of microbial communities in polycyclic aromatic hydrocarbon-contaminated tropical estuarine sediments undergoing simulated aerobic biotreatment**

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## **Abstract**

Coastal sediments contaminated by polycyclic aromatic hydrocarbons (PAHs) can be candidates for remediation via an approach like land farming. Land farming converts naturally anaerobic sediments to aerobic environments, and the response of microbial communities, in terms of community structure alterations and corresponding effects on biodegradative activities, is unknown. A key goal of this study was to determine if different sediments exhibited common patterns in microbial community responses that might serve as indicators of PAH biodegradation. Sediments from three stations in the Lagos Lagoon (Nigeria) were used in microcosms, which were spiked with a mixture of four PAH, then examined for PAH biodegradation and for shifts in microbial community structure by analysis of diversity in PAH degradation genes and Illumina sequencing of 16S rRNA genes. PAH biodegradation was similar in all sediments, yet each exhibited unique microbiological responses and there were no microbial indicators of PAH bioremediation common to all sediments.

**Keywords:** Polycyclic aromatic hydrocarbons, Bioremediation, Bacteria, Sediment, Illumina, Lagos Lagoon

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