

Phosphate solubilizing and PAH-degrading bacterial isolates associated with Kadol Kele mangrove

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Microorganisms that inhabit mangrove ecosystems have very characteristic functions as mangrove ecosystems bear harsh environmental settings. Thus, they can perform important functions, such as solubilization of phosphate and biodegradation of polycyclic aromatic hydrocarbons (PAHs), under extreme environmental conditions. Phosphate solubilizing bacteria are beneficial for soil fertility, because soil phosphorous often becomes unavailable for plants due to the immobilization with Ca^{2+} . PAHs are organic aromatic hydrocarbons that cause severe environmental and health damages. Therefore, the aim of this study was to isolate and identify PO_4^{3-} solubilizing and PAH-degrading bacteria from Kadol kele mangrove ecosystem. Sediment flora was enriched with phosphate and naphthalene separately. Cycloheximide was added to Pikovskaya medium to suppress fungal growth and selectively isolate phosphate solubilizing bacteria. Naphthalene degrading bacteria were isolated on seawater aga and naphthalene was introduced as the sole carbon source during incubation by adding crystals to the lid. Purified bacterial cultures were identified using their morphological and biochemical characteristics. Three bacterial isolates belonging to genera *Bacillus* and *Pseudomonas* were capable of solubilizing insoluble phosphates, while two bacterial isolates belonging to genera *Pseudomonas* and *Vibrio* were capable of degrading the naphthalene. Further characterization of these bacterial strains may help in expanding their potential agricultural and environmental applications. Phosphate solubilizing microorganisms can play an important role in improving crop production in salt-rich fields as biofertilizers, and PAH-degrading bacterial isolates can use for the bioremediation of polluted mangrove sediments.

Keywords: *Mangrove sediment, Phosphate solubilizing bacteria, Naphthalene degrading bacteria*

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