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4B-2-b
Biodegradation of Ethers, Chlorinated Aliphatic Hydrocarbons and Aromatics by *Pseudonocardia* sp. D17

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Ethers, chlorinated aliphatic hydrocarbons (CAHs) and aromatics have posed severe environmental and health concerns as groundwater contaminants. Bioaugmentation, which enables efficient contaminant removal by the addition of specific microorganisms, is regarded as an efficient, economical and environmentally sound bioremediation strategy. Although various bacterial strains capable of degrading recalcitrant organic contaminants have been isolated and characterized during past years, most of them can normally degrade limited contaminants and cannot necessarily be applied to the environments polluted with different groups of contaminants. By contrast, we have revealed that *Pseudonocardia* sp. D17, one of the 1,4-dioxane-degrading bacteria, has the potential to degrade various recalcitrant organic chemicals such as cyclic ethers and chloroethenes. Therefore, this study aimed to further evaluate the ability of *Pseudonocardia* sp. D17 to aerobically degrade thirteen recalcitrant organic compounds including cyclic and linear ethers, CAHs and monoaromatics, which have been reported to occur frequently in groundwater. The results of 2-d degradation experiments revealed that *Pseudonocardia* sp. D17 can degrade most of the thirteen test compounds. Therefore, it suggested that *Pseudonocardia* sp. D17 might be a useful bioaugmentation agent for various groundwater contamination.

4B-2-c
Diversity of Anammox Bacteria Cultivated with Seawater from the Penjalinan Estuary, Indonesia

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Anaerobic ammonium oxidation (anammox) is an essential bioprocess of nitrogen cycle. Although anammox bacteria has been identified in estuaries of several countries, the limited information is available in estuaries of Indonesia. This research aimed to enrich anammox bacteria from the estuary environment in Indonesia. Sediment from the Penjalinan estuary, Padang City, Indonesia was collected, and inoculated in a filter bioreactor (FtBR) at ambient temperature. Seawater supplemented with 70 mg-N/L NH_4^+-N and 70 mg-N/L NO_2^--N fed to the reactor with a hydraulic retention time (HRT) of 24 hours. Influent and effluent samples were collected once a week for analyzing ammonium, nitrite, and nitrate concentrations based on Nessler, colorimetric, ultraviolet spectrophotometric screening method using a UV-Vis spectrophotometer. Illumina MiSeq sequencing analysis was performed to investigate the microbial community structure. The maximum nitrogen removal efficiency and nitrogen removal rate were 49.39% and 0.08 kg-N/m^3.d during 208 days operation. Microbial community analysis revealed that four species of anammox bacteria, *Candidatus Anammoxoglobus propionicus* (2.65%), *Candidatus Brocadia sinica* (1.95%), *Candidatus Jettenia unclassified* (1.64%), *Candidatus Brocadia fulgida* (0.51%), *Candidatus Jettenia sp.* (0.37%) were detected in the reactor.

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