

Degradation of Anthracene by Bacteria Isolated from Oil Polluted Tropical Soils

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Four bacteria, identified as *Pseudomonas aeruginosa*, *Alcaligenes eutrophus*, *Bacillus subtilis* and *Micrococcus luteus* were isolated from crude oil polluted soils using anthracene as the sole carbon and energy source. All the organisms utilized n-hexadecane, n-tetradecane, diesel oil, engine oil and naphthalene as sole carbon sources. None could utilize hexane, cycloheptane, xylene, benzene, toluene, phenol, fluoranthene, and kerosene as carbon sources. Highest cell density obtained with 0.1% (w/v) anthracene were 4.5×10^7 (cfu/ml), 8.6×10^6 (cfu/ml), 5.4×10^6 and 2.4×10^6 (cfu/ml) respectively, for *P. aeruginosa*, *A. eutrophus*, *B. subtilis* and *M. luteus* after 30 days incubation. Growth of the organisms on a Nigerian crude oil resulted in a residual oil concentration of 22.2%, 33.3%, 39.3%, 44% and 91.7% respectively, for *P. aeruginosa*, *A. eutrophus*, *B. subtilis*, *M. luteus* and the noninoculated control on the 14 th day. Ring fission enzymes of the *meta* pathway were detected in induced cells of *P. aeruginosa* and *A. eutrophus* while *ortho* pathway enzymes were detected in *B. subtilis* and *M. luteus*. *P. aeruginosa* and *A. eutrophus* had specific catechol-2,3-dioxygenase activities of 3.8 ± 0.183 and 0.64 ± 0.032 $\mu\text{mol} / \text{min} \times \text{mg protein}$ respectively while catechol-1,2-dioxygenase activities of 1.95 ± 0.029 and 1.89 ± 0.026 $\mu\text{mol} / \text{min} \times \text{mg protein}$ were detected in *B. subtilis* and *M. luteus* respectively. This work , highlights the capability of these unreported tropical strains of *A. eutrophus*, *B. subtilis* and *M. luteus* as anthracene degraders.