

B310 Assessment of Biodegradation Activities in Sediment
by Dehydrogenase Determinations

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We investigated the regional distribution of organic matter and dehydrogenase activities to evaluate the natural recovery potential of contaminated sediment. Assessment of biodegradation activity in coastal sediment was investigated by the 2,3,5-triphenyltetrazolium chloride (TTC) dehydrogenase technique and measurement of CO₂ evolution. Sediments were collected from Youngsan, Kwangyang, Ulsan, Chinhae, and Masan Bay. Sediments added with TTC and glucose were added to serum vial and incubated for 5 days at 20 °C, and were measured triphenyl formazan (TPF), CH₄, and CO₂. Addition of glucose increased TPF and gas evolution. Dehydrogenase activities of freshwater and seawater sediments was clearly discriminated. There was a positive correlation between dehydrogenase activities and organic matter contents. The amounts of TPF production and CO₂ evolution showed relatively positive correlations, but CH₄ production was not well correlated with TPF and CO₂.

B311 Isolation and characterization of phenanthrene-degradating
bacterium

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Phenanthrene-degrading bacterium, named 1-21, was isolated from oil contaminated soil. Also this strain was able to utilize fluorene as sole carbon and energy source. This strain could degrade 200ppm phenanthrene after 6 days incubation and 500ppm phenanthrene after 10 days incubation. In case of phenanthrene-induced cultures, this strain degraded 40% phenanthrene after 1 day and 3 days respectively 90%. In this case, phenanthrene concentration was 200ppm. The optimal temperature for phenanthrene degradation was 28°C-30°C, but this strain was also degradable a few phenanthrene as 30% at 20°C and 40°C. Analysis of intermediate by high-performance liquid chromatography showed that this strain utilized phenanthrene via 1-hydroxy-2-naphthoic acid, salicylaldehyde and salicylic acid.