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Environmental distribution and novel high-throughput screening of APEO-degrading bacteria using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-MS)

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Abstract:

Fifteen soil samples from the edge of a creek were investigated for alkylphenol polyethoxylate (APEO) degrading ability. Ten soil samples possessed PEG chain shortening activity and the other soil samples oxidized the terminal hydroxyl group to the corresponding carboxyl group. Colonies of APEO-degrading bacteria having slight morphological differences were isolated and the bacteria were grouped by MALDI-MS patterns, PCR-RFLP patterns, and sequence analysis of the *gyrB* gene. The isolates were divided into three groups by typing with the MALDI-MS pattern. PCR-RFLP analysis using 41f and 1066r primer sets and three kinds of restriction enzyme (*AluI*, *HaeIII*, *HhaI*) indicated that the isolates belonged to *Pseudomonas* sp., but all isolates gave the same RFLP pattern. Sequence analysis of *gyrB* gene divided the isolates into two groups. The grouping results by MALDI-MS spectra and *gyrB* sequence were identical and represent the APEO degrading ability of the isolates.

Keywords:

alkylphenol polyethoxylate (APEO), APEO-degrading bacteria, MALDI-MS, typing by MALDI-MS, PCR-RFLP, *gyrB*



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