

Diesel Pollution Biodegradation: Synergetic Effect of *Mycobacterium* and Filamentous Fungi¹

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Objective To biodegrade the diesel pollution in aqueous solution inoculated with *Mycobacterium* and filamentous fungi. **Methods** Bacteria sampled from petroleum hydrocarbons contaminated sites in Karamay Oilfield were isolated and identified as *Mycobacterium hyalinum* (MH) and cladosporium. Spectrophotometry and gas chromatography (GC) were used to analyze the residual concentrations of diesel oil and its biodegradation products. **Results** From the GC data, the values of apparent biodegradation ratio of the bacterial strain MH to diesel oil were close to those obtained in the control experiments. Moreover, the number of MH did not increase with degradation time. However, by using n-octadecane instead of diesel oil, the real biotic degradation ratio increased to 20.9% over 5 days of degradation. *Cladosporium* strongly biodegraded diesel oil with a real degradation ratio of up to 34% after 5 days treatment. When the two strains were used simultaneously, a significant synergistic effect between them resulted in almost complete degradation of diesel oil, achieving a total diesel removal of 99% over 5 days of treatment, in which one part of about 80% and another part of about 19% were attributed to biotic and abiotic processes, respectively. **Conclusion** The observed synergistic effect was closely related to the aromatics-degrading ability of *Cladosporium*, which favored the growth of MH and promoted the bioavailability of diesel oil.

Key words: Biodegradation; Diesel; Synergistic effect; *Mycobacterium hyalinum*; Fungi

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