

高效芘降解菌N12的分离鉴定与降解特性

胡凤钗^{1,2}, 苏振成², 孙健², 李旭^{2*}, 张惠文², 孙军德¹¹沈阳农业大学土地与环境学院, 沈阳 110161; ²中国科学院沈阳应用生态研究所, 沈阳 110016Isolation and identification of a highly efficient pyrene-degrading *Mycobacterium* sp. strain N12.HU Feng-chai^{1,2}, SU Zhen-cheng², SUN Jian², LI Xu², ZHANG Hui-wen², SUN Jun-de¹¹College of Land and Environment, Shenyang Agricultural University, Shenyang 110161, China; ²Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang 110016, China

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摘要 以芘为目标降解物, 利用选择性富集培养方法, 从沈抚灌区污染土壤中分离到一株高效芘降解菌N12, 经生理生化试验和16S rDNA测序分析, 该菌被鉴定为分枝杆菌属 (*Mycobacterium* sp.)。菌株N12能以菲、芘、芴和芘为唯一碳源和能源生长, 不能以蒽、萘和苯并芘为唯一碳源和能源生长。在菲和芘共同存在的情况下菌株N12可降解苯并芘, 9 d内对苯并芘降解率可达79.0%。摇瓶降解试验表明, 菌株N12可在7 d内将100 mg · L⁻¹的芘降解94.4%, 14 d内将其完全降解; 可将600 mg · L⁻¹的芘在7 d内降解56.1%, 14 d内降解95.5%。添加葡萄糖可促进N12对芘的降解。菌株N12是一株优良的多环芳烃降解菌, 可作为多环芳烃污染土壤生物修复的菌种资源。

关键词: 分枝杆菌 多环芳烃 芘 微生物降解

Abstract: By using selective enrichment method, a highly efficient pyrene-degrading bacterium strain N12 was isolated from an oil-contaminated soil collected from Shenfu irrigation area of Shenyang. Based on the physiological and biochemical characteristics and the phylogenetic similarity of 16S rDNA gene sequence, the strain N12 was identified as *Mycobacterium* sp., which could utilize phenanthrene, acenaphthene, fluorine, and pyrene, but not anthracene, naphthalene, and benzo(a)pyrene as the sole carbon and energy source. However, when the strain N12 was cultured with pyrene and phenanthrene, 79.0% of benzo(a)pyrene could be co-metabolized within 9 days. The degradation rate of 100 mg · L⁻¹ of pyrene by the strain N12 was 94.4% within 7 days and 100% after 14 days, and that of 600 mg · L⁻¹ of pyrene was 56.1% within 7 days and 95.5% within 14 days. The addition of glucose promoted the degradation of pyrene. It was suggested that the strain N12 was an efficient PAHs-degrading bacterium, being a potential candidate for the bioremediation of PAHs-contaminated soils.

Key words: *Mycobacterium* PAHs pyrene microbial degradation

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