عنوان مقاله:

First isolation of biodegradable polycyclic aromatic hydrocarbons Mycobacterium porcinum and Mycobacterium celeriflavum from oil-polluted ecosystems

نویسندگان:

Shiva Hosseini - *Department of Genetics, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran*

Davood Azadi - *Corresponding author: Department of Basic and Laboratory Sciences, Khomein University of Medical Sciences, Khomein, Iran*

Abdorrahim Absalan - *Department of Basic and Laboratory Sciences, Khomein University of Medical Sciences, Khomein, Iran*

خلاصه مقاله:

Background: Polycyclic aromatic hydrocarbons (PAHs) have detrimental effects on human, ecosystem, and biodiversity. Bioremediation is an option that has been used to remediate and reduce the risk of contaminants such as PAHs. Microorganisms are readily available to screen and can be rapidly identified to be used in many extreme environmental conditions. Mycobacteria have a great potential for the production of bioactive compound, which have degradation activity. Due to this issue, and also, as there is no study conducted on the biodiversity of biodegradable Mycobacterium in Markazi province, the present study aimed to assess the isolation and identification of biodegradable Mycobacterium species from diverse Markazi province ecosystems. Methods: Mycobacterium were screened from a total of ۳۰ soil, water, and sludge samples from the oilpolluted ecosystems of Markazi province and characterized to the genus and species level by applying molecular and conventional microbiological assay including the PCR amplification and sequence analysis of ۱۶SrRNA and hsp۶۵ genes. The growth rate in the presence of PAHs, turbidometry, and high performance liquid chromatography (HPLC) were used to determine their bioremediation capability. Results: In total, ۶ Mycobacterium isolates (۲۰%) were screened from ۳۰ samples, which belonged to two species of Mycobacterium consisting of M. porcinum (۴ isolates) and M. celeriflavum (۲ isolates). The strains of M. porcinum and M. celeriflavum could degrade ۷۰% and ۹۰% of ۱ mg/L PAH solution in ۷ days. Conclusion: According to the results, the M. porcinum and M. celeriflavum have a significant capability to biodegrade the PAHs. Therefore, more investigations are recommended for separation and applicational use of the mycobacterium species for bioremediation of PAHs.