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Abstract

Pyrene is a relatively persistent 4-ring polycyclic aromatic hydrocarbon (PAH) pollutant, and is often used as a model substrate in studies pertaining to high molecular weight PAH degradation. For degradation of pyrene, *Staphylococcus nepalensis* was isolated from diesel contaminated soil sample and it was tolerant to 50mgL⁻¹ of pyrene. In 16S rRNA gene sequence *Staphylococcus* sp. showed 96% sequence similarity with *Staphylococcus nepalensis*. For efficient degradation of pyrene, various parameters such as pH, temperature and contact time were optimized. In order to enhance the degradation rates of pyrene, carbon sources such as glucose and sucrose at different concentration were also evaluated. *Staphylococcus nepalensis* showed maximum degradation of pyrene at pH 8 and temperature at 30°C within 5 days of incubation. The excellent bacterial growth and efficient pyrene removal was more when enriched with carbon co-substrates (glucose 4%, sucrose 2%).

Refer

ences

- Mrozik, A. Piotrowska-seget A. and labuzek, S. 2003, Bacterial degradation and bioremediation of polycyclic aromatic hydrocarbon. *Pol. J. Environ. Stud.* 12, 15-25.
- Singh, S. N. Babita Kumari. Santosh Kumar U. Shweta Mishra, Dileep Kumar . 2013, Bacterial degradation of pyrene in minimal salt medium mediated by catechol dioxygenases: Enzyme purification and molecular size determination. *Bioresource Technology.* 133 , 293–300.
- Farshid, K. Fatemeh , H. P. Yaghoob T. and Hamid N. A. 2012. Bioremediation of pyrene by isolated bacterial strains from the soil of the landfills in Shiraz (Iran), *Scholars Research Library Annals of Biological Research.* 3 (1), 486-494.
- Gong, Z. Li, B. 2001. Co-degradation of pyrene in the soil. *Chinese J. Applied Ecology.* 12, 447–450.
- Shuyu¹, H. Qingmin, Miao, Z. D. Yang Z. and Hongwen, S. 2007. Optimized cultivation of highly-efficient degradation bacterial strains and their degradation ability towards pyrene. *Front. Biol. China.* 2(4), 387–390.
- Deng, L. Ren Y. and Wei, C. 2012. Pyrene degradation by *Pseudomonas* sp. and *Burkholderia* sp. enriched from coking wastewater sludge. *J. Environ. Sci. Health A.* 47, 1984–199.
- Moghadam, M. S. Ebrahimipour, G. Abtahi, B. and Ghassempour, A. 2013. Isolation, Identification and Optimization of Phenanthrene Degrading Bacteria From the Coastal Sediments of Nayband Bay Jundishapur. *J. Microbiol.* 6, (9).
- Wong, J. W. C Lai, K. M. Wan, C. K. Ma, K. K. and Fang, M. 2002. Isolation and optimization of PAH degradative bacteria from contaminated soil for PAHs bioremediation. *Water Air Soil Poll.* 139, 1-13.
- Ping, L. Zhang, C. Zhu, Y. Wu, M. Hu, X. Li, Z. Zhao, H. 2011. Biodegrading of Pyrene by a newly isolated *Pseudomonas putida* PL2. *Biotech. Bioprocess Eng.* 16(5), 1000-1008.
- Nnamchi, C. I. Obeta, JAN. Ezeogu, L. I. 2006. Isolation and characterization of some polycyclic aromatic hydrocarbon degrading bacteria from Nsukka soils in Nigeria. *Int. J. Environ. Sci. Tech.* 3(2), 181-190. [11 Nur Ceyhan. 2012. Biodegradation of pyrene by a newly isolated *Proteus vulgaris*. *Scientific Research and Essays.* 9 January 7(1), 66-77.

- Maiti, A. Das S. and Bhattacharyya, N. 2012. Bioremediation of High Molecular Weight Polycyclic Aromatic Hydrocarbons by Bacillus thuringiensis Strain NA2. J. Sci. . 72, 1-4.

Computer Science

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Keywords

Pyrene Staphylococcus Nepalensis Biodegradation Co-substrate.