

Phenanthrene degrading ability of the fungal species inhabiting the phyllosphere

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Abstract

Air pollution from the polyaromatic hydrocarbonic compounds which release from vehicular emission and oil refining processes give a great risk to all living beings due to high carcinogenicity and genotoxicity. Among sixteen polyaromatic hydrocarbonic compounds, phenanthrene takes special place as a hazardous compound since it has high carcinogenicity and long term persistency in the environment. Phyllosphere is the inner and outer area of a leaf which accommodates large number of microorganisms belongs to different genera of bacteria, fungi, algae, and protozoa. Microorganisms inhabit the phyllosphere has ability to degrade polyaromatic compounds and out of them fungi show high capability. Therefore this research attempt is to isolate the best phyllosphere fungi who are able to do phylloremediation of phenanthrene. The leaf samples collected from five urban polluted areas in Sri Lanka were used to isolate phenanthrene degrading fungal species. Phenanthrene degrading ability of them was screened using plate assays and further analysis was done using UV-spectrophotometric method and HPLC method. After selecting the best phenanthrene degraders they were identified up to species level using molecular techniques followed by PCR amplification, amplicons sequencing and BLASTN search. The results revealed *Penicillium oxalicum*, *Aspergillus aculeatus*, *Aspergillus oryza* and *Colletotrichum siamense* were efficient phenanthrene degraders. Out of them *Penicillium oxalicum* showed the highest degradation capability and it was more than 80 %. The best fungal species can be used as bioremediators to clean the air which is polluted from the polyaromatic hydrocarbons.

Biography:

Dr Lanka Undugoda has completed her PhD from University of Kelaniya based on the area of microbiology and biotechnology. At the moment she is a senior lecturer in Department of Biosystems Technology, Faculty of Technology, University of Sri Jayewardenepura.

Speaker Publications:

1. "Naphthalene and phenanthrene degradation by phyllosphere bacteria from the ornamental plants in urbanized and polluted areas of Sri Lanka"; International Journal of Agriculture and Environmental Research./2016 /Volume:02, Issue:05 (2016)
2. "Polyaromatic Hydrocarbon Degradation of Moss Endophytic Fungi Isolated from *Macromitrium* sp. in Sri Lanka"; Journal of Agricultural Science and Technology/ (2016) 171-182
3. "Aromatic Hydrocarbon Degrading Fungi Inhabiting the Phyllosphere of Ornamental Plants on Roadsides of Urban Areas in Sri Lanka"; Journal of Bioremediation & Biodegradation /Volume 7, Issue 1, 2016, 1000328
4. "Depolymerizing Activities of Aromatic Hydrocarbon Degrading Phyllosphere Fungi in Sri Lanka", Journal of J Bioremediation & Biodegradation, Volume 7, Issue 6 (2016), 1000372

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