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Polyaromatic hydrocarbons (PAHs) degradation ability of *Pseudomonas stutzeri* isolated from phyllosphere of urbanareas in Sri Lanka

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Polyaromatic hydrocarbons (PAHs) are persistent pollutants which are toxic to all living beings. Biodegradation of PAHs is an efficient way to remediate numerous pollutants. The discharge of such air pollutants gets settled over phyllosphere in a long run through dry and wet deposition and most of the phyllosphere bacteria are able to degrade PAHs. Among them, *Pseudomonas stutzeri* strains have been demonstrated to be a promising microbial agent that is able to metabolize compounds such as PAHs. The objective of this study was to identify the ability of PAH such as phenanthrene anthacene naphthalene and pyrene degradation by *P. stutzeri*. Bacterial isolations were done by the leaf samples collected from Panchikawatta, Orugodawatta, Pettah, Maradana, Colombo Fort, and Sapugaskanda oil refinery sites in Sri Lanka. Out of many isolations, *P. stutzeri* was identified up to species level through PCR amplification and sequencing the amplified 16s rRNA fragments using the primers 1492R and 27F. PAH degradation ability of isolated *P. stutzeri* was screened using plate assay and confirmed through UV-Vis spectrophotometer and HPLC. Toxicity assay and phyto-toxicity assay were performed. HPLC analysis revealed that *P. stutzeri*could degrade anthracene 98.77% while for phenanthrene (81.73%), naphthalene (80.73%), and pyrene (70.46%), respectively. The toxicity assay confirmed that the metabolites of these PAHs degradation were not toxic for the growth of *P. stutzeri* and the phytotoxicity assay confirmed that by-products were not harmful for the phyllosphere. *P. stutzeri* could be useful as a potential biological agent in an effective bioremediation process for polluted environments contaminated with polyaromatic hydrocarbons.

Keywords: *Pseudomonas stutzeri, bioremediation, polyaromatic hydrocarbons, HPLC, UV-Vis spectrophotometer*

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