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NAPHTHALENE DEGRADATION ABILITY OF PHYLLOPLANE *Bacillus* Sp. INHABITING URBAN AREAS IN SRI LANKA

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In the past decades, a wide variety of organic pollutants have been recognized as emerging pollutants in the phyllosphere environment. Naphthalene was considered as a major pollutant due to high carcinogenicity and genotoxicity effects to living beings. Even though there are numerous anthropogenic sources of polyaromatic hydrocarbons, the leading sources of naphthalene are vehicular emissions and products from oil refinery processes. The discharge of such air pollutants are getting settled over the phyllosphere through dry deposition and wet deposition in dense concentrations, while some of the phyllosphere bacteria are able to degrade naphthalene. The attempt of the current study was to identify the effective *Bacillus* species as naphthalene degraders from the phylloplane of urban areas. Bacterial isolations were carried out with leaf samples collected from Orugodawatta, Panchikawatta, Maradana, Pettah, Colombo Fort and Sapugaskanda oil refinery sites in Sri Lanka. Initially, naphthalene degradation ability of isolated phylloplane bacteria was screened using the plate assay method. Naphthalene degradation by each bacterial species was analyzed using UV-Visible spectrophotometry and high-performance liquid chromatography (HPLC). Results indicated that four *Bacillus* sp. were able to grow on naphthalene added Bacto Bushnell Hass agar medium, and they were identified up to species level through PCR amplification and sequencing the amplified fragments of the 16s rRNA gene using the primers 1492R and 27F. UV-Visible spectrophotometric and HPLC methods revealed that, out of these phyllosphere bacteria, *B. velezensis* (Accession No. MN190156) was the most efficient phyllosphere bacterial species which was highly capable of degrading naphthalene showing 71.63% degradation percentage while *Bacillus* sp. P_2B-02, *Bacillus* sp. 1 and *B. megaterium* show degradation percentages of 60.75%, 66.59% and 25.87%, respectively. These *Bacillus* sp. could be useful as potential biological agents in effective bioremediation of environments polluted with naphthalene-like polyaromatic hydrocarbons.

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