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Bıodegradatıon of Polycyclıc Aromatıc Hydrocarbons by Endophytıc Fungı Isolated from *Prosopis juliflora*, *Acacia auriculiformis*, *and Annona glabra*

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ABSTRACT

Polycyclic aromatic hydrocarbons (PAH) are considered as organic pollutants and occur naturally in fossil fuels. The burning of fossil fuels, garbage, or other organic substances causes the accumulation of PAHs in the environmental components such as air, water, and soil causing both short-term and long-term environmental issues. Bioremediation of environmental pollutants has gained momentum during the last few years. The symbiotic relationship between endophytes and host plants involves both mutualism and antagonism. Catabolic enzymes excreted by endophytic fungi to increase their adaptability can be utilized to degrade PAHs efficiently. In the present study, endophytic fungi grown in three well established invasive plants; *Prosopis juliflora* (Kalapu Andara), *Acacia auriculiformis* (Acacia), and *Annona glabra* (Wel atha) collected from Kalamatiya Sanctuary, Rekawa lagoon, and Kirala Kale of the Southern province respectively, and have been studied for bioremediation of PAH contamination. Endophytic fungi were successfully isolated and identified from the root suspension of above mentioned invasive plants. Five pure cultures were confirmed among twelve isolated samples and pure cultures were analyzed for their potential in degrading PAHs on Bacto Bushnell-Haas medium. The model PAHs, Naphthalene, and Anthracene were used as the carbon source separately. The spectrophotometric analysis confirmed acceptable degradation of both model PAHs by *Penicillium* sp1, *Penicillium* sp2, *Aspergillus* sp1, *Aspergillus* sp2, and *Aspergillus* sp3. The highest naphthalene and anthracene biodegradation percentages were shown by *Penicillium* sp2 and *Aspergillus* sp2 with values of (85.13±0.27) and (70.17±0.41) respectively, where the biodegradation percentages were significantly different compared to the control (Kruskal-Wallis; $P<0.05$). The findings of the study provide insight into how these endophytic fungi could be used for bioremediation of PAHs in environmental sites where contamination prevails and open avenues for future research in the relevant field. Further, the invasive plants can also be exploited beneficially by using them for bioremediation.

Keywords: *Bioremediation, endophytic fungi, polycyclic aromatic hydrocarbons*