

Green Approach: Exhibiting The Potential of Phytoremediation And Phycoremediation Techniques For Eradicating Dye Effluents From Contaminated Environment [†]

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[†] Presented at 3rd National Conference on Environmental Toxicology: Impact on Human Health (Env-Tox 2024)

Received: 16.02.2024; Accepted: 20.03.2024; Published: 28.03.2024

Abstract: Dyes are pigmented substances used in various industries including textile, food, pharmaceutical, and paper. Untreated synthetic dye effluents released into the environment are non-biodegradable and can persist for a long period and get into the food chain, causing countless repercussions. Phytoremediation and phycoremediation are eco-friendly, cost-effective, in-situ methods used for treating pollutants that can be organic and inorganic using plants and macro-micro algae's respectively. Phytoremediation helps to improve soil fertility, structure, and biological function of the environment, and it enhances the eradication of carbon dioxide from the air during photosynthesis. Reduction in the carbon footprint, i.e., excess carbon dioxide that causes atmospheric pollution is done via phycoremediation. These factors add more importance to these techniques for degrading dyes than other physical and chemical remediation methods. This study mainly focuses on different dyes and their degradation by phytoremediation and phycoremediation techniques. Also, it discusses macro-microalgal species and plants that are predominantly used in both techniques and showcases their efficiency for eradicating dyes, which do not require safety disposal as required for chemical remediation techniques. After reviewing numerous publications, it is concluded that in the future, the remediation of complex dyes and the extensive use of transgenic plants in the degradation of dyes should be enhanced. Advancements in the field of phycoremediation in water treatment will bring progressive changes in the future.

Keywords: phytoremediation; dye effluents; phycoremediation; macro-micro algae.

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Funding

None.

Acknowledgments

None.

Conflicts of Interest

The authors declare no conflict of interest.