

Phytoremediation of Grey Water

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Abstract: Greywater, generated from domestic activities excluding toilet waste, presents a significant challenge for water management due to its diverse contaminants and potential environmental impact. Conventional treatment methods often fall short in addressing the complex composition of greywater while maintaining sustainability. Phytoremediation, a green technology that utilizes plants and their associated microorganisms, offers a promising and ecofriendly alternative for greywater treatment.

This paper reviews the principles, mechanisms, and applications of phytoremediation in the context of greywater treatment. Various phytoremediation techniques such as rhizofiltration, phytoextraction, and phytodegradation are discussed, highlighting their efficacy in removing pollutants such as organic matter, nutrients, pathogens, and heavy metals from greywater. The role of specific plant species with remediation potential and their physiological mechanisms in contaminant uptake and transformation are examined.

Case studies and experimental findings from greywater phytoremediation projects around the world are presented to demonstrate the practicality and effectiveness of this approach. Factors influencing phytoremediation performance, including plant selection, hydraulic conditions, nutrient availability, and system design, are analysed to optimize greywater treatment efficiency.

Keywords: Greywater management, Plant-based greywater treatment, Greywater quality improvement, Greywater reuse