

Waste Water Treatment by using Root Zone Technology using *Canna Indica* Plant

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Abstract: Wastewater treatment is a critical process to mitigate the adverse environmental impact of contaminated water. Traditional treatment methods often prove to be expensive, energy-intensive, and may involve the use of harmful chemicals. In recent years, alternative approaches that utilize natural systems, such as constructed wetlands, have gained significant attention. One such innovative technique is the use of root zone technology, which harnesses the capabilities of plants to treat wastewater effectively. This study focuses on utilizing *Canna indica*, a versatile plant species known for its ability to thrive in aquatic environments, in the root zone technology for wastewater treatment. The research aims to evaluate the effectiveness of *Canna indica* in removing various pollutants and improving the overall quality of wastewater. The experiment will be conducted by setting up a series of treatment units consisting of a water holding tank, a root zone bed filled with sand and gravel, and planted with *Canna indica*. Wastewater samples will be collected at different stages of the treatment process to analyze the removal efficiency of key contaminants, including organic matter, nutrients, heavy metals, and pathogens. Physicochemical parameters such as pH, dissolved oxygen, and temperature will also be monitored to assess the overall performance of the system. The results obtained from this study will provide valuable insights into the efficacy of *Canna indica* in wastewater treatment. It is expected that the root zone technology using *Canna indica* will demonstrate efficient removal of pollutants, as the plant's roots act as a natural filter and microbial growth in the root zone aids in the breakdown and removal of organic matter. Additionally, the plant's uptake of nutrients can help reduce eutrophication in receiving water bodies. The findings of this research could have significant implications for wastewater treatment, particularly in areas where conventional treatment methods are not feasible due to financial or infrastructural constraints. The use of root zone technology with *Canna indica* has the potential to provide a cost-effective, environmentally friendly, and sustainable approach to wastewater treatment, contributing to the conservation and preservation of water resources.

Keywords: Wastewater treatment

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