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Optimizing Nickel Phytoremediation in Alternanthera ficoidea (L.) R.Br.: Chemical-Assisted Enhancement Strategies

Chandni Asha Syamlal and D. Sayantan
Department of Life Sciences, Christ (Deemed to be University), Bengaluru, Karnataka, India
chandni.as@res.christuniversity.in, sayantan.d@christuniversity.in
Corresponding Author: D. Sayantan

Abstract: *Nickel (Ni) contamination is recognized as a significant environmental concern on account of its poisonous nature and recycling in the biological systems of soil and water. Phytoremediation offers considerable promise as a way to tackle pollution of Ni, being a green and sustainable process for the disposal of foreign substances through plants. Outlining further methodologies of respective chemicals to enhance Ni recovery occurred in Alternanthera ficoidea (L.) R.Br. is hence the interest of the current study. Chemical treatments like chelating agents (ethylene diamine tetra acetic acid, or EDTA) and surfactants (sodium dodecyl sulphate) were tested in thefield trial for their effectiveness in increasing the nickel uptake and accumulation in plant tissues. Via the chelators and surfactants, an improved performance of Ni uptake within Alternanthera ficoidea (L.) R.Br. was comparatively found. It was finally clear by this work that the combined results were a good improvement to create synergy between EDTA and SDS. The significance of this study is scarred by the identification of chemicals as an aid to improved phytoremediation efficacy for sites aloft with Ni contamination. However, environmental impacts, sustainability, and cost-effectiveness need special attention by the industrial plants to embed these strategies practically. On the whole, the study produces unprecedented insights into the improvement of phytoremediation applications and the development of a more sustainable environmental management strategy to address contamination by metals such as heavy metals.*

Keywords: Nickel, SDS, EDDS, Phytoremediation

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