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## **A COMPREHENSIVE REVIEW ON ASSESSMENT OF AGRICULTURAL CROP WASTE MATERIALS AS BIOADSORBENTS FOR ENVIRONMENTAL REMEDIATION**

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### **Abstract**

Agriculture, a legacy from our ancient ancestors, is fundamental to human survival and prosperity. Each year, the agricultural industry generates a substantial volume of agricultural and horticultural waste. Concurrently, the disposal of solid waste, particularly heavy metal ions originating from a variety of metal manufacturing industries, poses a significant societal challenge and constitutes a considerable environmental hazard. Hence, bioadsorbents are viable alternate components in comparison to conventional tactics for the wastewater purification and are capable of competing graciously in the eradication of heavy metal ions from wastewater. The review deliberates the impending use of different agricultural waste and their utilization for the removal of heavy metals and contaminants in wastewater based on their adsorption capacities and operating factors, cost-effectiveness, and practical engineering solutions. Biosorption is considered as operational and eco-friendly alternative to conventional techniques such as chemical precipitation, ion exchange, and membrane filtration for removing toxic metal ions. This review emphasizes the exploitation of readily available agricultural waste as adsorbents for mitigating environmental pollutants. It further scrutinizes the influence of various treatment methodologies on augmenting their efficacy in pollution reduction.

*Key words:* agro-waste, bioadsorbent, environmental remediation, heavy metal, waste water treatment

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