# PHYTOREMEDIATION OF TANNERY INDUSTRIAL WASTEWATER USING WATER HYACINTH (*Eichhornia crassipes*) IN A WETLAND SYSTEM WITH DIFFERENT SOLID MEDIA

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## ABSTRACT

Tannery industries, such as those in Piyungan, Bantul, are often located near residential and agricultural areas. Their wastewater contains chromium (Cr) and exhibits Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) values that exceed environmental quality standards, leading to significant pollution. This study aimed to evaluate the effectiveness of water hyacinth (Eichhornia crassipes) grown in a wetland system with different solid media for remediating tannery industrial wastewater. The research utilized a two-factor Completely Randomized Design (CRD). The first factor was the presence of plants: T0 (without water hyacinth) and T1 (with water hyacinth). The second factor involved the type of solid media: K0 (no solid media), K1 (soil), K2 (manure and sawdust), and K3 (soil supplemented with a 2:1 mixture of manure and sawdust). The study was conducted using an artificial wetland system measuring 40x40x30 cm, with a wastewater volume of 40 L. Water hyacinth was cultivated for 15 days. The parameters analyzed were pH, Eh, COD, BOD, and total Cr. Data were analyzed using Analysis of Variance (ANOVA) at a 5% significance level. If significant differences were found, a Duncan Multiple Range Test (DMRT) was performed at a 5% significance level. The results showed that using water hyacinth did not significantly reduce Cr, BOD, or COD concentrations in the water, but it did significantly increase Eh. The type of solid media significantly increased BOD and COD, and remarkably reduced total Cr. Furthermore, the combination of treatments effectively lowered pH.

Keywords: Tannery wastewater, Cr, *Biologycal Oxygen Demand, Chemical Oxygen Demand*, wetland, water hyacinth