

POTENSI VETIVER (*Chrysopogon zizanioides* (L.) Roberty) SEBAGAI AGEN FITOREMEDIASI LIMBAH CAIR INDUSTRI ELEKTROPLATING: LAJU AKUMULASI DAN LAJU ELIMINASI

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INTISARI

Industri elektroplating menghasilkan limbah cair yang mengandung logam berat berbahaya bagi lingkungan. Hal ini meningkatkan potensi pencemaran logam berat pada ekosistem air. Dewasa ini pengolahan limbah cair elektroplating dinilai mahal dan kurang efektif sehingga dibutuhkan solusi. Fitoremediasi sebagai metode yang mudah, murah, dan ramah lingkungan dapat diterapkan dalam proses remediasi ekosistem air yang tercemar. Penelitian ini bertujuan untuk mempelajari potensi vetiver (*Chrysopogon zizanioides* (L.) Roberty) dalam menyerap dan mengeliminasi logam berat Cr dan Ni pada beberapa level konsentrasi (rendah, sedang, tinggi). Tanaman ditumbuhkan pada media air tercemar logam selama 28 hari (kondisi penyerapan) lalu dipindahkan ke media air tanpa kontaminasi logam selama 28 hari (kondisi eliminasi). Kadar logam berat pada air, akar, dan tajuk ditentukan dengan Spektrofotometer Serapan Atom (SSA). Laju akumulasi, laju eliminasi, *Bioconcentration Factor* (BCF), *Biological Absorption Coefficient* (BAC), dan *Translocation Factor* (TF) dihitung untuk mengevaluasi efektivitas tanaman dalam proses remediasi logam. Hasil menunjukkan bahwa vetiver (*C. zizanioides*) dapat menyerap serta mereduksi kadar Cr dan Ni pada media tanam. Laju penyerapan logam relatif lebih tinggi dari laju eliminasi logam. Nilai BCF, BAC, dan $TF > 1$ pada logam Cr serta BCF dan $BAC > 1$ dan $TF < 1$ pada logam Ni mengindikasikan vetiver berpotensi sebagai agen fitoremediasi Cr dan Ni melalui mekanisme fitoekstraksi dan fitostabilisasi.

Kata kunci: elektroplating, fitoekstraksi, fitostabilisasi, vetiver

PHYTOREMEDIATION POTENTIAL OF VETIVER (*Chrysopogon zizanioides* (L.) Roberty) FOR ELECTROPLATING WASTEWATER: UPTAKE AND ELIMINATION RATE

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ABSTRACT

Electroplating industry generates wastewater contain variety of heavy metals which potentially contaminate water ecosystems. The available and well known electroplating wastewater treatments are considered as expensive and less effective methods, therefore phytoremediation was used as an alternative friendly solution. This study was an evaluation of the uptake and elimination rate of heavy metals by vetiver (*Chrysopogon zizanioides* L.) on the remediation of metal-polluted water. Vetiver were planted in artificial electroplating wastewater containing different level (low, medium, high) of chromium (Cr) and nickel (Ni) for 28 days (uptake condition) and later then moved to uncontaminated water for 28 days (elimination condition). Water, roots, and shoots were collected periodically to determine of Cr and Ni contents using Atomic Absorption Spectrometry (AAS). The accumulation rate, elimination rate, Bioconcentration Factor (BCF), Biological Absorption Coefficient (BAC), and Translocation Factor (TF) were calculated to evaluate plants effectiveness in metal remediation processes. The results showed that vetiver (*C. zizanioides*) has high ability to uptake Cr and Ni. Metal uptake rate is relatively higher than the elimination rate and BCF, BAC and TF values indicated that vetiver is potentially for using as phytoremediation agent which is work through phytoextraction and phytostabilization.

Keywords: electroplating, phytoextraction, phytostabilization, vetiver