

**UJI TOKSISITAS KROMIUM TOTAL DALAM TANAH SEKITAR
INDUSTRI PENYAMAKAN KULIT HEWAN DI YOGYAKARTA
TERHADAP KANGKUNG DAN KACANG HIJAU**

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INTISARI

Uji toksisitas kromium total dalam tanah sekitar industri penyamakan kulit hewan di Yogyakarta terhadap Kangkung dan Kacang Hijau telah dilakukan. Penelitian ini bertujuan untuk menganalisis sifat fisikokimia dan kandungan logam berat dalam tanah sekitar penyamakan kulit hewan, mempelajari adsorpsi dan desorpsi tanah terhadap logam berat kromium (Cr) dan mengkaji pengaruh toksisitas logam Cr dalam tanah terhadap kangkung dan kacang hijau.

Sampel tanah dibagi menjadi empat titik sampel berdasarkan tempat pengambilannya, yaitu titik sampel I, II, III dan IV. Sifat fisikokimia yang dipelajari meliputi kadar air, pH, karbon organik total, kapasitas tukar kation, kadar N, P, K dan kadar logam berat yang terkandung. Kapasitas adsorpsi diketahui dengan menginteraksikan sampel dengan larutan Cr pada berbagai konsentrasi. Kajian desorpsi Cr pada sampel dilakukan dengan penambahan akuabides pada berbagai rasio larutan. Konsentrasi Cr yang terdapat dalam larutan setelah interaksi diukur dengan instrumen AAS. Uji toksisitas logam Cr dilakukan terhadap kangkung dan kacang hijau.

Hasil penelitian diperoleh bahwa titik sampel III memiliki kadar logam tertinggi, yakni sebesar 863 mg kg^{-1} . Isoterm adsorpsi Cr dalam tanah mengikuti isoterm Langmuir dengan nilai kapasitas adsorpsi maksimum sebesar $10.000 \text{ mg kg}^{-1}$. Desorpsi optimum terjadi pada rasio larutan 30 mL. Uji toksisitas menunjukkan Cr pada konsentrasi tinggi beracun terhadap kangkung dan kacang hijau.

Kata kunci: fisikokimia tanah, kromium, uji toksisitas

***TOXICITY TESTS OF TOTAL CHROMIUM IN SOIL AROUND LEATHER
TANNING INDUSTRY IN YOGYAKARTA AGAINST KALE AND
MUNG BEAN***

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ABSTRACT

Toxicity tests of total chromium in soil around leather tanning industry in Yogyakarta against Kale and Mung Bean has been carried out. The aims of this research are to analysis the physicochemical properties and heavy metal content of soil around the leather tanning industry, to study adsorption and desorption of soil against chromium (Cr) and to study ecotoxicity test of total chromium in soil around leather tanning industry against kale and mung bean.

Soil samples were divided into four sample points based on places where they taken, namely sample point I, II, III and IV. Physicochemical properties determined in this study included water content, pH, total organic carbon, cation exchange capacity, the content of N, P, K and the content of heavy metal. Study of Cr adsorption in samples was done by adding Cr solution and the effect of concentration are investigated. Study of Cr desorption in sampel was done by adding aquabides and the effect of ratio of solution are investigated. Cr concentration in the solution after interactions was measured by AAS method. Ecotoxicity test with the soil eeluates from the desorption experiments was performed with kale and mung bean.

This study showed that sample III had the highest total Cr content of 863 mg kg⁻¹. Adsorption isotherms of Cr in the soil followed the Langmuir isotherm with the largest value of adsorption capacity at 10.000 mg kg⁻¹. Optimum desorption occurred at ratio solution at 30 mL. An ecotoxicity test showed that total Cr at high concentration was found to be toxic towards kale and mung bean.

Keyword: chromium, ecotoxicity, soil physicochemistry