

**STUDY OF PHYSICO-CHEMICAL PROPERTIES IN SOIL AROUND
TEXTILES INDUSTRY AND THE EFFECT OF ZINC METAL ON THE
GROWTH OF GROUND KALE (*Ipomoea reptans P.*)**

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ABSTRACT

Study of physico-chemical properties in soil around textiles industry and the effect of zinc metal on the growth of ground kale (*Ipomoea reptans P.*) has been carried out. The aim of this research was to analyze the physicochemical properties and total zinc metal content of soil around the textile industry, to study adsorption and desorption of soil against zinc metal and to investigate the toxicity test of zinc metal in soil around the textile industry against ground kale (*Ipomoea reptans P.*).

Soil samples were taken from three different points, namely sample points A, B and C. Physicochemical properties that determined in this study consisted of water content, pH, electrical conductivity, total organic carbon, cation exchange capacity, ash content and total zinc metal content in soil. The study of zinc metal adsorption and desorption was measured by atomic adsorption spectrophotometer instrument. The toxicity test was performed by observing the effect of plants planted in the soil around textiles industry.

It was found that sample point A had the highest zinc metal content of $719.97 \pm 8.38 \text{ mg kg}^{-1}$. Adsorption isotherms of zinc metal in the soil followed the Langmuir isotherm model and optimum adsorption occurred at 100 mg kg^{-1} . Optimum desorption occurred at the concentration of citric acid 0.5 mol L^{-1} . It was also found that toxicity test showed that zinc metal at high concentration was toxic towards ground kale (*Ipomoea reptans P.*).

Keywords: adsorption, desorption, toxicity test, zinc metal.

***KAJIAN FISIKA-KIMIA PADA TANAH SEKITAR INDUSTRI TEKSTIL
DAN EFEK ION SENG TERHADAP PERTUMBUHAN KANGKUNG
DARAT (*Ipomea reptans* P.)***

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INTISARI

Telah dilakukan kajian fisika-kimia pada tanah sekitar industri tekstil dan efek ion seng terhadap pertumbuhan kangkung darat (*Ipomea reptans* P.). Penelitian ini bertujuan untuk menganalisis sifat fisiko kimia dan kandungan logam seng total tanah di sekitar industri tekstil, mempelajari adsorpsi dan desorpsi tanah terhadap logam seng dan untuk menguji efek logam seng pada tanah di sekitar industri tekstil terhadap tanaman kangkung darat (*Ipomea reptans* P.).

Sampel tanah diambil dari tiga titik yang berbeda yaitu titik sampel A, B dan C. Sifat fisiko kimia yang ditentukan dalam penelitian ini meliputi kadar air, pH, daya hantar listrik, karbin organik total, kapasitas tukar kation, kadar abu dan kadar logam seng total dalam tanah. Kajian adsorpsi dan desorpsi logam seng diukur dengan instrumen spektrofotometer serapan atom. Uji toksisitas dilakukan dengan mengamati pengaruh tanaman yang ditanam di tanah sekitar industri tekstil.

Dari penelitian yang dilakukan diketahui bahwa titik sampel A memiliki kandungan logam seng tertinggi yaitu $719,97 \pm 8,38 \text{ mg kg}^{-1}$. Isoterm adsorpsi logam seng dalam tanah mengikuti model isoterm Langmuir dan adsorpsi maksimum terjadi pada 100 mg kg^{-1} . Desorpsi optimum terjadi pada konsentrasi asam sitrat $0,5 \text{ mol L}^{-1}$. Uji toksisitas menunjukkan bahwa logam seng pada konsentrasi tinggi ditemukan bersifat toksik terhadap kangkung darat (*Ipomea reptans* P.).

Kata kunci: adsorpsi, desorpsi, uji toksisitas