UNIVERSITAS GADJAH MADA
Uji Toksisitas Logam Seng Dalam Tanah Sekitar Bekas TPA Kadisoka Terhadap Pertumbuhan Sawi (Brassica juncea L.) dan Kangkung (Ipomoea aquatica)
CHRISTINA L, Suherman, S.Si., M.Sc., Ph.D.; Dr. Agus Kuncaka, DEA.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

UJI TOKSISITAS LOGAM SENG DALAM TANAH SEKITAR BEKAS TPA KADISOKA TERHADAP PERTUMBUHAN SAWI (*Brassica juncea L.*) DAN KANGKUNG (*Ipomoea aquatica*)

Christina Lindamariana
16/394136/PA/17227

INTISARI

Uji toksisitas logam seng dalam tanah sekitar bekas TPA Kadisoka terhadap pertumbuhan sawi (*Brassica juncea L.*) dan kangkung (*Ipomoea aquatica*) telah dilakukan. Tujuan penelitian ini adalah menganalisis sifat fisikokimia dan kandungan logam seng total dalam tanah sekitar bekas Tempat Pembuangan Akhir (TPA) Kadisoka Sleman Yogyakarta, mempelajari adsorpsi dan desorpsi logam seng dalam tanah sekitar bekas TPA, dan mengkaji toksisitas logam seng dalam tanah sekitar bekas TPA terhadap pertumbuhan sawi (*Brassica juncea L.*) dan kangkung (*Ipomoea aquatica*).

Sampel tanah terdiri dari empat titik sampel berdasarkan tempat pengambilannya, yaitu titik sampel I, II, III, dan IV. Sifat fisikokimia yang dipelajari meliputi kadar air, pH, konduktivitas, karbon organik total, kapasitas tukar kation, kadar abu, kadar logam seng total dalam tanah, dan karakterisasi sampel tanah dengan Spektroskopi Inframerah Transformasi Fourier. Kapasitas adsorpsi logam seng diketahui dengan menginteraksikan sampel tanah dan larutan seng pada berbagai konsentrasi. Kajian desorpsi logam seng dalam sampel tanah dilakukan dengan penambahan asam sitrat pada berbagai konsentrasi. Konsentrasi logam seng setelah interaksi diukur menggunakan instrumen spektrofotometer serapan atom. Uji toksisitas logam seng dilakukan terhadap sawi (*Brassica juncea L.*) dan kangkung (*Ipomoea aquatica).*

Hasil penelitian diperoleh bahwa titik sampel II memiliki kadar logam seng tertinggi yaitu 397,5 ± 6,69 mg kg^{-1}. Isoterm adsorpsi logam seng dalam tanah mengikuti model isoterm Langmuir dan adsorpsi maksimum terjadi pada konsentrasi 100 mg kg^{-1}. Desorpsi optimum terjadi pada konsentrasi larutan asam sitrat 0,7 mol L^{-1}. Uji toksisitas logam seng menunjukkan bahwa logam seng pada konsentrasi tinggi bersifat racun terhadap sawi (*Brassica juncea L.*) dan kangkung (*Ipomoea aquatica).*

Kata kunci: adsorpsi, desorpsi, logam seng, uji toksisitas.

UNIVERSITAS GADJAH MADA
Uji Toksisitas Logam Seng Dalam Tanah Sekitar Bekas TPA Kadisoka Terhadap Pertumbuhan Sawi (Brassica juncea L.) dan Kangkung (Ipomoea aquatica)
CHRISTINA L, Suherman, S.Si., M.Sc., Ph.D.; Dr. Agus Kuncaka, DEA.
Universitas Gadjah Mada, 2020 | Diunduh dari http://etd.repository.ugm.ac.id/

TOXICITY TEST OF ZINC METAL IN SOIL AROUND THE SCARS OF TPA KADISOKA ON THE GROWTH OF MUSTARD GREENS (Brassica juncea L.) AND WATER SPINACH (Ipomoea aquatica)

Christina Lindamariana
16/394136/PA/17227

ABSTRACT

Toxicity tests of zinc metal in soil around the scars of TPA Kadisoka on the growth of mustard greens (*Brassica juncea L.*) and water spinach (*Ipomoea aquatica*) has been carried out. The aims of this research are to analysis the physicochemical properties and total zinc metal content of soil around the scars of TPA Kadisoka Sleman Yogyakarta, to study adsorption and desorption of soil against zinc metal, and to study ecotoxicity test of zinc metal in soil around the scars TPA Kadisoka against mustard greens (*Brassica juncea L.*) and water spinach (*Ipomoea aquatica*).

Soil samples were divided into four sample points based on places where they were taken, namely sample point I, II, III, and IV. Physicochemical properties determined in this study included water content, pH, conductivity, total organic carbon, cation exchange capacity, ash content, total zinc metal content in soil, and characterization of soil samples by Fourier Transform Infrared Spectroscopy. Study of zinc metal adsorption in samples was done by adding zinc solution and the effect of concentration are investigated. Study of zinc metal desorption in sample was done by adding citrate acid and the effect of concentration are investigated. Zinc metal concentration after interactions was measured by atomic adsorption spectrophotometer instrument. Ecotoxicity test with the soil eluates from the desorption experiments was performed with mustard greens (*Brassica juncea L.*) and water spinach (*Ipomoea aquatica*).

This study showed that sample point II had the highest zinc metal content of 397,5 ± 6,69 mg kg^{-1}. Adsorption isotherms of zinc metal in the soil followed the Langmuir isotherm model and maximum adsorption occurred at 100 mg kg^{-1}. Optimum desorption occurred at the concentration of citrate acid 0,7 mol L^{-1}. An ecotoxicity test showed that zinc metal at high concentration was found to be toxic towards mustard greens (*Brassica juncea L.*) and water spinach (*Ipomoea aquatica*).

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