

HEALTH RISK ASSESSMENT OF HEAVY METALS IN SOILS AND VEGETABLES GROWN AROUND A DUMPSITE IN LAGOS, SOUTHWEST, NIGERIA.

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Abstract

This research work is aimed at determining the uptake of trace elements by vegetables from the soil and related health hazard implications to the people living around Isolo dumpsite, Lagos Southwest Nigeria. Surface soils and vegetables were sampled within the study area. The plants include Okro (*Hibiscus Esculentus*), Ewedu (*Corchorus Olitorus*), Soko (*Celosia Argentea*), Water Leaf and African Spinach. Trace elements in both soils and plants were determined by Atomic Absorption Spectrophotometer (AAS). Concentration of Cd, Cr, Cu, Zn, Ni and Pb in soils show the following ranges in ppm 3.56-25.8, 42-125, 16-496, 78.5-1626, 13-61 and 23-1057 respectively. The mean concentration of Cd, Cr, Cu, Zn, Ni and Pb in soils is 1.22, 66.56, 45.44, 157.33, 22.44 and 130.11 respectively. Pollution index values for Zn, Cu, Pb and Cd are >1 while Cr and Ni are <1. Total chronic hazard quotient index (THI) of oral exposure to soil contamination in the study area for the populace ranged between 4.03 and 14.6 for a child and 0.721 and 2.61 for an adult and thus depicting a great hazard for both young and old.

The concentration of trace elements in all the vegetables show the following ranges in ppm Cu (2.34-39-63), Zn (54.6-130.9), Ni (3.656.5), Cr (2.6-8.26), Cd (3.65-25.8) and Pb (1.12-4.33) respectively. The values are higher than the Maximum Permissible Limit (MPL) for all the vegetables except Okro and Spinach which show lower concentration of Cu. All the vegetables are within the Maximum Allowable Concentration (MAC) for all the trace elements.

Soil to vegetable transfer factors (TF) for Cu, Zn, Ni, Cr, Cd and Pb are 0.41-7.91, 1.99-7.25, 0.04-0.07, 0.7-1.71, 1-2.59 and 0.09-0.39 respectively while the bio-accumulation of trace elements in the analyzed vegetables show the following trend Ewedu > Soko > Water leaf > Okro > African Spinach. The Total Hazard Quotient (THQ) for the above metals in humans with an average body of 65kg (adult) and 30kg (children) is below 1 except for Zn in adults.

Keywords: Vegetables, Hazard Quotient, Soil, Metals, Lagos