

HEAVY METALS AND ITS CONTAMINATION IN SOIL AND VEGETABLES

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Executive Summary

Heavy metal contamination is one of the most serious ecological problems on a world scale and also in our country. So a study was carried out to determine the status of heavy metals in non-polluted and polluted soils and vegetables during November 2016-March 2017. Thirty soil and vegetable samples were randomly collected from inside of Bangladesh Agricultural Research Institute, Gazipur and thirty from Gazipur sadar, Sreepur and Kapasia upazillas near bus stands, drains and also roadside. The dominant textural class in case of non-polluted soils was sandy loam and in polluted soils it was clay loam. The polluted soils were slightly acidic to neutral and the non-polluted soils were neutral to slightly alkaline in nature. Most of the heavy metals in both non-polluted and polluted soils were negatively correlated with silt and positively correlated with sand. There was no significant correlation between heavy metal content and soil pH or organic matter in both non-polluted and polluted soils with very few exceptions. The mean concentrations of Pb, Cd, Ni, Co, Cr, and Mn in non-polluted soils were 5.16, 0.89, 15.14, 12.84, 21.95, 12.59 $\mu\text{g g}^{-1}$ and in polluted soils were 7.33, 2.41, 27.36, 22.64, 31.32, 17.83 $\mu\text{g g}^{-1}$, respectively. Concentrations of heavy metals were higher in leafy vegetables compared to fruit, root and tuber vegetables. The highest concentrations of Cd ($1.21\mu\text{g g}^{-1}$), Ni ($8.19\mu\text{g g}^{-1}$) were found in spinach while Pb ($1.37\mu\text{g g}^{-1}$) in Amaranth, Cr ($17.61\mu\text{g g}^{-1}$) in Cauliflower and Co ($3.27\mu\text{g g}^{-1}$) in Red amaranth and Mn ($17.10\mu\text{g g}^{-1}$) in Cabbage for polluted vegetable. For both soils and vegetables, among the heavy metals; the Cr concentration was highest. The concentration status was almost uncontaminated to slightly contaminate for both soils and vegetables and within the limit allowed for maximum acceptable concentration (MAC) for satisfactory crop production but still care should be taken properly so that it cannot go above the critical level.

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