

## **HEAVY METAL ACCUMULATION IN RICE GRAINS AND RICE GROWING SOILS IN KALUTARA SEGMENT, SRI LANKA**

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Assessment of environmental risk associated with the pollution of heavy metals is important for proper management of paddy soils. A study was conducted to determine concentration of heavy metals in rice grains and rice growing soils in Kalutara segment in western province, Sri Lanka. Soil and grain samples were collected from randomly selected rice growing fields in different locations. Soil and grain samples were analyzed for As, Cd, Ni, Pb, and Hg using Inductively Coupled Plasma Optical Emission Spectrophotometer. The mean concentration of As, Cd, Ni and Pb in the soil were 1.5, 0.49, 8.2 and 35.8 mgkg<sup>-1</sup> respectively. Mercury was not detected in any soil sample. According to geoaccumulation index ( $I_{geo}$ ) most of the tested rice growing soils can be classified as uncontaminated with respect to As and Ni, uncontaminated and uncontaminated to moderately contaminated in Cd, moderately and moderately to highly polluted in Pb. Heavy metals were detected in 36% out of 83 grain samples. The range of mean concentration of As, Cd and Pb observed in grain samples were 0.03-0.08, 0.01-0.04 and 0.21-0.27 mgkg<sup>-1</sup> respectively. Mercury and Ni were not detected in any grain sample. According to permissible level recommended by FAO/WHO Joint CODEX Alimentarius, accumulation of Pb in 16% of the total grain samples were higher than the permissible level. However, there was no any relationship observed between heavy metal content in grain samples and soil samples. The study reveals that there is a potential to accumulate a few heavy metals in rice grain above permissible level. Therefore, further studies are needed to determine mobility and bioavailability of heavy metals in paddy soils in order to recommend remedial measures.

**Keywords:** Geoaccumulation index, Heavy metals, Paddy soils, Permissible level of heavy metals