

ASSESSMENT OF SELECTIVE HEAVY METAL CONTENTS IN SOIL AND RICE GRAINS OF SELECTIVE FIELDS IN THE DRY AND INTERMEDIATE ZONE OF SRI LANKA

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The objectives of this study were to determine the heavy metal concentrations in soils and rice grains of different varieties grown under conventional and organic management systems in the dry and intermediate zones in Sri Lanka. Rice grain and soil samples were collected from two locations in Kurunegala district, two locations in Polonnaruwa district and Mahailuppallama and Eppawala in Anuradhapura district. Rice grains were collected from seven rice varieties namely Bg 300, Bg 352, Bg 358, Kalu Heenati, Madathawalu, Sudu Heenati and Suwandal.

Soil and rice grain samples were analyzed for selective heavy metals (Zn, Cu, Pb, Ni, Cr and Cd). Soil with the highest Zn concentration was reported from Eppawala (104.0 mg/kg). Soil with the highest Cu concentration was reported in Eppawala (140.0 mg/kg). Soil with the highest Pb concentration was reported from Mahailuppallama (87.0 mg/kg). Soil with the highest Ni concentration was reported from Eppawala (33.4 mg/kg). Soil with the highest Cr concentration was reported from Kurunegala (42.6 mg/kg). Concentrations of Cd were below the minimum detection limit of the instrument (<0.01 mg/kg) in all the soil samples collected. The observed heavy metal concentrations were lesser than the European Community Set Standard in 2002 for the maximum permissible level of heavy metals for agricultural soil.

Rice grain with the highest Zn concentration (22.9 mg/kg) was observed for Kalu Heenati rice variety grown under organic farming system in Kurunegala and the highest Cr concentration (2.18 mg/kg) was observed for Sudu Heenati rice variety grown under conventional rice production system in Mahailuppallama, Anuradhapura and other heavy metals (Cu, Pb, Ni, and Cd) were not detected in rice variety in studied areas. The observed heavy metal concentrations were less than the European Union food legislation provided maximum permissible level of heavy metals in rice and Safe limits given by world health organization and food and agriculture organization in 2007.