

**PRELIMINARY STUDY ON HEAVY METAL CONTENT OF RICE GRAINS AND PADDY SOILS OF AMPARA DISTRICT, EASTERN PROVINCE, SRI LANKA**

E.M.J.M. Rizvi

*Department of Biological Science, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai. rizvijam@fas.seu.ac.lk*

Heavy metals induce multiple organ damage even at low levels of exposure. They are also classified as known or probable human carcinogens in the United States. Man is exposed to environmental heavy metals mainly through the soil crop system. Rice is one of the major sources of human intake of Cd and Pb. Ampara district is an area of intensive paddy cultivation with high input of chemical fertilizers and agrochemicals, which are anthropogenic sources of heavy metals. This preliminary study was conducted to determine whether the heavy metal content of paddy soils and rice in Ampara district is at safe levels. Random samples in triplicates of grains of *Oryza sativa* L. (variety AT 362) and paddy soil in 2016/17 'Maha' season from three different sites 1. Addalachenai, 2. Sammanthurai and 3. Urani were collected the day prior to harvest. Soil samples and dehusked paddy grains were tested using ICP-OES (ICAP Thermo, USA) for sixteen heavy metals. Data of different sites were compared using Turkey's pair wise comparison (Minitab 2017) and the data from individual sites were compared with maximum permissible level standards using 'one sample t-test' (<http://www.statskingdom.com>). All tested metals Ag, As, Be, Cd, Co, Cr, Cu, Fe, Ga, In, Mn, Mo, Ni, Pb, V and Zn, in the paddy soils of all three sites were within the maximum permissible levels as per different international standards. However, the As content of grains in Addalachenai and Sammanthurai sites ( $0.27 - 0.31 \text{ mg kg}^{-1}$ ) were 100% higher than the maximum permissible level ( $0.15 \text{ mg kg}^{-1}$ ). The adult daily intake rate of As was  $2.15 \text{ } \mu\text{g/kg}$  body weight/day, closer to the potential tolerable daily intake ( $3.0 \text{ } \mu\text{g}$ ) thus consuming rice from sites 1 and 2 could be risky. The contents of Cr at all three sites, Cd at sites 1 and 3 and Pb at site 3 of the grains were not significantly different from the standards at some sites and thus need precautionary measures to avoid exceeding permissible levels.

**Key words:** Ampara district, Heavy metals, Rice grains, Paddy soils