

ID 121

Bioaccumulation of toxic metals in *Oryza sativa* grown in North Central province in Sri Lanka

M.K.J.K. Kumari^{1*}, W.A.P.J. Premaratne¹, P.L.R.A. Perera¹, W.P.R.T. Perera² and J.A. Liyanage¹

^{1*} Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka

² Department of Indigenous Medical Resources, Faculty of Indigenous Health Sciences and Technology, Gampaha Wickramarachchi University of Indigenous Medicine, Sri Lanka

Abstract

This study was carried out to assess the levels of heavy metals such as Arsenic (As), Cadmium (Cd), and Lead (Pb) in domestically grown rice sold in North Central Province (NCP) which is identified as a high CKDu prevalent area in Sri Lanka. Based on eight paddy areas, thirty *Oryza sativa* composite samples were collected in each selected Divisional Secretariat (DS) area in NCP. Samples were subjected to microwave digestion process and As, Cd and Pb analysis were carried out by the ICP-MS. The mean Pb levels in domestically grown rice were significantly higher than the FAO/WHO allowable limits (Pb- 200 µg/kg) in most of the DS areas. Among selected DS areas, the Padaviya DS area has highlighted reporting 2815 µg/kg mean Pb content in the rice samples. However, none of the mean values of As and Cd in rice samples in selected areas have exceeded the FAO/WHO allowable limits (As- 200 µg/kg, Cd-400 µg/kg). The Highest Cd contamination was reported in Higurakgoda and Padaviya DS areas and the values were 106.69 µg/kg, 105.69 µg/kg, respectively. The highest mean value of as was reported in the Kebithigollewa DS area and it was 49.75 µg/kg. The values of estimated daily intake (EDI) of the analyzed metals were also very far below than the Tolerable Daily Intake (TDI) (Pb - 250 µg/day, Cd - 62 µg/day, As - 3 µg/day). Owing to high Pb content in domestically grown rice samples in selected areas, long term consumption of rice causes to accumulate the Pb in body tissues and generates a health risk of residents in selected CKDu affected areas in NCP.

Keywords: CKDu, Contamination, Rice, Toxic metals

***Corresponding Author:** mkjkawshi@gmail.com