Oral presentation: 73

Heavy metal analysis of selected fruits and vegetables grown in CKDu prevalent Medawachchiya area in Sri Lanka

H. K. Hiruni and M. K. B. Weerasooriya*

Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka
*bandu@kln.ac.lk

In Sri Lanka, CKDu has become a major health issue over the past two decades. The disease is proved to be endemic. The number of environmental risk factors has been recognized globally as other probable causes of CKDu, such as exposure to heavy metals (cadmium, lead, mercury, and chromium), agrochemicals, and nephrotoxic substances. Hence, the current study was aimed to investigate whether there is any relationship between CKDu and heavy metal contaminants of selected fruits and vegetables grown in the effected area. Fruits of *Mangifera indica* (Mango), and *Carica papaya* (Papaw), leaves of *Centella asiatica* Gotukola), *Talinum fruticosum* (Gas nivithi), *Amaranthus cruentus* (Thampala) and fruit of *Solanum torvum* (Thibbattu) were selected for the study. Study was based on 15 sites of each Gramasevaka Niladhari (GN) area (Puhudiwula, Mahadiwulwewa, Unagaswewa) in Medawachchiya. Information of the about CKDu patients and above fruits and leafy vegetables (n=45) grown in their home gardens were collected during the *Maha* season. The content of Copper (Cu), Chromium (Cr), Cadmium (Cd) and Lead (Pb) in samples were analyzed using Flame atomic absorption spectroscopy. The results showed that leafy and fruity vegetables *(*Thibbattu) contain higher concentrations of heavy metals than fruits. The concentrations of Cu, Cr, Cd and Pb detected in the vegetable and fruit samples were ranged from 3.64 ± 0.07 to 23.60 ± 0.14 mg/kg, 0.60 ± 0.09 to 17.11 ± 0.16 mg/kg, 0.08 ± 0.03 to 0.88 ± 0.00 mg/kg and 0.18 ± 0.08 to 7.70 ± 1.48 mg/kg (dry weight basis) respectively. None of the fruits and vegetables tested in three study areas exceeded WHO safe limit for Cu, 40 mg/kg. All the Mango and papaya samples tested below safe limit of 4 tested metals. Regarding the leafy and fruity vegetables all the samples at Mahadivulwewa, nearly 95% samples at Puhudivula and 70% at Ungaswewa exceed the safe limit for Cd. Nearly 20% of leafy vegetables at Mahadiwulwewa,10% at Ungaswewa and Puhudivula exceed the safe limit for Pb whereas nearly 80% of leafy vegetables at three tested areas exceed the safe limit for Cr. Of the 15 sites selected, 13 patients at Mahadivulwewa, 07 and 05 patients at Puhudivula and Ungaswewa were recorded respectively. Heavy contamination of Cd recorded in the leafy and fruity vegetables in the home gardens of Mahadivulwewa could be one of the risk factor accounts for higher number of CKDu patients. Cd accumulation in renal cortex reported to cause renal damage decreasing Glomeular Filtration rate. However, further analysis is required to establish this fairly conclusively.

Keywords: CKDu, fruits and vegetables, heavy metals, Medawachchiya

Acknowledgement: This work was supported by University Grant commission under the research grant RP/03/SR/02/06/01/2016.