Abstract No: 62 *Climate, Environment and Earth Sciences*

SELENIUM IN RICE (*ORYZA SATIVA*) FROM DIFFERENT GEOGRAPHIC AND CLIMATIC REGIONS OF SRI LANKA

Saranga Diyabalanage[1], Thamara Navarathna[2] and Rohana Chandrajith[3*]

[1]Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka
[2]Bandaranayake Memorial Ayurvedic Research Institute, Maharagama, Sri Lanka
[3]Department of Geology, University of Peradeniya, Peradeniya, Sri Lanka
[*]rohanac@pdn.ac.lk

Rice is the main staple food in Sri Lanka as in many other Asian countries. It has been identified that people who consume rice as a staple food are inevitably exposed to significant amounts of different trace elements. Among these trace elements, selenium (Se) is one of the least known, but essential element for both humans and animals. Deficiency of Se can increase the susceptibility of the kidney's to oxidative damage, but Se becomes toxic to humans when the intake exceeds 900 µg/kg per day.

Availability of Se and other bio-important trace elements in rice from Wet Zone (WZ), Dry Zone (DZ) and Intermediate Zone (IZ) were investigated in this study. Concentrations of 19 trace elements in 200 rice samples, including improved (n=188) and traditional rice varieties (n=12) were measured with Inductively Coupled Plasma Mass Spectrometry (ICP-MS) after microwave aided acid digestion.

The Se contents in improved rice varieties ranged from 0.03 to 261 µg/kg with mean values of 35.4 µg/kg, 42.8 µg/kg and 22.1 µg/kg for WZ, DZ and IZ, respectively. Comparatively higher Se levels were recorded in white polished rice varieties from the DZ and IZ than brown rice varieties from the same regions. Comparatively higher Se levels were observed in traditional rice varieties that varied from 77.51 to 163.8 µg/kg with the mean of 116.4 µg/kg. Among them, the highest Se content was reported in "*Maa Vee*", which is widely recommended for diabetes, tuberculosis, constipation, hemorrhoids and cardiovascular diseases in traditional medicine. Based on the average daily consumption of rice by a person, the total daily intake (TDI) of Se was calculated. The TDI are 10.04 µg, 12.14 µg and 6.26 µg from rice of WZ, DZ and IZ, respectively. Results of the study also demonstrate that the Se concentration does not vary significantly among climatic zones. Though Se is available in other foods such as garlic and other vegetables, the recorded values for Se in rice are far below the recommended daily Se intake. Although some early studies indicated higher arsenic (As) contents in Sri Lankan rice, this study reveals that it is well below the Codex Alimentarius recommended maximum allowable limit.

Financial assistance given by National Research Council, Sri Lanka (12-102) is acknowledged.