

Determination of selenium content in conventional leafy green vegetables consumed by Sri Lankans

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Selenium is an essential micro-nutrient for both humans and animals, specially incorporated in the form of amino acids. It is an important trace element required for humans for proper thyroid functioning and to promote their immune system. Most of the South Asian communities, especially Sri Lankans frequently have plant-derived food as the main component in their diet. Since it is widely believed that conventional leafy vegetables are a rich nutrient source, this study was carried out to determine the selenium content in seven selected types of abundant conventional leafy green vegetables that are consumed by Sri Lankans. *Centella asiatica* (Sin. Gotukola), *Alternanthera sessilis* (Sin. Mukunuwenna), *Basella alba* (Sin. Nivithi / Spinach), *Boerhavia diffusa* (Sin. Sarana), *Ipomoea aquatica* (Sin. Kankun), *Amaranthus spinosus* (Sin. Thampala) and *Hygrophila schulli* (Sin. Neeramulliya) are the leafy vegetable samples that were selected for the evaluation of selenium content. The samples were collected from five districts, (Gampaha, Kandy, Kurunegala, Anuradhapura and Puttalam) which have different environmental and climatic conditions. Soil samples corresponding to each leafy vegetable sample were also collected, and analyzed to identify the relationship between the selenium content in plants and soil.

The sample analysis was carried out using Hydride Generation Atomic Absorption Spectrometer (HGAAS). Prior to the analysis, cleaned leafy vegetable samples and corresponding soil samples were subjected to acid digestion with nitric acid. Selenium concentrations in leafy vegetable samples analyzed were found to be in the range of 31.2 -103.2 $\mu\text{g kg}^{-1}$ on dry weight basis. *Centella asiatica* (84.1 $\mu\text{g kg}^{-1}$) and *Hygrophila schulli* (103.2 $\mu\text{g kg}^{-1}$) varieties showed relatively high selenium concentrations, highest value of Selenium (103.2 $\mu\text{g kg}^{-1}$) was reported from *Hygrophila schulli* and the lowest was from *Boerhavia diffusa* (31.2 $\mu\text{g kg}^{-1}$). The selenium content in corresponding soil samples ranged from 96.4 to 133.9 $\mu\text{g kg}^{-1}$ in dry weight basis. The measured soil selenium content was always higher than the corresponding plant selenium content; however the plants that were grown in selenium rich soils have not shown greater absorption of selenium. Hence, there may be no positive correlation between the uptake of selenium by leafy vegetables and the selenium content in soil.

Keywords: Hydride generation Atomic Absorption Spectrometer, Leafy vegetables Selenium, Soil