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A preliminary study on selected metals in processed tea samples produced in different regions of Sri Lanka

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Sri Lanka is one of the oldest and most renowned tea exporters in the world. There are three major geographical zones (Up, Mid and Low country) and seven sub agro-ecological regions where tea is cultivated in Sri Lanka. The cultivation and processing have unique features in each region. Therefore, tea produced in specific regions in Sri Lanka acquires unique flavor characteristics and attracts higher prices in the international markets than tea produced in other countries. Often 'Ceylon tea' is blended with tea from other origins and sold as 'Pure Ceylon tea' to exploit this advantage. The objective of this study was to identify chemical parameters specific to the region of production to obtain geographical indications (GI) for tea produced in different regions of Sri Lanka. Generally, a combination of chemical parameters is used to establish GI. In this study, the focus was on the variation of selected metal contents in tea produced in different regions. The selected metals were Zn, Cu, Pb, Fe, Cr, Na, K and Ca. Tea samples from six agro-ecological regions were collected for the study. Microwave digestion was used as a rapid and efficient method for sample decomposition and the determination of metals was done by Flame Atomic Absorption Spectrometry and Flame Photometry. Results of the statistical analysis using one-way ANOVA indicated that there were significant differences in the mean levels of selected metals in tea among different regions of production. This may be due to the use of fertilizers which contain these metals and differences in soil metal composition in different regions. Machinery contamination may also have a minor contribution. Dendrogram obtained in cluster analysis shows that variation in mean values of metal contents can be clustered into three groups according to the similarity levels. One group is Dimbula and Uva. This might be of significance because they are highly sought-after teas of Sri Lankan origin. Results from the study indicated that variation of metal contents could be used as one parameter to distinguish highly sought-after tea of Dimbula and Uva regions from other regions after establishing the baseline levels for the regions.

Keywords: Agro-ecological regions, Atomic absorption spectrometry, Geographical indications, Metals, Processed Tea