

**Preliminary study on identification of the region of production of  
*Ceylon Tea* using concentration of selected elements**

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Sri Lanka is one of the world's leading tea exporters and *Ceylon Tea* is acclaimed as the best tea in the world due to its unique flavor characteristics. Flavor characteristics of tea are mainly influenced by the variety of tea, climatic conditions and processing methods. Tea is grown in several geographical regions in Sri Lanka and tea produced in those regions acquire distinct flavor characteristics specific to the region. Due to the distinct flavor characteristics, *Ceylon Tea* fetches 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 obtain higher prices. In addition, tea produced in particular regions in Sri Lanka are blended with tea produced in other regions of Sri Lanka (e.g. *Dimbulla* and *Uva*) which are much sought after teas of Sri Lankan origin. At present, organoleptic assessments are used to identify such adulterations, which could be challenged in courts and arbitration panels. Although not essential, identification of chemical parameters specific to the region of production would facilitate obtaining geographical indications (GI) for tea produced in certain regions such as *Dimbulla* and *Uva* in Sri Lanka. Therefore, chemical parameters to distinguish *Ceylon Tea* from other origin teas and to identify the region of production in Sri Lanka would be invaluable for the marketing of *Ceylon Tea*.

A combination of trace metal content and isotopic ratios of Nitrogen (N), Carbon (C) and oxygen (O) are often used to identify the geographical region of production. Therefore, content of selected metals in tea produced in five regions (Low country, Mid country, *Udapussellewa*, Up country and *Uva*) of Sri Lanka was measured as a preliminary investigation to find any relationship with the region of production. Potassium, calcium, manganese, iron, copper, zinc, rubidium, strontium and bromine content of fifteen tea samples representing the five regions were measured using X-ray Fluorescence Spectroscopy (XRF) technique. The results obtained, in the present study indicated that there is a direct correlation between the rubidium content of tea and the region of production. Mean Rb content of tea in the five production regions ( $\text{mg kg}^{-1}$ ) were 45.43 (Low country), 39.31 (Mid country), 36.89 (*Udapussellewa*), 30.98 (Up country) and 20.29 (*Uva*) on dry weight basis. Tea produced in lower elevations had high Rb content and the Rb content of tea decreased with the increase in elevation. The differences of Rb content in tea could be due to the differences in Rb content in soils in these regions. Results obtained for concentrations of other elements did not indicate any relationship with the region of production. Results of this study indicate that Rb content could be used as one of the parameters for the identification of region of production in *Ceylon Tea*. Further studies using larger number of tea samples from each region along with soil samples from those regions is required for confirmation of the conclusion.

**Keywords:** Ceylon Tea, XRF, Metal, Rubidium