

RARE EARTH ELEMENTS IN TEA GROWING SOILS FROM DIFFERENT AGRO-CLIMATIC REGIONS OF SRI LANKA

N. Wickramasinghe^{1*}, G.P. Gunaratne¹ and R. Chandrajith²

¹*Soils and Plant Nutrition Division, Tea Research Institute, Talawakelle, Sri Lanka*

²*Department of Geology, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka*

**niluwick1@gmail.com*

There is a growing concern about the accumulation of rare earth elements (REE), particularly light REE, in tea growing soils. Therefore, this study investigated the distribution of REE in tea growing soils from different agro-climatic zones of Sri Lanka. Eighty sampling locations were selected from five tea growing agro-climatic zones, namely Mid-Country Intermediate (IM), Up-Country Intermediate (IU), Low-country Wet (WL), Mid-Country Wet (WM), and Up-Country Wet Zone (WU). Two samples were collected from each location at depths of 0 – 15 cm and 15 – 30 cm. REE in soils were quantified by ICP-MS after microwave-assisted digestion. The mean total REE concentrations (Σ REE) in IM, IU, WL, WM and WU zones were 268 (\pm 78.5), 195 (\pm 42.5), 158 (\pm 71.7), 211 (\pm 58.4) and 182 (\pm 65.7) mg/kg, respectively. The light REE (La to Eu) concentrations were higher in all five zones than the heavy REE (Gd to Lu and Y) and Sc. Approximately 84% of the Σ REE in soils were accounted for by light REE. Post-Archean Australian Shale (PAAS) normalized REE pattern showed a very similar distribution in all study zones. However, the pronounced positive Ce anomaly in the mid-country wet zone and the positive Gd anomaly in all five zones indicated anthropogenic input of these elements. Further studies are required to confirm the anthropogenic sources of the soils.

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