

Revisiting Magmatic Rocks of Sri Lanka: Evidence for an Ancient Accretionary Complex?

Sanjeewa P.K. Malaviarachchi

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

E-mail: malavi@pdn.ac.lk

Sri Lanka is predominantly composed of Precambrian rocks of which majority are metamorphosed under high temperature conditions. Mainly, the rocks are distributed in four litho tectonic units namely, Highland Complex, Wannian Complex, Vijayan Complex and Kadugannawa Complex. These rocks include a vast volume of magmatic intrusions and some of them are now metamorphosed with their host metamorphites. According to the limited data, magmatic rocks of Sri Lanka cover a broad spectrum of composition from under-saturated alkaline types over metabasaltic to highly differentiated granites. The Kadugannawa Complex and the Vijayan Complex of Sri Lanka define chemical trends typical of calc-alkaline rock series whereas samples from the Highland-Wannian Complexes show a broad scatter suggesting bimodal distributions. The rocks with alkaline affinity show surprisingly high concentrations of $\text{Na}_2\text{O} > 6 \text{ wt\%}$, $\text{K}_2\text{O} > 6 \text{ wt\%}$, Ba up to 12000 ppm and Sr upto 4000 ppm. Based on the preliminary data available alkaline rocks in the Highland-Wannian Complexes can be distinguished into two groups. Group I alkaline rocks are extremely enriched in LREE with a marked decrease in HREE. Group II rocks are less strongly fractionated and display negative Eu anomalies. Some of these patterns appear to be affected by charnockite formation by a CO_2 rich magma flow from the mantle. There is a systematic elemental correlation displayed with continuous SiO_2 trends in variation diagrams inferring a cogenetic calc-alkaline rock suit and suggest subduction-type magmatism occurred along an old continental margin. Detailed investigations using advanced analytical facilities including geochronology are necessary to unravel their petrogenetic relationships with respect to space and time.