GEOCHEMISTRY OF THE DOLERITE DYKES OF SRI LANKA—CONSTRAINTS ON THE EXTENT OF GONDWANA MAGMATIC PROVINCES

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Dolarite dykes from the Vijayan Complex and the South Western Group of Sri Lanka have been sampled for geochemical, paleomagnetic and isotopic study. The aim of this study is to correlate the basaltic igneous activity between the once contiguous Gondwana fragments.

The discordent dykes from both regions are not metamorphosed and have chilled margins against country rock in the Vijayan Complex. Dykes from both regions at Gallodai and Maddegedara are very similar in major and trace element compositions (Table 1). They are evoled quartz-normative tholeiites ranging in Mg-number (Mg/Mg+FeX 100) from 58 to 33 and have moderately potassic compositions (Na_2O/K_2O of about 1.6).

The Sri Lanka dykes are different in composition from the Middle Proterozoic Amundsen dykes of Enderby Land, Antarctics which are 1190 Ma old and are also quite distinct from the 480 Ma old K-rich melasyenite dykes of Antarctics (Sheraton and Black, 1981). Thus although striking similarities exist in tectonics and metamorphism between the Proterozoic (ca. 1100 Ma) mobile belt geology of Sri Lanka and the East Antarctic Shield, the distinctive nature of the fresh dolerite dykes in the two regions show there to also be important geological differences.

Reference

Sheraton J. W. and Black L. P., 1981. Geochemistry and geochronology of Proterozoic tholeiite dykes of East Antarctics: evidence for mantle metasomatism. Contributions to Mineralogy and Petrology, 78, pp. 305 - 317.

Table 1. Geochemistry of the dolerite dykes of Sri Lanka.

	Gallodai Dyke (ESL7) Vijayan Complex	Maddegedara Dyke (ESL13) South Western Group
SiO_2	52.43	52.49
TiO_2	1.28	1.28
Al_2O_3	13.80	13.96
Fe_2O_3	2.65	3.81
FeO	8.38	7.33
MnO	0.18	0.18
MgO	5.89	5.89
CaO	8.54	8.58
Na_2O	2.48	2.63
K_2O	1.49	1.52
P_2O_5	0.40	0.41
S	0.08	0.09
H_2O+	1.67	1.19
H_2O+	0.35	0.57
CO_2	0.39	0.27