

## **GRANULITE FACIES VESTIGES IN THE VIJAYAN COMPLEX, SRI LANKA: NEW PETROLOGICAL AND GEOCHEMICAL EVIDENCES**

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The Precambrian basement of Sri Lanka is subdivided into four major terrains, from northwest to southeast: The Wannai Complex (WC), the Kadugannawa Complex (KC), the Highland Complex (HC) and the Vijayan Complex (VC). The granulite facies HC has been studied in detail where UHT with T of up to 1150°C is reported and U/Pb dating of zircon suggests metamorphism at ~550 Ma. In contrast to the HC, the metamorphic history of the VC is poorly understood. The age of metamorphism in the VC is similar or slightly older than in the HC, and the grade of metamorphism seems to be high as well. Garnet-bearing gneisses, as well as charnockitic layers in migmatitic orthogneisses in the VC investigated during the present study suggests up to 900 – 930°C and 8.4 -8.9 kbar from conventional geothermo-barometry, including feldspar thermometry as well as P-T modelling using PerpleX on several well suited samples from different parts of the VC. However, pseudo-section modelling suggests conditions, which are lower for some samples compared to feldspar thermometry and garnet – plagioclase – quartz barometry (e.g., ~740°C and 9 kbar for the central area of the VC). The data obtained, especially feldspar thermometry, indicates that at least parts of the VC have seen a granulite facies peak metamorphic event. In addition to the geothermobarometric results, comprehensive geochemical data were obtained for more than 20 samples. The investigated gneisses were derived from igneous precursor rocks such as granites, granodiorites and quartz monzonites. Major element distribution display clear negative trends in Fe<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, CaO and MgO, typical for calc alkaline suites. Trace element distributions follow expected magmatic differentiation trends. However, a suite of clinopyroxene-bearing granitic gneisses may have a different origin seen in unusual enrichments in Nd, Y, and Zr.

Recently, VC is interpreted as a Grenville-age magmatic arc with emplacement ages of 1100 – 1000 Ma. The Irumide belt of East Africa closely correlates with VC with respect to ages of magmatic intrusion, metamorphic overprint and geochemical signature. The VC has been overprinted by high grade metamorphism that led to widespread migmatite formation. This tectono-metamorphic event was part of the Pan-African orogeny during which the Sri Lankan domains were finally assembled and amalgamated to the Gondwana supercontinent. Sri Lanka, with its central position within the Africa-India-Madagascar and East Antarctica collage of the supercontinent Gondwana, provides essential insights into the Neoproterozoic/Cambrian Pan african tectonic event. In respect to that the high-grade basement of Sri Lanka is interpreted as a crustal segment of East Gondwana.

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