

**STRUCTURE, GEOCHRONOLOGY AND GEOCHEMISTRY  
OF THE KADAVUR DOME, SOUTHERN INDIA.**



**A thesis presented to the  
School of Geology and Geophysics,  
University of Adelaide,  
by William Teale, 2010**

## Abstract

An Investigation of the structure of the Kadavur Dome in India's Southern Granulite Terrain has revealed an absence of domal features, and instead evidence for poly-deformational folding and thrusting. Zircon U/Pb analysis by Laser Ablation Inductively Coupled Mass Spectrometry (LA-ICPMS) reveals that the quartzites of the Kadavur Valley in the north of the Madurai Block were deposited between the late Palaeo- and early Neoproterozoic. The depositional age and the detrital zircon populations found in the Kadavur quartzites are analogous to the depositional age and detrital zircon populations found in the Itremo Group of central Madagascar, which has been identified as a part of the former continent Azania. Metamorphic zircon rim analyses of Kadavur quartzites yield dates of ~840ma and ~882 Ma. These rims are interpreted as a result of contact metamorphism induced by the intrusion of nearby anorthositic gabbros, dated in this study at  $825 \pm 17$  Ma. Thermal Ionisation Mass Spectrometry (TIMS) on whole rock samples of the igneous suite present in the Kadavur area reveal negative  $\epsilon_{Nd}$  values, while evidence of crustal contamination has been found by both Sensitive High Resolution Ion Microprobe (SHRIMP) analysis of oxygen isotopes and LA-Multicollector-ICPMS analysis of Lu/Hf isotopes. Thin section analysis reveals that the igneous suite is divided mineralogically into two broad groups. Major, trace and rare earth element (REE) geochemical analysis of these groups shows that they are also divided chemically. Geochemical discrimination plots of these samples suggest an Island Arc Basalt/Tholeiite petrogenesis. Of particular interest is a felsic gneiss sampled in the Kadavur Valley that has been interpreted as either a tuffaceous/volcanoclastic meta-sediment or felsic intrusive. The implication of this sample being a tuffaceous meta-sediment is that its age would date the Kadavur sequence and hence date the Itremo Group.

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