Metamorphic and geochronological constraints from a proposed continental suture in southern India

Elizabeth Metz

Supervisors: Martin Hand and David Kelsey
Centre for Tectonics, Resources and Exploration (TRaX)
Department of Geology and Geophysics
School of Earth and Environmental Sciences
University of Adelaide, South Australia
elizabeth.metz@student.adelaide.edu.au

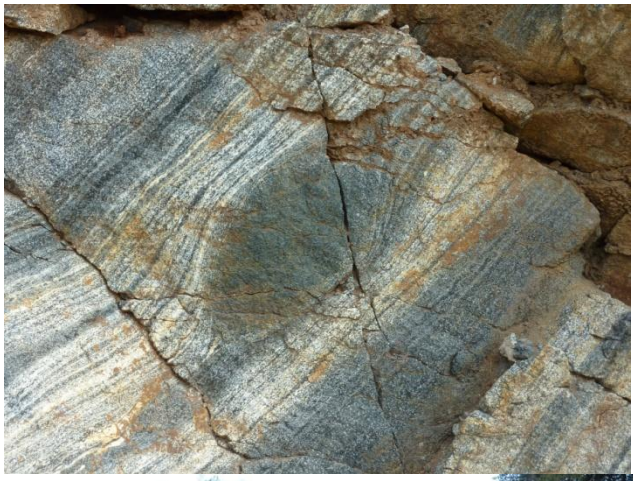

Table of Contents

Metamorphic and geochronological constraints from a proposed continental suture in southern India

Elizabeth Metz

Supervisors: Martin Hand and David Kelsey
Centre for Tectonics, Resources and Exploration (TRaX)
Department of Geology and Geophysics
School of Earth and Environmental Sciences
University of Adelaide, South Australia
elizabeth.metz@student.adelaide.edu.au

Abstract

The Palghat-Cauvery Shear System (PCSS) has been proposed as a major suture in the assembly of Gondwana, delineating the site of closure of the Mozambique Ocean. Evidence of an 830 °C and 14 kbar peak metamorphic event has been identified in the Namakkal area, central PCSS. This event is associated with late Mesoproterozoic to early Neoproterozoic Sm-Nd age constraints recorded in the cores of 3000 and 5000 µm diameter garnets. Further *P-T* constraints, retrieved from structurally-defined younger mineral assemblages associated with partially reset Sm-Nd ages varying between 870.7±3.9 Ma and 683.3±3.0 Ma and moderately prolonged cooling periods of ~30 Myr, indicate that the central PCSS underwent a long-lived period of high-pressure amphibolite facies metamorphism, eventually heating to granulite facies, consistent with the Gondwana-forming suture hypothesis. This evidence supports the model for an early Neoproterozoic protolith metamorphosed during the Pan-African in a collision event for the Palghat-Cauvery Shear System.

Key words: Palghat Cauvery Shear System, South India, Gondwana, Neoproterozoic, Cambrian, Sm-Nd, thermobarometry