

A complex terrane accretion process shaped the southernmost part of Peninsular Indian

A publication by Vijaya Kumar and others in the Bulletin, Geological Society of America demonstrates that southernmost part of the Indian peninsula consists of different crustal terranes that formed in a 2 Billion Year-interval between ~2.5 to 0.5 Ga. This paper documents charnockite protolith ages based on precise U-Pb zircon age dating as well as zircon Hf-isotopic and trace element compositions on charnockite orthogneisses from the Madurai, Trivandrum and Nagercoil blocks. The data, synthesized in the figure indicate four major magmatic episodes at ca. 2.62–2.46 Ga, ca. 2.05–1.84 Ga, ca. 1.0–0.9 Ga, and ca. 0.80–0.76 Ga., where major juvenile additions to the crust occurred during the 2.0 Ga and 1.0 Ga episodes. The terrane amalgamation and regional high-grade metamorphism took place during the Ediacaran-Cambrian Period (770-500 Ma). The new data corroborate the model that southern India lay within a Himalayan-scale collision orogen, the East African Orogen occupying parts of Eastern Africa, Madagascar, India, Sri Lanka and Antarctica during the Ediacaran-Cambrian Period.

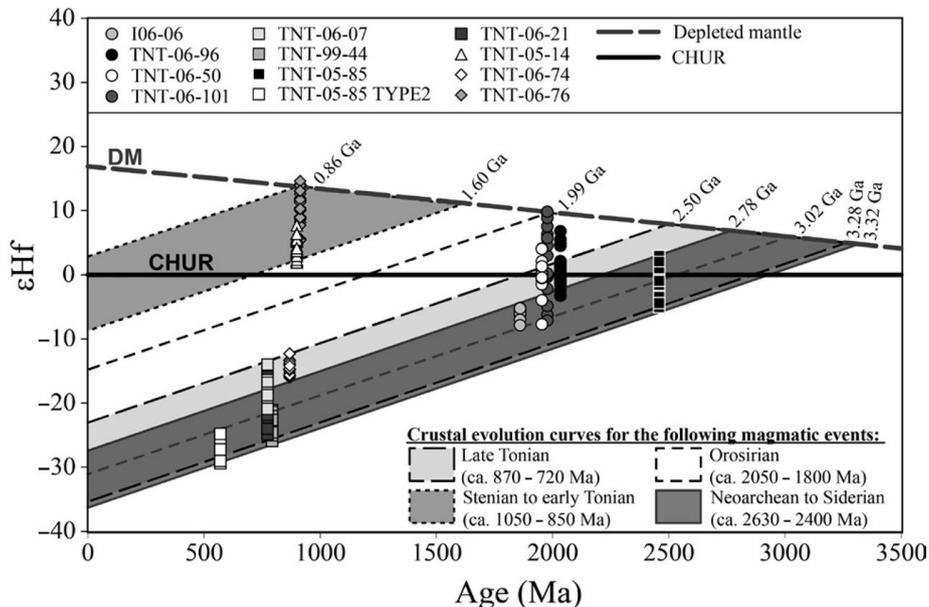


Fig. : U-Pb age vs. $\epsilon_{\text{Hf}(t)}$ representation of the zircons from charnockite orthogneiss samples from different spatio-temporal groups in the Madurai, Trivandrum, and Nagercoil blocks of the Southern Granulite Terrane. DM—depleted mantle; CHUR—chondritic uniform reservoir.

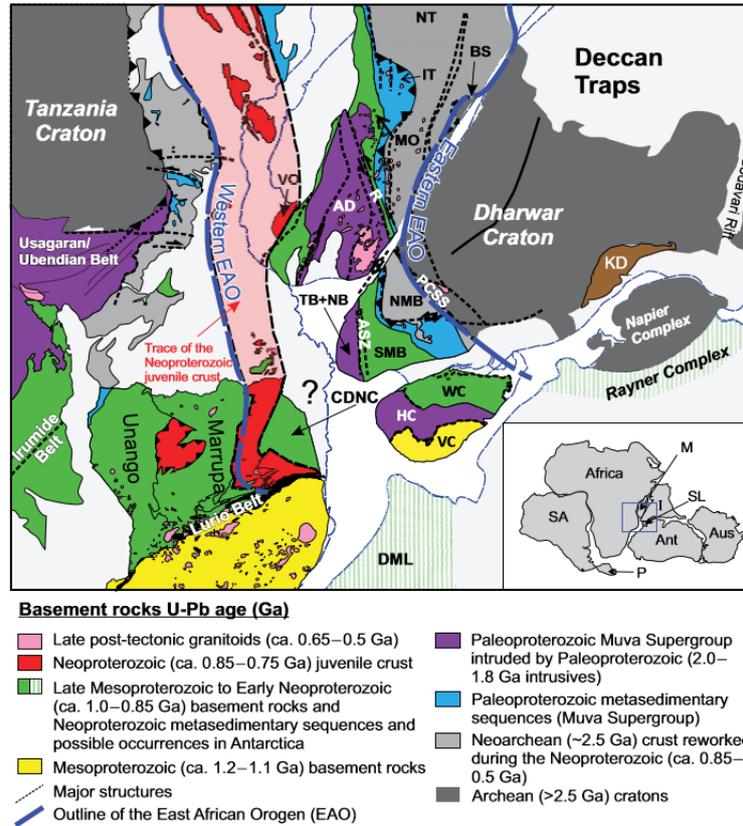


Figure: Geological sketch showing different Precambrian terranes and major shear/ suture zones within the different continental fragments in a Gondwana reconstruction and their potential correlation with terranes in southern India. The major geological blocks, formations, and structures include: NT—Antananarivo block; IT—Itermo Group; MO—Molo Group; AD—Androyen block; VO—Vohibory block; CDNC—Cabo Delgado nappe complex; BS—Betsimisaraka suture; R—Ranotsara shear zone; PCSS—Palghat-Cauvery shear system; ASZ—Achancovil shear zone; the eastern and western limits of East African orogen (EAO); NMB—northern Madurai block; SMB— southern Madurai block; TB+NB—Trivandrum and Nagercoil blocks; WC—Wanni complex; HC—Highland complex; DML—Dronning Maud Land; KD—Krishnagiri domain.

For Further Details: T. Vijaya Kumar, Y. J. Bhaskar Rao. Bulletin, Geological Society of America, 2016, doi: 10.1130/B31474.1