Transition from Accretionary to Collisional orogenesis in the Central Indian Tectonic Zone: Linking Columbia with Rodinia Supercontinent Assembly

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Although, significant progress has been made over the years to understand the assembly, configuration and components of the Palaeoproterozoic and Late Mesoproterozoic supercontinents, Columbia and Rodinia, the nature of the supercontinent tectonics in the intervening time period is debatable. In this work, we address this issue using integrated metamorphic and geochronological studies from the Central Indian Tectonic Zone (CITZ).

Meta-tuffs of the Mahakoshal belt from the northern margin of the CITZ record an andalusite facies, low-P/moderate-T regional metamorphism, which has been dated at 1740±46 Ma (monazite chemical age; MSWD=15, 2 sigma error). SHRIMP U-Pb zircon and monazite chemical age dating of garnetiferous, biotite tonalite (cf. Tirodi biotite gneiss) and metapelite migmatites reveal broadly co-eval arc magmatism (at ~1617.6±6.3 Ma) and deep crustal, ultrahigh-temperature (UHT) granulite metamorphism along a counter-clockwise metamorphic P-T path (at ~1.6 Ga), in two spatially associated, northern-central and southern domains of the Sausar Mobile Belt (SMB). Barrovian, low-medium grade metapelites of the Sausar Group from the central domain and the high-grade metapelite migmatites and associated syn-metamorphic magmatic charnockites from the northern domain of the SMB, on the other hand, record characteristic Grenvillian metamorphic and magmatic age domains at ~1062±13 (MSWD=1.2) to ~993±19 Ma (MSWD=0.16), ~992±10 Ma (MSWD=1.5) and ~934±10 Ma (in order of rock sequence). The findings are consistent with the evolving character of the *Central Indian Orogenesis* from one of Palaeoproterozoic to Early Mesoproterozoic accretionary orogenesis along the margins of the Columbia supercontinent to classical Late Mesoproterozoic, continent-continent collisional orogenesis. The latter is linked to the assembly and the growth of the Greater Indian landmass, in the Rodinia supercontinent.