

How strong are the Pan-African signatures from the northern part of the Eastern Ghats Belt?

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The northernmost segment of the Eastern Ghats Mobile Belt (Domain 4) occurs on the southern margin of the Rengali Orogenic Belt and is separated from the southern segment (Domain 3) by the Mahanadi Shear Zone. Domain 4 preserves poly-deformed and poly-metamorphosed garnet-sillimanite-biotite-quartz-feldspar bearing khondalites that are interspersed with different generations of charnockites.

A gamut of monazite ages from both the khondalites and the charnockites imply that the charnockites were emplaced between 1100-900 Ma during the second phase of deformation and partial melting of the associated khondalites. Nevertheless, both the khondalites and the charnockites record a partial melting event between 880-750 Ma, the period that represents break up of the of the Rodinia. Domain 3 evolved with the Prydz Bay region of East Antarctica during 990-900 Ma and was amalgamated to the peninsular India during the final assembly of Rodinia in India-Antarctica sector. During the breakup of Rodinia, Domain 3 was fragmented and separated but again amalgamated to the Eastern Ghats Belt during the assembly of East Gondwana during Pan-African time.

Records of similar aged tectonic events from Domains 4 and 3 imply that both the segments underwent partial melting during 990-900 Ma. Nevertheless, the Domain 4 shows evidences of upper amphibolite facies partial melting while Domain 3 shows evidences of UHT metamorphism at the mid-crustal levels.

Although, the signatures of Pan African ages are recorded from the pelitic schists caught up within the Rengali orogenic Belt and also within the khondalites south of the Mahanadi Shear Zone, in Domain 3, the monazite populations with Pan-African age ranges like ~650-550 Ma are very less abundant within the lithological units of Domain 4.

Hereby it may be proposed that in comparison to that of the Domains 3 and 2, the lithodemic units of Domain 4 the Eastern Ghats Mobile belt show a distinct evolutionary history within which the Pan African history is poorly shown.