

## Proterozoic crustal evolution of northern domain of the Eastern Ghats Mobile Belt, India

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The Eastern Ghats Belt (EGB) is considered as a collage of four isotopic domains [1]. The Pan African Rengali Orogenic Belt (isotopic domain 4) at the northern part of EGB formed during its accretion with the Singhbhum craton, the Neoproterozoic Gangpur Schist Belt and Bastar craton [1]. In contrast, the geochronological and petrological data from the granulite facies lithologies in the Chilka Lake area of EGB (isotopic domain 3), implies collision and final amalgamation with Indian craton between 990-900 Ma [2]. In addition, monazite ages obtained from charnokite from adjoining areas near Mahanadi Shear Zone (MSZ), constrain age of shearing between 800-750 Ma. Such dataset questions tectonic models suggesting that isotopic domains of EGB evolve as a coherent crustal unit prior to their amalgamations with peninsular India.

In order to address such controversies, in this study we have carried out detailed petrochronological studies along multiple N-S transects across isotopic domain-4 to MSZ in the north. The garnet-sillimanite-bearing khondalites and charnokites are the dominant lithologies and are intensely deformed and metamorphosed. Around ~ 100 µm monazites are dispersed throughout the studied samples. The EPMA monazite ages from the samples north of MSZ and within the MSZ show two age clusters at ~1000-950 Ma and ~850-800 Ma. Geochronological studies from Chilka Lake area (isotopic domain -3) indicate partial melting at ~988 Ma, followed by decompression and cooling events spanning from 780-750 Ma and heating at 550 Ma [2].

A close comparison of the geochronological data suggest Proterozoic evolutionary history of isotopic Domain 4 and Domain 3 of EGB was distinct in the Proterozoic time until their final amalgamation with peninsular India.

[1] Bhattacharya *et al.* (2016) *Lithos.* **263**, 192-212. [2] Bose *et al.* (2016) *Lithos.* **263**, 169-189.