Geotransect across south of Singhbhum Craton-Rengali Province-Eastern Ghats Province, India: Multiple orogenic belts of contrasting age and tectonic evolution of Eastern Indian terrane

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South- to southwest of Archean Singhbhum Craton, presently is juxtaposed by high-grade metamorphosed and complexly deformed deep- to intermediate-depth continental crustal rocks. This craton-margin area preserves the rock record of continental evolution from the Neoarchean Era to the Ediacaran-Cambrian period. In the present study, we shall integrate the petrological, structural, and geochronological data along a geotransect from the southern part of the Singhbhum Craton, through the Rengali Province up to the Phulbani Domain of Eastern Ghats Province. The cratonic core of the Singhbhum Craton is composed of granitoids and is surrounded by supracrustal belts of Paleoarchean to Mesoproterozoic ages. The southern margin of the Singhbhum Craton is composed of high-grade granulites along with amphibolite-greenschist facies metasedimentary and metavolcanic rocks, collectively termed as the Rengali Province which represents a Neoarchean orogenic belt. The Rengali Province was thrusted over the Singhbhum Craton along the Sukinda thrust-Barakot-Akul fault system during the Rengali orogeny (ca. 2.83–2.78 Ga). Moreover, this province represents a deeper section of the Singhbhum Craton which was structurally emplaced in the shallow level possibly by a transpression-dominated tectonic setting at ca. 0.5 Ga. However, the boundary between the Rengali Province and the Eastern Ghats is enigmatic because both the terranes have preserved broadly similar metamorphic rocks and the possible contact zone is concealed below a Gondwana sedimentary basin.

Here we shall highlight the new zircon and monazite age data from the Rengali Province and the northern-northwestern parts of the Eastern Ghats (including Phulbani Domain) revealing the tectonic evolution of the Rengali Province and its eventual juxtaposition to the Eastern Ghats Province. This provides important clues to the long yet punctuated evolution of the Eastern Indian terrane.

Keywords: Archean Singhbhum Craton; Craton-margin multiple orogenic belts; Rengali Province-Eastern Ghats Province; Zircon and monazite geochronological data

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