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# Evidence of pre-Gondwana tectono-thermal event from the Bhilwara Supracrustal units of Rajasthan, north-west India

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In the Indian subcontinent, two pre- Gondwana (pre- Pan African) orogenies are mostly recorded and well-studied from the Eastern Ghat Mobile Belt: (i) >1.1 Ga and (ii) ∼950 Ma. During the ∼950Ma orogeny, the pre-existing granulites have been re-melted under granulite facies conditions at ∼8 kbar, 800-850ºC in the sillimanite stability field with formation of garnet-orthopyroxene in the restites.

In this study we report garnet-sillimanite bearing and garnet-staurolite-kyanite bearing supracrustal rocks from the Bhilwara Supergroup in Rajasthan, N-W India. Peak assemblage in the garnet-sillimanite bearing metapelite is: garnet-sillimanite-biotite-plagioclase-quartz. Garnet porphyroblasts contain sillimanite-biotite bearing inclusion trails. Matrix foliations consist of biotite, sillimanite, quartz. Peak pressure-temperature calculated for garnet formation are ∼7-8 kbar, 800ºC. Garnet is replaced along the margins by biotite during retrogression. Within garnet-staurolite-kyanite schist, peak assemblage is formed of garnet-staurolite-biotite-kyanite quartz, where garnet and staurolite occur as porphyroclasts and the matrix foliations are formed of kyanite-biotite-quartz. Mineral assemblages and compositions in the rock indicate peak pressure-temperature >8 kbar, 600ºC. The ages of the metamorphic events at sillimanite and kyanite facies are not well-constrained. However since the Bhilwara supracrustal units occur close to the Grenvillian orogenic belt at Sandmata Complex, the timing of the peak metamorphism can be constrained at ∼1.0 Ga.

Garnet-sillimanite-bearing assemblages noted in the Bhilwara Supracrustal Belt, has also been noted from the Grenvillian belts in the Eastern Ghat Mobile Belt. So the question that needs to be addressed is whether the Grenvillian orogenic belt recorded form the Sandmata Complex in Rajasthan and that of the Eastern Ghat Belt had been a continuous orogenic belt? Such possibilities can be addressed by establishing detailed structural analyses from the two domains. Such study can provide well-constrained facts about the position of Indian sub-continent in the reconstruction of Rodinia and Gondwana.