CRUSTAL ACCRETION ACROSS THE CENTRAL INDIAN TECTONIC ZONE: CONSTRAINTS FROM THE GANGPUR SCHIST BELT, INDIA

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The Gangpur Schist Belt (GSB), sandwiched between the Singhbhum Craton and the Chottanagpur Gneissic Complex (CGC) in eastern India, is a part of the Central Indian Tectonic Zone (CITZ), thought to be the accretion zone between the northern and southern blocks of the Indian Shield. The schist belt is subdivided into a southern Bonai Group and a northern Gangpur Group of rocks. In the Gangpur Group, two metamorphic events are identifiable, the first (M_1) stabilized high-Mn garnet (Grt_1), porphyroblastic biotite, tourmaline and ilmenite at peak P-T conditions of 11±2 kbar and 571±37ºC [1]. The second metamorphism (M_2) led to the growth of low-Mn, high-Mg garnet (Grt_2), and staurolite at P-T conditions of 648±25 ºC and 11±3.5 kbar [1]. Chemical dating of monazite furnish ages of 1384±17 Ma and 963±3 Ma for the M_1 and M_2 metamorphic events. Monazites in schists of the Bonai Group also records two prominent metamorphic events at 1548±11 Ma (M_1) and 1401±9 Ma (M_2) with a few grains giving ca. 1000 Ma ages. The M_1 event formed high Mn-garnet (Grt_1) + biotite at P-T conditions of 9.5 kbar and 567 ºC and the M_2 event stabilized low-Mn, high-Mg garnet (Grt_2) + staurolite + muscovite at 604 ºC and 10 kbar. The GSB rocks are intruded by syn to post tectonic S-type granites and pegmatites. Monazites in granites from the Gangpur Group furnish an age of 973±5 Ma correlatable with the M_2 metamorphic event. In contrast, monazite from granites intruding the Bonai Group give 1345±31 Ma ages and hence are post M_2. The results indicate a two-stage accretion history across the GSB. It is suggested that the Bonai Group accreted to the Singhbhum Craton at 1550 Ma. The amalgamation of Gangpur and Bonai Group to form the GSB took place around 1400 Ma. The Singhbhum Craton- GSB composite accreted with the CGC at around 950 Ma. The geodynamic scenario is comparable to the evolution of the North Singhbhum Mobile Belt and correlatable with orogenic events along the southern margin of the CITZ [2] [3].

[1] Holland *et al.* (1998). *J. Met. Geol*. **16**, 309–343. [2] Bhowmik *et al.* (2011). *Geol. J*. **46**, 574-596. [3] Rekha et al. (2011). *Precambrian Res.* **187**, 313-333.