ABAESTIRE

The present study aims towards an understanding of P-T evolution of the high-grade cordierite - garnet bearing metapelites of the Umpyrtha–Patharkhammah area, Meghalaya and to correlate different metamorphic events with EPMA monazite and xenotime dating in order to identify the significance of the terrain in view of global scale Pan-Gondwanic reconstruction. The metapelites show three phases of deformations (F₁, F₂ and F₃ fold deformations) and four distinct metamorphic events (M₁, M₂, M₃ and M₄) where the M₂ is the peak metamorphic event characterized by granulite facies condition with high temperature anatexis. The peak metamorphic (M₂) condition is represented by a temperature range, 706 -785°C at 5.8 kbar while P-T values of M₃ retrogression, a regionally developed fabric forming event (S₂) is at 670°C and ~ 5.3 kbar. The M₄ is characterized by cordierite-corona forming episode which shows P-T values at 620°C and ~3 kbar indicating isothermal decompression (ITD) path at the rate of 2.8 kbar / 70°C. The ITD path strongly favors the continental collision model for the metamorphic events of the study area.

The EPMA monazite and xenotime dates cluster respectively at 532 ± 3 Ma and 498 ± 13 Ma from the Umpyrtha- Patharkhammah metapelites, irrespective of the textural position of monazite and xenotime. The similarity in ~500Ma geological history between the Prydz Bay and the study area, particularly characteristic ITD path in late-retrograde metamorphic episodes and emplacement of post- tectonic granitoids both in the study area and the Prydz Bay areas in the east Antarctica along with other compelling evidences as reflected from the present study such as high temperature melting and metamorphism followed by intense compressive deformations and regionally developed NNE directed sinistral shearing undoubtedly have placed the Umpyrtha-Patharkhammah region as one of the most strategic areas in the final amalgamation of the Indian plate with the Australo-Antarctic plate during Pan- African period.