

A review of imprints of Pan-African orogenic event in East Antarctic Shield: linkages and correlation

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The Pan-African event which was initially interpreted to be a tectono-thermal event in the African subcontinent has been widely recognised as the main coalescing event of the Gondwanian crustal segments. In the context of Gondwana, the present-day East Antarctic Shield (EAS) can be pictured as an amalgam of Indo-Antarctic, Australo-Antarctic, and Africo-Antarctic domains with a complex network of Pan-African aged mobile belts defining the terrane boundary sutures as well as bordering older cratons^[1]. The prominent mobile belts include Prydz-Denman-Darling orogen^{[2][3]} in Princess Elizabeth Land (PEL) and the extension of the East African orogen in Dronning Maud Land (DML)^[3] (Fig. 1). Geophysical evidence has indicated the presence of an Indo-Australo-Antarctic Suture^[4] joining the Eastern DML with PEL- Wilkes Land (Fig. 1). The cryptic relation of the cross-cutting Pan-African belts with the hidden Gamburtsev Subglacial Mountains remains a key research question both in terms of the role of GSM in Gondwana amalgamation as well as in terms of crustal affinity to other Gondwana counterparts. This work collates the available metamorphic, geochemical and geochronological data in the time frame of 800-400 Ma, manifesting the Pan-African event witnessed by multiple microcontinents of East Antarctic Shield either as a thermal imprint or a UHT-HT metamorphic event with or without local granite emplacement. This is an attempt to understand the crustal dynamics that pertained to the widespread impact of the Pan-African event in EAS, marking out gaps and key questions for future geological investigations.

References:

[1]Fitzsimons, I. C. W. "A review of tectonic events in the East Antarctic Shield and their implications for Gondwana and earlier supercontinents." *Journal of African Earth Sciences*(2000): 3-23.

[2]Fitzsimons, I. C. W. "Grenville-age basement provinces in East Antarctica: evidence for three separate collisional orogens." *Geology* (2000): 879-882.

[3]Arora, Devsamridhi, et al. "Insights into geological evolution of Princess Elizabeth Land, East Antarctica-clues for continental suturing and breakup since Rodinian time." *Gondwana Research* 84 (2020): 260-283.

[4]Bo, Sun, et al. "Assembly and breakup of Indo-Antarctica revealed." In: *Abstracts, XIII International Symposium on Antarctic Earth Sciences: (2019)*.

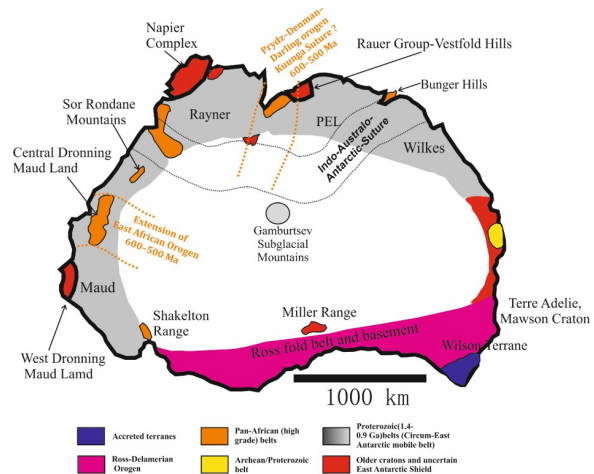


Figure 1: Map of East Antarctic Shield showing the major geological terrains based on inferences from exposures of rock mountains in the coastal areas, modified from [1][2][3][4].