

Distribution of the Pan-African Domains in East Antarctica and Adjacent Areas



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Abstract: The Pan-African event is widely distributed in East Antarctica craton. Many terranes or outcrops of the craton bear more or less signs of the event. From characteristics of the shear zones, granites, pegmatites, feature and time of high grade metamorphism and detrital zircon ages peaks of the downflowing sediments from the plateau, the Pan-African event in the East Antarctica and adjacent areas in the Gondwana reconstruction, like SE Africa, southern India and SW Australia, was distributed as special zones or areas in many localities, including both the coastal regions and interior of the East Antarctica. In geochemistry, the granites are generally anorogenic, occasionally

with some gabbros or dolerite dykes, showing sign of bi-modal feature. The water or fluid available along the shear zones were responsible for retrogression of the earlier, e.g., Grenville age, high grade outcrops to later Pan-African amphibolite facies metamorphism. Meanwhile, the Pan-African event has influenced most isotopic systems, including the U-Pb, Sm-Nd, Rb-Sr and Ar-Ar systems, giving younger apparent ages. Manifestation of the Pan-African event is distributed from possibly locally granitic magmatism, to wider medium-high grade metamorphism, and mostly widespread in resetting for some isotope systems, suggesting the prevailing thermal effect.

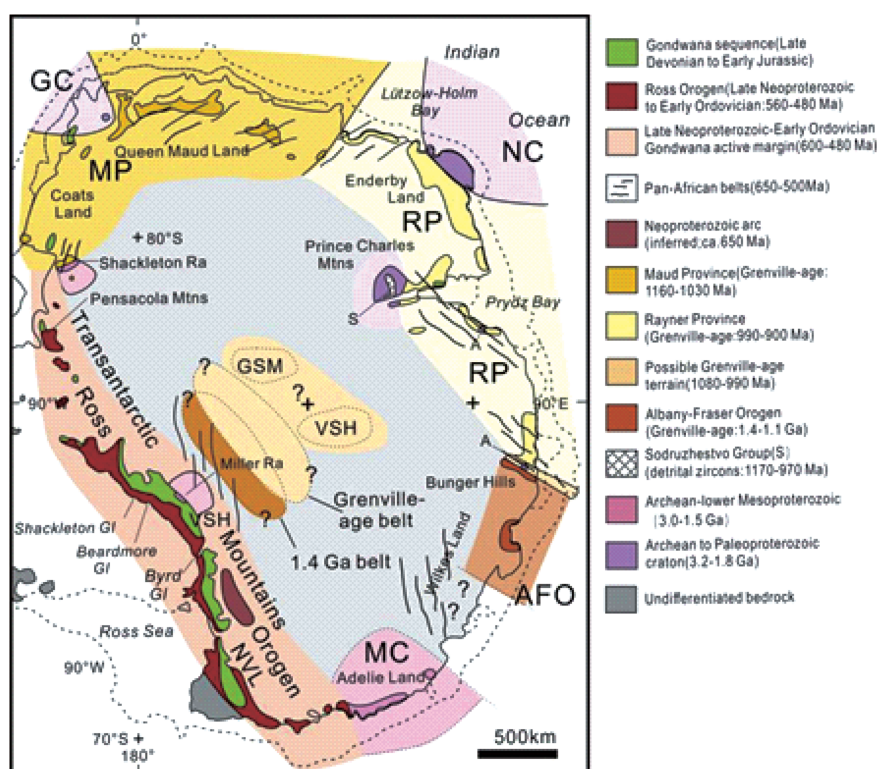


Fig. 1. Map of the East Antarctic basement showing inferred provinces, including the Grenville and Pan-African demonstration domains.

The dashed lines mean proposed sutures or shear zones. Abbreviations: AC–Achancovil Suture Zone; BH–Bunger Hills; DG–Deman Glacier; EG–Eastern Ghats Land; GC–Grunehogna Craton; GDK–Gulden Draak Knoll (magnified); GSM–Gamburtsev Subglacial Mountains; H–Highland Complex; LH–Lützow-Holm Bay; MC–Mawson Craton; MD–Madagascar; NVL–Northern Victorian Land; PB–Prydz Bay; PC–Palghat-Cauvery Shear Zone; RC–Rayner Complex; RZ–Ranotsara Shear Zone; SM–Shillong-Meghalaya Plateau; SPCM–Southern Prince Charles Mountains; SR–Shackleton Range; VJ–Vijayan; VSH–Vostok Subglacial Highlands; W–Wanni Complex; WI–Windmill Islands; WL–Wilkes Land.

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Before Gondwana formation, local depressions in the East Antarctica could be filled with sediments, implying the initial breakup period of the Rodinia. The later Pan-Gondwana counterrotating cogs shaped the interstitial fold belts between continent blocks and formed a set of shear zones. The mafic underplating in the Gondwana may be responsible for the widespread granites, pegmatites and more or less isotopic resetting due to strong thermal effect from the deep. That is, the Pan-African event is a possible response of the plate movement surrounding the continent swarms in the non-stable interior of the consolidated Gondwana. The Pan-African event may be an overwhelmingly extensional and transcurrent tectonics in mechanism.

Key words: Pan-African event, distribution, granite, metamorphism, East Antarctica

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