

Re-examination of metamorphic and geochronologic events in eastern Dronning Maud Land and Enderby Land, East Antarctica: current status and future perspectives

*Tomokazu Hokada^{1,2}, Sotaro Baba³, Atsushi Kamei⁴, Ippei Kitano⁵, Prayath Nantasin⁶, Nugroho Setiawan⁷, Davaa-ochir Dashbaatar⁸, Yoichi Motoyoshi^{1,2}, Yoshikuni Hiroi¹, Yasuhito Osanai⁵, Daniel Dunkley, Kenji Horie^{1,2}, Mami Takehara¹, Kazuyuki Shiraishi¹

1. National Institute of Polar Research, 2. The Graduate University for Advanced Studies (SOKENDAI), 3. University of the Ryukyus, 4. Shimane University, 5. Kyushu University, 6. Kasetsart University, 7. Gadjah Mada University, 8. Mongolian University of Science and Technology

Eastern part of Dronning Maud Land in East Antarctica comprises of the multiple high-grade metamorphic terranes as major constituents of Gondwana supercontinent. The Lützow-Holm Complex in eastern Dronning Maud Land has been believed to be typical of continental collision metamorphic belt of which amphibolite to granulite (partly UHT) facies regional metamorphism and clockwise P-T trajectory supported by the widespread occurrence of sillimanite with prograde kyanite and retrograde andalusite (e.g., Hiroi et al., 1983). However, it requires re-evaluation of the metamorphic processes by recent finding of nanogranite/felsite inclusions (Hiroi et al., 2014) and unusual occurrence of kyanite and andalusite. Major 550-520 Ma metamorphic age episode was indicated by SHRIMP zircon geochronology (e.g., Shiraishi et al., 1992; 1994; 2003) and was recently refined the early metamorphic events at >600 Ma (Hokada and Motoyoshi, 2006; Dunkley et al., 2014).

Archaean and Proterozoic pre-Gondwana history is preserved in the Napier Complex and the Rayner Complex in Enderby Land with the earliest geologic history traced back to >3.8 Ga (e.g., Harley and Kelly, 2007). Western Rayner Complex located between Lützow-Holm Complex and Napier-Rayner Complexes is key for the linkage between Gondwana and pre-Gondwana areas. All these areas were experienced granulite-facies partly UHT metamorphism.

This study will present our current understanding of the metamorphic and geochronologic evolution of these areas and the recent geologic field survey at Lützow-Holm, Western Rayner, Rayner and Napier Complexes during 2016-2017, and also future perspectives.

Keywords: Antarctica, Gondwana, supercontinent, metamorphism, geochronology