東南極の基盤地質研究

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Basement geological research of East Antarctica

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Dynamics of crustal formation and evolution through the Earth's history is one of fundamental questions. The Antarctic Continent preserves long geologic history over a period of 3 billion years, and traces of the Gondwana supercontinent. Fragmentation of Gondwana can be found on the seafloor of the Antarctic Ocean that surrounds the Antarctic continent. Therefore, the Antarctic region is ideal field for studying continental evolution from Archaean to Phanerozoic.

Geology program of the Japanese Antarctic Research Expedition (JARE) started in 1957 when the JARE's first expedition landed at Soya Coast in Dronning Maud Land, East Antarctica. Since then, the JARE's geology programs have covered the area of longitude between 10°E and 55°E of the Antarctic continent, and published total 39 sheets of geological map series.

For the next stage of the JARE scientific program, we propose research plan on the three areas - such as (1) Syowa Station area, (2) Sør Rondane Mountains, and (3) Enderby Land. Enderby Land is unique area where ancient ~4000-3800 Ma SHRIMP zircon U-Pb ages have been reported from the Napier Complex (Compston and Williams, 1982; Black et al., 1986; Kelly and Harley, 2005). It is, however, still not yet fully understood the temporal and spatial distributions of Archaean crustal components in this part, and most of the crustal components are probably younger than c.3000-3300 Ma (Harley and Kelly, 2007; Hokada et al., 2004, 2008; Horie et al., 2012). Latest Archaean ultrahigh temperature (UHT) metamorphism reported in this area has also attracted interests worldwide. Based upon the accumulated geologic, petrologic, geochemical and geochronological information (Ishizuka, 2008), we will make the next step forward the integrated field program targeting the Napier Complex, Rayner Complex and Western Rayner Complex in Enderby Land, East Antarctica.

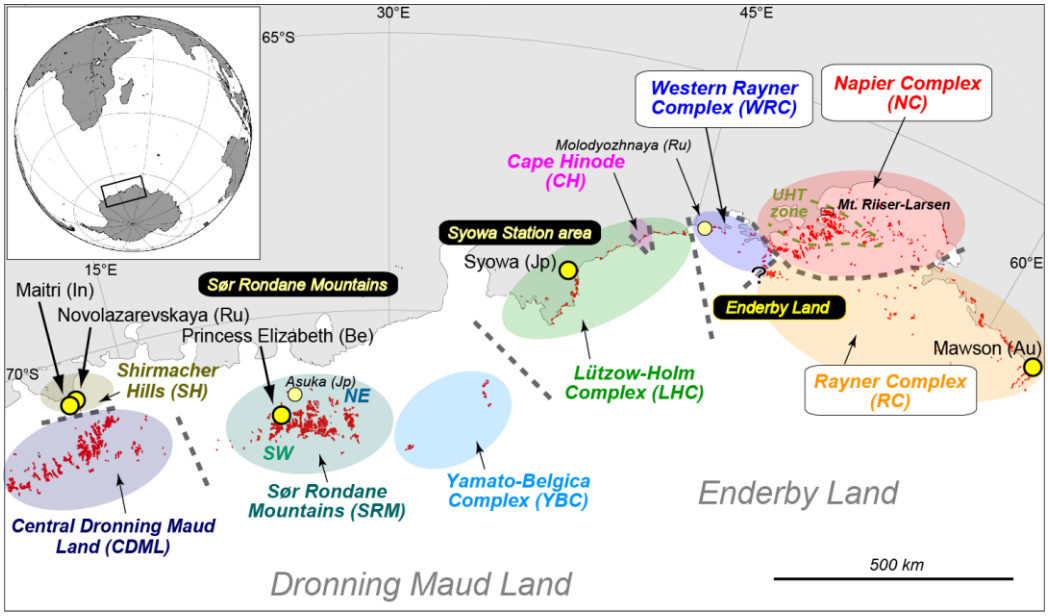

Figure 1. Simplified geologic unit map in eastern Dronning Maud Land and Enderby Land, East Antarctica. .

In addition to the basement geological research, geophysical studies by using aircraft and research vessel are also important as estimating the inland and seaward extension of geological structures and tectonic provinces around the Enderby Land. Our research project will elucidate tectonic history and evolution and fragmentation of the continent since Archaean around the Enderby Land from integrated studies with geology and geophysics, and provide new constrains on global dynamics.

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