Proterozoic cratonic fragments in western and northern Mongolia: importance in the onset of formation of the Central Asian orogenic belt

*Uyanga Bold[1], Francis Macdonald[2], Yukio Isozaki[1]

1. The University of Tokyo, 2. Harvard University

Despite extensive work on the Paleozoic Central Asian orogenic belt (CAOB), little is known about the initiation and early stages of tectonism. The Zavkhan and Tuva-Mongolia terranes are Proterozoic cratonic fragments with Neoproterozoic to Paleozoic cover sequences that constitute majority of southwestern and northern Mongolia and record the earliest stages of tectonism in the CAOB. Here we present new geochronologic data to constrain Proterozoic to Paleozoic tectonic evolution of the two regions and propose a tectonic scenario for the initiation of orogenesis in the CAOB. Available geochronologic and lithostratigraphic data of the Neoproterozoic through Terreneuvian strata of the Tuva-Mongolia and Zavkhan terranes are similar. The ~ 2 Ga Gargan basement of the Tuva-Mongolia terranes, its overlying ~ 750 Ma Sarkhoi Group volcanics and Neoproterozoic carbonate dominated strata of the Khuvsgul Group are all comparable. We suggest that the two regions have co-evolved geologically and the areal extent of the Proterozoic cratonic fragments in western and northern Mongolia is much vaster than previously estimated. Particularly, orogenesis began around these terranes with arc accretion followed by slab reversal and accretion around Proterozoic cratonic fragments and ribbon continents, which later oroclinally bent and trapped supracrustal material between larger cratons.

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