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PTt history from kyanite-sillimanite migmatites and garnet-staurolite schists from the Bayankhongor area, Mongolia indicates suprasubduction switching from extension to compression during Rodinia assembly

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The tectonometamorphic evolution of the peri-Siberian tract of the Central Asian Orogenic Belt is mainly characterized by Baikalian Late Proterozoic – Early Cambrian cycle related to amalgamation of Proterozoic oceanic and continent fragments to Siberain landmass. Here we present in-situ monazite geochronology linked to *P–T* modelling of micashischsts and migmatite gneisses at the northern part of the Precambrian Baydrag block (central Mongolia) previously considered as a part of Baikalian metamorphic belt. Garnet-sillimanite-kyanite gneiss records first burial to the sillimanite stability at ~725 °C and 6.5 kbar, followed by burial to the kyanite stability at ~650 °C and ~8 kbar. The garnet-staurolite schist records burial to the staurolite-stability at ~620 °C and 6 kbar, followed by a nearly isothermal burial to ~580 °C and 9 kbar. The monazite data yield a continuum of ^{207}Pb-corrected ^{238}U/^{206}Pb dates of c. 926–768 Ma in the Grt–Sil–Ky gneiss, and c. 937–754 Ma in the Grt-St schist. Based on monazite textural positon and internal zoning, the time of prograde burial and peak under a thermal gradient of 28–32 °C/km is estimated at c. 870–890 Ma. It is not clear whether such high grade conditions prevailed until a phase of further burial under a geothermal gradient of 18–22 °C/km and dated at 800–820 Ma. Additionally, monazite with dates of c. 568–515 Ma occurs as whole grains or as rims with sharp boundaries on Grenvillean monazite in Grt-St schist testifying for minor Baikalian overprint. Metamorphic zircon rims with Th/U ratio ~0.01–0.06 in Grt–Sil–Ky gneiss with 877 ± 7 Ma age, together with lower intercepts of zircon discordia lines in both Grt-Sil-Ky gneiss and Grt-St schist further support the Tonian age of high grade metamorphism. The *P–T* and geochronology data show anticlockwise P–T evolution from c. 930 to 750 Ma which is interpreted as a result of thickening of supra-subduction extensional and hot edifice – probably of back arc or arc type. This kind of prograde metamorphism was so far described only on the northern part of the Tarim block and interpreted

as a result of initiation of peri-Rodinian subduction of Mirovoi Ocean. Here, we further discuss geodynamic consequences of a unique discovery of Tonian metamorphism in term of tectonic switch related to initiation of peri-Rodinian oceanic subduction during supercontinent assembly followed by strong mechanical coupling potentially related to onset of Rodinia splitting.