

A-type granites in the western margin of the Siberian Craton: implications for breakup of the Precambrian supercontinents Nuna and Rodinia

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Here we present geochemical and geochronological data from a suite of A-type granites from the complexes of Yenisey Ridge at the western margin of the Siberian Craton [1-9]. They comprise a broad compositional spectrum of rocks that crystallized from high-temperature and anhydrous magmas with high contents of alkalis, REE and HFSE. A rift-related origin for the rocks is favored based on their occurrence as dykes and sills in narrow linear zones along the faults, and geochemical characteristics [10]. We suggest that the emplacement of these rocks took place in intraplate extensional setting, caused by rising mantle plume. Zircon SHRIMP U–Pb analyses coupled with *in situ* U–Th–Pb geochronology of monazite constrain the timing of emplacement of the rift-related granites and suggest two consequential breakup events. The magmatic events at *c.*1380 Ma and 800–720 Ma can be associated with the possible breakup of the supercontinents Nuna and Rodinia. Four distinct age matches between the continents 1380, 800, 750 and 720 million years ago supports the spatial proximity of Siberia and North Atlantic cratons (Laurentia and Baltica) over the long period 1.38–0.72 Ga. Our results are equally compatible with the proposed Neoproterozoic paleogeographic reconstructions of Nuna and Rodinia that have placed southern Siberia adjacent to northern Laurentia, which is supported by reliable paleomagnetic data [11,12] and the continuous record of Proterozoic Large Igneous Provinces [13].

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