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The earliest stages of the Central Asian fold belt continental crust formation: magmatism and paleotectonic reconstructions of the Yenisey Ridge orogen from the southwestern framing of the Siberian craton

Vernikovskaya, A.E.^{1,2}, Vernikovskiy, V.A.^{1,2}, Matushkin, N.Yu.^{1,2}, Kadilnikov, P.I.^{1,2} and Romanova, I.V.^{1,2,3}

¹A.A. Trofimuk Institute of Petroleum Geology and Geophysics SB RAS, pr. Ak. Koptyuga 3, Novosibirsk, 630090, Russia, VernikovskayaAE@ipgg.sbras.ru

²Novosibirsk State University, ul. Pirogova 2, Novosibirsk, 630090, Russia

³Queensland University of Technology, GPO Box 2434, Brisbane, QLD 4001, Australia

Yenisey Ridge orogen, located in the *southwestern framing* of the *Siberian craton*, represents the *northeastern segment* of the Central Asian fold belt. Neoproterozoic magmatic history of the Yenisey Ridge reflects the earliest stages of the tectonic evolution of this belt. A number of Neoproterozoic magmatic events that associate with the Yenisey Ridge formation were determined, based on the geological, geochronological, geochemical and paleomagnetic data. Formation of the Yenisey Ridge started with the process of oblique collision between the Central Angara terrane, the largest terrane within the Yenisey Ridge, and Siberia Craton, marked by emplacement of the earliest collisional granites at 760-720 Ma [1]. Importantly, the Central Angara terrane was at a considerable distance (> 1000 km) from Siberia, based on paleomagnetic measurements from the 880-860 Ma granitoids [2]. The subsequent tectonic processes and accompanying magmatic events in the Yenisey Ridge are associated with evolution of subduction zone, formed at the Siberian margin. Subduction stage of 711-624 Ma recorded simultaneous magmatism within the island arc and the active continental margin of Siberia [1, 3]. The island arc magmatism included volcanics of differentiated magmatic series and plagiogranites from the Priyenisei fault zone that recorded the island arc accretion to the western margin of the Siberian continent. Magmatism at the active continental margin is associated with the emplacement of nepheline and alkaline syenites, carbonatites, Nb-enriched granites and diabase at the Tatarka-Ishimba fault zone, located within the Central Angara terrane and elongated along the western Siberian margin. The alkali-enriched magmatism along the Tatarka-Ishimba fault zone provided a significant input of heat and enriched mantle components (e.g., Nb, Ta). Adakitic and plagiogranitic dikes and small bodies of gabbro-anorthosite, found within the Nb-enriched metabasites of Zimovey massif, are likely to represent another subduction stage at 576-546 Ma. Zimovey massif was formed at the Siberia continental margin within the southern part of the Tatarka-Ishimba fault zone. Paleomagnetic pole, calculated for small magmatic bodies from Zimovey massif, is in agreement with the apparent polar wander path (APWP) of Siberia at the corresponding Neoproterozoic time interval [4]. Furthermore, paleomagnetic data support formation of the Zimovey massif within the uniform paleosubduction system, continued to the Altai-Sayan folded area. This paleosubduction system is located to the southwest of the Yenisey Ridge and is characterized by similar magmatic associations. Our study showed that the formation of the Central Asian fold belt began in the northwestern (in modern coordinates) segment of the Yenisey Ridge, about 760 Ma, where the magmatic events continued until the end of the Neoproterozoic almost without intermission. These processes took place with both remelting of the continental crust material and with additional supply of mantle component since 711 Ma.

References:

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