



The oldest island arc and ophiolite complexes of the Russian Arctic (Taimyr Peninsula)

Antonina E. Vernikovskaya (1,2), Valery A. Vernikovskiy (1,2), Dmitriy V. Metelkin (1,2), Nikolay Y. Matushkin (1,2), Irina V. Romanova (1,2)

(1) Trofimuk Institute of Petroleum Geology and Geophysics, Novosibirsk, Russia, (2) Novosibirsk State University, Russia

Knowing the age of indicator complexes such as island arc, ophiolite, collisional, subductional etc. is extremely important for paleogeodynamic reconstructions. The age along with other geological and geophysical data enables the reestablishing of the positions of terranes of various origins in relation to continental margins and to each other. When studying the issues concerning the ancient Arctida paleocontinent, the nature of terranes and continental plates that compose the present day arctic shelf and submerged ridges it is important to determine the main stages of tectonic events. At the same time it is particularly important to establish the earliest stages of tectonic transformations. The Taimyr-Severnaya Zemlya orogenic belt is one of the large accretionary-collisional key structures in the Arctic. The Central Taimyr accretionary belt includes two granite-metamorphic terranes: Faddey and Mamont-Shrenk that include the oldest igneous formations of Taimyr. Those are granitoids with U/Pb zircons age of 850-830 Ma (Faddey) and 940-885 Ma (Mamont-Shrenk). Presently we have determined fragments of paleo-island arcs and ophiolites in the framing of these terranes. Moreover, in addition to already identified Neoproterozoic (755-730 Ma) ophiolites and island arc rocks (plagiogranites, gabbro, volcanics) we found more ancient rock complexes in the framings of both terranes closer in age to the Meso-Neoproterozoic boundary. In the region of the Tree Sisters Lake a paleo-island arc complex was found including plagiogranites and plagiorthodacites with U-Pb isotopic zircon age of 969-961 Ma. Sm-Nd isotopic data for these rocks showed a Mesoproterozoic model age: $T_{Nd(DM)}$ varies from 1170 to 1219 Ma. These data as well as Rb-Sr isotopic investigations indicate a predominance of a mantle component in the magmatic sources of these rocks: $\epsilon_{Nd}(967-961) = 5.1-5.2$ and $(87Sr/86Sr)_0 = 0.70258-0.70391$. In the framing of the Mamont-Shrenk terrane we determined ophiolite fragments in the mouths of Krasnaya River and Kabachkovaya Hill. The Kabachkovaya ophiolites form near E-W elongated narrow zones of ultramafic rocks and small plutons of fine and medium grained gabbros and diabbases among flows of tholeiitic basalts forming pillow lavas and tuffs. Ar/Ar dating of amphiboles from metagabbros in the Krasnaya R. mouth yielded an age of 1029 Ma. In conclusion, these data indicate the existence of Meso-Neoproterozoic ophiolites and island arcs in the Russian Arctic, which, with available paleomagnetic data, allows composing more correct plate tectonic reconstructions for the early stages of the evolution of this region.