

# U-Pb Detrital Zircon and Sm-Nd Isotopic Studies of the Neoproterozoic to Triassic Sandstones from the Taimyr Fold and Thrust Belt: Implication for Tectonic Evolution

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Taimyr fold and thrust belt (TFTB) was affected by orogenic events in Neoproterozoic, late Paleozoic and Mesozoic. It is commonly accepted that the southern zone of the TFTB is a deformed margin of the Siberian craton, whereas central and northern zones contain accreted terranes. To clarify evolution of the eastern part of the TFTB we carried out SHRIMP U-Pb detrital zircon and whole-rock Sm-Nd isotopic studies of 5 sandstone samples from Neoproterozoic-Lower Cambrian and 3 sandstone samples from Permian and Triassic successions. Both U-Pb and Sm-Nd studies were done at VSEGEI, St. Petersburg.

All samples from Neoproterozoic-Lower Cambrian succession contain numerous zircons with ages varying from 800 Ma to 950 Ma. Approximately 40% of grains are Paleoproterozoic and Archean. Detrital zircons of 1930 Ma – 2020 Ma predominate in samples from the lowermost unit of Neoproterozoic succession pointing to Siberian basement source for several terranes from the central zone of the TFTB. Other samples show a mixture of local and Siberian craton sources that corresponds with Sm-Nd isotopic data as well.

Permian and Triassic sandstone samples contain detrital zircon with age varying mainly from 440 Ma to 540 Ma, although many grains are 300 Ma and younger. Only a few grains are ca. 780 Ma or older. The only possible sources for most grains are granite and metamorphic rocks from the northern zone of the TFTB, Severnaya Zemlya islands and, probably, submerged parts of the Kara plate. Sm-Nd isotopic study shows evidence of erosion of Neoproterozoic or younger oceanic-type rocks. Absence of Paleoproterozoic and Archean grains shows that neither the Siberian craton nor central zone of TFTB were significantly eroded in Permian and Triassic.

Combined results of U-Pb detrital zircon and Sm-Nd whole-rock isotopic studies show that during Permian and Triassic both southern and central zones of the TFTB were lowlands and no divide separated eroded northern Taimyr and Kara plate from sedimentary basin in the southern TFTB. It demonstrate that no late Paleozoic (Hercynian) tectonic event affected central and southern zones of the TFTB and numerous thrusts which cut Neoproterozoic and Paleozoic succession of the southern and central zones were formed during a Mesozoic tectonic event.