

The U-Pb Dating of Detrital Zircons From the Neoproterozoic-Early Cambrian Deposits of North-West Russia: The Timanian Orogen Signature

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ABSTRACT

Late Neoproterozoic-earliest Cambrian Timanian orogeny affected northeastern part of the Russian Platform and possibly stretched across eastern part of the Barents Sea. So far, there are few models describing the different scenarios of the Timanian orogeny. The one model considers the Timanian orogeny as a several episodes of accretion (Gee, Pease, 2004), the second model claims that it is a result of collision between enigmatic Arctida to Batica (Kuznetsov, 2010). The felsic magmatism described from the Timan-Pechora lasted from the 622-510 Ma. However, there are no any age constrains from its northern continuation. Timanian orogeny is considered as a main source of the clastic through latest Neoproterozoic – Cambrian for the many localities across the Russian part of Arctic (Severnaya Zemlya, Novaya Zemlya and New Siberian Islands archipelagoes) and in northern part of the Russian platform (Lorenz et al, 2008, 2013; Ershova et al, 2015, 2016, Ivleva et al, 2016). Here we present the results of U-Pb dating of detrital zircons from the Neoproterozoic-Cambrian strata of north-western part of the Russian Platform (Baltic monocline) and Mezen syncline which give additional data on evolution of Timanian orogen. The U-Pb dating of detrital zircon revealed that Late Mesoproterozoic-Neoproterozoic deposits sourced from the neighboring parts of Baltic shield with majority of detrital zircon grouped in few peaks around 2,5 - 2,6, 1,6 - 1,8 and 1,5 Ga. The detrital zircon's signature of the earliest Cambrian sandstones is characterized by majority of Mesoproterozoic grains from 1,7 to 1,0 Ga and with few latest Neoproterozoic-earliest Cambrian peaks between 630 and 520 Ma. The U-Pb dating of the Mesoproterozoic - Lower Neoproterozoic sandstones of Mezen syncline showed that detrital zircons grouped in peaks at 1,5 and 2,0 – 2,5 Ga. The detrital zircons from the latest Neoproterozoic (Ediacaran) deposits comprise main peaks at 0,9 – 1,6 Ga and 600 Ma with minor younger grains tailing to 550 Ma. Thus, our data show that Timanian orogeny became the main source area for clastics in the latest Neoproterozoic-earliest Cambrian in northern part of Russian platform. This research was supported by RFBR grants 16-55-20012, 17-05-00858.