

Rodinia, peri-Gondwana and convergence with Baltica in the late Ediacaran-Cambrian

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In paleogeographical reconstructions, Baltica is positioned next to Amazonia in the supercontinent of Rodinia. The two cratons drifted away when Rodinia broke up. Eventually Baltica became an independent continent whose (modern) southwestern edge (Teisseyre-Tornquist, TT) was a thinned out passive margin that faced the Tornquist Ocean. It is known that continental accretion to this margin occurred in the Late Ordovician, when East Avalonia of Gondwana descent docked to Baltica. New isotopic studies revealed abundance of Ediacaran detrital zircons in shallow marine siliciclastics of early Cambrian age, deposited on the TT sloped margin of Baltica. However the only igneous Ediacaran rocks on Baltica are in the Volyn Volcanic Complex (SW Baltica) composed of 570-540 Ma basaltic traps which, even with some associated pyroclastics, can be hardly taken as effective zircon suppliers to Ediacaran-lower Cambrian deposits on the TT margin. At the opposite NE margin of Baltica, the Timanian orogenic belt was developing at 540-510 Ma. In view of that, the abundance of Ediacaran detrital zircons in the lower Cambrian siliciclastics of the TT slope can be explained by derivation from external source(s). To learn more on the provenance of detritus of that age, Ediacaran-Cambrian siliciclastics from the TT margin of Baltica and from adjacent tectonostratigraphic were examined in terms of their geochemistry and U-Pb and Hf-T_{DM} ages of the zircons. Lower Cambrian rocks from the studied units in Poland contain abundant 0.7-0.55 Ga detrital zircons (15-50%) and older groups of 0.9-1.2, 1.4-1.6, 1.8-2.2, 2.7-3.0 Ga. The age spectra with clusters > 0.9 Ga are assignable to both Baltica and Amazonia. While integrated with the 0.7-0.55 Ga cluster, the obtained data suggest that peripheral fragments of Amazonian peri-Gondwana were then close to the TT margin of Baltica. Those fragments formed the Teisseyre-Tornquist Terrane Assemblage (TETA) which obliquely docked and overrode the thinned southwestern margin of Baltica. Summing up, in the late Ediacaran-early Cambrian, parts of the Cadomian orogenic belt must have arrived close and become accreted to Baltica, presumably in the position in proximity to fragments that were derived and detached from the Pan-African domains of peri-Gondwana. Grant NCN 2017/25/B/ST10/02927 is acknowledged.