



Geotectonic provenance of Malopolska and Lysogory crustal blocks, southern Poland: evidence from Nd isotopic composition of clastic material

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Nd isotopic composition of clastic material is used to reconstruct the geotectonic history of Małopolska and Lysogory blocks in southern Poland. These crustal blocks are situated within the Trans European Suture Zone (TESZ), the enigmatic tectonic domain that separates the old Precambrian Platform from the Alpine and Variscan orogenic mobile belts of western Europe. The TESZ is extending from North Sea in the NW to Denmark, north German through Poland, Ukraine until the Black Sea in the SE with the distance exceeding 2000 km. The primary configuration of blocks within the TESZ and their provenance are still a matter of debate. Malopolska and Lysogory reveal significant differences in their Ediacaran to Silurian sedimentary evolution and tectonic development. They were considered as an integral part of the paleocontinent of Baltica mostly based on occurrence of faunas characteristic of the Baltic realm. On the other hand, the detailed geophysical and other geological data rather indicates affinities with the Peri-Gondwana plates. This is why the accretion scenarios of Małopolska and Łysogóry play important role in the understanding of the late Precambrian/early Paleozoic geotectonic history of the European lithosphere. In addition to provenance data of detrital zircons and muscovites, which were collected in the past primarily from coarse-grained clastics, the present Nd isotopic studies have been performed on various clastic rocks present in the Cambrian sedimentary successions of Malopolska and Lysogory. The study revealed significant differences in the Nd model ages (TDM) and ϵ_{Nd} values of the investigated clastic rocks. In the Malopolska block the ϵ_{Nd} values, from -5.5 to -8.5 , are more radiogenic than those of Lysogory, which range from -9.6 to -1.1 . The Cambrian clastics show a wide spectrum model ages both in Malopolska and Lysogory. In the former the model ages range from 1.52 Ga to 2.35 Ga, whereas in the latter the spectrum is from 1.86 Ga to 2.41 Ga. There is however, some correlation between the types of clastic material and their model ages. The Nd isotopic data indicate a derivation of clastic material primarily from Gondwanan sources, like Amazonian craton or Bohemian Massif. The input of clastic material from Baltica, if any, was probably only in Lysogory. In overall, the new provenance data confirm some earlier interpretations that Malopolska and Lysogory represent Gondwana-derived continental microplates accreted to the margin of Baltica paleocontinents in early Paleozoic times.