

Anomalous magnetization of the transitional Permian-Triassic Nedubrovo red beds, Moscow Basin, Russia, as a probable magnetostratigraphic marker

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The best sections of the Permian-Triassic (P-Tr) continental sediments of the Russian Platform are located in the Vologda Region, in the north-eastern part of the Moscow Basin (syneclyse). Most of P-Tr outcrops consist of red beds – clays, sand- and siltstones, rarely carbonates, which are the best objects for paleomagnetic and magnetostratigraphy studies. In order to construct a modern magnetostratigraphy scale of the key P-Tr sections and to obtain a reliable paleomagnetic data for the Upper Permian and the Lower Triassic, we have conducted detail paleomagnetic studies of the Permian-Triassic transition in the Nedubrovo outcrop, located on the left bank of the Kichmenga River near Nedubrovo village, 7 km north-west of Kichmengskiy Gorodok town.

The Nedubrovo member is the subject of continuing disputes due to the uncertainty of its age (Arefiev et al., 2015). Numerous determinations of fauna and flora allow to suggest the age of the Nedubrovo deposits as Upper Permian or Lower Triassic. The uniqueness of the Nedubrovo member is also determined by the absence of its stratigraphic analogues within the Moscow Basin. The obtained paleomagnetic direction of the characteristic magnetization of the studied red beds has been suggested to be anomalous (slat = 60.04521°, slong = 45.74047°, N = 142, D = 246.3°, I = -6.6°, K = 10.0, α_{95} = 3.9°). We believe, that this paleomagnetic record corresponds to the period of significant and prolonged (thousands of years) deviation of the Earth's magnetic field configuration from the Geocentric Axial Dipole (GAD), possibly an excursion. Such an anomalous paleomagnetic records can be used as a powerful tool for local, regional and, probably, global magnetostratigraphic correlations. The signs of an anomalous record characterized by low inclinations can be found in Upper Permian paleomagnetic data from the Siberian Traps (Mikhailov et al., 2012), that is indirectly suggests the Upper Permian age of the Nedubrovo sediments and point out the global scale of this geomagnetic event.

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References:

- 1) Type and reference sections of the Permian-Triassic continental sequences of the East European Platform: main isotope, magnetic, and biotic events / M.P. Arefiev et al. - Moscow, PIN RAS, 2015. - 104 p.
- 2) Mikhailov, N.E., Kazansky, A.Y., Ryabov, V. V., Shevko, A.Y., Kuprish, O. V., Bragin, V.Y., 2012. Paleomagnetism of trap basalts in the northwestern Siberian craton, from core data. Russ. Geol. Geophys. <https://doi.org/10.1016/j.rgg.2012.09.009>