

RECOGNITION OF THE ILLAWARRA REVERSAL HORIZON IN THE PERMIAN OF THE WESTERN CARPATHIANS (SLOVAK REPUBLIC)

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Abstract: The magnetostratigraphic investigation on the profile of the Upper Carboniferous-Permian belonging to the Hronic Unit in the Nízke Tatry Mts. was performed. The measurements revealed occurrence of the first-order time marker, so called Illawarra Reversal, near the boundary separating 2nd and 3rd megacycles at localities of the Malužiná Fm.

Key words: magnetostratigraphy, Upper Carboniferous-Permian, Hronic Unit of Nízke Tatry Mts., Illawarra Reversal

Magnetostratigraphy measurements

The Hronic Unit is a nappe system characterized by uniform Permo-Carboniferous sedimentary-volcanic sequence, Oberostalpine-type Triassic and locally preserved Jurassic-Early Cretaceous formations. The continental sequences of the Permian in the Western Carpathians are generally very poor in organic remnants determining insufficient radiometric data. The time period within the range of 300 - 250 Ma is prevalingly represented by clastic sediments and volcanic, which are preserved in the structure of Alpine units of the Western Carpathians in relicts only. The complete profile of Upper Carboniferous-Permian of the Hronic Unit in the Nízke Tatry Mts. was analysed by standard magnetostratigraphical methods. At these complexes we assume preservation of primary remanent magnetic polarization. Moreover, these sequences are continuously preserved from the underlying Upper Carboniferous rocks to the overlying Lower Triassic rocks.

The 351 rock samples from 23 outcrops of investigated profile were elaborated. Each sample was undergone thermal magnetic cleaning. Paleomagnetic measurements were carried out in Paleomagnetic laboratory of the Geophysical Institute SAS Bratislava. The demagnetization step of 50 °C from the natural stage till to 650 °C was used. The remanent magnetic polarization as well as volume magnetic susceptibility were measured after each demagnetization step. Thermal cleaning was performed into MAVACS – system, magnetic polarization was measured on spinner magnetometer JR-5 and volume magnetic susceptibility on kappa-bridge KLY-3. The demagnetization graphs, so called Zijderveld-diagrams of XY and XZ components and stereographic projection of the remanent magnetic polarization were analysed. Mean paleodirection of each locality (outcrops) was calculated using the Fisher statistics.

In the Upper Carboniferous the reversal and normal pattern has been found. The normal event is in coincidence with the similar according Menning (1995). Within the lower part of the Permian sediments both normal and reversal magnetic polarization have been found besides several inhomogenous samples, event. outcrops. Prevalent part of sediments is characterized by reversal polarity. Only two outcrops have normal magnetic polarization one

coincides with equivalent by Menning (1995) another does not. The mean values of magnetic inclination is ranging from -57° to 43° .

There is evidence that within the lower part of the Upper Permian sequence a systematic change in the inclination occurs. The mean value of inclination is shifting from -49° to 60° . This zone could be correlated with Illawarra Reversal (Irving and Parry, 1963; Khramov, 1963; Menning, 1995). This assumption is supported by the radiometric data 263 resp. 274 Ma from the lithostratigraphical equivalent uranium-bearing horizon. Beyond this IR horizon there are alternating reversed and normal polarity zones. They should be correlated with The Permian-Triassic Mixed Megazone (Menning 1995).

Conclusions

The following facts underline the reliability of the results:

- The Autunian-Saxonian sequences are divided from the Thuringian of the Malužiná Fm. by a strong change of polarity confirming by the Illawarra Reversal.
- The polarity determination in the whole complex of collected sediments was complicated. Additional investigations of adequate horizons in the Permian sequences of the Western Carpathians are following.

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