CENOZOIC PALEOMAGNETIC ROTATIONS IN THE INNER WEST CARPATHIANS

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Abstract: Contribution presents paleomagnetic directions from Cenozoic rocks of the Inner West Carpathians. The counterclockwise block rotations are the most frequent in the studied area.

Key words: paleomagnetic directions, Cenozoic rocks, Inner West Carpathians

Description of results

In the last decade a large number of paleomagnetic data have been obtained from the Cenozoic of the Inner West Carpathians. The age of the studied rocks is Eocene through Late Miocene, the lithology is variable, comprising sandstones, siltstones, marls, limestones and volcanoclastics. The large volcanic areas like the Central Slovakian volcanic region and the Tokaj-Slanec volcanic chain had been studied by another authors (Orlický et al. 1970, 1984, Pagáč 1986).

Our data are not covering the studied area evenly for the simple reason that Cenozoic sediments are confirmed to several basins separated by metamorphic or magmatic units (West Slovakia – Kováč et al. 1989, Túnyi, Kováč 1991, Kováč, Túnyi 1995; Southern Slovakia – Márton et al. 1992, 1996, Vass et al. 1996, Túnyi et al. 1999; Eastern Slovakia – Márton et al. 2000; Northern Slovakia – Márton et al. 1999). Moreover, suitable rocks have not been found in all basins, thus the paleomagnetic data are practically representing the basins sorruonding the "hard core" of the Inner West Carpathians (Fig. 1).

Each of the paleomagnetic declinations shown in Fig. 2 are the locality mean declinations calculated from the individual paleomagnetic vectors of several samples. They are typically counterclockwise rotated. These depositing from the general trend are either younger than the termination of the CCW rotation, like one for the South Slovak Basin, a result of Badenian age (arrow 1 – Orlický et al. 1995) and the one from the East Slovak Basin, a result of Pannonian age (arrow 2 – Márton et al. 2000) or may be due to local tectonics (arrows 3, 4,5 – Túnyi, Köhler 2000).

An interesting aspect of the Cenozoic paleomagnetic data is that despite of the complicated tectonic structure of the Inner West Carpathians, the paleomagnetic rotations are consistent. This suggest that the mechanism responsibile for the rotations is not local but regional tectonics. We think that the paleomagnetic pattern reflects the rotation of the studied area during tectonic escape and its final enplacement.

At present, the data available poorly constrain the termination of the rotations. It seems, however, that the rotation ended in the Badenian in the Central part (Orlický et al. 1995), while only in the Pannonian in the East Slovak Basin (Márton et al. 2000). To follow up these indications our plans include the re-investigation of the Neogene volcanic areas as well as the small basins in the central part of the Inner West Carpathians.

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Fig. 1 Geological sketch map of the Carpathians with studied area marked by rectangle.

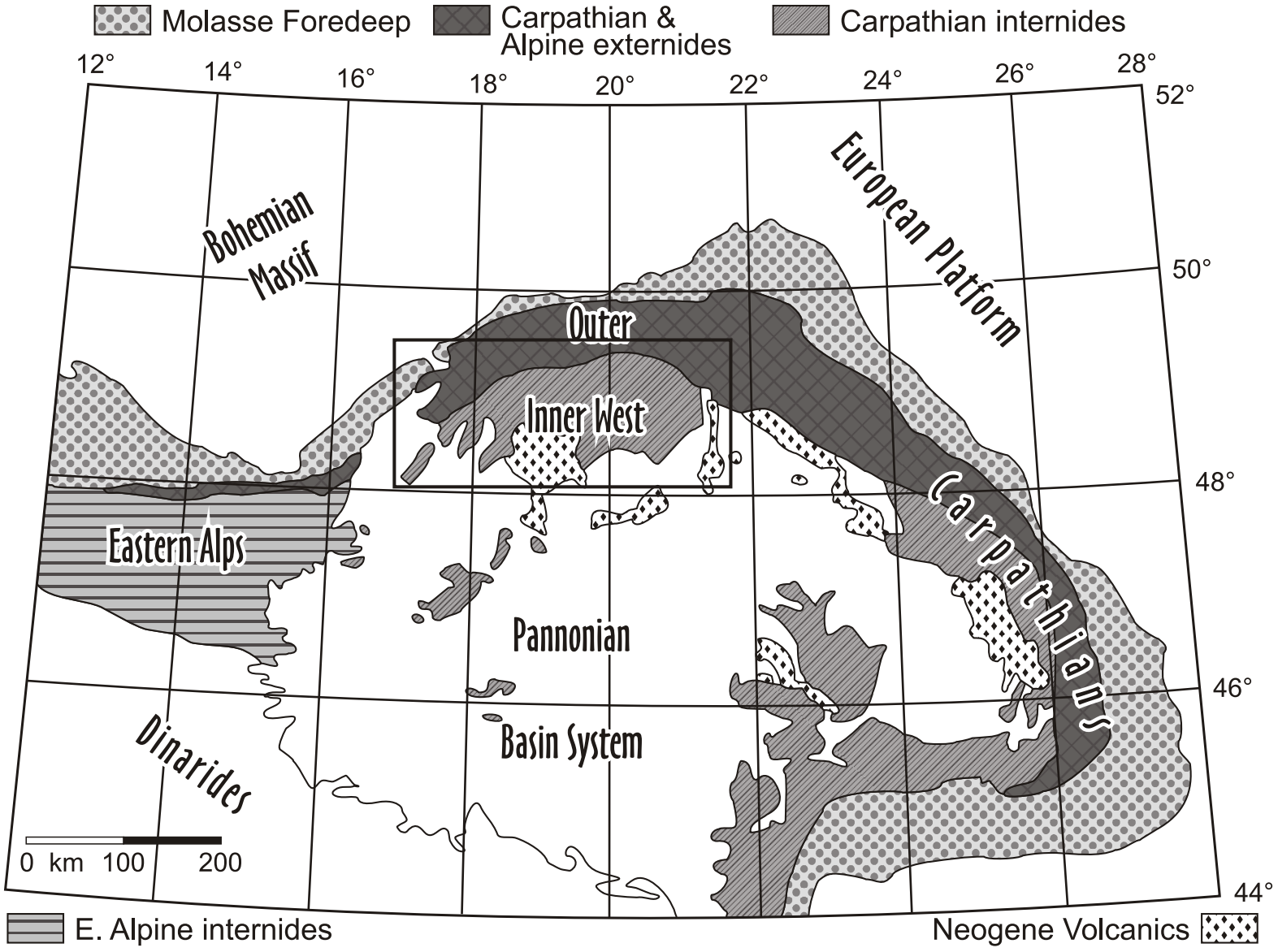
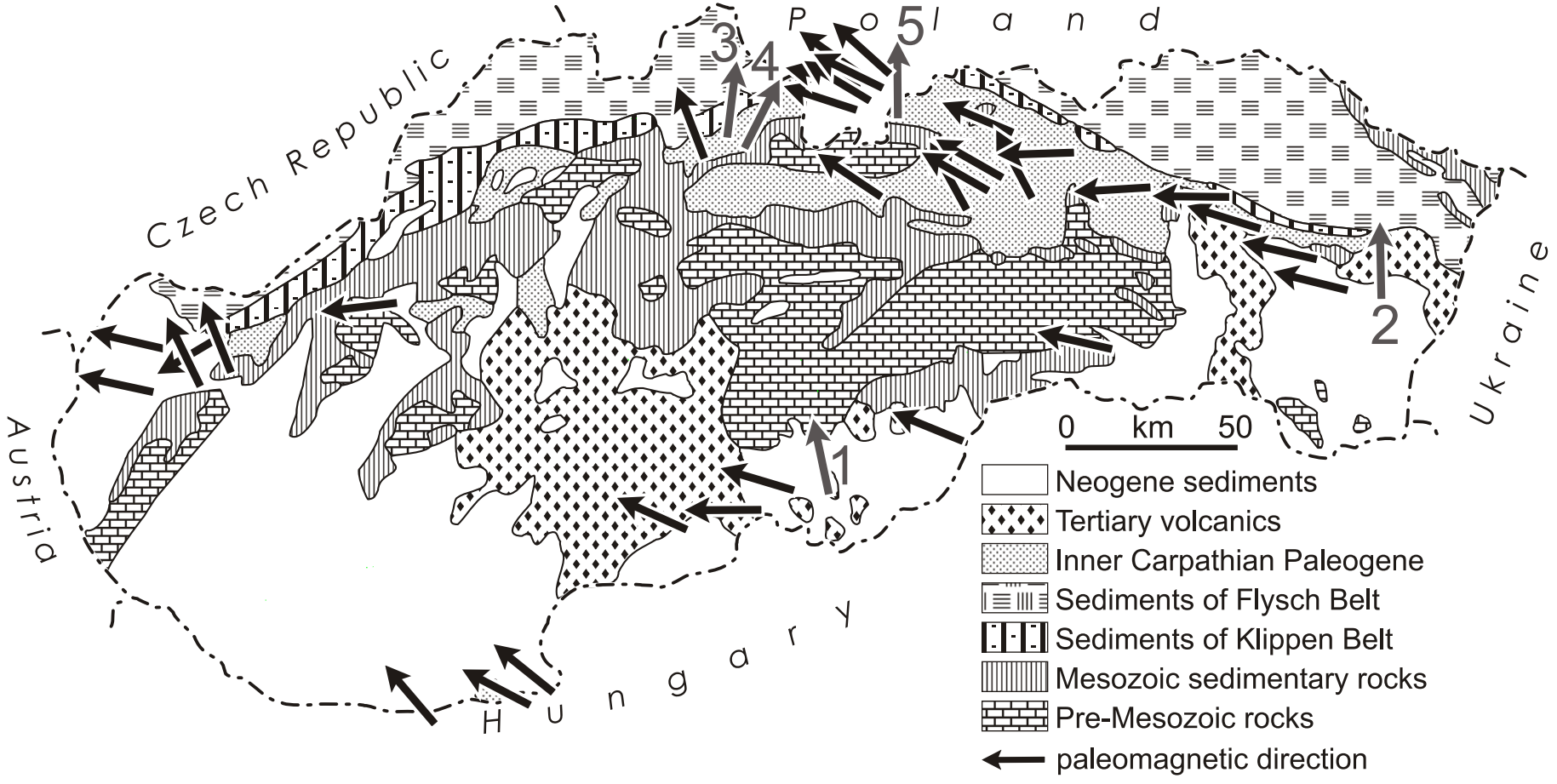


Fig.2 Cenozoic paleomagnetic rotations in the Inner West Carpathians

(Geological map of the West Carpathians of Slovakia after J. Nemčok)