Tectonic events of the Neoalpine orogeny in the Carpathian Flysch Belt (South Moravia)

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Microtectonic analysis was used to study the successive stages of the Late Cretaceous to Neogene Neoalpine orogeny in the Ždánice unit of the Carpathian Flysch Belt in Southern Moravia. Detailed measurements were taken on more than 130 localities in the Ždánice unit north of the Dyje river, where numerous occasional exposures, such as railway and road cuts and pipeline trenches, were accessible for investigation during the two last decades. The presented results are based mainly on evaluation of the fold axes orientation; although, additional measurements of dip directions of axial planes, as well as observations of fold geometry, intensity of folding and other structural features were used occasionally.

The Ždánice unit, together with the outermost Pouzdřany unit, represent an accretionary wedge which formed in front of the Magura Group of nappes. During various stages of the Neoalpine orogeny, these units were largely thrust over the Lower Miocene sedimentary fill of the Neogene foredeep. The đdánice unit consists of strata, ranging from Late Cretaceous to Early Miocene. The intensity of deformation of these strata varies greatly, depending on number of factors, such as the rheological properties of rocks or repeated refolding of previously folded strata.

The oldest strata, represented by Němčice and Menilite formations (Late Cretaceous - lowermost Early Oligocene), are intensely folded with ß-axis of folds oriented in both N-S and NE-SW directions. The overlying younger strata, including the Ždánice-Hustopeče Formation (Egerian) and the superimposed Lower Miocene Šakvice Marls, Pavlovice and Laa Formations of Early Miocene, are less intensely folded. The ß-axes of folds are predominantly oriented in the NE-SW direction. The differences in orientation of fold axes between the older and younger strata of the Ždánice unit indicate an existence of at least two movements of the Neoalpine tectonism. The older one took place before the deposition of the Ždánice-Hustopeče Formation of Egerian age and may correspond to the Helvetian orogenic movements. The younger event occurred on the Early/Middle Miocene boundary and affected the Ždánice-Hustopeče Formation and the deposits of the Early Miocene. It could be attributed to the Styrian orogenic movements. These conclusions are compatible with results of structural analysis conducted in the Carpathian Flysch Belt by Fodor (1991), Fodor et al. (1995), and Nemčok et al. (1998). They are also in agreement with the results of magnetic anisotropy measurements by Hrouda and Stráník (1985) and their recent unpublished results. All these investigations strongly support the view that the Styrian orogenic phase in Oligocene played an important role in deformation of the Carpathian Flysch Belt (Stráník 1981). On the other hand, the Styrian deformations could not be differentiated from those caused by the Savian orogenic movements, which occurred at the Paleogene/Neogene boundary. That indicates that the stress field did not change during Late Oligocene and Early Miocene times (Fodor 1991).

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