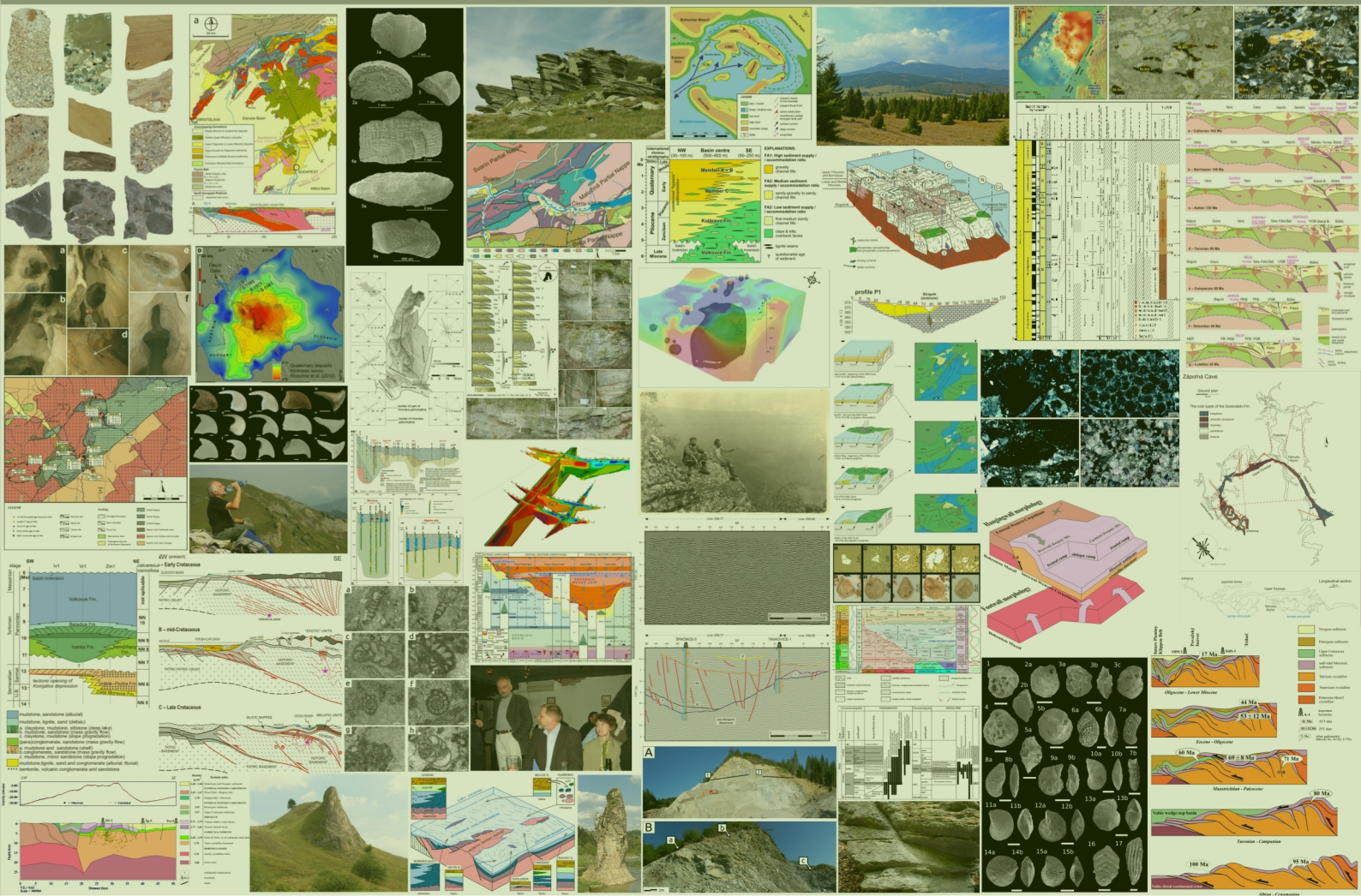




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Structural mapping, well data and stress field analysis in the surroundings of the Nekézseny Thrust Fault, NE Hungary

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The Bükk and Uppony Mts. located in NE Hungary are two adjacent structural units with different origins: while the nappes of the Bükk Mts. once formed part of the Inner Dinaric nappe system, the Uppony Mts. are correlated with the Western Carpathians (Schmid et al. 2008). The mainly S-SW-vergent Bükk and N-NW-vergent Uppony Units are separated by the Nekézseny Thrust Fault along which the Bükk-type Permomesozoic formations are thrust upon the Uppony-type Paleozoic and Senonian formations (Schréter 1945).

Despite of its obvious structural importance, the structural evolution of the Nekézseny Thrust Fault hasn't been studied in detail. The possible timing of its movements is between the Senonian and the Early Miocene. In their preliminary structural study Fodor et al. (2005) interpreted the results in the lights of the Paleogene deformation of the Darnó Deformation Zone. On the other hand, based on paleogeographic considerations Schmid et al. (2008) consider the Nekézseny Thrust Fault as the suture zone of the Meliata Ocean thus assume that the age of this structural contact is Early Cretaceous.

Consequently, the aim of our study was to understand the deformation geometry and the timing of activity along the Nekézseny Thrust Fault. As part of the study core samples from boreholes that drilled through the supposed structural contact were reviewed, sampled and interpreted. Detailed structural mapping in the surroundings of the Nekézseny Thrust Fault was followed by stress field analysis and preparation of cross-sections.

According to our results, at least seven tectonic phases could be separated. Syn-diagenetic early faults and cracked pebbles in the Gosau-type Nekézseny Conglomerate indicate that syn-sediment compressional deformation was already present during the Senonian (D1 phase), however, the Conglomerate is completely lack of Bükk-type materials (Brezsnyánszky & Haas, 1984). Thrusting of the Bükk on the Uppony Unit is the result of NW-SE compression in the D2 phase during which pre-tilt and post-tilt thrust faults formed, the Senonian was folded and the Paleozoic formations were refolded. Map scale folds show NW vergency and sedimentological observations (like inverse grading and sandstone injection dykes pointed downward) indicate overturned bedding. Cataclasite and breccia samples from the shear zone indicate low-temperature deformation. Based on the geometry of the stylolite surfaces, burial happened only after or simultaneously with the low-temperature deformation. All this indicate Latest Cretaceous or Early Paleogene activity for the Nekézseny Thrust Fault. Following an E-W compressional event in the Early Miocene

(D3 phase) D4-D7 tectonic phases are connected to the formation and extensional deformation of the Pannonian Basin during which multiphase reactivation of the inherited structures is observed. All this may contribute to understanding not only the deformation history of the Nekézseny Thrust Fault, but the role of the Darnó Deformation Zone during the Mesozoic structural evolution of the area.

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