Geodynamic consequences of Tertiary structural development in SW-Pannonian inselbergs (Mecsek and Villány Mts, SW Hungary)

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The aim of this study was to gain and analyse detailed structural data on the Tertiary evolution of SW Hungary, in order to compare them to similar data in the area to the east: the Great Hungarian Plain and the Apuseni Mts/Transylvanian Basin. All these areas are members of an Intra-Carpathian microplate, which suffered a very complicated Tertiary evolution with major rotations. This comparison was used to find some geodynamic reasons for this complex structural development and in a broader sense to explain the formation of the Carpathian arc.

Three independent methods: paleomagnetic investigation, analysis of reflection seismic sections and structural study of outcrops has been applied on Mesozoic-Tertiary rocks of SW Hungary exposed in the Mecsek and Villány Mts. All three methods gave a similar structural history. Both paleomagnetic and structural data indicate that the main phase of rotation and complex transpressional deformation was in Late Oligocene-Ottnangian (until 18 Ma), followed by a more quiescent period in this part of the Pannonian Basin. Several strong reactivations, perhaps with incipient rotation are experienced from Late Miocene (ca 11.5 and ca 7 Ma) on and probably are still in vigour. Local flexural basin development accompanied these inversions. On the other hand major transversal tear faults and huge grabens developed in the Middle Miocene to the east, in an area between the Mecsek and Apuseni Mts. On the eastern side of the Apuseni, a limited amount of Early Miocene rotation and consequent inversion was followed by a major clockwise rotation during the Middle Miocene.

Comparison of our and regional structural data and rotation pattern strongly modifies the original concepts about microplate behaviour in the Carpathian realm. The concept of uniform rigid microplates gives way to internally deformed, flexible ones. The geodynamic history is dominated by the opposite rotation and consequent interplay of two major blocks: Alcapa and Tisza. Differential Early Miocene rotations and deformations within Tisza are explained by major tears or thrusts across this block. Left lateral wrench zones within the clockwise rotating Tisza block are explained by differential movements due to this rotation. Major transversal extensional faults in the Middle Miocene are also explained by differential rotations. Local flexural and extensional basins are located along the major transversal structures across the microplate. The driving force of this complex interplay is the nothwards propagation of Apulia vs. Europe and the subduction-rollback in the East Carpathians.

Deformation and sedimentary pattern propagation in the Transdanubian Central Range, Hungary

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The Transdanubian Central Range (TCR) is an inselberg of Alpine origin within the Pannonian Basin, W. Hungary. It is a broad Mesozooic synform, in the axis of which Cretaceous deposits are preserved. From the many deformational events, linked to sedimentary cycles, our main interest here is the Cretaceous tectono-sedimentary history. Many stress the importance of Albian-Late Cretaceous NW–SE shortening. We put emphasis on an earlier structural phase. Two lines of evidence were examined: sedimentary pattern of Cretaceous deposits and structural analysis of exposed areas and mine works. Naturally, many observations from the litterature were also integrated.

Early Creteceous sedimentary pattern sug-