Neogene tectonic evolution of the Mecsek Mts (Hungary, Tisia–Dacia unit)

László Benkovics[1]

[1]*Department of Engineering Geology, Technical University of Budapest, H-1521 Budapest, Hungary*

Prior to Neogene uplift Mesozoic beds experienced intense deformation which resulted in the formation of asymmetric anticlines, overturned beds, ramps of NW vergence. No significant post Mesozoic cover developped in Mecsek area. Five main tectonic phases were observed having close correlation with sedimentary cycles. The dating of this phases is possible on the basis of major Neogene discontinuity surfaces.

The first phase is an extensional one with NE–SW synsedimentary normal faults. The regional occurrence of these faults is well documented by the thickness map of Ottnangian — Eggenburgian (21–17 Ma) sediments. In addition indications of sinistral E–W strike-slips were also deduced.

The second phase is also characterized by extension. The NW-SE dextral and NE–SW sinistral faults of this phase were active in the Carpathian (Lower Miocene). The axis of σ_1 has an N–S while the axis of σ_3 an E–W orientation. This phase well correlates with the regional large-scale Carpathian–Badenian (17–13 Ma) E–W extension of the Pannonian Basin.

The Sarmatian – Lower Pannonian (13–9 Ma) transtensional phase includes the development of normal faults (NE–SW). At some locations left lateral strike-slip faults (ENE–WSW) were also observed. The continuation of this strike-slip fault also exists to the East and to West.

The Late Pannonian (7.5–6 Ma) phase appears in different tectonic style. Flexural beds, pop-up structures, overthrust toward the foredeep (both to the North and to the South) indicate this change of stress field, and the compression. The fold axes, strike-slips faults and overthrusts refer to σ_1 axis of N–S. This compressional phase resulted in the rejuvenation of large-scale left lateral strike-slip faults located at the southern margin of Mecsek Mts. In relation to this faulting en-echelon anticlines and synclines were formed.

The latest deformation of Upper Pannonian–Pleistocene to Recent period is of extensional origin with dextral (E–W) and sinistral (NNW–SSE) faults. This phase (σ_1 is NW–SE) appears to be active nowadays, too.