Structural evolution of the NE part of Hungary

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Three Mesozoic structural units are exposed in N Hungary: the lowermost Torna-Bükk unit, the overriding oceanic Meliata–Szarvaskô unit, and the topmost Szilice–Bódva unit. These are covered by Tertiary strata. We were mainly interested in the structural evolution of the Mesozoic units, because Tertiary strata have already been investigated. We measured structural elements in main outcrops, caves and quarries near the Hungarian/Slovakian border. Dating of the structures is relative and questionable.

A first E–W tensional phase was recorded by syndepositional, mostly W dipping normal faults in early Middle Triassic limestones. A first ductile shear phase was recorded in the lower Torna and Meliata units. This comprises SE striking stretching lineations with top to SE rotated clasts. The proposed age for this deformation is Late Jurassic, coeval with high pressure metamorphism.

The next phase was recorded in the Szilice units with reactivated faults, flat S dipping thrust faults and folds, giving a north-vergent overthrust. Based on similar structures across the border, the age of the deformation is inferred to be Albian. Two ductile-brittle phases follow, both giving spectacular structures. Depending on lithology they are characterized by folds or strike slip faults. A supposedly first phase has NE–SW fold axes and a SE vergence, while the second has NW–SE fold axes and a NE vergence. Both might be related to Paleogene–Early Miocene deformations and their relative positions or successions might be explained by large rotations during the Early Miocene. These rotations affect large areas in N Hungary–SE Slovakia.

Two more brittle tensional phases were recorded. A NE–SW extension and a NW–SE extension. The former might be Miocene in age, while the latter might be recent, because of the structures on cavity fillings in the caves. The found structures might be fitted in a complex model in the contact area of the Austroalpine, Dinaric, Meliatic plates and complete previous data on the Hungarian and Slovakian side.