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LINKAGE OF YOUNG TECTONICS AND SURFACE DEVELOPMENT IN THE EASTERN ALPINE FOOTHILLS

Summary

The study area is a transition zone between the still uplifting Eastern Alps and the subsiding Little Hungarian Plain, delineated by the Répce, Rába and Lafnitz rivers, and the metamorphic Kőszeg and Bernstein Mts. in the north. It is a hilly area dissected by steep scarps, east of the lower course of Pinka river the terrain is gently undulating, whereas to the west the terrain is more dissected. As for the formation of the the steep scarps, previous studies are contradictory. The aforementioned characteristic morphology and the bimodal distribution of drainage orientation (N-S and W-E) raise several questions about the landform evolution of this area. In order to answer these questions I used the toolkit of geomorphometry, tectonic geomorphology, field surveys, previous geological and geophysical data (maps, drilling data, industrial seismics).

Results of geomorphometric analyses revealed that the area W from Pinka valley is much more dissected and uplifted than the eastern one, and the catchments are more graded. The unit is bordered by lineaments that correspond to normal faults, identified by previous studies, and that are still active, according to my sinuosity analysis.

The surface morphology of the less dissected eastern part correspond to the buried continuation of Kőszeg–Rechnitz Mountains and Vas Hill, while the sinuosity changes of streams are aligned with the basement structure.

Stream deflections coincide with the strike of Pinnye and Mihályi basement highs. Horizons, delineated using industrial seismics, imply active deformation as early as coeval with the Late Pannonian sedimentation; nevertheless the sinuosity changes of the streams suggest the recent activity of the updoming process.

Generally, close correspondence between basement morphology and the surficial phenomena have been detected. The results show the active, relative uplift of the South Burgenland Swell. Further basement highs show similar behaviour. In the light of previous findings, several scenarios are presented to explain these phenomena.

Six phases of the drainage evolution have been defined based on evaluation of neotectonic structural features. In general, the initial flow direction trend coincides with the fill-up direction of the Pannon Lake; subordinately it was determined by the direction of the foreland pediments. Subsequently, the main trunk channel was forced to continued avulsion by the general southward tilting and the eastern tilting of the Lafnitz–Strem interfluve unit.

Flowing direction was also modified by the structural preformation of Stegerbach line and middle section of Strem valley. Channel cannibalism can also be detected in several phases. Drainage reorganization resulted in formation of wide and flat-floored valleys, non-dissected terrace surfaces; valley beheadings are evidenced by wind gaps.