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Pleistocene alterations of drainage network between the Alps and the Pannonian Basin

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The investigated study area is situated in the transition zone between the still uplifting Eastern Alps and the subsiding Little Hungarian Plain (Joó 1992), bordered by Lafnitz (Lapincs), Répce (Rabnitz) and Rába (Raab) rivers. The contrasting forcing of the regions of differential uplift created a distinctive surface morphology of typically low relief that has a characteristic drainage network pattern as well. Our study is aimed at the reconstruction of the surface evolution by separation of individual geomorphic domains delineated by their geomorphometric characteristics.

The hilly area is mostly covered by Miocene sediments. The mesoscale geomorphological units of the study area are influenced by the uplifting metamorphic core complex of Koszeg–Rechnitz Mountains (Tari – Horváth 1995), by the also metamorphic and relatively uplifting Vas Hill as well as by the subsiding grabens. There are two dominant flow directions alternating downstream. Valley segments are often bordered by steep scarps, which were identified by previous research as listric normal faults and grabens. Largely, the investigated area consists of tilted blocks bordered by 30-60 m high and steep, fault-related escarpments as it was demonstrated by the analysis of lignite layers, topographic sections and topographic swath analyses (Kovács et al. 2010, Kovács et al. 2011).

Drainage network reorganizations occurred in several steps during the Pleistocene. Corresponding landforms are abrupt changes in stream direction, wind gaps, uplifted terrace levels built up of sedimentary rocks and wide alluvial valleys. Terraces are best developed along the Strem stream, which has a strikingly small drainage area at present, due to the Pinka River, which captured the upper parts of the drainage basin. The widest valley belongs to Pinka River. Drainage reorganizations are most likely due to the uplifting scarps that diverted the streams.

Remainders of previous cross-valleys are wind gaps. Using these markers (wide alluvial valleys with relatively small streams, terrace levels and wind gaps) and the different height of the scarps we roughly elaborated the geomorphological development of the area, including relative age of drainage network elements, tectonic features and river captures.
Results indicate a detailed but still regionally dissected timeline about drainage network alterations, including phases of gravel sedimentation, incision and beheadings.

The abstract titled "Pleistocene alteration of drainage network and surface morphology caused by basement structure in the foreland of Eastern Alps" determine the origin of the investigated scarps. This paper was supported by Hungarian Scientific Research Fund (OTKA NK83400).

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