Geophysical Research Abstracts
Vol. 12, EGU2010-376-1, 2010
EGU General Assembly 2010
© Author(s) 2009

Faulted and eroded gravel deposit in western Hungary

Gábor Kovács (1,2,3), Tamás Telbisz (2), Balázs Székely (3,4)

(1) Department of Cartography and Geoinformatics, Eötvös Loránd University, Budapest, Hungary, (2) Department of Physical Geography, Eötvös Loránd University, Budapest, Hungary, (3) Department of Geophysics and Space Sciences, Eötvös Loránd University, Budapest, Hungary, (4) Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Vienna, Austria

During the Pleistocene, rivers of the Eastern Alps drained more water into the Pannonian Basin as in recent times. The excess discharge, due to the meltwater of glaciers, transported detrital material from the periglacial areas that built low-relief gravel deposits up in the transitional regions. Today most of these separated gravel plains highly dissected by the frequent, N–S stream network developed in the post-Pleistocene times. Exceptions can also be found, where flat plains form slightly tilted blocks, bordered by W–E steep scarps. Owing to these scarps, streams are unable to incise as deep as in other aforementioned areas, thus these flat plains are expected to represent the nearly intact, Pleistocene paleosurface.

The study area in Western Hungary is bordered by Raba (Raab), Lapincs (Lafnitz) and Repce (Rabnitz) rivers, and include two parts of the uplifting outcrops of the Penninic nappe: Koszeg and Vas mountains. The area can be divided to 3 different sections:

- West from the Gyongyos stream almost totally flat area can be found, bordered by steep scarps followed by Repce river on North
- the area between Pinka and Gyongyos streams seems to be tilted blocks, divided by the W–E steep scarps
- the westernmost domain of the study area (in Austria) is characterized by a highly incised valley network.

Concerning the first mentioned section, suddenly left-turning streams imply neotectonic movements. The changes of sinuosity of those streams on this area also suggest differential uplift or subsidence.

Previous studies, using borehole data, proved the neotectonic origin of the most significant scarp on the second section. W–E lineaments shown by streams frequently turn into that almost perpendicular secondary main direction, what is often controlled by steep scarps. Unfortunately this assumption can be verified only a partly by borehole data in the area of the lignite occurrence where a dense borehole network exists.

In this paper we assume that previously described neotectonic influences also occur on the third section. To verify this, a DTM-based study was performed. Since the dissected area can be divided into almost homogeneous swaths parallel to the general slope, the statistical analysis of these swaths may reveal internal dependencies. Therefore swath-analyses were carried out in order to collect elevation data from a previously defined rectangular swaths. The three dimensional data set was processed to get maximum, minimum, mean and median of the data. These values were resampled in a previously defined resolution and represented by the distance from the beginning line of the swath. Thus, if the highly eroded original paleosurface is still present on the ridges, the large-scale changes of the general slope can be seen.

Finally the investigation resulted in unexpectedly revealed changes of the general morphology that correspond to the geological structure and the results of the investigations about neighboring sections. This observation makes it very likely that the aforementioned geomorphic features are related to neotectonic features or they are even currently by recent tectonic activity.