



Quantitative geomorphologic data from the Hluboká Fault System, Budejovice Basin (southern Bohemian Massif)

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The NW-striking Hluboká-Fault System in southern Bohemia is a late Variscan fault, which was repeatedly reactivated in Mesozoic, Miocene and Pliocene times. The fault forms the NE margin of the Budějovice Basin with its up to 340 m thick Cretaceous to Neogene sediments overlying the hanging wall of the fault. Geomorphologic analyses focus on the part of the fault, which is characterized by a prominent NW-trending topographic scarp delimiting the hilly country of crystalline basement rocks NE of the fault from the lowlands of the Budějovice Basin SW of it.

Quantitative morphological indices compare this SW-facing fault-parallel scarp with slopes of the same mountain, which are apparently not fault controlled. Analyses particularly use morphological parameters of small tributaries of the Vltava River. All of these non-perennial or ephemeric creeks cut into crystalline basement units, and all creeks are similar with respect to length, hydrological conditions, catchment areas and the common base level formed by the Vltava River. Morphological differences in valley shapes are therefore likely to result from different uplift of the mountain with respect to the area south of the Hluboká Fault. All parameters were measured from a 10 m resolution DEM and digital topographic maps 1:10.000. Additional field measurements were made in places where the resolution of the digital data appeared insufficient.

Mountain front sinuosity (Smf) of the hillslope following the Hluboká Fault is extremely low with values between 1.01 and 1.06 characterizing a very straight mountain-piedmont junction in the vicinity of the fault. Values indicate that morphology is influenced by uplift along the fault. The values are significantly smaller than those observed at the other mountain slopes with values between 1.17 and 1.37.

Analyses of streams use the ratio of valley floor width to valley height (Vf), stream-length-gradients (SF) and thalweg sections. The results are in line with the evidence obtained from mountain sinuosity. The mountain slope at the fault shows deep and narrow V-shaped valleys with streams that are actively incising (Vf values 0.05 to 0.26) probably responding to continuous uplift. The values are generally lower than those obtained from drainages not crossing the fault (Vf 0.13 to 7.14). The highest SL values (SL > 100, denoting the steepest reaches of the streams) are found next to the Hluboká Fault. Other creeks, which do not cross the fault generally show much lower SL values with the exception of short parts of two creeks (SL between 70 and 80), which were subjected to major anthropogenic overprint. Marked differences between the creeks crossing the Hluboká Fault and the drainages of the mountain not crossing the fault are further evident from thalweg sections. The creeks off the Hluboká Fault generally show simple concave-up profiles while streams crossing the fault show marked convex-up knickpoints close to the fault.

The quantitative geomorphologic data in sum accord in indicating that the crystalline massif in the footwall of the Hluboká Fault is uplifting with respect to the Budějovice Basin in the hangingwall of the fault.