

LARGE-SCALE LANDSLIDES IN THE CULMINATION PART OF THE CZECH FLYSCH CARPATHIANS

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ABSTRACT

Deep seated slope deformations play an essential role at forming the morphology of mountain ridges of flysch Carpathians. They occurred continuously throughout the Quaternary and currently represent the main source of hazards connected with the emergence of shallow landslides. Despite a large number of slope deformations in the Czech Carpathians little is known about these geomorphologic phenomena from the point of their geomorphologic effect. Our research of slope deformations is of a multidisciplinary character and apart from traditional geomorphologic methods it uses geologic, geophysical, sedimentologic and geoinformatic instruments. Attention is paid mainly to geomorphologic impact of large-scale deep seated rock landslides whose area often exceeds 1 km², volume oscillates between tens and hundreds of millions of cubic meters and depth reaches up to 100 m. These rock landslides have distinctive succession character and in individual areas we can identify displays of lateral-spreading, toppling, various forms of translational and rotational landslides, rock avalanches and debris flows. Apart from slight modelation of slopes and ridges including tension cracks, double ridges, internal drainage depressions and rotated blocks we have identified displays leading to overall decrease in water divide parts (e.g. formation deep saddles as a consequence of rotational landslides), formation of large-scale convex cuts affecting up to several hundreds of meters of the elevation gradient of individual slopes, asymmetric valley development as a consequence of landslide pressure, and frequent displays of the damming of valley profiles. In the past large-scale rock landslides in this area were classified as fossil. Our research involving both absolute and relative dating disproves these former hypotheses. Some of the large-scale slope deformations occurred or were reactivated in Upper Holocene or in the historic period. Radiocarbon dating of sediments in landslide-dammed paleolakes and dating of organic sediments deposited in internal drainage depressions under landslide scarps point to a significant landslide phase in the Subboreal and Subatlantic. Several landslides were dated back to the Atlantic and a transition phase of the Last Glacial and Lower Holocene. In connection with deforestation accompanying the colonization of mountains and aggravated climatic conditions in the period of the so-called Little Ice Age we also presume an increased occurrence of shallow landslides and debris flows.

Keywords: Western Carpathians, landslides, landslide activity, 14C dating

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