

# Quaternary exhumation of Western Carpathians: A record from Orava–Nowy Targ Intramontane Basin, Polish Galicia and Slovakia

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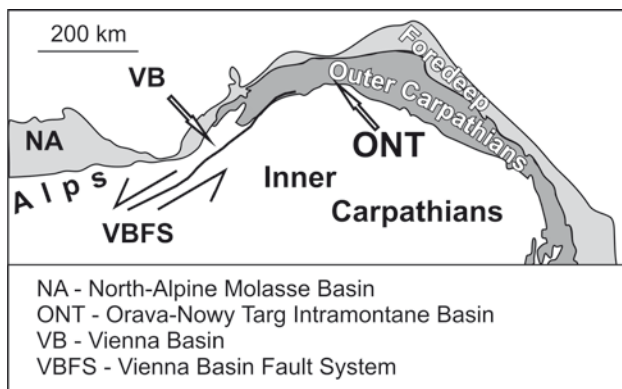
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This paper discusses the results of studies of gravels comprised within Neogene and Quaternary fill of the Orava–Nowy Targ Intramontane Basin (ONT). The ONT is an important structure of the Western Carpathians. First, the ONT is the only basin, except the Vienna Basin, which straddles across the junction of the Inner and Outer Carpathians (Fig. 1). Therefore, the infill of the ONT records the behaviour of tectonic units of the Western Carpathians during regional collapse, which was the last stage of structural development of the Carpathians. Second, the ONT is located at the NE termination of the Mur–Žilina fault zone of prominent seismic activity (Lenhardt et al., 2007). The NE segment of the zone corresponds to the Vienna Basin Fault System, which had been locus of sinistral strike-slip since 17 Ma until 9–8 Ma, and again since the Middle Pleistocene times (Fodor, 1995; Decker et al., 2005). The activity of this fault zone has been essential for structural development of the Western Outer Carpathians and Carpathian Foredeep (Márton et al., 2011).

The infill of the ONT comprises two tiers showing contrasting lithology. The Neogene tier is largely composed of claystones and siltstones, whereas the Quaternary tier is dominated by gravels. The two sequences are separated by an erosional surface underlain by a regolith. Deposition of the Neogene sequence took place during subsidence of the basin. No prominent relief existed in the area of present-day mountains actually surrounding the basin at that time. The regolith started to form at the onset of basin inversion. Still, no prominent relief existed in the present-day mountains. The onset of deposition of Quaternary gravels in the basin corresponds to acceleration of uplift of the surrounding mountains, which has been continuing until now. The Pieniny Klippen Belt has been subjected to erosion, at least locally, since the deposition of the basal part of the Neogene sequence filling of the Orava–Nowy Targ Basin until present times. In contrast, the Paleogene cover of the Tatra Mts. was removed only during Quaternary.



**Fig. 1.** Position of the ONT within the Carpathian-Alpine orogenic system.

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