In the Carpathians foreland, along the entire sector of the East and South Carpathians where the Moesian platform is present in the foreland, the frontal part of the thin-skinned nappe pile is covered by post-collisional Uppermost Miocene to Quaternary deposits with up to 5 km thickness. Particularly large subsidence in the centre and large scale tilting on the western flank of the Focsani basin is just a Pliocene-Quaternary interference of a crustal folding mechanism with increased effects in this particular sector of the chain. Here, the inversion taking place at the end of the Pliocene has led to large scale vertical movements have, actively changing the shape of the basin, the overlying topography and the rivers network. This has led to exaggerated Pliocene-Quaternary sedimentological features, as a direct result of the interplay between actively uplifting source areas, mass transport in the adjacent basins and possible climatic changes taking place at the beginning of the Quaternary. The amplitude of the subsidence in the Focsani basin area is furthermore exaggerated by the uplift in the neighbouring East-European/Scythian block, undergoing contrasting lithospheric folding.

Towards the Carpathians hinterland, the amplitude of the vertical movements is gradually decreasing. The overall folding mechanism induced a Pliocene – Quaternary uplift, recorded in the Persani and Apuseni Mountains, and subsidence in the Brasov basin and, at a reduced scale, further to the west in the Transylvania basin. In the later, the Middle Miocene salt formation detaches in the post-Pannonian times the larger wavelength folding subsidence of the pre-Miocene basement from the very short, up to 20 km shallow folds of the Middle – late Miocene sequence. The basin has recorded significant tilting movements, and near the South Apuseni Mountains, large scale NE-SW oriented thrusting took place, reactivating inherited Cretaceous-Eocene Transylvanides structures. The large scale differential Pliocene – Quaternary deformations depicted in the present study reflect the impact of the lithosphere to surface processes on the recent topography in post-collisional times. It represents also a prime example of the impact of inherited crustal and lithospheric structure on the recent evolution of continental intraplate areas.

Petrogenesis, Age and Tectono-Metamorphic Evolution of the Acid Metavolcanites of the Stronie Formation (Orlica-Śnieżnik Dome, Sudetes, SW Poland)

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The supracrustal Stronie formation, together with a variety of gneisses embracing small bodies of granulites and eclogites, forms the Orlica-Śnieżnik Dome (OSD) – a unit with a complex tectono-metamorphic history. New U-Pb SHRIMP zircon ages for three samples of acid metavolcanic rocks yielded similar ages of ca. 500 Ma, interpreted as the age of crystallization of their magmatic precursors. Some zircons interpreted as inherited xenocrysts reveal ages of ca. 520 and 560 Ma. The oldest ages ranging from ca. 1,3 to 2,1 Ga were ascertained for a few rounded xenocrysts from two samples. Thin metamorphic rims with high U and Th content were found on several grains coming from one sample. These rims reveal the age of ca. 330–340 Ma. Geochemical data based on measured concentration of trace elements and Sm, Nd and Pb isotopic ratios favours an active continental margin as a geotectonic environment in which protolith of acid metavolcanites and, what follows, the entire Stronie Formation of the OSD was formed. The tectono-thermal episode taking place in this geotectonic setting at ca 500 was responsible for melting of an older continental crust (probably of Cadomian age, as it is indicated by the ages of inherited zircons ranging from 520 to 560 Ma) leading to formation of different kind of granitic rocks. However a geotectonic setting and mechanism controlling the early stage of the tectono-metamorphic evolution of the OSD is difficult to reveal, the P-T trajectories obtained for rocks of the Stronie formation, with prograde P-T evolution dominated by the increase of temperature with a moderate increase of pressure together with moderate P-T ratio, favour continental collision as a geotectonic process controlling the early stage of its metamorphism. This thermal event was responsible for growth of ca. 330–340 Ma old metamorphic rims on 500 Ma old zircon grains. Shortening connected with this collision led to the subduction of the Stronie formation causing the metamorphism of rocks under the amphibolite facies conditions. Structural relicts of this shortening, occurring in form of rare intrafolial folds and traces of steep foliation planes preserved as a inclusion trails in porphyroblasts, indicates that shortening took place along the general E-W direction. Subsequent uplift was accompanied with a development of a bi-vergent tight to isoclinal folds, resulting form subvertical shortening and flattening. Under this circumstances primary isograd pattern was developed, indicating decrease of the peak-metamorphic conditions towards the west. As a result of continuous convergence and due to the lack of space, movements along the colliding crustal units took place. This latter event is treated as a cause for disturbance of the isograd and isotherm pattern observed within rocks of the Stronie formation. It is also responsible for zonal shearing, taking place generally along the N-S direction.