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Abstracts

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A review of the geodynamic setting of the volcanic provinces in the Carpathian-Pannonian region

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The Carpathian-Pannonian region (CPR) area, as part of the Alpine–Himalayan orogenic belt shows a complex late Cenozoic-Quaternary geodynamic evolution of the magmatism. However, the relationship between geodynamic processes and magmatism remains controversial.

The magmatism starts with 'orogenic' magmas and end with 'anorogenic' ones. Since the formation of most of the 'orogenic' volcanic rocks postdates the active subduction process the 'subduction-related' geochemical character of the volcanic rocks is supposed to be inherited from the mantle source regions modified previously by fluids or sediments released from subducted slabs. Post-collisional extension of the lithosphere could result in the decompression melting of the hydrous portion of the lithospheric mantle followed by the melting of the deeper asthenosphere.

Ignimbrite flare-up is characteristic for the inception of extensional tectonic processes in CPR, followed by a variety of subalkaline, potassic or ultrapotassic (orogenic) magmas suggesting a progressive dehydration and "de-fertilization" of the lithospheric mantle source. The latest magmas are less voluminous, silica-undersaturated and sodic-alkaline in composition (anorogenic), suggesting a transition from lithosphere to asthenosphere melting in the orogenic environment.

We do know that there is a relationship of the volcanoes with regional tectonic setting since volcanoes generally lay along or near major faults or within severely faulted areas, however we do not really tell the triggering mechanism of the eruptions. Large, initial ash-flow calderas that may imply a huge size, now hidden by the younger events raise a lot of questions about their relationships with regional geological framework, especially how such vast material was accumulated or how the eruptions were triggered. The Subalkaline magmatism is constantly younging from west to east, as connected with different local basins, suggesting a NE-ward time-dependent migration that followed the trend of extensional tectonics in each basin; various tectonic processes were suggested: lateral extrusion, wide rift or core complex extension, or transpressional-transtensional tectonics. Juxtaposition in both space and time suggests that the rate of volcanic activity should be related to the rate of tectonic activity.

Much of the present contribution is an update review of the relationship between the volcanism and tectonic activity in CPR. Few additional subjective suggestions can be used in the

future for a petrological-geophysical multidisciplinary approach to investigate the premises how volcanism is related to the tectonically controlled accumulation and storage of magmas in releasing structures that could be themselves oriented for eruption or are associated with such structures.

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