

Volcanic forms of Neogene to Quaternary volcanism in Western Carpathians

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Neogene to Quaternary volcanic/magmatic activity in Western Carpathians took place between 16.5 and 0.1 Ma. It shows a great variability of volcanic forms reflecting compositional variability (calc-alkaline basalts to rhyolites, alkali basalts) and variability in environment of volcanic eruptions (terrestrial, shallow submarine). Most of primary volcanic forms have been affected by erosion, especially in areas of post-volcanic uplift. Volcanic forms identified in Western Carpathians can be classified as monogenetic or polygenetic volcanoes and their subsurface/intrusive counterparts (Lexa et al., 2010). Monogenetic volcanic forms occur often as integral parts of polygenetic composite or compound volcanoes. Monogenetic volcanoes associated with calc-alkaline basaltic andesite and andesite magmas are represented by solitary domes, dome-flows, tuff cones, small simple cones, dikes, sills, laccoliths, irregular intrusions and stocks. These forms occur usually at parasitic vents of mature stratovolcanoes and in areas of bimodal andesite/rhyolite volcanic activity with multiple vents. Solitary intrusions occur also in strongly uplifted and deeply denudated areas. Felsic extrusive lava domes and dome-flows with associated pyroclastic rocks and minor intrusions could form fields of dispersed monogenetic volcanic forms. Maars, tuff-rings, tuff-cones, scoria-cones with related lava flows and flow fields, necks and/or plugs, dikes, sills, diatremes are characteristic of alkali basalt

monogenetic volcanic fields. Polygenetic volcanoes have been created by longer-lasting, often re-current and voluminous eruptions. Among alkali basalt volcanic forms only maar-diatreme volcanoes fulfil this definition. Basaltic andesite and andesite stratovolcanoes are the most widespread polygenetic volcanic forms. Stratovolcanoes show a great variability in size and complexity from simple cones of the dominantly pyroclastic, stratovolcanic or effusive type to large composite and compound stratovolcanoes involving variably incorporated monogenetic volcanic forms, calderas, domes and dome-flows of differentiated rocks and intravolcanic and/or subvolcanic intrusive complexes. Most of the stratovolcanoes evolved in terrestrial conditions and their distal zones are represented by fluvial and lacustrine facies. Some of the stratovolcanoes grew close to the coast, hence they grade into shallow marine facies at the distal zone. Intermediate composition polygenetic volcanic forms are represented also by dome-flow fields and polygenetic lava fields with no obvious central volcanic features in volcanotectonic depressions – grabens. Subvolcanic and hypabyssal intrusive complexes represent subsurface equivalents of polygenetic volcanoes. Felsic rocks occur mostly as monogenetic volcanic forms, however, they occur also as polygenetic/compound dome-flow complexes.

References:

Lexa, J., Seghedi, I., Németh, K., Szakács, A., Konečný, V., Pécskay, Z., Fülöp, A., Kovacs, M. (2010): Neogene-Quaternary volcanic forms in the Carpathian-Pannonian region: a review. – *Central European Journal of Geosciences*, 2, 207-270.