



## **The origin of dacite of the Ciomadul (Csomád) volcano (SE Carpathians)**

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In the Carpathian-Pannonian region the last volcanic eruption occurred in the dacitic Ciomadul volcano at 30 ka. Considering the long repose time between the active phases, renewal of the volcanic activity cannot be excluded. Thus, it is crucial to obtain detailed information about the magma genesis of this volcano. In this study, we show the result of a very detailed, combined textural and geochemical investigation on crystal-rich lava dome rocks from the northern crater rim of the volcano. The main mineral phases are plagioclase and amphibole, which show diverse zoning patterns. They occur often as glomerocrysts, where the plagioclases are rounded or have thin reverse rim, sieve texture and characterized by low FeO content ( $<0.2$  wt%). The strongly opacitized amphiboles are typically low in  $Al_2O_3$  (around 7.7 wt%). Quartz and sanidine crystals are also rounded and accompanied usually with titanite, allanite, apatite and zircon. All of these minerals are interpreted as antecrysts representing fragments of a granodioritic crystal-mush occurred at  $\sim 2.5$  kbar and  $740 \pm 30^\circ C$ , close to the solidus temperature based on the amphibole-plagioclase and two feldspar geothermometry. The dacite contains also clinopyroxene and olivine crystals with high magnesium content ( $mg\# > 0.8$ ). These crystals are also antecrysts, but originated from a mantle-derived primitive basaltic magma. Second generation of amphibole having higher  $Al_2O_3$  content (around 11.8 wt%) occurs as microphenocrysts and reverse rim of the antecrysts. Plagioclase microphenocrysts are euhedral and have higher FeO content (0.3-0.4 wt%) than the antecrystic plagioclases. These crystals are phenocrysts (s.s.) and crystallized from a hybrid melt. This melt was generated by the reactivation of a long-lasting crystal-mush due to intrusion of mafic magmas. The pre-eruptive storage conditions were  $840 \pm 11^\circ C$  at  $\sim 2.9$  kbar based on amphibole-plagioclase microphenocryst pairs. Accordingly, the Ciomadul dacite contains a mixture of crystals of crustal derived felsic and mantle derived mafic magmas. This work belongs to the K68587 OTKA research projekt.