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# Complex magma differentiation history revealed by chemical and isotopic zoning in plagioclase phenocrysts from Capraia Volcano (Italy)

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Plagioclase phenocrysts in dacites from the high-K calc-alkaline Capraia volcano (7.2-7.6 Ma) in the Tuscan Magmatic Province were analysed for major, minor elements and Sr isotope variations in order to evaluate the open-system history of the volcano. Most lavas are dacitic in composition and have a predominantly high-K calc-alkaline signature. Repeated dissolution zones (comprising several resorption events) in plagioclase phenocrysts from two dacitic units are associated with increasing An content and Sr isotopic variations ($^{87}Sr/^{86}Sr$ = 0.70872-0.71004), which argue for repeated magma recharge events. Taking into consideration both chemical data (mol% An, $Fe_T$) and isotopic variations, we also show that individual plagioclase phenocrysts in the Monte Castello dacitic unit display, at least in part, a shared crystallisation/resorption history. Sr isotopic zoning further suggests that the magma chamber was repeatedly replenished with both unradiogenic and radiogenic magmas. Recharge with an unradiogenic magma, perhaps basaltic in composition, concurs with the predominance of reverse zoning in pyroxene and the presence of olivine in some dacites. We suggest that the high An, Fe, Sr contents and radiogenic Sr in some plagioclase rims reflect recharge with a lamproitic magma prior to eruption. The decrease in An% after most dissolution zones, as well as the low temperature estimates from two-pyroxene thermometry ($<$700ºC) also emphasize the importance of crystal fractionation, which occurred during or shortly after most recharge events.