



## **History of magmatic feeding system of Vesuvius and Campi Flegrei caldera.**

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The definition of the magmatic feeding system of active volcanoes, in terms of composition, time-scale of crystallization, relation between composition of the erupted magma and structural position of vents, magma chamber processes is of extreme importance for the prevision of the eruptions and for the hazard evaluation. The studies that are carried out for the definition of the magmatic systems include detailed mineralogical, geochemical and isotopic analyses (Sr, Nd, Pb).

The Somma-Vesuvius magmatic structure is characterized by deep and shallow reservoirs and by the operativity of crystal fractionation, and mixing-mingling processes among isotopically and compositionally distinct magmas, acting before and during Plinian, sub-Plinian and low-magnitude strombolian activity. Magma composition varies from K-basalts to phonolitic-tephrites.

The Campi Flegrei caldera magmatic structure is characterized by deep and shallow magma chambers. The shallow reservoirs were mostly located at less than 3 km of depth, in different sectors of the caldera. The youngest magma chambers, that have fed the younger than 4.5ka eruptions were located along the board of the resurgent block and at the intersection of NW and NE trending faults. Magma composition varies from shoshonite to phonolite. The shallow Campi Flegrei magma chambers were characterized by the operativity of fractional crystallization, and mixing-mingling processes among isotopically and compositionally distinct magmas before and during the eruption.

The knowledge of the time evolution of both Somma-Vesuvius volcano and Campi Flegrei caldera feeding systems, allows us to formulate evolutionary models to project into the present and to infer the possible composition of the magma, that will feed the

future eruptions of both volcanoes and the possible processes that will act during the magma stagnation at shallow depths before and during eruption. This information is of extreme importance to depict the future behavior of both volcanoes and to contribute to the hazard evaluation.