MANTLE AND CRUSTAL COMPONENTS IN THE GENESIS OF MAGMAS OF THE PHLEGREAN VOLCANIC DISTRICT (ITALY)


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New isotopic investigation has been carried out on potassic volcanic rocks representative of the magmatic activity of the Campi Flegrei caldera, and the islands of Procida and Ischia. These volcanoes form the Phlegraean Volcanic District (PVD) in the Campanian Region (Italy). The results of this investigation allowed us to define at least three distinct components in the petrogenesis of the magmas erupted in the PVD. Two components, located in the mantle, include a T-MORB type mantle source and a slab-derived source, likely representing fluids and partial melts of sediments of the subducting Ionian plate. The third component, as previously suggested, is represented by continental crust-derived fluids or partial melts which are incorporated into mantle-derived magmas, during stagnation at mid-crustal depth, before rising to the surface. Crustal contamination has been most effective during the volcanic activity of Campi Flegrei younger than 39 ka. We have detected an eastward spatial variation, from Procida and Ischia islands to Campi Flegrei, in the isotopic characteristics of the volcanic rocks. This variation can be interpreted as the result of variable contribution of the slab-derived component to the magmas feeding the magmatic systems, due to the variable position of the volcanoes with respect to the Ionian plate, presently sinking beneath the Southern Tyrrhenian sea.