Sr AND Nd ISOTOPIC STUDY OF THE ALBAN HILLS VOLCANICS: CONSTRAINTS TO THE ROLE OF THE CARBONATE BASEMENT FOR THE PETROGENESIS

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The Alban Hills volcanic complex, Central Italy, consists of ultrapotassic pyroclastic products and subordinately of lavas, ranging in composition from leucite tephrite to leucite phonolite. The volcanic activity can be divided into two Stages pre- and post-calderic, separated by an explosive episode. Common geochemical features are their high alkali, REEs and HFSEs contents. New Sr and Nd isotopic data show that no significant difference of the Nd isotopic compositions exists between the products of the two Stages, while higher $^{87}Sr/^{86}Sr$ ratios (0.71050) characterize the pre-calderic products with respect to those of the post-calderic stage (0.71035). As a whole, both geochemical and isotopic data support a common enriched mantle source for all the products; however, both the enrichment of incompatible elements and higher $^{87}Sr/^{86}Sr$ ratios of the pre-calderic rocks with respect to those of the post-calderic Stage cannot be explained by common petrogenetic processes. In contrast, elemental and isotopic characteristics can be accounted for considering that interaction processes occurred between magmas and the local carbonate basement. The difference in the $^{87}Sr/^{86}Sr$ values observed in pre- and post-calderic products must be related to the interaction between magma and Mesozoic limestones ($^{87}Sr/^{86}Sr$ about 0.708). According to this hypothesis the pre-calderic volcanics represent rather primitive magmas.