



Sr ISOTOPE RATIOS OF CENTRAL ITALY WATERS TO ASSESS THEIR ORIGIN

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Sr isotopes have so far applied only occasionally to the study of the waters from central Italy. Therefore, we have analyzed more than 30 water samples from thermal and cold springs, and from the lakes located in the Quaternary K-alkaline volcanic districts of Latium, aimed at providing significant information on the sources of Sr and the hydrologic circulation.

The $^{87}\text{Sr}/^{86}\text{Sr}$ composition of the waters shows a general correlation with the aquifer rocks, resulting in the waters from older carbonatic rocks having a less radiogenic signature than those from younger K-alkaline volcanic rocks. The Sr-isotope ratios of most thermal waters range narrowly by 0.708, indicating a common source of Sr, likely represented by the Upper Triassic Burano Anhydrites, i.e. the lowermost permeable formation in the study area. Moreover, the positive correlation between Sr and Ca suggests that bulk Ca was also supplied from that source. A minor number of thermal waters as well as all the waters from the lakes and cold springs display a larger Sr isotopic range (0.7085-0.7115), suggesting a relative large spectrum of sources for Sr. In particular, some waters derive their Sr from a singular source, but the most show isotopic signatures suggestive of mixed contributions from different aquifers. As a whole, the results from this study confirm that Sr isotopes are a useful tool contributing to explain the geochemical characteristics of surficial and groundwaters.