Outcrops of X-5 and X-6 tephra markers along the Southern Tyrrhenian coast of Italy

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Volcaniclastic layers interbedded in the sedimentary sequences of Marine Isotope Stage (MIS) 5 have been the subject of many tephrostratigraphic studies over the past decades. In particular, two important markers, named the X-5 (105 ± 2 ka) and X-6 (107-108 ka) tephras were recognised in many Mediterranean marine and lacustrine sequences. First identified within Ionian Sea marine cores [1] these marker tephras have since been recognised in Tyrrhenian Sea cores [2] and terrestrially at Lago Grande di Monticchio [3,4].

In a recent paper [5] the two tephras were identified in the lacustrine sequence of Sulmona basin and along the Cilento coastline. Here we present new petrographic and microanalytical data on volcaniclastic deposits outcropping in the Cilento area. Trace element concentration determined on single glass shards by LA-ICP-MS unequivocally confirms these volcaniclastic levels as the X-5/TM-25 and X-6/TM-27 markers tephras. Moreover, additional investigations of a volcaniclastic level outcropping in Valle del Crati (northern Calabria), near the village of Tarsia, allows a correlation of this level with the X-6 marker tephra. The associated age of the X-6 (107-108ka) is in contrast with the previous thermoluminescence age of this level (42-25 ka [6]).

Volcaniclastic deposits with similar characteristics to those along the Cilento coastline have also been recognised along the Lucania and Calabria Tyrrhenian coast. The mineralogical assemblage (alkali feldspar + diopsidic to salitic clinopiroxene + plagioclase + feldspathoids ±- biotite and amphibole) and the trachytic composition of the glasses strongly suggest a correlation of these layer with the X-5 and X-6 tephras. Further trace element analysis is required to reinforce links to the Cilento levels.

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Mg and Fe isotope constraints on the genesis of Paleoproterozoic magnesite deposits, NE China

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As the world famous magnesite mineralization belt, the Paleoproterozoic magnesite deposits in eastern Liaoning, NE China, accounting for about 30% of the whole world reserves, have experienced multi-geo-processes (evaporation deposit, regional metamorphism etc.), and the genesis is still in debate: chemical deposition or metasomatism. In this study, Mg and Fe isotope compositions of carbonate and magnesite were determined for tracing the genesis of the magnesite deposits. The δ^{26}Mg values (*ca*. -1.5‰ to DSM3) of the magnesite are in the range of the Mg isotope composition of the carbonate, differing from the magmatic source (δ^{26}Mg values *ca*. -0.25‰) and present seawater (δ^{26}Mg values *ca*. -0.83‰). Furthermore, if consider about recent stimulation experiments that the abiotic chemical precipitation could produce a large rang of Mg isotope fracitionation (*ca*. -2‰ for the calcite precipitatioan and *ca*. -1.19‰ for the magnesite precipitation at 150°C) from aqueous to solid, the Mg isotope results are consistent with a chemical precipitation origin. This view is also supported by the fact that the δ^{56}Fe values of the deposits (range from -1.0 to -0.13‰ to IRMM, with an average value of -0.43‰) are compatible to the Fe isotope composition of the sedimentary carbonates.

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