



Characterisation and Uranium-Series Dating of Travertine from Süttö in Hungary

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Terrestrial carbonate formations, such as travertines, speleothems and lake sediments, are archives of terrestrial climate forcing. At the Süttö section in Hungary, a succession of travertine is covered by a loess-palaeosol sequence; both are high resolution terrestrial archives of climate and environment change. Uranium-series ($^{230}\text{Th}/\text{U}$) dating using thermal ionisation mass spectroscopy was carried out to set up a reliable chronological frame for the travertine. As the growth of travertine is complex, pore cements may cause serious problems for precise dating. Therefore, we applied microscopic, mineralogical and geochemical methods to determine the abundance of secondary calcite. The state of alteration of primary spar and micrite was characterised by cathodoluminescence and microprobe analyses. The travertine from Süttö showed homogeneous phases of primary calcite, minor micropores and rare pore cements. Stable carbon and oxygen isotope analyses were carried out to characterise the depositional environment of the Süttö travertines. The carbon isotopic composition indicated that the source of carbon was a mixture of atmospheric and soil derived CO_2 . Calculated water temperatures based on oxygen isotope data ranged from 22°C to 31°C . For uranium-series dating bulk samples were prepared from areas with mainly micrite and spar. $^{230}\text{Th}/\text{U}$ ages were determined applying an isochron approach. As the dense travertine deposits had a dense structure, the bulk sampling method was successfully applied in determining uranium-series ages with much higher precision than former studies with alpha spectrometry could achieve. Travertines from Süttö yielded Mid-Pleistocene ages ranging from the antepenultimate glacial to the penultimate interglacial (310-240 ka). These results are in agreement with those from OSL and AAR dating of the overlying sediment indicating at least an MIS 7 age for the travertine.