U-series isotope systematics in the Pleistocene travertine system of Antalya, Turkey

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Stalagmite, travertine/tufa carbonates are widely used as archives for the reconstruction of paleoclimatic changes, usually based on ^{18}O and ^{13}C and other climate proxies, whereas attempts at setting their age are generally made using ^{14}C and uranium disequilibrium series. We present here U-series measurements carried on samples from a large array of carbonate facies observed in the Antalya Pleistocene travertine system that covers about ~ 600 km^2 and reaches a maximum thickness of about 250 m (Glover et al, *Geol. J.,* 2003), as well as in modern springs and streams of the area. The travertine system forms two major terraces, at elevations of ~ 300 m and 200-100 m respectively, and a third less documented deposit below modern sea level. Physico-chemical and U-isotope measurements were also carried out on water samples from modern springs and streams. The physico-chemical and biogenically induced carbonate deposits depict a large array of facies: micritic, oncolitic, pisolitic and stromatolitic, and a large spectrum of textures and porosity. Up to now, no clear chronostratigraphic scheme has been established and the age of the travertine deposits remain controversial (Koşun, *Carb. Evap. 2012*). Our preliminary U-Th measurements in samples from the lower terrace depict a wide range of ages, suggesting deposition starting prior to the age limit of the method (~ 600 ka) until the present. Two clusters at ca 300 and 70 ka (uncorrected ages) are interpreted as indicating two intervals with more intense travertine deposition. However, detrital contamination in most samples, lead to plan further analysis in order to derive isochron ages. Unfortunately, the analysis of coeval facies within given depositional units of the lower terrace clearly indicate an open system behavior with U-relocation between facies, due to the high overall porosity and oxidizing conditions. Thus, the setting of a robust chronostratigraphy of the Antalya travertine system based on U-series might remain out of reach, although data from the most cemented facies could yield some useful information on ages of the final closure of the U-Th system.