A first speleothem hydroclimate record for the 93-76 ka BP interval in the Western Mediterranean

B. SÁNCHEZ-MARTÍN[1], J. MARTÍN-CHIVELET[1]*, M.J. TURRERO[2], R.L. EDWARDS[3], A.I. ORTEGA[4] AND P. GARAY[5]

[1]Complutense University of Madrid. Madrid, Spain. (beatsa05@ucm.es, *correspondence: martinch@ucm.es)
[2]Ciemat, Madrid, Spain (mj.turrero@ciemat.es)
[3]University of Minnestota, Minneapolis, USA. (edwar001@umn.edu)
[4]Cenieh, Burgos, Spain (anaisabel.ortega@fa.cenieh.es)
[5]Generalitat Valenciana, DGMN, Valencia, Spain (garay_pol@gva.es).

An U-series dated speleothem from Don Juan Cave (Jalance, Valencia, SE Spain), which grew without significant interruption 93 and 76 ka ago, yields a first paleo-hydroclimate time-series for this interval in the western Mediterranean, a key area for understanding the behavior of teleconnections between the Arctic – North Atlantic and the Eastern Mediterranean, at decadal to centennial scales.

The study presents high-resolution stable isotope ($\delta^{18}O$ and $\delta^{13}C$) and microstratigraphy (fabrics, stacking patterns and morpho-stratigraphic elements) records which reveal for the whole interval conditions substantially wetter and colder than the semiarid Mediterranean climate that prevails today. The records show a broad cooling trend for the 93 to 85 ka BP interval, a thermal minimum lasting about 1000 years between 85-84 ka BP, and a warming trend from 84 ka BP onwards. Beyond these broad trends, significant decadal, centennial, and millennial variations between relatively dry and humid climate, have been recognized and analyzed statistically.

Our records are compared with ice-core data from Greenland and speleothem data from the Eastern Mediterranean and other mid- and low- latitude areas in order to interpret long-distance teleconnections at decadal to centennial scales during the first phases of the last glacial period. The comparison indicates significant inverse correlation between the Greenland and the Mediterranean climate records, that should be understood in the framework of the North Atlantic climate variability at those time scales.

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