



Reconstruction of past climate variability in SE Spain between 14 and 8 ka

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In comparison to the large climatic oscillations during the Pleistocene, Holocene climate only underwent minor changes. Nevertheless, cyclic climate changes also occurred during the Holocene. The Bond events, represented by the presence of cold, ice-bearing waters from the north of Iceland as far south as the latitude of Britain, occurred at a cyclicity of about 1500 a and were particularly pronounced during the Early Holocene. However, their climatic impact on the terrestrial realm was not consistent over Europe, in particular with respect to changes in precipitation.

Here we present a precisely dated high-resolution flowstone record from Cueva Victoria, SE Spain, a site well suited to study the competing influence of the Atlantic and Mediterranean Sea on the southern Iberian Peninsula. We sampled several flowstones with a thickness of up to 60 cm. $^{230}\text{Th}/\text{U}$ -dating has shown that these deposits mainly formed during relatively warm climate intervals of the Middle and Late Pleistocene, i.e. interglacials and interstadials (Budsky et al., 2015; Gibert et al., 2016).

Here we focus on a short (11 cm) flowstone sequence from the Holocene with a high temporal resolution (centennial for stable isotopes and annual for trace elements). The flowstone grew between 14 and ca. 8 ka b2k. The decreasing trend of the $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ values as well as of several trace elements between 12 and 11 ka b2k reflects an increase in temperature and precipitation at the beginning of the Holocene. In particular, Sr and Mg show a trend towards low and stable values. Subsequently, from 10.5 to 8 ka b2k, the $\delta^{13}\text{C}$ values show a high variability (-11 to -4 ‰), whereas the $\delta^{18}\text{O}$ values are rather stable (between -6 and -7 ‰). Maxima in $\delta^{13}\text{C}$ are interpreted as drier conditions in response to Bond events. These events possibly led to a change of the atmospheric circulation, affecting the vegetation in SE Spain, which evolved towards an open C_3 vegetation at ca. 8 ka b2k concomitant with drier conditions.

Budsky, A., Scholz, D., Gibert, L., Mertz-Kraus, R., 2015. $^{230}\text{Th}/\text{U}$ -dating of the Cueva Victoria flowstone sequence: Preliminary results and paleoclimate implications, in: Gibert, L., Ferràndez-Canadell, C. (Eds.), *Geology and Paleontology of Cueva Victoria*. Mastia 11-13, Cartagena, pp. 101–109.

Gibert, L., Scott, G.R., Scholz, D., Budsky, A., Ferràndez, C., Ribot, F., Martin, R.A., Lería, M., 2016. Chronology for the Cueva Victoria fossil site (SE Spain): Evidence for Early Pleistocene Afro-Iberian dispersals. *Journal of Human Evolution* 90, 183–197.