



Belgian speleothems from the Last Interglacial: insights in the onset of glacial conditions in north western Europe.

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Currently, a dataset combining at least four speleothems from two different cave systems in southern Belgium (Han-sur-Lesse and Remouchamps) is being constructed to improve the understanding of the termination of the Eemian and the millennial to decadal variability of the Early Glacial times in north western Europe. Here, one of those speleothems is presented.

The Han-stm-9 (or 'Triptyque') speleothem is a broken, 68 cm long and candle-shaped stalagmite from the Han-sur-Lesse cave system. The stalagmite was collected in summer 2013 within the southern part of the cave network and was dated between ~ 126 and ~ 99 ka. Most likely, climate optimum conditions during the 130-125ka interval are linked to the growth of this and other speleothems from Belgian caves. This particular speleothem gained interest because of the partial conformity with the continental interglacial period in northern western Europe (130 – 118ka) and its dense calcite composition with visible layering, excluding post-depositional deformation. Furthermore, the stalagmite displays a complex growth history, with large variations in growth rates (ranging from and periods of ceased speleothem formation. Two hiatuses, with a distinct macroscopic expression, occur. The first one starts at 118.4ka and lasts until 113.0ka. A second hiatus is situated between ~ 108 ka and 103.7ka. A trend in growth rate, consisting of slow growth gradually increasing towards very fast speleothem formation before both hiatuses, is observed. These intervals with very high growth rates, for instance around 118ka, enable high-resolution climate reconstructions via stable isotopes ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$) and trace elements (Mg, Sr, Ba and P), down to centennial and decadal scale.

The timing of the first hiatus corresponds with Greenland Stadial 26 and with the generally accepted termination of the Eemian in northern Europe at 119-118ka. Also, preliminary stable isotope studies have indicated a large deterioration of $\delta^{13}\text{C}$ occurring right before the second hiatus, while $\delta^{18}\text{O}$ increases only gradually. This could indicate drastic vegetation changes in the area occurring around the timing of GS25. Furthermore, both $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ time series clearly display millennial to centennial scaled variability during the onset of the Last Glacial.

These proxies thus indicate a rather complex glacial-interglacial transition, which is in line with other archives from different locations in Belgium and Europe. Eventually, integrating these findings into a more regional dataset can lead to an improved knowledge of continent-scaled tendencies, such as previously suggested N-S gradients in the onset of Interglacial and Glacial conditions.