



Pollen and eDNA analyses from accurately dated speleothems.

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In this study we use two Early Holocene stalagmites from the well investigated Milchbach cave system (Switzerland, 1840 m asl) to test the potential of pollen assemblages and environmental DNA (eDNA) from speleothems to provide palaeovegetation reconstructions. We demonstrate that pollen is chiefly associated with bacterially mediated calcite fabrics, typical of a well-ventilated cave system whereas it is noticeably absent from columnar fabrics associated with phases of glacier advance (Luetscher et al., 2011). Our results confirm that, in presence of sufficient air flow, even small amounts of calcite (0.8-2.5 g) can contain enough pollen grains to deliver a pollen spectra representative of the original vegetation. This clearly opens new perspectives for both palaeobotany and speleothem science. Considering that speleothems provide independent chronological control back to ca. 800 ka, the single evidence of plant taxa can be particularly valuable for locations/time periods for which no palaeovegetational data can be obtained from sediment and peat archives, while having information about the outer cave environment is crucial for a correct interpretation of the geochemical signal stored in speleothems. The occurrence of pollen grains in the speleothems offers us the opportunity to run an eDNA metabarcoding experiment targeting the intron trnL plastidial barcode region. Methodology and some preliminary results are presented and discussed.