



High accurate seasonal-resolved speleothem record of the last 2000yr from northwest Iberian Peninsula.

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Because of its latitudinal situation, northwest Iberian Peninsula is one of the best regions all over the North Hemisphere, to identify Atlantic climate and paleoclimate variability using different climate proxies. Taking into account the recently fast climate change, in extratropical regions is essential to determinate the evolution of the climatological conditions during the recent period to develop a good interpretation of the future evolution of the climate in a region so representative of north hemisphere climate variability. Thus, a high resolved proxy of the recent period is needed to characterize and identify the evolution of the climate in this region, with special attention with climate events during the instrumental period. Here we present a high resolved speleothem record of the last 2000 yr, from a cave located in the central Cantabric coastline which allowed the assessment of how was the seasonal variability evolution of the climate in the region studied during this period. With CO₂ and geochemical seasonal variability in trace elements with high signal in Sr, this 2000yr stalagmite dated with U/Th method with a growth rate from 100 to 250 micrometers/yr calculated with B-Chron age model and adjusted with a continue wavelet transform mathematical method, give us a very accurate chronological information of the climate conditions near the cave. Trace elements are analyzed at 8 micrometers intervals by Laser Ablation ICP-MS which resolves even monthly resolution with special attention with Sr, Mg and Ba. As well, we have trace elements and stable isotope d13C, d18O data with spatial resolution of 0.2mm during the instrumental period analyzed with ICP-MS and IR-MS, which allow us to compare the geochemical variability between them. Several significant climatological periodicities are identified in laser ablation data using wavelet analysis along the 30cm of the speleothem: annual, decadal and multidecadal. The continuity of growth in instrumental period is suggested by Suess effect in d13C and is pending confirmation of the 14C bomb spike which would better constrain chronology. The last 40 years of the instrumental period have no seasonal cycles and shift to the highest Sr/Ca ratios of the whole record, and appear to reflect a land use change to eucalyptus plantation. The preceding portion of the instrumental record may still provide useful calibration of geochemical proxies.