



Speleothem records of western Mediterranean. Hydrological variability along the Last Interglacial Period and marine linkages

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This study aims to identify and characterize regional hydrological variability in the western Mediterranean region in base to different geochemical parameters ($\delta^{18}\text{O}$, $\delta^{13}\text{C}$, and Mg/Ca ratios). Speleothems have been recovered from several caves located in southern central Pyrenees one and the others from the Balearic Islands. Their chronologies have been constructed in base on U/Th absolute dating and indicate that the speleothem sequences cover the end of the last interglacial and the glacial inception. One of the most remarkable features of the records is the intense and abrupt shift toward more arid conditions that marks the end of the last interglacial (MIS 5e). Furthermore, our speleothem records also show relatively humid but highly variable hydrological conditions during the interstadial periods from MIS 5c to 5a.

These speleothem records have been compared with new generated western Mediterranean marine records from the Balearic Sea (MD99-2343) and Alboran Sea (OPD-977). Marine records include (1) proxies of sea surface temperature and changes in evaporation-precipitation rates based on pair analysis of $\delta^{18}\text{O}$ and the Mg/Ca ratios in planktonic foraminifera *Globigerina bulloides*; (2) proxies of deep-water currents associated with the Western Mediterranean Deep Water (WMDW) based on grain size analyses. The results reveal that arid conditions on land were coeval with cold sea surface sub-stages (MIS 5b and 5d), and also with increases in the intensity of the WMDW-related currents. By contrast, humid and hydrological unstable atmosphere conditions were synchronous with sea surface warm sub-stages, and lower WMDW-related currents intensities (MIS 5a, c and e). Consequently, our results highly evidence a strong atmospheric-oceanic coupling, involving parallel changes in both surface but also deep western Mediterranean Sea conditions during the last interglacial period and the glacial inception.