Can high-resolution marine and land records resolve Atlantic vs. monsoonal system signals in the Eastern Mediterranean region?

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The Eastern Mediterranean (EM) region receives most of its rainfall from Atlantic-Mediterranean fronts, but the main supply of sediments is via the monsoonal controlled Nile River. This work compares the high-resolution O, C, U and Sr isotopic records of well-dated EM speleothems using MC-ICP-MS with the marine record of two cores located in the NE and SE Levantine basin, based on high-resolution planktonic foraminifera (*G. ruber*) isotopic record combined with total organic carbon (TOC) and its $\delta^{13}C$ values, pollen, and foraminifera assemblages. Comparison between the speleothems and *G. ruber* isotopic records shows that the paleoclimate variations of the EM during the Upper Quaternary coincide with north latitude climatic changes. Rainfall was enhanced during periods of sapropel accumulation and an extreme warm and wet event occurred at ~54 kyr. During the LGM both marine and land SST were lower by ~7-10°C compared with present day.

Changes in the Arboreal Pollen and Non Arboreal Pollen ratio match the speleothem record. Sapropels are easily recognized by the high concentrations and good state of preservation of pollen grains. The contribution of pollen originated from nilotic origin is also clearly evident.

TOC contents during sapropel events are significantly higher throughout the Levantine Basin. However, for most of the record TOC values are 2-3 times higher (0.6-0.9%wt) in the SE Levantine Basin compared with the NE basin (0.2-0.3%wt), indicating a strong link between Nile River discharge and primary production in the distal parts of the Nile delta. $\delta^{13}C_{org}$ values differ also between the SE and NE basins, reflecting a strong N-S gradient in climatic and environmental conditions: the NE basin reflecting a climate regime mainly influenced by the Mediterranean – North Atlantic system and the SE basin a significant and continuous contribution from the Nile River.

The multi proxy land and marine records from the EM region thus show that the timing of increased activity of the Atlantic-Mediterranean system coincide with periods of enhanced Nile sediment supply associated with monsoonal systems.