

Climatic conditions in the Eastern Mediterranean region during glacial marine isotopic stage 6

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During glacial marine isotopic stage 6, from 165 to 135 kyr, large ice sheet covered northern Europe whereas conditions in the tropics were humid, with heavy African monsoons (Rossignol-Strick, 1995). This stage in the Eastern Mediterranean (EM) Sea includes a sapropel layer (S6) that differs from interglacial sapropels because it contains pollen and fauna assemblages typical of glacial conditions (Cheddadi and Rossignol-Strick, 1995). The accurate dating of speleothems from the EM region (Israel) enables us to accurately determine the precise ages of events during stage 6 which are of special importance because no means of obtaining such precise ages are possible in the marine environment.

The isotopic record of the speleothems shows that minimum $\delta^{18}\text{O}$ values of -6‰ occur at 180-178 kyr and of -6 to -4.5‰ occur from 156 to 142 kyr. $\delta^{13}\text{C}$ values vary between -13 and -10‰ . These low values are typical to the isotopic values of speleothems that have deposited during interglacial, rather than glacial conditions (Bar-Matthews et al., 2000), and indicate that in this part of the EM region, the rainfall amount increased dramatically, and the climate was influenced by the humid conditions that prevailed over North Africa. In between these intervals, the speleothems $\delta^{18}\text{O}$ values are higher (ca. -3‰) and more typical to those deposited during glacial conditions. This suggests that the climate was colder, but probably never as dry as during much of the last glacial as indicated by the relatively low $\delta^{13}\text{C}$ values (-11‰ to -10‰), suggesting that the dominant vegetation during the entire stage was of C3 type. Thus, climatic events during this stage seem to be coeval with the large expansion of the northern ice sheet on one hand, and with wet tropics with monsoon index maxima on the other hand.

The transition from marine isotopic glacial stage 6 into stage 5 on land in the EM region occurred in two steps. The first step towards wetter and warmer conditions lasted from 135 to 128 kyr, followed by a deluge period starting at 128 kyr and lasting 9000 years.

References

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