



Measurement of exceptionally high biospheric productivity at the beginning of MIS11 based on $\Delta 17\text{O}$ of O_2 in ice cores

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During the Quaternary, the deglaciations are associated with large changes of atmospheric CO_2 concentration with a difference of up to 100 ppm between the glacial and the interglacial periods. A complete and quantitative explanation for these CO_2 increases in atmospheric CO_2 concentration is still an open question since several fluxes contribute to the variations of atmospheric CO_2 . Biological productivity is often invoked as one of the processes involved in the changes of atmospheric CO_2 , and understanding its impact over deglaciations is key. While marine and continental proxies have been used to reconstruct the past variations of productivity at a regional scale, measurements of $\Delta 17\text{O}$ of O_2 ($\ln(\delta 17\text{O}+1) - 0,516 \ln(\delta 18\text{O}+1)$) in ice core has revealed to be a good indicator for inferring the past variation of global biospheric oxygen fluxes. We focus here on the special case of Termination V and the influence of the flux associated with biospheric productivity.

Of the last 9 deglaciations, Termination V displays a unique feature. This deglaciation occurs during a minimum in eccentricity and follows a strong glacial period (MIS 12) preceding the long and warm MIS 11 interglacial period. It is the first termination clearly associated with the 100 ka glacial – interglacial periodicity after the MPT.

Here we present the first record of the variation of the global biospheric productivity reconstructed from the triple isotopic composition of atmospheric oxygen ($\Delta 17\text{O}$ of O_2) measured in the bubbles of 50 samples of EDC ice core (Antarctica) over Termination V, i.e. from 444,1 to 405,7 ka. Compared to the previous records of $\Delta 17\text{O}$ of O_2 on the last 400 ka (Blunier et al., 2012), results show that Termination V is the only termination on which we can observe a different trend between CO_2 and $\Delta 17\text{O}$ of O_2 , the decrease of $\Delta 17\text{O}$ of O_2 during the Termination and the beginning of MIS 11 being twice longer than the increase in CO_2 . This shift reflects an increase in global oxygen biospheric productivity up to 20 % higher compared the other interglacial periods hence confirming the specificity of Termination V and MIS 11.

We then confront this result to other long series linked to terrestrial and marine productivities for a perspective on the link between CO_2 concentration and productivity over Termination V compared to the 4 younger Terminations.