



## **PALEOPRECIPITATION RECONSTRUCTION FROM LOESS ISOTOPIC RECORD. APPLICATION TO THE LOESS SEQUENCE OF VILLIERS-ADAM, FRANCE.**

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Paleoclimatic databases lack of terrestrial data, essentially for glacial periods. Due to their rapid accumulation rate, loess sequences are well suited to observe terrestrial responses to rapid climatic changes occurring during glacial periods, with the temporal resolution required. Some studies based on the meaning of isotopic composition ( $\delta^{13}\text{C}$ ) of loess organic matter were performed in China, Europe and United States. All are based on the fingerprinting of environmental conditions by  $\delta^{13}\text{C}$  in plants and on its preservation during burial and sedimentation without disturbance. Application on Chinese and American loess sequences shows that waverings between C4 and C3 landscape are linked to changes in Monsoon regimes and variations in El Niño strength, respectively. In NW Europe, no change in photosynthetic pathway of the vegetation was observed. The vegetation is highly dominated by C3 plants allowing to interpret directly variations of typical loess  $\delta^{13}\text{C}$  in terms of isotopic response of C3 plants to environmental changes. Most important parameters influencing isotopic composition of C3 plants are temperature, isotopic composition and concentration of atmospheric  $\text{CO}_2$  ( $\delta^{13}\text{C}_{\text{atm}}$  and  $[\text{CO}_2]$  respectively), and water availability.  $[\text{CO}_2]$  and  $\delta^{13}\text{C}_{\text{atm}}$  are global paleoclimatic parameters available in literature. It is thus possible to infer the regional impact of global changes and to define a "continentality index" (CI) that would represent water availability and temperature changes. In some favourable environments, we can even derive precipitation. Comparing indepen-

dent records shows the reliability of the method. Paleo-precipitation reconstruction at Villiers-Adam (north of Paris) using our method for the two last glaciations, exhibits equivalent "M-shaped" pattern with three drastic episodes for each glaciation inserted in unstable milder phases. Teleconnections between ice, marine and continental systems are discussed.