

## Reply to Guo Zhengtang's review

We would like to express our sincerest thanks for your review, Prof. Guo, for your highly constructive comments and suggestions, which are very useful for improving the paper.

\* add a figure showing the modern seasonal distributions of precipitation and temperature

=> we added it as figure 2 as illustration of the modern situation in § 3.2. We numbered other figures in accordance (we also noted we missed to refer to Figure 5, former figure 4, we corrected it). In order to illustrate the seasonality, we chose to show the annual distribution of precipitation.

\* add a paragraph addressing the role (significant or not) of temperature on the occurrence of the C4-dominance

=> We added a mention to the modern plant distribution in the Surduk (§2.1 Lines 146-147) and refer to Pyankov et al. (2010) study (as suggested by Hong Wang) to explain the past C4 plants taxonomic distribution (§4.2 Lines 344-354). We likely faced C4 plants (dicots and chenops) that mostly react to precipitation.

\* add one or two curves of the malacology assemblages in Figure 4

=> it would make sense indeed to compare  $\delta^{13}\text{C}$  directly with malacological record obtained on the same sequence or at least on a sequence with a similar temporal resolution. Unfortunately Surduk malacological investigation is still in progress and data available for surrounding sequences were not sampled for the same scientific issue. Their aim was more to get a wide (spatially and temporally) overview of the malacological distribution and of the derived paleo-ecological interpretation than to focus at high resolution on one climatic cycle or on some events as we did here. Thanks to these previous studies, we knew that this place was of great interest for past atmospheric circulation reconstruction. Temporal resolution of previous malacological studies and sequence thicknesses are definitely lower than the  $\delta^{13}\text{C}$  study performed on Surduk. As C4 episodes are tiny and recorded by less than 30cm of loess, they are included into the larger malaco samples extracted from surrounding sequences. Because of this large difference of temporal resolution it is not possible to "correlate" Surduk loess sequence with surrounding ones as precisely as this study requires. By looking at malacological assemblages we found occurrences of some species that fit with our results but we don't know exactly their timing.

We are not able to accede reviewer request. Anyway we dug out into archives and literature and completed a little bit this part.