

Dear Editor,

We are glad that reviewers consider our manuscript worthy of publication in *Biogeosciences* after our changes and detailed replies. All of the minor changes have been addressed, and we have provided our reply below.

Kind regards,

Ana B. Marín-Arroyo

Reviewers

I think that most of the major issues of the previous versions have been solved. I only have a couple of suggestions/comments:

Title: I think that “evolutionary ecology” is not the best choice for this paper, since the field of evolutionary ecology deals with topics relating ecology and evolutionary patterns, and there is no “evolutionary discussion” of the results in this manuscript. So, why not “Paleoecology of ungulates...”? This would be a good summary of the results.

Agree. We modified the title to “Palaeoecology of ungulates in northern Iberia during the Late Pleistocene through isotopic analysis of teeth”

Fig. 2, please, specify which dates are ^{14}C , ESR and OSL in figure 2.

This data has been included in the figure caption.

New caption> Figure 2. Representation of the duration each archaeological level (dots represent the median values, bars represent 95% confidence intervals for ^{14}C dates and 68% for ESR and OSL dates) related to techno-complexes in both northwestern (in black) and northeastern Iberia (in green) and the $\delta^{18}\text{O}$ record from the NGRIP (North Greenland Ice Core Project members, 2004; Rasmussen et al., 2014). Grey bands indicate Greenland Stadials (GS). Dates from EL Castillo (^{14}C UF, ESR), El Otero (^{14}C UF), Axlør (^{14}C UF, OSL), Labeko Koba (^{14}C UF), Aitzbitarte III-interior (^{14}C AMS) and Canyars (^{14}C UF, ABA, ABOx-SC) are shown in Appendix B and C.

I think that the potential evaporation and amount effect interferences should be clarified. Line 354-355-> authors have discussed about the negligible effect of plant evapotranspiration. This is fine, but there are also other evaporative effects that have not been properly discussed. For example, the evaporation of rain drops when precipitation is scarce (amount effect), especially in dry periods, like the last glacial cycle (or even in summer precipitation). It should also be mentioned the evaporation that occurred in the water bodies (ponds, lakes) where these animals would drink. These effects would modify the isotopic value of the drinking water, and would also mask the temperature signal. In their response authors said that “evaporation and aridity do not seem to impact our samples, and for some individuals, we justify a seasonal pattern reflecting seasonal rainfall. “. However, this response is very vague. For example, the “amount effect” (Dansgaard 1964) affects precipitation when it is scarce (amount) and specially when the atmosphere is dry (glacial periods, summer periods, etc). It is very important at low latitudes. In mid latitudes such as the Iberian Peninsula, there would be a mixture between amount and temperature effect (specially in dry periods: summer, glacial...). Authors should discuss this potential effect in their samples. See the classic paper from Dansgaard (1964). In the case of water bodies (ponds, lakes, etc.), authors could argue that low temperatures during the last glacial cycle would prevent (or reduce) evaporation.

In section 5.2 (lines 590-656) we provide a detailed discussion about this issue. Regarding the influence of water sources susceptible to evaporation, this is mentioned in lines 651-656. We

concur with the reviewers and consider this to be a potential cause of the non-sinusoidal profiles observed (line 635). We have provided further clarification regarding the "*amount effect*"

Line 894 ATC (and throughout the manuscript)-> Please use "HS" for the Heinrich stadials. "HE" is only related to the specific episodes of IRD discharge in the North Atlantic.

This change has been addressed throughout the text.