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Climate of the Past Discussions

Interactive comment on "Heinrich Event 4 characterized by terrestrial proxies in southwestern Europe" *by* J. M. López-García et al.

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Dear Editor, We want to thank, firstly, the reviewer 2 comments in our manuscript, that have been very useful to improve the paper. All the minor remarks have been changed, for the other commentaries the response are exposed following: General comments: as suggests the reviewer the papers on vegetation and climate, such as Fletcher and Sánchez-Goñi, 2008; Fletcher et al. 2010; Bout-Roumazeille et al. 2006 and Combourieu Nebout et al. 2002 have been cited in the introduction and discussion. 1-Introduction: About the question of the interest of this paper in the introduction we exposed in the abstract that it is the first time that is used the small-vertebrate assemblage for the characterization of the H4 event. However, as suggest the reviewer we add a phrase to clarify the importance of our paper in the introduction. 2-

Site description: as suggest the reviewer we change the title by "Site description and chronology". To clarify the question about the dating we add a table (table 1) with the samples location, the material used for the dating, the BP dating and the calibration dating. 3-Method -Palaeoenvironmental reconstruction: the composition of chorotypes and their climate are exposed in table 2. Furthermore, as we said to the reviewer 1 the difference between Mid-European species tolerant and Non-strict Mediterranean. The Mid-European species tolerant to Mediterranean conditions have climatic requirements that not allow them to survived in sites with precipitation below 600 mm. On the other hand, the non-strict Mediterranean species refereed to the generalist species without climatic requirements (page 652) (Sans-Fuentes and Ventura, 2000; López-García et al. 2010b). On the other hand the habitat weighting method is a very common used method to grouped the small mammals or small vertebrate assemblages by their habitat preferences, in the manuscript are cited all the previously published and peer-reviewed papers were this methods is used (Cuenca-Bescós et al., 2005, 2009; Blain et al., 2008; Rodriguez et al., 2011; López-García et al., 2010a, 2011a).

-Palaeoclimatic reconstruction: as suggest the reviewer we add a phrase about the faunal composition of the Iberian peninsula today. Furthermore, we change the explanation of the MCR method to a better understanding of how we use the method and calculate the climatic parameters.

4-Results:

-Palaeoenvironmental and palaeoclimatic reconstruction: as suggest the reviewer and had suggested the reviewer 1 we add in the table 4 a column with the currently climatic data coming from the Barcelona airport meteorological station. As suggest the reviewer we change to a better understanding of the climatic conditions we change the phrase related with the temperature and precipitation in relation to present data.

-Comparison and discussion Comparison with other terrestrial proxies: As has been previously suggested by reviewer 1 Artemisa is written in italics. As suggest the re-

viewer the names of taxa have been changed of the position in different parenthesis after polles, etc. To a better understanding of the sentence page 659 lines 1-3, we changed it following the suggestions of the reviewer in comments. The other part, that we repeat in the previously chapter has been deleted as had been suggested by the reviewer 1. On the other hand, in response to reviewer comment the co-occurrence of temperate and cold-adapted small mammal species not means a mixed assemblage, it is normal dynamic detected in south European peninsulas, such as the Iberian peninsula, which functioned as refuges for species in cold periods (e.g. Sommer and Nadachowski, 2006).

Comparison with other sites: In response to the reviewer comments, the sites exposed in the manuscript, El Portlón and Cueva del Conde have been dated and the calibrated 14C have been published in López-García et al. (2010a; 2011b). Although the reviewer is right because the three sites could be considered with the same age. Their differences should be related, as we exposed in the manuscript, by their different location. However, as suggest the reviewer we add a sentence relating our data with the data exposed by Fletcher and Sénchez-Goñi (2008) for the different phases of the H4 event in the Iberian peninsula.

5-Discussion: As we exposed above, the calibrated dating of the used sites for comparison appears in the different peer-reviewed papers cited in our manuscript. Moreover, in relation to the comments about the discussion, we put in relation our data with the previously woodland and SST curves, and as can be seen in the figure 8, more or less the terrestrial data that we have obtained with small vertebrate assemblages from the different studied sites coincide with the marine sea cores. Is true, that is difficult to correlate this two kind of proxies because the resolution obtained wit small-vertebrate terrestrial proxies in not continuous, as success with the sea cores, but we have tried to do an attempted correlation. Despite this the possibilities exposed by Fletcher and Sánchez-Goñi (2008) have been pointed in this chapter.

We hope that the changes done in the manuscript and the answers to the reviewer

comments are satisfactory for you to consider the publication of our paper into your journal Climate of the Past. Yours Sincerely Dr. Juan Manuel López-García

Please also note the supplement to this comment:
http://www.clim-past-discuss.net/9/C265/2013/cpd-9-C265-2013-supplement.pdf

Interactive comment on Clim. Past Discuss., 9, 647, 2013.

Site Inventory	Material	Lab#	Pre-treatment	δ13C	AgeBP	calBP(2δ)
TC07-I-L24-MCV	Charcoal	Beta273965	ABA	–23.5‰	33,800±350	37,405-39,720
	(*Pinus sylvestris* type)					
TC07-I-L25-MCV	Charcoal	OxA-23643	ABA	–23.0‰	34,540±330	38,756-40,516
	(*Pinus sylvestris* type)	OxA-2416-44	ABOx-SC	–22.89‰	34,980±350	39,048-41,004
TC07-I-L25-MCV	Charcoal	OxA-23644	ABA	–23.35‰	34,810±360	38,904-40,849
	(*Pinus sylvestris* type)	OxA-24057	ABOx-SC	–22.77‰	34,900±340	38,993-40,916

Fig. 1.