

Clim. Past Discuss., referee comment RC2
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Comment on cp-2021-143

Anonymous Referee #2

Referee comment on "Impact of terrestrial biosphere on the atmospheric CO₂ concentration across Termination V" by Gabriel Hes et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-143-RC2>, 2021

In this manuscript Hes et al. studied the pollen as a proxy for forest development and paleoclimate from the 433-405 kyr time span from a deep-sea marine sediment core from the Gulf of Cadiz (IODP Site U1386). This study then deals with a very interesting period in Earth history during the mid-Bruhnes transition: Termination V - the transition from Marine Isotope Stage MIS12 to MIS11, which was characterized by the largest deglaciation of the late Pleistocene, and by one of the warmest and longest interglacials of the Pleistocene, MIS11.

Another particular feature of MIS 11 is that an early CO₂ peak, usually associated to the deglaciation in response to increasing temperatures, fails to be detected. Therefore, all these questions make this study of great interest to researchers working on paleoclimate and modelers forecasting future climate scenarios.

From all this, I think this is an interesting study but I have major concerns that should be dealt before publication:

- My main concern is the overinterpretation of the data. This study is too ambitious and the conclusions obtained about the CO₂ mitigation by high-latitude forests are barely justified by the scarce data available for this time-span. In particular, only two records including the one studied here are available for the Mediterranean forest group and the resolution (and thus accuracy) of the pollen analyses are not that great either (700-yr in this study and even lower in site U1385). The statement about that Mediterranean forest development wasn't thus important in the CO₂ mitigation is in my opinion very risky. More discussion about this should be added and/or the language should be toned down.
- Regarding the site groupings done for the different pollen sites covering the selected time span, it looks to me that it was done with a very loose criterium. For example, in the "Euroasian" group, records from all over this area were chosen including records

characterized by very distinct climate requirements such as Chinese records very conditioned by monsoon or other climate patterns. Also, the taxa used to represent the pollen record are very random; sometimes using single species and other times using group of taxa.

In this respect, why the two Mediterranean sites were separated from the Eurasian group? Aren't they also located in Euroasia?

Tropical and South African records show very ambiguous signals during the deglaciation with maxima around 430 kyr (see Fig. 5) – could they also be involved in the CO₂ mitigation during TV?

- The authors focus on Termination V (TV, see for example manuscript title), however in reality the authors not only focus on that deglaciation that should have occurred relatively fast - I read in other papers between 427-424 kyr; see for example Hodell et al., 2003 - but also on MIS11 (see Fig. 3 also picturing MIS11e, d and c) and fail to give a clear picture of the time period that they are really focusing on in this study. Therefore, a clear definition of the TV period should be given and should also be shown in the different figures.
- Sometimes it is confusing where the authors are placing the beginning of MIS11 interglacial in their pollen record and should be clarified. In Fig. 3 it is placed when the "ubiquist" group enhanced but in Fig. 2 it is placed when the Mediterranean taxa increased (pollen zone 2b). Please be consistent.

By the way, what is SINES? The definition should be added to the text and figures.

- It is interesting to see that the "warm foraminifera" are also delayed with respect to the isotopic data. Does this also mean that the marine environment in this area didn't react to this climate change that fast either?
- Where is the dashed black line in fig. 8?
- The resolution is too low to resolve submillennial-scale changes (see conclusions).
- The pollen records studied here suggest a moderate warming during MIS11, disagreeing with the statement in the conclusions "The strong warming at the onset of MIS11..." Please add more discussion about this.