Dear authors,

Thank you for providing responses to the review. Both reviewers made constructive feedback.

We thank the Editor for the careful evaluation of the manuscript and the constructive synthesis of the reviewers' main concerns, which has helped us improve the clarity of the work.

While I notice that the authors responded to the minor comments of R1, I acknowledge that they have not responded to the major points which I copied below: "My major concern relates to the effects of pollarding. It is still quite unexpected to observe such a small difference between the uncorrected and corrected RWI and LWI chronologies. As mentioned in the discussion, I agree with the authors that this is most likely due to the high replication and the asynchronicity of pollarding events among trees. However, this asynchronocity among events is not shown in the manuscript. I believe it would be valuable to include a figure showing how many trees were affected by pollarding over time."

We appreciate this observation and agree that explicitly illustrating the temporal distribution of pollarding events is essential to support the interpretation of the limited differences between corrected and uncorrected chronologies.

This point was addressed in the previous revision in response to Reviewer 1 (comment 6) and Reviewer 2 (comment 4), where we incorporated a new supplementary figure (Fig. S4) quantifying the percentage of trees affected by pollarding each year relative to the number of trees available in the chronology, following the approach of Sanmiguel-Vallelado et al. (2024).

Figure S4 clearly shows that pollarding was highly asynchronous across trees in both dehesas. Most events affected only a small fraction of individuals (75% of events involve less than 6% of trees), while only three years (1697, 1736, and 1800) exhibit higher synchrony (>30%). This strong temporal dispersion explains why corrected and uncorrected RWI and LWI chronologies differ only slightly, as pollarding effects are distributed across time and therefore largely diluted at the stand level.

In parallel, we revised the manuscript to make this interpretation more explicit and less categorical. Rather than presenting pollarding as having no effect on the stand-level signal, we now frame its influence as dependent on the degree of temporal synchrony among trees. Under conditions of strong asynchrony, tree-specific growth disturbances occur in different years and do not systematically alter the shared hydroclimatic signal.

This interpretation is consistent with the chronology statistics. RBAR (0.21), representing the mean inter-series correlation, is expected to decrease when asynchronous disturbances introduce tree-specific noise. In contrast, Series IC (0.50) *remains high, indicating that a coherent common signal is preserved despite this variability. Together, these results support a rotational and asynchronous pollarding regime in which management effects are largely diluted at the stand level.*

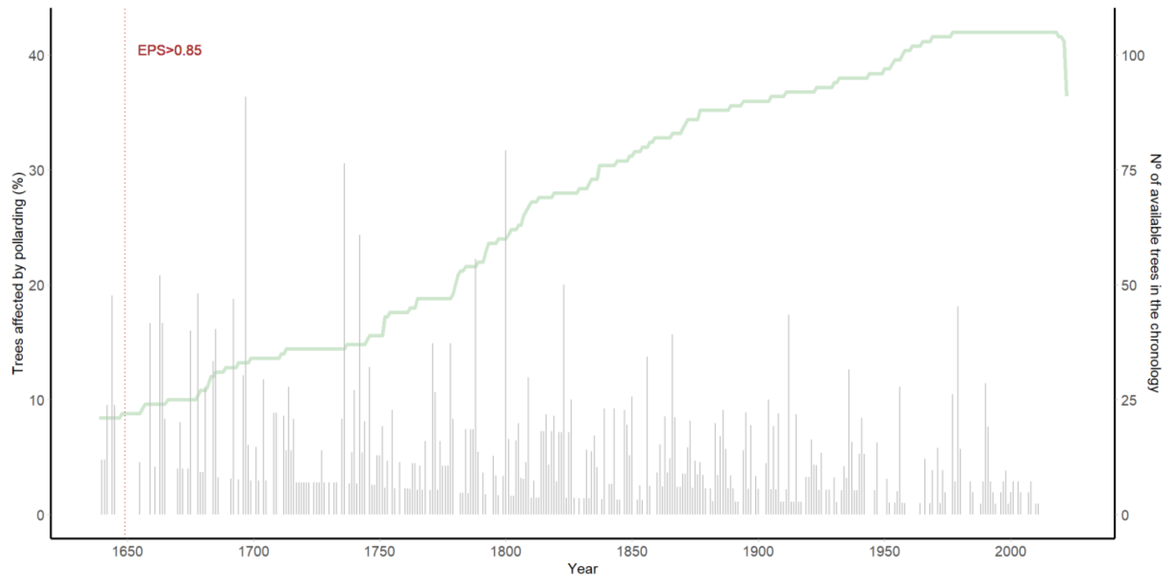

Figure S4. Percentage of trees affected by pollarding events each year (grey segments) relative to the number of trees available in the chronology at that time (green line), based on Sanmiguel-Vallelado et al. (2024).

Also, it is hard to evaluate whether the authors truly addressed the comments of Reviewer 1. For example, the update made to Figure 1 is not shown.

We acknowledge this issue. As we were initially unfamiliar with the journal's workflow, we expected that reviewers would have access to the revised manuscript in parallel with the response document. For this reason, we referenced line numbers rather than reproducing all modified content in the response file.

At this stage, we are able to provide the full revised manuscript. The tracked-changes version now clearly shows all modifications, including the update to Figure 1, allowing direct verification that all changes described in the responses have been implemented.

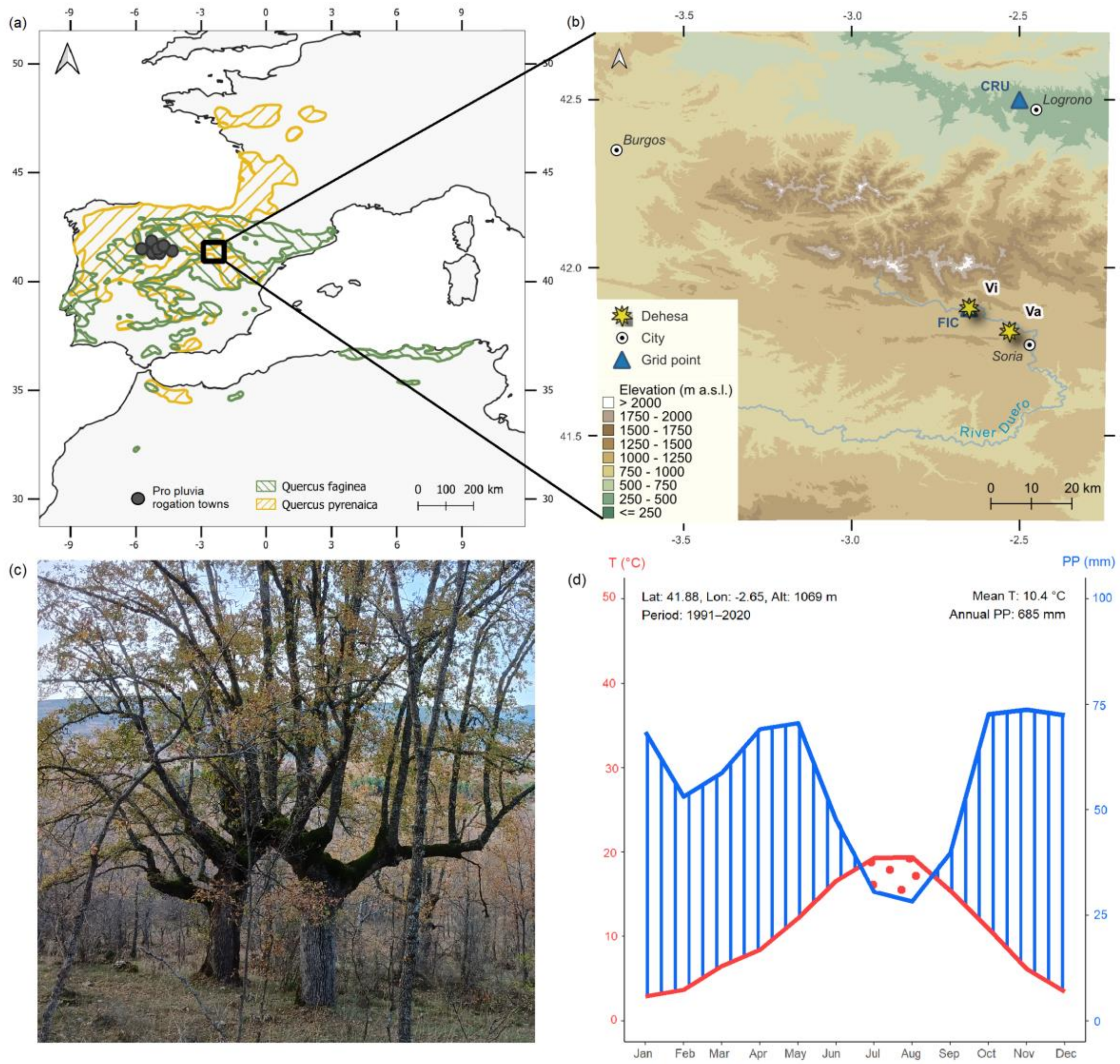

Figure 1: (a) Distribution of Q. pyrenaica and Q. faginea in Europe and Northern Africa, adapted from Caudullo et al. (2017). (b) Location of the Vilviestre (Vi) and Valonsadero (Va) dehesas, northwest of Soria, as well as the central position of the grid cells from the Climate Research Unit (CRU) and Fundación para la Investigación del Clima (FIC) used to obtain climate data. Digital Terrain Model source: PNOA 1:200,000, ETRS89 HU30, Soria. (c) Pollarded Q. faginea trees in Vi. (d) Walter & Lieth climate diagram for Vi constructed from climate data from the FIC. The red line represents mean monthly temperature, and the blue line represents total monthly precipitation. Periods where precipitation falls below twice the temperature are classified as arid (shaded with red dots), while periods above this threshold are considered wet (shaded with blue lines).

Responses to the comment about Detrending is not well-substantiated, and responses are based on belief is not a strong rationale for why the cut-off was set. Keeping the chronology as is, because the authors feel comfortable is not a scientific approach. I would advise the authors to be more careful in writing their response statement.

Our intention was not to rely on subjective preference, but to support our decision empirically. As part of our previous response to reviewer #1, we produced four new versions of the latewood chronology using different detrending approaches – including the approach suggested by reviewer #1. The differences (or rather, lack of differences) in the end results were presented in Table R1 (repeated below).

	Presented chronology	***FIC, 1952-2020***	***CRU, 1952-2020***	***CRU, 1902-2020***
Fixed-50, PT	*0.958 / 0.927*	*0.820*	*0.794*	*0.746*
Fixed-50, non-PT	*0.957 / 0.925*	*0.810*	*0.790*	*0.748*
ADC, PT	*0.928 / 0.834*	*0.803*	*0.799*	*0.733*
ADC, non-PT	*0.930 / 0.829*	*0.815*	*0.777*	*0.747*

Table R1. Correlation between fixed-frequency and ADCS chronologies (power transformed and non-power transformed) and original iteration (for 1902-2020 / full chronology), and the different climate products.

We quantitatively show that choices in detrending do not impact the magnitude of signal. The correlations with climate targets (FIC and CRU for either period) are not statistically significantly different from each other based on a Fisher's z-test (Fisher 1921). This type of analysis is rarely presented in manuscripts that study the effects of detrending choices, let alone in dendroclimatic reconstructions. As such, we consider that the analyses provided sufficiently demonstrate the robustness of the selected approach. If the editor prefers for these results to be included as supplementary information, we are happy to do so.

Reference: *Fisher, R.A. (1921). On the 'probable error' coefficient of correlation deduced from a small sample. Metron* ***1****: 3-32.*

Responses to the comments by Reviewer 2 is more detailed, and I thank the author for being diligent in their responses.

We thank the Editor for this positive assessment.

With this said, my decision is "major revisions". Please consider the comments above, very carefully and please indicate clearly in the revisions (with marked changes) where the edits were made. When your revised manuscript is received, I have it reviewed again.

We acknowledge the decision of "major revisions" and have carefully addressed all comments raised by the Editor and reviewers. All modifications are clearly marked in the tracked-changes manuscript to facilitate verification.

Lastly, please make sure that data used in the manuscript are cited if not original from this work, or had obtained permission to reuse from the original researchers.

We confirm that all datasets used in the manuscript are appropriately cited when derived from external sources, and that permission for reuse has been obtained where applicable.

Best wishes,
Voary