

The paper presents an interesting dendrochronological study of *Polylepis pepeii* growing at the tropical Andes–Amazon treeline in Bolivia, with the aim of exploring long-term growth variability and its relationship to climate.

Despite the novelty introduced by the investigation of a new species in the dendroecological panorama and the recognition of a great effort considering the anatomical characteristic of the species, some important notes should be mentioned.

One of the main concerns is about the application of the change point detection analyses to the raw data (L225) and the fact that there was no clear presentation of the results of this analysis in the proper section. Trends and breakpoints should be analyzed primarily on the detrended chronology in a way that biological growth signals are removed. A 60 years cubic spline was correctly applied to effectively remove individual growth trends, therefore the analysis should focus on the low frequency trend that can still be observed after 1960, especially in the standard chronology. This could be further supported by the climatic information showed in the supplementary. When looking at the climatic variables showed in Fig. A5, time series are clearly reporting a change in the trend after 1960. For these reasons, the narrative of the manuscript revolving around 1997 should be better explained and supported by clear results, and the discussion about the change in 1960 integrated. In addition, in view of the negative trend after the '60s, CGC correlation should be performed with detrended climate data and detrended RW chronology, to remove the possibilities of spurious correlations.

The manuscript should be improved with some more classic style publication-level wordings, avoiding informal language or personal interpretation. English proofreading is strongly suggested. Readability could improve also by removing unnecessary abbreviations and repetitions of concepts explained with parenthesis throughout the manuscript. If the information is considered important then it can be included as subscript (e.g.,  $T_{min_{1960-2015}}$ ). Within the introduction part, several punctuation marks are missing, and repetitions were observed. Especially within the discussion, connections between different points should be better explained to improve fluency. Results should be written using the same tense, past simple usually.

Line by line comments:

L. 21 Presenting the results without explaining methods and aims reads strange. Please reformulate.

L. 33 A better formulation of the closing sentence is advised. For example, you could state which severe implications you are expecting.

L. 57-60 Despite the topic is still about climate influence on tropical mountain species, it refers to a different aspect of the species ecology than TRW. This second part of information could be introduced with a connecting sentence.

L. 62 you may write populated by or characterized by instead of "site of"  
you may write growing "at"

These kind of corrections can be avoided when the article is proofread by a native speaker.

L. 79 I suggest joining paragraph 4 5 and 6, in a way that the description of the species and the reasons why this is the species of interest are joined together.

L. 85 The reasons why this is the case are not clarified. Also consider adding link to the next sentence

L. 86 Reporting the references at the end of the sentence would improve readability avoiding mid-sentence brackets.

L. 87 Either soil temperature is reported as "soil temperature above 5 cm " or >5 can be omitted. These kind of stylistic adjustments were reported only the first time the issue appeared. However, they should be corrected throughout the whole manuscript.

L. 92 " Southwest of our *P. pepeii* site" is an example of colloquial tone. You may write "Southwest of the study area in object" or "In areas located southwest of the study area"

L. 111-117 This part should be joined with the third paragraph where the study site is described. Description can also be shortened as the materials and method section can be used for such precise description.

L. 125-128 The sampling strategy should indicate the number of samples taken for both living and dead trees as you correctly did in paragraph 2.3. I suggest moving these information and sample processing to paragraph 2.3 as 2.1 correspond to site description and climate

Section 2.3 should contain also other info:

How were the cross section treated? From how many radii were RW extracted? From which direction were the cores taken? In the species description, it is mentioned that this species can also have a shrub phenology, how many stems were included? What was the tree selection criteria? These information are crucial to establish the effectiveness of the sampling strategy.

L.134-136 This sentence would help reformulation in a scientific tone and further explanations. You should consider checking a botanical description of the species and a possible comparison with your observation to the description.

L. 138-146 Consider removing the brackets and explicitly state the ranges and the abbreviations. Correlations results seem something that should belong to the results section or, possibly, the next section where climatic data collected are described in depth. Site description should include a sole description of the site with no interpretation.

L. 147 The authors showed a lot of effort in collecting and managing such an amount of data. This complex dataset deserves a clear explanation and structure. It is advisable to add an introductory sentence where it is clarified which data are local and which are gridded and the reason why so many different climate data were collected.

- L. 178 Panel B includes a legend with four indexes but the figure shows only two.
- L. 191 It would be more precise to refer to vessel distribution. Also, as for diffuse porous, ring porous does not need quotation mark, it is considered common nomenclature of the anatomical structures.
- L. 198-200 Between the sample processing and the chronology development step, the image acquisition process should also be described. Especially considering the different samples analyzed. What was the acquisition procedure for core surfaces and thin sections? Which resolution was obtained?
- L. 208-218 and throughout the whole manuscript It is important to state the function used for each analysis and the working environment.
- L. 210 What does “initial” stand for?
- L. 225 Refer to the initial comment. Moreover, further explanation on the aims of this analysis should be added, along with some context.
- L. 229 As reported before, many different climate data were collected, with different time-span and resolutions. However, there does not seem to be an explanation on why the climate growth correlation was performed only for the period from 1960 to 2019. Either this should be clarified, even considering that the amount of work for this manuscript is already reasonable, or it would be interesting to perform a moving climate correlation and observe what effect does the shift have on the TRW correlation. In any case, as it was previously specified, the noticeable trend in the climate data should be removed to exclude spurious correlations.
- L. 278 Results for the Pettitt analysis on the change point detection do not seem to be shown, nor in the manuscript nor in the supplementary material. Results could be displayed as a table in case multiple years are detected, and at least listed here.
- L. 289 Information on the sampling strategies are missing. See comment on paragraph 2.1 and 2.3. If some side of the stem showed visible ring while others did not, it might also mean that reaction wood (commonly forming larger rings) was measured, partially invalidating the results. Better specification on the samples and especially image acquisition would clarify this aspect, especially in view of the difficult material examined (i. e., diffuse porous, shrub form). Why were thin sections not useful? on how many samples were they performed?
- L. 291-293 Trends should be analyzed primarily on the standard chronology in a way that common biological growth signals are removed.
- L. 299-300 It is unclear how one point in time measure can provide information on how fast trees are growing.
- L. 302-304 Extreme years and events identification could be shown in the current figure but should be stated in the appropriate section

- L. 323 It's unusual to directly refer to the image, results should be rather reported and the figure reference should go in brackets.
- L. 328 It should refer to figure 3D.
- L. 349 Complete information should be reported. It is not clear which chronology was used here.
- L. 369 In the image, it seems more meaningful to indicate the parameters rather than the source. "vs Prec  $\gamma_1$ " could be a better way to explain what is represented in the first panel for example. All the other info can be reported in the caption.
- L. 387 Quality and resolution of figure 5 should be improved. The two numbers in panel A overlap, are they outliers? if so they should be mentioned in the caption.
- L. 404-405 After this sentence, the reader would expect a list of factors that influence tree growth, ordered by what is a recent discover from this study, towards what is already known in literature. For how it is written now, the ranking is not clear, nor is clear what new results have been discovered.
- L. 417- 421 Please refer to all the comments previously done. Discussions should be adjusted accordingly.
- L. 521 "Moving forward" does not sound like scientific language