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Comment on hess-2022-328

Anonymous Referee #1

Referee comment on "Technical note: Validation of Aleppo pine transpiration rate measurements using the heat ratio method under laboratory conditions" by Ana M. Sabater et al., Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2022-328-RC1, 2022

The manuscript has a substantial contribution to scientific progress due to it tries to validate a methodology already published to measure transpiration in Aleppo Pine and to make easier the extrapolation to forest level. The manuscript is well-written and despite being a technical/methodological manuscript it is easy to follow in all its sections. Moreover, it includes the study of the response to environmental variables (VPD and REW) which gives extra information of the validation. Moreover, it also recognises the weakness of the study which is the main problem of this novel manuscript from my point of view.

The validation of the method has been done only in three juvenile individuals, which it is clearly not enough for a serious validation of any method. Besides, it has been done in juveniles, and not in adults, so the intraspecific variability is expected to be higher than in adults, so the results could be compromised. Specially, if we consider that the manuscript highlights the relevance of this study to scale transpiration in trees to a forest level even considering that the environmental conditions could be in the same range than in field conditions. The length of the study doesn't compensate this low n, but it is true that gives the opportunity to test the method in a wider range of environmental conditions. I suggest to add more n, or in case it wasn't possible, to include another complementary study in adults, with at least 6-10 adults. If it is not possible, I suggest to rewrite some paragraphs or phrases to adequate que results to the fact. For example, excluding the word validation, recognizing and/or showing the variability among juveniles....

There are other reasons supporting my suggestion of major revision.

- There is no clear information of how much time the plants were be growing until the experiment started and in which environmental conditions they grew. We only know that plants were located in the experimental area one week before the experiment began (acclimation).

- We don't know the environmental conditions of the experimental area. Is it an open area? is it a greenhouse? In abstract the authors indicate that the plants were in a wide range of abiotic conditions, but "natural" abiotic conditions or "controlled"? More information is needed. Reading App. C seems like they were in controlled conditions, but the authors don't give the range/means of this environmental conditions.

- Could be the highest absolute error of lead cell in pine 3 due to it was another model compared with pine 1 and 2? This point should be justified.

Other minor comments:

- In the abstract authors generalize the results into the species level, but this can't be done due to we are talking about juveniles, and only about 3 juveniles. This should be put into context.

- Any reference to hypothesis i?? how do you know?

- Are the three pines in the same stage of maturity?

- line 158. Considering tree...they are juveniles, not adult trees....the same happens in some sections of the manuscript. It can be confusing.

- Table 1,2,3 could be combined to compare better the results.

- Did you move the plants during the experiment to avoid the effect of being near the fog system generation?

- I suggest to include in results the response of each pine to VPD and REW, in order to check the variation in the response to these variables depending on the studied pine. I expect that the response to VPD could be high among pines due to the intraspecific variation in juveniles and due to the position in the experimentation area.