

Review for “Trade-offs between water loss and carbon gain in a subtropical primary forest on Karst soils in China”

General comments

This is over-all a good article studying gas-exchange and intrinsic water use efficiency relations in a large sample of Karst species. The main results interestingly found that although the area has low-nutrient soil and low water availability, the species had relatively high assimilation rates and low water use efficiency. These were controlled by stomatal conductance, mesophyll conductance and the maximum carboxylase activity of Rubisco and their covariation. The paper is sufficient in detail and has novel insight into an ecosystem that has not been well studied.

Specific comments

- I feel the explanation and justification of the chosen methodology for measuring and calculating mesophyll conductance should be in the Materials and Methods section, not in the discussion. It takes away from your actual results.
- Although an “in review” article is cited in the materials and methods, I think this is not an acceptable description of methodology (line 140). This should be written out in detail as I cannot access the information from there. I would like to have more details about leaf sampling and measurements. What were the temperature and humidity chosen for the measurements? How were the leaves collected? Did you collect leaves or twigs which you then cut under water or did you collect separate leaves which you measured in the field? Did you measure fluorescence? Could you calculate your results with the Harley method as well? It is common nowadays to confirm your results with a second method as all methods have some constraints.
- I would also like to see more detail and justification in the statistical analysis section of the materials and methods
- In the results, you bring out that g_s was better correlated with A , but l_m was more limiting. This would be important to discuss in detail in the discussion. This is an extremely important result.
- The conclusions are a bit flat, I would like to see the paragraph rephrased so it is a bit more exciting.
- Figure 5 needs an explanation about the whiskers: are they SEs or SDs? If they are SEs, I do not find it likely that g_m was indeed the most important limiter in vines and ferns, but only grasses.

Technical comments

- Line 31: grammatical error, should be “plants”
- Line 38: delete first “and”
- Line 38: add “their” between “measured” and “CO₂”
- Line 38: ... calculated “the” corresponding...
- Line 73: replace “indeed” with “however”
- Line 84: within “a” leaf.
- Line 110: delete “The”. Sentences should not be started with an article before an abbreviation. This is bad style.
- Lines 125 and 126: this sentence should be in the present if the soil conditions are unlikely to radically change in a short period of time.

- Line 130: same comment as the previous, should be in the present if this does not change rapidly.
- Line 140: You cannot use “were” if the article you are citing is still in review. This is chronologically incoherent.
- Line 148: the citation is doubles, delete one
- Line 153: delete “The”
- Line 161: no need to redefine abbreviations in each section – once is enough
- Line 166: this sentence needs to be rephrased. Stomata are not a barrier inside the leaf, like this sentence seems to claim.
- Line 214: last equation was 8, this should be 9
- Line 253: both implies 2 variables: delete “both of”
- Line 256: delete “The”
- Line 257: move “respectively” to the end of the sentence
- Line 269: delete “The”
- Line 271: delete “The”
- Line 272: Change to “Grasses”
- Line 273: Change to “Accordingly, grasses”
- Line 276: delete “The”
- Line 284: delete “The”
- Line 295: Recent work has compared Harley, Ethier and the anatomical models finding good correlations, so I would not write largely unknown, rather "to some extent"
- Line 353: this sentence should be rephrased, leads to the impression that you also did ultrastructural sampling
- Lines 368-374: chloroplasts do not have cell walls, the sentences need to be rephrased
- Line 402: “highly efficient”
- Line 411: delete the first “in this study”
- Line 415: “lose” not “loss”
- Lines 416-417 “The results ...”: unnecessary sentence, delete
- Line 422: full stop missing from the end
- Line 424: delete “The”
- Lines 424-425 stating with “In theory”: should be in the present
- Line 433: This sentence should be in the present
- Line 448: ...inefficiency in “the” trade-off
- Line 452: “low nutrient”
- Line 461: iWUE is not in italic in any other place
- Line 462: ...forms in “the” field
- Line 463: ... used “a” diverse
- Line 464: ... maintain “a” relatively
- Line 465: ... used “the”
- Line 483: “References”