

***Interactive comment on* “Trade-offs between water loss and carbon gain in a subtropical primary forest on Karst soils in China” by Jing Wang et al.**

Anonymous Referee #1

Received and published: 6 March 2018

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 gs was better correlated with A, but Im 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 gm was indeed the most important limiter in vies 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

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not a barrier inside the leaf, like this sentence seems to claim. âĀĀ Line 214: last equation was 8, this should be 9 âĀĀ Line 253: both implies 2 variables: delete “both of” âĀĀ Line 256: delete “The” âĀĀ Line 257: move “respectively” to the end of the sentence âĀĀ Line 269: delete “The” âĀĀ Line 271: delete “The” âĀĀ Line 272: Change to “Grasses” âĀĀ Line 273: Change to “Accordingly, grasses” âĀĀ Line 276: delete “The” âĀĀ Line 284: delete “The” âĀĀ 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” âĀĀ Line 353: this sentence should be rephrased, leads to the impression that you also did ultrastructural sampling âĀĀ Lines 368-374: chloroplasts do not have cell walls, the sentences need to be rephrased âĀĀ Line 402: “highly efficient” âĀĀ Line 411: delete the first “in this study” âĀĀ Line 415: “lose” not “loss” âĀĀ Lines 416-417 “The results ...”: unnecessary sentence, delete âĀĀ Line 422: full stop missing from the end âĀĀ Line 424: delete “The” âĀĀ Lines 424-425 stating with “In theory”: should be in the present âĀĀ Line 433: This sentence should be in the present âĀĀ Line 448: ...inefficiency in “the” trade-off âĀĀ Line 452: “low nutrient” âĀĀ Line 461: iWUE is not in italic in any other place âĀĀ Line 462: ...forms in “the” field âĀĀ Line 463: ... used “a” diverse âĀĀ Line 464: ... maintain “a” relatively âĀĀ Line 465: ... used “the” âĀĀ Line 483: “References”

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-44/bg-2018-44-RC1-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-44>, 2018.

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