

Interactive comment on “Spatial trends in leaf size of Amazonian rainforest trees” by A. C. M. Malhado et al.

Anonymous Referee #2

Received and published: 27 April 2009

General Comments

This manuscript presents an investigation into leaf structural traits and their correlation with environmental as well as physiological gradients within the Amazon Basin. The manuscript presents the research topic with much clarity and an in depth background, with an array of ideas that represent our current state of knowledge on leaf economics and a strong foundation for the subsequent analysis.

With such a complex dataset, containing multiple covariates, a complete statistical analysis is challenging. The statistics presented here may not fully capture some of the leaf-environment relationships that exist (i.e. cut-off p-value of 0.05 is quite conservative) but may also over estimate the relationship due to the application of

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



multiple ANOVA tests and regrouping of leaf area data.

The collection of leaf characteristics from Herbarium specimens might also affect the analysis because intra-specific plasticity was not considered, presuming that the Herbarium sample were collected from one site, and then applied to all site by species combinations (which might justify the broader categories for leaf area used in the ANOVA).

It would be interesting to compare the spatial patterns of the findings in this study with recent work on the patterns of drought resilience in the Amazon from remote sensing and/or whole-ecosystem experiments. Also useful in the discussion would be a mention of possible site-level feedbacks that may act to minimize water stress (i.e. hydraulic lift and deep soils and roots) that might confound climatic variables and their role in determining leaf structure.

Specific Comments

1. An elaboration on the pioneer-climax gradient. This is used in the analysis as a covariate, but it is unclear why.
2. A better description of herbarium methodology is needed. Were these images scanned and measured digitally?
3. Was any data transformation required before analysis? The raw data are not presented (i.e. plots between precipitation and leaf size) and so it is not possible to evaluate this.
4. Section 2.3, first paragraph, its unclear from this paragraph why the splitting into groups is necessary, perhaps explain why the comparison to other studies is necessary earlier on.
5. It would be helpful to define " pioneer " species and how this concept was posed to the experts for their classification.

BGD

6, S910–S912, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



6. A table summarizing the wood density relationship, one of the main points of the paper, is not included

Technical Corrections

1. Throughout, be more precise than " humped " distribution, perhaps " unimodal " would be appropriate?
2. Was the ANOVA on p2141, line 5-9 for just two groups? A t-test would perhaps have been more appropriate, but would have given the same results. What were the criteria for this data grouping, multiple tests might need to be weighted statistically.
3. Would be useful to see xy plots
4. Figures: In general, the axis labels should be made larger

Interactive comment on Biogeosciences Discuss., 6, 2125, 2009.

BGD

6, S910–S912, 2009

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

