Biogeosciences Discuss., 12, C4010–C4014, 2015
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Biogeosciences Discussions
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Interactive comment on "Soil microbial nutrient constraints along a tropical forest elevation gradient: a belowground test of a biogeochemical paradigm" *by* A. T. Nottingham et al.

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Referee comment:

This study presents evidence for the hypothesis that there is a shift in nutrient limitation from tropical lowland to highland forest. I enjoyed reading the paper because it is well written: âĂć Background and hypothesis are clearly stated. The results are expected, however, it is good to do have it confirmed empricially. âĂć The indirect nature of the evidence (compared to a fertilization experiment) is well discussed. âĂć Study site and methods are described in sufficient detail. âĂć Results and figures are mostly clear. âĂć The discussion puts the results in context.

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Author response: We thank the reviewer for these positive comments.

Referee comment:

I only ask for several small clarifications: The text could clarified better why and for whom the studied hypothesis is important.

Author response:

We added a sentence to the opening paragraph in the introduction to clarify why the study is important (Lines 62-64) as follows: “It is important to identify nutrient constraints to soil microbial process in tropical forests to understand how anthropogenic alteration of biogeochemical cycles will impact C storage in these ecosystems.”

Referee comment:

Fig 1 presents results of global meta-analysis for comparison. A discussion in the text would be appreciated.

Author response:

We now refer to this meta-analyses comparison in our discussion. The most interesting comparison was the relatively low microbial C:P ratios in our samples compared to the global data set reported in Cleveland and Lipzin (2007). This is discussed in the context of mechanisms by which microbes might maintain homeostasis (e.g. nutrient acquisition and immobilisation) in the face of changing resource availability (Lines 409-411).

Referee comment:

Fig 3 presents total mineralized N using log scale. I get the impression that it does not change. However, the actual significant decrease is one of the main arguments for increasing N limitation with elevation.

Author response:

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We agree with the reviewer, and have placed the total mineralized N and N-acetyl glucosaminidase activity on different y-axes. The significant decrease with elevation is now much clearer (and further supported by statistics in Table 1).

Referee comment:

Figure caption of Fig. 4 states "maximum potential enzyme activities determined" What is the meaning of the "maximum"?

Author response:

Maximum potential activity refers to Vmax of enzymatic activity, whereby enzyme activities were determined under saturating substrate. We have simplified the caption to refer simply to enzyme activity, which is commonly used in the literature to refer to maximum potential activity.

Referee comment:

The statements of p-values hampers a fluent reading of the text. If allowed by the journal, I suggest to provide the values only when significance is marginal and when the reader is helped by the values to evaluate the results.

Author response:

Although we agree that the statistical information impedes the flow of the text, we have retained the p-values in the results section because we think that, by showing the level of significance, they help the reader interpret the relationships.

Interactive comment on Biogeosciences Discuss., 12, 6489, 2015.

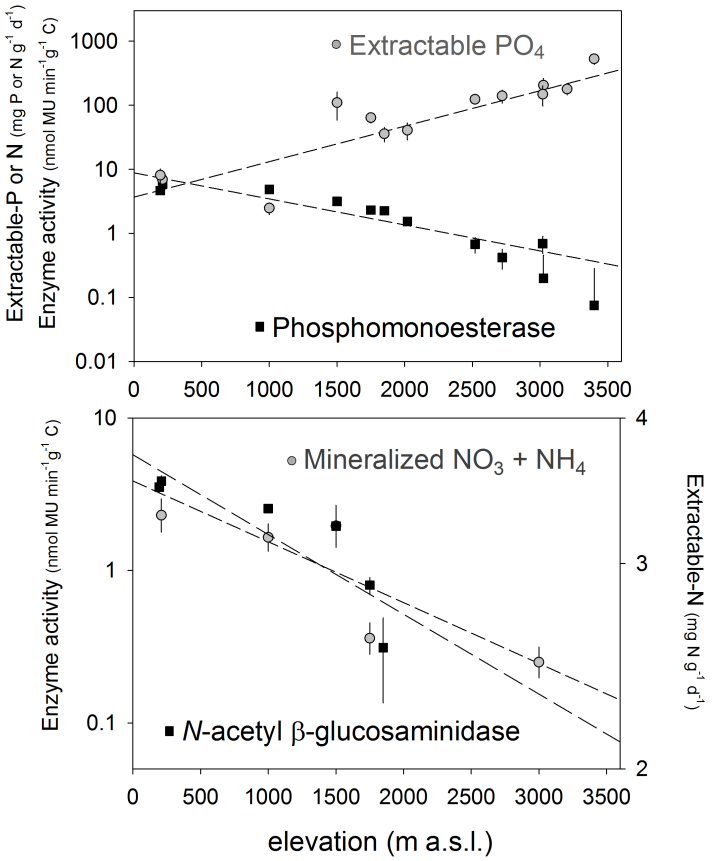

Fig. 1. Figure 3 _ edit y axis scale

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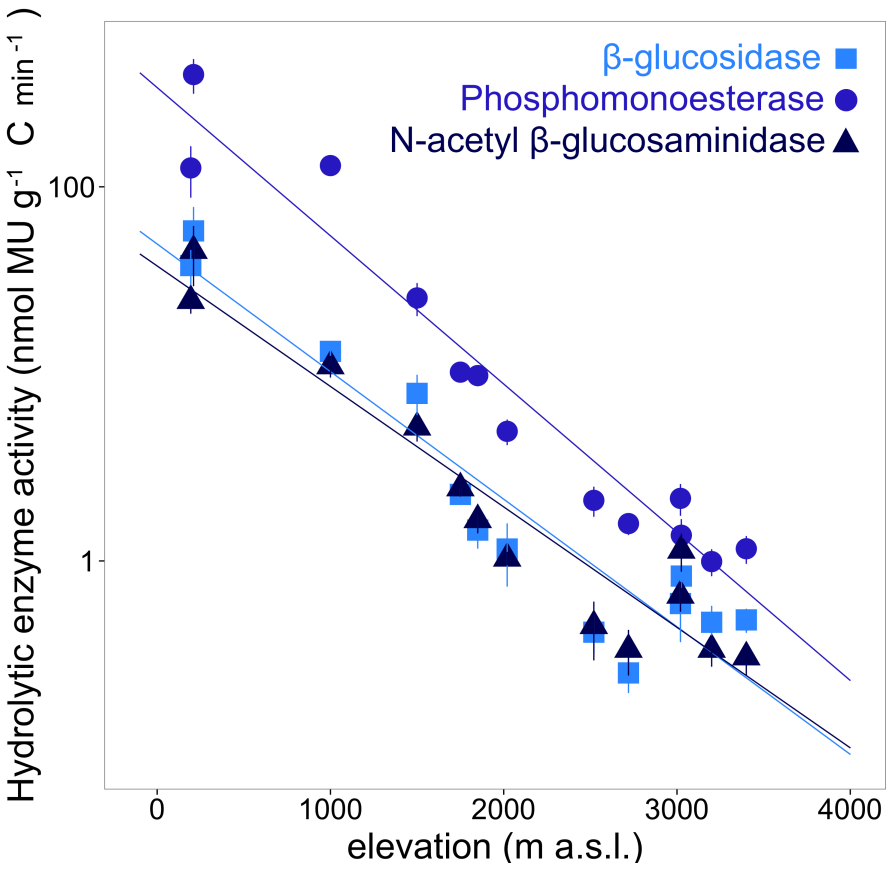

Fig. 2. Figure 4 _ edit y axis label

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