Biogeosciences Discuss., 6, S1267–S1268, 2009
www.biogeosciences-discuss.net/6/S1267/2009/

Biogeosciences Discussions

Interactive comment on "Basin-wide variations in foliar properties of Amazonian forest: phylogeny, soils and climate" *by* N. M. Fyllas et al.

j. grace (Editor)

jgrace@ed.ac.uk

Received and published: 27 July 2009

The paper provides insights into the biogeochemistry of Amazonian trees species, confirming by ratio-metric analysis the overall scarcity of phosphorus as opposed to nitrogen in Amazonian ecosystems and highlighting important east-to-west variation in soil fertility, which is related to the turnover rate of tree populations. Remarkably, it has been possible to identify and quantify the extent to which variation can be attributed to a genetic basis (by reference to taxonomic groups, family, genus and species). One imagines also that the longevity of leaves is an important factor- the leaves of tropical trees vary in their life span from less than a year to many years (unfortunately this parameter has only ever been measured for a handful of species).

There remain some unanswered questions which deserve further attention. It is known

that root surfaces themselves show strong biogeochemical activity, both in the extent to which they have active fungal and bacterial symbionts, and the extent to which they are equipped with surface phosphatases (enzymes which enable the release of inorganic phosphorus from organic residues in the soil). What role do these systems play in the biogeochemistry of these ecosystems? One presumes that natural selection would result in extremely high investment in such enzyme systems. At the same time, we know rather little about the process of nitrogen fixation in the Fabaceae. Is it possibly, as the authors suggest at one point in the paper, that the nitrogen fixing Rhizobium bacteria do not function properly as a result of a fatal deficiency of Calcium?

Overall, plenty of work remains to be done, but meanwhile this paper is a large step forward.

Minor errors found:

p3710, line 3: for phosphorous insert phosphorus p3714, line 24: insert period before 'Our..'

Interactive comment on Biogeosciences Discuss., 6, 3707, 2009.