Biogeosciences Discuss., 8, C790–C791, 2011
www.biogeosciences-discuss.net/8/C790/2011/

Biogeosciences Discussions

Interactive comment on "The effect of resource history on the functioning of soil microbial communities is maintained across time" *by* A. D. Keiser et al.

M. Wallenstein (Referee)

mawallen@nrel.colostate.edu

Received and published: 3 May 2011

This manuscript investigates whether microbial communities exhibit functional legacies of previous environmental conditions. I consider this to be a topic of high importance because it is an important aspect of predictions of ecosystem function under environmental change. This paper also addresses the fundamental question of whether microbial communities are functionally redundant. Here, the question is limited to the broad function of C mineralization and respiration, and the authors acknowledge that this relationship may be different for more narrow biochemical functions.

The authors utilize a clever lab mesocosm experiment where litter is innoculated from

different sources in a common garden design. To assess the role of community shifts in determining function, they utilize a pyrosequencing approach. I had no concerns with the technical approach.

The paper is short and straightforward. It provides strong evidence not only of legacies in microbial function, but also is a clear example of trade-offs for specialization. It also elucidates a mechanism underlying home-field advantage.

In the introduction, please explicitly state which litter is the poor resource environment, and which is considered the rich.

This is a subjective, stylistic comment: I feel the term "That is" is overused.

Not sure if you want to go there, but it seems the results are consistent with a heritable, but non-genetic trait inheritance. Could epigenetics be a possible mechanism?

Bossdorf O, Richards CL, Pigliucci M (2008). Epigenetics for ecologists. Ecology Letters 11: 106-115.

Casadesus J, Low D (2006). Epigenetic Gene Regulation in the Bacterial World. Microbiol Mol Biol Rev 70: 830-856.

Interactive comment on Biogeosciences Discuss., 8, 1643, 2011.