

## ***Interactive comment on “Litter type affects the activity of aerobic decomposers in a boreal peatland more than site nutrient and water level regimes” by P. Straková et al.***

### **Anonymous Referee #3**

Received and published: 15 June 2011

#### General comments

The authors have produced an ms which shows a strong development of a research field that has been underdeveloped for a long time. In short- and long-term drained wetland ecosystems they have investigated no less than 23 combinations of plant litter and type of nutrient regime using analyses of enzymes and microbial communities. The focus has been on an analysis of microbial community and the activity of no less than 11 extracellular enzymes. The authors conclude that litter species/litter type is the main factor determining enzyme activity and thus decomposition rate.

Although the authors have made an interesting study and produced a manuscript that

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is scientifically correct and acceptable I found it a bit difficult to read. An interesting study must be ‘sold’ to the reader to reach a wider acceptance. One general problem is the number of abbreviations, which may be necessary, but I found the language a bit difficult too (see below)

In general the ms appears very good and I would suggest minor revisions.

#### Specific comments

Page 4, section 2.2, line 4. The first time a Latin name is written – write out the full name, e.g. *S. balticum* should be *Spagnum balticum*

Page 4, section 2.2 last sentence in first para. Sub-samples were withdrawn to determine initial litter quality. . . . . How many subsamples (n=?). At what temperature were they dried?

Page 4, section 2.2, second para, line 3. The opposite? Opposite to what? Nutrients? Klason lignin? Holocellulose?

Page 5, section 2.4, line 4. The authors mention incubation temperature ‘high’ and ‘natural’ – why not give them in °C here?

Page 5, section 2.4.1 line 2. Substrate in plural

Page 6 bottom. Substrate concentration mol/L is normally written with M, M meaning molar or mol per litre.

Page 6 line 3 from the bottom. I have tried to see what ‘dicq’ stands for, assuming that it is an abbreviation. I think it may need some kind of explanation (alt a correction).

Page 9, section 3.1. The authors use the term ‘easily assimilable C’. I assume that this is concentration of water soluble substance obtained in the Klason lignin analysis?

Page 9 section 3.2. The authors refer to Fig 2 and in the following (the last) sentence – “Allocation of enzyme activity. . . . .” Should this sentence also be supported from Fig

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2? What I can see in the two lower subfigures are negative relationships, not positive.

A comment to figure 2 – the text – litter mass loss rate? The upper left figure has accumulated mass loss on the X axis. Mass loss as written on the X axis is OK but please change the legends. The upper right figure shows ‘extractives’ – is that water soluble or water soluble plus that of an organic solvent?

Page 9, section 3.3 last para. If possible, support your statement with error bars in the figure. For *Betula nana* the differences appear small – as far as I can read the figure.

Page 10 line 2. Litter chemical quality? This is a small thing and just a comment. The term ‘litter quality’ was once introduced (I think by Aber and Melillo) to indicate degradability. High quality – high degradation rate. Basically this could be related back to chemical composition. Having said that I believe that ‘litter chemistry’ or ‘litter quality’ would be better to use here.

Page 10 3rd para, the first 3 words. ‘Enzyme activity allocation’. Is that an accepted expression? To me enzymes can be allocated but activity reflects a property of an allocated enzyme and is a consequence of e.g. temperature or pH.

Table 2. It would be helpful to have MUF explained in the legend.

Appendix A. The head text says “Enzyme activity, mass loss (%) and pH, mean values . . . . .” I had 4 pages of appendix in my ms copy and can only find values for enzyme activity.

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Interactive comment on Biogeosciences Discuss., 8, 1879, 2011.