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Interactive comment on “Compound-specific ¹⁵N stable isotope probing of N assimilation by the soil microbial biomass: a new methodological paradigm in soil N cycling” by A. F. Charteris et al.

Anonymous Referee #2

Received and published: 4 January 2016

A compelling premise and promising application for looking at microbial metabolism. However, I think the importance of this paper is overstated at almost every turn. As far as I know, compound-specific measurements of amino-acid d15N aren't new. I think that there is some information missing, particularly relating to the calculation of assimilated N. Fixing these issues will make the paper much stronger in my opinion. I also have a few minor comments on missing details and style. Comments are below.

Introduction: Using quotation marks implies imprecise language and this is a scientific paper. Please avoid using words in quotation marks.

Page 1138, Line 28: The term total hydrolysable AA pool is not defined here. As far as

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Interactive Discussion

Discussion Paper



I know, this is not a commonly used term and should be defined here.

Page 1139, Line 24: How long were soil samples stored before freeze-drying?

Page 1139-1140: It is not clear what the final enrichment of the inorganic and total N pools were for each of the three treatments (NH₄, NO₃, and Glu-N). Having these data, as well as initial concentrations of NH₄, NO₃, and AA in the samples prior to treatment, will make it more clear that these are tracer additions of labeled N.

Page 1141: What was the sample size for combustion analysis? A range would be fine.

Equation 6: Looks like this assumes 100% conservation of the label? Since you have %TN and d¹⁵N, you should be able to calculate a %recovery of the label. I think this is an important piece of information missing from this manuscript.

Page 1145: Any explanation why, if this is a tracer addition, there is twice as much THAA in the ¹⁵N-Glu treatment compared to the inorganic N treatments? Is that all due to the added Glu? If this point is addressed and I missed it, my apologies. Otherwise, it needs to be addressed.

Page 1147: Regarding Figure 3, you need to address how this may not simply be due to differences in label recovery between treatments. What was the %recovery in each treatment? Addressing this will make your conclusions that much stronger.

Discussion: You have a chance in this paper to compare/contrast this method with other methods, namely ¹⁵N in total microbial biomass N. If this truly is to be a new paradigm, you must put it in context with the old one.

Interactive comment on SOIL Discuss., 2, 1135, 2015.

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2, C661–C662, 2016

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