

## ***Interactive comment on “Subcritical water extraction to isolate kinetically different soil nitrogen fractions” by S. Sleutel et al.***

**S. Sleutel et al.**

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General comment raised by both referees: (line numbers Lxxx-xxx refer to the revised manuscript in word format with track changes)

As indicated by both referees, the discussion on the relationship between anaerobic N mineralization and abiotic soil factors was limited. We have expanded our discussion by further interpreting the newly added stepwise linear regression, which now included SCWE N and C, general soil properties and the SCWE temperature dependency model parameters. This expanded analysis gave some interesting additional indications towards abiotic controls of anaerobic mineral N release in the studied set of paddy soils. (newly added L434-444 and L451-466).

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We further motivated why, although with limited results for the studied set of paddy soils, SCWE may hold potential to extract soil N fractions having different degrees of OM- or mineral association and therefore bio-availability (18 lines added L477-495).

Specific Comment Referee 1:

1) P9775 L6-10: As requested by referee1, we have now re-conducted the correlation analysis between extraction temperature and C and N cumulatively extracted by SCWE (instead of temperature interval SCWE C and N). Fig. 4 has been replaced. We changed the text in results and discussion accordingly (L263-274, L360-361, L369).

2) P6767 L19: We added the following sentences to further clarify our interpretation of ‘physical aspects’: For instance, physical occlusion of particulate organic matter in micro-aggregates slows its microbial consumption (e.g. Six et al., 2000). In addition, soil structure controls microbial community structure and thereby indirectly determines soil N supply. For example, in soil with a larger proportion of 15-30  $\mu\text{m}$  pore necks, Sleutel et al. (2011) found a promotion of fungi over bacteria. Since both decomposer groups have differing C:N ratios and N-requirements, variation in microbial community structure logically results in differing utilization of OM and in mineral N-release

Minor comment referee 1:

Table 1: Fixed-NH<sub>4</sub><sup>+</sup> data have now been added to Table 1. For some fields no measurements were available. This has also been stated so in Table 2, where correlations between Fixed-NH<sub>4</sub><sup>+</sup> and SCWE fractions are presented.

Table 1: Footnote now refers to the ‘cropping pattern’ column

P9768 L21 corrected

P9770 L7 organic carbon was already specified on P9767 L5 Non-exchangeable NH<sub>4</sub><sup>+</sup> replaced by fixed- NH<sub>4</sub><sup>+</sup> throughout the text

P9774 L14 Reference to Fig 2 corrected

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P9779 L4 Indeed we refer to the extraction at 100°C: we added 'at 100°C'  
Fig 2 and C added, remaining replaced by leaving

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