

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

S. Sleutel et al.

steven.sleutel@UGent.be

Received and published: 17 September 2013

Specific comment Referee 2

(line numbers Lxxx-xxx refer to the revised manuscript in word format with track changes) General comment raised by both referees has been addressed in our response to referee 1.

1) Referee 2 enquired about a check of prerequisites to calculate Pearson's correlation coefficients:

- Continuous variables: only continuous variables were included
- Normal Distribution of data: The Pearson's correlation coefficient tests for the ex-

C5120

istence of a linear relationship between two continuous variables, regardless of their distributions. Hence, there is no requirement that the distribution of (X ,Y) is bivariate normal.

-outliers: We have now examined boxplots for the data and found indications for one critical outlier for the C content of the SCWE residue. We omitted this point from the analysis and adjusted the reported correlation coefficient in Table 4. Other variables also contained 'outliers' (>3x inter quartile range boxplot): Mnox content of soils 11 & 24 (=0.62 & 0.67 g kg⁻¹); C:N-ratio of soil 37 (=12.8); sand% of soils 13 & 28 (=78 & 71%). These data points all appear realistic and we see no reason to omit them from our correlation analysis. The fitted a-parameter for N for soil 29 (=0.019) was also termed outlier by SPSS. However, the fit of the non-linear model describing the temperature dependency of the cumulative extraction of N with increasing SCWE temperature was 0.99 for soil 29 and therefore we ought this data-point valid.

-Linear relationships: We visually inspected scatterplots between N mineralization data and all investigated remaining variables of our datasets. We found no indications for significant non-linear relations, for which data transformation (linearization) would have been required.

2) Response to referee 2's remark on inclusion of a general linear model: In our original submission we already fitted a general linear regression model to analyze data-interrelationships between the aerobic or anaerobic N mineralization rate and the contents of N and C in the isolated soil fractions. This was only briefly mentioned in the discussion (original lines and not mentioned in section '2.5 Statistical Analysis'. Both referees suggested to widen our analysis and discussion beyond the study of a relationship between the isolated SCWE C and N fractions. We have now expanded the regression analysis to include general soil properties (sand%, silt%, clay%, pH, Feox, Mnox, Alox) and the a and b parameters of the exponential model fitted to the cumulatively SCWE extracted C and N contents. We used stepwise linear regression as it explicitly accounts for multi-collinearity amongst the predictors. The stepwise linear

C5121

model fitted to the anaerobic N mineralization rates withheld pH and bOC as predictors. An interpretation of this new information has now been added to the discussion (L -).

3) We have elaborated on the specifics of anaerobic vs. aerobic N mineralization in paddy soils throughout the added discussion (see general comment above)

Minor comment:

Fig. 3 number of replicates added to Fig. 3

We included two extra references to Table 4 in the related discussion (L394 & L400).
Section 2.5 We have now explained that Pearson's correlation coefficients were calculated and that we used stepwise linear regression (L194 and L202-206).

Interactive comment on Biogeosciences Discuss., 10, 9765, 2013.