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## Publication

d15N natural abundance may directly disclose perturbed soil when related to C:N ratio

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**Author(s)** Conen, F.; Yakutin, M.V.; Carle, N.; Alewell, C.

**Author(s) at UniBasel** [Conen, Franz](#) ; [Alewell, Christine](#) ;

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**RATIONALE** Natural abundance  $^{15}\text{N}$  values in soil samples analysed by isotope ratio mass spectrometry (IRMS) are often used to confirm a perturbation after it has been indicated by other parameters. We propose a concept of how  $^{15}\text{N}$  values may a priori indicate a perturbation. **METHODS** We analysed the  $^{15}\text{N}$  values and C:N ratios of 102 soil samples from five regions in northern Eurasia by using an elemental analyser coupled to an isotope ratio mass spectrometer. **RESULTS** Unperturbed samples ranged in  $^{15}\text{N}$  values from 4.8 to 9.7 parts per thousand and in C:N ratio from 6.4 to 48.1. The  $^{15}\text{N}$  values were linearly proportional to the inverse of the square root of the C:N ratio ( $R^2=0.79$ ). At any particular C:N ratio, 94 % of the  $^{15}\text{N}$  values of the unperturbed samples were within  $\pm 2.4$  parts per thousand, but 72 % of perturbed samples had values outside this range. **CONCLUSIONS** The  $^{15}\text{N}$  natural abundance values, when related to the C:N ratios, may readily indicate perturbation of soil N cycling prior to other, more demanding investigations into related processes and extend the current use of IRMS in ecosystem research.

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