# 日本の森林土壌における窒素安定同位体比の変動様式について
# Natural abundance of $^{15}N$ in Japanese forest soils

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Natural abundance of $^{15}N$ of bulk soil N has been investigated in many studies with emphasis on soil N decomposition, N loss, and chronosequence of N dynamics in forests. $\delta^{15}N$ of bulk soil N generally increases with soil depths, which is considered as a consequence of the loss of $^{15}N$-delpleted N via leaching and gaseous loss both coupled with N mineralization and nitrification as well as the incorporation of $^{15}N$-enriched N into bulk soil N via microbial biomass. However, the details on how $^{15}N$ of bulk soil N can be discriminated during these processes are not clear.
We analyzed the $\delta^{15}N$ of bulk soil N collected in the GRENE (Green Network of Excellence) environmental information project and the ReSIN (Regional and comparative Soil Incubation study on Nitrogen dynamics in forest ecosystems) project (Urakawa et al. 2014, 2016). Mineral forest soils were collected in each watershed from five soil profiles with different soil depths down to 40 or 50cm depth. We used a modified EA-IRMS in TUAT with higher sensitivity to measure the $\delta^{15}N$ of bulk soil N with low N concentrations. We analyzed the soil samples (488 samples from 32 watersheds) with higher N concentration than ca. 0.1% (with less than 8mg sample weight to run) to reduce the risk of incomplete combustion.
$\delta^{15}N$ of bulk soil N ranged from -3.2 to +10.2 permill with N concentrations ranging from 0.1 to 1.3%. Isotopic fractionation factors for bulk soil N, estimated from the relationship between N concentrations and $\delta^{15}N$ values, ranged from 0.6 to 7.2 permill. The differences in mycorrhizal association of plants would influence the isotopic fractionation factor (Hobbie and Ouimette 2009), although we found no significant relationships between mycorrhizal associations (ECM, AM) and the isotopic fractionation factors. Climate factors such as MAT and MAP suggested as the factors affecting $\delta^{15}N$ of bulk soil N (Amundson et al. 2003) were not significantly correlated with $\delta^{15}N$ of bulk soil N. In the presentation we will discuss the possible factors influencing $\delta^{15}N$ of bulk soil N and isotopic fractionation factors in the forest watersheds.

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