

## 斜面森林土壌における亜硝酸の動態と制御要因について Soil nitrite transformation along a forest slope and controlling factors

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We conducted a tracer study to clarify the spatial heterogeneity of nitrite ( $\text{NO}_2^-$ ) dynamics in forest soils. Because of its reactive nature,  $\text{NO}_2^-$  does not usually accumulate in forest soils. This low concentration and experimental difficulties of accurate quantification have hampered quantitative detailed analyses of gross  $\text{NO}_2^-$  production and consumption in terrestrial environments. However,  $\text{NO}_2^-$  is an intermediate in many N transformation processes including nitrification and denitrification. Furthermore  $\text{NO}_2^-$  can also be reduced to gaseous N and react with organic matter not only biologically but also chemically. Thus  $\text{NO}_2^-$  dynamics may control whole N retention/emission characteristics in forest soils.

We added  $^{15}\text{NO}_2^-$  to mineral top soils derived from a slope of a Japanese cedar forest. Primary properties of soils such as concentration of inorganic N, pH and water content differed geographically; N concentration, pH and water content are lower in the upper soils.  $\text{NO}_2^-$  production and consumption rates gradually increased from upper slope to lower slope. Quite short mean residence time of  $\text{NO}_2^-$  implies that  $\text{NO}_2^-$  consumed very rapidly anywhere in slope. The dominant pathway of  $\text{NO}_2^-$  consumption change geographically. It is suggested that the conversion to DON and gaseous N is more important in upper soils. On the other hand, conversion to  $\text{NO}_3^-$  (nitrification) is dominant in lower soils.

At this presentation, we focus on geographical difference of  $\text{NO}_2^-$  dynamics and their regulation by environmental factors.

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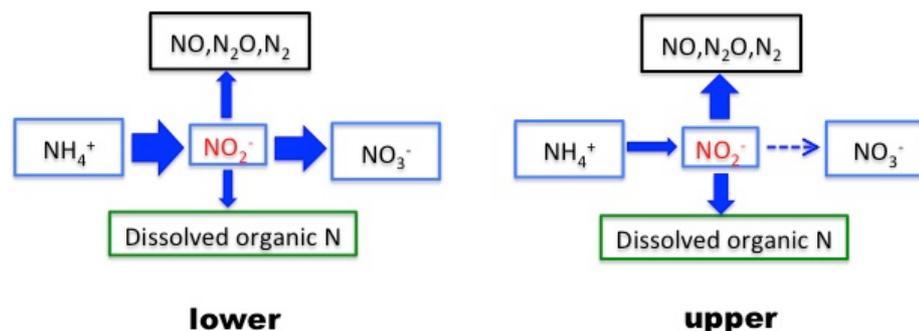


Fig.1 Schematic picture of nitrite dynamics along a forest slope.  
Difference between upper and lower soils.