

窒素負荷量の異なる2林分における樹木と土壌の窒素同位体比

Nitrogen isotope patterns of trees and soils in two different nitrogen deposition forests

*田中 あゆみ¹、稲垣 善之²、 学炎³、矢野 翠⁴、木庭 啓介⁴、平井 敬三¹

*Ayumi Oda Tanaka¹, Yoshiyuki Inagaki², Xue-Yan Liu³, Midori Yano⁴, Keisuke Koba⁴, Keizo Hirai¹

1.森林総合研究所、2.森林総合研究所四国支所、3.中国科学院、4.京都市大学生態学研究センター

1.Forestry and Forest Products Research Institute, 2.Shikoku Research Center, Forestry and Forest Products Research Institute, 3.Chinese academy of sciences, 4.Center of ecological research, Kyoto University

Anthropogenic nitrogen (N) deposition on forest site is concerning to modify plant species diversity and soil-to-plant N uptake. The N isotope ratio ($\delta^{15}\text{N}$) of soil and foliage reflects nitrogen cycle in the ecosystem and distinct plant N source. To better understand the effects of N deposition to soil N status and plant N uptake, we analyzed N content and $\delta^{15}\text{N}$ of soils and foliage in two different N deposition forests (Mt. Tsukuba: $11.5 \text{ kg N ha}^{-1} \text{ year}^{-1}$, Katsura: $7.5 \text{ kg N ha}^{-1} \text{ year}^{-1}$) in Kanto region. We sampled soil from upper and lower position of the two forest site respectively, and measured extracted inorganic N content and isotope ratio. We also analyzed leaf N content (N%) and $\delta^{15}\text{N}$ values of 30 woody species with different life forms (canopy and understory species). The soil nitrate concentration in Mt. Tsukuba was 25 fold higher than Katsura, and the $\delta^{15}\text{N}$ value was constant through the site ($-2.6 \pm 0.1\%$). While in Katsura, ammonium concentration in soil was high especially in upper slope, but in lower slope dominated nitrate. The foliage N% was high in Mt. Tsukuba than Katsura. The foliage $\delta^{15}\text{N}$ value differed significantly among species in Katsura but in Mt. Tsukuba foliage $\delta^{15}\text{N}$ value showed steady through species and the value corresponded with soil nitrate $\delta^{15}\text{N}$. From these results, N deposition may lead changing soil N status and alter plant N source and uptake.

キーワード：窒素同位体比、窒素負荷、無機態窒素

Keywords: Nitrogen isotope ratio, Nitrogen deposition, Inorganic nitrogen