

Mean residence time of leaf nitrogen and leaf longevity of hinoki cypress (*Chamaecyparis obtusa*) under nutrient-poor soil

*Asami Nakanishi¹, Yoshiyuki Inagaki²

1.Field Science Education and Research Center, Kyoto University, 2.Shikoku Research Center, Forestry and Forest Products Research Institute

Mean nitrogen residence time of plants is decided by nitrogen resorption and leaf longevity. However, there is little knowledge about intra-specific variation in leaf longevity and mean nitrogen residence time along a soil nitrogen gradient. We evaluated the effects of nitrogen resorption and leaf longevity on mean residence time of leaf nitrogen (leaf-N MRT) of hinoki cypress under different soil nutrient status.

Mean residence time of nitrogen in organic horizon (A_0 N-MRT) was used as the index of soil nutrient status. A_0 N-MRTs ranged 5.4 to 38.3 years that were longer than those in other stands of hinoki cypress. Leaf longevity and leaf-N MRT increased as A_0 N-MRT increased. Leaf production and leaf-fall nitrogen mass decreased with increasing A_0 N-MRT. There were no significant relationships between A_0 N-MRT and nitrogen resorption, leaf biomass, leaf nitrogen mass, nitrogen concentrations of fresh-leaf and leaf-fall. Nitrogen resorption was higher than that in other stands of hinoki cypress. It was suggested that nitrogen resorption did not significantly correlated with A_0 N-MRT because of high resorption rate in all plots. These findings indicated that hinoki cypress under nutrient-poor soil to maximize mean residence time of leaf nitrogen increased nitrogen resorption before leaf-fall first, and additionally, altered leaf longevity by changing leaf production along a soil nitrogen gradient.

Keywords: mean residence time of leaf nitrogen, leaf longevity, leaf production, hinoki cypress, organic horizon