

## Effects of thinning on delta-<sup>15</sup>N in leaves of hinoki cypress and understory vegetation

INAGAKI, Yoshiyuki<sup>1\*</sup>, NOGUCHI Kyotaro<sup>2</sup>, FUKATA hidekisa<sup>3</sup>

<sup>1</sup>Forestry and Forest Products Research Institute, <sup>2</sup>Shikoku Res Center, FFPRI, <sup>3</sup>Kochi Prefectural Forestry Technology Research Center

Light, water and nutrient availability for remaining trees increases after thinning in hinoki cypress plantation. Soil nitrification often increases after thinning. Abundance of understory vegetation also increases. These changes may affect nitrogen use strategy of hinoki cypress and understory vegetation but there is no information about hinoki cypress plantation in Japan. If nitrification increases after thinning, the nitrate should have lower delta<sup>15</sup>N while remaining ammonium should have higher delta<sup>15</sup>N. The preferential uptake of nitrate and ammonium should affect delta<sup>15</sup>N of plants.

In this study, we investigated changes of delta<sup>15</sup>N in hinoki cypress plantations at two different altitude (Tengu 1150m, Furumiya 710m). Two adjacent plots (20m x 20m) were located. One plot was thinned in 2002 and the other was remained as a control. Organic layer and surface soil at 5cm depth were samples in 2002. Leaves of hinoki cypress and understory vegetation (*Lindera triloba* in Tengu and *Lindera sericea* in Furumiya) were collected in July from 2002-2007. Nitrogen concentration of these samples were measured by NC analyze while delta<sup>15</sup>N of them were measured by IRMS.

The results suggest that leaf delta<sup>15</sup>N in understory vegetation is more affected by thinning than hinoki cypress. Higher delta<sup>15</sup>N in leaves suggests preferential uptake of nitrate by understory vegetation in thinned forest in Tengu or reliance of nitrogen sources in the upper layer of soil, i.e. organic horizon by hinoki cypress in Furumiya. These findings indicate that measurement of delta<sup>15</sup>N in leaves provide valuable insights about the nitrogen sources for plants.

Keywords: hinoki cypress, understory vegetation, thinning, <sup>15</sup>N