

Nitrogen utilization of hinoki cypress at high and low altitude in Kochi

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Hinoki cypress is one of major tree species for timber in Japan. Hinoki cypress is an evergreen conifer which attains leaves in the crown for several years. Leaf longevity of hinoki cypress has shown to be longer in cooler areas. By contrast, evergreen tree species has been dominant in nutrient-poor soil condition and leaf longevity of a single species can vary with soil nutrient condition. We investigated nitrogen utilization of hinoki cypress in relation to soil condition at high and low elevation sites in Kochi prefecture, southern Japan. Nitrogen concentration in fresh leaves or leaf litter was negatively correlated with soil C/N ratio in each area but these relationships were different between two areas. Mean residence time of leaf nitrogen, leaf longevity and nitrogen resorption efficiency was different between two areas but was not related with soil C/N ratio. Leaf nitrogen content per area was related with soil CN ratio and common regression line was obtained for two areas. Because there is a tradeoff between leaf longevity and nitrogen concentration in fresh leaves between two areas, leaf nitrogen content was not different between two areas. Leaf nitrogen content was positively correlated with tree height growth and common regression was obtained for two areas. Therefore leaf nitrogen content is a useful index of nitrogen use by hinoki cypress in wide range of climate condition because it is less affected by mean temperature of the area.

Keywords: hinoki cypress, nitrogen, leaf longevity, altitude