Leaf biomass of hinoki cypress forests along a slope gradient in Kochi Prefecture.

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Leaf biomass in forest ecosystems is estimated by several techniques. Leaf biomass is known to be proportional to the basal area at the crown base. The basal area at the crown base can be indirectly predicted from tree height, height at the base crown and diameter at the breast height of trees. From these principles a simple method for leaf biomass estimation is developed for hinoki cypress trees. The method is applied for 18 hinoki cypress forests in two areas at different elevations in Kochi prefecture, southern Japan. Leaf biomass raged from 14.1 to 19.2 Mg/ha at the high elevation area and from 12.6 to 18.2 Mg/ha at the low elevation area. Leaf biomass was not different between the two areas or among different slope positions. The linear regression was applied for log-transformed leaf biomass and stem biomass in each forest. The slope of the regression lines ranged from 0.75 to 1.03 at the high elevation area and from 0.92 to 1.05 at the low elevation area. The slope of the regression was positively correlated with relative yield index which is correlated with height growth of trees. The results indicate that smaller trees have greater amount of leaves per unit of stem biomass at the low productivity sites and smaller trees have fewer leaves at the high productivity sites. This mechanism explains relatively constant leaf biomass along a slope gradient.

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