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Longitudinal Change of Dynamic Modulus of Elasticity and Quality Evaluation by a Non-destructive Method in Todomatsu (*Abies sachalinensis*) Plus Trees

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Abstract: Longitudinal changes of dynamic modulus of elasticity values (E_{fr}) of logs for todomatsu (*Abies sachalinensis*) were investigated to clarify the best vertical region of the stem (height from ground level) to estimate its mean E_{fr} value, using plus trees and breeding stock. The relationship between stress wave velocity (V_p) of standing trees and E_{fr} of logs was also investigated to test the suitability of the stress wave propagation method for todomatsu. The longitudinal changes of E_{fr} of logs show similar tendencies within individuals for each clone. E_{fr} of the region from ground level to a height of 3 m could be used as an alternate value to the mean E_{fr} , and the region including breast height was appropriate for its genetic comparison between clones. Significant correlation between E_{fr} of logs and V_p of standing trees was obtained both in individuals and in clones. The correlation coefficients were especially high. Therefore it would be possible to estimate E_{fr} of logs in todomatsu based on the measurement of V_p of standing trees at breast height. This method will allow us to evaluate the wood quality of clones non-destructively.

Keywords: todomatsu, stress wave velocity, standing tree, dynamic modulus of elasticity



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