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The Evaluation of Modulus of Elasticity at an Early Stage of Growth in Sugi (*Cryptomeria japonica*) Wood Using S2 Microfibril Angle of Latewood Tracheids as a Wood Quality Indicator

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Abstract: The objective of this study was to examine the evaluation of modulus of elasticity (*MOE*) in mature wood using microfibril angle at an early stage of growth. Several wood qualities, such as latewood tracheid length, microfibril angle of S2 layer in latewood tracheid (*MFA*), and static bending property were examined in 45-year-old sugi (*Cryptomeria japonica*) trees originated from seedlings. From the results of the radial variation of the *MFA* and latewood tracheid length, the boundary between juvenile wood and mature wood was determined to be around 21st to 24th annual rings from the pith. *MFA* showed a significant negative correlation with *MOE* and specific *MOE*, r=-0.747 and r=-0.889, respectively. In addition, the *MFA* value at the 3rd annual ring showed a significant negative correlation with *MOE* and specific *MOE*, r=-0.556 and r=-0.623, respectively. These results indicate that *MOE* value in mature wood can be evaluated using *MFA* values at an early stage of growth in sugi wood originated from seedlings.

Keywords: *Cryptomeria japonica*, S2 microfibril angle, modulus of elasticity

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