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Longitudinal Changes of Basic Density and Non-Destructive Quality Evaluation Using the Pilodyn in Todomatsu (*Abies sachalinensis*) Plus Tree Clones

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Abstract: The longitudinal changes in the basic density of disks (mean *B*d) of todomatsu (*Abies sachalinensis*) were investigated using plus-tree clones and breeding-material clones. The relationship between Pilodyn penetration of a standing tree and mean *B*d was also investigated. The patterns of longitudinal change of mean *B*d differed among clones and could be classified into several types. The mean *B*d of the region 1-3 m above ground could be used as an alternate value to the mean *B*d, and including breast height was appropriate for a genetic comparison. A significant negative correlation between Pilodyn penetration of a standing tree with and without bark and mean *B*d was obtained in both individuals and clones. Pilodyn penetration with bark was more useful than that without bark because it was easier. Therefore, it would be possible to evaluate the mean *B*d in todomatsu based on the measurement of Pilodyn penetration with bark of standing trees at breast height. This method will allow us the non-destructive evaluation, and will be available as a good indicator of the wood quality of both individuals and clones.

Keywords: todomatsu, clone, longitudinal change, basic density, Pilodyn penetration

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