

Ecophysiological Strategies for Sustainable Growth of Large and Long-lived Trees, and Their Conservation Value in Ecological Context

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Abstract

In Japan, 70% of the land is covered by forests, and coniferous planted forests such as cedar and cypress are growing and aging significantly. Maximum tree height is an important indicator of stand productivity that can be used for forestry, and it is also a scientific question for trees as living organisms that "What factors determine the limit of tree height?".

By directly observing the tops of trees over 100 m tall, this study challenged the prevailing theory based on years of theoretical studies and discovered a new adaptive mechanism as a hydraulic homeostasis within the crown of tall conifer trees through a multiple approach that includes physiology, anatomy, and physico-chemistry^{1,2}.

Furthermore, as trees age, the surface area of the tree surface increases and its branch and leaf ("crown") structure develops three-dimensionally. In this study, we characterized the crown environment of long-lived large trees and evaluated its ecological role within forest ecosystems in interactions with vascular epiphytes³.

References

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