

Rainfall intensity affects foliar water uptake of conifers

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Abstract

Foliar water uptake (FWU) may be a significant way for trees to obtain water; however, studies are lacking on FWU. To determine whether FWU occurs in *Platycladus orientalis* growing in seasonally arid areas, the process of FWU under soil water content (SWC) of 3.9–6.5%, 6.5–9.1%, 9.1–15.6%, 15.6–20.8%, and 20.8–26.0% and different precipitation gradients (1/mm, 5 mm/h, 10 mm/h, and 15 mm/h) was studied using precipitation with labeled isotopes in simulated rainfall experiments with indoor potted plants. The results showed that FWU occurred in each treatment if the SWC [?] 21.9% no matter the amount of precipitation. The absorption rate of rainfall by leaves increased with the increase of rainfall intensity, but decreased with the increase of SWC. The greatest rates of FWU were 2.77% and 9.52% of rainfall intensity of 1 mm/h and 15 mm/h, respectively, in the 3.9–6.5% treatment. The precipitation absorbed by the leaves of *P. orientalis* can be transported to xylem or root system along the water potential gradient of leaves–branches–roots. The precipitation with reverse migration in branches and roots increased with the increase of the water potential gradient of leaves–branches–roots. This study provided insight into water use patterns and water migration within trees.

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