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GROWTH AND HYDRAULIC CHARACTERISTICS OF
TWO TROPICAL DECIDUOUS SEEDLINGS
SUBJECTED TO DIFFERENT WATER SUPPLY

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Abstract

Growth and above ground plant hydraulic characteristics were assessed on 9 months old potted seedlings of *Terminalia arjuna* and *Berrya cordifolia*. The seedlings were subjected to high and low watering treatments. Leaf water potentials (ψ_{Leaf}) were measured using a pressure chamber. Whole plant shoot hydraulic conductivity (k_{max}), leaf specific hydraulic conductivity (k_l), xylem specific hydraulic conductivity (k_s) and hydraulic conductivity per unit shoot dry mass ($k_{\text{max}}/\text{TSDM}$) were assessed using Low pressure flow meter (LPFM). The midday embolism was quantified as the percentage loss in hydraulic conductivity (PLC). Vessel diameter at the distal end of the shoot stem was also measured. Plant growth parameters were investigated in terms of height, diameter, leaf area and plant dry mass. Measured predawn ψ_{Leaf} (equivalent to soil ψ) and midday ψ_{Leaf} were insignificant between treatments. But genus effect was significant where *T. arjuna* operated at low xylem water potential than *B. cordifolia*. Higher plant growth and dry mass accumulation were observed in high watered seedlings than low watered seedlings. The genus effect on growth parameters were significant with *T. arjuna* which invested more dry mass than *B. cordifolia*. Hydraulic parameters significantly differed between treatments and genus. However, significant reduction in hydraulic conductivities such as k_{max} , k_l and k_s and increased PLC were observed in *T. arjuna* subjected to low watering treatment. Established relationship between hydraulic parameters (k_{max} and k_s) and vessel diameter indicated increases in hydraulic conductivities strongly associated with increase in vessel diameter. The strong relationship between k_l and shoot dry mass supports hydraulic limitation hypothesis that increase of k_l sufficiency decreases water stress and supports growth.

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