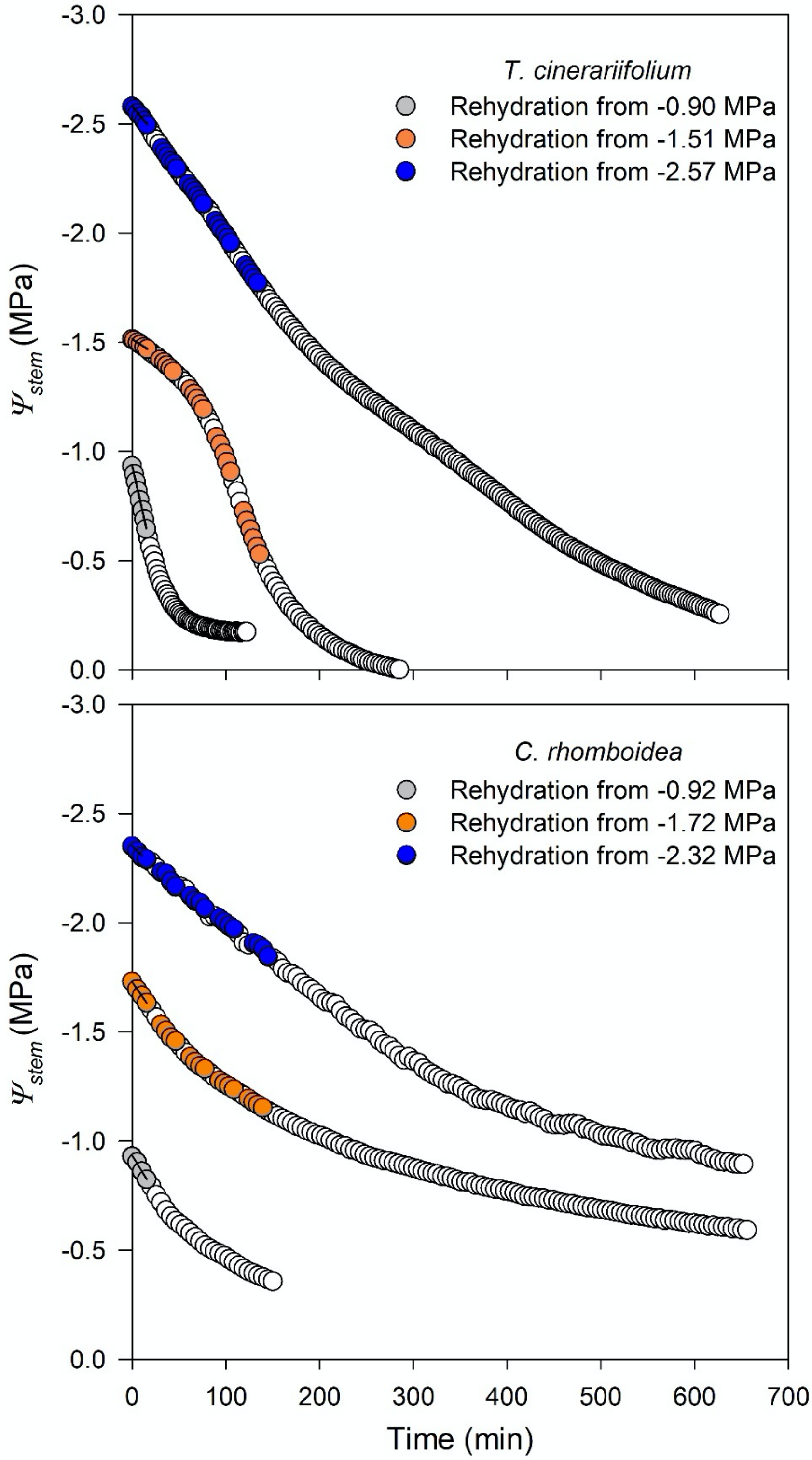
Supplemental Data

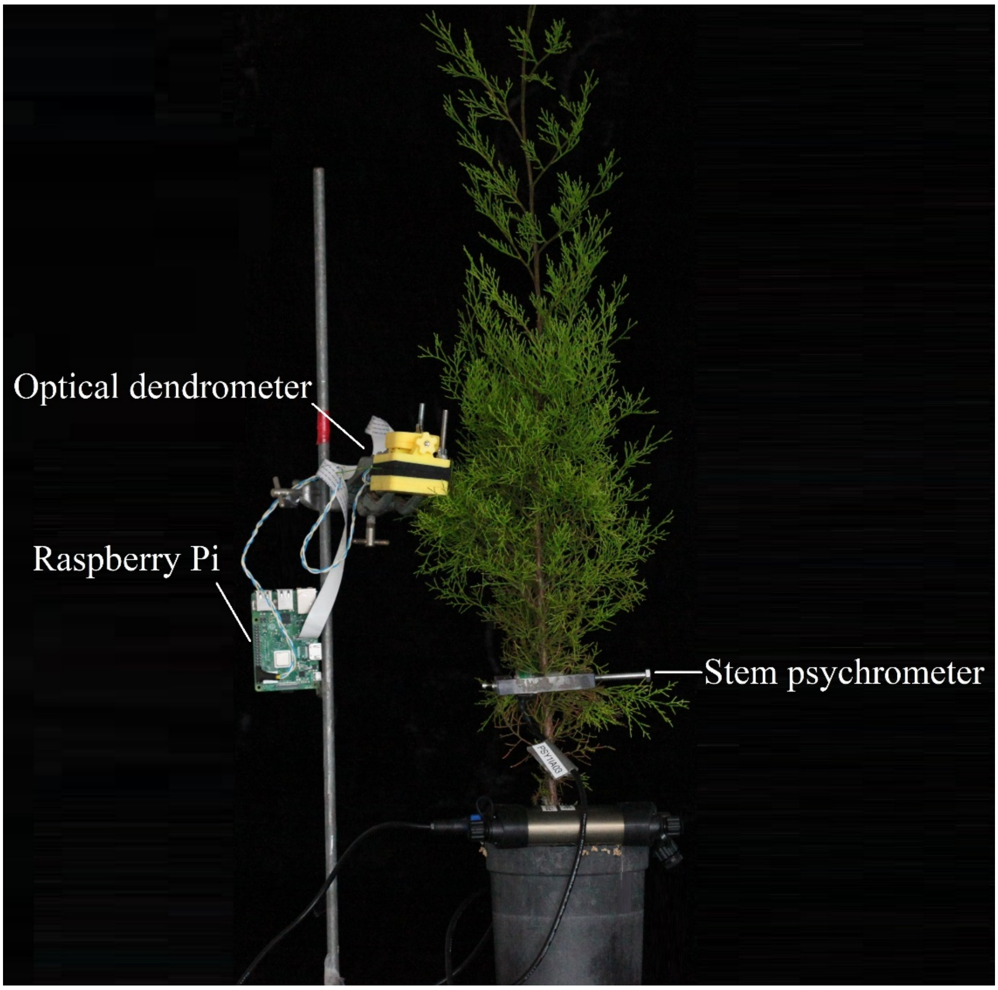
Ibrahim Bourbia, Carola Pritzkow and Timothy J. Brodribb
School of Natural Sciences, University of Tasmania, Private Bag 55, Hobart, Tas. 7001, Australia

Author for correspondence:
Timothy J. Brodribb
Tel: +61 (0)3 6226 1707
Email: timothy.brodribb@utas.edu.au

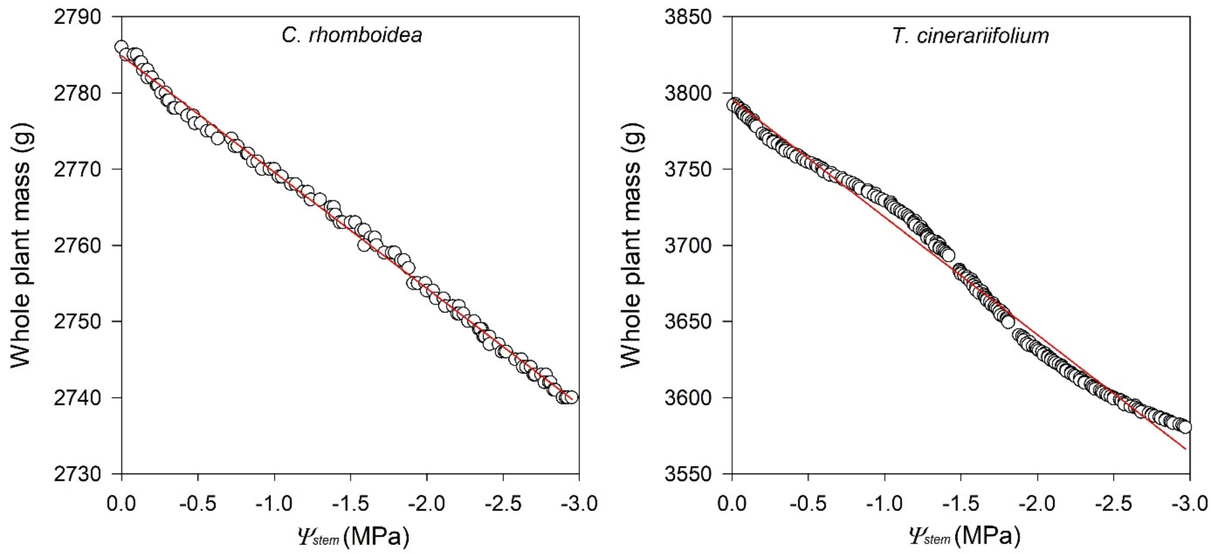


Supplemental Figure S1. Stem water potential Ψ_{stem} relaxation kinetics (open circles) predicted using petiole width displacement recorded by optical dendrometers while rehydrating plants through the soil at different water stress levels. Exponential regressions (solid lines) were fitted to the first 15 min of stem water potential relaxation data at rehydration (coloured circles) and used to calculate the initial *Kr* at different water stress levels. The trajectory of *Kr* recovery from Ψ_{soil} ~ -1.5 MPa (orange circles) and Ψ_{soil} ~ -2.5

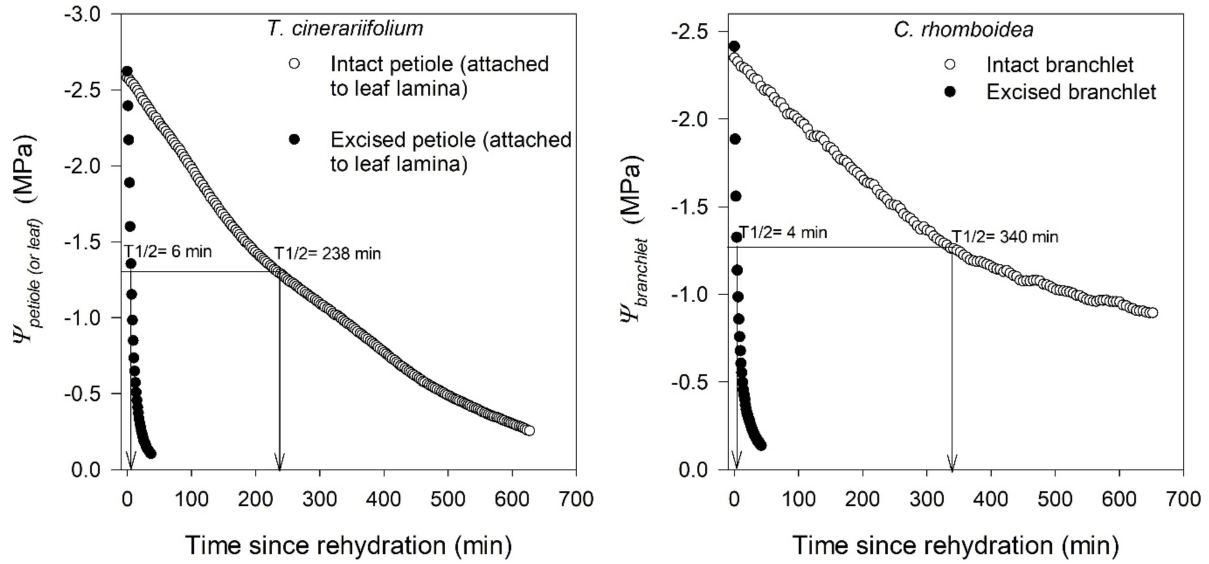
MPa (blue circles) was calculated the same way by fitting an exponential regression to 15 min of Ψ_{stem} relaxation data every 30 min over the first 120 min of rehydration.



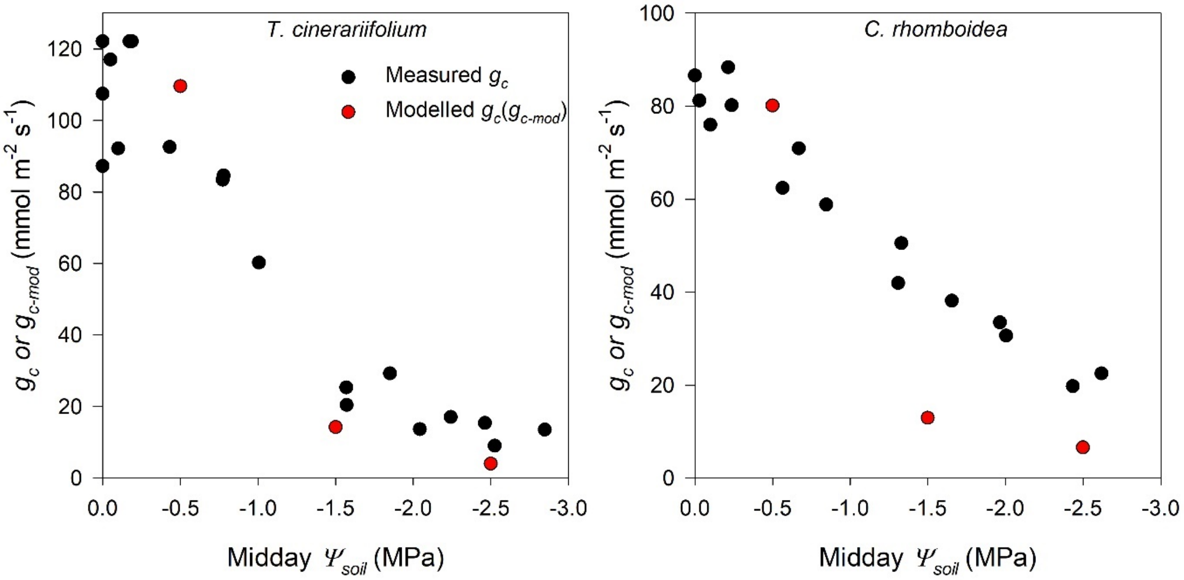
Supplemental Figure S2. The set-up for root hydraulic conductance measurements in the woody *C. rhomboidea*. Branchlet width changes during drying and rehydration are continuously monitored with an optical dendrometer connected to a Raspberry Pi microcomputer. Stem water potential is measured with a stem psychrometer attached to the stem at the base of the plant.



Supplemental Figure S3. Simultaneous measurements of whole plant mass and stem water potential Ψ_{stem} (open circles) in individual plants of the woody *C. rhomboidea* and the herbaceous *T. cinerariifolium*. Whole plant capacitance C_{plant} (mmol m^{-2} MPa^{-1}) was determined from the slope of the linear relationship (red solid lines) between whole plant mass and Ψ_{stem} (between 0 and -3 MPa) and normalized by total plant projected leaf area (m^2).



Supplemental Figure S4. Rehydration kinetics of excised and intact petioles (attached to their leaf laminas) and branchlets in the herbaceous *T. cinerariifolium* and the woody *C. rhomboidea*. Water potential of both intact and excised petioles/branchlets ($\Psi_{petiole\ (or\ leaf)}$ and $\Psi_{branchlet}$, respectively) was predicted using petiole and branchlet width displacement recorded by optical dendrometers that were securely attached to these tissues while rehydrating. Rehydration of excised petioles (attached to their leaf laminas) and branchlets (with dendrometers) was done by detaching them under filtered/degassed water from plants when reached moderate (~ -2.5 MPa). For both intact and excised petioles/branchlets, the initial and final Ψ following rehydration were measured with a pressure chamber to validate the predicted Ψ. The initial Ψ of excised petioles/branchlets was measured using a neighbouring leaf/branchlet while the final Ψ was determined on the captured detached ones themselves after removing them from the dendrometers. Rehydration from ~ -2.5 MPa was much faster in excised than in intact petioles and branchlets. The half time (T1/2) of relaxation was 6 min in excised compared with 238 min in intact petioles of the herbaceous *T. cinerariifolium* and 4 min in excised compared with 340 min in intact branchlets of the woody *C. rhomboidea*



Supplemental Figure S5. Measured (black circles) and modelled (red circles) canopy conductance using observed root hydraulic conductance (*Kr*) during increasing soil water stress in the herbaceous *T. cinerariifolium* and the woody *C. rhomboidea*.