

Transpiration Induced Changes in Atmospheric Water Vapor $\delta^{18}\text{O}$ via Isotopic Non-Steady-State Effects on a Subtropical Forest Plantation

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Introduction

This supporting information provides the related tables and figures as seen in the main article.

Table S1. Mean, minimum and maximum values, and standard deviation (SD) of $\delta^{18}\text{O}$ in xylem and leaf water of *C. lanceolata*, *P. massoniana*, and *P. elliotii*, and soil water at 0–5, 15–20, and 40–45 cm depths, and water vapor at heights of 17 and 27 m.

Xylem water $\delta^{18}\text{O}$ (‰)	<i>C. lanceolata</i> (n=17)	<i>P. massoniana</i> (n=18)	<i>P. elliotii</i> (n=18)
Mean	−5.89	−6.67	−7.33
Minimum	−6.54	−7.30	−7.91
Maximum	−4.74	−5.96	−6.65
SD	0.49	0.39	0.37
Leaf water $\delta^{18}\text{O}$ (‰)	<i>C. lanceolata</i> (n=18)	<i>P. massoniana</i> (n=18)	<i>P. elliotii</i> (n=18)
Mean	10.69	7.48	8.09
Minimum	4.86	3.37	3.36
Maximum	17.41	15.69	12.46
SD	2.91	3.12	2.39
Soil water $\delta^{18}\text{O}$ (‰)	0–5 cm (n=18)	15–20 cm (n=18)	40–45 cm (n=18)
Mean	−8.84	−9.48	−9.39
Minimum	−9.57	−10.65	−10.88
Maximum	−8.27	−8.45	−8.59
SD	0.38	0.50	0.55
Water vapor $\delta^{18}\text{O}$ (‰)	17 m (n=61)	27 m (n=61)	
Mean	−15.61	−15.76	
Minimum	−17.20	−17.40	
Maximum	−14.36	−14.39	
SD	0.69	0.72	

Note: n means sampling number.

Table S2. Correlation factor (R) among $\delta^{18}\text{O}$ of xylem (XW) and leaf (LW) water of *C. lanceolata* (C.L.), *P. massoniana* (P.M.), and *P. elliptii* (P.E.), and soil water at 0–5 (SW 0–5), 15–20 (SW 15–20) and 40–45 (SW 40–45) cm depths, and water vapor at heights of 17 (WV 17) and 27 (WV 27) m.

	XW C.L.of	XW of P.M.	XW of P.E.	LW C.L.of	LW of P.M.	LW of P.E.	SW 0–5	SW 15– 20	SW 40– 45	WV 17	WV 27
XW of C.L.	1										
XW of P.M.	−0.110	1									
XW of P.E.	−0.171	0.571 *	1								
LW of C.L.	−0.254	0.350	0.437	1							
LW of P.M.	−0.220	0.188	0.025	0.585 *	1						
LW of P.E.	−0.241	0.287	0.179	0.843 **	0.795 **	1					
SW 0–5	−0.136	−0.063	−0.389	−0.143	0.076	0.038	1				
SW 15–20	−0.158	0.212	−0.193	0.130	0.161	0.300	0.547 *	1			
SW 40–45	0.045	0.295	−0.214	−0.237	−0.088	−0.259	0.225	0.341	1		
WV 17	0.197	−0.125	−0.069	−0.593 **	−0.824 **	−0.747 **	−0.020	−0.118	0.234	1	
WV 27	0.223	−0.137	−0.068	−0.636 **	−0.821 **	−0.778 **	−0.002	−0.181	0.207	0.990 **	1

Note: * and ** represents a significant relationship at $p = 0.05$ and 0.01 levels, respectively. The values in the top right corner are deleted because they are the same as those in the bottom left corner.

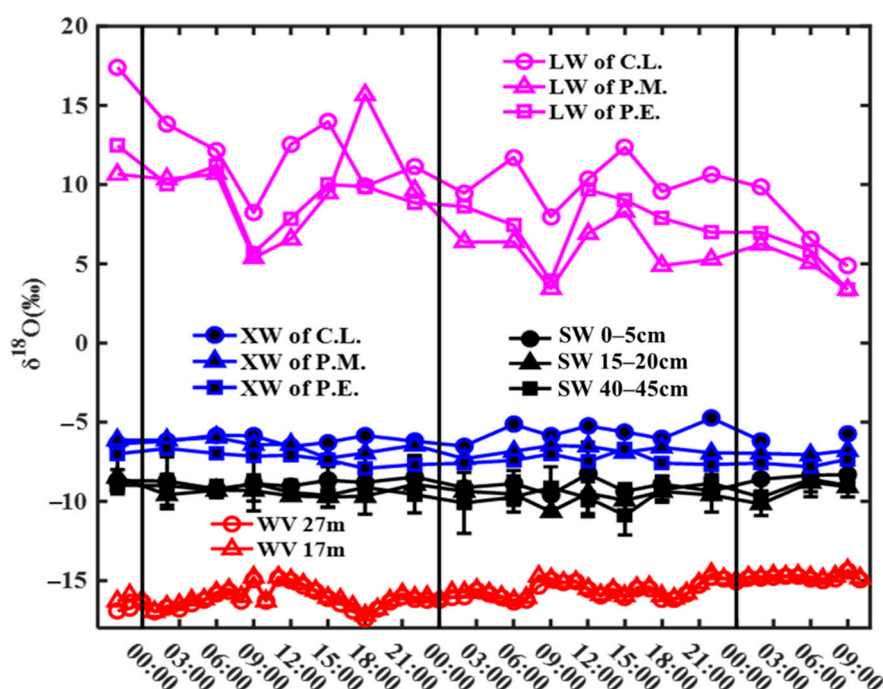


Figure S1. Diurnal variation of $\delta^{18}\text{O}$ in xylem (XW) and leaf (LW) water of *C. lanceolata* (C.L.), *P. massoniana* (P.M.), and *P. elliptii* (P.E.), and soil water at 0–5 (SW 0–5 cm), 15–20 (SW 15–20 cm) and 40–45 (SW 40–45 cm) cm depths, and water vapor at heights of 17 (WV 17 m) and 27 (WV 27 m) m.

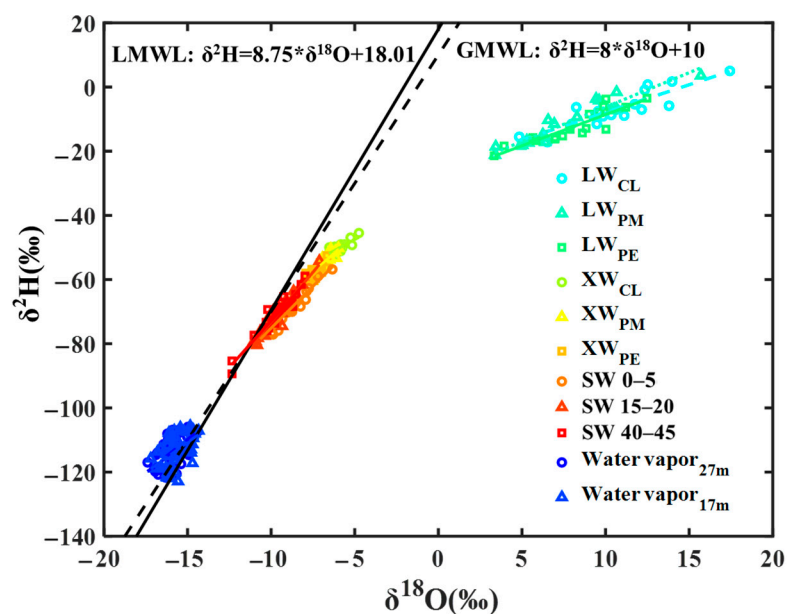


Figure S2. $\delta^2\text{H}$ - $\delta^{18}\text{O}$ plots of xylem (XW) and leaf (LW) water of *C. lanceolata* (CL), *P. massoniana* (PM), and *P. elliotii* (PE), and soil water at 0–5 (SW 0–5), 15–20 (SW 15–20) and 40–45 (SW 40–45) cm depths, and water vapor at heights of 17 and 27 m. LMWL means local meteoric water line, and GMWL means global meteoric water line.

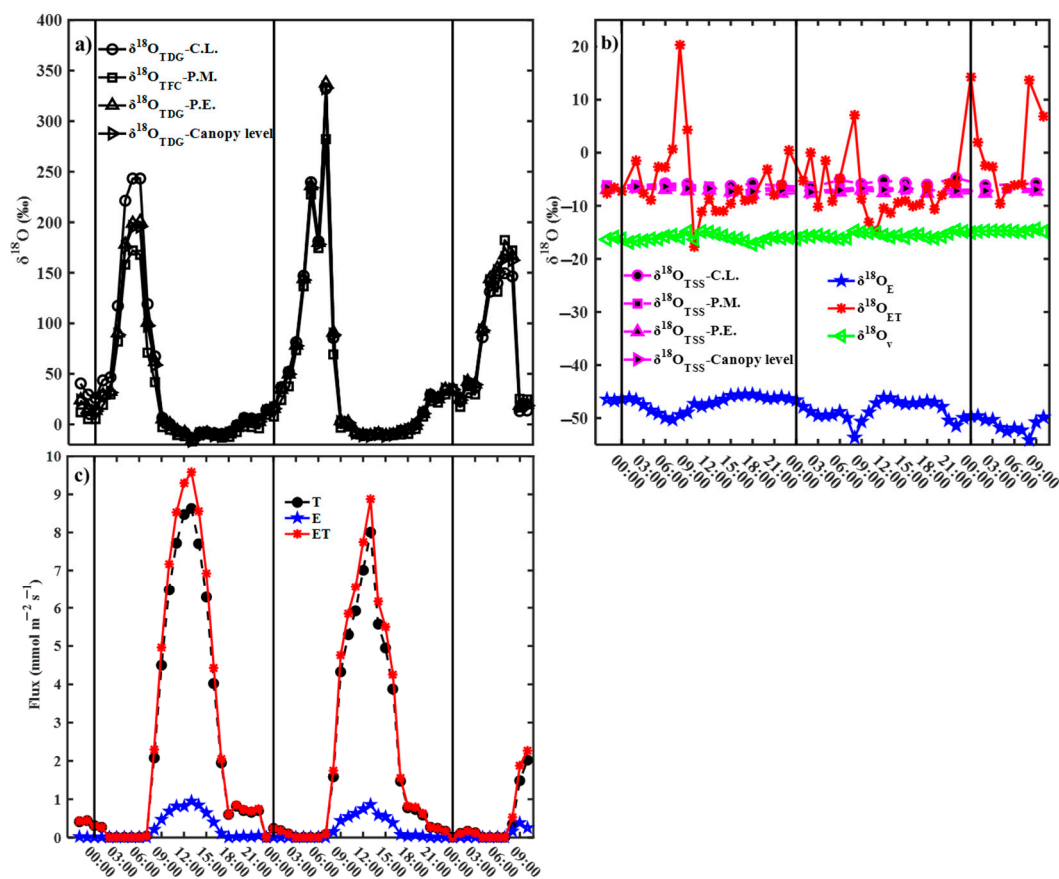


Figure S3. Diurnal patterns of (a) transpiration $\delta^{18}\text{O}$ via non-steady ($\delta^{18}\text{O}_{\text{T DG}}$ and $\delta^{18}\text{O}_{\text{T FC}}$), (b) transpiration $\delta^{18}\text{O}$ via steady-state ($\delta^{18}\text{O}_{\text{T SS}}$), evaporation $\delta^{18}\text{O}$ ($\delta^{18}\text{O}_{\text{E}}$), evapotranspiration $\delta^{18}\text{O}$ ($\delta^{18}\text{O}_{\text{ET}}$), and water vapor $\delta^{18}\text{O}$ ($\delta^{18}\text{O}_{\text{V}}$), and (c) transpiration, evaporation and evapotranspiration flux. $\delta^{18}\text{O}_{\text{T DG}}$ and $\delta^{18}\text{O}_{\text{T FC}}$ mean $\delta^{18}\text{O}_{\text{T}}$ obtained by using simulated $\delta^{18}\text{O}_{\text{L,e}}$ with the Dongmann (DG) and Farquhar–Cernusak (FC) model into equation 10, respectively. C.L., P.M., and P.E. indicate *C. lanceolata*, *P. massoniana*, and *P. elliotii*, respectively.