Tables and captions

Table S1. Tree height, trunk diameter, and estimated sapwood width for *H. rhamnoides* and *P. davidiana* in both pure and mixed plantations.

Plantation type	No.	Height (m)	Trunk diameter (mm)	Sapwood width (mm)
H. rhamnoides in pure plantation	1	3.95	45	9
	2	4.26	53	11
	3	4.05	51	10
	4	4.13	49	9
	5	3.98	50	10
	6	4.1	51	11
	7	4.3	57	12
	8	3.86	44	9
	9	3.92	53	11
P. davidiana in pure plantation	1	4.41	58	17
	2	3.9	52	9
	3	3.92	56	16
	4	4.35	56	17
	5	4.59	58	16
	6	4.2	53	13
	7	4.29	54	15
	8	3.86	51	9
	9	3.98	52	11
H. rhamnoides in mixed plantation	1	4.36	52	11
	2	3.9	49	8
	3	4.23	51	10
	4	4.5	56	15
	5	4.73	55	14
	6	3.96	49	8
	7	4	51	10
	8	4.52	53	12
	9	4.39	52	11
P. davidiana in mixed plantation	1	4.12	53	11
	2	3.75	46	9
	3	4.5	57	13
	4	4.21	53	11
	5	4.2	53	11
	6	4.16	51	10
	7	3.8	45	9
	8	4.95	59	13
	9	4.16	51	10

The sapwood width was estimated through the equation between established through 12 unmonitored individual core samples for each species with different diameters. The core sample was obtained using an increment borer, and the colour difference between sapwood and heartwood was large. The equation between trunk diameter (mm) and sapwood width (mm) was $y=0.248x-2.296$ $R^2=0.84$ $p<0.05$ for *H. rhamnoides* in pure plantation; $y=0.353x-5.932$ $R^2=0.72$ $P<0.05$for *H. rhamnoides* in mixed plantation; $y=1.126x-47.66$ $R^2=0.83$ $P<0.05$ for *P. davidiana* in pure plantation; $y=0.317x-5.71$ $R^2=0.939$ $P<0.05$.

Table S2. Independent-sample *t*-test parameters for predawn (Ψ_{pd}), midday (Ψ_m), and gradient of leaf water potential ($\Psi_{pd}-\Psi_m$) between the first and second after each rainfall amount.

	Rainfall amount (mm)	*df*	Ψ_{pd}		Ψ_m		$\Psi_{pd}-\Psi_m$	
			t	*p*	*t*	*p*	*t*	*p*
H. rhamnoides in pure plantation	3.4	4	0.18	0.87	1.21	0.29	-2.5	0.07
	7.9	4	0.33	0.75	0.79	0.58	-8.01	0.47
	15.4	4	0.85	0.44	0.27	0.8	0.21	0.85
	24	4	0.97	0.39	-0.67	0.54	2.13	0.1
	35.2	4	-0.09	0.93	-7.1	0.52	0.28	0.79
P. davidiana in pure plantation	3.4	4	0.88	0.43	0.66	0.55	0.81	0.47
	7.9	4	0.34	0.08	0.75	0.49	-1.8	0.14
	15.4	4	0.23	0.83	0.73	0.51	-0.82	0.46
	24	4	-2.08	0.11	1.14	0.32	-0.85	0.45
	35.2	4	-1.67	0.17	1.15	0.31	-2.22	0.09
H. rhamnoides in mixed plantation	3.4	4	2.53	0.07	1.4	0.24	-0.6	0.58
	7.9	4	1.24	0.28	2.02	0.11	-1.87	0.14
	15.4	4	-0.9	0.42	0.96	0.39	-1.29	0.27
	24	4	1.74	0.16	2.04	0.11	-1.22	0.29
	35.2	4	1.89	0.13	2.57	0.06	-0.29	0.78
P. davidiana in mixed plantation	3.4	4	0.07	0.95	1.9	0.13	-0.35	0.72
	7.9	4	0.81	0.46	0.96	0.39	-0.46	0.67
	15.4	4	0.7	0.52	2.12	0.1	-0.53	0.62
	24	4	1.85	0.14	0.74	0.49	0.48	0.66
	35.2	4	2.23	0.09	1.21	0.3	0.55	0.61

Table S3. Regression of relative response of normalized sap flow (SF_R) and water absorption proportions from three soil layers (n=15).

Water sources	*H. rhamnoides* in pure plantation		*H. rhamnoides* in mixed plantation		*P. davidiana* in pure plantation		*P. davidiana* in mixed plantation	
	R^2	p	R^2	p	R^2	p	R^2	p
0-30cm	0.42	0.24	0.62	0.11	0.71	0.07	0.75	0.06
30-100cm	0.07	0.66	0.01	0.87	0.61	0.12	0.32	0.71
100-200cm	0.85	0.03	0.84	0.03	0.71	0.07	0.81	0.04

The regression equation is y=ax+b

Table S4. Regression of reference evapotranspiration (ET_0) and relative response of normalized sap flow (SF_R).

Independent factors	*H. rhamnoides* in pure plantation		*H. rhamnoides* in mixed plantation		*P. davidiana* in pure plantation		*P. davidiana in mixed plantation*	
	R^2	p	R^2	p	R^2	p	R^2	p
ET_0	0.18	0.47	0.11	0.59	0.44	0.22	0.39	0.26
Relative response of ET_0	0.35	0.32	0.61	0.12	0.12	0.56	0.25	0.4

The regression equation is y=ax+b for all equations in this Table. Relative response of ET_0 is calculated as the same SF_R in Eq. (7) in the manuscript, with before and after precipitation event parameter is ET_0 instead.

Table S5. Parameters of allometric equation and average (± SD) estimated biomass of leaf, branches, wood, and roots of *H. rhamnoides* and *P. tabuliformis* in pure and mixed plantations (n=6).

Species		*a*	*b*	Biomass in pure plantation	Biomass in mixed plantation
H. rhamnoides	leaf	0.017	0.541	0.51 ± 0.02	0.55 ± 0.04
	branches	0.013	0.042	0.16 ± 0.05	0.14 ± 0.01
	wood	0.036	0.721	2.4 ± 0.09	2.6 ± 0.07
	roots	0.019	0.732	1.51 ± 0.06	1.79 ± 0.04
	total biomass			4.58 ± 1.01	5.08 ± 1.13
P. tabuliformis	leaf	0.052	0.621	1.21 ± 0.05	1.58 ± 0.09
	branches	0.025	0.81	1.35 ± 0.04	1.32 ± 0.06
	wood	0.0492	0.832	4.22 ± 0.11	4.73 ± 0.13
	roots	0.031	0.791	2.02 ± 0.06	2.75 ± 0.1
	total biomass			8.8 ± 1.39	10.38 ± 1.55

$Y=a(D^2H)^b$, Y is biomass (kg), D is trunk diameter measured at 1.3 m above the ground (cm), H is tree height (m). Six standard individuals of *H. rhamnoides* and *P. tabuliformis* in pure and mixed plantations were selected for average Y calculation.

Figure Legends

Figure S1. Independent-sample *t*-test for diurnal variation of sap flow between the first and second day after rainfall amount of 24 and 35.2 mm.

Figure S2. Surface area of fine root distribution for *H. rhamnoides* and *P. davidiana* in pure (a) and mixed (b) plantations.

Figure S3. Independent-sample *t*-test for diurnal variation of sap flow before and after 5 rainfall events for *H. rhamnoides* in pure (a-e) and mixed plantation (f-j). Before and after rainfall indicated the value in the day before and after a rainfall event. Error bars indicate the standard deviation.

Figure S4. Independent-sample *t*-test for diurnal variation of sap flow before and after 5 rainfall events for *P. davidiana* in pure (a-e) and mixed plantation (f-j). Before and after rainfall indicated the value in the day before and after a rainfall event. Error bars indicate the standard deviation.

Figure S5. Variation in $\delta^{18}O$ and δD of rainwater, soil water at seven depths, and stem water for *H. rhamnoides* in (a–e) pure and (k–o) mixed plantations and for *P. davidiana* in (f–j) pure and (k–o) mixed plantations after five rainfall events.

Figure S6. Relationship between rainfall amount and (a) relative response of normalized sap flow (SF_R) and (b) rainwater uptake proportion (RUP) for *H. rhamnoides* in both plantation types, and these corresponding parameters for *P. davidiana* (c–d) in both plantation types.

Figure S1

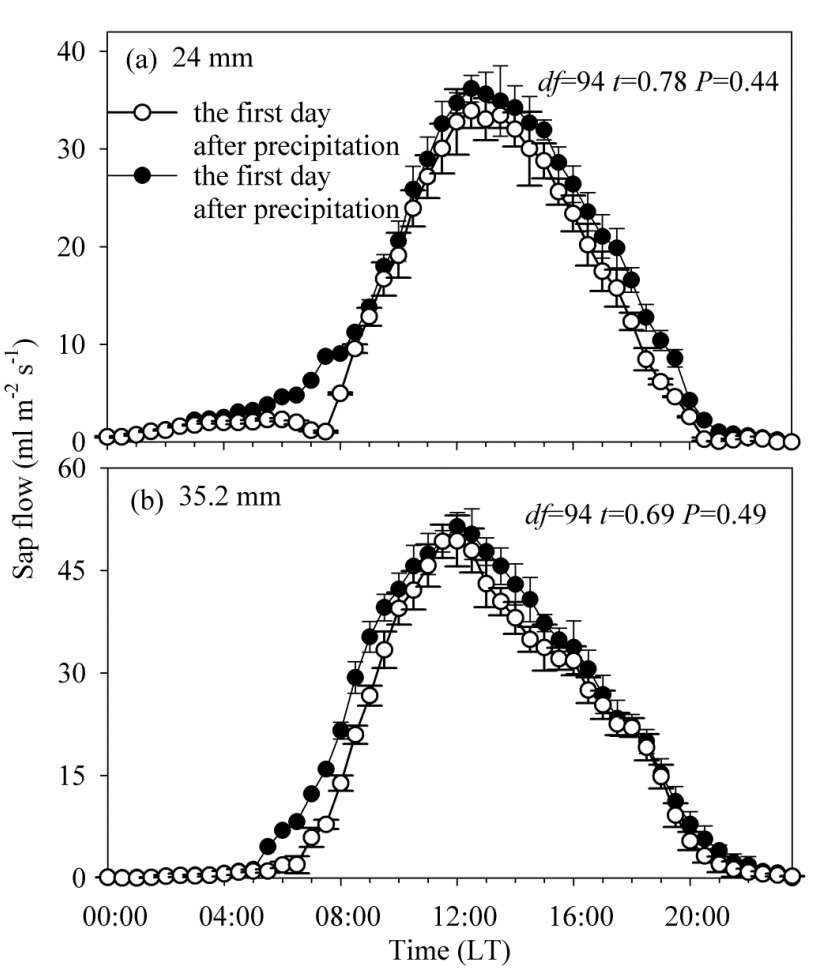

(a) 24 mm
df=94 t=0.78 P=0.44
the first day after precipitation
the first day after precipitation
(b) 35.2 mm
df=94 t=0.69 P=0.49
Sap flow (ml m-2 s-1)
Time (LT)
00:00
04:00
08:00
12:00
16:00
20:00

Figure S2

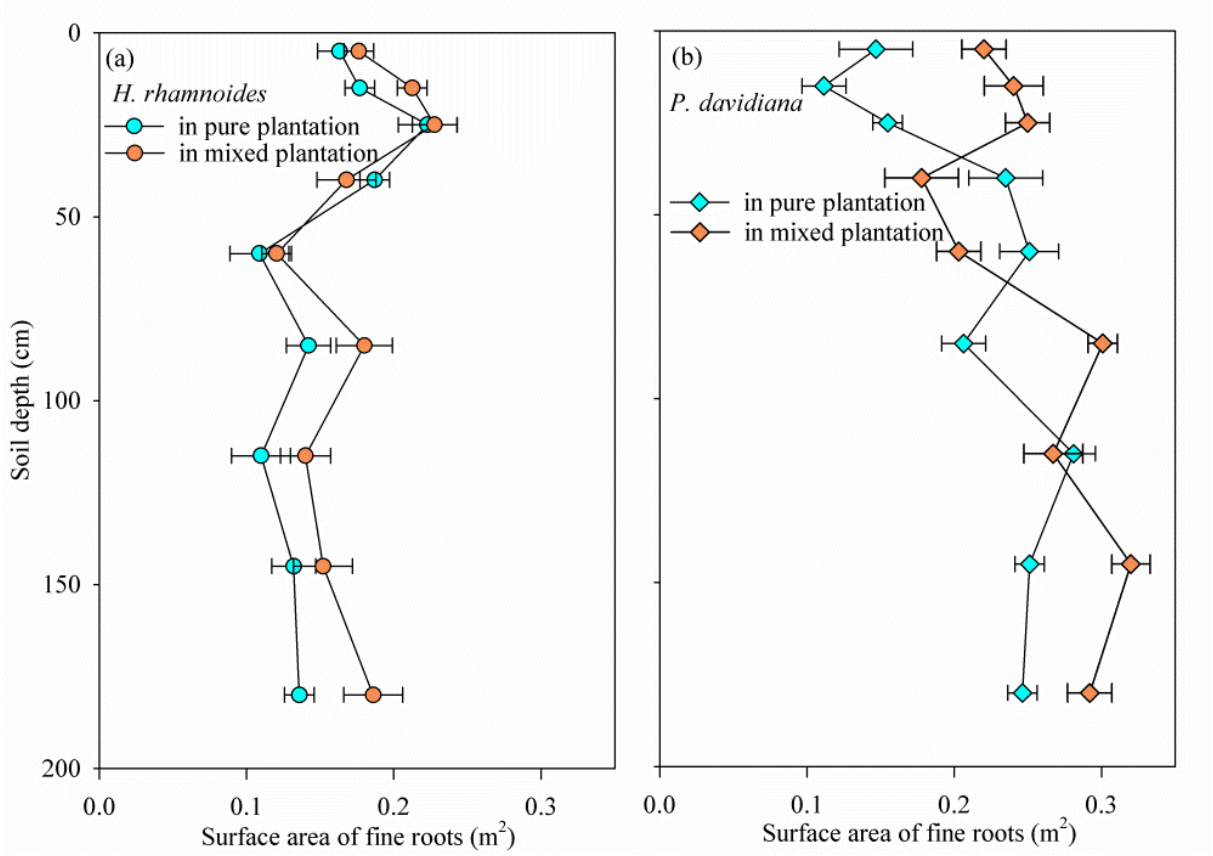

(a)
H. rhamnoides
in pure plantation
in mixed plantation
(b)
P. davidiana
in pure plantation
in mixed plantation
Soil depth (cm)
0
50
100
150
200
0.0
0.1
0.2
0.3
Surface area of fine roots (m2)
Surface area of fine roots (m2)

Figure S3

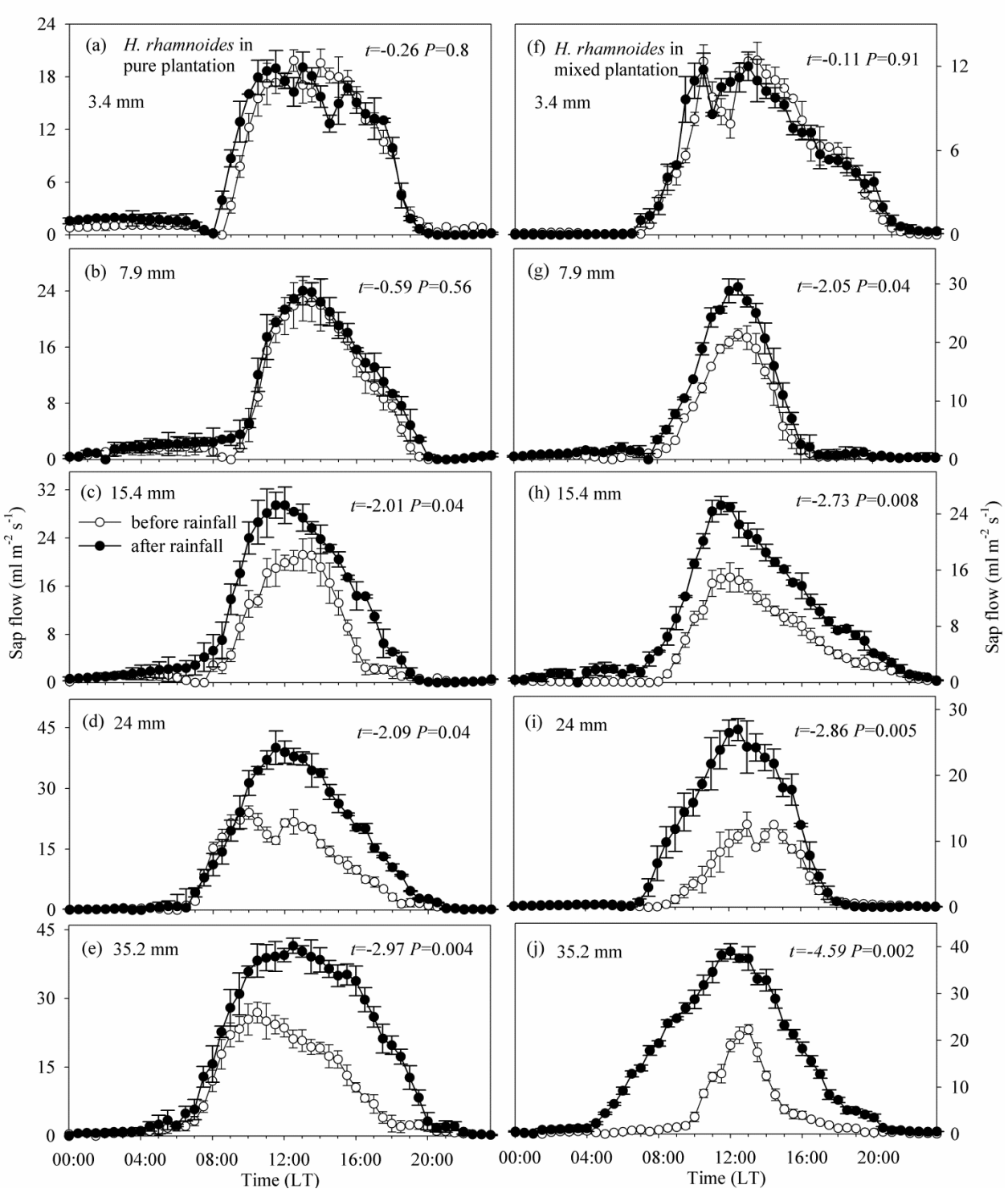

(a) H. rhamnoides in pure plantation
3.4 mm
t=-0.26 P=0.8
(b) 7.9 mm
t=-0.59 P=0.56
(c) 15.4 mm
before rainfall
after rainfall
t=-2.01 P=0.04
(d) 24 mm
t=-2.09 P=0.04
(e) 35.2 mm
t=-2.97 P=0.004
(f) H. rhamnoides in mixed plantation
3.4 mm
t=-0.11 P=0.91
(g) 7.9 mm
t=-2.05 P=0.04
(h) 15.4 mm
t=-2.73 P=0.008
(i) 24 mm
t=-2.86 P=0.005
(j) 35.2 mm
t=-4.59 P=0.002
Sap flow (ml m-2 s-1)
Time (LT)
00:00
04:00
08:00
12:00
16:00
20:00

Figure S4

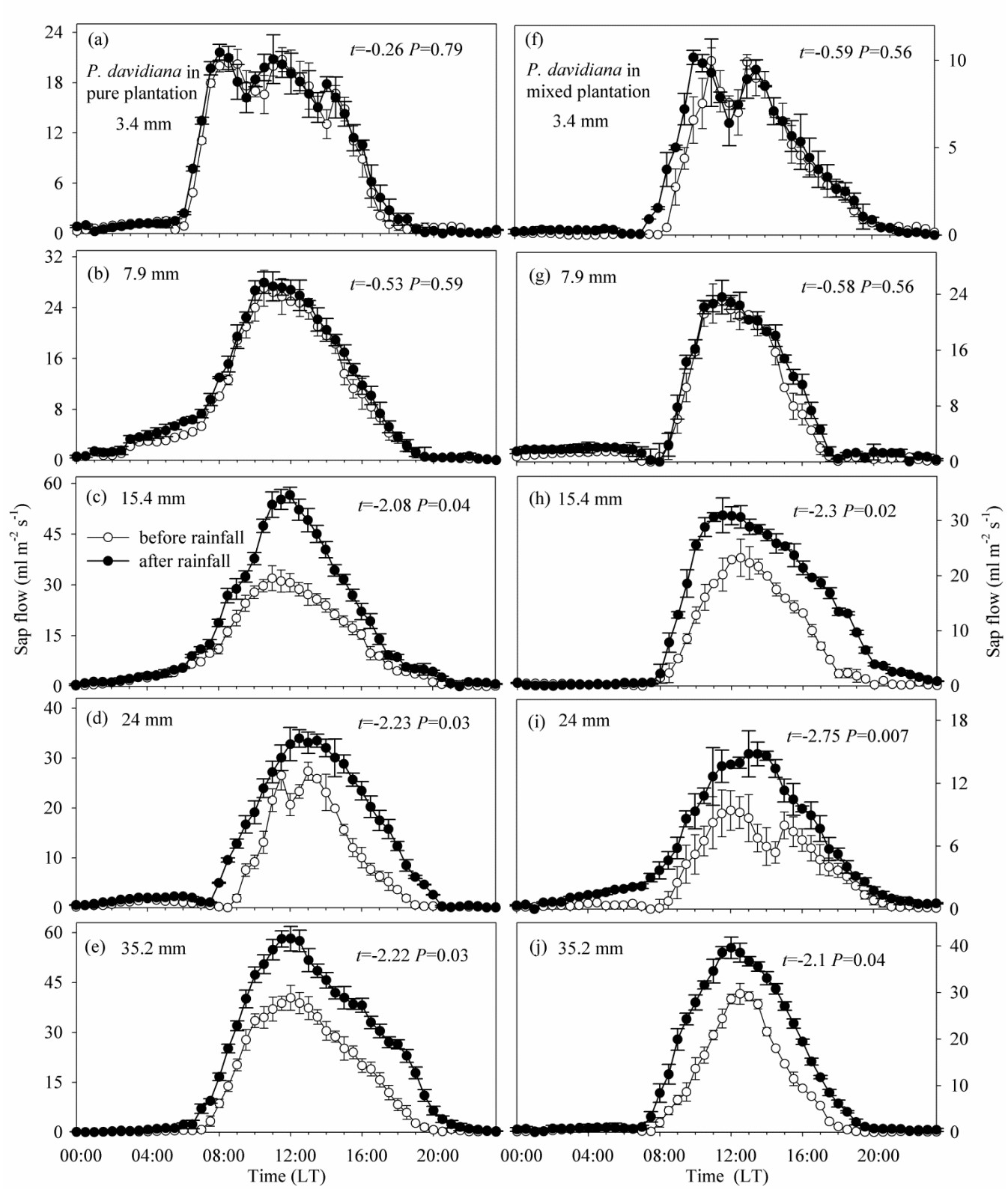

(a)
P. davidiana in pure plantation
3.4 mm
t=-0.26 P=0.79
(f)
P. davidiana in mixed plantation
3.4 mm
t=-0.59 P=0.56
(b) 7.9 mm
t=-0.53 P=0.59
(g) 7.9 mm
t=-0.58 P=0.56
(c) 15.4 mm
t=-2.08 P=0.04
before rainfall
after rainfall
(h) 15.4 mm
t=-2.3 P=0.02
(d) 24 mm
t=-2.23 P=0.03
(i) 24 mm
t=-2.75 P=0.007
(e) 35.2 mm
t=-2.22 P=0.03
(j) 35.2 mm
t=-2.1 P=0.04
Sap flow (ml m-2 s-1)
Sap flow (ml m-2 s-1)
00:00 04:00 08:00 12:00 16:00 20:00
Time (LT)
00:00 04:00 08:00 12:00 16:00 20:00
Time (LT)

Figure S5

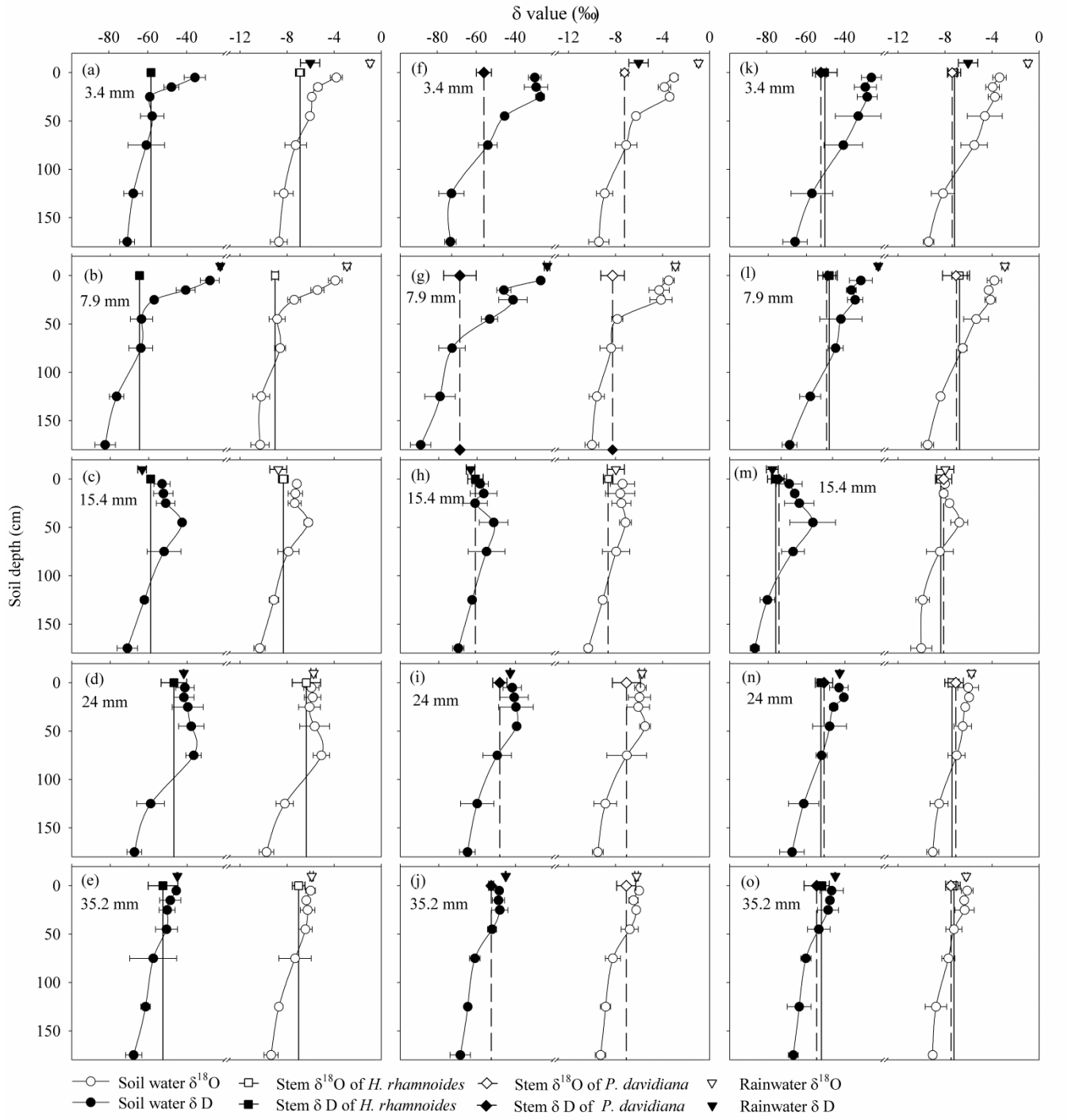
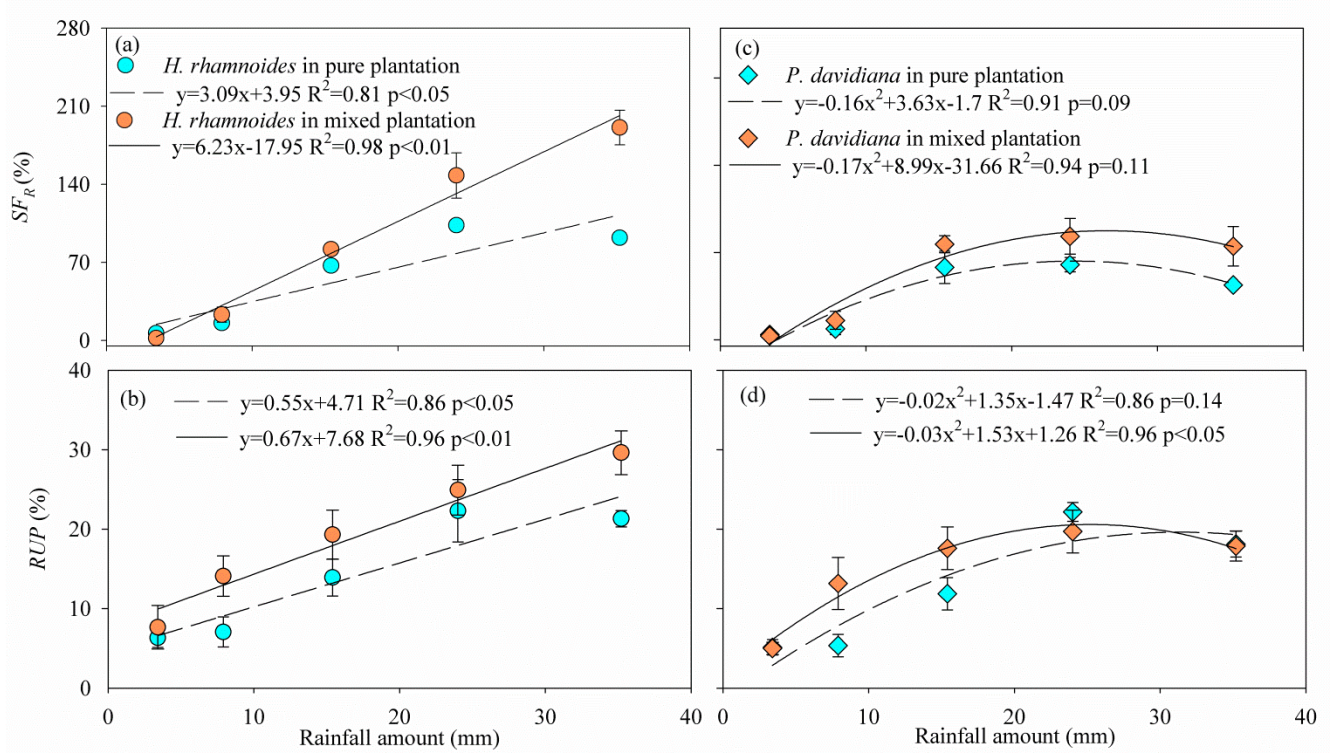

δ value (‰)
-80 -60 -40 -12 -8 -4 0
Soil depth (cm)
0 50 100 150
(a) 3.4 mm
(b) 7.9 mm
(c) 15.4 mm
(d) 24 mm
(e) 35.2 mm
(f) 3.4 mm
(g) 7.9 mm
(h) 15.4 mm
(i) 24 mm
(j) 35.2 mm
(k) 3.4 mm
(l) 7.9 mm
(m) 15.4 mm
(n) 24 mm
(o) 35.2 mm
Soil water δ18O
Soil water δ D
Stem δ18O of H. rhamnoides
Stem δ D of H. rhamnoides
Stem δ18O of P. davidiana
Stem δ D of P. davidiana
Rainwater δ18O
Rainwater δ D

Figure S6


(a)
H. rhamnoides in pure plantation
y=3.09x+3.95 R2=0.81 p<0.05
H. rhamnoides in mixed plantation
y=6.23x-17.95 R2=0.98 p<0.01
(c)
P. davidiana in pure plantation
y=-0.16x2+3.63x-1.7 R2=0.91 p=0.09
P. davidiana in mixed plantation
y=-0.17x2+8.99x-31.66 R2=0.94 p=0.11
(b)
y=0.55x+4.71 R2=0.86 p<0.05
y=0.67x+7.68 R2=0.96 p<0.01
(d)
y=-0.02x2+1.35x-1.47 R2=0.86 p=0.14
y=-0.03x2+1.53x+1.26 R2=0.96 p<0.05
SFR (%)
RUP (%)
Rainfall amount (mm)
Rainfall amount (mm)