

Variability in $\delta^2\text{H}$ and $\delta^{18}\text{O}$ of Soil Water and Its Linkage to Precipitation in an East Asian Monsoon Subtropical Forest Plantation

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Introduction

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Table S1. The slopes (a) and intercepts (b), together with standard deviations (SD) of local meteoric water lines (LMWL), the average Root Mean Sum of Squared Error (RMSE_{av}) value of the fit, the number of samples (n) and the significance in the difference of each regression to that of OLSR (p-value), when the ordinary least squares regression (OLSR), reduced major axis regression (RMA), major axis regression (MA), and the corresponding precipitation weighted regressions (PWLSR, PWRMA and PWMA) were used, in spring, summer, autumn and winter.

Methods	a±SD	b±SD	RMSE _{av}	n	p-value
Spring					
OLSR	7.71±0.20	14.0±0.88	1.021	157	-
RMA	8.11±0.20	15.7±0.88	1.008	157	0.165
MA	8.52±0.21	17.3±0.93	1.021	157	0.006
PWLSR	7.81±0.19	14.2±0.91	1.016	157	0.742
PWRMA	8.19±0.20	15.8±0.92	1.008	157	0.103
PWMA	8.57±0.20	17.4±0.95	1.023	157	0.004
Summer					
OLSR	7.41±0.15	5.42±1.26	1.011	128	-
RMA	7.61±0.15	6.99±1.25	1.004	128	0.367
MA	7.80±0.15	8.54±1.30	1.011	128	0.076
PWLSR	7.35±0.17	6.12±1.50	1.010	128	0.788
PWRMA	7.61±0.17	8.24±1.51	1.005	128	0.383
PWMA	7.86±0.18	10.3±1.55	1.019	128	0.049
Autumn					
OLSR	8.19±0.23	15.2±1.72	1.012	73	-
RMA	8.43±0.23	16.9±1.70	1.005	73	0.481
MA	8.67±0.24	18.5±1.77	1.012	73	0.165
PWLSR	8.24±0.19	15.7±1.60	1.007	73	0.897
PWRMA	8.40±0.19	17.0±1.61	1.004	73	0.534
PWMA	8.57±0.20	18.3±1.64	1.009	73	0.271
Winter					
OLSR	8.68±0.10	23.4±0.73	1.002	82	-
RMA	8.73±0.10	23.7±0.72	1.001	82	0.735
MA	8.78±0.10	24.0±0.74	1.002	82	0.505
PWLSR	8.65±0.08	23.5±0.67	1.003	82	0.864
PWRMA	8.69±0.08	23.7±0.67	1.001	82	0.950
PWMA	8.72±0.08	23.9±0.67	1.001	82	0.771

Table S2. The weighted average $\delta^2\text{H}$ and $\delta^{18}\text{O}$ in soil water at 0-5 (SW 0-5), 15-20 (SW 15-20), and 40-45 (SW 40-45) cm depths, and precipitation of different rainfall intensity during winter, spring, summer and autumn. ^a

$\delta^2\text{H} \pm \text{SD}$ (‰)	Winter	Spring	Summer	Autumn
SW 0-5	-42.9 \pm 21.4a (279)	-25.1 \pm 10.3a (308)	-59.8 \pm 13.2b (310)	-53.4 \pm 10.2a (271)
SW 15-20	-54.4 \pm 19.1b (282)	-26.9 \pm 7.37a (305)	-59.2 \pm 15.4b (313)	-62.8 \pm 7.62b (273)
SW 40-45	-55.9 \pm 11.7b (282)	-32.9 \pm 7.77b (309)	-49.9 \pm 13.7a (312)	-60.1 \pm 7.05b (270)
Precipitation (0-5 mm/day)	-31.4 \pm 24.7 (165)	-17.4 \pm 13.5 (255)	-53.6 \pm 14.3 (186)	-45.0 \pm 15.2 (196)
Precipitation (5-10 mm/day)	-33.8 \pm 34.4 (33)	-17.9 \pm 13.7 (58)	-53.9 \pm 16.9 (35)	-45.5 \pm 16.5 (20)
Precipitation (10-20 mm/day)	-37.5 \pm 39.0 (28)	-18.2 \pm 13.6 (51)	-54.2 \pm 17.6 (40)	-46.8 \pm 17.1 (25)
Precipitation (20-30 mm/day)	-40.0 \pm 44.7 (10)	-19.3 \pm 14.6 (18)	-54.7 \pm 16.1 (19)	-50.3 \pm 15.8 (10)
Precipitation (30-40 mm/day)	-39.5 \pm 35.3 (6)	-21.2 \pm 16.1 (15)	-55.5 \pm 15.6 (9)	-49.1 \pm 16.4 (5)
Precipitation (>40 mm/day)	-35.0 \pm 43.0 (5)	-25.3 \pm 15.5 (15)	-55.5 \pm 16.7 (25)	-51.1 \pm 16.8 (13)
$\delta^{18}\text{O} \pm \text{SD}$ (‰)	Winter	Spring	Summer	Autumn
SW 0-5	-6.00 \pm 2.42a	-4.37 \pm 1.35a	-7.94 \pm 1.70b	-6.61 \pm 1.62a
SW 15-20	-7.83 \pm 2.21b	-4.62 \pm 0.94a	-8.13 \pm 1.89b	-8.38 \pm 0.94b
SW 40-45	-8.02 \pm 1.41b	-5.40 \pm 0.98b	-7.20 \pm 1.69a	-8.15 \pm 0.96b
Precipitation (0-5 mm/day)	-6.34 \pm 2.87	-4.04 \pm 1.67	-8.15 \pm 1.87	-7.40 \pm 1.78
Precipitation (5-10 mm/day)	-6.63 \pm 3.94	-4.11 \pm 1.70	-8.21 \pm 2.24	-7.46 \pm 1.94
Precipitation (10-20 mm/day)	-7.07 \pm 4.46	-4.15 \pm 1.68	-8.27 \pm 2.34	-7.63 \pm 2.04
Precipitation (20-30 mm/day)	-7.32 \pm 5.17	-4.28 \pm 1.78	-8.37 \pm 2.21	-8.05 \pm 1.85
Precipitation (30-40 mm/day)	-7.25 \pm 4.19	-4.45 \pm 1.99	-8.50 \pm 2.12	-7.89 \pm 1.99
Precipitation (>40 mm/day)	-6.74 \pm 5.14	-4.91 \pm 1.96	-8.57 \pm 2.30	-8.16 \pm 2.08

^a SD means standard deviation; the different lower case letters indicate significant differences according to the post hoc Tukey test at $\alpha = 0.05$. Number in the parentheses are the number of samples, and the number of samples of $\delta^{18}\text{O}$ was the same as those of $\delta^2\text{H}$ for each type of samples, and thus they were omitted.

Table S3. The $\delta^2\text{H}$ and $\delta^{18}\text{O}$ of soil water source by regression-based approach (Source Obs) and Craig and Gordon model-based approach at 0-5 (Source CG 0-5), 15-20 (Source CG 15-20), and 40-45 (Source CG 40-45) cm depths, and $\delta^2\text{H}$ and $\delta^{18}\text{O}$ in precipitation (precipitation amount > 5 mm), during winter, spring, summer and autumn. ^a

$\delta^2\text{H} \pm \text{SD}$ (‰)	Winter	Spring	Summer	Autumn
Source obs	-79.8 \pm 40.4c	-69.3 \pm 43.4b	-98.3 \pm 44.5c	-88.5 \pm 24.9b
Source CG 0-5	-48.5 \pm 22.4a	-34.2 \pm 12.4a	-78.9 \pm 19.4b	-77.3 \pm 17.0a
Source CG 15-20	-57.7 \pm 18.4ab	-33.5 \pm 8.71a	-74.8 \pm 20.3b	-87.6 \pm 13.6b
Source CG 40-45	-66.0 \pm 17.1b	-38.3 \pm 9.54a	-59.5 \pm 17.2a	-84.6 \pm 11.3ab
Precipitation (P>5 mm)	-33.8 \pm 34.4	-17.9 \pm 13.7	-53.9 \pm 16.9	-45.5 \pm 16.5
$\delta^{18}\text{O} \pm \text{SD}$ (‰)	Winter	Spring	Summer	Autumn
Source obs	-11.4 \pm 4.72c	-10.2 \pm 5.08b	-13.6 \pm 5.21c	-12.4 \pm 2.92b
Source CG 0-5	-7.77 \pm 2.64a	-6.11 \pm 1.46a	-11.3 \pm 2.26b	-11.1 \pm 2.02a
Source CG 15-20	-8.86 \pm 2.16ab	-6.02 \pm 1.04a	-10.8 \pm 2.43b	-12.3 \pm 1.59b
Source CG 40-45	-9.82 \pm 2.00b	-6.59 \pm 1.11a	-9.04 \pm 2.05a	-11.9 \pm 1.42ab
Precipitation (P>5 mm)	-6.63 \pm 3.94	-4.11 \pm 1.70	-8.21 \pm 2.24	-7.46 \pm 1.94

^a SD means standard deviation; the different lower case letters indicate significant differences according to the post hoc Tukey test at $\alpha = 0.05$.