Table S1. Descriptive statistics of soil moisture content, soil temperature, isotopic, and chemical compositions for soil water samples.

		A	2B	3BC	C
Soil moisture content (%)	Mean	36.51	35.60	32.08	23.19
	Min	19.69	21.75	25.05	19.15
	Max	45.21	42.25	35.37	24.79
	SD	9.32	8.03	3.93	2.15
Soil temperature (°C)	Mean	14.04	13.88	14.76	14.53
	Min	2.88	3.68	5.46	6.22
	Max	25.88	24.95	25.14	24.23
	SD	8.31	7.82	7.33	6.65
δ^2H *(‰)*	Mean	-58.06	-57.86	-49.83	-47.41
	Min	-74.64	-69.59	-51.68	-50.64
	Max	-30.17	-46.97	-46.83	-44.00
	SD	12.70	7.39	1.63	2.65
$\delta^{18}O$ *(‰)*	Mean	-8.52	-8.65	-7.68	-7.32
	Min	-10.68	-10.07	-7.84	-7.68
	Max	-4.24	-6.96	-7.44	-6.94
	SD	1.83	1.00	0.15	0.32
d-excess (‰)	Mean	10.13	11.31	11.60	11.15
	Min	3.75	8.71	10.64	10.19
	Max	13.76	13.97	12.69	12.01
	SD	2.64	1.36	0.67	0.55
F^- *(mg/L)*	Mean	0.14	0.31	0.32	0.11
	Min	0.06	0.06	0.05	0.06
	Max	0.34	1.48	1.99	0.18
	SD	0.08	0.42	0.68	0.04
Cl^- *(mg/L)*	Mean	2.82	3.51	2.51	1.55
	Min	0.39	0.22	0.45	0.49
	Max	6.61	10.96	8.69	3.01
	SD	2.31	2.96	2.79	1.03
NO_2^- *(mg/L)*	Mean	1.26	0.15	0.13	1.76
	Min	0.70	0.02	0.05	0.22
	Max	2.52	0.29	0.23	2.70
	SD	0.72	0.12	0.08	1.03
NO_3^- *(mg/L)*	Mean	0.52	0.65	0.78	5.00
	Min	0.03	0.01	0.20	2.54
	Max	1.50	2.23	2.50	6.80
	SD	0.53	0.76	0.88	1.59
PO_4^{3-} *(mg/L)*	Mean	2.06	2.18	3.17	2.19
	Min	1.11	0.66	1.56	1.70
	Max	2.97	3.26	4.33	2.97
	SD	0.80	1.01	1.10	0.57
SO_4^{2-} *(mg/L)*	Mean	6.18	1.50	15.15	5.95

	Min	0.97	0.54	7.34	3.71
	Max	14.88	3.31	35.13	9.56
	SD	3.75	0.90	8.59	2.22
Na+ (mg/L)	Mean	2.59	1.86	5.53	4.11
	Min	0.68	0.81	3.12	2.71
	Max	3.67	2.65	12.55	8.65
	SD	1.11	0.59	3.03	2.55
NH4+ (mg/L)	Mean	0.55	0.56	4.35	0.85
	Min	0.13	0.10	0.99	0.22
	Max	3.02	1.38	9.20	3.01
	SD	0.84	0.45	3.04	1.21
Mg2+ (mg/L)	Mean	16.15	21.55	48.47	45.37
	Min	0.54	0.44	41.02	41.17
	Max	25.87	40.49	61.63	49.56
	SD	7.98	12.62	7.84	3.86
K+ (mg/L)	Mean	0.31	0.33	1.36	0.95
	Min	0.18	0.09	0.28	0.44
	Max	0.76	0.97	5.00	2.10
	SD	0.17	0.29	1.56	0.66
Ca2+ (mg/L)	Mean	61.64	60.74	56.53	77.64
	Min	6.15	36.56	33.78	62.66
	Max	90.31	82.93	85.37	101.33
	SD	22.33	14.89	17.13	17.25

Table S2. The results of testing the assumptions of normality of soil moisture content, soil temperature, isotopic, and chemical compositions for soil water samples.

Shapiro–Wilk test	A		2B		3BC		C	
	W	p	W	p	W	p	W	p
Soil moisture content	0.84	0.03	0.76	0.003	0.76	0.004	0.73	0.002
Soil temperature	0.92	0.26	0.91	0.23	0.91	0.19	0.91	0.25
δ^2H	0.93	0.36	0.96	0.81	0.94	0.62	0.89	0.25
$\delta^{18}O$	0.90	0.20	0.95	0.62	0.91	0.35	0.86	0.12
d-excess	0.84	0.04	0.95	0.58	0.94	0.57	0.98	0.94
F^-	0.85	0.04	0.64	0.0001	0.46	0.00	0.92	0.55
Cl^-	0.87	0.08	0.86	0.05	0.75	0.01	0.93	0.61
NO_2^-	0.79	0.05	0.90	0.39	0.83	0.10	0.91	0.44
NO_3^-	0.80	0.01	0.81	0.02	0.72	0.003	0.94	0.70
PO_4^{3-}	0.88	0.29	0.90	0.33	0.92	0.56	0.90	0.43
SO_4^{2-}	0.92	0.31	0.85	0.04	0.75	0.01	0.90	0.43
Na^+	0.86	0.05	0.94	0.46	0.74	0.01	0.62	0.001
NH_4^+	0.54	0.00004	0.84	0.03	0.90	0.27	0.60	0.001
Mg^{2+}	0.88	0.11	0.91	0.27	0.88	0.19	0.88	0.32
K^+	0.71	0.0006	0.79	0.01	0.70	0.002	0.73	0.02
Ca^{2+}	0.87	0.08	0.95	0.67	0.97	0.88	0.87	0.26

Table S3. The results of testing the assumptions of homogeneity of soil moisture content, soil temperature, isotopic, and chemical compositions for soil water samples.

Levene's test

Source of Variation: Between Groups	SS	df	MS	F	P-value	F crit
Soil moisture content	277.70	3	92.57	8.24	0.00	2.82
Soil temperature	11.87	3	3.96	0.32	0.81	2.82
δ^2H	436.73	3	145.58	7.20	0.00	2.88
$\delta^{18}O$	8.84	3	2.95	6.11	0.00	2.88
d-excess	10.77	3	3.59	2.64	0.06	2.88
F^-	0.81	3	0.27	3.03	0.04	2.91
Cl^-	5.59	3	1.86	0.74	0.53	2.91
NO_2^-	2.20	3	0.73	9.12	0.00	3.16
NO_3^-	1.39	3	0.46	1.83	0.16	2.91
PO_4^{3-}	0.55	3	0.18	1.15	0.35	3.16
SO_4^{2-}	101.87	3	33.96	2.84	0.05	2.91
Na^+	13.29	3	4.43	2.97	0.05	2.91
NH_4^+	25.13	3	8.38	11.33	0.00	2.91
Mg^{2+}	116.82	3	38.94	1.12	0.36	2.91
K^+	4.00	3	1.33	4.06	0.02	2.91
Ca^{2+}	54.94	3	18.31	0.16	0.92	2.91

Table S4. The result of the ANOVA test of soil temperature, PO_4^{3-}, Mg^{2+}, and Ca^{2+} within the four groups.

ANOVA test

	SS	df	MS	F	p-value
soil temperature	6.13	3	2.05	0.04	0.99
PO_4^{3-}	4.13	3	1.38	1.64	0.22
Mg^{2+}	6792.36	3	2264.12	25.83	0.00*
Ca^{2+}	1473.40	3	491.10	1.46	0.25

*Significance at $p < 0.05$

Table S5. The result of the Kruskal–Wallis test of soil moisture, δ^2H, $\delta^{18}O$, d-excess, F^-, Cl^-, NO_2^-, NO_3^-, SO_4^{2-}, Na^+, NH_4^+, and K^+ within the four groups.

Kruskal–Wallis (KW) test

	df	Critical Chi square value	K-W (H statistic)	p-value
soil moisture	3	7.82	19.74	0.0002
δ^2H	3	7.82	15.15	0.002
$\delta^{18}O$	3	7.82	12.75	0.01
d-excess	3	7.82	4.25	0.24
F^-	3	7.82	3.54	0.32
Cl^-	3	7.82	1.57	0.67
NO_2^-	3	7.82	13.98	0.003
NO_3^-	3	7.82	13.63	0.004

SO_4^{2-}	3	7.82	24.88	0.00
Na^+	3	7.82	19.39	0.0002
NH_4^+	3	7.82	15.97	0.001
K^+	3	7.82	15.37	0.002

Table S6. The result of Tukey HSD post hoc comparison between groups. Statistically significant differences between group means are marked in italics.

Tukey HSD test

Parameter		Mg^{2+} (mg/l)
Group	*Group*	mean difference
A	*2B*	5.40
A	*3BC*	*32.32**
A	*C*	*29.21**
2B	*3BC*	*26.92**
2B	*C*	*23.82**
3BC	*C*	3.10

*Significance at $p < 0.05$

Table S7. The result of the Mann–Whitney U post hoc comparison between groups. Statistically significant differences between group means are marked in italics.

Mann–Whitney U test

Parameter		soil moisture (%)	δ^2H (‰)	$\delta^{18}O$ (‰)	NO_2^- (mg/l)	NO_3^- (mg/l)	SO_4^{2-} (mg/l)	Na^+ (mg/l)	NH_4^+ (mg/l)	K^+ (mg/l)
Group	*Group*				*mean difference*					
A	2B	0.91	0.20	0.12	*1.11**	0.12	*4.68**	0.73	0.01	0.02
A	3BC	*4.43**	*8.22**	*0.84**	*1.14**	0.26	*8.97**	*2.94**	*3.80**	*1.05**
A	C	13.32	*10.65**	*1.20**	0.50	*4.48**	0.23	1.51	0.29	*0.64**
2B	3BC	3.52	*8.03**	*0.97**	0.03	0.13	*13.65**	*3.67**	*3.79**	*1.03**
2B	C	*12.41**	*10.45**	*1.33**	*1.61**	*4.36**	*4.45**	*2.24**	0.28	*0.62**
3BC	C	*8.89**	2.42	*0.36**	*1.64**	*4.22**	*9.20**	1.42	*3.51**	0.41

*Significance at p < 0.05