Table S1 Data source of δD and $\delta^{18}O$ values of karst groundwater from published literature.

Number	Study area	Type of karst groundwater	δD min /‰	δD max /‰	δD mean /‰	$\delta^{18}O$ min /‰	$\delta^{18}O$ max /‰	$\delta^{18}O$ mean /‰	Data source
1	Guanling − Huajiang	karst spring / karst groundwater	-89.65	-59.94	-73.32	-11.15	-7.26	-9.12	[1]
2	Qixingguan district of Bijie	karst groundwater	-67	-52.5	-59.28	-9.81	-8.12	-8.97	[2]
3	Sangiao district of Guiyang	karst groundwater	-121.2	16.5	-37.5	-16.7	-0.73	-6.75	[3]
4	Banzhai catchment	karst groundwater	-66.99	-32.66	-52.27	-9.71	-5.36	-7.89	[4]
5	Chenqi catchment	karst groundwater	-63.48	-41.47	-55.8	-9.31	-6.55	-8.22	[4]
6	Dengzhanhe catchment	karst groundwater	-68.55	-42.48	-56.08	-10.18	-6.30	-8.26	[4]
7	Zhenning region	karst spring/ karst groundwater	-77	-53	-63.7	-11.1	-7.8	-9.3	[5]
8	Houzhai catchment	underground channel outlets	-71.5	-42	-57.4	ND	ND	-8.38	[6, 7]
9	Xiangshui cave,	underground river	-51.53	-40.45	-44.97	-8.36	-7.15	-7.81	[8]
10	Shawan karst test site	karst groundwater	-74.66	-32.96	-61.72	-10.68	-5.55	-8.66	[9]
11	Gaoping basin	karst groundwater	-52.00	-43.00	-43.62	-7.90	-6.80	-6.78	[10]
12	Babu watershed	karst groundwater	-60.50	-49.10	-54.90	-8.80	-7.40	-8.20	[11]

Number	Study area	Type of karst groundwater	δD min /‰	δD max /‰	δD mean /‰	$\delta^{18}O$ min /‰	$\delta^{18}O$ max /‰	$\delta^{18}O$ mean /‰	Data source
13	The Ecohydrological Observation Station of the State Engineering Technology Institute for Karst Desertification Control	karst groundwater	ND	ND	-53.73	ND	ND	-8.02	[12]
14	Wangjiazhai catchment	karst spring	ND	ND	-45.72	ND	ND	-6.03	[13]
15	Xingren coalfield	karst spring	-70.00	-55.00	-62.00	-10.10	-9.00	-9.50	[14]
16	Jade Dragon Snow Mountain (JDSM) Jinsha-Daju spring	karst spring	ND	ND	-112.87	ND	ND	-15.66	[15]
17	Jade Dragon Snow Mountain (JDSM) Changshui spring	karst spring	ND	ND	-114.8	ND	ND	-15.79	[15]
18	Jade Dragon Snow Mountain (JDSM) Baishui spring	karst spring	-103.45	-100.7	-104.96	-14.37	-13.62	-14.74	[15]
19	Jade Dragon Snow Mountain (JDSM) Heishui spring	karst spring	-108.05	-106.4	-108.33	-14.86	-14.26	-15.45	[15]
20	Jade Dragon Snow Mountain (JDSM) Yuzhuqingtian spring	karst spring	-109.34	-108.03	-110.26	-15.17	-14.89	-15.43	[15]
21	Jade Dragon Snow Mountain (JDSM) Yuhuizhai spring	karst spring	-110.56	-109.48	-111.29	-15.22	-14.81	-15.46	[15]
22	Eastern Yunnan and Western Guizhou	karst groundwater	-72.34	-66.40	-69.72	-10.51	-9.95	-10.2	[16]

Number	Study area	Type of karst groundwater	δD min /‰	δD max /‰	δD mean /‰	$\delta^{18}O$ min /‰	$\delta^{18}O$ max /‰	$\delta^{18}O$ mean /‰	Data source
23	Huanglong spring catchment	karst spring	-91.42	-85.08	-89.37	-12.85	-12.03	-12.53	[17]
24	Qingshuitan	karst spring	-88.54	-85.96	-87.67	-12.6	-11.64	-12.17	[18]
25	Hunshuitan	karst spring	-90.01	-78.76	-85.59	-12.22	-10.81	-11.69	[18]
26	Xiaoshuitan	karst spring	-88.87	-84.08	-86.37	-12.19	-11.27	-11.8	[18]
27	Qinglongtan I	karst spring	-90.14	-86.83	-88.23	-12.83	-12.19	-12.47	[19]
28	Qinglongtan II	karst spring	-90.14	-86.83	-87.74	-12.83	-12.19	-12.44	[19]
29	Qinglongtan III	karst spring	-90.54	-85.35	-88.33	-12.88	-12.11	-12.45	[19]
30	Qinglongtan IV	karst spring	-90.54	-85.35	-88.41	-12.88	-12.11	-12.51	[19]
31	Qinglongtan V	karst spring	-90.54	-85.35	-88.31	-12.88	-12.11	-12.5	[19]
32	Bashuitai	karst spring	-116.7	-104.7	-109.53	-15.38	-14.75	-15.11	[20]
33	Nandong underground river basin	karst groundwater	-86.4	-69.7	-73.75	-10.42	-9.46	-10.14	[21]
34	Maoping	karst spring	-72	-66	-68.33	-10.7	-10.1	-10.3	[22]
35	Shuifang spring	karst spring	ND	ND	-54.8	ND	ND	-8.6	[23]
36	Qingmuguan karst watershed	karst groundriver	-49.86	-46.08	-48.13	-7.95	-7.08	-7.41	[24]
37	Longfeng karst trough valley	karst groundwater	ND	ND	-46.7	ND	ND	-7.8	[25]
38	Lanhuagou spring	karst spring	-46.03	-26.98	-37.83	-7.15	-4.47	-6.15	[26]
39	Furong cave	karst spring	ND	ND	-48.55	ND	ND	-7.83	[27]
40	Mingyueshan	karst groundwater	-58.1	-40.7	-46.48	-8.91	-6.48	-7.41	[28]
41	East Chongqing	karst groundriver	-61.4	-37	-47.96	-8.56	-5.63	-7.08	[29]
42	Northeast Chongqing	karst groundriver	-69.6	-48.4	-59.13	-9.98	-6.66	-8.53	[29]

Number	Study area	Type of karst groundwater	δD min /‰	δD max /‰	δD mean /‰	$\delta^{18}O$ min /‰	$\delta^{18}O$ max /‰	$\delta^{18}O$ mean /‰	Data source
43	Southeast Chongqing	karst groundriver	-73.8	-20.1	-44.48	-10.48	-4.34	-6.94	[29]
44	West Chongqing	karst groundriver	-61.2	-53.8	-57.5	-8.77	-7.42	-8.07	[29]
45	Guancun karst spring ES1	karst spring	-35.29	-25.94	-29.99	-7.18	-5.34	-6.08	[30]
46	Guancun karst spring ES2	karst spring	-43.32	-24.48	-35.415	-7.2	-6.09	-6.215	[30]
47	Lijiang river basin	karst groundwater	-38.4	-20.5	-30.89	-6.12	-5.3	-5.48	[31]
48	Yaji karst experimental site	karst spring	-47.72	-34.97	-40.67	-7.3	-5.39	-6.65	[32]
49	Fengyu cave	karst groundriver	-50	40	-45.25	-6.2	-5.5	-5.8	[33]
50	Huanjiang	karst groundwater	-59.1	-35.4	-47.03	-8.8	-6.36	-7.33	[34]
51	Huixian karst wetland	karst groundwater	-45.5	-28	-33.77	-6.94	-3.75	-5.5	[35]
52	Sidi watershed	karst groundwater	-38	-30	-34	-6.1	-5.2	-5.8	[36]
53	Xiangshuixi spring	karst spring	-62	-53.7	-57.6	-9.9	-8.7	-9.2	[37]
54	Jiuzhaigou	karst spring	-90.3	-67.9	-84	-13.1	-10.1	-11.18	[38]
55	Junlian watershed	karst groundwater	-61	-34.3	-47.62	-9.3	-5.9	-7.65	[39]
56	Heidong basin and Tiantang basin	karst groundwater	-44.9	-42.3	-42.66	-7.34	-6.91	-7.09	[40]

Note: ND represent no data.

Table S2 Data source of seasonal variation of δD and $\delta^{18}O$ values of karst groundwater from published literature.

Number	Study area	Seasons	δD mean /‰	$\delta^{18}O$ mean /‰	Seasons	δD mean /‰	$\delta^{18}O$ mean /‰	Data source
1	Lijiang river basin	RS	-27.5	-5.1	DR	-34.28	-5.87	[31]
2	Yaji karst experimental site	RS	-36.99	-6.25	DR	-44.34	-7.04	[32]
3	Guancun karst spring ES1	RS	-28.67	-5.94	DR	-31.31	-6.22	[30]
4	Guancun karst spring ES2	RS	-33.69	-5.91	DR	-37.14	-6.52	[30]
5	Huanjiang karst spring 2	RS	-45.70	-7.30	DR	-45.50	-7.40	[41]
6	Shuanghe cave basin	RS	-34.26	-6.32	DR	-54.25	-8.61	[42]
7	Banzhai karst catchments	RS	-56.64	-8.72	DR	-57.65	-8.75	[4]
8	Chenqi karst catchments	RS	-54.00	-7.95	DR	-56.44	-8.55	[4]
9	Dengzhanhe karst catchments	RS	-56.45	-8.26	DR	-56.60	-8.58	[4]
10	Shawan karst test site (Bare rock land)	RS	-60.65	-8.67	DR	-68.81	-9.92	[9]
11	Shawan karst test site e (Bare soil land)	RS	-51.72	-7.30	DR	-70.58	-9.45	[9]
12	Shawan karst test site (Cropped land)	RS	-51.41	-7.14	DR	-73.23	-9.91	[9]
13	Shawan karst test site (Grassland)	RS	-51.96	-7.72	DR	-69.23	-9.75	[9]
14	Shawan karst test site (Shrubland)	RS	-50.81	-7.31	DR	-70.83	-9.54	[9]
15	Caohai wetland catchment	RS	-76.86	-10.77	DS	-74.19	-10.35	[43]
16	Qingshuitan	RS	-87.54	-12.2	DR	-87.78	-12.15	[18]
17	Hunshuitan	RS	-84.88	-11.62	DR	-86.18	-11.74	[18]
18	Xiaoshuitan	RS	-86.53	-11.86	DR	-86.23	-11.75	[18]
19	Huanglong spring catchment	RS	-87.95	-12.37	DR	-90.39	-12.63	[17]
20	Chongqing karst groundwater	RS	-48.1	-7.32	DR	-52.6	-7.7	[29]

Note: RS represent no Raining Season, DR represent Dry Season.

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