

1 Supporting information

2 **Table S1.** Chemical compositions of the Tengchong fluid samples

Site	Sample	pH	Temperature °C	TA mM	F mM	Cl mM	SiO ₂ mM	SO ₄ mM	NO ₃ mM	Na mM	Mg mM	K mM	Ca mM	Li μM	Rb nM	Cs nM
DPZ	015-DPZ-1	8.63	94.0	n.d.	n.d.	0.553	n.d.	b.d.	b.d.	14.1	0.142	0.441	0.104	11.9	24	11
DT	015-DT-1	7.90	75.0	3.70	n.d.	0.023	n.d.	0.157	b.d.	2.13	0.917	0.155	0.428	3.14	4	2
DT	015-DT-3	8.01	50.0	3.79	n.d.	0.025	n.d.	0.159	b.d.	1.85	0.784	0.131	0.445	2.46	4	2
DT	015-DT-4	7.50	75.0	n.d.	n.d.	0.023	n.d.	0.155	b.d.	1.90	0.802	0.132	0.408	2.55	4	2
HGQ	015-HGQ-1	2.88	58.0	n.d.	n.d.	0.003	n.d.	b.d.	b.d.	0.572	0.511	0.399	4.20	0.344	19	1
HGQ	015-HGQ-2	2.20	70.0	n.d.	n.d.	0.003	n.d.	b.d.	b.d.	0.431	0.532	0.283	2.28	0.465	19	1
HGQ	015-HGQ-3	2.67	61.0	n.d.	n.d.	0.031	n.d.	b.d.	b.d.	0.261	0.211	0.154	0.978	0.106	9	0
HNT	015-HNT-1	8.14	56.0	n.d.	n.d.	0.979	n.d.	b.d.	b.d.	8.21	0.370	0.735	0.155	20.2	31	9
HNT	015-HNT-3	8.06	59.0	7.29	n.d.	0.970	n.d.	b.d.	b.d.	7.87	0.328	0.662	0.138	18.0	29	9
HNT	015-HNT-5	8.11	66.0	n.d.	n.d.	0.970	n.d.	b.d.	b.d.	8.14	0.354	0.708	0.160	19.9	31	9
HTJ	015-HTJ-1	8.82	99.0	n.d.	n.d.	8.130	n.d.	0.080	b.d.	32.6	b.d.	2.66	0.028	143	206	41
HTJ	015-HTJ-2	8.59	81.0	n.d.	n.d.	4.539	n.d.	0.190	b.d.	16.8	0.004	1.44	0.052	76.9	110	21
LX	015-LX-1	8.00	80.0	15.3	n.d.	2.423	n.d.	0.103	b.d.	20.4	0.170	1.20	0.113	45.5	55	31
SHD	015-SHD-1	8.36	69.0	3.78	n.d.	0.090	n.d.	0.021	b.d.	4.32	0.003	0.118	0.370	4.13	8	2
SQ	015-SQ-1	7.75	68.5	22.5	n.d.	0.810	n.d.	b.d.	b.d.	22.0	1.12	1.90	0.209	32.7	50	20
SQ	015-SQ-3	8.46	68.0	n.d.	n.d.	0.739	n.d.	b.d.	b.d.	21.3	1.13	2.01	0.205	33.3	50	18
ZZQ	015-ZZQ-1	3.23	95.0	n.d.	n.d.	0.491	n.d.	0.281	b.d.	1.71	0.017	0.451	0.069	4.93	35	2
BLZ	2020-BLZB3-L 1	8.56	84.3	7.40	1.035	0.539	0.549	0.589	0.001	9.57	0.007	0.689	0.079	46.0	50	39
BLZ	2020-BLZ-L1	9.26	91.9	7.65	1.000	0.530	0.551	0.558	0.001	9.34	0.005	0.596	0.039	48.8	53	42
DFQ	2020-DFQ-L2	8.97	96.4	6.83	0.939	0.468	0.552	0.701	0.001	8.98	0.006	0.534	0.061	43.8	44	38

DT	2020-DT-L1	8.02	66.0	4.76	b.d.	0.024	0.368	0.162	b.d.	1.93	0.892	0.156	1.37	2.81	4	2
HGQ	2020-HGQ-L1	3.65	91.6	n.d.	0.028	0.028	0.520	1.670	b.d.	0.411	0.156	0.224	1.08	0.094	6	0
HGQ	2020-HGQ-L2	3.47	91.6	n.d.	0.069	0.044	0.533	1.612	0.001	0.412	0.155	0.241	1.08	0.089	6	0
HGQ	2020-HGQ-L4	4.80	57.7	n.d.	0.009	0.011	0.431	0.886	b.d.	0.211	0.085	0.092	0.324	0.028	2	0
QK	2020-QK-L1	8.47	48.6	4.58	0.609	0.129	0.481	b.d.	0.0157	4.70	0.044	0.094	0.383	2.65	3	1
LW	2020-LW-L2	8.39	80.6	2.92	0.544	0.582	0.521	b.d.	0.0011	4.30	0.017	0.203	0.311	6.50	12	5
LX	2020-LX-L1	8.43	75.5	15.13	b.d.	2.43	0.618	0.480	0.001	18.9	0.165	1.073	0.531	43.5	51	28
river	2020-RLJ-L1	7.29	n.d.	n.d.	b.d.	0.045	0.284	0.165	b.d.	0.233	0.148	0.059	0.372	0.072	1	0
river	2020-RLJ-L1	7.29	n.d.	n.d.	b.d.	b.d.	0.258	0.428	b.d.	0.231	0.145	0.057	0.366	0.074	1	0
RST	2020-RST-L2	8.48	71.5	14.8	0.348	7.962	0.543	0.069	b.d.	21.1	0.308	1.22	0.778	32.0	70	9
SHD	2020-SHD-L1	8.41	64.0	3.51	b.d.	0.211	0.519	0.069	b.d.	3.59	0.003	0.134	0.324	3.17	7	2
SHD	2020-SHD-L3	8.51	66.3	3.73	0.621	0.175	0.535	0.016	b.d.	3.82	0.002	0.128	0.344	3.49	7	2
SQ	2020-SQ-L1	8.16	65.4	22.86	0.141	1.559	0.516	0.012	0.003	19.5	1.21	1.64	1.97	28.8	48	19
SQ	2020-SQ-L3	8.20	66.6	n.d.	0.163	1.658	0.506	b.d.	0.002	19.9	1.15	1.62	1.62	28.5	48	19
SQ	2020-SQ-L4	8.14	63.3	n.d.	b.d.	b.d.	0.512	b.d.	b.d.	20.2	1.20	1.68	1.84	29.4	49	20
TH	2020-TH-L2	8.59	87.1	8.17	0.574	1.382	0.597	0.330	0.003	9.97	0.020	0.506	0.172	2.02	40	13
XLS	2020-XLS-L1	8.76	74.8	2.16	1.020	b.d.	0.473	0.109	0.001	3.19	0.001	0.068	0.061	1.99	4	2
XLS	2020-XLS-L1	9.04	74.8	n.d.	b.d.	b.d.	b.d.	b.d.	b.d.	3.39	0.001	0.066	0.059	1.97	4	2
XLS	2020-XLS-L3	8.41	60.3	2.73	0.980	0.089	0.473	0.087	0.001	3.64	0.007	0.071	0.107	2.69	4	1

n.d.: –

b.d.: below detection line

Sample names beginning with "015" are samples collected in 2019, and those beginning with "2020" indicate samples obtained in 2020. The reason for multiple samples from the same sample site is that there are multiple vents within a sample site, and we sampled all of them, with some differences in fluid content between vents, but less variation between vents within the same site.