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Supplemental Material

Figure S1. Acritarchs from the carbonaceous shale in the Shenshan tectonic mélange. A-C, E, F: *Celtiberium*？ *papillatum* Moczydłowska, 1998; D: *Asteridium pallitum* (Volkova, 1969) comb. Moczydłowska, 1991; G- K: *Asteridium lanatum* (Volkova, 1969) comb. Moczydłowska, 1991; I-N: *Comasphaeridium agglutinatum* Moczydłowska, 1988. All scale bars are 10μm**.**

Figure S2. Acritarchs from the carbonaceous shale in the Shenshan tectonic mélange. A-F: *Skiagia ciliosa* (Volkova, 1969) comb. Downie, 1982. G: *Skiagia* cf. *insigne* (Fridrichsone, 1971) comb. Downie, 1982. H, I: *Leiofusa* sp. J: Cyanobacterial filament, like ‘Tortunema (Hermann,1976) emend. Hermann, 1989’. All scale bars are 10μm.

Figure S3. Acritarchs from the turbidite in the Shenshan tectonic mélange. A: *Leiosphaeridia* sp. B: *Germinosphaera* sp. C, D: *Palaeopleurocapsa reniforma* Ogurtsova and Sergeev, 1987. All scale bars are 10μm.

Table S1. SHRIMP U-Pb data for zircons from tuff (S202) in Shenshan Tectonic Mélange, Jiangxi, South China

Table S2. Results of mixture modeling (Sambridge and Compston, 1994), using Isoplot, of data from samples B, H, L and M of Wang et al. (2020). Through trial and error shown in this table, we choose three age components for samples B and H and four components for samples L and M (the rows shown in bold). This choice is the most reasonable one as decreasing the numbers of components would significantly increase the values of relative misfit for each sample, and increasing them would not significantly decrease the misfit, but would significantly reduce the consistency of the age components identified among the samples, as is evident from results shown here.

Supplementary figures S1, S2 and S3:

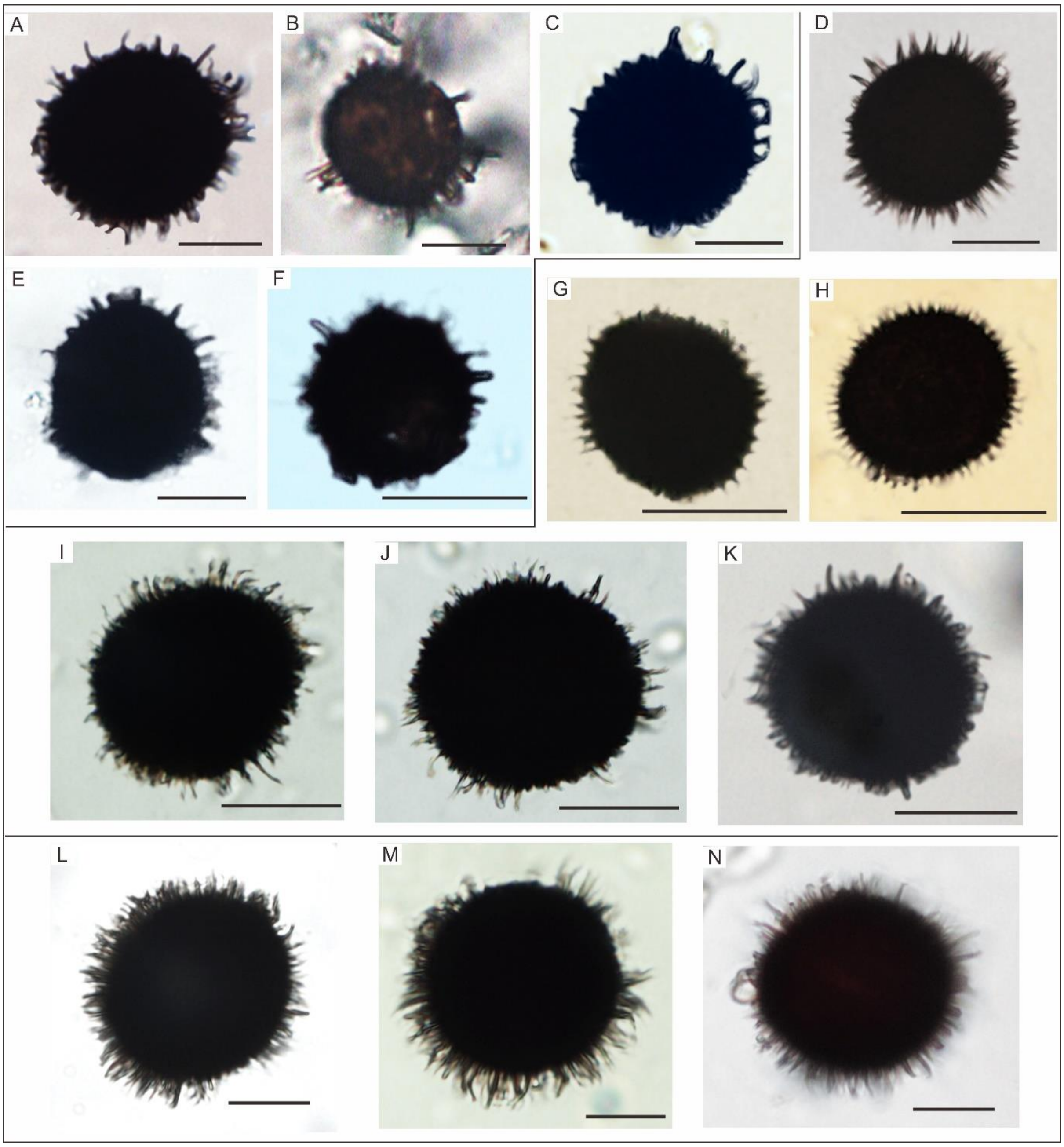
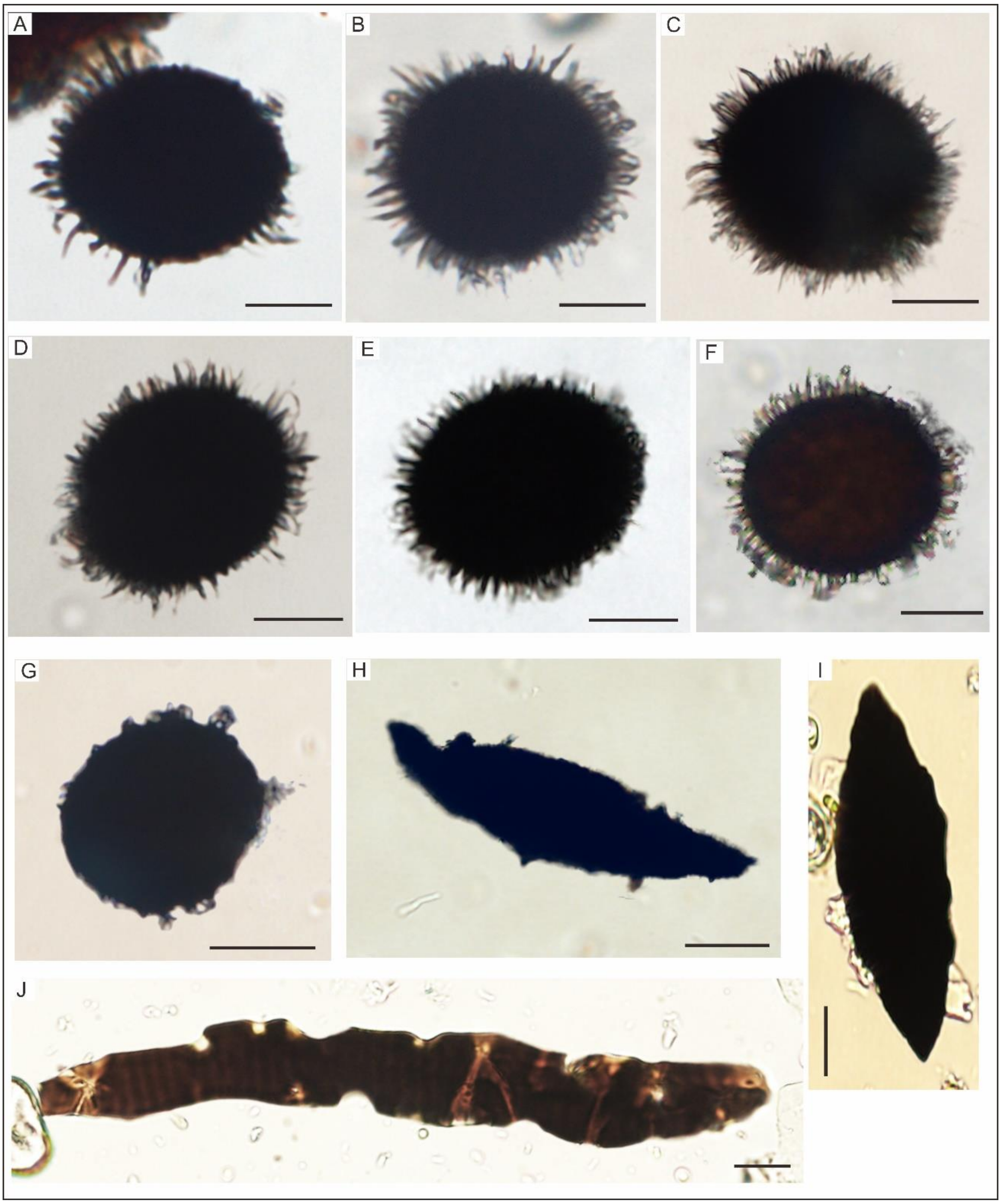


Fig. S1. Acritarchs from the carbonaceous shale in the Shenshan tectonic mélange. A-C, E, F: *Celtiberium*? *papillatum* Moczydłowska, 1998; D: *Asteridium pallitum* (Volkova, 1969) comb. Moczydłowska, 1991; G-K: *Asteridium lanatum* (Volkova, 1969) comb. Moczydłowska, 1991; I-N: *Comasphaeridium agglutinatum* Moczydłowska, 1988. All scale bars are 10μm**.**



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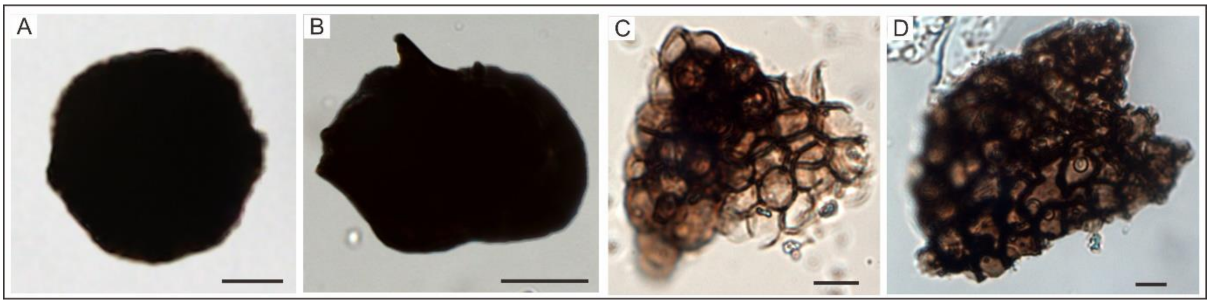

Fig. S3. Acritarchs from the turbidite in the Shenshan tectonic mélange. A: *Leiosphaeridia* sp. B: *Germinosphaera* sp. C, D: *Palaeopleurocapsa reniforma* Ogurtsova and Sergeev, 1987. All scale bars are 10μm.

Table S1. SHRIMP U-Pb data for zircons from tuff (S202) in Shenshan Tectonic Mélange, Jiangxi, South China

Anlysis Spot	**%** **$^{206}Pb_c$**	**ppm U**	**ppm Th**	**^{232}Th $/^{238}U$**	**ppm** **$^{206}Pb^*$**	**$^{207}Pb^*$ $/^{206}Pb^*$**	**±%**	**$^{207}Pb^*$ $/^{235}U$**	**±%**	**$^{206}Pb^*$ $/^{238}U$**	**±%**	**err corr**	**^{206}Pb $/^{238}U$**	**^{207}Pb $/^{206}Pb$**	**% Discordant**
S202-1	0.51	152	142	0.96	17.6	0.0609	2.6	1.123	3.2	0.1338	1.8	.584	810 ±14	634 ± 55	-28
S202-2	0.32	383	287	0.77	156	0.1639	0.99	10.65	2.3	0.4714	2.1	.900	2,490 ±42	2,496 ± 17	0
S202-3	0.25	114	156	1.41	14.1	0.0641	3.4	1.268	3.9	0.1434	1.9	.493	864 ±16	746 ± 72	-16
S202-4	0.14	96	57	0.61	11.5	0.0683	2.7	1.301	3.5	0.1382	2.2	.624	834 ±17	877 ± 57	5
S202-5	0.44	83	109	1.35	10.2	0.0656	3.8	1.284	4.9	0.1420	3.2	.641	856 ±25	794 ± 80	-8
S202-7	0.12	309	330	1.10	35.5	0.06458	1.5	1.188	2.4	0.1334	1.9	.779	807 ±14	761 ± 32	-6
S202-8	0.57	199	202	1.05	24.1	0.0597	3.3	1.154	4.0	0.1402	2.2	.555	846 ±18	593 ± 72	-43
S202-9	0.04	163	107	0.68	70.0	0.1602	0.90	11.00	2.4	0.498	2.2	.926	2,606 ±47	2,458 ± 15	-6
S202-10	1.89	43	52	1.25	4.79	0.0587	13	1.03	14	0.1276	3.0	.221	774 ±22	555 ±290	-39
S202-11	0.38	72	40	0.57	8.53	0.0635	6.4	1.197	6.8	0.1368	2.2	.328	827 ±17	724 ±140	-14
S202-12	0.77	107	167	1.61	13.7	0.0610	3.6	1.236	4.1	0.1470	2.0	.480	884 ±16	638 ± 77	-39
S202-13	0.21	118	194	1.70	13.5	0.0673	3.2	1.234	3.7	0.1329	1.9	.517	804 ±15	848 ± 66	5
S202-14	0.19	201	163	0.84	27.8	0.0629	3.2	1.391	3.8	0.1604	2.1	.553	959 ±19	705 ± 68	-36
S202-15	0.68	123	112	0.94	13.2	0.0625	3.1	1.071	3.6	0.1244	1.9	.525	756 ±14	690 ± 66	-10
S202-16	0.10	87	68	0.81	24.1	0.1063	1.9	4.71	2.7	0.3213	2.0	.727	1,796 ±31	1,737 ± 34	-3
S202-17	0.35	120	97	0.83	14.3	0.0610	4.0	1.162	4.5	0.1382	1.9	.433	835 ±15	638 ± 87	-31
S202-18	0.24	153	142	0.96	17.6	0.0617	2.5	1.134	3.1	0.1332	1.9	.606	806 ±14	665 ± 53	-21
S202-19	0.31	64	7	0.11	27.8	0.1632	1.4	11.31	2.6	0.503	2.2	.845	2,625 ±47	2,489 ± 23	-5
S202-20	0.00	62	38	0.63	7.23	0.0671	5.6	1.248	6.1	0.1349	2.3	.381	816 ±18	841 ±120	3
S202-21	0.05	194	210	1.12	23.0	0.0655	2.2	1.244	2.9	0.1377	1.8	.639	831 ±14	791 ± 46	-5
S202-22	0.37	94	131	1.43	11.0	0.0612	3.8	1.148	4.4	0.1360	2.1	.486	822 ±16	648 ± 82	-27
S202-23	0.31	48	47	1.01	5.52	0.0622	4.8	1.135	5.4	0.1324	2.3	.434	801 ±18	680 ±100	-18
S202-24	0.41	100	84	0.87	11.2	0.0613	3.1	1.098	3.9	0.1299	2.3	.592	788 ±17	650 ± 67	-21
S202-25	0.35	161	162	1.04	18.8	0.0615	2.6	1.143	3.2	0.1348	1.9	.602	815 ±15	657 ± 55	-24
S202-26	0.51	104	57	0.57	13.0	0.0658	3.0	1.316	3.6	0.1450	2.0	.547	873 ±16	801 ± 63	-9
S202-27	0.23	158	281	1.84	18.0	0.0636	2.4	1.164	3.3	0.1327	2.4	.711	803 ±18	730 ± 50	-10
S202-28	0.04	203	129	0.65	88.3	0.16655	0.57	11.62	1.9	0.5062	1.8	.952	2,640 ±39	2,523.3 ± 9.6	-5
S202-29	0.11	354	207	0.60	40.8	0.06350	1.5	1.172	2.3	0.1338	1.7	.746	810 ±13	725 ± 32	-12
S202-30	0.19	101	106	1.09	12.1	0.0679	3.0	1.299	3.6	0.1388	1.9	.540	838 ±15	865 ± 62	3
S202-31	2.36	354	487	1.42	40.8	0.0620	4.3	1.120	4.6	0.1311	1.7	.372	794 ±13	673 ± 92	-18
S202-32	0.04	347	415	1.24	143	0.16245	0.46	10.76	1.8	0.4802	1.7	.966	2,528 ±36	2,481.4 ± 7.7	-2

Table S2. Results of mixture modeling (Sambridge and Compston, 1994), using Isoplot, of data from samples B, H, L and M of Wang et al. (2020). Through trial and error shown in this table, we choose three age components for samples B and H and four components for samples L and M (the rows shown in bold). This choice is the most reasonable one as decreasing the numbers of components would significantly increase the values of relative misfit for each sample, and increasing them would not significantly decrease the misfit, but would significantly reduce the consistency of the age components identified among the samples, as is evident from results shown here.

Sample B					
# of age components	Age (Ma)	Error (2σ)	Proportion	Error (2σ)	Misfit
1	804.8	2.1	1.00	---	1.000
2	781.9	2.8	0.59	0.19	0.541
	842.7	3.7	0.4	---	
3	**770.9**	**3.6**	**0.38**	**0.16**	**0.449**
	814.1	**3.9**	**0.43**	**0.17**	
	863.6	**6.4**	**0.19**	**---**	
4	765.8	8.2	0.28	0.18	0.414
	797.4	9.9	0.33	0.17	
	832.2	6.4	0.28	0.15	
	876.3	8.8	0.11	---	
5	751.3	11	0.08	0.09	0.401
	776.5	5.3	0.29	0.15	
	805.7	5.9	0.30	0.15	
	837.3	7.3	0.24	0.14	
	880.1	10	0.10	---	
6	751.1	11	0.08	0.09	0.398
	776	5.3	0.28	0.15	
	803.1	7.2	0.26	0.15	
	829.4	11	0.20	0.16	
	850.2	18	0.09	0.14	
	882.3	8.8	0.09	---	
Sample H					
1	812.4	1.9	1.00	---	1.000
2	797.9	2.2	0.78	0.23	0.556
	863	4.7	0.22	---	
3	**778.6**	**3**	**0.47**	**0.18**	**0.361**
	821.6	**2.6**	**0.43**	**0.17**	
	885.6	**5.3**	**0.10**	**---**	
4	778.6	3	0.47	0.18	0.333
	821.5	2.7	0.43	0.17	
	876.7	6.7	0.09	0.08	
	935.8	14	0.02	---	
5	774.5	3.7	0.37	0.17	0.299

	805.1	3.7	0.29	0.15	
	832	3.5	0.24	0.13	
	877.2	5.8	0.08	0.08	
	935.8	14	0.02	---	
6	774.5	3.7	0.37	0.17	0.296
	804.7	4.2	0.28	0.15	
	827.6	6.6	0.17	0.13	
	844.4	9.1	0.09	0.11	
	879.9	7.5	0.07	0.07	
	935.8	14	0.02	---	
Sample L					
1	773.5	2.3	1.00	---	1.000
2	759.2	2.8	0.66	0.23	0.611
	818.7	5.5	0.34	---	
3	753.9	5.7	0.51	0.24	0.545
	797.4	12	0.41	0.21	
	852	12	0.08	---	
4	**742.9**	**4.8**	**0.25**	**0.15**	**0.490**
	773.1	**4.6**	**0.44**	**0.20**	
	811.6	**7**	**0.26**	**0.15**	
	859.4	**14**	**0.05**	**---**	
5	742.1	5.2	0.22	0.15	0.485
	767.9	7.2	0.34	0.21	
	789.5	14	0.21	0.19	
	817.7	13	0.18	0.17	
	861.1	14	0.05	---	
6	Unable to find a solution				
Sample M					
1	781.2	1.7	1.00	---	1.000
2	762.5	2.3	0.56	0.19	0.434
	823.3	2.7	0.44	---	
3	762.5	2.2	0.55	0.19	0.376
	816.5	3	0.37	0.16	
	860.6	7.2	0.08	---	
4	**742.2**	**4.5**	**0.18**	**0.11**	**0.312**
	772.7	**3.1**	**0.38**	**0.16**	
	816.7	**3**	**0.36**	**0.16**	
	860.6	**7.2**	**0.08**	**---**	
5	742.1	4.5	0.18	0.11	0.299
	772.6	3	0.38	0.16	
	806.2	5.2	0.17	0.12	
	828.2	4.9	0.22	0.13	

	867.8	8.8	0.05	---	
6	742.1	4.5	0.18	0.11	0.298
	772.6	3	0.38	0.16	
	805.4	5.9	0.16	0.12	
	825.6	5.7	0.21	0.14	
	845	20	0.02	0.05	
	868.2	9.1	0.05	---	