

GSA Data Repository 2017205

Jones, D.S., Martini, A.M., Fike, D.A., and Kaiho, K., 2017, A volcanic trigger for the Late Ordovician mass extinction?: Mercury data from South China and Laurentia: Geology, doi:10.1130/G38940.1

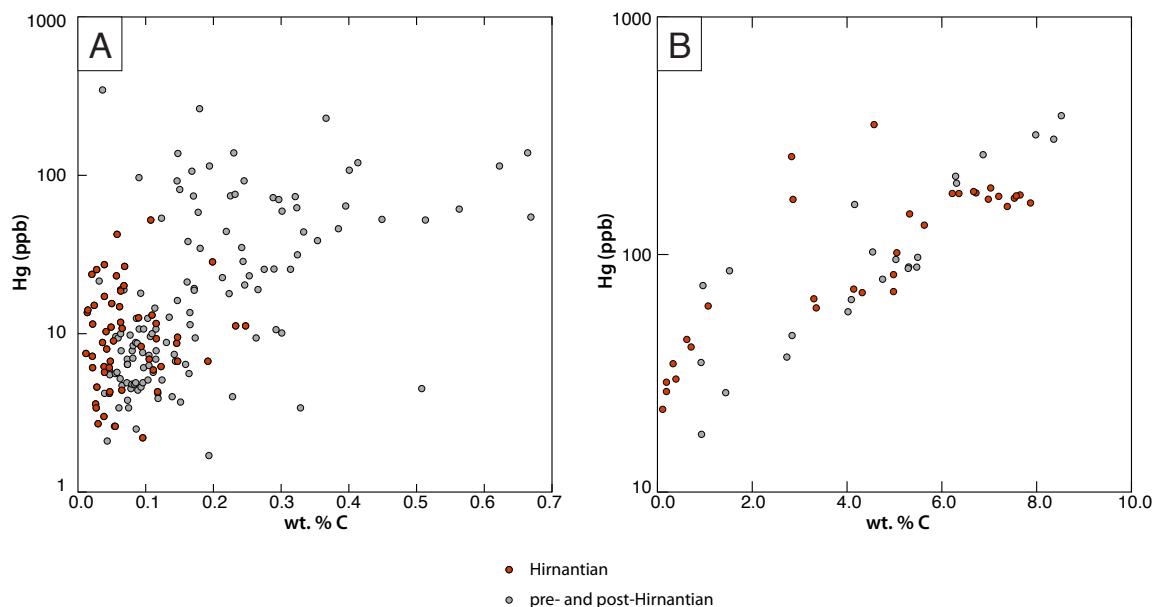


Figure DR1. Cross plots of Hg concentration vs. total organic carbon content. A) Data from Monitor Range section. There is no statistically significant correlation between Hg content and TOC before, during, or after the Hirnantian, indicating that Hg/TOC ratios are controlled primarily by temporal variations in environmental Hg concentration. B) Data from Wangjiawan Riverside section. Hg concentration is partially controlled by TOC ($r^2 = 0.53$) across a wide range of organic carbon contents, although significant variability in Hg concentration is not accounted for by TOC and is inferred to originate from temporal variation in environmental Hg loading.

Table DR 1

30° 58' 56" N, 111° 25' 10" E

Geochemical data for strata from Wangjiawan Riverside, South China

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{org}}$ (‰-VPDB)	graptolite zone	% carbonate	Hg (ppb)	% TOC	Hg/TOC
1.47	-29.6	<i>pacificus</i>	4.15%	64.6	4.09%	15.8
1.50	-29.6	<i>pacificus</i>	2.67%	45.6	2.84%	16.1
1.53	-29.8	<i>pacificus</i>	3.32%	57.4	4.02%	14.3
1.55	-29.4	<i>pacificus</i>	4.64%	102.5	4.54%	22.6
1.58	-29.5	<i>pacificus</i>	4.69%	95.3	5.03%	18.9
1.61	-29.1	<i>pacificus</i>	3.25%	78.7	4.75%	16.6
1.64	-30.1	<i>pacificus</i>	1.92%	88.6	5.30%	16.7
1.66	-29.2	<i>pacificus</i>	1.38%	88.5	5.47%	16.2
1.68	-29.2	<i>pacificus</i>	4.09%	87.4	5.29%	16.5
1.71	-29.6	<i>pacificus</i>	1.16%	37.0	2.73%	13.5
1.74	-29.7	<i>pacificus</i>	4.02%	97.3	5.49%	17.7
1.78	-29.6	<i>pacificus</i>	3.70%	213.5	6.29%	34.0
1.80	-29.9	<i>pacificus</i>	6.10%	319.0	7.98%	40.0
1.82	-29.8	<i>pacificus</i>	7.40%	384.1	8.52%	45.1
1.83	-29.1	<i>pacificus</i>	8.79%	305.8	8.36%	36.6
1.85	-29.3	<i>pacificus</i>	21.61%	263.1	6.87%	38.3
1.88	-29.1	<i>extraordinarius</i>	35.98%	132.9	5.63%	23.6
1.90	-29.3	<i>extraordinarius</i>	48.06%	69.8	4.98%	14.0
1.93	-29.3	<i>extraordinarius</i>	57.00%	82.3	4.98%	16.5
1.96	-29.1	<i>extraordinarius</i>	49.27%	148.2	5.32%	27.8
2.00	-29.1	<i>extraordinarius</i>	34.96%	180.7	6.22%	29.1
2.02	-29.2	<i>extraordinarius</i>	27.75%	101.7	5.05%	20.1
2.07	-29.1	<i>extraordinarius</i>	16.02%	71.5	4.14%	17.3
2.10	-29.1	<i>extraordinarius</i>	16.19%	69.1	4.32%	16.0
2.13	-29.1	<i>extraordinarius</i>	17.02%	65.1	3.30%	19.7
2.19	-28.9	<i>extraordinarius</i>	25.34%	59.6	3.35%	17.8
2.22	-28.7	<i>extraordinarius</i>	21.75%	352.3	4.57%	77.1
2.26	-28.8	<i>extraordinarius</i>	8.81%	170.6	2.86%	59.6
2.29	-28.9	<i>extraordinarius</i>	9.67%	258.3	2.83%	91.2
2.32	-28.8	<i>extraordinarius</i>	18.93%	60.7	1.07%	57.0
2.35	-28.3	<i>extraordinarius</i>	24.42%	43.9	0.62%	71.3
2.38	-28.6	<i>extraordinarius</i>	48.91%	34.7	0.33%	105.0
2.41	-27.9	<i>persculptus</i>	84.30%	22.3	0.11%	208.0
2.44	-28.0	<i>persculptus</i>	60.53%	29.0	0.19%	156.6
2.47	-27.7	<i>persculptus</i>	66.07%	26.5	0.19%	138.6
2.50	-27.5	<i>persculptus</i>	60.58%	29.9	0.39%	77.4
2.53	-28.7	<i>persculptus</i>	35.71%	40.8	0.71%	57.2
2.57	-29.4	<i>persculptus</i>	6.08%	170.9	6.98%	24.5
2.60	-29.5	<i>persculptus</i>	5.44%	159.3	7.38%	21.6

Table DR 1

30° 58' 56" N, 111° 25' 10" E

Geochemical data for strata from Wangjiawan Riverside, South China

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{org}}$ (‰-VPDB)	graptolite zone	% carbonate	Hg (ppb)	% TOC	Hg/TOC
2.63	-29.5	<i>persculptus</i>	4.82%	178.1	7.65%	23.3
2.65	-29.6	<i>persculptus</i>	4.37%	172.6	7.53%	22.9
2.68	-30.0	<i>persculptus</i>	5.09%	175.7	7.20%	24.4
2.70	-29.0	<i>persculptus</i>	0.95%	190.6	7.03%	27.1
2.72	-29.6	<i>persculptus</i>	2.92%	180.6	6.36%	28.4
2.74	-29.3	<i>persculptus</i>	5.39%	181.7	6.72%	27.1
2.81	-28.8	<i>persculptus</i>	7.68%	164.8	7.87%	20.9
2.84	-29.4	<i>persculptus</i>	5.24%	184.1	6.67%	27.6
2.87	-30.2	<i>ascencus</i>	5.37%	199.6	6.31%	31.6
2.91	-29.4	<i>ascencus</i>	4.60%	85.4	1.52%	56.0
2.95	-29.9	<i>ascencus</i>	3.96%	162.4	4.16%	39.0
2.98	N.D	<i>ascencus</i>	49.09%	17.5	0.93%	18.9
3.01	N.D	<i>ascencus</i>	44.31%	74.0	0.96%	76.9
3.03	N.D	<i>ascencus</i>	50.30%	35.1	0.92%	38.1
3.06	-28.8	<i>acuminatus</i>	38.60%	26.2	1.44%	18.1

Table DR 2

N39.2110°, W116.4042°

Geochemical data for strata from Monitor Range, Nevada

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{carb}}$ (‰-VPDB)	$\delta^{18}\text{O}_{\text{carb}}$ (‰-VPDB)	% carbonate	Hg (ppb)	% TOC	Hg/TOC
6.1	-1.40	-7.57	85.8%	96.7	0.09%	1073.8
6.9	-1.04	-9.19	72.9%	107.7	0.40%	268.7
12.2	-4.94	-7.18	90.5%	64.0	0.40%	161.9
13.0	-1.90	-7.56	81.0%	72.3	0.29%	250.9
19.0	-0.73	-8.84	84.3%	229.4	0.37%	626.2
21.0	-0.94	-6.61	90.5%	106.2	0.17%	631.6
22.0	-0.64	-8.91	89.2%	92.2	0.15%	630.1
24.1	-0.21	-10.45	91.8%	120.1	0.41%	290.5
27.0	-1.41	-8.29	94.4%	44.2	0.22%	202.0
28.0	-0.90	-6.22	93.5%	75.9	0.23%	327.1
28.9	-1.13	-6.62	95.8%	74.0	0.17%	433.7
30.0	-0.68	-8.20	88.8%	263.5	0.18%	1467.7
32.0	0.14	-7.66	83.0%	138.6	0.23%	602.5
34.0	0.19	-7.40	83.8%	137.4	0.15%	931.5
36.0	0.47	-8.06	82.5%	70.3	0.30%	237.1
37.0	0.53	-7.74	91.1%	73.4	0.32%	228.9
41.0	0.48	-9.33	93.0%	92.3	0.25%	376.4
44.0	0.30	-8.03	75.0%	114.5	0.19%	589.9
48.0	0.10	-8.52	69.3%	114.5	0.62%	183.9
53.0	0.76	-7.80	79.6%	62.4	0.32%	193.0
57.0	1.03	-6.15	84.0%	46.0	0.38%	119.6
63.0	0.93	-5.82	85.6%	28.6	0.24%	117.1
64.0	1.26	-5.20	84.6%	25.5	0.28%	92.7
67.9	0.84	-6.36	74.3%	31.5	0.32%	97.2
68.0	1.11	-5.78	82.5%	25.5	0.31%	81.2
71.0	0.72	-5.73	86.6%	18.8	0.17%	109.6
75.8	0.46	-5.64	83.2%	35.0	0.24%	144.9
77.0	0.72	-5.54	78.0%	20.3	0.25%	82.6
78.0	0.09	-5.17	80.5%	23.2	0.25%	91.6
80.9	-1.39	-5.46	89.2%	19.3	0.17%	112.6
83.0	-5.05	-4.50	90.3%	13.6	0.17%	82.2
84.3	-0.61	-6.87	63.9%	59.4	0.30%	197.2
85.1	-0.58	-7.36	70.5%	138.7	0.66%	208.8
88.0	0.19	-6.88	71.4%	54.5	0.67%	81.5
99.9	-5.41	-5.04	93.3%	17.9	0.22%	80.4
105.0	1.83	-5.33	95.8%	4.0	0.14%	28.4
118.0	2.30	-9.20	98.8%	12.5	0.09%	144.7
120.0	1.74	-11.45	98.9%	16.2	0.15%	110.6
122.0	2.31	-6.67	99.2%	8.8	0.13%	67.6

Table DR 2

N39.2110°, W116.4042°

Geochemical data for strata from Monitor Range, Nevada

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{carb}}$ (‰-VPDB)	$\delta^{18}\text{O}_{\text{carb}}$ (‰-VPDB)	% carbonate	Hg (ppb)	% TOC	Hg/TOC
124.0	2.10	-7.03	99.0%	18.9	0.07%	278.2
125.0	2.21	-10.81	85.3%	18.0	0.09%	194.8
127.1	1.77	-5.15	99.1%	3.9	0.12%	32.8
127.3	1.77	-5.16	98.3%	1.7	0.19%	8.9
127.7	1.52	-5.78	98.1%	10.7	0.10%	110.5
128.0	1.73	-5.27	99.3%	9.4	0.17%	54.5
128.3	1.86	-6.56	98.7%	12.5	0.10%	120.9
128.6	1.73	-6.58	99.5%	7.0	0.08%	85.8
128.9	1.64	-5.54	98.7%	7.6	0.10%	79.4
129.3	1.81	-5.52	99.5%	7.8	0.08%	97.9
129.7			99.2%	3.4	0.07%	45.5
130.0	1.75	-5.38	43.1%	7.8	0.06%	122.3
131.0			93.9%	3.4	0.33%	10.4
131.8	1.68	-5.30	99.3%	5.9	0.05%	128.0
132.5	1.62	-5.48	99.1%	2.5	0.09%	29.2
133.1			98.5%	346.0	0.04%	9539.6
133.6	4.98	-7.91	95.6%	2963.8	0.05%	57785.2
133.9	2.60	-8.03	95.7%	58.4	0.18%	328.9
134.1			94.7%	81.4	0.15%	541.6
134.6	1.77	-6.44	81.1%	7.8	0.12%	67.2
134.9	1.50	-6.48	98.8%	4.5	0.08%	57.2
135.2	1.24	-5.97	88.7%	10.0	0.11%	91.6
135.8			97.4%	7.4	0.14%	52.3
136.7	1.19	-5.63	98.6%	6.1	0.10%	63.4
137.2	0.82	-7.90	91.1%	6.9	0.11%	60.3
137.6	1.10	-6.54	98.7%	9.4	0.06%	158.2
138.1			98.4%	10.7	0.09%	118.3
139.1	1.19	-6.37	98.9%	8.7	0.09%	99.8
139.3			99.5%	2.6	0.05%	48.6
140.0	1.06	-6.26	85.9%	3.7	0.15%	24.6
140.4	1.09	-5.51	79.3%	4.6	0.09%	49.8
141.1	1.89	-10.04	92.4%	9.8	0.08%	127.3
141.8	0.32	-5.44	96.4%	4.7	0.06%	72.1
142.3	-0.24	-4.83	99.2%	3.4	0.06%	55.5
142.8			99.3%	5.2	0.06%	83.6
144.8			86.8%	74.2	0.23%	329.5
145.1	0.71	-5.72	62.9%	19.0	0.27%	71.5
145.6	1.40	-6.40	92.2%	22.6	0.21%	106.1
146.0			14.9%	38.7	0.35%	109.5
147.7	1.40	-4.53	84.4%	34.6	0.18%	191.5

Table DR 2

N39.2110°, W116.4042°

Geochemical data for strata from Monitor Range, Nevada

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{carb}}$ (‰-VPDB)	$\delta^{18}\text{O}_{\text{carb}}$ (‰-VPDB)	% carbonate	Hg (ppb)	% TOC	Hg/TOC
148.0	1.58	-3.76	77.4%	61.2	0.56%	108.8
148.5			77.0%	52.2	0.51%	101.8
149.0	1.48	-4.87	83.2%	52.7	0.45%	117.3
149.3	2.02	-6.21	90.7%	43.9	0.33%	131.8
150.2			95.7%	28.4	0.20%	143.1
151.1			91.8%	11.2	0.25%	45.2
151.7	3.40	-5.60	91.9%	11.2	0.23%	48.3
152.1	3.57	-6.26	93.7%	6.7	0.19%	35.1
152.7	4.37	-5.76	95.5%	6.9	0.11%	65.3
153.1	3.97	-5.79	92.6%	9.3	0.12%	80.4
154.4	5.98	-6.03	97.2%	4.4	0.06%	67.6
154.7			94.7%	12.6	0.09%	140.3
155.3	6.17	-7.43	99.3%	3.0	0.04%	77.6
156.0	5.21	-4.78	93.3%	9.5	0.15%	64.3
156.2			95.7%	6.7	0.15%	45.3
158.2	5.54	-13.02	98.8%	17.2	0.04%	441.2
159.0	7.26	-6.84	98.0%	11.0	0.05%	225.4
159.4			99.3%	8.8	0.04%	241.4
159.9	7.31	-5.70	99.5%	4.6	0.03%	163.3
160.9	6.73	-7.42	97.9%	20.1	0.07%	296.4
161.3			96.8%	18.9	0.06%	299.9
162.3			98.3%	3.6	0.03%	139.9
162.7	6.14	-7.89	98.6%	7.2	0.02%	342.0
163.0			99.1%	6.1	0.05%	131.3
163.8	6.95	-7.21	99.0%	10.3	0.04%	248.7
164.5			97.5%	27.3	0.04%	699.1
165.8	6.42	-8.38	98.6%	25.4	0.03%	920.1
166.5	6.74	-6.45	99.0%	14.8	0.06%	240.1
168.1	6.39	-9.57	99.4%	13.6	0.01%	985.3
169.6	5.93	-7.90	98.6%	18.6	0.06%	293.9
170.2			99.5%	15.1	0.02%	627.7
170.4			98.1%	42.4	0.06%	734.3
170.9	6.17	-7.94	99.5%	6.7	0.05%	140.8
171.2			99.2%	9.0	0.05%	171.2
171.8	6.47	-8.23	99.1%	13.1	0.11%	120.2
172.8	6.23	-8.31	99.4%	4.2	0.05%	90.1
172.9			98.3%	52.2	0.11%	485.7
173.1			99.5%	2.7	0.03%	91.2
173.9			99.4%	15.5	0.05%	310.5
175.0	5.53	-8.06	98.4%	11.6	0.12%	100.3

Table DR 2

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Geochemical data for strata from Monitor Range, Nevada

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{carb}}$ (‰-VPDB)	$\delta^{18}\text{O}_{\text{carb}}$ (‰-VPDB)	% carbonate	Hg (ppb)	% TOC	Hg/TOC
175.4			99.0%	8.7	0.15%	59.4
175.7	5.50	-8.08	99.3%	8.3	0.09%	88.8
176.4			98.3%	26.6	0.07%	386.7
176.8	5.92	-7.43	99.8%	14.1	0.01%	961.1
177.5			99.6%	23.2	0.06%	409.4
179.0	5.43	-7.10	98.8%	11.5	0.02%	531.5
179.6			99.1%	6.1	0.02%	281.9
179.8			99.0%	5.9	0.11%	52.7
180.2	5.18	-6.00	98.7%	8.0	0.04%	188.1
180.5			98.4%	11.8	0.06%	187.6
180.9			98.7%	4.3	0.12%	36.3
181.2	5.04	-6.52	99.1%	2.6	0.05%	46.4
181.5			98.3%	10.8	0.07%	166.2
181.8			98.8%	2.2	0.10%	23.3
182.4	4.73	-7.97	99.2%	6.2	0.12%	50.6
182.8			99.6%	23.7	0.02%	1157.6
183.1			99.6%	7.5	0.01%	636.5
186.4			98.5%	5.7	0.04%	145.9
186.6	3.12	-7.56	98.4%	4.3	0.05%	91.6
187.1			98.8%	3.4	0.03%	128.0
187.8	3.22	-7.70	98.1%	6.2	0.04%	161.5
188.1			96.9%	5.5	0.05%	117.5
190.2	1.71	-11.12	94.3%	53.6	0.12%	434.1
190.5			98.7%	21.5	0.03%	686.7
191.0	0.99	-8.55	95.0%	21.2	0.16%	131.3
191.4			94.4%	25.6	0.29%	88.5
192.3			98.7%	38.2	0.16%	235.4
192.8	1.00	-8.76	96.2%	12.7	0.13%	94.5
193.8			96.8%	10.6	0.29%	36.1
194.0			98.7%	14.5	0.11%	128.0
195.5	0.63	-7.49	98.5%	9.4	0.26%	35.6
195.8			98.3%	10.1	0.30%	33.7
196.5	0.76	-6.85	99.0%	4.2	0.12%	35.5
198.1			99.4%	5.7	0.11%	51.2
199.7	0.43	-6.17	99.4%	6.4	0.16%	40.2
200.6	0.39	-5.88	99.7%	4.8	0.08%	60.5
200.9			99.5%	4.9	0.10%	50.7
201.8	0.03	-6.13	99.4%	4.4	0.09%	50.0
203.6	0.21	-6.91	99.6%	6.4	0.07%	87.5

Table DR 2

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Geochemical data for strata from Monitor Range, Nevada

Stratigraphic Height (m)	$\delta^{13}\text{C}_{\text{carb}}$ (‰-VPDB)	$\delta^{18}\text{O}_{\text{carb}}$ (‰-VPDB)	% carbonate	Hg (ppb)	% TOC	Hg/TOC
204.2			98.4%	4.0	0.23%	17.4
204.5	0.05	-7.10	98.6%	9.6	0.11%	89.7
204.9			99.6%	5.6	0.06%	101.3
205.1			92.9%	8.4	0.08%	103.3
205.4	0.55	-6.70	98.7%	10.7	0.12%	92.9
205.8			96.6%	4.5	0.51%	9.0
206.2			99.5%	6.4	0.07%	87.5
206.5	0.09	-6.11	99.8%	2.1	0.04%	48.5
207.3			62.5%	5.6	0.16%	34.2
207.6	0.15	-6.68	99.4%	6.3	0.10%	60.2
207.9			98.7%	3.8	0.07%	51.7
208.2			97.4%	5.1	0.10%	49.6
208.8			99.6%	4.9	0.07%	68.3
209.3	0.26	-5.64	99.8%	4.2	0.04%	107.3
209.6			98.8%	5.1	0.12%	40.9
209.9	0.41	-5.82	99.4%	5.7	0.06%	98.7
210.3			97.9%	7.3	0.10%	69.7
210.6	-0.07	-6.19	98.0%	11.4	0.17%	68.9
210.9			99.3%	4.8	0.08%	57.5
211.1	-0.25	-6.02	97.5%	8.8	0.09%	103.7
211.4			99.3%	9.6	0.06%	172.3
211.9			99.5%	4.9	0.09%	57.1
213.3	-0.18	-6.23	98.2%	6.7	0.14%	46.3
213.5			98.8%	10.0	0.06%	159.2