Electronic Supplementary Information (ESI) Section:

Annual Air Pollution Caused by the Hungry Ghost Festival

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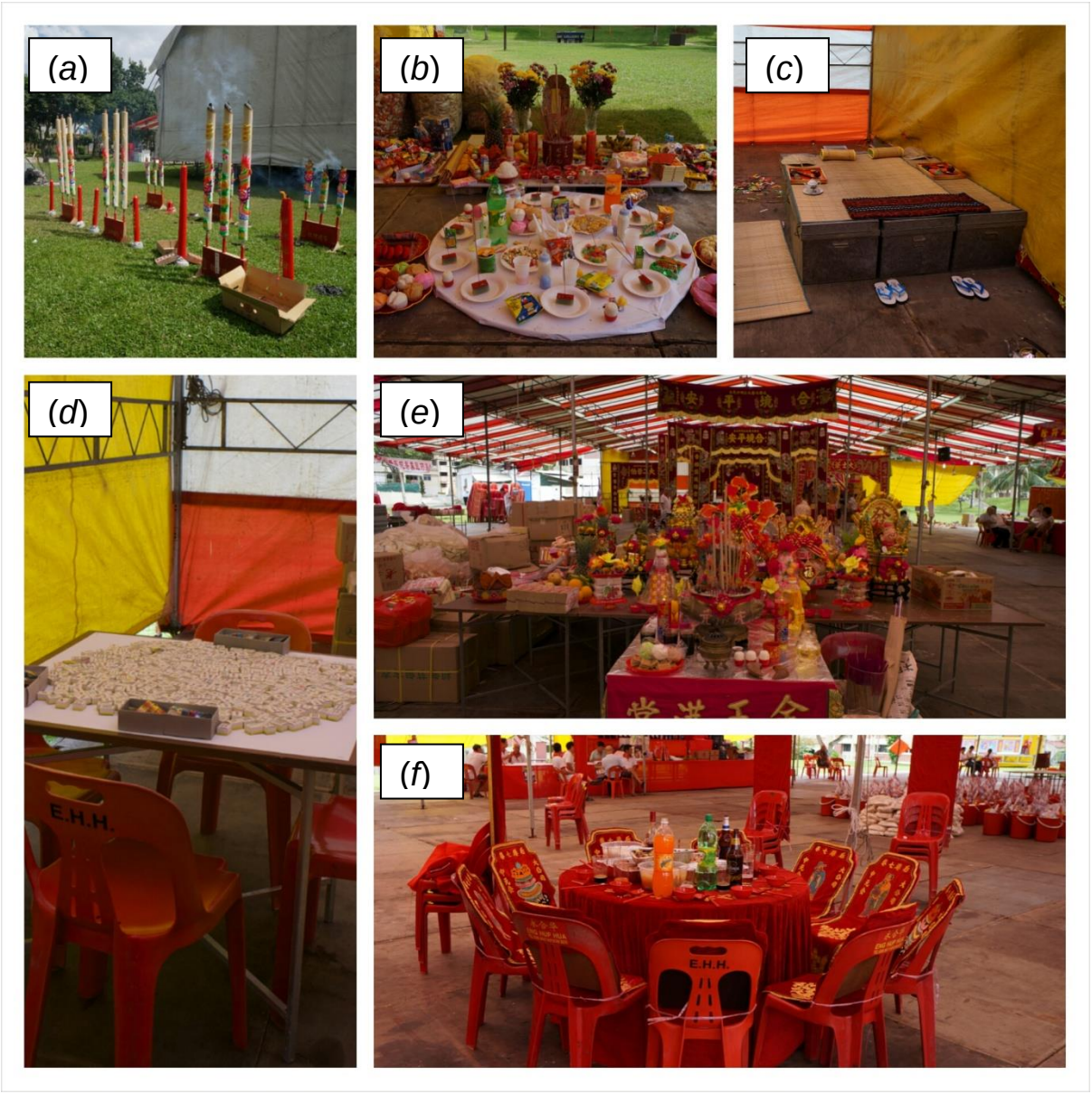


Figure S1. (Group A): (*a*) Burning incense, (*b*, *e*) Offerings of food and drink for ghosts, (*c*) Bed (*d*) Entertainment (*f*) Offerings to GOD, in 15th day (Ghost day, Hougang 2013).

Figure S1. (Group B): Offerings of food and drink in the first day of Ghost month in Jorung area, (g) Jurong West Ave 5, (h) Jurong West Street 75, (i, j) Jurong West Street 74 and (k, l) 50 Jurong Gate Way Road.

Figure S1. (Group C): Burning Joss paper during Ghost month in different area of Singapore, (m, n) Hougang (o) 50 Jurong Gate Way Road (p) Clementi (r) Jurong West Street 75, (s) Jurong West Street 81.

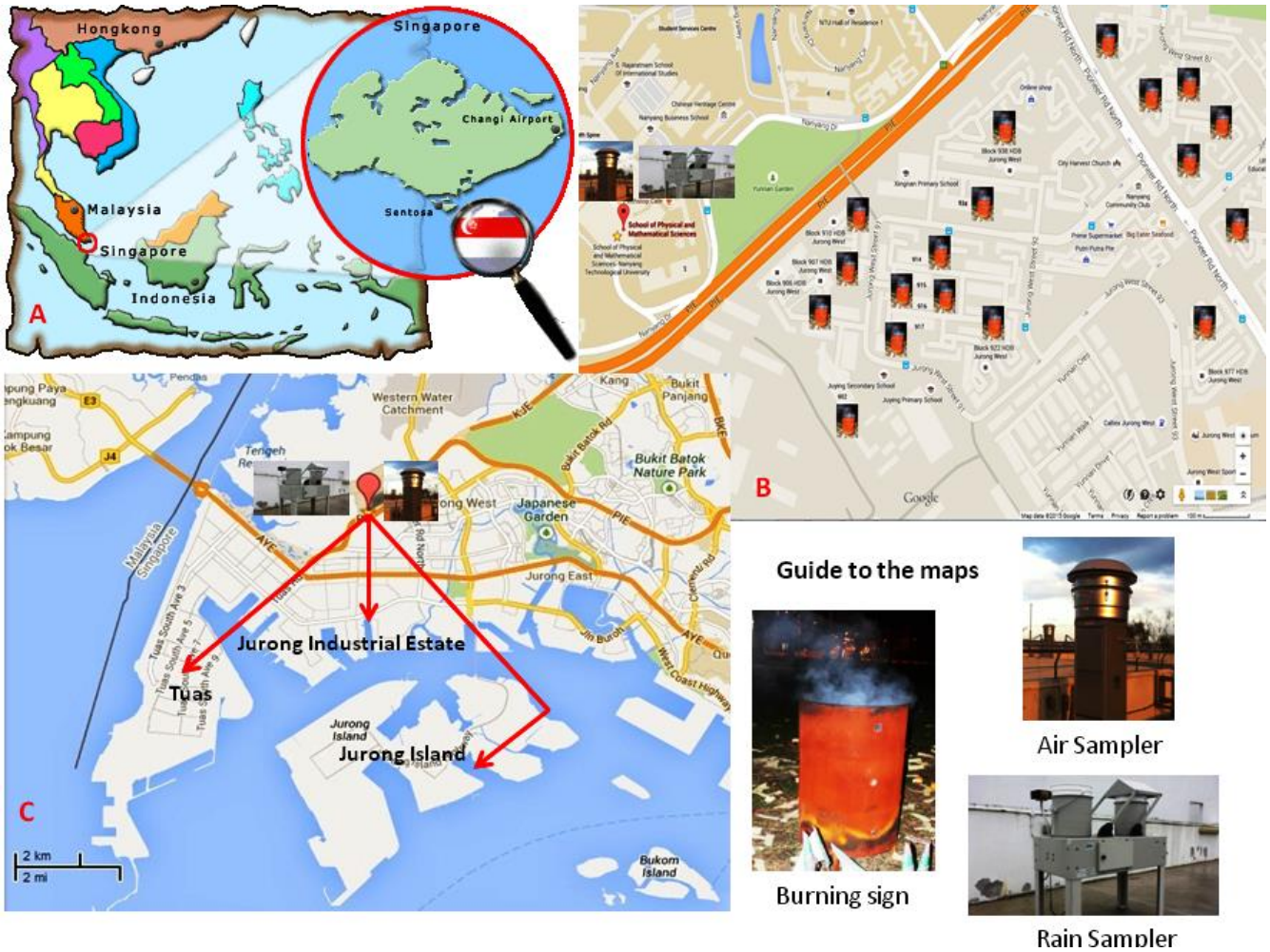


Figure S2. Sampling location: (*a*) Singapore map, (*b*) sampling site location towards main road and residential area, and (*c*) industrial areas.

Table S1. Microwave digestion protocols.

a) For PM Samples (CEM)

Step	Power	Program	Temp	Time	Recipe
	W		ºC	mm:ss	
1	800/1600*	Temp ramp	185	20:00	5 ml HNO_3 + 1 ml HCl + 2 ml H_2O
2	800/1600*	Temp hold	185	10:00	
3	0.0	Cooling	-	15:00	

b) For Joss paper and incense samples and their related ash (Anton Paar Multiwave PRO).

Step	Program	Power	Temp	Time	Recipe	Limits:
		W	ºC	mm:ss		p-Rate limit [bar/s]: 0.4
1	Power ramp	850/1500*	-	20:00	5 ml HNO_3 + 1 ml HCl + 2 ml H_2O	Pressure limit [bar]: 60
2	Power hold	850/1500	-	20:00		Power limit [W]: 900/1600
3	Cooling	0.0	55	30:00		IR limit [ºC]: 240
						Internal T Limit [ºC]: 260

* depends on the number of the vessels.

Table S2. Operating conditions and instrumental setup for ICP-MS.

Parameter	ICP-MS	ICP-OES
Instrument	Agilent 7700 Series (Japan), MicroMist nebulizer, Quartz spray chamber, 3 channel peristaltic pump	Thermo Scientific iCAP 6000 Series, standard nebulizer (Concentric glass nebulizer) and ultrasonic nebulizer (USN 5000AT+), Duo quartz torch, Glass spray chamber, 4 channel peristaltic pump
Torch View	Not Applicable	Duo view System, Auto view used for this application
Tuning Solution	Li, Mg, Y, Ce, Tl, Co; 1 µg/L; 2% HNO_3	Not Applicable
RF Power	1550 W	1200 W
Nebulizer gas flow	0.7 L min^{-1}	0.7 L min^{-1}
Auxiliary gas flow	0.35 L min^{-1}	0.5-0.7 L min^{-1}
Lens voltage	Extract 1: 0 V, Extract 2: -200 V, Omega Bias: -90 V, Omega Lens: 10.8 V	Not Applicable
Octopole Parameter	Octp RF: 200 V, Octp Bias: -18 V	Not Applicable
Cone	Ni Sampling cone, Ni Skimmer cone	Not Applicable
Collision Cell	3^{rd} generation Octopole Reaction System (ORS^3), He mode	Not Applicable
Sample Parameter	Agilent Integrated. Autosampler (I-AS), sample uptake rate 0.3 mL min^{-1}, rinsing time 190 s (Ultra pure water and 2% HNO_3)	ASX-529 Cetac autosampler, sample uptake rate 0.3 mL min^{-1}, rinsing time 60 s (Ultra pure water)
Data Acquisiation	3 readings per replicate	3 readings per replicate
Time	5 min	2-3 min

Table S3. Percentage increase in the chemical composition of $PM_{2.5}$ during August and September (Ghost Month Festival). The increase was calculated by the difference between the monthly and yearly mean concentrations for each element.

		Na (%)	Mg (%)	Al (%)	K(%)	Ca (%)	Ti (%)	V (%)	Cr (%)	Mn (%)
2010	Aug-10	34	46	44	50	51	38	42	20	35
	Sep-10	19	29	29	28	35	17	25	9	18
2011	Aug-11	39	49	47	54	59	41	45	23	36
	Sep-11	5	14	19	7	15	11	8	7	11
2012	Aug-12	40	52	71	64	60	42	45	31	37
	Sep-12	44	57	86	63	63	45	47	32	41
2013	Aug-13	51	55	51	57	61	48	51	32	51
	Sep-13	30	21	35	32	32	24	29	18	36
		Fe (%)	Ni (%)	Co (%)	Cu (%)	Zn (%)	Ga (%)	As (%)	Rb (%)	Sr (%)
2010	Aug-10	46	27	28	40	53	43	38	25	37
	Sep-10	28	13	20	29	26	21	19	18	22
2011	Aug-11	50	30	31	44	60	52	41	28	39
	Sep-11	16	16	7	14	16	19	11	6	11
2012	Aug-12	55	37	32	47	65	44	46	28	38
	Sep-12	52	33	32	47	66	46	47	27	41
2013	Aug-13	56	43	38	45	62	52	43	39	41
	Sep-13	35	26	30	22	29	22	26	22	28
		Zr (%)	Mo (%)	Cd (%)	Sn (%)	Sb (%)	Ba (%)	Ce (%)	W (%)	Pb (%)
2010	Aug-10	43	18	25	43	19	44	22	36	25
	Sep-10	26	8	15	25	11	22	15	30	13
2011	Aug-11	46	20	27	39	22	45	23	39	30
	Sep-11	20	10	5	7	8	17	11	13	8
2012	Aug-12	48	23	25	49	21	45	36	39	31
	Sep-12	45	27	22	46	24	49	32	43	33
2013	Aug-13	55	25	32	44	25	61	27	41	28
	Sep-13	30	18	20	26	14	23	15	23	18

Table S4. Comparison of the absolute chemical composition of $PM_{2.5}$ (ng/m^3) during the August and September (Ghost Month Festival) and the yearly monthly average.

		Na	Mg	Al	K	Ca	Ti	V	Cr	Mn
2010	Aug-10	10985.12	1354.94	3027.462	3389.09	6053.23	21.98	13.82	5.85	15.54
	Sep-10	9707.95	1197.77	2707.07	2879.72	5405.16	18.59	12.10	5.31	13.67
	Yearly Ave	**8183.61**	**927.99**	**2102.85**	**2255.83**	**4000.82**	**15.89**	**9.7**	**4.89**	**11.54**
2011	Aug-11	11999.51	1706.82	3667.67	3703.11	8063.08	28.59	17.99	31.91	18.56
	Sep-11	9102.62	1306.958	2959.987	2581.14	5805.69	22.48	13.43	27.64	15.08
	Yearly Ave	**8648.87**	**1142.23**	**2491.18**	**2410.17**	**5068.99**	**20.3**	**12.45**	**25.95**	**13.62**
2012	Aug-12	26657.61	3627.68	20006.64	14989.38	21463.98	52.73	24.44	22.41	26.17
	Sep-12	27333.22	3742.09	21756.3	14914.92	21816.09	53.67	24.86	22.51	26.90
	Yearly Ave	**19041.1**	**2379.37**	**11668.4**	**9163.84**	**13373.25**	**37.14**	**16.9**	**17.11**	**19.04**
2013	Aug-13	25624.78	4048.62	10434.103	11213.78	15837.28	68.45	20.74	13.67	22.08
	Sep-13	22017.63	3142.34	9297.243	9386.66	13003.96	57.56	17.79	12.20	19.91
	Yearly Ave	**16962.15**	**2605.47**	**6895.14**	**7123.79**	**9814.89**	**46.37**	**13.78**	**10.35**	**14.64**
		Fe	Ni	Co	Cu	Zn	Ga	As	Rb	Sr
2010	Aug-10	265.01	8.510	0.29	14.38	2566.02	143.61	1.45	2.481	70.81
	Sep-10	232.82	7.576	0.28	13.23	2105.88	121.29	1.25	2.342	62.73
	Yearly Ave	**181.77**	**6.69**	**0.23**	**10.27**	**1676.17**	**100.56**	**1.05**	**1.98**	**51.57**
2011	Aug-11	500.33	10.64	0.45	17.42	1786.66	135.62	1.64	2.390	78.68
	Sep-11	387.41	9.44	0.36	13.74	1295.04	106.14	1.28	1.98	62.66
	Yearly Ave	**333.38**	**8.16**	**0.34**	**12.10**	**1119.1**	**89.19**	**1.16**	**1.87**	**56.53**
2012	Aug-12	401.55	15.24	0.77	12.38	8048.83	387.00	1.92	6.01	113.59
	Sep-12	395.828	14.87	0.76	12.32	8122.77	392.77	1.92	5.97	115.70
	Yearly Ave	**259.58**	**11.15**	**0.58**	**8.40**	**4892.08**	**269.11**	**1.31**	**4.69**	**82.13**
2013	Aug-13	427.87	13.77	0.55	11.91	10887.15	513.69	1.70	7.54	116.96
	Sep-13	369.21	12.18	0.52	9.98	8679.77	410.16	1.50	6.61	105.66
	Yearly Ave	**274.04**	**9.66**	**0.40**	**8.20**	**6707.48**	**337.53**	**1.19**	**5.41**	**82.87**
		Zr	Mo	Cd	Sn	Sb	Ba	Ce	W	Pb
2010	Aug-10	2.90	0.33	0.51	1.39	0.35	689.73	1.62	0.16	8.43
	Sep-10	2.55	0.30	0.47	1.22	0.33	587.71	1.53	0.15	7.60
	Yearly Ave	**2.03**	**0.28**	**0.41**	**0.97**	**0.3**	**480.03**	**1.33**	**0.12**	**6.76**
2011	Aug-11	2.73	0.43	0.74	5.25	0.37	534.28	3.01	0.347	10.90
	Sep-11	2.235	0.39	0.61	4.05	0.33	431.36	2.69	0.28	9.08
	Yearly Ave	**1.87**	**0.36**	**0.58**	**3.78**	**0.31**	**367.69**	**2.44**	**0.25**	**8.40**
2012	Aug-12	8.59	1.6	0.46	4.64	0.42	1934.34	3.10	0.87	12.98
	Sep-12	8.44	1.67	0.45	4.54	0.43	1983.24	2.99	0.89	13.20
	Yearly Ave	**5.82**	**1.31**	**0.37**	**3.12**	**0.35**	**1332.01**	**2.27**	**0.63**	**9.89**
2013	Aug-13	9.48	0.32	0.69	2.46	0.40	3068.81	3.12	0.55	16.39
	Sep-13	7.93	0.31	0.64	2.15	0.37	2340.89	2.81	0.48	15.00
	Yearly Ave	**6.12**	**0.26**	**0.53**	**1.71**	**0.32**	**1909.63**	**2.45**	**0.39**	**12.76**

Table S5. Elemental analysis of material used during ghost month and the respective ash generated.

(*a*) Elemental analysis for unburnt joss paper and incense.

	Ca	Al	Mg	Na	K	Fe	Ti
				(mg/gr)			
Hell Bank Note	**91.03**	**7.75**	1.7	1.18	0.18	0.39	0.23
Joss Paper 1	**17.35**	**6.88**	2.83	0.36	0.2	0.64	0.06
Joss Paper 2	**23.36**	**4.98**	3.79	0.14	0.23	0.91	0.07
Joss Paper 3	**27.6**	**7.09**	1.75	0.44	0.19	0.75	0.1
Joss Paper 4	**20.5**	**1.33**	0.45	0.77	0.27	0.69	0.02
Joss Paper 5	**38.42**	**5.68**	0.87	0.44	0.12	0.27	0.13
Joss Paper 6	**34.88**	**18.83**	15.4	2.54	0.89	0.64	0.08
Joss Paper 7	**33.97**	**3.2**	1.03	2.43	0.18	0.18	**84.09**
Incense 1	**15.8**	1.42	1.42	0.42	**8**	1.32	0.06
Incense 2	**20.28**	0.28	0.79	0.97	**2.81**	0.3	0.05
Incense 3	**79.38**	1.55	2.46	1	**8.41**	1.06	0.19

	Ba	Cu	Sr	Ga	Zn	Mn	Sn	Mo	Zr	Pb	Cr	V	Co	Ce	Ni	La	Y	As	Rb	Nd	Cd	Sc	Pr	W	Sb	Se	Cs	Hg
										ug/gr																		
Hell Bank Note	330.97	65.66	56.98	77.61	18.11	19.74	16.97	12.68	6.77	1.97	4.19	2.24	2.52	2.56	1.45	1.65	0.98	0.88	0.54	0.79	0.46	0.46	0.25	0.18	0.11	0.09	0.04	<DL
Joss Paper 1	50.36	64.6	22.55	13.63	22.66	28.04	0.98	0.39	11.48	11.42	7.46	2.97	0.41	2.31	1.91	1.28	0.54	0.33	1.78	0.82	0.12	0.51	0.25	6.06	0.09	0.12	0.19	<DL
Joss Paper 2	145.6	218.31	33.01	36.53	78.87	79.52	1.57	15.04	47.32	9.56	5.61	2.39	2.99	1.97	1.43	0.99	0.54	0.39	1.29	0.66	0.16	0.62	0.19	15.02	0.05	0.16	0.12	<DL
Joss Paper 3	35.13	143.23	42.04	9.99	66.76	37.23	7.63	12.64	6.02	3.04	4.9	1.73	0.55	2.17	2.25	1.15	0.45	0.66	1.26	0.7	0.22	0.33	0.21	0.16	0.11	0.09	0.1	<DL
Joss Paper 4	47.4	1.29	4.61	11.8	28.38	91.08	0.17	0.03	1.08	0.38	2.55	1.09	0.16	0.2	0.56	0.23	0.63	0.06	3.23	0.18	0.03	0.05	0.05	0.46	0.02	0.21	0.16	<DL
Joss Paper 5	17.75	36.45	28.48	4.33	19.31	19.52	0.83	0.12	9.05	1.19	3.67	1.26	1.24	1.62	1.05	0.89	0.34	0.19	0.55	0.54	0.08	0.31	0.16	0.04	0.05	0.08	0.04	<DL
Joss Paper 6	23.19	1.73	155.27	5.32	27.23	50.79	0.7	0.25	12.4	1.16	21.47	4.9	0.36	1.4	1.29	0.01	0.38	2.53	3.8	0.01	0.1	0.15	0.04	<DL	0.04	0.55	0.35	<DL
Joss Paper 7	209.45	4.1	32.78	57.24	7.18	9.72	0.83	0.47	16.03	0.98	13.82	0.76	0.15	1.13	0.63	0.64	0.36	0.25	0.59	0.38	0.06	0.25	0.11	0.33	0.1	0.16	0.05	<DL
Incense 1	72.81	15.22	38.23	19.16	27.85	**343.16**	0.21	0.14	0.46	2.51	2.49	2.43	0.49	1.75	1.63	0.8	0.42	0.69	23.63	0.6	0.24	0.28	0.16	2.23	0.12	0.13	0.32	0.19
Incense 2	19.11	3.4	50.97	3.78	17.27	**62.55**	0.08	0.24	0.45	0.78	3.76	0.63	0.1	0.29	1.15	0.19	0.13	0.12	11.74	0.11	0.04	0.05	0.03	0.36	0.03	0.08	0.11	0.27
Incense 3	27.16	12.25	451	5.02	22.87	**328.1**	0.18	0.05	0.88	8.56	2.41	2.35	0.48	2.23	1.64	1.09	0.98	1.23	14.43	0.86	0.2	0.36	0.23	0.94	0.07	0.1	0.45	0.13

(*b*) Elemental analysis for bottom ash generated by burning joss paper and incense.

	Ca	Al	Mg	Na	K	Fe	Ti
				(mg/gr)			
Ash Hell Bank Note	**358.77**	**29.66**	7.1	4.47	0.7	1.59	1.07
Ash Joss Paper 1	**147.42**	**54.4**	31.79	2.74	1.7	6.28	0.72
Ash Joss Paper 2	**181.9**	**38.54**	30.8	1.2	1.78	7.15	0.65
Ash Joss Paper 3	**238.11**	**59.69**	17.43	4.24	1.96	6.74	1.2
Ash Joss Paper 4	**29.33**	**49.39**	10.51	15.22	8.44	15.57	0.49
Ash Joss Paper 5	**314.51**	**45.39**	7.36	3.1	0.95	2.28	1.04
Ash Joss Paper 6	**331.9**	**42.82**	10.67	1.84	0.97	2.29	1.24
Ash Joss Paper 7	**311.28**	**34.17**	10.24	23.85	1.67	1.74	0.94
Ash Incense 1	**284.76**	6.62	14.68	3.59	**40.85**	5.22	0.83
Ash Incense 2	**242.01**	11.41	11.91	2.41	**43.34**	10.42	0.91
Ash Incense 3	**270.74**	9.99	12.01	3.13	**46.06**	7.2	0.95

	Ba	Cu	Sr	Ga	Zn	Mn	Sn	Mo	Zr	Pb	Cr	V	Co	Ce	Ni	La	Y	As	Rb	Nd	Cd	Sc	Pr	W	Sb	Se	Cs	Hg
										ug/gr																		
Ash Hell Bank Note	**395.27**	**217.58**	**230.86**	**105.5**	**82.93**	**82.38**	**79.74**	1.23	30.59	6.9	20.03	9.36	8.92	10.07	6.52	6.36	3.94	3.01	2.21	3.38	2.08	1.7	1.07	0.57	0.63	0.71	0.18	0.71
Ash Joss Paper 1	**513.71**	**186.96**	**191.25**	**100.5**	**216.48**	**266.2**	5.94	2.5	112.89	**71.41**	**247.15**	25.22	4.59	17.43	**90.4**	9.6	4.44	2.59	14.29	6.57	0.31	3.91	1.93	8.07	1.84	0.57	1.52	<DL
Ash Joss Paper 2	**1136.47**	**1756.39**	**263.54**	**290.49**	**618.68**	**645.03**	10.77	**97.94**	**381.28**	**101.37**	50.64	19.31	18.78	14.84	16.26	7.93	4.26	2.62	10.09	5.49	1.01	4.53	1.58	**196.68**	1.98	0.68	0.99	0.68
Ash Joss Paper 3	**371.51**	**1117.96**	**345.48**	**78.11**	**568.67**	**362.46**	**79.93**	2.89	77.91	33.74	50	17.69	5.12	20.63	15.73	11.84	4.6	6.59	13.71	7.38	1.94	2.83	2.2	0.27	2.29	0.55	1.04	<DL
Ash Joss Paper 4	**411.19**	**54.55**	**174.66**	**88.04**	**634.43**	**2268.64**	6.24	1.04	10.1	**73.04**	62.59	26.68	4.21	58.27	16.19	49.74	**106.61**	1.76	**101.56**	**37.5**	1.21	3.62	10.29	30.02	2.26	6.82	4.27	6.82
Ash Joss Paper 5	**144.33**	**303.48**	**224.59**	**34.03**	**143.78**	**156.94**	6.56	1.06	82.69	8.5	35.01	9.9	9.86	12.81	15.86	7.51	2.8	1.26	4.29	4.66	0.35	2.21	1.4	1.67	0.67	0.42	0.3	<DL
Ash Joss Paper 6	**61.64**	**17.42**	**256.87**	**19.51**	**67.28**	**135.86**	5.07	0.73	66.6	8.68	32.38	16.07	1.9	13.39	13.16	7.35	4.04	1.39	5.69	4.96	0.2	2.87	1.45	1.51	2.17	1.1	0.44	<DL
Ash Joss Paper 7	**72.83**	**36.74**	**302.97**	**19.19**	**80.74**	**92.45**	5.73	0.46	160.72	7.19	**130.63**	7.85	1.41	11.13	5.91	6.15	3.44	1.54	5.77	3.66	0.29	2.2	1.09	0.39	0.86	0.35	0.44	0.35
Ash Incense 1	**461.47**	**31.3**	**1111.42**	**89.38**	**135.91**	**735.13**	5.34	0.99	5.27	12.7	14.93	11.16	2.06	12.42	52.77	6.85	3.97	4.35	71.49	4.87	0.3	1.4	1.32	8.94	0.42	0.39	0.86	0.83
Ash Incense 2	**1007.19**	**111.58**	**560.16**	**213.61**	**251.5**	**1738.83**	15.71	4.01	6.79	26.32	19.96	16.8	3.34	22.6	97.04	10.25	4.49	8.99	141.23	9.03	1.41	2.06	2.5	14.15	1.46	0.67	1.69	0.62
Ash Incense 3	**2049.07**	**309.49**	**1084.04**	**425.26**	**280.24**	**1585.71**	6.43	1.53	6.8	21.51	14.59	13.42	2.96	18.44	163.8	8.29	4.88	4.48	114.33	7.29	0.77	1.73	1.98	38.18	0.62	0.56	1.29	0.31

Table S6. Metal recovery of unburnt and bottom ash of joss paper and incense.

	Ca (%)		Al (%)		Mg (%)		Na (%)		K (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	90	94	87	95	96	102	71	84	73	84
JP2	86	102	80	87	90	98	69	79	68	79
JP3	93	111	83	91	94	112	75	83	69	88
JP4	97	99	77	86	91	123	71	87	71	91
JP5	87	95	75	92	96	103	73	92	69	89
JP6	83	91	79	98	92	99	69	79	73	84
JP7	98	116	85	101	93	117	71	91	70	79
HBN	81	98	87	96	96	105	73	102	71	88
I1	93	97	89	98	92	111	77	86	75	101
I2	90	105	91	115	96	118	74	89	70	98
I3	96	98	88	97	90	98	71	101	77	90
	Fe (%)		Ti (%)		Ba (%)		Cu (%)		Sr (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	85	98	78	86	91	112	89	108	81	97
JP2	81	102	75	91	85	98	95	115	73	101
JP3	94	115	77	88	87	95	83	98	79	87
JP4	86	101	80	95	90	102	73	98	69	79
JP5	89	97	81	93	87	112	86	107	77	95
JP6	83	99	78	88	91	98	90	99	72	88
JP7	90	101	79	102	85	111	79	102	83	97
HBN	91	117	81	96	93	101	87	98	75	103
I1	86	98	83	104	92	109	90	113	77	89
I2	83	94	79	99	79	93	86	97	73	91
I3	88	116	81	109	85	92	93	104	81	112
	Ga (%)		Mn (%)		Sn (%)		Mo (%)		Zr (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	79	94	87	109	79	99	89	116	71	79
JP2	79	110	93	99	77	86	85	97	76	87
JP3	81	98	81	95	75	88	86	94	78	85
JP4	75	86	85	89	70	91	82	102	77	102
JP5	81	105	78	101	73	88	85	101	79	86
JP6	78	99	90	98	75	92	89	96	75	79
JP7	77	89	88	103	78	93	88	112	73	105
HBN	80	108	91	112	78	102	83	98	74	89
I1	81	99	88	96	74	99	92	98	70	92
I2	76	87	91	106	77	114	89	105	76	85
I3	72	103	83	94	83	95	90	98	71	79

Table S2 continued below

	Pb (%)		Cr (%)		V (%)		Co (%)		Ce (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	91	123	68	79	85	91	80	102	75	87
JP2	86	101	73	88	81	87	69	81	79	85
JP3	81	98	73	84	81	112	78	86	73	88
JP4	68	83	69	91	86	108	75	89	75	91
JP5	75	89	68	79	83	98	76	84	75	89
JP6	79	84	71	85	85	93	81	101	70	93
JP7	89	101	69	102	87	112	78	88	72	88
HNB	88	115	71	88	79	89	75	92	73	94
I1	69	89	74	91	83	101	70	84	74	90
I2	81	101	71	93	80	93	81	98	69	88
I3	77	96	73	110	77	94	76	101	72	83
	Ni (%)		La (%)		Y (%)		As (%)		Rb (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	89	112	69	81	71	93	83	109	77	84
JP2	88	104	81	97	76	89	88	103	81	96
JP3	83	96	75	84	73	91	84	94	79	105
JP4	85	96	78	91	71	83	85	97	77	89
JP5	79	88	71	79	77	85	83	103	74	87
JP6	82	89	75	86	75	96	86	97	73	91
JP7	86	103	75	88	76	103	80	106	73	96
HNB	83	112	69	79	71	97	77	89	79	87
I1	91	98	80	96	69	79	73	92	82	112
I2	88	102	73	101	76	86	82	96	77	102
I3	78	91	77	89	71	94	78	101	78	97
	Nd (%)		Cd (%)		Sc (%)		Pr (%)		W (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	70	98	86	115	76	95	73	101	89	97
JP2	68	91	82	101	77	89	88	105	94	112
JP3	71	83	81	95	70	101	76	89	95	119
JP4	69	83	79	88	71	83	74	87	87	99
JP5	70	92	85	97	71	80	73	91	96	107
JP6	70	90	84	103	73	92	74	97	86	97
JP7	68	79	82	96	74	86	71	101	88	113
HNB	72	101	80	96	71	105	70	81	89	121
I1	68	85	85	94	76	89	69	80	89	97
I2	71	79	82	112	73	86	81	92	94	104
I3	71	86	86	123	77	91	77	89	88	96

Table S2 continued below

	Sb (%)		Se (%)		Cs (%)		Hg (%)	
	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt	Bottom Ash	Unburnt
JP1	73	88	77	104	74	87	68	85
JP2	70	91	71	88	77	101	68	83
JP3	76	89	77	101	75	88	71	79
JP4	78	101	75	89	75	92	70	81
JP5	71	95	76	92	71	89	72	88
JP6	73	89	73	110	73	91	69	80
JP7	73	92	72	89	73	86	68	86
HNB	70	87	69	86	75	106	68	79
I1	75	101	78	94	73	91	70	79
I2	69	79	70	89	72	84	68	81
I3	80	93	74	82	80	93	71	80

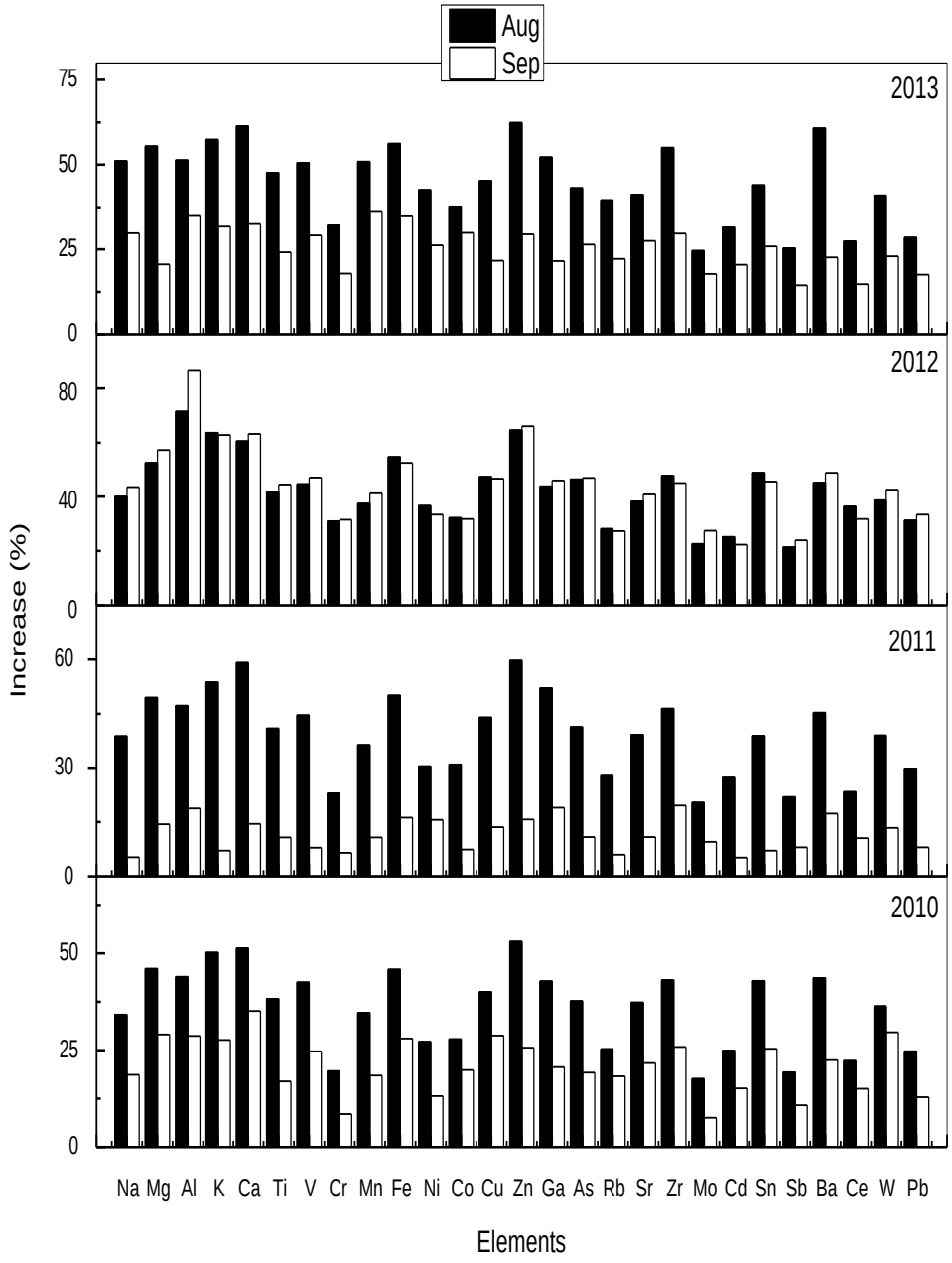


Figure S3. Percentage increase in the chemical composition of $PM_{2.5}$ during August and September (Ghost Month Festival). The increase was calculated by difference between monthly and yearly mean concentration for each element.

Photographs of Joss Paper and Incense used in this study:

(a) Joss Paper (JP):

Joss Paper 1 (JP1):

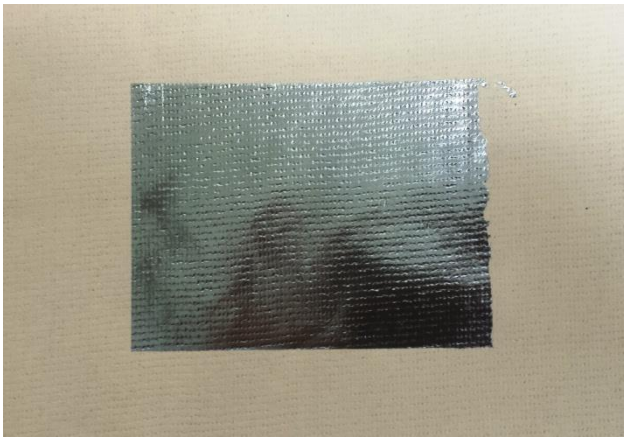
Joss Paper 2 (JP2):

Joss Paper 3 (JP3):

Joss Paper 4 (JP4):

Joss Paper 5 (JP5):

Joss Paper 6 (JP6):



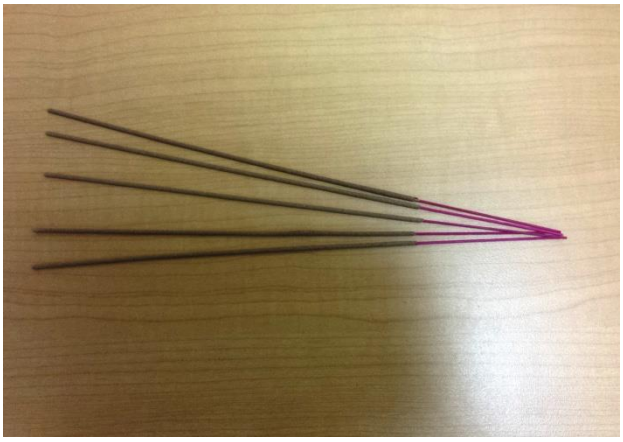
Joss Paper 7 (JP7):

Hell bank note (HBN)

(b) Incense (I):

Incense 1 (burnt for God only) (I1)

Incense 2 (burnt for ancestors only) (I2)



Incense 3 (I3)