

Table S1. meteorological and environmental factors during ragweed pollen scattering period.

	Temperature (°C)			Relative hu- midity	Precipitation	Daily Sunlight	Wind Direc- tion	Wind Speed	PM _{2.5}	SPM	SO ₂	NOx
	mean	max.	min	(%)	(mm)	h		(m/s)	µg/m ³	µg/m ³	ppb	µg/m ³
1-Sep	27.9	33.9	21.6	56	0	11.5	WNW	11.5	13.8	31	3	14
2-Sep	27.7	33	23.9	65	0	8.3	E	8.3	18.9	42	3	11
3-Sep	27.9	33.5	24.3	67	0	7.2	E	7.2	10	32	3	7
4-Sep	27.3	31.1	24	75	3	3.6	NNW	3.6	7.6	28	3	6
5-Sep	29.6	35.6	25.1	65	0	10.1	S	10.1	6.6	26	3	12
6-Sep	30.3	34.2	26.9	63	0	9.6	S	9.6	5.5	24	3	10
7-Sep	28.4	31.9	26	73	0.5	3.6	S	3.6	4.7	21	3	13
8-Sep	26.9	30.3	23.4	82	39.5	0.5	S	0.5	5.2	26	3	13
9-Sep	27.5	32.4	23.9	69	6	4.4	NW	4.4	3.8	19	3	10
10-Sep	27.2	32.2	23.8	65	0	6.4	N	6.4	9.5	24	3	7
11-Sep	25	28	23.2	72	0	2.5	ESE	2.5	5.5	23	3	7
12-Sep	25.5	29	23.1	71	0	2.1	E	2.1	8	23	3	7
13-Sep	22.7	24.3	21.3	89	34.5	0	NE	0	3.3	16	3	14
14-Sep	24	27.2	21	77	0	0.3	NW	0.3	7.8	19	3	20
15-Sep	25	27.3	23.3	78	7	0.1	ESE	0.1	11.5	31	3	32
16-Sep	23.7	25.3	22.1	80	0	0	E	0	8.8	26	3	22
17-Sep	26.3	30.4	22.5	71	0	5.9	WNW	5.9	19	35	3	20
18-Sep	23.7	25.8	22.5	87	4.5	0	NNW	0	9.6	28	3	11
19-Sep	21.3	22.6	19.4	91	13	0	ENE	0	1.8	17	3	7
20-Sep	19.1	19.8	17.9	93	68.5	0	N	0	-0.4	13	3	9
21-Sep	20.7	23.4	18.2	76	0	0.2	NNW	0.2	8.9	22	3	11
22-Sep	19.8	20.8	18.5	91	28.5	0	NNW	0	4.4	18	3	9
23-Sep	21.2	21.9	20.1	92	8.5	0	N	0	8.5	21	3	24
24-Sep	21.9	22.7	21.2	91	2.5	0.1	N	0.1	11.1	30	3	22
25-Sep	24.5	29.3	20.4	76	0	5.2	SSW	5.2	15	28	4	13
26-Sep	25.8	30.1	23.3	77	0	3.7	E	3.7	18.6	38	4	15
27-Sep	26.6	30.5	23.3	77	0	2.9	S	2.9	18.1	44	4	19

28-Sep	26.6	30	24.7	77	0	2.2	NNW	2.2	21.3	48	4	21
29-Sep	24.7	28.1	22.5	79	0.5	0.7	N	0.7	9.7	25	4	17
30-Sep	22.5	25.3	20	52	0	3.7	E	3.7	5.8	18	4	14
1-Oct	20.9	21.9	19	73	0	0	N	0	11.4	27	3	13
2-Oct	24.7	29.9	20.3	64	0	9.4	SSE	9.4	16.5	27	4	10
3-Oct	22.7	24	21	85	1	0	NNW	0	12.3	38	4	26
4-Oct	26	32.4	20.7	61	0	7.5	NNW	7.5	11.8	22	4	19
5-Oct	23.5	26.1	21.2	71	0	1	NW	1	11.0	28	4	20
6-Oct	26.1	30.9	22	53	0	8.4	NNW	8.4	5.5	20	4	10
7-Oct	21.9	26	19.4	45	0	5.2	NNW	5.2	7.2	21	3	12
8-Oct	19.3	20.7	17.7	82	14.5	0	NW	0	14	28	3	24
9-Oct	21.8	25.3	18.9	67	6.5	0	NNW	0	8.4	20	4	10
10-Oct	18.6	19.8	17.2	56	0	0.4	ENE	0.4	3.6	15	3	7
11-Oct	17.9	19.8	16.2	60	0	0.9	E	0.9	5.5	17	3	12
12-Oct	18.8	23.9	13.7	54	0	7.9	NNW	7.9	12.4	20	3	20
13-Oct	16.8	18	15.9	59	0	0	ENE	0	7.6	23	3	14
14-Oct	16.3	19.7	12.6	57	0	4.7	N	4.7	12.7	25	3	25
15-Oct	17.3	24	11	54	0	10.7	NW	10.7	16.8	24	3	20
16-Oct	18.1	23.4	12.4	55	0	6.6	NW	6.6	21.1	31	3	18
17-Oct	17.5	18.6	15.7	87	10.5	0	NNW	0	17	32	3	27

N, north, S,south, E,east,S,south.

Table S2. Ionic concentration in PM1.1 and coarse particles during ragweed pollen scattering period.

		Ionic Contents									pH	Na ⁺ /Cl ⁻	NO ₃ ⁻ / SO ₄ ²⁻	nNO ₃ ⁻ / nSO ₄ ²⁻	Ionic Bal- ance
		Na ⁺	NH ₄ ⁺	K ⁺	Mg ²⁺	Ca ²⁺	Cl ⁻	NO ₃ ⁻	SO ₄ ²⁻	Total					
PM _{1.1}	Period 1	0.08	0.44	0.06	0.02	0.08	0.02	0.05	1.45	2.19	5.98	4.68	0.032	0.049	1.10
	Period 2	0.03	0.31	0.06	0.01	0.06	0.02	0.16	0.81	1.46	5.49	2.45	0.192	0.297	1.20
	Period 3	0.06	0.39	0.06	0.02	0.08	0.03	0.08	1.06	1.79	5.58	2.68	0.075	0.117	1.30
	Period 4	0.03	0.45	0.03	0.01	0.04	0.01	0.10	1.17	1.84	4.84	3.72	0.086	0.133	1.13
	Period 5	0.03	0.31	0.04	0.01	0.05	0.02	0.09	0.81	1.35	5.4	2.86	0.110	0.170	1.19
	Period 6	0.04	0.31	0.10	0.01	0.07	0.02	0.14	0.71	1.40	5.35	4.17	0.195	0.302	1.50
	Period 7	0.06	0.45	0.08	0.02	0.21	0.02	0.41	0.91	2.16	5.34	4.41	0.458	0.708	1.61
Coarse par- ticles	Period 1	0.24	0.00	0.02	0.03	0.17	0.27	0.39	0.10	1.23	6.55	1.35	3.886	6.016	1.40
	Period 2	0.10	0.00	0.02	0.02	0.13	0.12	0.23	0.09	0.72	6.36	1.25	2.484	3.846	1.44
	Period 3	0.10	0.00	0.03	0.02	0.12	0.07	0.32	0.11	0.77	5.91	2.11	2.907	4.501	1.32
	Period 4	0.09	0.00	0.02	0.02	0.17	0.08	0.37	0.09	0.84	6.39	1.83	3.945	6.108	1.46
	Period 5	0.19	0.00	0.03	0.03	0.29	0.26	0.41	0.21	1.42	6.52	1.10	2.012	3.116	1.42
	Period 6	0.42	0.00	0.03	0.06	0.26	0.71	0.32	0.23	2.03	5.61	0.90	1.382	2.140	1.25
	Period 7	0.05	0.00	0.01	0.02	0.38	0.07	0.21	0.06	0.81	6.56	1.21	3.375	5.226	3.51

Table S3. PCA analysis results of meteorological factors and airborne ragweed pollen during ragweed pollen scattering period.

	PC1	PC2	PC3	PC4	PC5
Account	44.5%	16.6%	14.0%	7.7%	6.5%
Ragweed	0.11	-0.12	0.24	-0.61	0.68
Tmean (°C)	0.35	-0.23	0.30	0.12	-0.07
Tmax (°C)	0.37	-0.17	0.22	0.06	-0.09
Tmin (°C)	0.26	-0.28	0.38	0.28	-0.09
RHmean (%)	-0.35	-0.18	0.28	0.18	0.14
RHmax (%)	-0.25	-0.19	0.38	0.32	0.13
RHmin (%)	-0.36	-0.12	0.15	0.12	0.23
Daily sunlight (h)	0.37	-0.02	0.05	-0.17	-0.20
Precipitation (mm)	-0.26	0.30	0.38	-0.21	-0.22

Maximum Hourly Precipitation (mm)	-0.23	0.27	0.37	-0.26	-0.42
WSmean (m/s)	0.17	0.53	0.14	0.21	0.24
WSmax (m/s)	0.14	0.48	-0.01	0.42	0.30
WSmin (m/s)	0.22	0.26	0.34	-0.13	0.03

Table S4. Size distribution of Amb a1 during 7 sampling periods.

	Amb a 1 (ng/m³)					Ragweed (Pollen/ m³)	
	≤1.1 μm	1.1–2.0 μm	2.0–3.3 μm	3.3 –7.0 μm	≥7.0 μm	TSP	
Period 1 (Sep. 1st- 6th)	1.83	0.8	0.68	0.87	0.55	4.73	135.04
Period 2 (Sep. 9th -14th)	0.84	0.65	0.02	0.45	0.29	2.25	90.88
Period 3 (Sep. 15th-19th)	1.58	0.46	0.15	1	0.47	3.66	35.38
Period 4 (Sep. 21st - 28th)	1.35	0.56	0.47	0.16	0.09	2.63	46.58
Period 5 (Sep.29th- Oct. 6th)	2.06	0.88	1.22	2.01	0.4	6.57	14.81
Period 6 (Oct. 7th -13th)	2.7	0.31	1.79	0	0.53	5.26	1.10
Period 7 (Oct. 14th - 17th)	4.59	1.12	0	0.22	2	7.90	0