

Atmospheric Chemistry and Physics

Supporting Information for

Gas-particle partitioning of pesticides in the atmosphere of the North China Plain

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Text S1. Calculation of the mass concentration of pesticides in ambient air

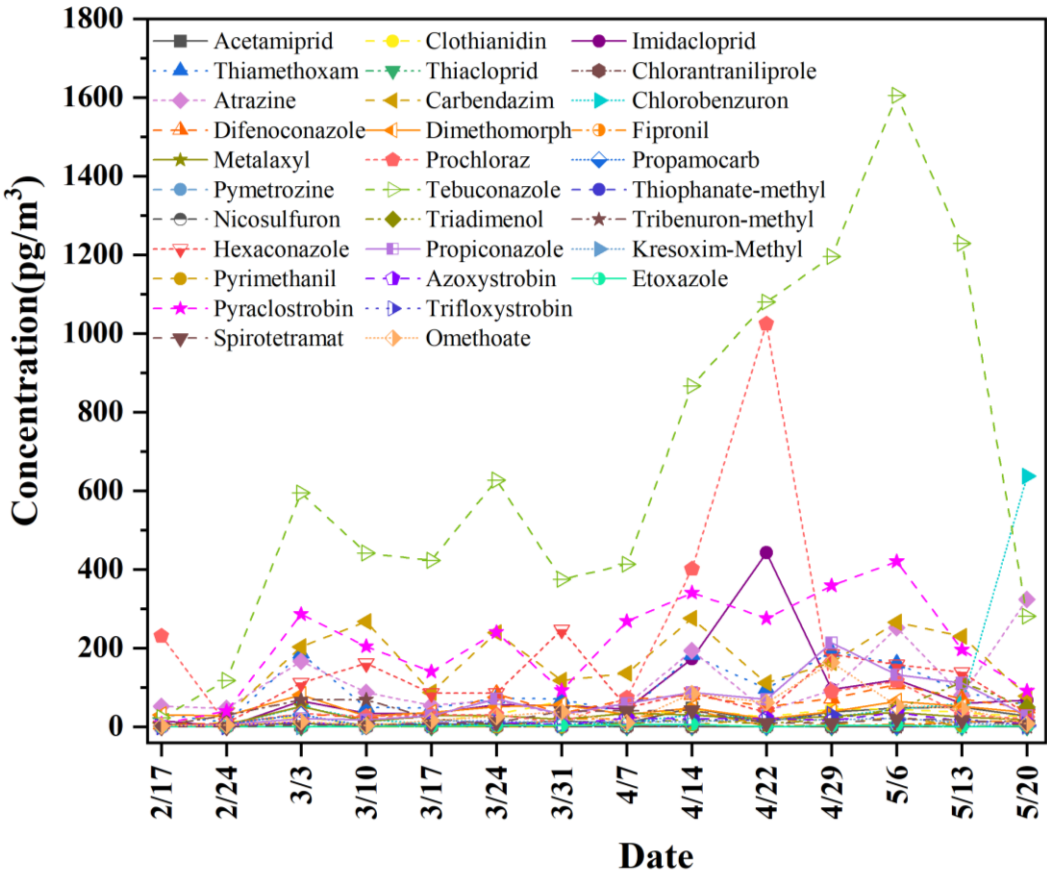
The mass concentration of pesticides per sample was calculated using equation (1):

$$C_{sample} = \frac{C_{detected} \cdot V_{extract} \cdot m_{sample} \cdot 10}{m_{detected} \cdot V} \quad (1)$$

Where C_{sample} is the concentration of each individual pesticide in ambient air during the sampling period (pg/m^3). $C_{detected}$ is the directly detected concentration ($\mu\text{g}/\text{L}$). $V_{extract}$ is the volume of the extract (mL), m_{sample} is the mass of each sample (g), $m_{detected}$ is the mass of the samples used to detect (g) and V is the air volume passing through the filter membrane during the sampling period (m^3) with the value of 1512 calculated using the equation (2) by combining the flow rate of the sampler (150 L/min) and the sampling time (7 d).

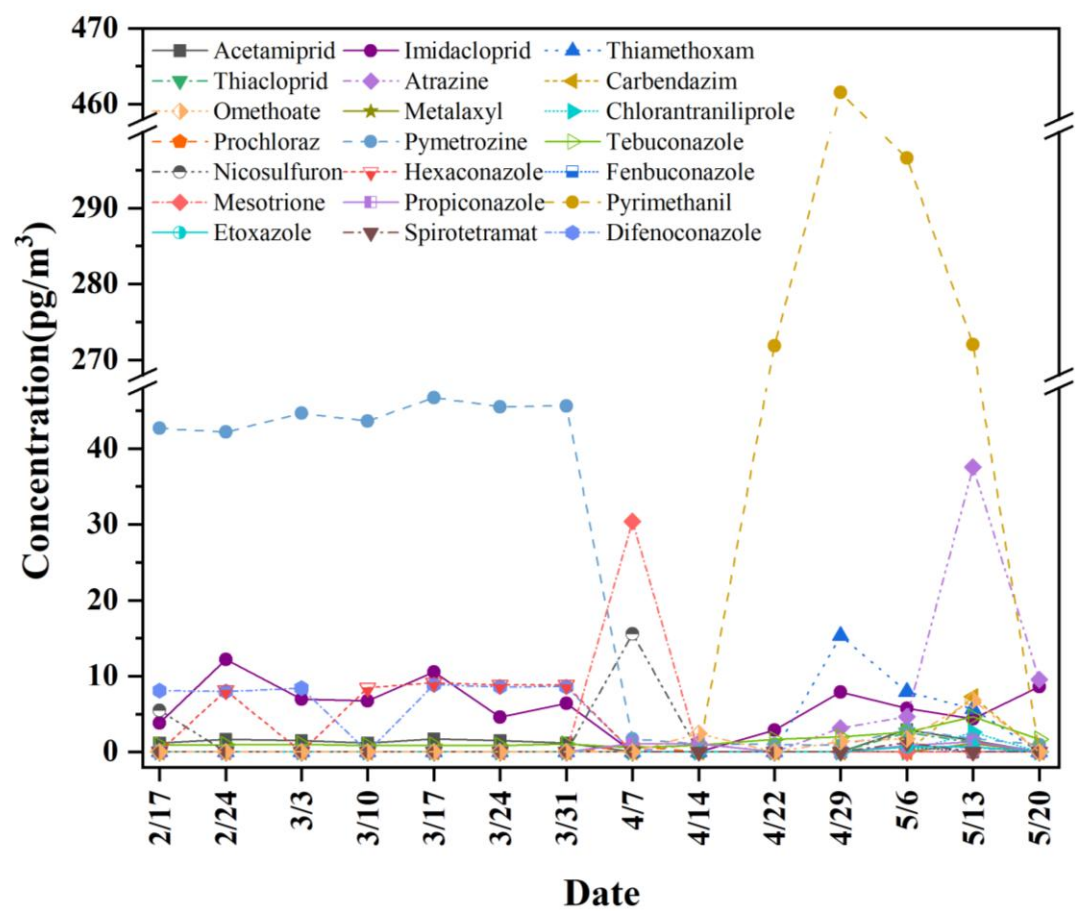
$$V = 1.44R \times t \quad (2)$$

where R is the sampling rate of the high-volume air sampler (L/min) and t is the number of days during the deployment period (d). In this study, a sampling rate of 150 L/min was applied.



42

43 **Figure S1.** The trend of different pesticide concentrations in particulate phase with time during the
44 sampling period from February 2023 to May 2023. The mean concentrations of 31 pesticides during
45 the sampling period are shown in the plot. Different colors indicate different pesticides.



47

48 **Figure S2.** The trend of different pesticide concentrations in gas phase with time during the
49 sampling period from February 2023 to May 2023. The mean concentrations of 21 pesticides during
50 the sampling period are shown in the plot. Different colors indicate different pesticides.

51

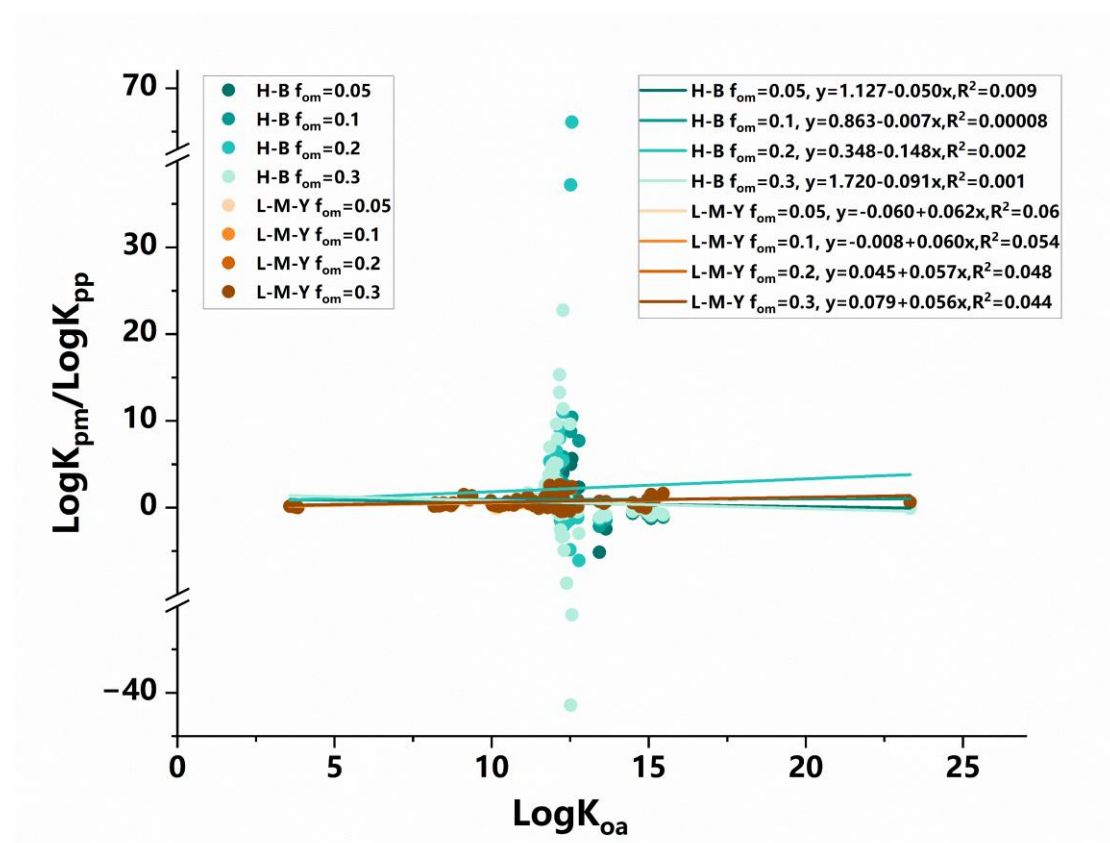


Figure S3. The slope of $\text{LogK}_{\text{pm}}/\text{LogK}_{\text{pp}}$ and LogK_{oa} fitting line predicted by L-M-Y model was closer to 0 compared with H-B model and indicated that the L-M-Y model may have a better prediction. The slope of $\text{LogK}_{\text{pm}}/\text{LogK}_{\text{pp}}$ and LogK_{oa} fitting line were measured to predicted $\log K_p$ plots evaluated by the H-B and the L-M-Y partitioning models and the different colors represent different pesticides, K_{mp} represents the measured K_p values and K_{pp} represents the predicted K_p values.

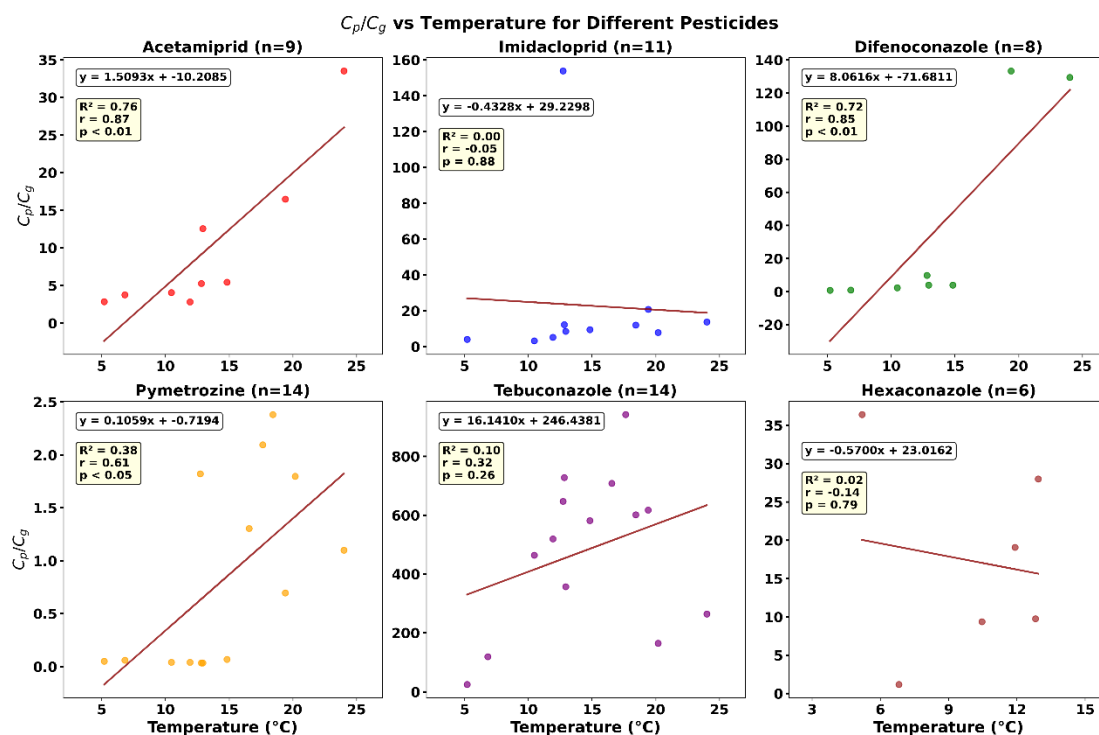


Figure S4. The correlation between C_g/C_p for pesticides and temperature. The "n" in the figure represents the number of valid data points for each type of pesticide in the C_g/C_p measurement. Pearson correlation analysis was conducted between C_g/C_p and temperature for pesticides with more than five valid data points. R^2 represents the coefficient of determination for Pearson correlation, r represents the correlation coefficient, and p represents the significance level.

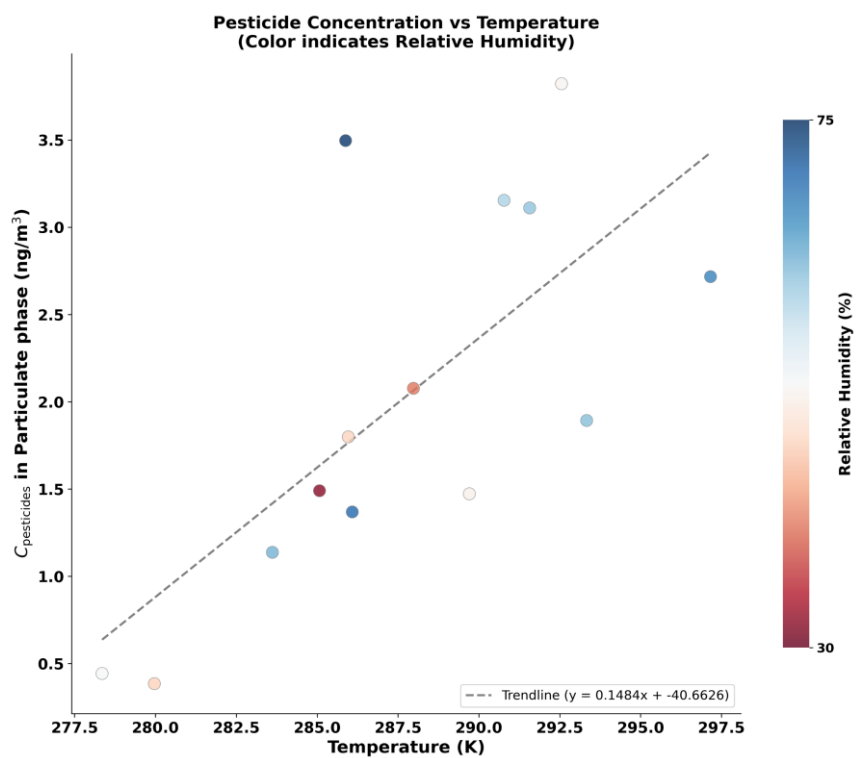


Figure S5. The correlation between particulate-phase pesticide concentration and temperature is shown, with color representing relative humidity.

Table S1. Information of the samples

Samples types	Flow velocity (L/min)	Sampling time (d)	Start time	End time	Quality of filter membrane before sampling(g)	Quality of filter membrane after sampling(g)	Particle mass (g)
TSP and gas	150	7	2023/2/17 12:57	2023/2/24 12:57	4.256	4.657	0.401
TSP and gas	150	7	2023/2/24 13:07	2023/3/3 13:07	4.464	4.721	0.257
TSP and gas	150	7	2023/3/3 13:17	2023/3/10 13:17	4.442	4.809	0.367
TSP and gas	150	7	2023/3/10 13:24	2023/3/17 13:24	4.334	5.000	0.666
TSP and gas	150	7	2023/3/17 13:34	2023/3/24 13:34	4.343	5.121	0.778
TSP and gas	150	7	2023/3/24 13:40	2023/3/31 13:40	4.417	4.714	0.297
TSP and gas	150	7	2023/3/31 14:15	2023/4/7 14:15	4.383	4.565	0.182
TSP and gas	150	7	2023/4/7 14:25	2023/4/14 14:25	4.414	5.313	0.899
TSP and gas	150	7	2023/4/14 18:57	2023/4/21 18:57	4.438	5.291	0.853
TSP and gas	150	7	2023/4/22 8:38	2023/4/29 8:38	4.362	4.598	0.236
TSP and gas	150	7	2023/4/29 9:14	2023/5/6 9:14	4.389	4.604	0.215
TSP and gas	150	7	2023/5/6 15:03	2023/5/13 15:03	4.285	4.468	0.183
TSP and gas	150	7	2023/5/13 17:07	2023/5/20 17:07	4.206	4.514	0.308
TSP and gas	150	7	2023/5/20 17:07	2023/5/27 17:07	4.323	4.706	0.383

Table S2. Information of the meteorological data in the sampling period

Sampling time	Temperature/ °C	Atmospheric pressure/hpa	Precipitation/mm	Relative humidity/%	Wind speed/m s ⁻¹	PM ₁₀ /μg·m ³	PM _{2.5} /μg·m ³
2/17-2/24	5.20±0.87	1023.19 ± 5.23	0.00	52.52 ± 15.05	2.59 ± 0.42	100.71 ± 51.67	63 ± 42.06
2/24-3/3	6.82±2.29	1027.05 ± 5.08	0.00	47.33 ± 12.81	2.64 ± 0.81	115.71 ± 12.69	62.71 ± 12.41
3/3-3/10	14.83±2.02	1013.98 ± 3.69	0.00	40.52 ± 6.77	2.10 ± 0.65	177.43 ± 28.19	93.43 ± 21.5
3/10-3/17	11.92±4.24	1016.41 ± 9.62	0.14 ± 0.35	32.02 ± 8.12	3.89 ± 1.09	194.29 ± 101.28	35.29 ± 10.02
3/17-3/24	10.47±2.29	1012.86 ± 6.46	0.00	63.20 ± 17.72	2.84 ± 0.60	295 ± 414.43	85.86 ± 58.62
3/24-3/31	12.81±2.76	1015.88 ± 2.48	0.00	47.45 ± 7.03	2.65 ± 0.52	152 ± 39.11	55.43 ± 5.73
3/31-4/7	12.94±2.88	1010.84 ± 1.31	2.37 ± 3.52	70.32 ± 10.61	3.47 ± 1.53	77.29 ± 37.62	44.57 ± 17.11
4/7-4/14	16.56±2.73	1009.87 ± 6.33	0.00	51.53 ± 11.32	2.66 ± 0.60	343.43 ± 307.06	78.57 ± 48.17
4/14-4/21	17.63±1.75	1004.51 ± 3.06	0.00	59.65 ± 5.54	2.80 ± 0.65	206.43 ± 124.48	61.29 ± 18.65
4/22-4/29	12.73±4.61	1015.17 ± 7.42	6.16 ± 8.50	74.47 ± 14.90	2.79 ± 0.78	66.29 ± 48.47	31.57 ± 11.11
4/29-5/6	18.42±1.66	1005.39 ± 2.16	1.51 ± 2.46	61.53 ± 21.88	3.10 ± 0.69	83.71 ± 31.66	35.14 ± 9.19
5/6-5/13	19.41±2.08	1012.72 ± 3.06	0.00	51.96 ± 8.57	2.33 ± 0.92	69.71 ± 13.65	32.57 ± 7.46
5/13-5/20	24.01±2.47	1000.58 ± 4.53	8.89 ± 21.77	67.69 ± 9.43	3.11 ± 0.70	81.43 ± 12.93	41 ± 6.46
5/20-5/27	20.18±0.96	1007.44 ± 2.76	0.67 ± 1.49	62.02 ± 12.35	2.75 ± 1.18	92 ± 41.3	35.43 ± 12.28

Table S3. Information of standard substance

Pesticides	Classification	CAS	Molecular weight (g/mol)
Carbendazim	fungicides	10605-21-7	191.19
Difenoconazole	fungicides	119446-68-3	406.27
Dimethomorph	fungicides	110488-70-5	387.82
Metalaxyl	fungicides	57837-19-1	279.33
Prochloraz	fungicides	67747-09-5	376.67
Propamocarb	fungicides	24579-73-5	188.27
Tebuconazole	fungicides	107534-96-3	307.82
Thiophanate-methyl	fungicides	23564-05-8	342.39
Triadimenol	fungicides	55219-65-3	295.76
Hexaconazole	fungicides	79983-71-4	314.15
Fenbuconazole	fungicides	114369-43-6	336.78
Kresoxim-Methyl	fungicides	143390-89-0	313.33
Propiconazole	fungicides	60207-90-1	342.22
Pyrimethanil	fungicides	53112-28-0	199.25
Azoxystrobin	fungicides	131860-33-8	403.39
Trifloxystrobin	fungicides	141517-21-7	408.77
Pyraclostrobin	fungicides	175013-18-0	387.81
Atrazine	herbicides	1912-24-9	215.68
Nicosulfuron	herbicides	111991-09-4	410.37
Tribenuron-methyl	herbicides	101200-48-0	395.39
Mesotrione	herbicides	104206-82-8	339.28
Acetamiprid	insecticides	135410-20-7	222.67
Clothianidin	insecticides	210880-92-5	249.68
Imidacloprid	insecticides	138261-41-3	255.66
Dinotefuran	insecticides	165252-70-0	202.21
Thiamethoxam	insecticides	153719-23-4	291.71
Thiacloprid	insecticides	111988-49-9	252.72
Imidaclothiz	insecticides	105843-36-5	261.69
Nitenpyram	insecticides	150824-47-8	270.72
Cycloxaprid	insecticides	1203791-41-6	280.73
Paichongding	insecticides	948994-16-9	350.25
Chlorantraniliprole	insecticides	500008-45-7	483.15
Chlorobenzuron	insecticides	57160-47-1	305.73
Fipronil	insecticides	120068-37-3	437.15
Pymetrozine	insecticides	123312-89-0	217.23
Etoxazole	insecticides	153233-91-1	359.22
Spirotetramat	insecticides	1172614-86-6	373.44
Omethoate	insecticides	1113-02-6	213.19

Table S4. Limit of quantitation and limit of detection

Pesticide name	PUF		QFF	
	LOQ (pg/m ³)	LOD (pg/m ³)	LOQ (pg/m ³)	LOD (pg/m ³)
Acetamiprid	0.384	0.115	1.793	0.538
Clothianidin	0.06	0.115	0.096	0.029
Imidacloprid	2.142	0.643	0.028	0.009
Thiamethoxam	3.825	1.148	0.131	0.039
Dinotefuran	31.075	9.323	19.625	5.888
Thiacloprid	1.182	0.355	0.008	0.002
Imidaclothiz	0.043	0.013	0.018	0.005
Nitenpyram	6.797	2.039	4.382	1.315
Cycloxaprid	1.378	0.414	1.118	0.335
Paichongding	0.503	0.151	0.001	4.172×10^{-4}
Atrazine	0.462	0.139	0.052	0.016
Carbendazim	4.075	1.223	0.353	0.106
Chlorantraniliprole	0.092	0.028	0.667	0.2
Chlorobenzuron	0.698	0.21	0.783	0.235
Difenoconazole	0.22	0.066	1.817	0.545
Dimethomorph	1.552	0.466	1.274	0.382
Fipronil	1.409	0.423	0.056	0.017
Metalaxyl	0.908	0.272	0.001	3.363×10^{-4}
Prochloraz	0.71	0.213	2.566	0.77
Propamocarb	0.157	0.047	0.456	0.137
Pymetrozine	0.534	0.16	0.07	0.021
Tebuconazole	0.339	0.102	0.039	0.012
Thiophanate-methyl	2.724	0.817	0.006	0.002
Nicosulfuron	3.669	1.101	0.975	0.292
Tribenuron methyl	0.431	0.129	0.002	0.001
Triadimenol	0.745	0.224	0.116	0.035
Hexaconazole	0.041	0.012	0.001	2.223×10^{-4}
Azoxystrobin	0.099	0.03	1.081	0.324
Fenbuconazole	0.071	0.021	0.738	0.222
Mesotrione	0.921	0.276	0.067	0.02
Propiconazole	0.309	0.093	0.085	0.025
Pyrimethanil	1.591	0.477	0.007	0.002
Azoxystrobin	1.043	0.313	0.572	0.172
Trifloxystrobin	0.711	0.213	0.197	0.059
Pyraclostrobin	0.149	0.045	0.001	2.955×10^{-4}
Etoazole	0.104	0.031	0.025	0.008
Spirotetramat	0.229	0.069	0.429	0.129
Omethoate	0.947	0.284	0.037	0.011

"PUF" stands for polyunsaturated fat sample (gas phase), "QFF" stands for quartz fiber filter sample (particulate phase)

Table S5. Log P_L⁰ of each pesticide in each sampling period

Pesticide name	Log P _L ⁰													
	2/17	2/24	3/3	3/10	3/17	3/24	3/31	4/7	4/14	4/22	4/29	5/6	5/13	5/20
Acetamiprid	-2.77	-2.71	-2.20	-1.71	-2.20	-2.33	-2.03	-2.08	-1.83	-1.88	-2.05	-1.92	-1.66	-1.71
Imidacloprid	-3.92	-3.86	-3.30	-2.76	-3.30	-3.44	-3.11	-3.16	-2.89	-2.94	-3.13	-3.00	-2.71	-2.76
Thiamethoxam	-4.24	-4.17	-3.61	-3.05	-3.61	-3.75	-3.41	-3.46	-3.19	-3.24	-3.43	-3.29	-3.00	-3.05
Thiacloprid	-3.91	-3.85	-3.29	-2.75	-3.29	-3.43	-3.10	-3.15	-2.88	-2.94	-2.13	-2.99	-2.70	-2.75
Atrazine	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95	-2.95
Carbendazim	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28	-4.28
Chlorantraniliprole	-12.00	-11.91	-11.04	-10.19	-11.04	-11.26	-10.73	-10.82	-10.39	-10.48	-10.77	-10.95	-10.10	-10.19
Difenoconazole	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97	-6.97
Dimethomorph	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79	-4.79
Metalaxyl	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48
Prochloraz	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60	-2.60
Propamocarb	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Pymetrozine	-5.18	-5.11	-4.50	-3.91	-4.50	-4.67	-4.29	-4.35	-4.32	-4.12	-4.32	-4.17	-3.86	-3.91
Tebuconazole	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
Nicosulfuron	-10.38	-10.29	-9.49	-8.70	-9.49	-9.69	-9.20	-9.28	-8.89	-8.97	-9.24	-9.04	-8.62	-8.70
Hexaconazole	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89	-3.89
Propiconazole	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25	-4.25
Pyrimethanil	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95	-1.95
Etoazole	-6.31	-6.24	-5.59	-4.95	-5.59	-5.75	-5.36	-5.42	-5.11	-5.17	-5.39	-5.23	-4.89	-4.95
Spirotetramat	-7.83	-7.75	-7.04	-6.35	-7.04	-7.23	-6.80	-6.87	-6.52	-6.59	-6.83	-6.66	-6.28	-6.35
Omethoate	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48	-2.48

Table S6. Log K_{oa} of each pesticide in each sampling period

pesticide name	Log K _{oa}													
	2/17	2/24	3/3	3/10	3/17	3/24	3/31	4/7	4/14	4/22	4/29	5/6	5/13	5/20
Acetamiprid	8.78	8.75	8.46	8.20	8.46	8.54	8.38	8.40	8.27	8.29	8.39	8.32	8.18	8.20
Imidacloprid	12.27	12.24	11.95	11.70	11.95	12.04	11.87	11.90	11.76	11.79	11.88	11.82	11.67	11.70
Thiamethoxam	14.03	14.00	13.71	13.45	13.71	13.80	13.63	13.66	13.52	13.55	13.64	13.57	13.43	13.45
Thiacloprid	11.01	10.98	10.69	10.43	10.69	10.77	10.61	10.63	10.50	10.53	10.62	10.55	10.41	10.43
Atrazine	11.08	11.02	10.49	10.02	10.49	10.65	10.34	10.39	10.14	10.19	10.37	10.24	9.98	10.02
Carbendazim	11.26	11.23	10.88	10.57	10.88	10.98	10.78	10.81	10.65	10.68	10.80	10.72	10.54	10.57
Chlorantranilprole	24.05	24.02	23.67	23.36	23.67	23.77	23.57	23.60	23.44	23.47	23.58	23.50	23.32	23.36
Difenoconazole	15.46	15.43	15.07	14.76	15.07	15.18	14.97	15.01	14.84	14.88	14.99	14.91	14.73	14.76
Dimethomorph	11.19	11.16	10.84	10.56	10.84	10.93	10.75	10.78	10.63	10.66	10.76	10.69	10.53	10.56
Metalaxyl	9.43	9.39	9.05	8.74	9.05	9.15	8.95	8.98	8.82	8.85	8.97	8.88	8.71	8.74
Prochloraz	11.11	11.08	10.73	10.43	10.73	10.83	10.63	10.67	10.51	10.54	10.65	10.57	10.40	10.43
Propamocarb	9.09	9.06	8.74	8.46	8.74	8.84	8.65	8.68	8.53	8.56	8.67	8.59	8.43	8.46
Pymetrozine	12.55	12.52	12.17	11.85	12.17	12.27	12.06	12.10	11.93	11.97	12.08	12.00	11.82	11.85
Tebuconazole	12.78	12.74	12.39	12.08	12.39	12.49	12.29	12.32	12.16	12.19	12.31	12.22	12.05	12.08
Nicosulfuron	15.92	15.88	15.53	15.22	15.53	15.63	15.43	15.46	15.30	15.33	15.45	15.37	15.19	15.22
Hexaconazole	11.19	11.16	10.80	10.49	10.80	10.91	10.70	10.74	10.57	10.61	10.72	10.64	10.46	10.49
Propiconazole	11.96	11.93	11.64	11.39	11.64	11.73	11.56	11.59	11.45	11.48	11.57	11.51	11.36	11.39
Pyrimethanil	9.84	9.80	9.45	9.15	9.45	9.55	9.35	9.39	9.23	9.26	9.37	9.29	9.12	9.15
Etoazole	11.78	11.75	11.46	11.21	11.46	11.55	11.38	11.41	11.27	11.30	11.39	11.32	11.18	11.21
Spirotetramat	15.04	15.00	14.65	14.34	14.65	14.76	14.55	14.59	14.42	14.45	14.57	14.49	14.31	14.34
Omethoate	4.31	4.27	3.92	3.61	3.92	4.02	3.82	3.85	3.69	3.72	3.84	3.75	3.58	3.61

Table S7. Detection frequency of the pesticides in gas phase and particulate phase

Pesticide name	Detection frequency in the gas phase	Detection frequency in the particulate phase
Acetamiprid	64.29%	100.00%
Clothianidin	0.00%	92.86%
Imidacloprid	85.71%	92.86%
Dinotefuran	0.00%	0.00%
Thiamethoxam	21.43%	100.00%
Thiacloprid	14.29%	7.14%
Imidaclothiz	0.00%	0.00%
Nitenpyram	0.00%	0.00%
Cycloxaprid	0.00%	0.00%
Paichongding	0.00%	0.00%
Atrazine	35.71%	100.00%
Carbendazim	7.14%	100.00%
Chlorantraniliprole	7.14%	14.29%
Chlorobenzuron	0.00%	100.00%
Difenoconazole	57.14%	100.00%
Dimethomorph	0.00%	100.00%
Fipronil	0.00%	57.14%
Metalaxyl	7.14%	100.00%
Prochloraz	7.14%	100.00%
Propamocarb	0.00%	100.00%
Pymetrozine	100.00%	100.00%
Tebuconazole	100.00%	100.00%
Thiophanate-methyl	0.00%	7.14%
Nicosulfuron	14.29%	21.43%
Tribenuron methyl	0.00%	78.57%
Triadimenol	0.00%	100.00%
Hexaconazole	42.86%	100.00%
Fenbuconazole	7.14%	0.00%
Mesotrione	7.14%	0.00%
Azoxystrobin	0.00%	71.43%
Propiconazole	28.57%	100.00%
Pyrimethanil	28.57%	50.00%
Azoxystrobin	0.00%	100.00%
Trifloxystrobin	0.00%	92.86%
Pyraclostrobin	0.00%	100.00%
Etoxazole	14.29%	78.57%
Spirotetramat	7.14%	85.71%
Omethoate	28.57%	100.00%

Table S8. Concentration of the pesticides in gas phase and particulate phase

pesticide name	Concentration(pg/m ³)					
	Max		Min		Mean	
	gas phase	particulate phase	gas phase	particulate phase	gas phase	particulate phase
Acetamiprid	2.940	50.674	1.196	3.409	1.036±0.507	20.628±17.422
Clothianidin	N/D	65.028	N/D	3.989	N/D	28.714±15.877
Imidacloprid	12.183	443.092	2.88	15.6	5.774±2.639	90.415±107.405
Thiamethoxam	15.331	190.928	5.688	10.914	2.069±4.117	91.823±60.510
Dinotefuran	N/D	N/D	N/D	N/D	N/D	N/D
Thiacloprid	2.572	6.307	1.264	N/D	0.274±0.654	0.45
Imidaclothiz	N/D	N/D	N/D	N/D	N/D	N/D
Nitenpyram	N/D	N/D	N/D	N/D	N/D	N/D
Cycloxaprid	N/D	N/D	N/D	N/D	N/D	N/D
Paichongding	N/D	N/D	N/D	N/D	N/D	N/D
Atrazine	37.535	324.542	1.175	31.585	4.004±13.45	110.717±86.226
Carbendazim	7.282	275.879	<LOQ	10.666	0.52	158.673±86.544
Chlorantraniliprole	N/D	13.942	N/D	13.932	N/D	1.991±0.005
Chlorobenzuron	2.638	637.354	N/D	1.911	0.188	66.000±159.493
Difenoconazole	8.882	108.557	0.55	6.73	3.708±3.364	50.957±30.012
Dimethomorph	<LOQ	81.692	<LOQ	20.342	<LOQ	43.290±16.279
Fipronil	N/D	42.082	N/D	2.837	N/D	8.774±11.943
Metalaxyl	1.127	52.457	1.127	5.795	0.08	24.600±12.011
Prochloraz	0.806	1024.793	0.806	7.651	0.058	152.042±263.704
Propamocarb	N/D	31.239	N/D	1.602	N/D	4.864±7.482
Pymetrozine	46.718	3.05	0.875	1.559	22.958±21.503	2.059±0.383

Tebuconazole	4.644	1605.278	0.584	23.271	1.480±1.027	662.487±448.517
Thiophanate-methyl	N/D	0.21	N/D	0.21	N/D	0.015
Nicosulfuron	15.592	5.729	5.503	1.493	1.507±5.045	0.660±1.886
Tribenuron-methyl	N/D	68.97	N/D	0.823	N/D	14.673±25.251
Triadimenol	N/D	113.657	N/D	1.683	N/D	21.492±29.499
Hexaconazole	9.124	247.392	0.082	2.994	3.103±3.217	99.476±69.209
Kresoxim-Methyl	N/D	22.163	N/D	1.595	0	9.852±5.295
Fenbuconazole	0.682	N/D	N/D	N/D	0.049	N/D
Mesotrione	30.405	N/D	N/D	N/D	2.172	N/D
Propiconazole	1.346	213.889	0.84	2.709	0.316±0.180	63.047±56.598
Pyrimethanil	461.535	27.106	271.865	0.576	93.003±79.177	4.992±9.578
Azoxystrobin	N/D	37.072	N/D	1.968	N/D	13.677±9.120
Trifloxystrobin	N/D	31.657	N/D	0.619	N/D	11.476±7.960
Pyraclostrobin	N/D	420.742	N/D	7.985	N/D	212.011±119.693
Etoazole	0.709	6.819	0.709	0.305	0.101	2.371±2.097
Spirotetramat	1.26	42.441	N/D	3.546	0.090	15.254±14.249
Omethoate	6.842	164.182	1.406	2.937	0.886±2.191	38.276±42.539

N/D: not detected

Table S9. Gas-particle partition coefficients of the pesticides

Pesticide name	K _p (m ³ /pg)													
	sample 1	sample 2	sample 3	sample 4	sample 5	sample 6	sample 7	sample 8	sample 9	sample 10	sample 11	sample 12	sample 13	sample 14
Acetamiprid	0.0108	0.0221	0.0225	0.0064	0.0079	0.0269	0.1044	-	-	-	-	0.1362	0.1646	-
Imidacloprid	0.0154	-	0.0389	0.0118	0.0062	0.0625	0.0708	-	-	0.9856	0.0843	0.1721	0.0675	0.031
Thiamethoxam	-	-	-	-	-	-	-	-	-	-	0.0876	0.1678	0.0763	-
Atrazine	-	-	-	-	-	-	-	-	0.2924	-	0.207	0.4487	0.0105	0.1343
Carbendazim	-	-	-	-	-	-	-	-	-	-	-	-	0.155	-
Chlorantraniliprole	-	-	-	-	-	-	-	-	-	-	-	-	0.1124	-
Difenoconazole	0.0031	0.0058	0.0163	-	0.0046	0.0499	0.0334	-	-	-	-	1.1023	0.6361	-
Metalaxyl	-	-	-	-	-	-	-	-	-	-	-	-	0.1091	-
Prochloraz	-	-	-	-	-	-	-	0.155	-	-	-	-	-	-
Pymetrozine	0.0002	0.0004	0.0003	0.0001	0.0001	0.0002	0.0003	0.0022	0.0037	0.0117	0.0168	0.0058	0.0054	0.0071
Tebuconazole	0.0946	0.7027	2.3948	1.1805	0.9015	3.7071	2.9697	1.1916	1.6698	4.1462	4.2274	5.104	1.2989	0.6523
Hexaconazole	0.1373	0.007	-	0.0433	0.0182	0.0496	0.2327	-	-	-	-	-	-	-
Propiconazole	-	-	-	-	-	-	-	0.0876	0.1422	-	-	1.3025	0.408	-
Pyrimethanil	-	-	-	-	-	-	-	-	-	0.0005	0.0001	0.0008	0.00001	-
Etoxazole	-	-	-	-	-	-	-	-	-	-	-	0.0567	-	-
Spirotetramat	-	-	-	-	-	-	-	-	-	-	-	0.1374	-	-
Omethoate	-	-	-	-	-	-	-	-	0.0619	-	0.8213	0.2568	0.0334	-

K_p was only calculated for pesticides whose concentrations are detected in both gas phase and particulate phase at the same time, where "-" means that K_p was not calculated