Tables

Table S1. Concentrations of measured particulate organic species in $PM_{2.5}$ at PKU and Yufa site in summer of Beijing 2008 (ng/m^3)

Compound	PKU		Yufa	
	average	std	average	std
Non-polar compounds				
Naphthalene[1]	2.4	0.8	0.9	0.4
Acenaphthylene[1]	0.3	0.2	0.3	0.4
Acenapthene[1]	0.3	0.2	0.2	0.2
Fluorene	0.5	0.3	0.4	0.3
1-Methylnaphthalene[1]	1.4	0.5	0.9	0.6
2-Methylnaphthalene[1]	0.9	0.4	0.8	0.6
2,6-Dimethylnaphthalene[1]	0.4	0.2	0.2	0.3
Methyl-fluorene	0.7	0.5	0.8	0.5
Dibenzofuran	0.0	0.0	0.0	0.0
Phenanthrene	0.9	0.7	0.8	0.4
Anthracene	0.2	0.1	0.2	0.2
Fluoranthene	1.1	0.6	1.1	0.4
Pyrene	1.0	0.5	1.1	0.5
Retene	0.5	0.3	0.6	0.3
Methyl-fluoranthene	0.1	0.1	0.1	0.1
9-Methylanthracene	0.0	0.1	0.1	0.1
Benzo[a]anthracene	0.8	0.9	1.4	0.9
Chrysene	1.3	0.8	1.4	1.0
Benzo[b]fluoranthene[*]	2.3	1.5	2.1	1.3
Benzo[k]fluoranthene[*]	0.7	0.5	1.4	1.0
Benzo[e]pyrene[*]	1.3	0.9	1.3	0.9
Benzo[a]pyrene	1.1	0.8	0.6	0.7

Compound	PKU		Yufa	
	average	std	average	std
Benzo[ghi]flouranthene	0.6	0.4	0.6	0.3
Cyclopenta[cd]pyrene	0.6	0.5	0.9	0.8
Methyl-chrysene	0.1	0.1	0.1	0.1
Indeno[1,2,3-cd]pyrene*	1.2	0.9	1.3	1.2
Benzo[ghi]perylene	2.6	7.1	2.9	2.5
Dibenzo[a,h]anthracene*	0.1	0.2	0.2	0.4
Picene*	0.1	0.3	0.2	0.5
Coronene	0.3	0.4	0.1	0.2
Perylene	0.2	0.3	0.3	0.2
Dodecane[1]	1.2	0.8	1.9	2.2
Tridecane[1]	1.9	0.8	2.3	1.2
Tetradecane[1]	2.7	1.1	3.0	1.4
Pentadecane[1]	4.7	2.2	5.0	2.1
Hexadecane[1]	6.6	3.2	7.8	3.9
Norpristane[1]	4.5	2.6	4.6	2.6
Heptadecanoic[1]	9.3	5.4	11.9	6.9
Pristane[1]	1.8	1.1	1.8	1.0
Octadecane[1]	3.5	2.0	4.1	1.5
Phytane[1]	2.3	1.2	2.5	0.9
Nonadecane[1]	3.9	2.2	5.2	1.6
2-Methylnonadecane[1]	1.9	1.0	1.4	0.7
3-Methylnonadecane[1]	1.7	0.7	1.3	0.6
Eicosane[1]	4.2	2.0	5.1	1.8
Heneicosanoic[1]	3.8	2.2	5.3	1.8
Decylcyclohexane[1]	0.4	0.3	0.5	0.3
Pentadecylcyclohexane	0.3	0.2	0.4	0.2
Docosane[1]	3.4	1.8	4.7	1.4

Compound	PKU		Yufa	
	average	std	average	std
Tricosane	3.9	2.3	5.3	1.9
Tetracosane	3.5	2.3	4.7	2.2
Pentacosane	4.3	2.8	5.5	2.7
Hexacosane	2.8	1.9	3.7	1.7
Nonadecylcyclohexane	0.3	0.3	0.4	0.2
squalane	0.8	0.8	1.9	2.7
Heptacosane	6.1	2.7	7.4	3.1
Octacosane*	3.2	1.8	5.1	9.2
Nonacosane*	4.8	2.3	6.2	3.0
Triacontane*	1.9	1.0	2.9	6.5
Hentriacontane*	3.9	1.9	5.6	3.4
Dotriacontane*	1.5	0.8	1.6	1.2
Tritriacontane*	1.9	1.1	1.9	1.6
Tetratriacontane*	0.7	0.6	0.5	0.4
Pentatriacontane*	0.7	0.7	1.1	1.0
Hexatriacontane	0.3	0.4	0.9	0.9
Heptatriacontane	0.1	0.3	0.2	0.5
Octatriacontane	0.0	0.1	0.0	0.1
Nonatriacontane	0.0	0.1	0.0	0.1
Tetracontane	0.0	0.1	0.0	0.3
ABB-20R-C27-Cholestane	0.1	0.1	0.2	0.1
AAA-20S-C27-Cholestane	0.1	0.1	0.2	0.1
ABB-20R-C28-Methylcholestan	0.1	0.1	0.1	0.1
ABB-20R-C29-Ethylcholestane	0.1	0.1	0.1	0.1
17A(H)-22,29,30-Trisnorhopa*	0.5	0.4	0.5	0.4
17B(H)-21A(H)-30-Norhopane*	1.0	0.7	1.0	0.6
17A(H)-21B(H)-Hopane*	0.8	0.5	0.9	0.5

Compound	PKU		Yufa	
	average	std	average	std
Polar compounds				
Malonic Acid	18.4	20.3	19.4	35.3
Maleic Acid	19.5	22.2	11.6	7.6
Fumaric Acid	3.5	1.7	3.6	1.7
Succinic Acid	41.3	18.5	51.2	19.4
Glutaric Acid	14.0	7.2	14.9	5.2
Adipic Acid	9.2	4.8	7.5	3.8
Glycerine	28.4	15.8	28.8	17.7
Pimelic Acid	5.9	3.8	6.2	7.0
Suberic Acid	3.9	1.7	3.5	2.0
Azelaic Acid	38.6	23.2	31.0	23.0
Sebacic Acid	1.9	1.3	2.3	3.0
Phthalic Acid (1,2)	30.4	15.3	27.8	12.6
Isophthalic Acid (1,3)	13.0	22.6	25.5	27.2
Terephthalic Acid (1,4)	2.3	2.1	6.2	11.7
1,2,3-Benzenetricaboxylic Acid	46.6	24.2	55.5	22.0
1,3,5-Benzenetricaboxylic Acid	7.6	8.5	5.6	5.8
1,2,4-Benzenetricaboxylic Acid	0.2	0.2	0.2	0.2
1,2,4,5-Benzenetetracarboxy	7.7	8.5	13.0	20.8
Methylphthalic Acid	3.9	2.6	4.6	3.6
Hexanoic acid	30.4	29.0	18.4	14.4
Octanoic acid	29.6	20.8	14.7	8.9
Decanoic acid	15.8	5.3	7.8	3.1
Dodecanoic acid	23.1	9.9	15.4	6.5
Tetradecanoic acid	26.1	9.4	20.2	5.3
Palmitoleic Acid	2.2	2.2	1.2	0.6
Linoleic Acid	2.5	1.5	4.6	3.2

Compound	PKU		Yufa	
	average	std	average	std
Oleic Acid	4.5	1.7	4.1	1.6
Linolenic Acid	1.2	2.5	1.7	0.8
Octadecamide	3.9	2.8	10.8	8.3
Arachidic acid	21.9	15.4	17.0	7.8
Docosanoic acid	10.6	6.2	10.0	5.2
Eicosanol	0.5	0.4	0.8	0.5
Dehydroabietic Acid	15.8	19.2	15.6	9.7
Abietic Acid	3.2	12.3	2.3	4.2
Tetracosanoic acid	5.2	2.2	6.9	4.5
Octacosanoic Acid	1.8	1.1	3.3	2.9
Triacontanoic acid	1.6	1.5	12.1	19.2
Tricosanol	0.5	1.3	0.5	0.3
Triacontanol	3.2	12.1	10.4	9.4
Levoglucosan*	97.1	71.4	110.6	65.4
Manosan	39.5	25.7	40.9	26.2
Galactosan	10.3	5.9	19.8	6.9
Cholesterol	1.4	0.8	2.3	2.6
Stigmasterol	0.3	0.8	0.7	0.8
β-Sitosterol	1.3	1.1	3.2	2.4
Campersterol	0.4	1.1	0.7	1.0
Monopalmitin	6.4	2.3	2.9	1.7
Monoolein	3.1	2.0	2.2	1.0
Monostearin	2.0	1.6	0.7	0.4
Cholestanol	0.0	0.0	0.0	0.1
Stigmastenol	0.0	0.2	0.1	0.3
Guaiacol	0.3	0.4	0.2	0.5
2-Methoxymethylphenol	0.4	0.8	0.1	0.5

Compound	PKU		Yufa	
	average	std	average	std
Ethylguaiacol	0.0	0.1	0.1	0.4
Propylguaiacol	0.0	0.1	0.2	0.2
Eugenol	0.2	0.2	0.3	0.7
Acetovanillone	0.2	0.3	0.4	0.9
3,5-Dimethoxy-4-hydroxycinn	0.4	1.3	0.5	1.3
Iso-Eugenol	0.0	0.1	17.9	25.3
Vanillin	0.7	0.5	0.9	0.5
Syringealdehyde	1.0	1.1	1.1	1.1
4-Hydroxy-3-methoxycinnamal	2.2	3.7	1.5	1.6
SOA tracers				
2-Methylglyceric acid	21.0	19.5	29.9	19.9
2-Methylthreitol	42.2	28.2	63.6	46.8
2-Methylerythritol	77.2	60.2	121.5	101.4
3-Isopropylpentanedioic acid	8.7	7.1	9.6	7.2
3-Acetylpentanedioic acid	6.8	7.1	5.3	2.8
2-Hydroxy-4-isopropyladipic acid	4.6	4.0	4.3	6.9
3-Acetylhexanedioic acid	8.3	5.8	7.7	5.5
3-Hydroxyglutaric acid	51.7	31.3	57.5	27.4
2-Hydroxy-4,4-dimethylglutaric acid	9.9	9.1	8.3	6.7
3-(2-Hydroxy-ethyl)-2,2-dimethylCyclobutane-carboxylic acid	8.5	10.1	6.1	5.5
Pinic acid	3.2	6.4	3.4	5.7
Pinonic acid	11.9	6.3	21.9	9.2
2,3-Dihydroxy-4-oxopentanoic acid	13.3	7.7	11.7	6.9
β-Caryophyllinic acid	5.1	4.5	3.6	2.3

[*] Used as tracers in CMB modeling

[1]Intermediate volatility organic compounds (IVOCs), the concentrations are underestimates for their partitioning between gas and particle phases

Table S2 The accuracy of the organic species analysis, expressed as recovery

Compound	Recovery	Compound	Recovery
Hexanoic acid	0.68	n-Eicosane	0.67
Heptanoic acid	0.75	2-Methylnonadecane	0.65
Octanoic acid	0.60	Pentadecylcyclohexane	0.73
Nonanoic acid	0.65	n-Heneicosane	0.79
Decanoic acid	0.70	n-Docosane	0.85
Undecanoic acid	0.70	n-Tricosane	0.88
Dodecanoic acid	0.89	n-Tetracosane	0.88
Tridecanoic acid	0.89	Nonadecylcyclohexane	0.87
Tetradecanoic acid	0.91	n-Pentacosane	0.89
Pentadecanoic acid	0.90	n-Hexacosane	0.88
Hexadecanoic acid	0.97	n-Heptacosane	0.87
Heptadecanoic acid	0.91	n-Octacosane	0.90
Octadecanoic acid	0.95	n-Nonacosane	0.91
Nonadecanoic acid	0.93	n-Triacontane	0.89
Eicosanoic acid	0.93	Squalane	0.91
Docosanoic acid	0.92	n-Hentriacontane	0.89
Tricosanoic acid	0.94	n-Dotriacontane	0.91
Tetracosanoic acid	0.92	n-Tritriacontane	0.96
Hexacosanoic acid	0.88	n-Tetratriacontane	1.02
Octacosanoic Acid	0.85	Naphthalene	0.67
Nonacosanoic acid	0.69	Acenaphthylene	0.70
n-tetradecanol	0.81	Acenapthene	0.78
n-Pentadecanol	0.86	Fluorene	0.75
n-Hexadecanol	0.96	1-Methylnaphthalene	0.78
n-Octadecanol	0.98	2-Methylnaphthalene	0.80
n-Eicosanol	0.98	2,6-Dimethylnaphthalene	0.79
n-Tricosanol	0.99	Pyrene	0.63
n-Triacontanol	0.89	1-Methyl pyrene	0.73
Palmitoleic Acid (F16:1)	0.92	Chrysene	0.86
Linoleic Acid(F18:2)	0.90	Retene	0.74
Oleic Acid(F18:1)	0.99	Methyl-chrysene	0.60
Linolenic Acid	0.93	Fluoranthene	0.72
Fumaric(F4(1t):2)	0.73	Benzo[ghi]flouranthene	1.15
Succinic(F4:2)	0.61	Cyclopenta[cd]pyrene	1.01
Glutaric(F5:2)	0.65	Perylene	0.86

Compound	Recovery	Compound	Recovery
Adipic(F6:2)	0.84	Benzo[b]fluoranthene	0.62
Pimelic(F7:2)	0.81	Benzo[a]pyrene	0.70
Suberic(F8:2)	0.81	Benzo[e]pyrene	0.90
Azelaic(F9:2)	0.83	Indeno[1,2,3-cd]pyrene	0.79
Sebacic(F10:2)	0.81	Benzo[ghi]perylene	1.16
Dehydroabietic Acid	0.97	Coronene	0.75
Abietic Acid	0.62	ABB-20R-C27-Cholestane	0.85
Benzoic acid	0.85	AAA-20S-C27-Cholestane	0.82
Phthalic Acid (1,2)	0.71	ABB-20R-C28-Methylcholestane	0.86
terephthalic acid(1,4)	0.66	ABB-20R-C29-Ethylcholestane	0.85
isophthalic acid(1,3)	0.71	17A(H)-22,29,30-Trisnorhopane	0.89
Methylphthalic Acid	0.76	17B(H)-21A(H)-30-Norhopane	0.88
3,5-Dimethoxyphenol	0.72	17A(H)-21B(H)-Hopane	0.85
Vanillin	0.71	Mannan	0.95
Iso-Eugenol	0.61	Levoglucosan	0.83
Acetovanillone	0.76	Coprostanol	0.97
Methyl vanillate	0.71	Cholesterol	0.87
Syringaldehyde	0.81	Cholestanol	0.94
Vanillic acid	0.85	Campesterol	0.89
Homovanillic acid	0.83	Stigmasterol	0.90
3,5-Dimethoxy-4-hydroxyaceto phenone	0.87	β-Sitosterol	0.91
4-Hydroxy-3-methoxycinnamal dehyde	1.07	Stigmastenol	0.94
3,5-Dimethoxy-4-hydroxycinna maldehyde	1.17	Glycerine	0.95
Monopalmitin (16:0)	1.12	Monostearin (18:0)	1.08
Monoolein (18:1)	1.06		

The standard with known concentration was spiked on the blank quartz filter, and then the filter was extracted and measured by using the same procedure. At the meanwhile, the standard with the same concentration was directly measured by GCMS. The recovery for each organic species was calculated by comparing these two results.

Table S3. Instrumental precision in organic species analysis, expressed as the standard deviation of duplicate analysis results

Compounds	Standard Deviation	Compounds	Standard Deviation
Malonic (C3)	7.9%	Napthalene	0.7%
Maleic (C3=)	6.8%	Acenaphthylene	1.7%
Fumaric (C4=)	6.1%	Acenapthene	1.0%
Succinic (C4)	0.5%	Fluorene	1.7%
Glutaric (C5)	7.6%	1-Methylnaphthalene	1.6%
Adipic (C6)	0.9%	2-Methylnaphthalene	1.1%
Glycerine	1.7%	2,6-Dimethylnaphthalene	1.4%
Pimelic (C7)	1.0%	Methyl-fluorene	1.5%
Suberic (C8)	2.5%	Dibenzofuran	1.3%
Azelaic (C9)	3.1%	Phenanthrene	0.5%
Sebacic (C10)	2.3%	Anthracene	3.7%
Phthalic Acid (1,2)	5.9%	Fluoranthene	0.3%
Isophthalic Acid (1,3)	4.6%	Pyrene	2.0%
Terephthalic Acid (1,4)	1.2%	Retene	0.2%
1,2,3-Benzenetricaboxylic Acid	3.3%	Methyl-fluoranthene	0.3%
1,3,5-Benzenetricaboxylic Acid	1.5%	9-Methylanthracene	1.6%
1,2,4-Benzenetricaboxylic Acid	8.2%	Benzo[a]anthracene	0.6%
1,2,4,5-Benzenetetracarboxylic	3.1%	Chrysene	0.1%

Compounds	Standard Deviation	Compounds	Standard Deviation
Acid Methylphthalic Acid	3.8%	Benzo[b]fluoranthene	4.2%
C6:0	0.4%	Benzo[k]fluoranthene	5.6%
C8:0	0.9%	Benzo[e]pyrene	3.8%
C10:0	3.8%	Benzo[a]pyrene	0.7%
C12:0	1.8%	Benzo[ghi]flouranthene	1.0%
Pinonic Acid	7.5%	Cyclopenta[cd]pyrene	1.5%
C14:0	2.7%	Methyl-chrysene	4.5%
C16:0	4.3%	Indeno[1,2,3-cd]pyrene	1.0%
C18:0	3.2%	Benzo[ghi]perylene	8.2%
Palmitoleic Acid (C16:1)	2.4%	Dibenzo[a,h]anthracene	5.5%
Linoleic Acid (18:2)	3.2%	Picene	3.7%
Oleic Acid (C18:1)	2.6%	Coronene	7.7%
Linolenic Acid	3.2%	Perylene	5.9%
Octadecamide	16.7%	n-C9	6.2%
C20:0	2.5%	n-C10	3.1%
C22:0	0.9%	n-C11	1.8%
Eicosanol	5.2%	n-C12	1.0%
Dehydroabietic Acid	3.3%	n-C13	1.7%
Abietic Acid	5.5%	n-C14	1.9%
C24:0	1.2%	n-C15	1.6%

Compounds	Standard Deviation	Compounds	Standard Deviation
Octacosanoic Acid	0.0%	n-C16	2.5%
Triacontanoic acid	2.1%	norpristane	1.2%
Tricosanol	3.2%	n-C17	1.5%
Triacontanol	4.0%	Pristane	2.0%
Levoglucosan	0.4%	n-C18	1.4%
Manosan	0.2%	Phytane	1.3%
Galactosan	6.9%	n-C19	1.3%
Cholesterol	0.1%	2-Methylnonadecane	2.0%
Stigmasterol	0.3%	3-Methylnonadecane	1.1%
β-Sitosterol	0.5%	n-C20	1.2%
Campersterol	0.2%	n-C21	1.6%
Monopalmitin (16:0)	0.4%	Decylcyclohexane	1.9%
Monoolein (18:1)	2.5%	Pentadecylcyclohexane	0.3%
Monostearin (18:0)	1.5%	n-C22	2.2%
Cholestanol	0.8%	n-C23	2.3%
Stigmastenol	1.9%	n-C24	1.6%
Guaiacol	0.9%	n-C25	2.7%
2-Methoxymethylphenol	1.3%	n-C26	3.1%
Ethylguaiacol	1.9%	Nonadecylcyclohexane	3.4%
Propylguaiacol	1.3%	squalane	2.2%
Eugenol	1.3%	n-C27	2.3%
Acetovanillone	1.6%	n-C28	1.6%
3,5-Dimethoxy-4	1.6%	n-C29	2.9%

Compounds	Standard Deviation	Compounds	Standard Deviation
-hydroxycinn			
Iso-Eugenol	1.3%	n-C30	3.3%
Vanillin	0.6%	n-C31	2.3%
Syringealdehyde	1.9%	n-C32	1.8%
4-Hydroxy-3-me	5.2%	n-C33	3.3%
thoxycinnamal			
ABB-20R-C27-	2.0%	n-C34	2.0%
Cholestane			
AAA-20S-C27-	5.9%	n-C35	4.1%
Cholestane			
ABB-20R-C28-	6.1%	n-C36	3.1%
Methylcholestan			
ABB-20R-C29-E	6.8%	n-C37	3.6%
thylcholestane			
17A(H)-22,29,30	5.0%	n-C38	5.0%
-Trisnorhopa			
17B(H)-21A(H)-	0.8%	n-C39	5.4%
30-Norhopane			
17A(H)-21B(H)Ho	3.5%	n-C40	4.1%
pane			

The same standard was measured for 6 times. The precision was expressed as the standard deviations of the calculated concentrations for each species.

Table S4. T-test statistical results (*t* value) between absolute source contributions of non-controlled period and controlled periods, significance level α=5%, 95% confidence interval

	PKU (compared with NC)				Yufa (compared with NC)			
	BO-I	BO-II	DO	AO	BO-I	BO-II	DO	AO
Isoprene SOC	1.00	4.38	2.29	3.86	0.88	2.93	2.99	2.80
α-pinene SOC	1.18	0.81	0.85	1.15	0.57	0.83	1.13	3.23
toluene SOC	1.42	1.86	0.85	1.15	0.29	1.50	0.60	0.40
β-caryophyllene SOC	0.41	0.72	5.00	4.78	0.21	2.15	2.02	2.72
Vegetative detritus	0.54	0.99	2.79	2.19	0.45	0.95	1.16	0.59
Biomass burning	1.08	2.18	2.61	2.75	2.07	2.18	2.62	2.27
Diesel vehicles	2.07	2.76	2.84	3.54	2.16	2.21	2.56	2.61
Gasoline vehicles	2.30	2.80	2.94	2.62	2.09	2.25	3.22	2.36
Coal burning	2.16	2.33	2.63	2.72	2.27	2.45	2.34	2.17
df	27	19	18	12	29	20	26	13
p value	2.052	2.093	2.101	2.179	2.045	2.042	2.056	2.16

The t values are calculated by comparing NC period with each Non-fully-Controlled period (BO-I, BO-II, DO or AO)

If *t*>*p*, two groups have statistical differences.

Table S5. Define of different control periods and corresponding control measures

Sampling duration	Period description	Control measures [a]
Jul. 15th – Jul. 20th	Not-fully-Controlled period (NC) No precipitation	1. Yellow Labeled Vehicles: not allowed to drive throughout Beijing; 2. 30% of the government-owned vehicles were halted from driving; 2. Stringent entrance check for express ways: only Euro II (or higher) gasoline powered vehicles, Euro III diesel powered vehicles, and other vehicles with specific permits were allowed to enter Beijing; 3. Power plants: halted from production;
Jul. 21st –Jul. 31st	Before Olympics period I (BO-I) Pollution episode I: low wind speed, pollution accumulating	Besides the measures above, stringent controls were as following: 1. Green Labeled Vehicles: odd-even plate number rule was

Aug. 1st –Aug. 8th	Before Olympics period II (BO-II) Pollution episode I: low wind speed, pollution accumulating	implemented throughout Beijing; 2. Government owned vehicles: extra 40% were halted from driving; 3. Cargo trucks: not allowed to drive inside the sixth ring;
Aug. 9th –Aug. 24th	During Olympics period (DO), several precipitation processes	
Aug. 25th – Aug. 31st	After Olympics period (AO)	Same as the period of Jul. 21st to Aug. 24th, except for that odd–even plate number rule was only implemented inside the fifth ring.

[a] The major contents of the air quality controls made by Beijing municipal government, the Ministry of Public Security of China, the Ministry of Transport of China, and the Ministry of Environmental Protection of China

Figure caption

Figure S1. Concentrations of measured organic compounds in different periods at an urban site PKU and an upwind rural site Yufa site

Figure S2. Distributions of n-Alkanes in different periods at PKU and Yufa, NC=Not-fully-Controlled, BO=Before Olympic, DO=During Olympic, AO= After Olympic

Figure S3. Distributions of PAHs in different periods at PKU and Yufa, NC= Not-fully-Controlled, BO=Before Olympic, DO=During Olympic, AO= After Olympic

Figure S4. Concentrations of sugar compounds in different periods at PKU and Yufa, NC= Not-fully-Controlled, BO=Before Olympic, DO=During Olympic, AO= After Olympic

Figure S5. Concentrations of hopanes in different periods at PKU and Yufa, NC= Not-fully-Controlled, BO=Before Olympic, DO=During Olympic, AO= After Olympic

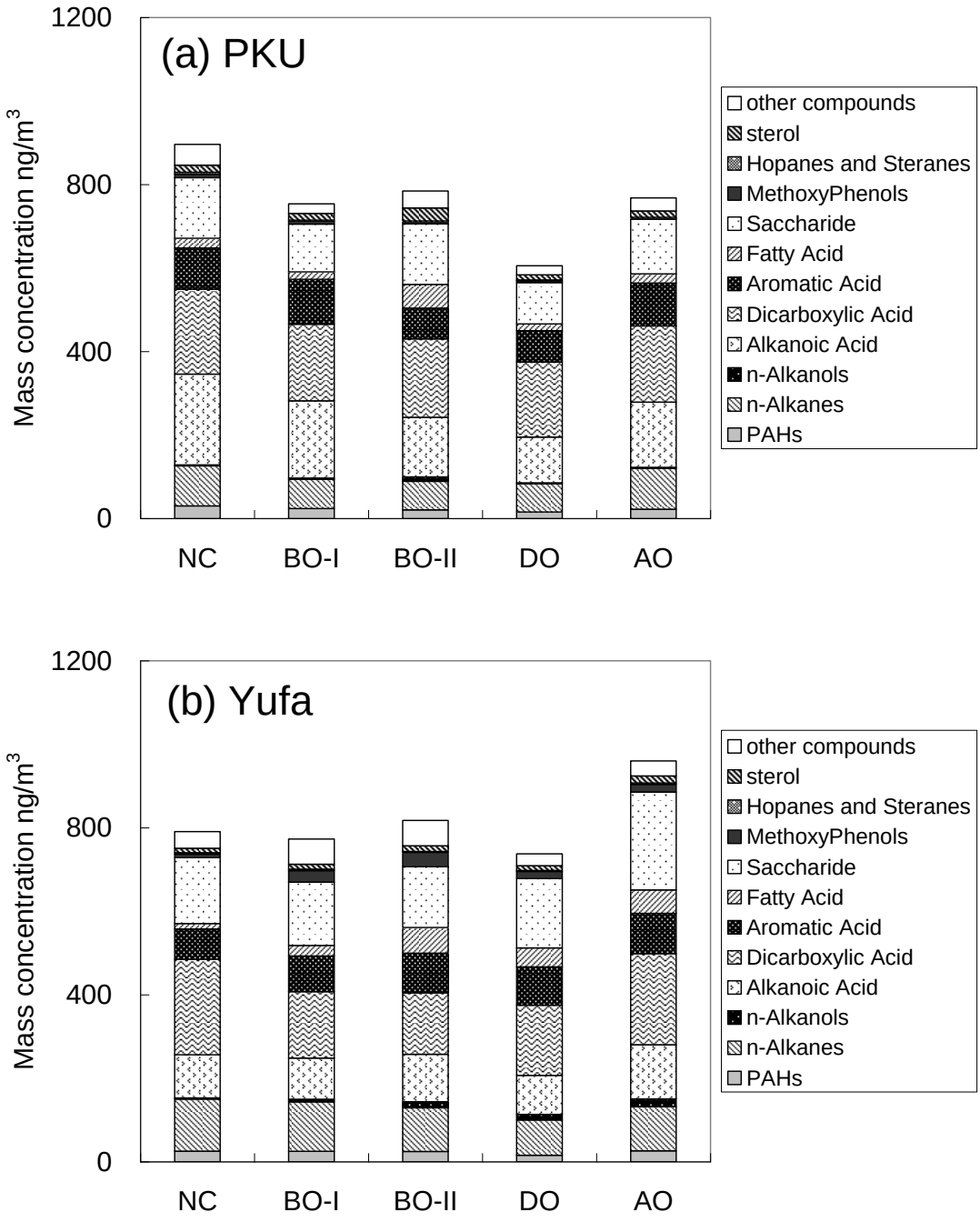

Figure S1. Concentrations of measured organic compounds in different periods at an urban site PKU and an upwind rural site Yufa site

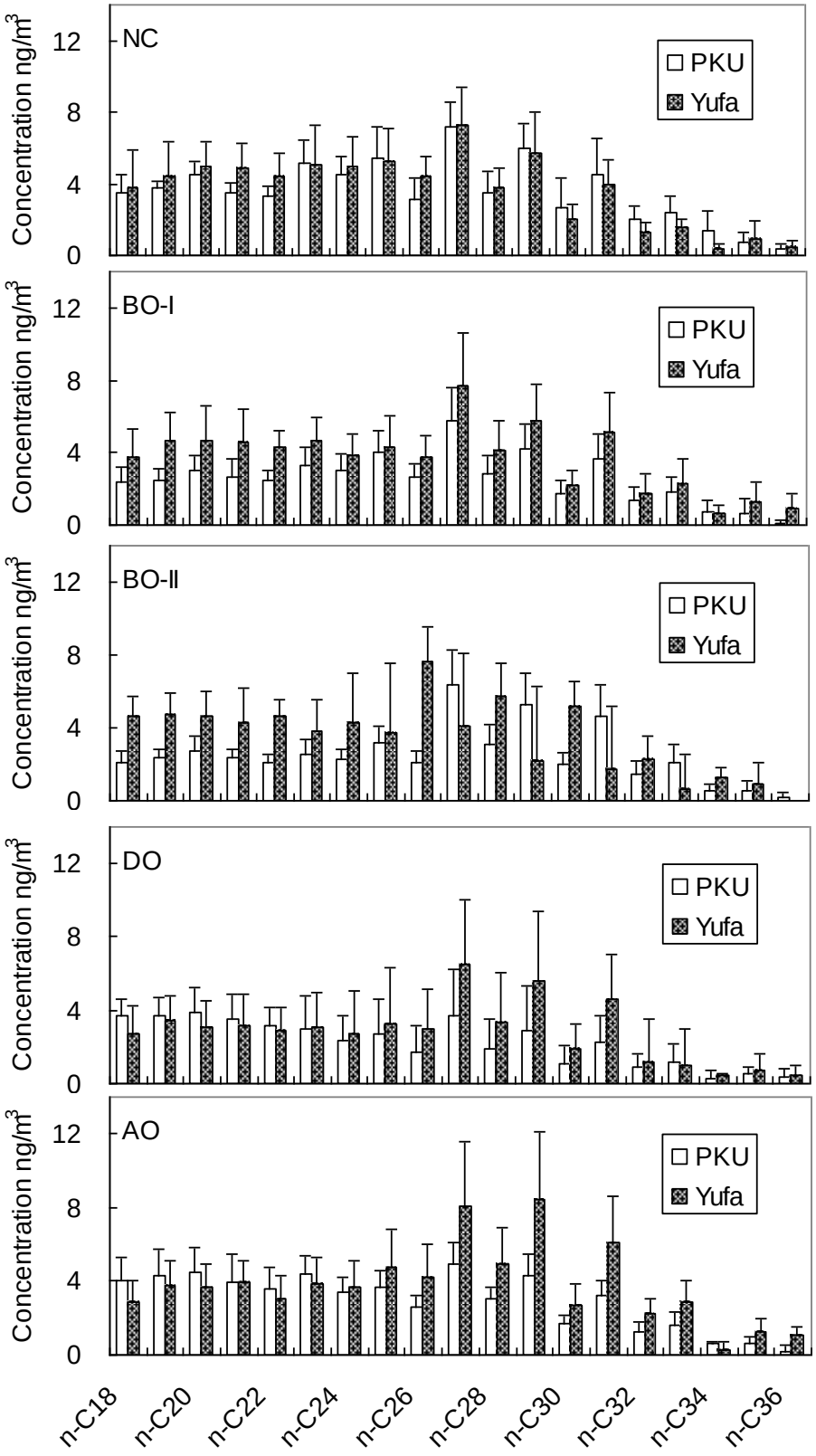

Figure S2. Distributions of n-Alkanes in different periods at PKU and Yufa

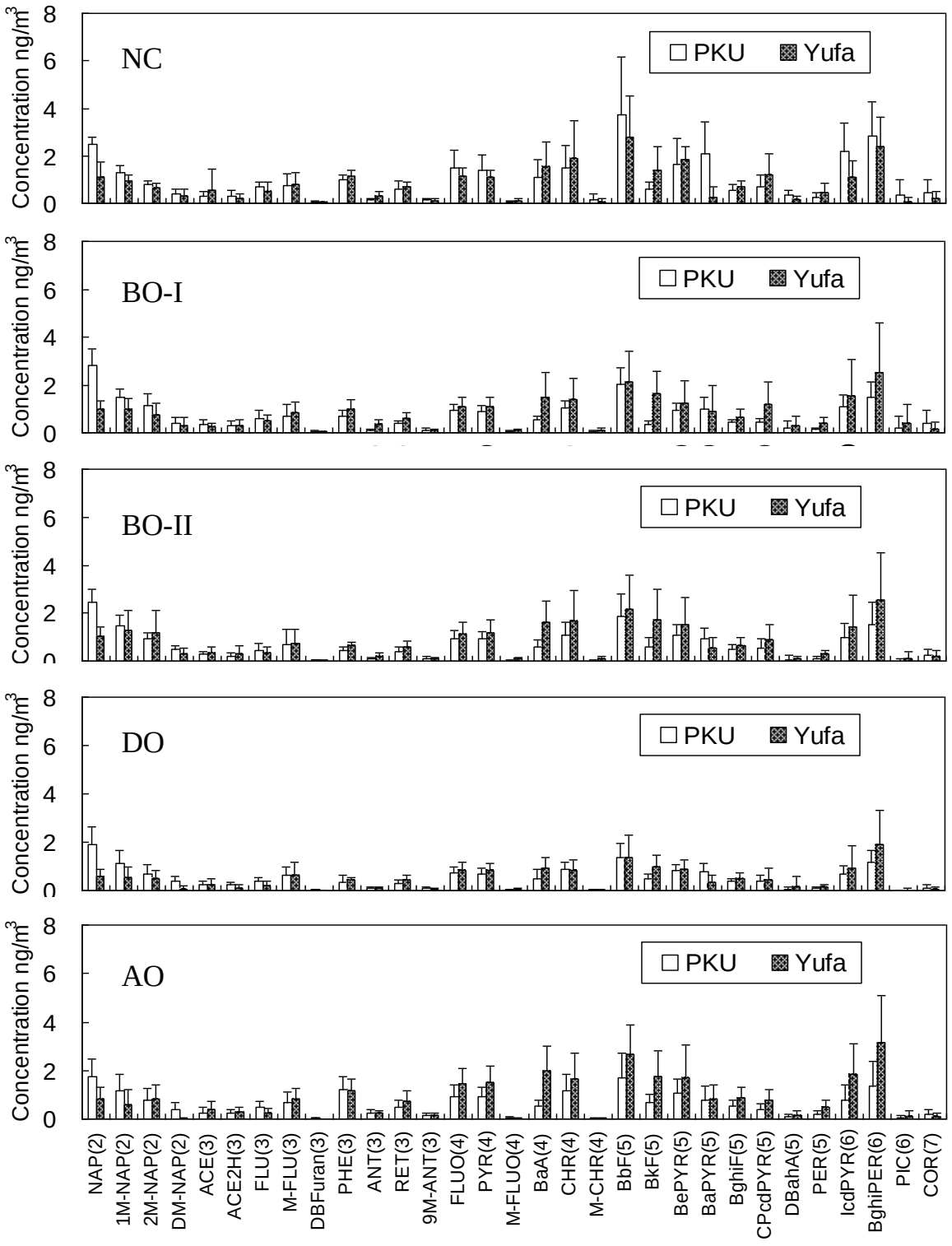

Figure S3. Distributions of PAHs in different periods at PKU and Yufa

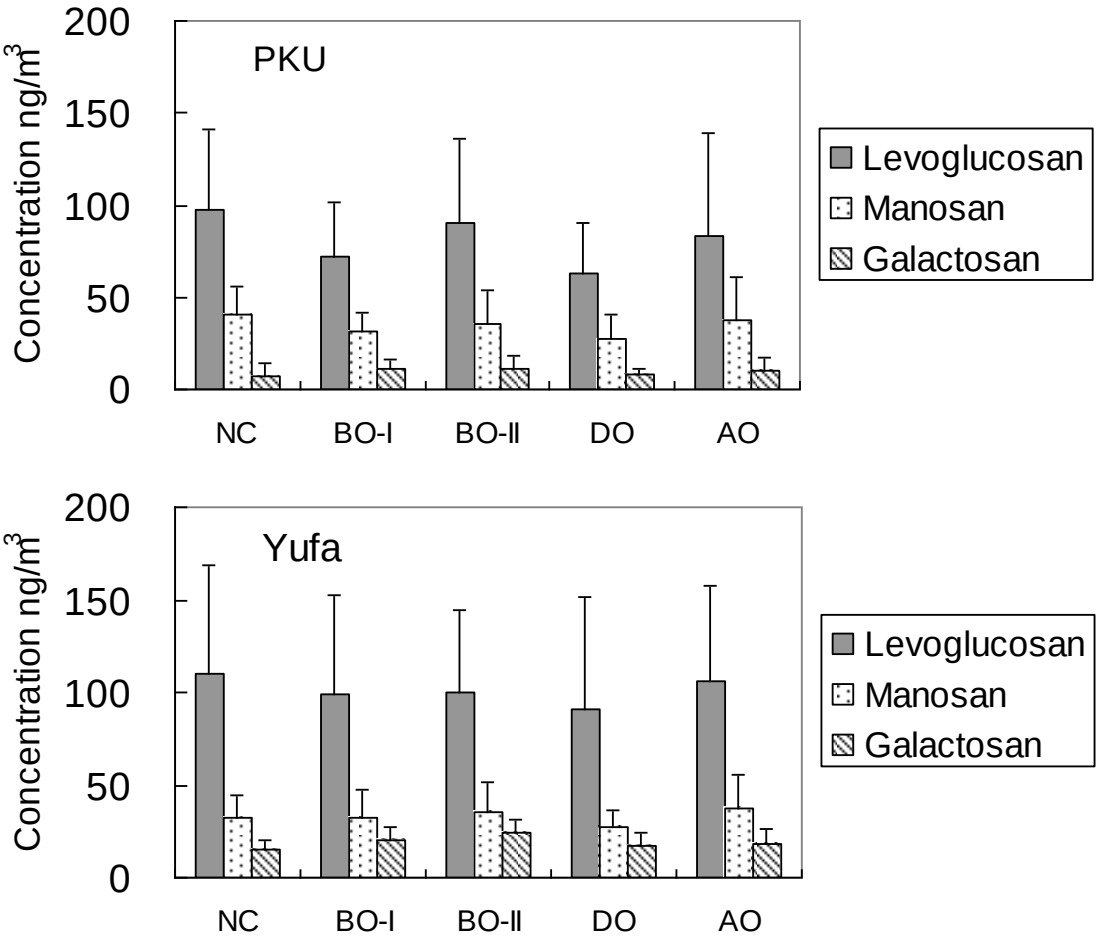

Figure S4. Concentrations of sugar compounds in different periods at PKU and Yufa

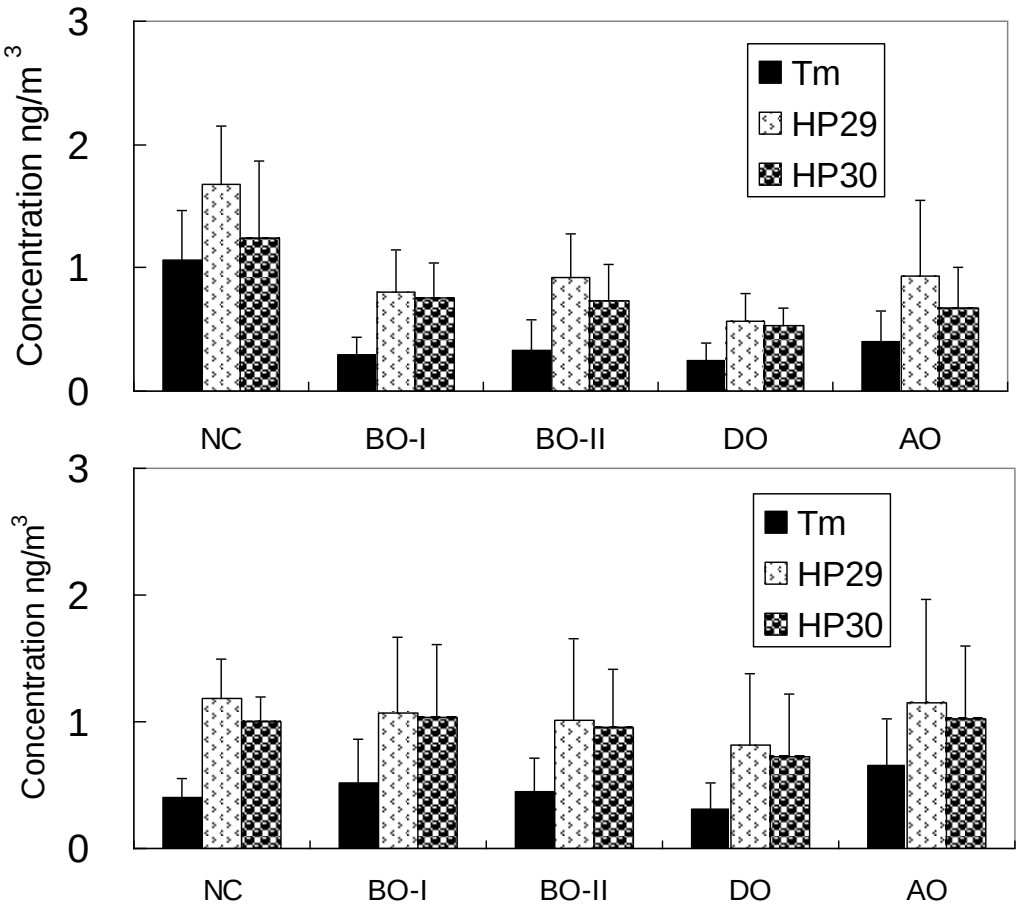

Figure S5. Concentrations of hopanes in different periods at PKU and Yufa, Tm: 17A(H)-22,29,30-Trisnorhopa, HP29: 17B(H)-21A(H)-30-Norhopane, HP30: 17A(H)-21B(H)-Hopane