Tables

Table S1. Summary of the statistics for CMB fitting results

Parameter	Square regression coefficient R^2	Square residual Chi-square value χ^2	explained mass
Value	0.85-1.0	0.8-4.0	80%-120%

Table S2. Concentrations of measured particulate organic species at PKU and Yufa site in summer of Beijing 2008 (ng/m^3)

Compound	PKU		Yufa	
	average	std	average	std
Non-polar compounds				
Naphthalene	2.4	0.8	0.9	0.4
Acenaphthylene	0.3	0.2	0.3	0.4
Acenapthene	0.3	0.2	0.2	0.2
Fluorene	0.5	0.3	0.4	0.3
1-Methylnaphthalene	1.4	0.5	0.9	0.6
2-Methylnaphthalene	0.9	0.4	0.8	0.6
2,6-Dimethylnaphthalene	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
Benzo[ghi]flouranthene	0.6	0.4	0.6	0.3
Cyclopenta[cd]pyrene	0.6	0.5	0.9	0.8

Compound	PKU		Yufa	
	average	std	average	std
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	1.2	0.8	1.9	2.2
Tridecane	1.9	0.8	2.3	1.2
Tetradecane	2.7	1.1	3.0	1.4
Pentadecane	4.7	2.2	5.0	2.1
Hexadecane	6.6	3.2	7.8	3.9
Norpristane	4.5	2.6	4.6	2.6
Heptadecanoic	9.3	5.4	11.9	6.9
Pristane	1.8	1.1	1.8	1.0
Octadecane	3.5	2.0	4.1	1.5
Phytane	2.3	1.2	2.5	0.9
Nonadecane	3.9	2.2	5.2	1.6
2-Methylnonadecane	1.9	1.0	1.4	0.7
3-Methylnonadecane	1.7	0.7	1.3	0.6
Eicosane	4.2	2.0	5.1	1.8
Heneicosanoic	3.8	2.2	5.3	1.8
Decylcyclohexane	0.4	0.3	0.5	0.3
Pentadecylcyclohexane	0.3	0.2	0.4	0.2
Docosane	3.4	1.8	4.7	1.4
Tricosane	3.9	2.3	5.3	1.9
Tetracosane	3.5	2.3	4.7	2.2

Compound	PKU		Yufa	
	average	std	average	std
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
Polar compounds				
Malonic Acid	18.4	20.3	19.4	35.3

Compound	PKU		Yufa	
	average	std	average	std
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
Oleic Acid	4.5	1.7	4.1	1.6
Linolenic Acid	1.2	2.5	1.7	0.8

Compound	PKU		Yufa	
	average	std	average	std
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
Ethylguaiacol	0.0	0.1	0.1	0.4
Propylguaiacol	0.0	0.1	0.2	0.2

Compound	PKU		Yufa	
	average	std	average	std
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-dimethyl Cyclobutane-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

Table S3. Define of different control periods and corresponding control measures

Sampling duration	Period description	Control measures [a]
Jul. 15th – Jul. 20th	Non-Control 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=Non-Control, BO=Before Olympic, DO=During Olympic, AO= After Olympic

Figure S3. Distributions of PAHs in different periods at PKU and Yufa, NC=Non-Control, BO=Before Olympic, DO=During Olympic, AO= After Olympic

Figure S4. Concentrations of sugar compounds in different periods at PKU and Yufa, NC=Non-Control, BO=Before Olympic, DO=During Olympic, AO= After Olympic

Figure S5. Concentrations of hopanes in different periods at PKU and Yufa, NC=Non-Control, BO=Before Olympic, DO=During Olympic, AO= After Olympic

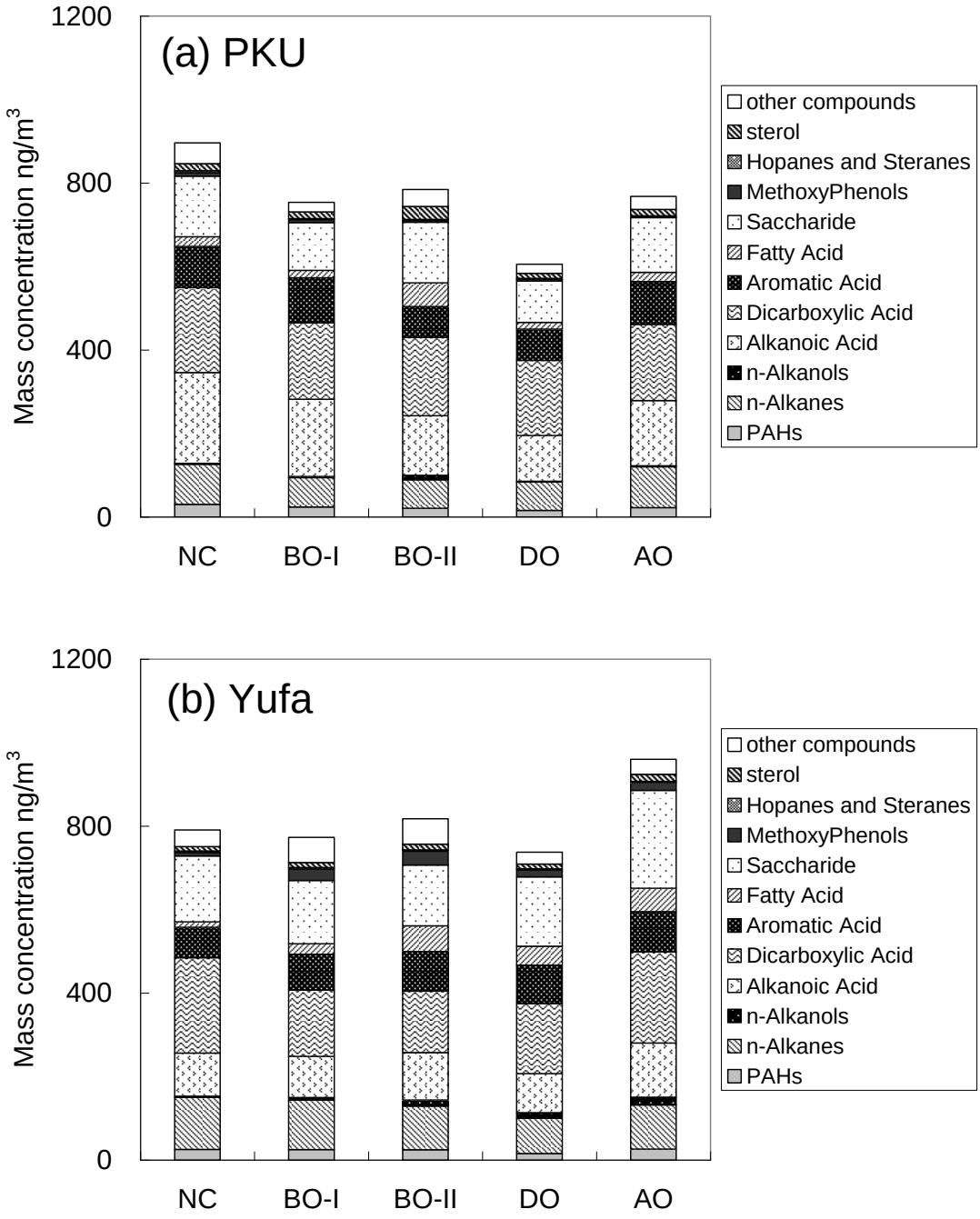

Figure S1. Concentrations of measured organic compounds in different periods at an urban site PKU and an upwind rural site Yufa site

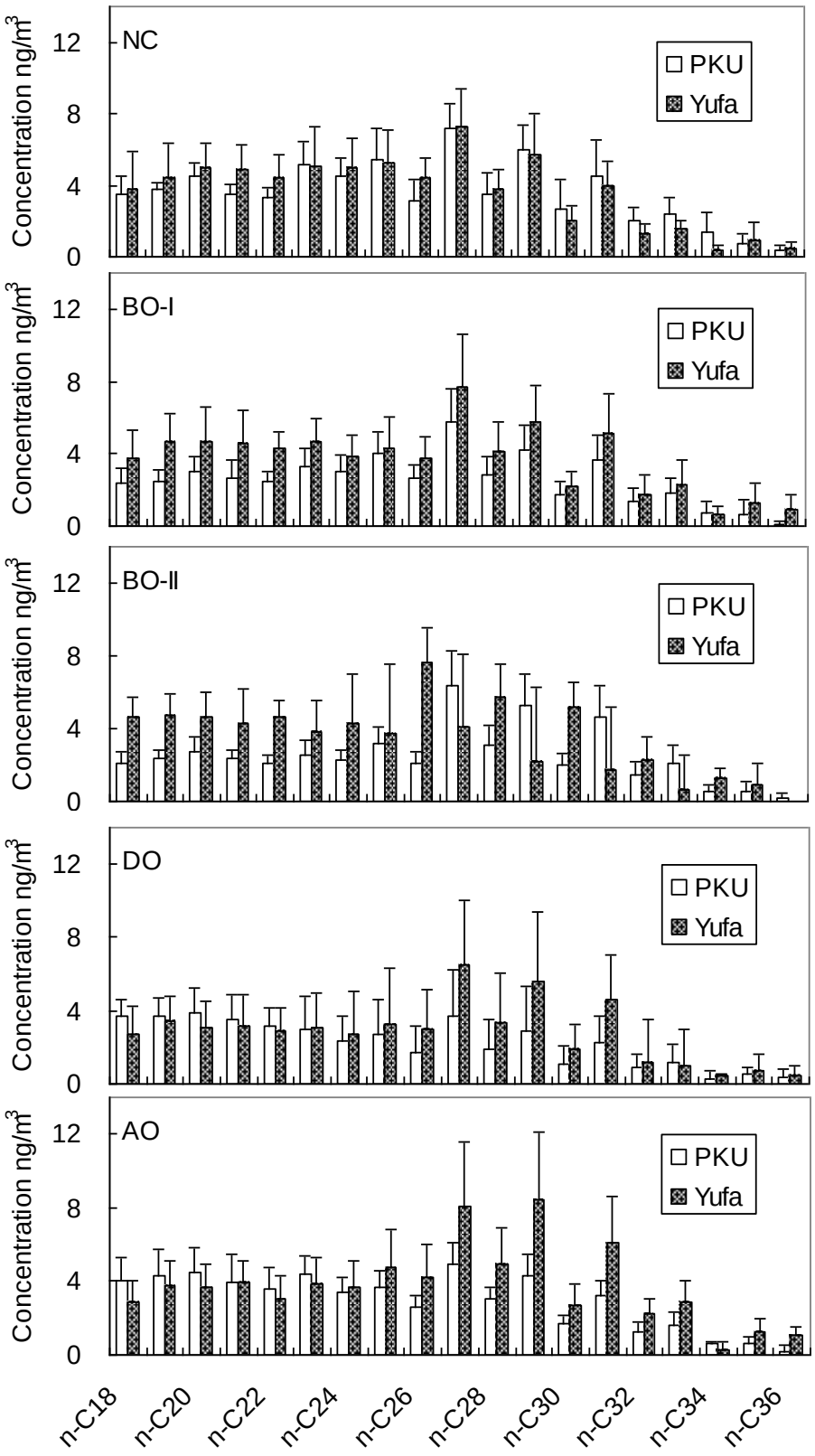

Figure S2. Distributions of n-Alkanes in different periods at PKU and Yufa

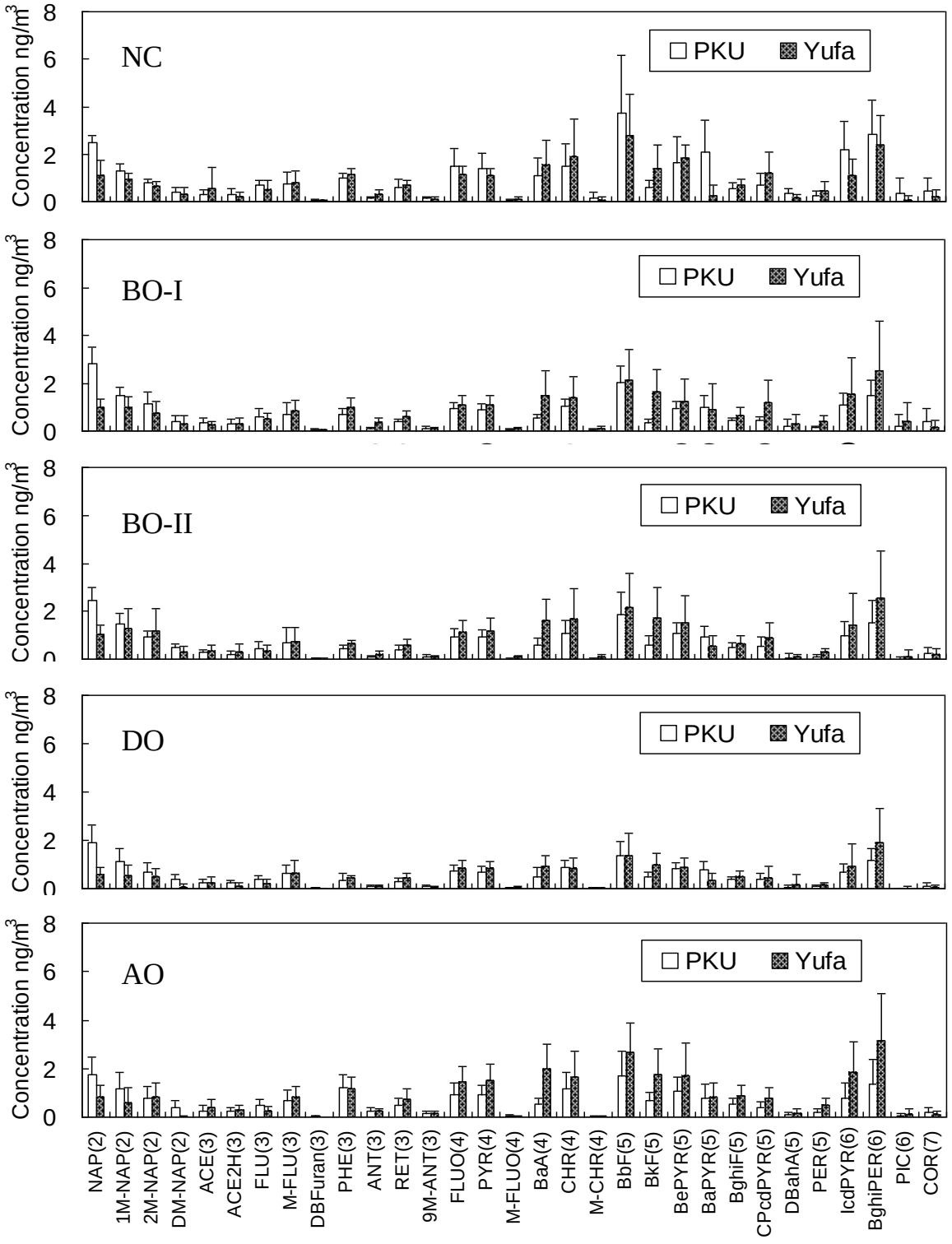

Figure S3. Distributions of PAHs in different periods at PKU and Yufa

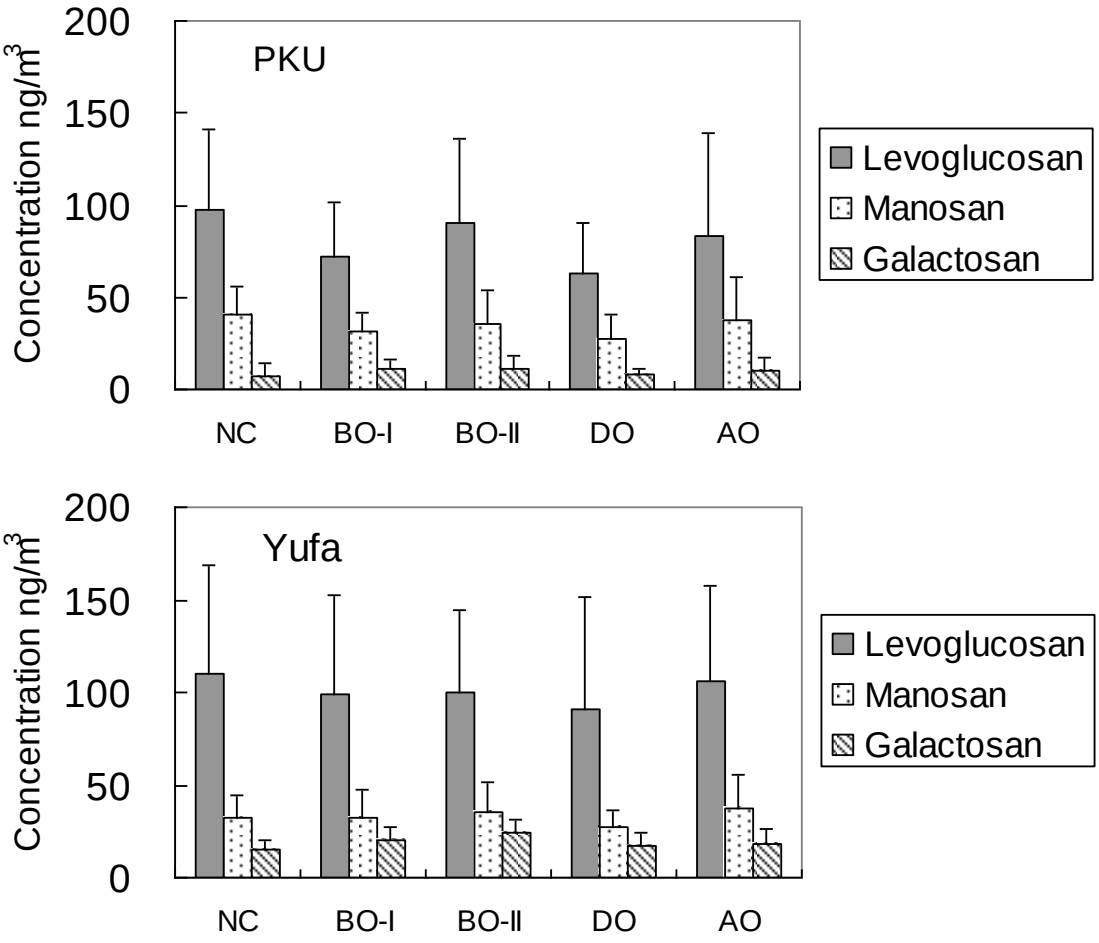

Figure S4. Concentrations of sugar compounds in different periods at PKU and Yufa

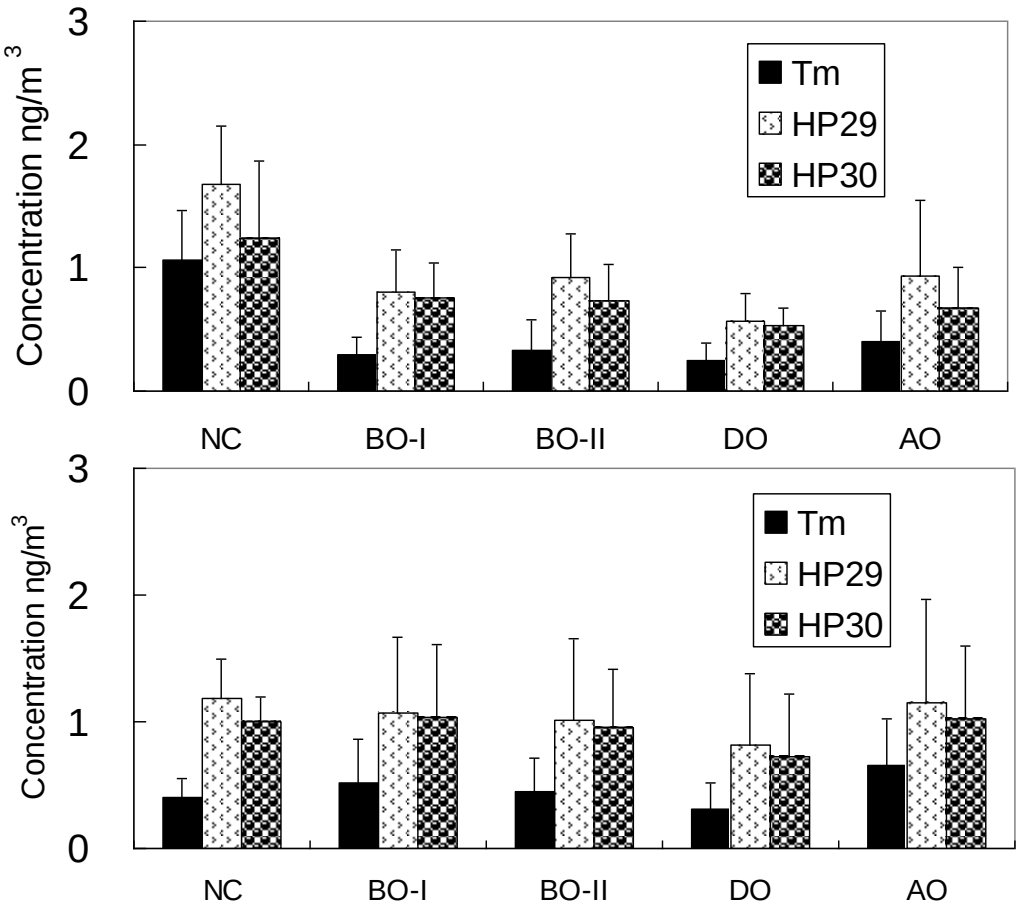

Figure S5. Concentrations of hopanes in different periods at PKU and Yufa