Concentrations and composition profiles of sugars and amino acids in atmospheric fine particulates : identify local primary sources characteristics

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Table 1. The Characteristics of sampling sites.

Sampling sites	characteristics
Urban	an area characterized by high traffic volumes (1,042 vehicles h^{-1}), high population density (8,399 people km^{-2}) and low vegetation coverage (29%).
Rural	open area influenced by agricultural activities
Forest	~20 km from the city center, characterized by low traffic volumes (24 vehicles h^{-1}), low population density (315 people km^{-2}), and high vegetation coverage (71.2%).

Table S2. Calibration curves parameters, limits of detection (LOD), relative standard deviation (RSD), recoveries and of the sugar standards.

Compounds	Compound class	Concentration range (ng μL⁻¹)	Slope	Intercept	r^2	LOD(ng μL⁻¹)	LOD(ng m⁻³)	RSD(%)	Recovery(%)
Levoglucosan	Anhydrosaccharides	1.6-162.1	0.0156	-0.0252	0.999	0.8	1.0	3.2	106.5±3.4
Mannosan	Anhydrosaccharides	1.6-162.1	0.0193	-0.0114	0.987	0.6	0.7	8.8	102.6±9.1
Galactosan	Anhydrosaccharides	1.6-162.1	0.0392	-0.0351	0.988	0.8	1.0	3.5	89.4±3.1
Galactose	Monosaccharides	1.8-180.2	0.0320	-0.0195	0.995	0.9	1.1	3.1	107.9±3.3
Ribose	Monosaccharides	1.5-150.1	0.0340	-0.0278	0.991	0.4	0.5	6.0	90.4±5.4
Fructose	Monosaccharides	1.8-180.2	0.0178	-0.0246	0.991	0.5	0.6	5.3	104.2±5.5
Glucose	Monosaccharides	1.8-180.2	0.0128	-0.0974	0.975	0.9	1.1	7.0	107.7±7.6
Sucrose	Disaccharides	3.4-342.3	0.0286	-0.0261	0.990	0.7	0.8	1.7	104.4±1.8
Maltose	Disaccharides	3.6-360.3	0.0129	-0.0173	0.984	0.8	1.0	5.5	97.9±5.4
Turanose	Disaccharides	3.4-342.3	0.0194	-0.0381	0.986	0.9	1.1	3.2	95.0±3.0
Lactulose	Disaccharides	3.4-342.3	0.0208	-0.0243	0.982	0.8	1.0	4.4	108.0±4.8
Trehalose	Disaccharides	3.8-378.3	0.0271	-0.0195	0.989	0.6	0.7	2.7	91.4±2.5
Arabitol	Sugar alcohols	1.5-152.2	0.0268	-0.0392	0.999	0.4	0.5	10.8	91.8±9.0
Mannitol	Sugar alcohols	1.8-182.2	0.004	-0.0558	0.950	0.2	0.2	8.4	93.5±7.9
Pinitol	Sugar alcohols	1.9-194.2	0.0262	-0.0213	0.992	0.4	0.5	10.2	94.8±9.6
inositol	Sugar alcohols	1.8-180.2	0.0278	-0.0124	0.984	0.6	0.7	11.6	108.8±12.6
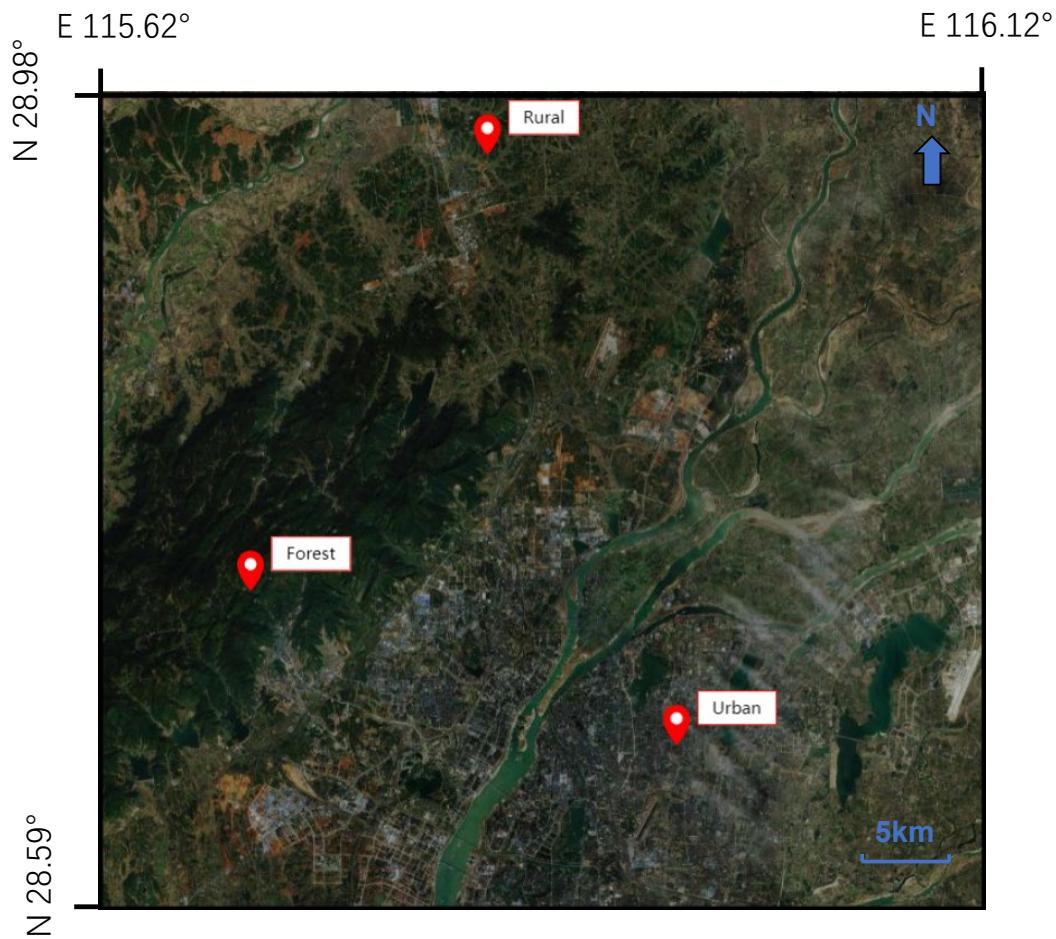
Figure 1. Map showing the locations of the sampling stations. The locational map was modified from MAPWORLD (https://map.tianditu.gov.cn/).
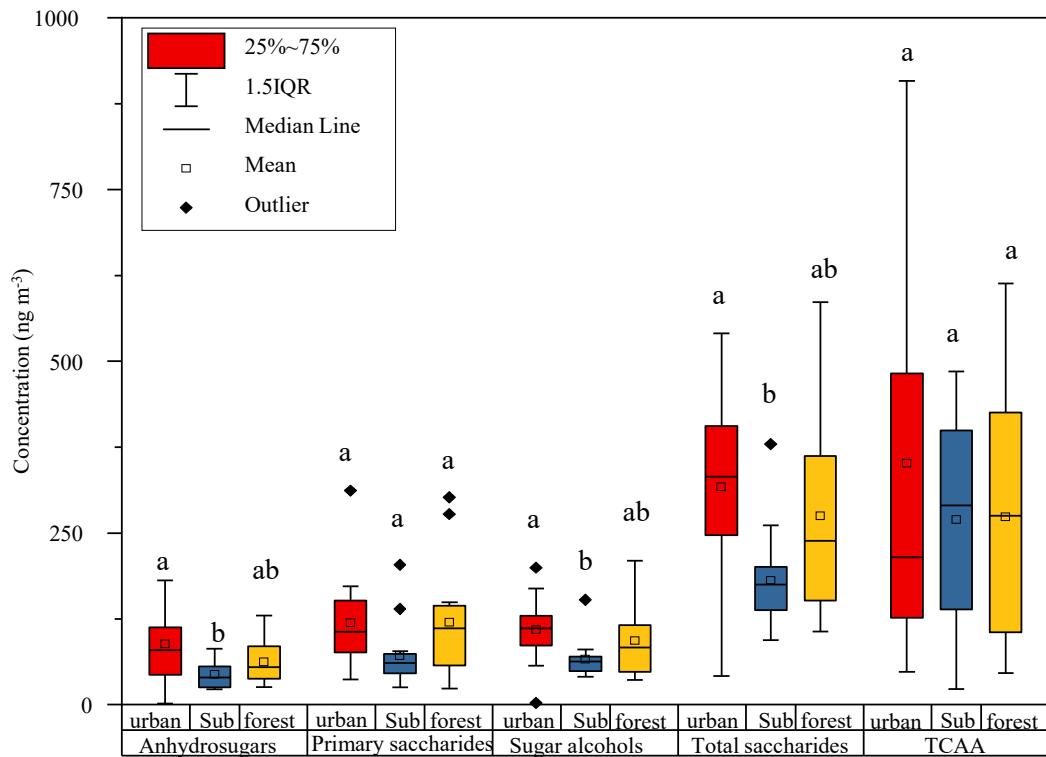
Figure S2. Concentrations of anhydrosugars, primary saccharides, sugar alcohols, total saccharides and TCAA in PM2.5 sampled from urban, rural and forest sites. The box encloses 50% of the data, the whisker is 1.5 interquartile range of the data, the horizontal bar is the median, hollow square is mean and solid diamond are outliers. Different lower case letters denote means found to be statistically different between sites (one-way ANOVA, p < 0.05).
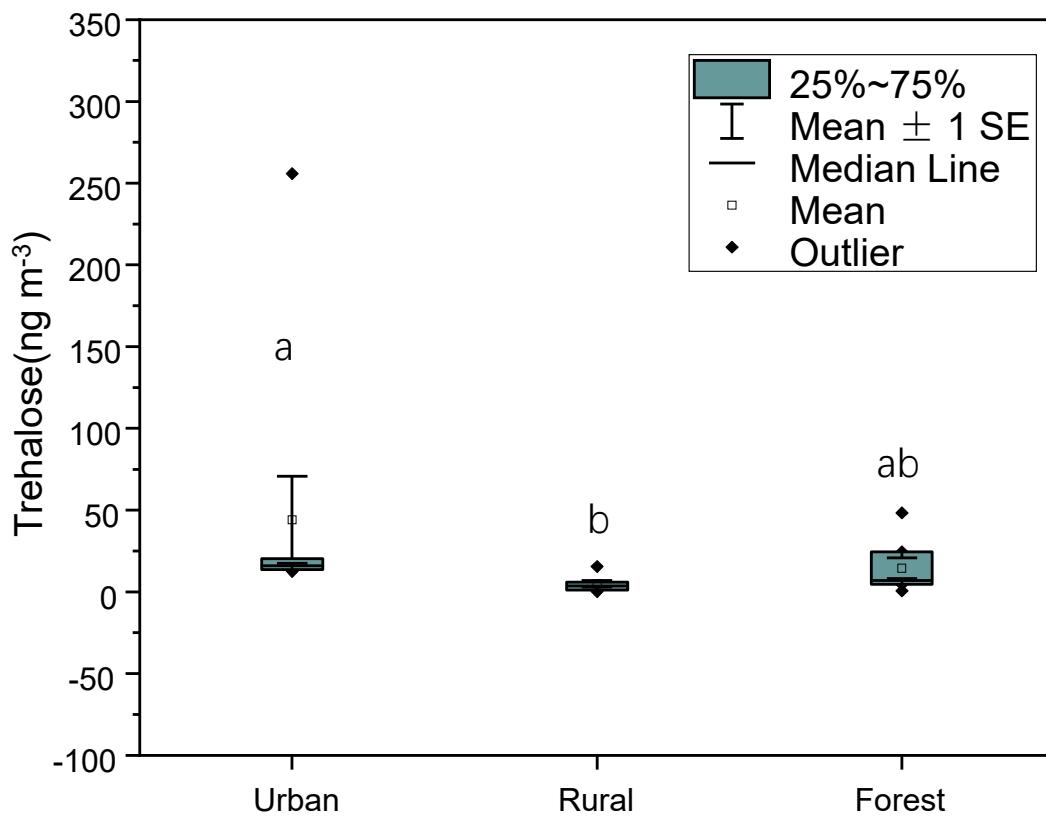
Figure S3. Concentrations of trehalose in PM2.5 sampled from urban, rural and forest sites. The box encloses 50% of the data, the whisker is standard error of the data, the horizontal bar is the median, hollow square is mean and solid diamond are outliers. Different lower case letters denote means found to be statistically different between sites (one-way ANOVA, $p < 0.05$).
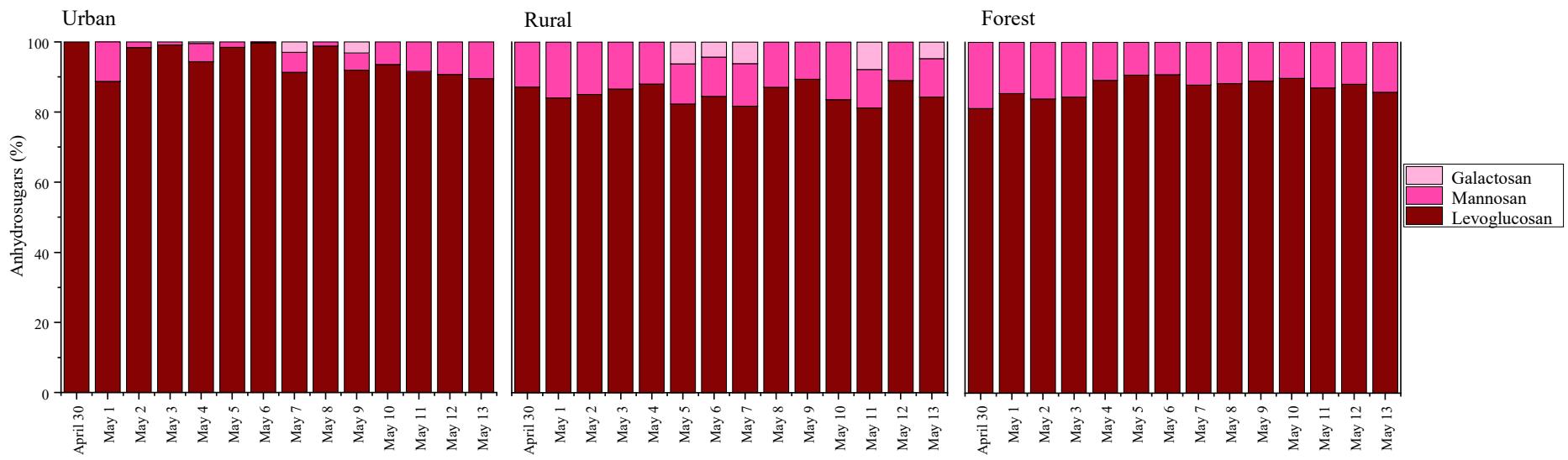
Figure S4. The percent distributions of each individual anhydrosugars (% of total anhydrosugars) in PM2.5 sampled in urban, rural and forest sites.
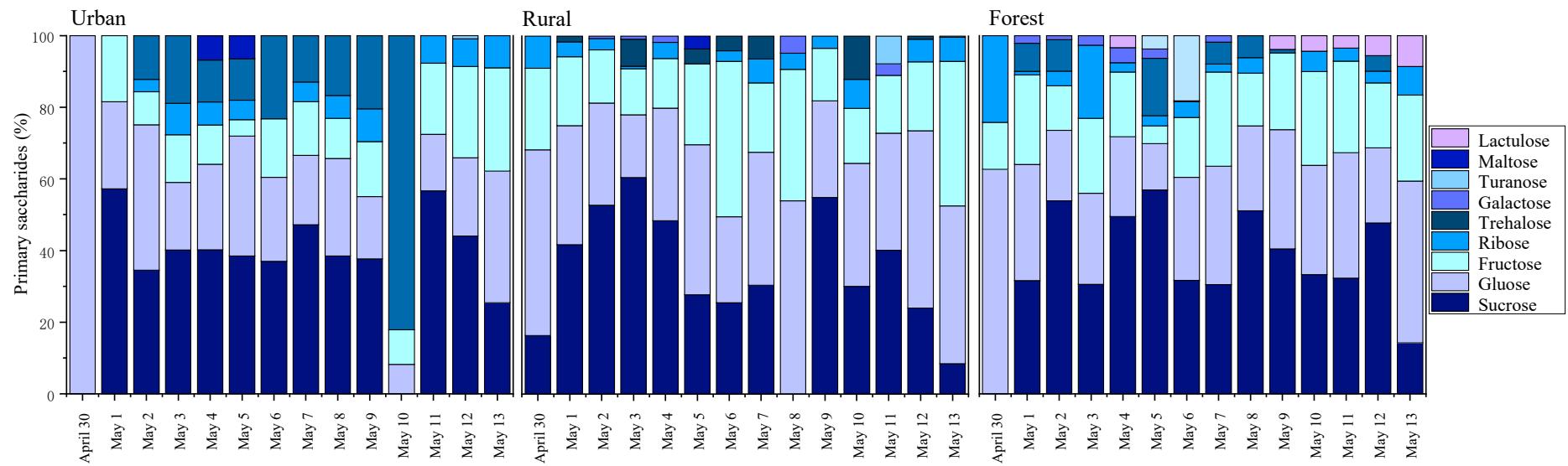
Figure S5. The percent distributions of each individual primary saccharides (% of total primary saccharides) in PM2.5 sampled in urban, rural and forest sites.
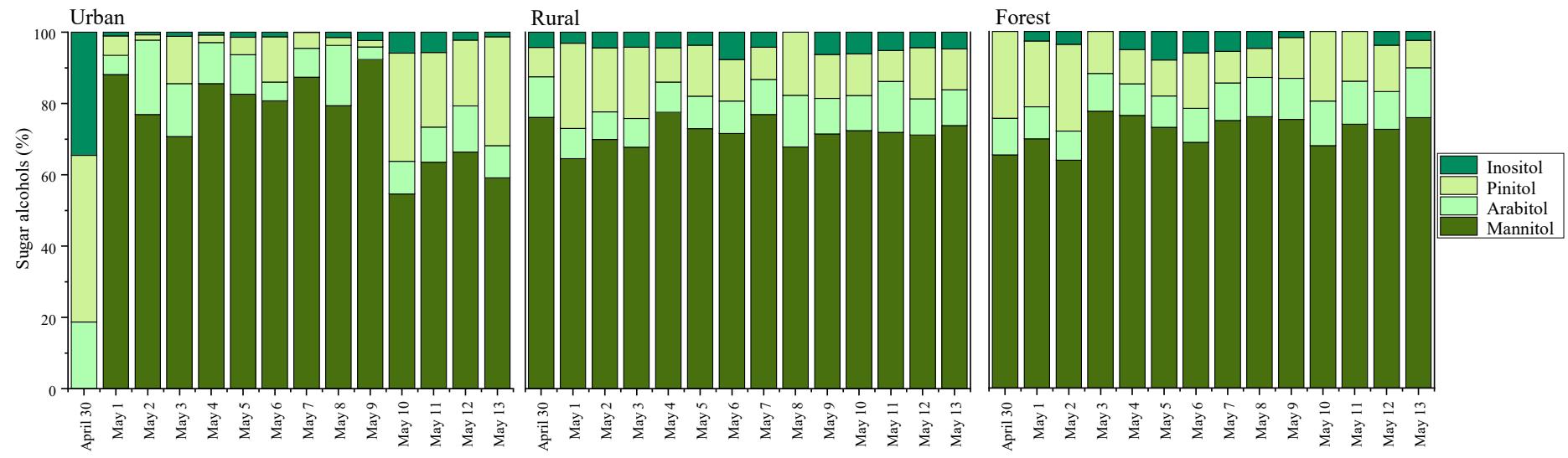
Figure S6. The percent distributions of each individual sugar alcohols (% of total sugar alcohols) in PM2.5 sampled in urban, rural and forest sites.
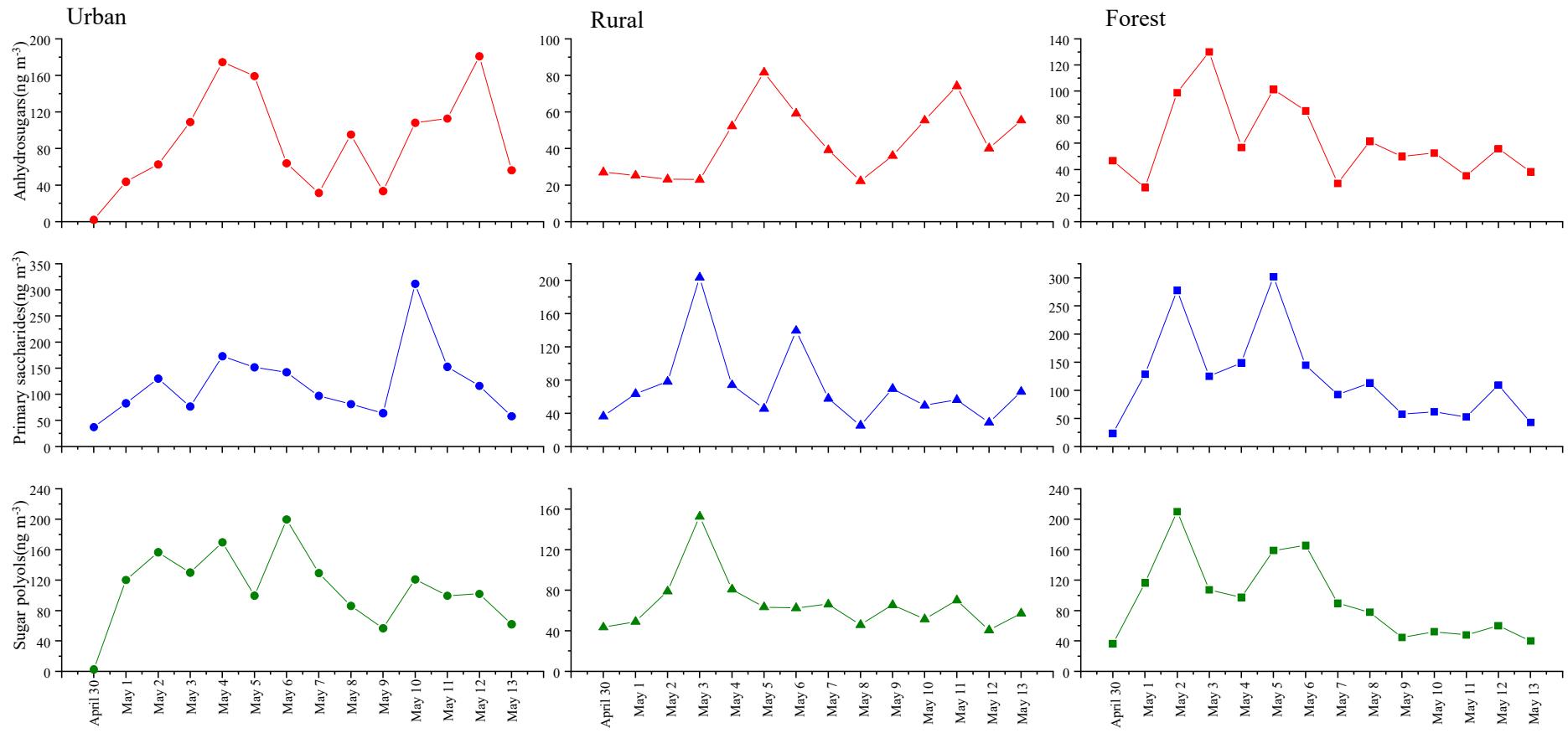
Figure S7. Temporal variations in the concentrations of anhydrosugars, primary saccharides and sugar alcohols detected in PM2.5 at urban, rural and forest sites.
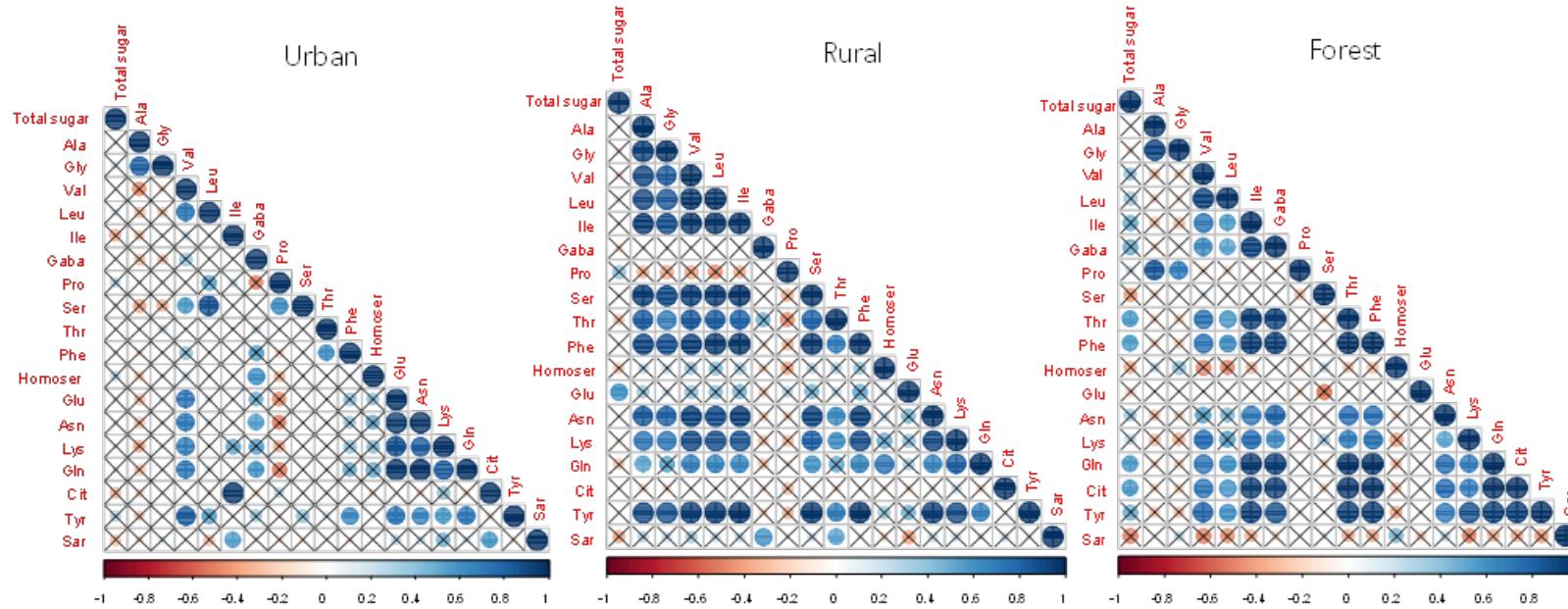
Figure S8. Pearson correlations between Σsugar concentrations and individual FAA species in PM2.5 collected in urban, rural and forest sites. The cross indicates a *p*-value higher than 0.05. The ball indicates a *p*-value less than 0.05. The larger a ball is, the more significant the correlation is