Supplementary Information

Direct Measurement of the Deposition of Submicron Soot Particles on Leaves of Platanus acerifolia Tree

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S1. Validation of submicron soot measurement

To investigate the effects of ammonium dihydrogen phosphate on the elimination of carbonate interference, a solution containing 5 μg mL^{-1} carbonate was mixed with 2 mg mL^{-1} ammonium dihydrogen phosphate ($(NH_4)_2H_2PO_4$) for three 15-min intervals with a rotation table maintained at 200 r min^{-1}. After that, the solution was injected into a Multi N/C analyzer (Analytik Jena AG, Germany) for inorganic carbon (IC) measurements. The experiments were carried out in 7 parallel samples (Table S1). The levels of inorganic carbon in all samples were observed to be lower than the detection limits of instruments (0.02 μg mL^{-1}). The interferences of carbonate on the submicron soot determination in leaf samples with the use of the above extraction procedures in this study are considered to be negligible.

Furthermore, nanoscale graphene oxide (<10 nm, Sigma-Aldrich, US) dispersed in water solution and nanoscale carbon black (<30 nm, Sigma-Aldrich, US) dispersed in water solution were prepared for a standard solution, respectively. The two standard solutions with a series of mixed known concentrations (0.5-20 μg mL^{-1}) were injected into a Multi N/C analyzer (Analytik Jena AG, Germany) for inorganic carbon (IC) measurements. The signals for the determination of nanoscale graphene oxide for a series of mixed known concentrations (0.5-20 μg mL^{-1}) were in line with those of nanoscale carbon black (R^2=0.99) (Figure S3a). This experiment indicated that the submicron carbon morphology could not influence the accuracy of inorganic carbon (IC) in this study. The repeat-ability expressed as relative standard deviations for n = 7 measurements was within 3.2% (one day) and 4.3% (inter-day) for nanoscale soot determination at the concentration of 5 μg mL^{-1}, respectively (Table S2).

Finally, 2 μg mL^{-1} nanoscale graphene oxide and nanoscale carbon black was spiked with water extracts of leaf samples and measured with a Multi N/C analyzer for IC determinations, respectively. The recoveries ranged from 90 to 95% (Figure

S3b). The measurements were conducted in triplicate.

Table S1. Various blank preparations and results

Identifier	C Content (μg mL^{-1})	$^{13}\delta C$(‰)
Milli-Q water (n=7)	ND	/
Milli-Q water and 2 mg mL^{-1} ammonium dihydrogen phosphate ($(NH_4)_2H_2PO_4$) (n=7)	ND	/
5 μg mL^{-1} carbonate in Milli-Q water and 2 mg mL^{-1} ammonium dihydrogen phosphate ($(NH_4)_2H_2PO_4$) (n=7)	ND	/
Blank sample 1 and 2 mg mL^{-1} ammonium dihydrogen phosphate ($(NH_4)_2H_2PO_4$) (n=7)	0.02±0.01	-27.12
Blank sample 2 and 2 mg mL^{-1} ammonium dihydrogen phosphate ($(NH_4)_2H_2PO_4$) (n=7)	0.03±0.01	-26.89
Blank sample 3 and 2 mg mL^{-1} ammonium dihydrogen phosphate ($(NH_4)_2H_2PO_4$) (n=7)	0.03±0.01	-26.97

ND: lower than the detection limit (0.02 μg mL^{-1})

Table S2. Precision results

Identifier	One-day measurement	Inter-day measurement
5 μg mL^{-1} nanoscale graphene oxide (n=7)	2.3	4.1
2 μg mL^{-1} nanoscale graphene oxide and 3 μg mL^{-1} nanoscale nanoscale carbon black (n=7)	3.1	3.8
5 μg mL^{-1} nanoscale carbon black (n=7)	3.2	4.3

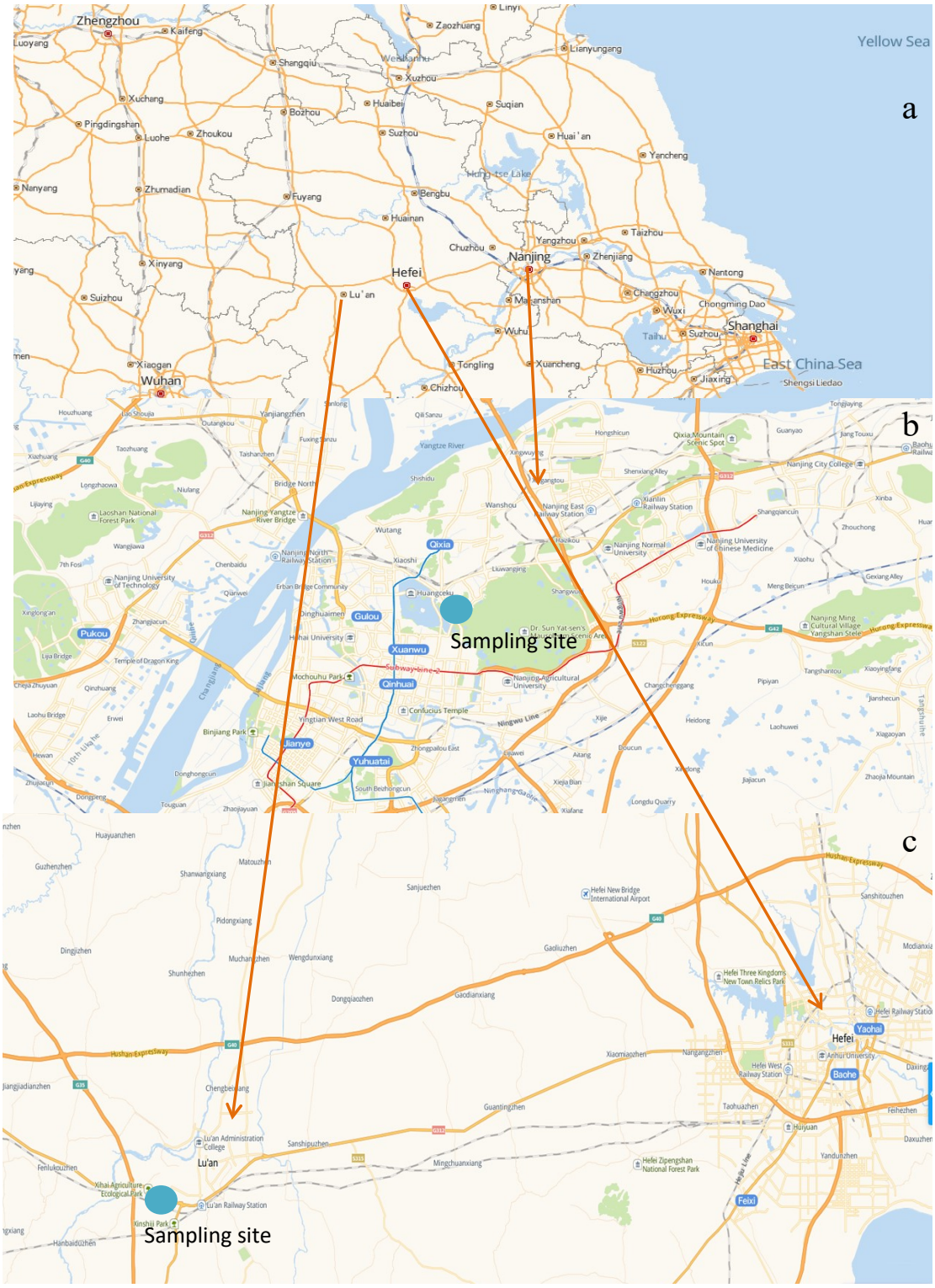

Figure S1. The locations of sampling sites. (a) The relative positions of the two sampling sites, (b) the sampling site (118.81 E, 32.07N) at Nanjing, and (c) the sampling site (116.36 E, 31.73N) at Lu'an.

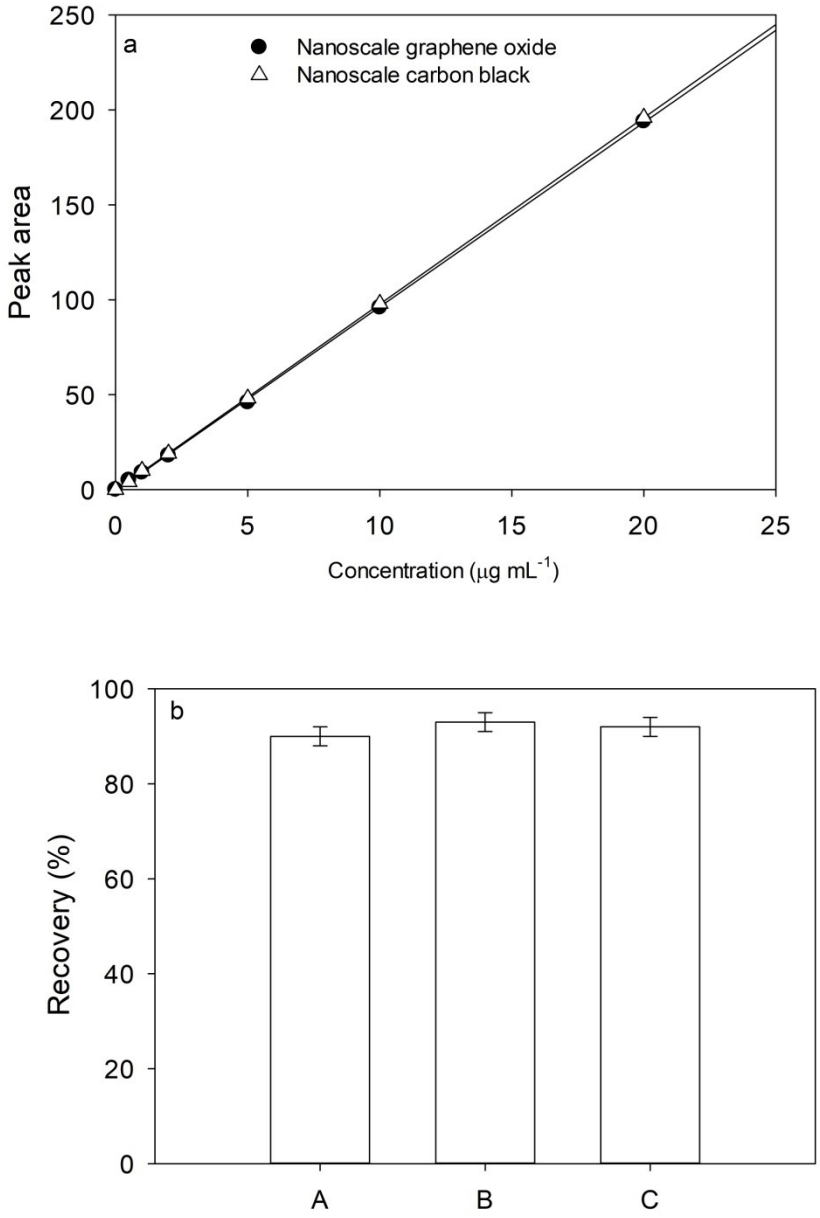

Figure S2. (a) The standard curves for the determination of nanoscale graphene oxide (0.5-20 μg mL^{-1}) and nanoscale carbon black (0.5-20 μg mL^{-1}). (b) The recovery results for the determination of nanoscale graphene oxide and nanoscale carbon black. A. water extracts with 5 μg mL^{-1} of nanoscale graphene oxide. B. water extracts with 5 μg mL^{-1} of nanoscale carbon black. C. water extracts with 2 μg mL^{-1} of nanoscale graphene oxide and 3 μg mL^{-1} of nanoscale carbon black.