Supplement of Atmos. Chem. Phys., 20, 2017–2030, 2020
https://doi.org/10.5194/acp-20-2017-2020-supplement
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Atmospheric Chemistry and Physics
Open Access
EGU

Supplement of

The characteristics of atmospheric brown carbon in Xi'an, inland China: sources, size distributions and optical properties

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Table List

Figure caption

Table S1 Correlation coefficients (r) between $abs_{\lambda=365nm}$ and organic carbon species during sampling periods.

	$abs_{\lambda=365nm}$-MeOH	
	Winter	Summer
Levoglucosan	0.98	0.73
PAHs	0.95	0.73
OPAHs	0.97	0.86
Nitrophenols	0.89	0.78

Note: all data are significant at the 0.01 level

Table S2 Values of Q_{true}, Q_{robust} and average r for the modeling results during sampling periods.

	Q true	*Q* robust	Average *r*
Sampling periods	724	718.7	0.98

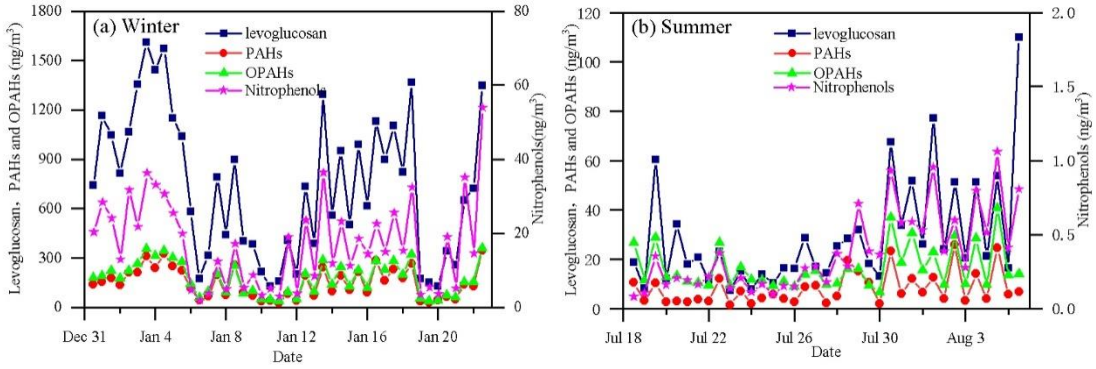

Fig. S1 Temporal variations of levoglucosan, PAHs, OPAHs, and nitrophenols during winter and summer.

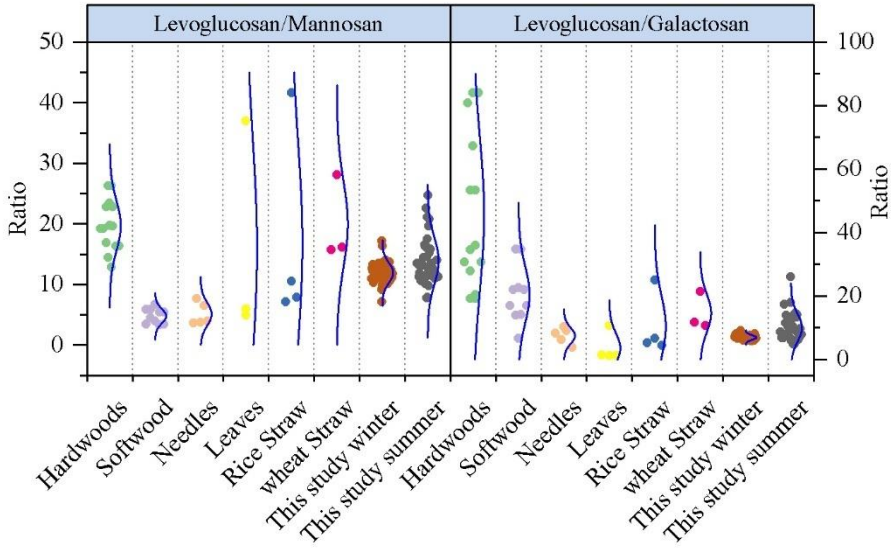

Fig. S2 Comparison of levoglucosan/mannosan and levoglucosan/galactosan ratios between biomass fuels and the samples of this study. Hardwoods cited from Fine et al. (2004a, 2004b);Bari et al. (2010), softwood cited from Fine et al. (2004a, 2004b);Bari et al. (2010), needles derived from Sullivan et al. (2014);Engling et al. (2006), leaves derived from Sullivan et al. (2014);Schmidl et al. (2008), rice straw cited from Sheesley et al. (2003);Yan et al. (2015), wheat straw derived from Yan et al. (2015).

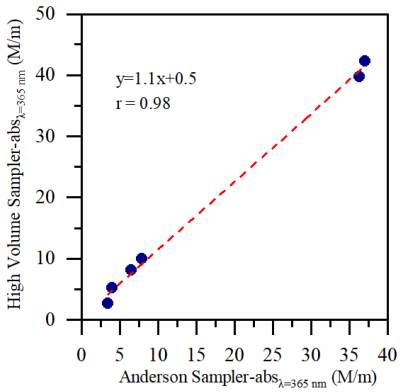

Fig. S3 A comparison on the results measured by Anderson (Dp< 2.1μm) and the $PM_{2.5}$ filter samples.

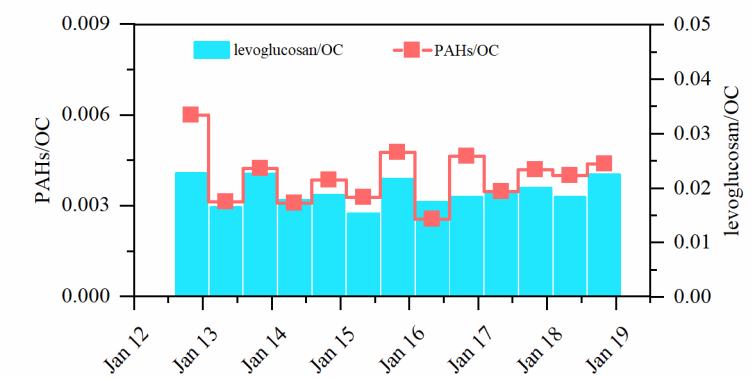

Fig. S4 Temporal variations of PAHs/OC and levoglucosan/OC during the haze period of January 12th to19th (corresponding to the cyan shadow in Figure 5) in Xi'an.

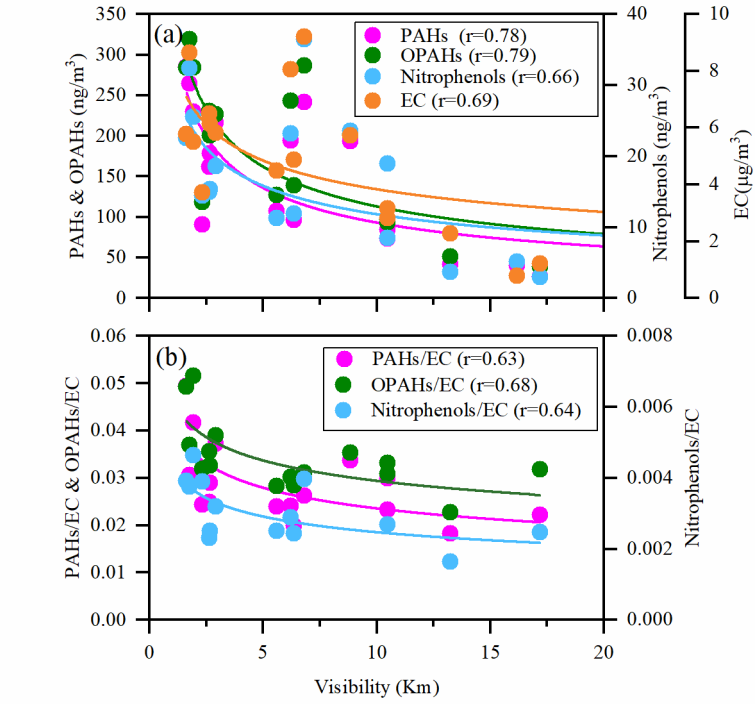

Fig. S5 Regression analysis for PAHs, OPAHs, nitrophenols, EC, and visibility. (a) PAHs, OPAHs, nitrophenols, and EC vs. visibility, (b) PAHs/EC, OPAHs/EC, and nitrophenols/EC vs. visibility.

References

Bari, M. A., Baumbach, G., Kuch, B., and Scheffknecht, G.: Temporal variation and impact of wood smoke pollution on a residential area in southern Germany, Atmospheric Environment, 44, 3823-3832, 2010.

Engling, G., Carrico, C., Kreldenweis, S., Collett, J., Day, D. W., Lincoln, E., Hao, W., Iinuma, Y., and

Herrmann, H.: Determination of levoglucosan in biomass combustion aerosol by high-performance anion-exchange chromatography with pulsed amperometric detection, Atmospheric Environment, 40, 299-311, 2006.

Fine, P. M., Cass, G. R., and Simoneit, B. R. T.: Chemical characterization of fine particle emissions from the fireplace combustion of wood types grown in the Midwestern and Western United States, Environmental Engineering Science, 36, 387-409, 2004a.

Fine, P. M., Cass, G. R., and Simoneit, B. R. T.: Chemical characterization of fine particle emissions from the wood stove combustion of prevalent United States tree species, Environmental Engineering Science, 21, 705-721, 2004b.

Schmidl, C., Bauer, H., Dattler, A., Hitzenberger, R., Weissenboeck, G., Marr, I. L., and Puxbaum, H.: Chemical characterisation of particle emissions from burning leaves, Atmospheric Environment, 42, 9070-9079, 2008.

Sheesley, R. J., Schauer, J. J., Chowdhury, Z., Cass, G. R., and Simoneit, B. R. T.: Characterization of organic aerosols emitted from the combustion of biomass indigenous to South Asia, Journal of Geophysical Research: Atmospheres, 108, n/a-n/a, 10.1029/2002jd002981, 2003.

Sullivan, A. P., May, A. A., Lee, T., McMeeking, G. R., Kreidenweis, S. M., Akagi, S. K., Yokelson, R. J., Urbanski, S. P., and Collett Jr, J. L.: Airborne characterization of smoke marker ratios from prescribed burning, Atmospheric Chemistry and Physics, 14, 10535-10545, 10.5194/acp-14-10535-2014, 2014.

Yan, C., Zheng, M., Sullivan, A. P., Bosch, C., Desyaterik, Y., Andersson, A., Li, X., Guo, X., Zhou, T., and Örjan, G.: Chemical characteristics and light-absorbing property of water-soluble organic carbon in Beijing: Biomass burning contributions, Atmospheric Environment, 121, 4-12, 2015.