
Suitability assessment of six tree species through combined analysis of PM_{2.5} capture ability and air pollution tolerance index (APTI) for urban green belt in Shenyang City, China

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Table S1 Basic growth condition of each tree species

Sites	Species	Life form	Average height (m)	DBH (cm)	Crown (m)	HCB (m)
SAU	<i>P. tabulaeformis</i>	Evergreen	4.6±0.2	19.1±0.6	4.8±0.5	1.9±0.2
	<i>A. holophylla</i>	Evergreen	13.8±1.6	39.8±2.1	8.3±0.8	2.2±0.1
	<i>J. chinensis</i>	Evergreen	8.0±0.1	9.5±0.8	1.6±0.3	1.0±0.1
	<i>S. babylonica</i>	Deciduous	8.5±0.4	23.0±3.7	6.7±1.3	2.3±0.2
	<i>R. pseudoacacia</i>	Deciduous	6.9±0.2	14.7±1.7	4.4±0.5	1.6±0.4
	<i>P. alba</i>	Deciduous	10.5±1.3	11.2±2.2	4.1±0.8	3.2±0.8
SFH	<i>P. tabulaeformis</i>	Evergreen	4.2±0.4	15.2±1.1	5.1±0.7	1.9±0.3
	<i>A. holophylla</i>	Evergreen	5.8±0.9	11.8±1.1	4.2±0.4	1.6±0.1
	<i>J. chinensis</i>	Evergreen	4.3±0.1	7.0±0.2	0.8±0.2	0.3±0.1
	<i>S. babylonica</i>	Deciduous	8.3±0.9	26.1±1.5	6.9±0.6	2.4±0.2
	<i>R. pseudoacacia</i>	Deciduous	8.1±0.9	21.9±3.9	4.3±0.7	1.8±0.2
	<i>P. alba</i>	Deciduous	9.8±1.0	30.5±2.2	6.8±0.9	2.5±0.6
XBP	<i>P. tabulaeformis</i>	Evergreen	3.9±0.7	16.2±0.8	4.8±0.9	1.6±0.4
	<i>A. holophylla</i>	Evergreen	8.7±2.2	15.6±1.7	6.3±1.2	1.6±0.8
	<i>J. chinensis</i>	Evergreen	6.8±0.4	8.6±1.7	0.7±0.3	0.3±0.1
	<i>S. babylonica</i>	Deciduous	10.7±1.0	20.3±0.7	6.4±0.7	2.1±0.3
	<i>R. pseudoacacia</i>	Deciduous	6.9±1.3	21.4±1.3	6.8±0.3	2.2±0.6
	<i>P. alba</i>	Deciduous	11.6±0.9	13.6±0.9	6.9±1.1	2.8±1.3

Table S2 APTI values among different species and sites

Sites	Species	RWC (%)	pH	TCC (mg·g ⁻¹)	AAC (mg·g ⁻¹)	APTI	PM _{2.5} (μg·cm ⁻²)
SAU	<i>P. tabulaeformis</i>	83.86±3.32	3.57±0.15	0.84±0.51	6.14±2.36	11.13±1.26	136.49±55.22
	<i>A. holophylla</i>	81.99±5.3	4.28±0.51	1.48±0.13	5.61±1.05	11.41±0.99	167.49±52.05
	<i>J. chinensis</i>	76.68±4.66	5.03±0.12	1.08±0.14	2.91±0.94	9.39±0.91	101.97±42.78
	<i>S. babylonica</i>	91.89±2.81	5.98±0.3	2.12±0.33	2.14±0.36	10.91±0.39	53.74±28.25
	<i>R. pseudoacacia</i>	89.6±4.63	6.5±0.18	2.9±0.32	8.25±2.17	16.73±1.97	35.38±20.89
	<i>P. alba</i>	78.49±9.46	5.84±0.15	1.82±0.29	5.5±1.33	11.6±2.09	71.13±36
SFH	<i>P. tabulaeformis</i>	83.23±2.78	3.43±0.14	0.47±0.22	7.74±2.34	11.41±1.08	223.03±88.39
	<i>A. holophylla</i>	84.24±2.28	3.8±0.43	0.74±0.17	8.12±2.42	12.11±1.12	314.4±138.76
	<i>J. chinensis</i>	74.89±4.36	5.22±0.31	0.67±0.11	2.97±0.73	9.29±0.65	198.27±72.3
	<i>S. babylonica</i>	89.26±3.4	5.72±0.3	2.01±0.28	2.71±0.9	11.02±0.57	91.17±39.62
	<i>R. pseudoacacia</i>	90.36±4.68	6.19±0.23	2.56±0.3	5.52±0.99	13.88±1.2	54.04±33.57
	<i>P. alba</i>	82.54±8.87	5.99±0.13	2.27±0.14	7.04±1.2	14.09±1.47	111.16±51.33
XBP	<i>P. tabulaeformis</i>	82.8±5.7	3.44±0.24	0.74±0.32	4.44±1.07	10.12±0.84	188.47±67.98
	<i>A. holophylla</i>	83.14±3.28	4.42±0.21	1.34±0.14	4.47±0.71	10.89±0.33	245.61±109.3
	<i>J. chinensis</i>	77.03±3.24	5.38±0.15	0.89±0.1	2.1±0.56	9.04±0.56	151.06±62.19
	<i>S. babylonica</i>	89.18±2.08	5.91±0.15	1.95±0.38	2.14±0.61	10.59±0.39	71.36±34.93
	<i>R. pseudoacacia</i>	84.82±6.57	6.26±0.37	2.54±0.38	5.66±2.13	13.58±1.81	46.74±27.59
	<i>P. alba</i>	82.21±7.86	5.71±0.27	2.35±0.1	4.29±1.13	11.64±1.33	87.45±40.27

Table S3 Relationship between contact angle and wettability		
Number	Contact angle	Wettability
1	$0 \leq 40^\circ$	Super-hydrophilic
2	$40^\circ < \theta \leq 90^\circ$	Highly-wettable
3	$90^\circ < \theta \leq 110^\circ$	Wettable
4	$110^\circ < \theta \leq 150^\circ$	Hydrophobic
5	$150^\circ < \theta$	Highly-hydrophobic

Table S4 API score, grade, and category for plant species		
API category	Score (%)	API category
0	≤ 30	Not recommended (NR)
1	31-40	Very poor (VP)
2	41-50	Poor (P)
3	51-60	Moderate (M)
4	61-70	Good (G)
5	71-80	Very good (VG)
6	81-90	Excellent (E)
7	91-100	Best (B)

1. Suitability Evaluation for Plants

The results of the suitability evaluation based on the NAPI are shown in Table S5. The suitability evaluation of the tested tree species is variable among sites. The tree species usually have a high NAPI value at the SFH, while the lowest value is at the SAU site. The suitability evaluation of *P. tabulaeformis* present is good (NAPI = 4), which had the highest NAPI score. *S. babylonica* is poor (NAPI=2) for suitability in research sites. The most appropriate species for planting was *P. tabulaeformis*, followed in order by *J. chinensis*, *A. holophylla*, *P. alba*, and *R. pseudoacacia*, while *S. babylonica* is not considered for its poor NAPI.

Table S5 New Anticipated Performance Index (NAPI) calculated by the PM_{2.5} capture capacity and APTI.

Sites	Species	APTI	PM _{2.5}	Plant	Canopy	Type	Laminar structure			Economic	Score		NAPI	Category
			capture	habit	structure	of				value				
			capacity			plant								
							Leaf	Hardi	Growing		Total	%		
							size	-ness	condition					
SAU	<i>P. tabulaeformis</i>	+	++	++	+	+	-	+	++	++	11	61.11	4	G
	<i>A. holophylla</i>	+	+++	+	+	+	-	+	++	+	10	55.56	3	M
	<i>J. chinensis</i>	+	++	+	++	+	-	+	++	+	10	55.56	3	M
	<i>S. babylonica</i>	+	+	++	+	-	+	+	+	+	8	44.44	2	P
	<i>R. pseudoacacia</i>	++	-	+	+	-	+	+	++	++	8	44.44	2	P
	<i>P. alba</i>	+	+	++	+	-	++	+	++	+	10	55.56	3	M
SFH	<i>P. tabulaeformis</i>	+	+++	++	+	+	-	+	++	++	12	66.67	4	G
	<i>A. holophylla</i>	++	+++	+	+	+	-	+	++	+	11	61.11	4	G
	<i>J. chinensis</i>	+	+++	+	++	+	-	+	++	+	11	61.11	4	G
	<i>S. babylonica</i>	+	+	++	+	-	+	+	+	+	8	44.44	2	P
	<i>R. pseudoacacia</i>	++	+	+	+	-	+	+	++	++	10	55.56	3	M
	<i>P. alba</i>	++	++	++	+	-	++	+	++	+	12	66.67	4	G
XBP	<i>P. tabulaeformis</i>	+	+++	++	+	+	-	+	++	++	12	66.67	4	G
	<i>A. holophylla</i>	+	+++	+	+	+	-	+	++	+	10	55.56	3	M
	<i>J. chinensis</i>	+	+++	+	++	+	-	+	++	+	11	61.11	4	G
	<i>S. babylonica</i>	+	+	++	+	-	+	+	+	+	8	44.44	2	P
	<i>R. pseudoacacia</i>	++	-	+	+	-	+	+	++	++	8	44.44	2	P
	<i>P. alba</i>	+	+	++	+	-	++	+	++	+	10	55.56	3	M

2. Effects of metal content in PM on biochemical parameters of plants

During the experimental design phase, we only measured four metal element content in PM accumulated on plant leaf surfaces and analyzed the correlation among the metal content, plant APTI, biochemical parameters and PM_{2.5} capture, but the results were mostly not significant ($p>0.05$) (Table S6). The reason may be caused by too small sample number or too few elements selected. It is hoped that future researchers can conduct in-depth studies to better explore the effects of PM chemical composition (including metals) on plant tolerance.

Table S6 Pearson correlation coefficient between metal element content in PM and plant biochemical parameters, the amount of PM_{2.5} capture and APTI.

	APTI	RWC	pH	TCC	AAC	PM _{2.5}
Hg	-0.133	-0.102	-0.39	-0.293	0.163	0.434
As	0.002	0.397	0.334	0.388	-0.247	-0.283
Pb	-0.124	-0.409	-0.690**	-0.485*	0.362	0.526*
Cd	-0.004	0.373	0.327	0.431	-0.304	-0.306

Notes: **: $p < 0.01$; *: $p < 0.05$.

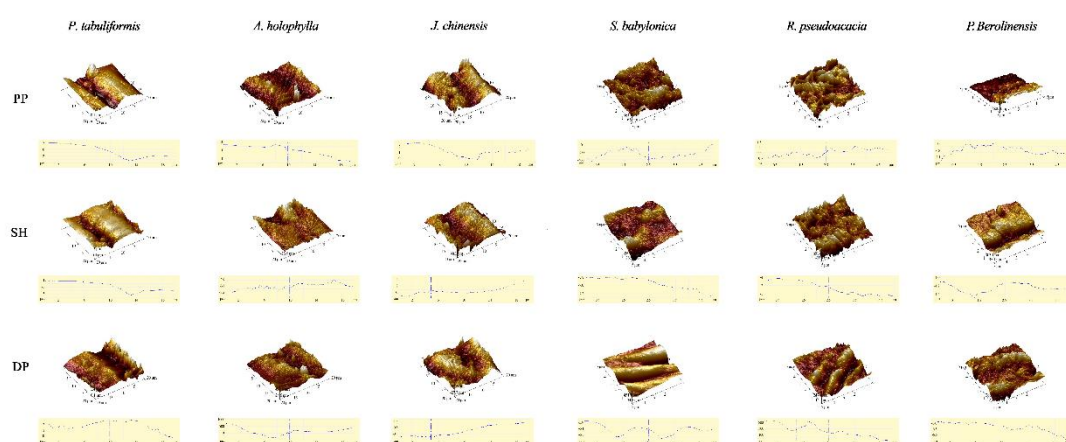


Figure S1. The atomic force microscopy (AFM) images of leaf surfaces.

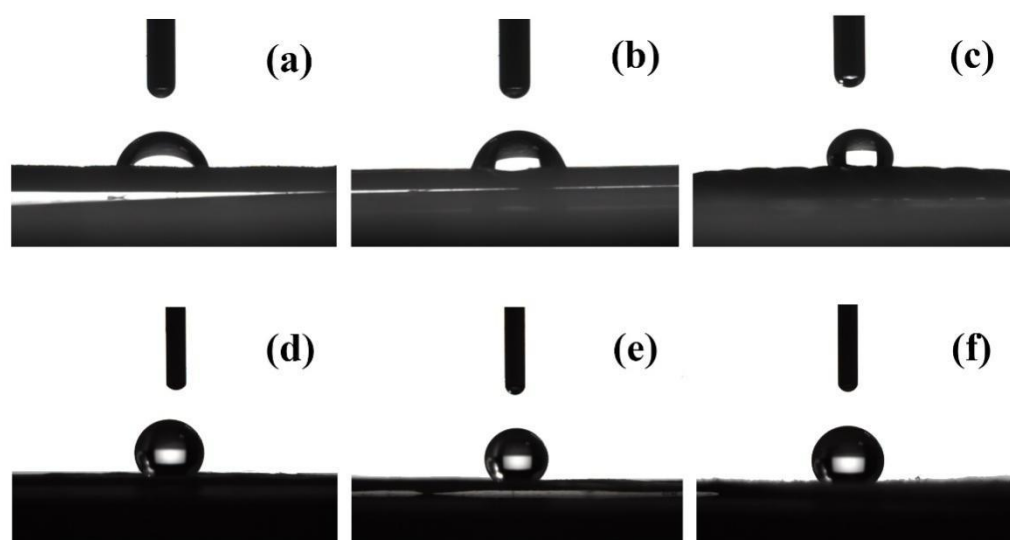


Figure S2. Measurement image of leaf surface contact angle.

Note: (a) *P. tabuliformis*; (b) *A. holophylla*; (c) *J. chinensis*; (d) *S. babylonica*; (e) *R. pseudoacacia*; (f) *P. berolinensis*

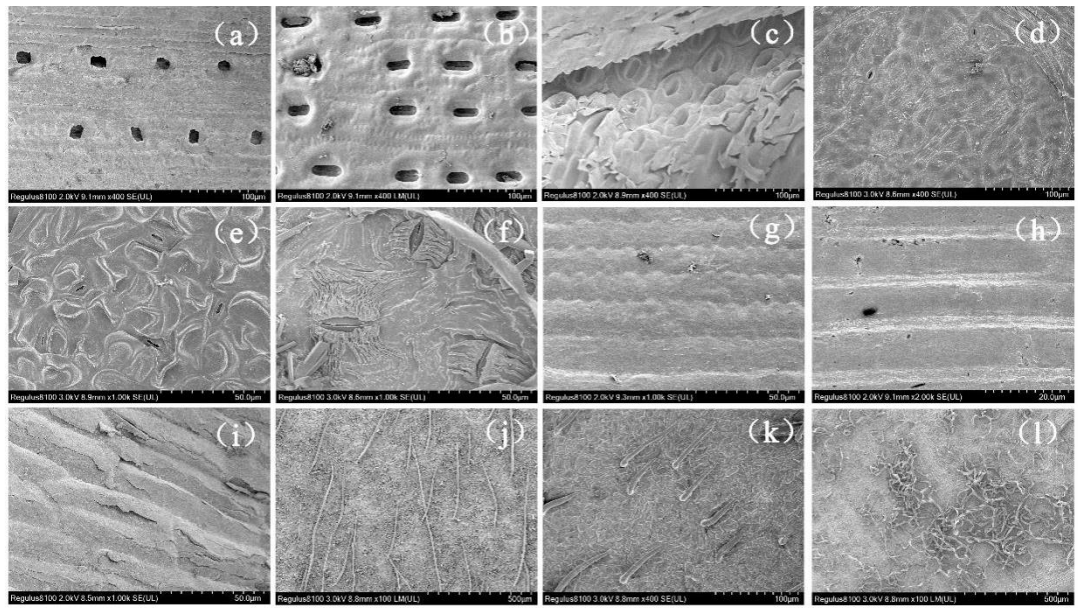


Figure S3. Scanning electron microscope images of different tree species.

Note:(a) *P. tabuliformis*, stomata; (b) *A. holophylla*, stomata; (c) *J. chinensis*, stomata; (d) *S. babylonica*, stomata; (e) *R. pseudoacacia*, stomata; (f) *P. berolinensis*, stomata; (g) *A. holophylla*, groove; (h) *P. tabuliformis*, groove; (i) *J. chinensis*, groove; (j) *S. babylonica*, trichome; (k) *R. pseudoacacia*, trichome; (l) *P. berolinensis*, trichome.