

Table S1. Data of studied species. Mean + standard deviation are shown.

Life form	Species	Family	LMA	LLS		P <sub>area</sub>	P <sub>mass</sub>	PNUE	N <sub>area</sub>	N <sub>mass</sub>	g <sub>s</sub>
Annual herb	<i>Persicaria thunbergii</i> (Sieb. et Zucc.) H. Gross	Polygonaceae	23.88 + 2.32	0.12	NA	17.08 + 1.68	718.3 + 85.8	249.2 + 28.8	0.069 + 0.009	4.09 + 0.17	0.80 + 0.08
	<i>Xanthium canadense</i> Mil.	Compositae	30.45 ± 3.23	0.15	NA	28.70 ± 1.66	951.6 ± 123.9	322.4 ± 31.8	0.089 ± 0.004	4.14 ± 0.42	2.16 ± 0.39
Perennial herb	<i>Fagopyron dibotrys</i> (D. Don) H. Hara	Polygonaceae	18.12 ± 0.86	NA	NA	13.60 ± 0.81	750.6 ± 27.4	216.0 ± 13.0	0.063 ± 0.001	4.87 ± 0.25	0.57 ± 0.10
	<i>Helianthus tuberosus</i> L.	Compositae	20.09 ± 1.51	0.16	NA	15.78 ± 1.09	789.9 ± 96.9	207.0 ± 11.0	0.076 ± 0.003	5.33 ± 0.43	0.82 ± 0.04
	<i>Phragmites communis</i> Trin.	Poaceae	69.95 ± 3.20	NA	NA	18.85 ± 3.20	268.7 ± 38.5	129.0 ± 19.5	0.146 ± 0.010	2.92 ± 0.10	0.34 ± 0.14
	<i>Pueraria lobata</i> (Willd.) Ohwi	Leguminosae	38.89 ± 5.33	NA	NA	18.63 ± 2.45	480.2 ± 31.0	158.1 ± 14.4	0.118 ± 0.014	4.26 ± 0.17	0.51 ± 0.12
	<i>Reynoutria sachalinensis</i> (Fr. Schm.) Nakai	Polygonaceae	39.35 ± 5.99	0.16	NA	19.07 ± 2.09	494.4 ± 97.5	169.6 ± 19.7	0.113 ± 0.007	4.05 ± 0.39	0.51 ± 0.05
Deciduous tree	<i>Rumex obtusifolius</i> L.	Polygonaceae	25.51 ± 3.35	NA	NA	22.09 ± 1.30	874.2 ± 96.6	212.1 ± 15.6	0.104 ± 0.007	5.81 ± 0.92	0.75 ± 0.21
	<i>Acer japonicum</i> Thunb.	Aceraceae	46.84 ± 4.97	0.53	NA	6.79 ± 0.49	146.7 ± 24.7	84.6 ± 12.2	0.081 ± 0.008	2.42 ± 0.08	0.09 ± 0.01
	<i>Acer mono</i> Maxim. var <i>marmoratum</i>	Aceraceae	65.34 ± 6.51	0.54	NA	10.65 ± 1.32	163.7 ± 20.2	85.2 ± 5.3	0.125 ± 0.013	2.68 ± 0.18	0.12 ± 0.01
	<i>Acer nikoense</i> Maxim.	Aceraceae	49.16 ± 1.30	0.51	NA	6.97 ± 3.23	140.6 ± 62.5	83.6 ± 36.9	0.082 ± 0.004	2.35 ± 0.05	0.13 ± 0.08
	<i>Mallotus japonicus</i> (Thunb. ex Murray) Muell. Arg.	Euphorbiaceae	60.04 ± 7.88	0.45	NA	19.02 ± 2.49	317.1 ± 20.0	121.8 ± 13.8	0.157 ± 0.025	3.66 ± 0.21	0.44 ± 0.12
	<i>Quercus crispula</i> Blume	Fagaceae	50.63 ± 0.13	0.53	NA	8.69 ± 0.50	171.6 ± 10.0	86.7 ± 6.8	0.100 ± 0.003	2.77 ± 0.08	0.11 ± 0.01
	<i>Quercus serrata</i> Thunb. ex Murray	Fagaceae	69.39 ± 7.01	0.54	NA	12.38 ± 0.54	180.0 ± 21.7	95.4 ± 4.2	0.130 ± 0.003	2.64 ± 0.23	0.16 ± 0.01
	<i>Zanthoxylum ailanthoides</i> Sieb. et Zucc.	Rutaceae	34.99 ± 4.74	NA	NA	17.09 ± 1.76	495.0 ± 80.1	160.0 ± 5.2	0.107 ± 0.011	4.34 ± 0.77	0.60 ± 0.06
	<i>Hydrangea macrophylla</i>	Hydrangeaceae	53.96 ± 12.37	0.51	NA	12.36 ± 0.62	238.0 ± 59.1	127.9 ± 23.0	0.099 ± 0.017	2.58 ± 0.17	0.27 ± 0.05
	<i>Morus australis</i> Poir.	Moraceae	51.73 ± 25.98	0.36	NA	15.23 ± 1.44	357.4 ± 167.9	119.1 ± 40.6	0.141 ± 0.053	4.05 ± 0.64	0.68 ± 0.27
Evergreen broad-leaved tree	<i>Camellia japonica</i> L.	Theaceae	142.70 ± 12.23	2.90 ± 0.30		7.30 ± 2.42	52.1 ± 19.0	48.0 ± 17.3	0.156 ± 0.021	1.53 ± 0.13	0.08 ± 0.04
	<i>Neolitsea sericea</i> (Bl.) Koidz.	Lauraceae	56.23 ± 5.64	2.20 ± 0.45		6.44 ± 0.77	115.1 ± 16.3	77.2 ± 4.9	0.083 ± 0.008	2.08 ± 0.16	0.09 ± 0.01
	<i>Phyllostachys bambusoides</i> Sieb. et Zucc.	Poaceae	64.16 ± 1.81	1.00 ± 0.00		8.96 ± 1.07	139.7 ± 17.0	78.3 ± 10.0	0.115 ± 0.006	2.50 ± 0.06	0.10 ± 0.01
Evergreen broad-leaved shrub	<i>Quercus myrsinaefolia</i> Blume	Fagaceae	79.25 ± 3.43	1.00 ± 0.00		6.34 ± 0.39	80.0 ± 1.4	63.2 ± 1.8	0.100 ± 0.004	1.77 ± 0.03	0.08 ± 0.01
	<i>Aucuba japonica</i> Thunb.	Cornaceae	61.61 ± 3.44	2.00 ± 0.33		6.56 ± 1.68	106.4 ± 27.4	60.0 ± 17.1	0.110 ± 0.006	2.50 ± 0.12	0.07 ± 0.04
	<i>Ilex crenata</i> Thunb.	Aquifoliaceae	106.06 ± 5.09	4.50 ± 0.40		11.74 ± 2.03	111.3 ± 22.4	79.6 ± 15.4	0.148 ± 0.004	1.96 ± 0.04	0.14 ± 0.04
	<i>Mahonia japonica</i> (Thunb.) DC.	Berberidaceae	92.85 ± 12.87	4.60 ± 0.40		7.02 ± 0.85	76.2 ± 10.4	64.2 ± 11.5	0.111 ± 0.017	1.67 ± 0.08	0.09 ± 0.02
	<i>Abies firma</i> Sieb. et Zucc.	Pinaceae	163.57 ± 25.54	7.30 ± 1.51		7.17 ± 1.27	42.0 ± 6.4	53.6 ± 5.2	0.127 ± 0.013	1.10 ± 0.14	0.09 ± 0.02
Evergreen conifer	<i>Cryptomeria japonica</i> (L. fil.) D. Don	Taxodiaceae	90.65 + 7.97	4.80 + 0.06		4.67 + 1.11	51.2 + 9.3	39.3 + 9.2	0.119 + 0.012	1.84 + 0.10	0.05 + 0.01

LMA, leaf mass per area ( $\text{g m}^{-2}$ ); LLS, leaf life span (year); P<sub>area</sub>, photosynthetic rate per area ( $\mu\text{mol m}^{-2} \text{s}^{-1}$ ); P<sub>mass</sub>, photosynthetic rate per mass ( $\text{nmol g}^{-1} \text{s}^{-1}$ ); PNUE, photosynthetic nitrogen use efficiency ( $\mu\text{mol mol}^{-1} \text{s}^{-1}$ ); N<sub>area</sub>, leaf nitrogen per area ( $\text{mol m}^{-2}$ ); N<sub>mass</sub>, leaf nitrogen per mass (%); g<sub>s</sub>, stomatal conductance for water vapour ( $\text{mol m}^{-2} \text{s}^{-1}$ ); C<sub>i</sub>/C<sub>a</sub>, the ratio of CO<sub>2</sub> concentration at intercellular space to that at air; R<sub>area</sub>, Rubisco per area ( $\text{g m}^{-2}$ ); R<sub>mass</sub>, Rubisco per leaf mass ( $\text{g g}^{-1}$ ); RNF, Rubisco nitrogen per leaf nitrogen ( $\text{mol mol}^{-1}$ ); RBUE, photosynthetic rate per Rubisco ( $\mu\text{mol g}^{-1} \text{s}^{-1}$ ); WM, cell wall mass per area ( $\text{g m}^{-2}$ ); WMF, cell wall mass per leaf mass ( $\text{g g}^{-1}$ ); WN, cell wall nitrogen per area ( $\text{mol m}^{-2}$ ); WNF, cell wall nitrogen per leaf nitrogen ( $\text{mol mol}^{-1}$ ); WNC, nitrogen concentration of cell wall (%); NA, not available.

$C_p/C_n$	$R_{area}$	$R_{mass}$	RNF	RBUE	WM	WMF	WN	WNF	WNC
0.87 ± 0.01	1.98 ± 0.09	0.084 ± 0.010	0.331 ± 0.042	8.63 ± 0.69	12.1 ± 0.9	0.52 ± 0.07	0.0047 ± 0.0006	0.067 ± 0.002	0.54 ± 0.10
0.89 ± 0.01	2.08 ± 0.31	0.068 ± 0.005	0.267 ± 0.038	14.01 ± 2.18	12.4 ± 1.9	0.41 ± 0.03	0.0037 ± 0.0009	0.042 ± 0.011	0.46 ± 0.17
0.86 ± 0.02	1.12 ± 0.09	0.060 ± 0.006	0.203 ± 0.016	12.51 ± 0.73	6.6 ± 0.4	0.36 ± 0.01	0.0013 ± 0.0011	0.013 ± 0.009	0.28 ± 0.23
0.88 ± 0.01	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
0.68 ± 0.10	3.14 ± 0.35	0.045 ± 0.003	0.245 ± 0.010	5.91 ± 1.48	41.4 ± 8.0	0.59 ± 0.13	0.0080 ± 0.0013	0.054 ± 0.004	0.28 ± 0.06
0.80 ± 0.02	1.44 ± 0.13	0.036 ± 0.002	0.137 ± 0.005	13.37 ± 1.27	13.8 ± 0.4	0.35 ± 0.05	0.0034 ± 0.0004	0.028 ± 0.000	0.34 ± 0.05
0.79 ± 0.02	3.11 ± 0.51	0.077 ± 0.001	0.313 ± 0.035	6.05 ± 1.29	13.2 ± 3.2	0.33 ± 0.04	0.0068 ± 0.0030	0.060 ± 0.023	0.70 ± 0.14
0.81 ± 0.07	2.74 ± 0.32	0.108 ± 0.011	0.301 ± 0.037	8.10 ± 0.48	8.5 ± 1.1	0.33 ± 0.03	0.0022 ± 0.0007	0.022 ± 0.007	0.37 ± 0.08
0.66 ± 0.03	0.97 ± 0.02	0.021 ± 0.002	0.138 ± 0.015	7.00 ± 0.53	19.6 ± 1.8	0.42 ± 0.07	0.0051 ± 0.0011	0.064 ± 0.014	0.37 ± 0.10
0.60 ± 0.05	2.05 ± 0.46	0.031 ± 0.006	0.181 ± 0.024	5.48 ± 0.65	24.8 ± 4.3	0.37 ± 0.07	0.0041 ± 0.0014	0.032 ± 0.013	0.24 ± 0.09
0.72 ± 0.05	1.65 ± 0.03	0.034 ± 0.001	0.229 ± 0.009	4.23 ± 2.00	17.8 ± 2.4	0.36 ± 0.05	0.0046 ± 0.0014	0.056 ± 0.020	0.37 ± 0.13
0.76 ± 0.04	2.18 ± 0.50	0.037 ± 0.005	0.164 ± 0.028	8.72 ± 0.72	18.7 ± 1.9	0.33 ± 0.05	0.0025 ± 0.0010	0.017 ± 0.009	0.19 ± 0.07
0.64 ± 0.02	2.28 ± 0.43	0.045 ± 0.009	0.259 ± 0.043	3.94 ± 1.05	28.4 ± 15.5	0.56 ± 0.31	0.0037 ± 0.0014	0.037 ± 0.014	0.23 ± 0.14
0.65 ± 0.02	3.00 ± 0.38	0.041 ± 0.006	0.262 ± 0.033	4.16 ± 0.36	31.7 ± 5.9	0.44 ± 0.08	0.0143 ± 0.0035	0.109 ± 0.027	0.62 ± 0.04
0.83 ± 0.02	2.16 ± 0.42	0.068 ± 0.014	0.220 ± 0.019	8.12 ± 0.56	10.8 ± 1.6	0.34 ± 0.06	0.0025 ± 0.0006	0.023 ± 0.003	0.33 ± 0.09
0.77 ± 0.04	2.19 ± 0.49	0.041 ± 0.001	0.252 ± 0.015	5.86 ± 1.41	20.5 ± 6.8	0.38 ± 0.08	0.0022 ± 0.0010	0.022 ± 0.007	0.15 ± 0.04
0.86 ± 0.05	3.57 ± 1.94	0.057 ± 0.011	0.246 ± 0.070	5.89 ± 4.37	20.2 ± 10.2	0.33 ± 0.04	0.0066 ± 0.0050	0.038 ± 0.024	0.40 ± 0.19
0.58 ± 0.06	2.70 ± 0.71	0.019 ± 0.004	0.196 ± 0.034	2.69 ± 1.62	65.0 ± 19.9	0.44 ± 0.09	0.0154 ± 0.0044	0.098 ± 0.015	0.33 ± 0.02
0.65 ± 0.07	1.42 ± 0.20	0.025 ± 0.002	0.186 ± 0.016	4.80 ± 0.71	37.7 ± 9.2	0.65 ± 0.11	0.0078 ± 0.0015	0.089 ± 0.013	0.29 ± 0.05
0.60 ± 0.04	2.12 ± 0.18	0.033 ± 0.002	0.213 ± 0.011	4.03 ± 0.64	41.3 ± 1.5	0.65 ± 0.04	0.0063 ± 0.0021	0.057 ± 0.022	0.21 ± 0.06
0.63 ± 0.02	1.15 ± 0.08	0.015 ± 0.001	0.132 ± 0.014	5.53 ± 0.55	41.9 ± 3.8	0.53 ± 0.05	0.0131 ± 0.0012	0.131 ± 0.008	0.44 ± 0.04
0.55 ± 0.09	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
0.59 ± 0.14	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
0.64 ± 0.04	1.89 ± 0.15	0.019 ± 0.000	0.181 ± 0.009	3.73 ± 0.28	54.2 ± 2.5	0.55 ± 0.02	0.0077 ± 0.0026	0.065 ± 0.024	0.20 ± 0.08
0.62 ± 0.08	2.72 ± 0.30	0.017 NA	0.245 NA	2.64 NA	103.8 ± 13.4	0.63 NA	0.0412 ± 0.0097	0.324 NA	0.56 ± 0.07
0.58 ± 0.05	1.86 ± 0.12	0.021 NA	0.179 NA	2.51 NA	45.5 ± 3.8	0.50 NA	0.0103 ± 0.0018	0.087 NA	0.32 ± 0.08