Supplementary Materials

Table S1 The alternative biomass equations of specie-specific and multispecies biomass equations of understory saplings.

Species Ranges of D, H, CA	Components (Sample Numbers)	Equations	ln*a*	*a* or *a′*	*b*	*c*	*d*	AIC	SEE	R^2	FI	F	CF	P
		Eq.1		-556.6	404.0			408.9	404.0	0.823	0.823	120.5		<0.001
		Eq.2		-425.0	3.752			413.7	364.5	0.790	0.790	97.59		<0.001
	BGB	Eq.7*	3.348	28.4	2.416			41.1	0.470	0.934	0.954	364.9	1.117	<0.001
	(30)	Eq.8	-3.761	2.3E-02	1.713			83.5	1.003	0.698	0.686	60.02	1.654	<0.001
		Eq.9	5.183	178.1	1.434			60.7	0.667	0.866	0.525	168.2	1.249	<0.001
		Eq.16	3.917	50.3	1.650	0.532		29.7	0.377	0.959	0.916	291.2	1.074	<0.001
		Eq.1		-2163.0	1530.8			485.6	1316.0	0.812	0.812	112		<0.001
Acer		Eq.2		-1814.5	14.762			481.1	1214.0	0.840	0.840	136.1		<0.001
mandshuricum		Eq.7*	4.495	89.6	2.498			37.3	0.439	0.945	0.916	447.3	1.101	<0.001
D(cm):	AGB	Eq.8	-2.970	5.1E-02	1.793			82.6	0.986	0.723	0.709	67.97	1.626	<0.001
0.491-7.100	(30)	Eq.9	6.396	599.7	1.459			65.7	0.729	0.849	0.496	146	1.304	<0.001
H(m):		Eq.15	1.945	7.0	0.845	1.013		46.1	0.506	0.930	0.757	166.1	1.136	<0.001
11-650		Eq.16	4.964	143.2	1.868	0.438		29.5	0.376	0.961	0.903	310.7	1.073	<0.001
CA(m^2):		Eq.17	3.473	32.2	1.449	0.344	0.485	25.2	0.343	0.969	0.920	251.1	1.061	<0.001
0.039-7.304		Eq.1		-2719.7	1934.8			497.7	1634.0	0.817	0.817	116		<0.001
		Eq.2		-2239.5	18.510			495.3	1564.0	0.832	0.832	129		<0.001
		Eq.7*	4.773	118.2	2.479			37.7	0.443	0.944	0.928	434.2	1.103	<0.001
	TB	Eq.8	-2.613	7.3E-02	1.775			82.7	0.987	0.719	0.708	66.44	1.628	<0.001
	(30)	Eq.9	6.659	779.5	1.453			64.4	0.713	0.853	0.505	151.4	1.289	<0.001
		Eq.15	2.335	10.3	0.821	1.020		45.3	0.498	0.931	0.755	168.9	1.132	<0.001
		Eq.16	5.264	193.2	1.819	0.459		28.9	0.372	0.962	0.911	312.9	1.072	<0.001
		Eq.17	3.827	45.9	1.415	0.332	0.504	25.0	0.342	0.969	0.923	249.4	1.060	<0.001
		Eq.1		-156.2	141.9			320.0	84.3	0.896	0.896	214.8		<0.001
		Eq.7	2.727	15.3	2.242			5.0	0.247	0.985	0.987	1662	1.031	<0.001
	BGB	Eq.8	-9.855	5.3E-05	2.646			56.7	0.643	0.900	0.285	223.9	1.229	<0.001
Ulmus	(27)	Eq.9	3.811	45.2	1.359			31.1	0.400	0.961	0.492	616	1.083	<0.001
laciniata		Eq.11		-93.7	78.0	36.8		302.0	59.4	0.950	0.950	229.2		<0.001
D(cm):		Eq.13		-75.0	103.3	-0.342	37.7	297.7	54.0	0.961	0.961	187.2		<0.001
0.256-5.769		Eq.16*	3.050	21.1	1.554	0.437		-8.3	0.190	0.992	0.963	1416	1.018	<0.001
H(m):		Eq.1		-847.1	664.1			421.1	548.4	0.816	0.816	111.1		<0.001
45-585		Eq.4		254.0	-482.5	198.3		345.4	132.8	0.990	0.990	1149		<0.001
CA(m^2):		Eq.7	3.470	32.1	2.706			-8.4	0.193	0.994	0.976	3980	1.019	<0.001
0.118-12.566	AGB	Eq.8	-11.725	8.1E-06	3.196			64.1	0.738	0.908	0.185	247.5	1.313	<0.001
	(27)	Eq.9	4.783	119.4	1.631			42.8	0.497	0.958	0.321	575	1.132	<0.001
		Eq.11		-447.0	255.8	235.5		404.1	393.8	0.909	0.909	120		<0.001
		Eq.16*	3.752	42.6	2.103	0.382		-27.7	0.132	0.997	0.976	4219	1.009	<0.001

		Eq.1		-1003.4	806.0		428.4	628.0	0.833	0.833	124.8		<0.001
		Eq.4		267.4	-517.1	228.8	344.6	130.7	0.993	0.993	1718		<0.001
		Eq.7	3.884	48.6	2.566		-5.0	0.205	0.992	0.975	3150	1.021	<0.001
	TB	Eq.8	-10.524	2.7E-05	3.031		61.7	0.706	0.907	0.242	243.2	1.283	<0.001
	(27)	Eq.9	5.128	168.6	1.551		37.4	0.450	0.962	0.425	635.4	1.107	<0.001
		Eq.11		-540.7	333.8	272.3	410.9	446.4	0.919	0.919	136.2		<0.001
		Eq.16*	4.202	66.8	1.889	0.430	-28.2	0.131	0.997	0.974	3865	1.009	<0.001
		Eq.1		-195.2	171.1		345.2	107.3	0.875	0.875	182		<0.001
		Eq.2		-138.1	1.326		346.9	110.6	0.867	0.867	169.8		<0.001
	BGB	Eq.7*	2.788	16.3	2.319		10.0	0.270	0.977	0.969	1108	1.037	<0.001
	(28)	Eq.8	-6.615	1.3E-03	2.058		33.2	0.409	0.947	0.913	468.6	1.087	<0.001
		Eq.9	4.072	58.6	1.263		63.6	0.703	0.844	0.576	141	1.280	<0.001
		Eq.1		-792.4	643.4		424.3	440.6	0.855	0.855	152.6		<0.001
Carpinus		Eq.2		-587.7	5.022		423.5	433.8	0.859	0.859	158.3		<0.001
cordata		Eq.4		289.0	-456.1	189.7	364.9	150.2	0.984	0.984	756.3		<0.001
D(cm):	AGB	Eq.7*	3.492	32.9	2.712		1.1	0.230	0.988	0.981	2082	1.027	<0.001
0.490-5.531	(28)	Eq.8	-7.576	5.1E-04	2.420		27.3	0.368	0.969	0.922	800.2	1.070	<0.001
H(m):		Eq.9	4.983	145.8	1.516		59.7	0.655	0.900	0.575	234.5	1.239	<0.001
35-630		Eq.15	-4.498	1.1E-02	1.825	0.418	19.1	0.312	0.978	0.917	560.9	1.050	<0.001
CA(m^2):		Eq.1		-987.6	814.4		435.7	539.9	0.862	0.862	162.9		<0.001
0.071-7.791		Eq.2		-725.8	6.347		435.3	536.1	0.864	0.864	165.6		<0.001
		Eq.4		347.4	-542.7	234.2	372.8	172.8	0.986	0.986	909.1		<0.001
	TB	Eq.7*	3.908	49.8	2.595		-5.0	0.206	0.989	0.981	2369	1.022	<0.001
	(28)	Eq.8	-6.666	1.3E-03	2.312		26.0	0.359	0.967	0.924	765.9	1.067	<0.001
		Eq.9	5.337	208.0	1.440		60.6	0.666	0.887	0.579	204.3	1.248	<0.001
		Eq.15	-4.223	1.5E-02	1.840	0.332	21.7	0.327	0.974	0.922	465.2	1.055	<0.001
		Eq.1		-245.8	195.6		424.3	172.3	0.853	0.853	174.1		<0.001
		Eq.2		-277.6	2.042		444.8	237.3	0.721	0.721	77.64		<0.001
		Eq.4*		80.4	-102.8	40.7	358.9	61.2	0.982	0.982	795.2		<0.001
	BGB	Eq.7	2.837	17.1	2.109		34.3	0.389	0.955	0.913	632.1	1.079	<0.001
	(32)	Eq.8	-9.062	1.2E-04	2.477		45.1	0.460	0.937	0.744	443.4	1.112	<0.001
		Eq.9	4.089	59.7	1.087		56.1	0.546	0.911	0.757	305.7	1.161	<0.001
Acer mono		Eq.15	-4.405	1.2E-02	1.600	0.412	39.7	0.417	0.950	0.809	273.6	1.091	<0.001
D(cm):		Eq.16	3.187	24.2	1.517	0.331	29.2	0.354	0.964	0.909	385.3	1.065	<0.001
0.528-7.481		Eq.1		-874.3	662.5		501.8	578.8	0.855	0.855	177.1		<0.001
H(m):		Eq.2		-994.7	6.965		521.4	785.2	0.733	0.733	82.53		<0.001
65-650		Eq.4		229.0	-346.8	137.6	433.1	194.8	0.984	0.984	899.3		<0.001
CA(m^2):		Eq.7	3.312	27.4	2.564		20.0	0.311	0.980	0.970	1461	1.050	<0.001
0.079-18.064	AGB	Eq.8	-11.228	1.3E-05	3.026		32.6	0.379	0.970	0.777	975.8	1.074	<0.001
	(32)	Eq.9	4.836	125.9	1.305		67.5	0.653	0.911	0.775	308.7	1.238	<0.001
		Eq.14*	-2.990	5.0E-02	1.498	1.306	-4.8	0.208	0.991	0.934	1653	1.022	<0.001
		Eq.15	-8.098	3.0E-04	2.436	0.277	29.9	0.358	0.974	0.836	548.9	1.066	<0.001
		Eq.16	3.574	35.7	2.120	0.248	15.9	0.287	0.983	0.964	859.4	1.042	<0.001
	TB	Eq.1		-1120.1	858.0		518.1	745.6	0.857	0.857	179		<0.001

	(32)	Eq.2		-1272.3	9.007			538.0	1018.0	0.732	0.732	82.02	<0.001
		Eq.4		309.4	-449.6	178.2		446.1	238.7	0.986	0.986	1005	<0.001
		Eq.7*	3.819	45.6	2.406			21.1	0.317	0.976	0.953	1243	1.051 <0.001
		Eq.8	-9.808	5.5E-05	2.836			34.5	0.390	0.964	0.772	809.3	1.079 <0.001
		Eq.9	5.249	190.3	1.232			61.0	0.590	0.918	0.773	336.6	1.190 <0.001
		Eq.15	-5.937	2.6E-03	2.107	0.342		29.4	0.355	0.971	0.835	491.4	1.065 <0.001
		Eq.16	4.131	62.3	1.879	0.295		14.4	0.281	0.982	0.949	795	1.040 <0.001
Total Sapling D(cm): 0.256-7.481 H(m): 11-650 CA(m^2): 0.071-18.064	BGB (117)	Eq.1		-229.6	181.2			1416.4	148.6	0.829	0.829	522.4	<0.001
		Eq.2		-196.5	1.686			1477.3	195.9	0.702	0.702	254.7	<0.001
		Eq.4		46.0	-70.5	38.5		1248.1	68.8	0.964	0.964	1415	<0.001
		Eq.7*	2.752	15.7	2.259			66.8	0.322	0.969	0.948	3390	1.053 <0.001
		Eq.8	-8.548	1.9E-04	2.411			192.6	0.570	0.903	0.725	1006	1.177 <0.001
		Eq.9	4.125	61.9	1.228			222.6	0.654	0.873	0.484	740.2	1.238 <0.001
		Eq.12		-161.1	1.197	36.9		1458.5	179.1	0.754	0.754	163.6	<0.001
		Eq.15	-3.654	2.6E-02	1.478	0.532		156.5	0.482	0.931	0.761	726.6	1.123 <0.001
		Eq.16	2.920	18.5	1.976	0.174		60.1	0.311	0.972	0.920	1822	1.049 <0.001
	AGB (117)	Eq.1		-864.0	649.2			1696.5	530.8	0.830	0.830	525.6	<0.001
		Eq.2		-756.4	6.081			1754.0	689.3	0.713	0.713	267.6	<0.001
		Eq.7	3.393	29.7	2.651			36.5	0.281	0.983	0.939	6150	1.040 <0.001
		Eq.8	-9.932	4.9E-05	2.842			200.6	0.591	0.923	0.690	1300	1.191 <0.001
		Eq.9	5.004	149.0	1.447			239.1	0.705	0.891	0.417	883.5	1.282 <0.001
		Eq.11		-749.3	522.5	86.4		1687.8	508.0	0.845	0.845	292.3	<0.001
		Eq.12		-593.3	3.826	170.0		1717.4	581.1	0.798	0.798	210.8	<0.001
		Eq.15	-4.213	1.5E-02	1.751	0.622		151.5	0.471	0.952	0.784	1056	1.117 <0.001
		Eq.16*	3.626	37.6	2.258	0.242		14.9	0.253	0.986	0.914	3787	1.033 <0.001
		Eq.17	1.622	5.1	1.957	0.416	0.207	2.3	0.238	0.988	0.928	2860	1.029 <0.001
	TB (117)	Eq.1		-1093.6	830.4			1744.1	658.9	0.838	0.838	558.1	<0.001
		Eq.2		-952.9	7.767			1805.1	869.6	0.718	0.718	274.4	<0.001
		Eq.7	3.836	46.3	2.527			27.7	0.270	0.983	0.955	6047	1.037 <0.001
		Eq.8	-8.854	1.4E-04	2.707			191.9	0.569	0.922	0.714	1276	1.175 <0.001
		Eq.9	5.371	215.1	1.379			228.7	0.672	0.891	0.464	882.1	1.253 <0.001
		Eq.11		-968.3	692.1	94.4		1737.9	637.8	0.850	0.850	301.9	<0.001
		Eq.12		-754.4	5.024	206.8		1771.7	743.8	0.795	0.795	207.9	<0.001
		Eq.14	1.610	5.0	2.122	0.470		12.6	0.251	0.985	0.956	3508	1.032 <0.001
		Eq.15	-3.359	3.5E-02	1.659	0.597		143.0	0.453	0.951	0.794	1036	1.108 <0.001
		Eq.16*	4.059	57.9	2.151	0.231		6.5	0.244	0.986	0.929	3714	1.030 <0.001
		Eq.17	2.238	9.4	1.877	0.378	0.200	-4.4	0.231	0.987	0.941	2762	1.027 <0.001

Those equations were listed in this table when all model parameters were significant at $p<0.01$ level. The models forms of Eq.1-17 were listed in Table1 in original manuscript.

* was the best fit equations which were chosen in manuscript.

Table S2 The alternative biomass equations of specie-specific and multispecies biomass equations of understory tree-like shrubs.

Species Ranges of D, H, CA	Components (Sample Numbers)	Equations	ln*a*	*a* or *a′*	*b*	*c*	*d*	AIC	SEE	R^2	FI	F	CF	p
		Eq.1		-499.5	331.3			518.7	253.9	0.895	0.895	298.9		<0.001
		Eq.2		-431.0	3.932			513.6	237.1	0.909	0.909	348.2		<0.001
	BGB	Eq.7*	2.884	17.9	2.435			30.7	0.347	0.971	0.967	1155	1.062	<0.001
	(37)	Eq.8	-7.794	4.1E-04	2.437			79.7	0.674	0.889	0.915	281.4	1.255	<0.001
		Eq.9	4.982	145.7	0.943			105.4	0.953	0.779	0.512	123.2	1.574	<0.001
Syringa		Eq.15	-4.015	1.8E-02	1.706	0.376		63.0	0.531	0.933	0.896	237.8	1.151	<0.001
reticulata var		Eq.1		-1450.8	945.4			610.6	878.8	0.853	0.853	203.2		<0.001
. amurensis		Eq.2		-1282.7	11.312			603.0	793.5	0.880	0.880	257.2		<0.001
D(cm):		Eq.7	3.445	31.4	2.722			36.4	0.375	0.973	0.905	1239	1.073	<0.001
0.533-7.933	AGB	Eq.8	-8.536	2.0E-04	2.733			85.5	0.728	0.896	0.821	302.9	1.304	<0.001
H(cm):	(37)	Eq.9	5.770	320.4	1.093			101.9	0.909	0.839	0.578	181.8	1.512	<0.001
42-630		Eq.15	-3.292	0.04	1.719	0.522		48.2	0.434	0.964	0.880	457.9	1.099	<0.001
CA(m^2):		Eq.16*	3.720	41.3	2.383	0.162		33.5	0.356	0.976	0.920	689.1	1.065	<0.001
0.001-12.456		Eq.1		-1950.3	1276.7			626.3	1088.0	0.874	0.874	242		<0.001
		Eq.2		-1713.6	15.244			618.6	979.0	0.898	0.898	306.8		<0.001
	TB	Eq.7*	3.941	51.5	2.611			20.1	0.301	0.981	0.981	1770	1.046	<0.001
	(37)	Eq.8	-7.550	5.3E-04	2.621			79.4	0.671	0.904	0.904	328.2	1.252	<0.001
		Eq.9	6.178	481.9	1.034			101.9	0.910	0.823	0.823	162.5	1.513	<0.001
		Eq.15	-2.919	5.4E-02	1.725	0.461		47.4	0.430	0.962	0.962	425.3	1.097	<0.001
		Eq.1		-550.4	402.8			529.3	203.7	0.909	0.909	370		<0.001
		Eq.2		-692.0	3.832			548.7	261.2	0.851	0.851	210.6		<0.001
	BGB	Eq.7*	2.859	17.4	2.815			39.1	0.380	0.961	0.958	899.9	1.075	<0.001
	(39)	Eq.8	-12.915	2.5E-06	3.203			69.2	0.558	0.915	0.950	396	1.169	<0.001
		Eq.9	4.600	99.5	1.323			88.7	0.717	0.859	0.597	225.6	1.293	<0.001
		Eq.1		-1063.1	757.9			594.1	467.2	0.871	0.871	249		<0.001
Prunus padus		Eq.2		-1320.7	7.183			609.3	568.2	0.809	0.809	156.4		<0.001
D(cm):		Eq.4		375.1	-502.8	203.6		490.8	122.8	0.991	0.991	2052		<0.001
0.543-5.883	AGB	Eq.5		641.7	-7.071	0.020		562.1	306.5	0.946	0.946	314.5		<0.001
H(cm):	(39)	Eq.7*	3.904	49.6	2.471			-0.6	0.228	0.981	0.975	1916	1.026	<0.001
85-605		Eq.8	-10.162	3.9E-05	2.851			28.3	0.331	0.960	0.915	894.3	1.056	<0.001
CA(m^2):		Eq.9	5.441	230.6	1.144			79.8	0.640	0.851	0.495	211.7	1.227	<0.001
0.059-6.350		Eq.11		-1217.3	1041.6	-231.5		588.0	427.3	0.895	0.895	153		<0.001
		Eq.1		-1613.5	1160.8			619.1	643.7	0.893	0.893	307.8		<0.001
		Eq.2		-2012.7	11.015			636.7	807.2	0.831	0.831	182.3		<0.001
	TB	Eq.4		396.4	-601.0	284.6		495.7	130.9	0.996	0.996	4153		<0.001
	(39)	Eq.5		850.7	-9.783	0.030		583.6	403.8	0.959	0.959	420.1		<0.001
		Eq.7*	4.234	69.0	2.559			-0.4	0.229	0.982	0.992	2047	1.027	<0.001
		Eq.8	-10.268	3.5E-05	2.941			36.6	0.368	0.954	0.942	770	1.070	<0.001

		Eq.9	5.822	337.5	1.192		78.9	0.633	0.864	0.537	235.2	1.222	<0.001
		Eq.11		-1807.6	1517.9	-291.5	614.5	599.7	0.909	0.909	180.6		<0.001
		Eq.1		-9.0	26.3		184.0	7.717	0.625	0.625	39.99		<0.001
	BGB	Eq.7*	2.687	14.7	1.919		29.7	0.398	0.848	0.626	133.9	1.082	<0.001
	(26)	Eq.8	-5.253	5.2E-03	1.644		33.8	0.430	0.823	0.574	111.2	1.097	<0.001
		Eq.9	4.310	74.4	1.094		67.0	0.815	0.362	0.054	13.6	1.394	<0.001
Eleutherococcus senticosus		Eq.1		-21.3	53.8		205.4	11.650	0.754	0.754	73.59		<0.001
		Eq.2		-14.7	0.371		200.6	10.620	0.796	0.796	93.43		<0.001
	AGB	Eq.7	3.273	26.4	2.153		26.6	0.375	0.888	0.772	189.8	1.073	<0.001
D(cm):	(26)	Eq.8*	-5.771	3.1E-03	1.874		26.3	0.372	0.889	0.773	192.9	1.072	<0.001
0.293-1.457		Eq.9	5.284	197.2	1.327		68.3	0.834	0.443	0.239	19.11	1.416	<0.001
H(cm):		Eq.12		-13.4	0.495	-85.0	194.6	9.309	0.850	0.850	64.89		<0.001
32-220		Eq.1		-30.3	80.1		230.8	18.980	0.719	0.719	61.39		<0.001
CA(m^2):		Eq.2		-19.6	0.545		228.9	18.320	0.738	0.738	67.68		<0.001
0.070-0.440	TB	Eq.7*	3.720	41.3	2.067		26.4	0.373	0.880	0.731	176.7	1.072	<0.001
	(26)	Eq.8	-4.919	7.3E-03	1.790		28.1	0.385	0.873	0.712	164.2	1.077	<0.001
		Eq.9	5.594	268.8	1.244		67.5	0.822	0.419	0.172	17.3	1.402	<0.001
		Eq.12		-17.2	0.775	-158.2	221.4	15.580	0.819	0.819	51.86		<0.001
		Eq.1		-130.8	122.4		307.6	83.2	0.773	0.773	81.84		<0.001
		Eq.2		-179.2	1.708		315.1	96.1	0.698	0.698	55.37		<0.001
	BGB	Eq.7*	2.694	14.8	2.293		18.4	0.320	0.951	0.846	469.5	1.052	<0.001
	(26)	Eq.8	-10.679	2.3E-05	2.888		45.1	0.535	0.864	0.736	152.3	1.154	<0.001
		Eq.9	4.348	77.3	1.212		46.8	0.552	0.855	0.623	141.5	1.164	<0.001
		Eq.16	3.030	20.7	1.839	0.278	15.9	0.300	0.959	0.829	269	1.046	<0.001
		Eq.1		-737.1	589.9		390.9	413.1	0.763	0.763	77.05		<0.001
		Eq.2		-1006.7	8.433		395.0	446.9	0.722	0.722	62.31		<0.001
Rhamnus schneideri		Eq.4		438.1	-622.4	235.4	336.4	142.4	0.973	0.973	413.9		<0.001
		Eq.5		800.2	-12.2	0.049	373.8	292.2	0.886	0.886	89.45		<0.001
	AGB	Eq.7	3.770	43.4	2.498		16.5	0.308	0.962	0.903	599.8	1.049	<0.001
D(cm):	(26)	Eq.8	-11.482	1.0E-05	3.280		23.8	0.355	0.949	0.886	445.9	1.065	<0.001
0.293-1.457		Eq.9	5.575	263.8	1.333		45.7	0.540	0.882	0.681	178.7	1.157	<0.001
H(cm):		Eq.15	-6.195	2.0E-03	2.266	0.477	10.8	0.272	0.971	0.890	389.4	1.038	<0.001
32-220		Eq.16*	4.231	68.8	1.876	0.381	8.5	0.260	0.974	0.901	426.4	1.034	<0.001
CA(m^2):		Eq.1		-867.9	712.4		397.0	464.5	0.787	0.787	88.83		<0.001
0.070-0.440		Eq.2		-1185.9	10.142		402.3	514.3	0.739	0.739	68.06		<0.001
		Eq.4		451.0	-648.1	264.2	343.4	162.8	0.975	0.975	447.9		<0.001
	TB	Eq.7	4.072	58.7	2.454		9.6	0.270	0.969	0.929	753.8	1.037	<0.001
	(26)	Eq.8	-10.773	2.1E-05	3.195		26.5	0.374	0.941	0.888	381.6	1.072	<0.001
		Eq.9	5.845	345.6	1.307		43.7	0.520	0.886	0.698	185.6	1.145	<0.001
		Eq.15	-5.150	5.8E-03	2.117	0.508	13.1	0.284	0.967	0.889	340	1.041	<0.001
		Eq.16*	4.509	90.9	1.865	0.360	-0.5	0.219	0.981	0.923	580.8	1.024	<0.001
Viburnum sargenti	BGB	Eq.1		-85.4	183.7		328.1	79.1	0.802	0.802	105.6		<0.001
	(28)	Eq.2		-137.9	1.560		342.3	101.8	0.673	0.673	53.44		<0.001

D(cm):		Eq.7*	4.114	61.2	1.949			74.9	0.860	0.701	0.744	60.99	1.448	<0.001
0.357-3.720		Eq.8	-8.287	2.5E-04	2.455			68.7	0.769	0.761	0.685	82.7	1.344	<0.001
H(cm):		Eq.9	4.832	125.5	0.939			83.1	0.995	0.600	0.242	39	1.641	<0.001
46-390		Eq.1		-214.8	463.8			375.9	185.6	0.825	0.825	122.3		<0.001
CA(m^2):		Eq.2		-390.3	4.167			383.0	210.8	0.774	0.774	88.92		<0.001
0.021-6.432		Eq.7	5.221	185.2	1.796			42.5	0.482	0.864	0.831	164.9	1.123	<0.001
	AGB	Eq.8*	-6.037	2.4E-03	2.229			30.8	0.391	0.910	0.851	264.3	1.079	<0.001
	(28)	Eq.9	5.898	364.2	0.890			55.8	0.611	0.782	0.268	92.97	1.205	<0.001
		Eq.15	-2.800	6.1E-02	1.633	0.314		20.4	0.320	0.942	0.774	204.4	1.052	<0.001
		Eq.16	5.491	242.5	1.210	0.370		33.8	0.406	0.907	0.809	122.3	1.086	<0.001
		Eq.1		-300.2	647.5			377.8	191.8	0.896	0.896	223		<0.001
		Eq.2		-528.1	5.727			393.9	255.8	0.814	0.814	114.1		<0.001
		Eq.7	5.546	256.3	1.828			42.1	0.479	0.870	0.880	173.2	1.121	<0.001
	TB	Eq.8*	-5.858	2.9E-03	2.258			32.5	0.403	0.908	0.887	255.1	1.085	<0.001
	(28)	Eq.9	6.228	506.7	0.894			58.4	0.640	0.767	0.286	85.55	1.227	<0.001
		Eq.15	-2.798	6.1E-02	1.694	0.296		24.5	0.344	0.935	0.817	180.5	1.061	<0.001
		Eq.16	5.795	328.7	1.288	0.342		35.1	0.416	0.905	0.879	119.6	1.090	<0.001
		Eq.1		-183.7	170.7			615.9	97.5	0.880	0.880	358		<0.001
		Eq.2		-234.8	1.839			648.6	134.4	0.771	0.771	165.4		<0.001
		Eq.4		23.9	-51.5	40.6		480.4	25.6	0.992	0.992	2930		<0.001
		Eq.7*	2.789	16.3	2.401			40.2	0.345	0.971	0.992	1620	1.061	<0.001
	BGB	Eq.8	-10.314	3.3E-05	2.733			84.7	0.534	0.930	0.870	648.9	1.153	<0.001
	(51)	Eq.9	4.162	64.2	1.014			102.5	0.636	0.900	0.785	443.1	1.224	<0.001
		Eq.11		-144.5	125.7	22.5		611.2	92.3	0.894	0.894	203.3		<0.001
		Eq.12		-119.2	0.837	44.3		633.3	114.6	0.837	0.837	123.3		<0.001
		Eq.15	-5.578	3.8E-03	1.838	0.354		78.5	0.498	0.940	0.882	377.2	1.132	<0.001
Euonymus		Eq.1		-520.2	464.6			727.0	290.0	0.860	0.860	299.9		<0.001
verrucosus		Eq.2		-642.2	4.936			759.6	399.3	0.734	0.734	135		<0.001
D(cm):		Eq.4		104.8	-204.4	122.1		569.7	61.4	0.994	0.994	3864		<0.001
0.199-5.689		Eq.7*	3.614	37.1	2.508			10.0	0.257	0.985	0.995	3198	1.033	<0.001
H(cm):		Eq.8	-10.233	3.6E-05	2.885			54.9	0.399	0.964	0.841	1298	1.083	<0.001
36-505	AGB	Eq.9	5.048	155.7	1.060			97.9	0.608	0.916	0.740	530.8	1.203	<0.001
CA(m^2):	(51)	Eq.10		-370.9	716.0	-3.0		721.5	272.2	0.879	0.879	174		<0.001
0.008-11.486		Eq.12		-341.3	2.327	115.4		748.9	356.1	0.793	0.793	91.69		<0.001
		Eq.13		-259.3	634.3	-3.330	54.7	718.5	261.9	0.890	0.890	126.9		<0.001
		Eq.15	-6.676	1.3E-03	2.213	0.266		48.6	0.371	0.969	0.850	752.1	1.071	<0.001
		Eq.16	3.806	45.0	2.170	0.156		5.1	0.242	0.987	0.987	1798	1.030	<0.001
		Eq.1		-703.9	635.4			755.4	383.0	0.868	0.868	321.5		<0.001
		Eq.2		-877.0	6.774			788.6	530.6	0.746	0.746	144		<0.001
	TB	Eq.4		128.7	-255.9	162.7		573.7	63.9	0.996	0.996	6634		<0.001
	(51)	Eq.7*	4.008	55.1	2.451			-4.6	0.222	0.988	0.997	4071	1.025	<0.001
		Eq.8	-9.470	7.7E-05	2.809			58.0	0.411	0.959	0.849	1158	1.088	<0.001
		Eq.9	5.410	223.5	1.036			93.3	0.581	0.919	0.754	554.9	1.184	<0.001

		Eq.10		-517.0	950.0	-3.754		750.7	362.4	0.884	0.884	183	<0.001
		Eq.12		-460.5	3.165	159.7		776.7	467.5	0.807	0.807	100.3	<0.001
		Eq.13		-353.3	830.1	-4.239	80.2	746.6	344.8	0.897	0.897	136.7	<0.001
		Eq.15	-5.418	4.4E-03	2.043	0.303		49.6	0.375	0.967	0.859	699.9	1.073	<0.001
		Eq.16	4.199	66.6	2.116	0.155		-11.9	0.205	0.990	0.990	2398	1.021	<0.001
Corylus mandshurica D(cm): 0.275-4.859 H(cm): 35-530 CA(m^2): 0.031-5.498	BGB (36)	Eq.1		-181.1	220.2			426.1	85.2	0.922	0.922	399.9		<0.001
		Eq.2		-214.7	2.067			427.2	86.5	0.919	0.919	386.8		<0.001
		Eq.7	3.583	36.0	2.213			58.7	0.518	0.913	0.930	355.8	1.144	<0.001
		Eq.8	-8.731	1.6E-04	2.539			61.0	0.535	0.907	0.783	331.8	1.154	<0.001
		Eq.9	4.740	114.4	1.145			60.1	0.528	0.909	0.899	341.2	1.149	<0.001
		Eq.10		-204.7	116.3	1.010		420.9	78.2	0.936	0.936	241		<0.001
		Eq.11		-124.8	125.8	75.4		420.3	77.5	0.937	0.937	245.6		<0.001
		Eq.12		-142.0	1.133	80.6		416.9	74.0	0.943	0.943	270.9		<0.001
		Eq.16*	4.115	61.2	1.202	0.538		270.9	0.495	0.923	0.963	196.9	1.130	<0.001
	AGB (36)	Eq.1		-532.2	516.2			506.0	258.2	0.876	0.876	239.2		<0.001
		Eq.2		-616.2	4.868			504.2	251.9	0.882	0.882	253.1		<0.001
		Eq.3		-189.8	391.5			509.7	272.1	0.862	0.862	212		<0.001
		Eq.7*	3.617	37.2	2.669			5.2	0.246	0.985	0.983	2290	1.031	<0.001
		Eq.8	-10.965	1.7E-05	3.011			51.5	0.468	0.947	0.941	607.7	1.116	<0.001
		Eq.9	5.008	149.6	1.359			48.3	0.448	0.952	0.795	667.5	1.106	<0.001
		Eq.12		-468.8	2.973	163.5		500.7	237.0	0.898	0.898	145.6		<0.001
		Eq.15	-3.010	4.9E-02	1.513	0.727		9.0	0.256	0.985	0.967	1055	1.033	<0.001
	TB (36)	Eq.1		-713.2	736.4			522.9	326.7	0.899	0.899	304		<0.001
		Eq.2		-830.9	6.935			521.6	320.8	0.903	0.903	316.6		<0.001
		Eq.3		-225.5	559.0			527.2	346.8	0.887	0.887	266.1		<0.001
		Eq.7	4.335	76.3	2.449			27.9	0.337	0.968	0.983	1025	1.059	<0.001
		Eq.8	-9.170	1.0E-04	2.786			46.3	0.436	0.947	0.916	602	1.099	<0.001
		Eq.9	5.612	273.6	1.254			47.7	0.445	0.944	0.840	576.3	1.104	<0.001
		Eq.10		-800.4	352.4	3.732		518.3	302.3	0.916	0.916	180.9		<0.001
		Eq.11		-534.3	436.4	239.6		519.7	308.5	0.913	0.913	173.1		<0.001
		Eq.12		-610.8	4.106	244.0		515.9	292.5	0.922	0.922	194.4		<0.001
		Eq.15*	-2.163	1.1E-01	1.467	0.640		11.8	0.267	0.981	0.984	832.9	1.036	<0.001
Euonymus alatus D(cm): 0.445-3.395 H(cm): 55-280 CA(m^2): 0.035-3.613	BGB (21)	Eq.1		-55.1	80.4			204.4	28.7	0.832	0.832	94.08		<0.001
		Eq.2		-72.6	0.954			210.1	32.8	0.780	0.780	67.25		<0.001
		Eq.5		63.0	-1.350	0.007		181.8	16.4	0.948	0.948	164.3		<0.001
		Eq.7*	2.522	12.5	2.337			28.8	0.437	0.909	0.878	189.4	1.100	<0.001
		Eq.8	-10.022	4.4E-05	2.693			39.5	0.565	0.848	0.807	105.8	1.173	<0.001
		Eq.9	4.105	60.7	1.103			36.4	0.524	0.869	0.939	126.1	1.147	<0.001
	AGB (21)	Eq.1		-193.9	264.2			258.3	103.3	0.804	0.804	78.03		<0.001
		Eq.2		-239.8	3.032			266.8	126.6	0.706	0.706	45.62		<0.001
		Eq.4*		113.5	-260.9	152.7		191.2	20.5	0.993	0.993	1223		<0.001
		Eq.5		284.0	-5.9	0.029		238.4	63.0	0.931	0.931	121.5		<0.001
		Eq.7	3.324	27.8	2.752			-1.1	0.215	0.983	0.956	1090	1.023	<0.001

		Eq.8	-11.410	1.1E-05	3.163			33.2	0.486	0.912	0.825	197.2	1.125	<0.001
		Eq.9	5.139	170.5	1.268			36.9	0.531	0.895	0.961	162.5	1.151	<0.001
		Eq.1		-249.0	344.6			266.9	126.9	0.823	0.823	88.03		<0.001
		Eq.2		-312.4	3.986			275.5	155.6	0.733	0.733	52.24		<0.001
		Eq.4		126.7	-297.4	186.6		204.3	28.0	0.992	0.992	1090		<0.001
	TB	Eq.5		347.0	-7.219	0.036		243.3	70.820	0.948	0.948	162.9		<0.001
	(21)	Eq.7	3.712	41.0	2.627			5.4	0.251	0.975	0.949	729.1	1.032	<0.001
		Eq.8	-10.345	3.2E-05	3.018			33.3	0.488	0.904	0.830	178.3	1.126	<0.001
		Eq.9	5.456	234.1	1.217			34.5	0.501	0.898	0.967	167.8	1.134	<0.001
		Eq.16*	4.089	59.7	2.124	0.260		2.5	0.229	0.980	0.981	437.2	1.027	<0.001
		Eq.1		-34.5	56.2			308.4	9.911	0.812	0.812	168.7		<0.001
		Eq.2		-36.3	0.452			349.6	16.4	0.488	0.488	37.09		<0.001
	BGB	Eq.4*		32.1	-80.4	62.4		266.0	5.846	0.936	0.936	279.5		<0.001
	(41)	Eq.7	2.831	17.0	2.422			22.5	0.303	0.896	0.882	335.2	1.047	<0.001
		Eq.8	-9.978	4.6E-05	2.627			70.9	0.547	0.661	0.457	75.9	1.162	<0.001
		Eq.9	3.528	34.0	0.737			71.7	0.553	0.654	0.458	73.65	1.165	<0.001
		Eq.1		-95.5	154.2			342.5	15.0	0.934	0.934	552		<0.001
Sorbaria		Eq.2		-107.6	1.294			415.3	36.5	0.611	0.611	61.16		<0.001
sorbifolia		Eq.7*	3.755	42.7	3.002			-48.5	0.128	0.987	0.961	2906	1.008	<0.001
D(cm):	AGB	Eq.8	-12.336	4.4E-06	3.300			72.3	0.557	0.748	0.596	115.8	1.168	<0.001
0.460-1.817	(41)	Eq.9	4.636	103.2	0.930			72.4	0.558	0.747	0.635	115.3	1.168	<0.001
H(cm):		Eq.10		-83.3	175.2	-0.255		340.2	14.5	0.941	0.941	300.4		<0.001
52-195		Eq.12		-55.0	0.623	67.9		406.2	32.3	0.703	0.703	44.97		<0.001
CA(m^2):		Eq.14	-4.822	8.0E-03	1.863	0.523		55.0	0.446	0.843	0.963	101.7	1.105	<0.001
0.047-1.649		Eq.1		-130.0	210.5			375.9	22.6	0.921	0.921	455.6		<0.001
		Eq.2		-143.8	1.746			443.6	51.5	0.589	0.589	55.84		<0.001
		Eq.4		40.6	-139.4	159.9		303.8	9.3	0.987	0.987	1449		<0.001
	TB	Eq.7*	4.104	60.6	2.816			-48.3	0.128	0.985	0.986	2544	1.008	<0.001
	(41)	Eq.8	-10.964	1.7E-05	3.090			67.8	0.527	0.744	0.577	113.2	1.149	<0.001
		Eq.9	4.928	138.1	0.870			68.1	0.529	0.742	0.603	112.2	1.150	<0.001
		Eq.10		-109.9	245.0	-0.420		372.7	21.5	0.931	0.931	254.4		<0.001
		Eq.15	-3.951	1.9E-02	1.748	0.488		51.2	0.426	0.837	0.986	97.71	1.095	<0.001
		Eq.1		-268.7	260.8			4116.7	205.0	0.805	0.805	1253		<0.001
Total		Eq.2		-352.7	2.869			4169.0	223.4	0.769	0.769	1008		<0.001
Tree-like		Eq.5		102.5	-1.620	0.008		3899.9	143.5	0.905	0.905	1438		<0.001
shrubs		Eq.6		-60.6	215.6	-8.141		4316.1	283.9	0.628	0.628	255.1		<0.001
D(cm):		Eq.7	3.053	21.2	2.363			588.3	0.631	0.896	0.892	2599	1.220	<0.001
0.199-7.933	BGB	Eq.8	-9.919	4.9E-05	2.709			649.6	0.697	0.872	0.879	2071	1.275	<0.001
H(cm):	(305)	Eq.9	4.448	85.4	1.110			743.6	0.813	0.826	0.528	1441	1.392	<0.001
32-630		Eq.10		-310.9	181.9	0.946		4102.9	200.1	0.815	0.815	666.1		<0.001
CA(m^2):		Eq.13		-333.8	203.2	1.032	-21.0	4100.6	199.1	0.818	0.818	450.2		<0.001
0.001-12.456		Eq.14*	-2.347	9.6E-02	1.458	1.121		532.1	0.574	0.914	0.933	1599	1.179	<0.001
		Eq.15	-4.838	7.9E-03	1.755	0.449		579.1	0.620	0.899	0.824	1349	1.212	<0.001

	Eq.16	3.399	29.9	1.797	0.300		562.3	0.603	0.905	0.856	1434	1.200	<0.001
	Eq.17	-1.470	2.3E-01	1.159	0.990	0.214	518.1	0.560	0.918	0.905	1125	1.170	<0.001
	Eq.1		-728.9	673.3			4696.4	530.4	0.805	0.805	1248		<0.001
	Eq.2		-871.7	7.061			4828.6	658.7	0.699	0.699	702.7		<0.001
	Eq.4		137.3	-250.3	152.0		4307.3	279.8	0.946	0.946	2636		<0.001
	Eq.5		222.6	-3.730	0.018		4679.0	514.6	0.817	0.817	672.7		<0.001
	Eq.7	3.798	44.6	2.496			535.2	0.578	0.919	0.942	3451	1.182	<0.001
AGB	Eq.8	-9.908	5.0E-05	2.862			611.9	0.656	0.896	0.811	2615	1.240	<0.001
(305)	Eq.9	5.274	195.2	1.179			705.4	0.764	0.859	0.552	1845	1.339	<0.001
	Eq.12		-696.5	5.102	132.1		4810.8	638.7	0.718	0.718	383.7		<0.001
	Eq.14*	-1.952	0.1	1.532	1.194		455.8	0.507	0.938	0.931	2292	1.137	<0.001
	Eq.15	-4.144	1.6E-02	1.780	0.509		501.7	0.546	0.928	0.799	1950	1.161	<0.001
	Eq.16	4.221	68.1	1.806	0.366		485.7	0.532	0.932	0.901	2064	1.152	<0.001
	Eq.1		-997.7	934.1			4863.1	697.0	0.821	0.821	1391		<0.001
	Eq.2		-1224.3	9.930			4985.8	852.4	0.733	0.733	829.9		<0.001
	Eq.4		147.0	-286.4	200.9		4465.0	362.3	0.952	0.952	2983		<0.001
	Eq.5		325.1	-5.350	0.026		4794.9	622.3	0.858	0.858	911.6		<0.001
	Eq.6		-184.0	670.7	-16.4		5080.4	993.7	0.638	0.638	265.7		<0.001
TB	Eq.7	4.222	68.2	2.437			506.5	0.552	0.923	0.947	3616	1.164	<0.001
(305)	Eq.8	-9.170	1.0E-04	2.796			584.4	0.627	0.900	0.849	2733	1.217	<0.001
	Eq.9	5.663	288.0	1.150			688.9	0.744	0.859	0.560	1852	1.319	<0.001
	Eq.12		-1024.0	7.689	151.1		4972.5	832.6	0.746	0.746	442.6		<0.001
	Eq.14*	-1.437	0.24	1.489	1.175		421.0	0.479	0.942	0.951	2451	1.121	<0.001
	Eq.15	-3.668	2.6E-02	1.763	0.486		474.5	0.522	0.931	0.824	2033	1.146	<0.001
	Eq.16	4.621	101.6	1.786	0.346		458.2	0.509	0.934	0.906	2152	1.138	<0.001

Those equations were listed in this table when all model parameters were significant at $p<0.01$ level. The models forms of Eq.1-17 were listed in Table1 in original manuscript. * means the best fit equations which were chosen in manuscript.

Table S3 The alternative biomass equations of specie-specific and multispecies biomass equations of understory typical shrubs.

Species Ranges of D, H, CA	Components (Sample Numbers)	Equations	ln*a*	*a* or *a'*	*b*	*c*	*d*	AIC	SEE	R^2	FI	F	CF	P
Ribes	BGB	Eq.1		-47.3	67.4			104.8	23.9	0.975	0.975	350.9		<0.001
komarovii	(11)	Eq.7*	3.602	36.7	1.252			-5.7	0.157	0.974	0.980	339.7	1.012	<0.001
D(cm):	AGB	Eq.7*	4.163	65.3	2.646			19.2	0.173	0.970	0.980	575.9	1.015	<0.001
0.698-6.637	(11)	Eq.10		-299.9	44.9	2.098		126.9	63.0	0.843	0.843	21.45		<0.001
H(cm): 135-220 CA(m^2): 0.196-1.492	TB (11)	Eq.7*	4.819	123.9	0.941			11.4	0.342	0.818	0.868	40.48	1.060	<0.001
Acer barbinerve D(cm): 0.387-18.782 H(cm): 65-810 CA(m^2): 0.024-19.635	BGB (23)	Eq.1		-308.2	221.6			336.4	333.2	0.881	0.881	155.9		<0.001
		Eq.2		-890.9	5.449			345.7	407.8	0.822	0.822	97.08		<0.001
		Eq.5*		116.2	-2.189	0.009		273.5	83.3	0.993	0.993	1406		<0.001
		Eq.7	2.592	13.4	2.027			39.4	0.524	0.936	0.947	309	1.147	<0.001
		Eq.8	-13.699	1.1E-06	3.311			51.3	0.678	0.894	0.975	176.4	1.258	<0.001
		Eq.9	3.952	52.0	0.938			54.9	0.733	0.875	0.286	147.5	1.309	<0.001
		Eq.15	-6.176	2.1E-03	1.903	0.448		43.0	0.556	0.932	0.813	136.6	1.167	<0.001
		Eq.16	2.984	19.8	1.461	0.294		36.1	0.478	0.950	0.910	188.1	1.121	<0.001
	AGB (23)	Eq.1		-1234.0	819.4			400.0	1330.0	0.864	0.864	133.8		<0.001
		Eq.2		-3302.8	19.8			411.6	1710.0	0.776	0.776	72.63		<0.001
		Eq.5*		948.0	-12.5	0.040		330.7	288.6	0.994	0.994	1633		<0.001
		Eq.7	3.574	35.6	2.174			46.5	0.610	0.926	0.927	262.2	1.205	<0.001
		Eq.8	-13.531	1.3E-06	3.480			62.9	0.872	0.849	0.992	117.7	1.462	<0.001
		Eq.9	5.036	153.8	1.016			56.9	0.766	0.883	0.288	158.8	1.341	<0.001
		Eq.11		-1397.9	1546.7	-627.4		390.4	1057.0	0.918	0.918	112.4		<0.001
		Eq.16	4.083	59.3	1.438	0.383		41.6	0.539	0.945	0.914	171.7	1.156	<0.001
	TB (23)	Eq.1		-1542.2	1040.9			410.0	1652.0	0.870	0.870	140		<0.001
		Eq.2		-4193.7	25.211			421.3	2111.0	0.787	0.787	77.54		<0.001
		Eq.5*		1064.0	-14.7	0.049		337.1	331.7	0.995	0.995	1986		<0.001
		Eq.7	3.928	50.8	2.119			42.6	0.562	0.933	0.948	294	1.171	<0.001
		Eq.8	-12.788	2.8E-06	3.401			59.7	0.814	0.860	0.992	129	1.393	<0.001
		Eq.9	5.352	211.0	0.988			54.9	0.733	0.886	0.287	163.7	1.309	<0.001
		Eq.11		-1743.6	1934.6	-770.8		400.7	1323.0	0.920	0.920	115.5		<0.001
		Eq.16	4.404	81.8	1.430	0.358		37.5	0.493	0.951	0.908	194.5	1.129	<0.001
Ribes	BGB	Eq.2		-181.9	2.347			140.2	45.9	0.831	0.831	53.99		<0.001

mandshuricum	(13)	Eq.5		259.9	-5.426	0.031	117.6	18.7	0.974	0.974	190.6		<0.001
D(cm):		Eq.7	3.030	20.7	1.319		20.3	0.457	0.847	0.909	61	1.110	<0.001
0.921-9.932		Eq.8	-9.818	5.4E-05	2.934		20.8	0.465	0.842	0.906	58.55	1.114	<0.001
H(cm):		Eq.9*	5.395	220.4	0.992		6.2	0.265	0.948	0.828	202.2	1.036	<0.001
70-190		Eq.11		-18.8	27.2	87.7	110.1	14.0	0.986	0.986	344.1		<0.001
CA(m^2):		Eq.16	4.716	111.7	0.419	0.731	1.8	0.217	0.969	0.964	154.1	1.024	<0.001
0.050-1.035		Eq.2		-272.5	3.481		157.3	88.4	0.744	0.744	31.96		<0.001
		Eq.5		549.6	-11.0	0.057	138.9	42.4	0.946	0.946	88.28		<0.001
	AGB	Eq.7*	3.354	28.6	1.299		28.7	0.630	0.739	0.943	31.12	1.219	0.000
	(13)	Eq.8	-8.866	1.4E-04	2.799		31.0	0.689	0.688	0.761	24.24	1.268	0.000
		Eq.9	5.579	264.9	0.897		30.6	0.679	0.697	0.590	25.31	1.259	0.000
		Eq.2		-454.4	5.828		167.1	129.2	0.792	0.792	41.95		<0.001
		Eq.5		809.5	-16.4	0.088	142.0	47.8	0.974	0.974	188.2		<0.001
	TB	Eq.7*	3.955	52.2	1.291		20.1	0.452	0.844	0.956	59.65	1.108	<0.001
	(13)	Eq.8	-8.554	1.9E-04	2.858		21.2	0.472	0.831	0.863	53.94	1.118	<0.001
		Eq.9	6.224	504.9	0.936		16.9	0.401	0.878	0.719	78.89	1.084	<0.001
		Eq.16	5.260	192.4	0.595	0.566	13.4	0.340	0.920	0.946	57.39	1.060	<0.001
Philadelphus	BGB	Eq.7	3.284	26.7	1.335		49.8	0.629	0.518	0.059	23.6	1.219	<0.001
schrenkii	(25)	Eq.9*	4.009	55.1	0.727		55.1	0.703	0.399	0.354	14.6	1.280	<0.001
D(cm):	AGB	Eq.7	3.907	49.8	1.470		48.8	0.616	0.576	0.593	29.83	1.209	<0.001
0.492-4.679	(25)	Eq.9*	4.719	112.1	0.948		46.0	0.581	0.623	0.576	36.28	1.184	<0.001
H(cm):		Eq.10		-95.8	73.7	0.747	264.8	54.5	0.773	0.773	35.69		<0.001
13-250	TB	Eq.7	4.329	75.9	1.399		50.0	0.632	0.539	0.495	25.68	1.221	<0.001
CA(m^2):	(25)	Eq.9*	5.107	165.1	0.954		43.3	0.550	0.651	0.560	41.1	1.163	<0.001
0.189-4.155		Eq.10		-115.0	86.9	1.160	281.5	77.1	0.750	0.750	31.54		<0.001
		Eq.1		-22.1	81.2		240.8	19.4	0.795	0.795	97.1		<0.001
		Eq.2		-47.8	0.832		244.2	20.7	0.767	0.767	82.43		<0.001
	BGB	Eq.3		18.5	64.3		259.2	27.4	0.594	0.594	36.55		<0.001
	(15)	Eq.7	3.868	47.8	1.624		60.7	0.692	0.609	0.799	38.97	1.271	<0.001
		Eq.8*	-6.798	1.1E-03	2.188		54.2	0.614	0.692	0.786	56.26	1.207	<0.001
Deutzia		Eq.9	4.210	67.3	0.638		74.8	0.899	0.341	0.496	12.93	1.497	<0.001
parviflora var.		Eq.1		-67.9	141.4		258.9	27.2	0.857	0.857	150.2		<0.001
amurensis		Eq.2		-102.7	1.366		275.8	37.2	0.734	0.734	68.9		<0.001
D(cm):		Eq.3		-10.5	0.634		218.0	12.8	0.969	0.969	772.8		<0.001
0.284-1.835		Eq.7	3.934	51.1	2.203		13.5	0.289	0.943	0.893	412	1.043	<0.001
H(cm):	AGB	Eq.8	-8.757	1.6E-04	2.590		45.1	0.519	0.815	0.716	110.4	1.144	<0.001
37-200	(15)	Eq.9	4.648	104.4	1.079		32.4	0.512	0.820	0.839	114.1	1.140	<0.001
CA(m^2):		Eq.11		-43.1	72.4	74.5	248.7	18.5	0.937	0.937	177.1		<0.001
0.059-2.238		Eq.12		-47.5	0.494	96.4	240.3	22.2	0.909	0.909	120.1		<0.001
		Eq.16*	4.158	64.0	1.712	0.296	7.3	0.253	0.958	0.940	260.8	1.033	<0.001
		Eq.1		-90.0	222.6		278.0	38.7	0.880	0.880	183.8		<0.001
	TB	Eq.2		-150.4	2.198		293.4	51.6	0.788	0.788	92.79		<0.001
	(15)	Eq.7	4.647	104.3	1.869		32.9	0.414	0.852	0.912	144.2	1.090	<0.001
		Eq.8	-6.858	1.1E-03	2.354		34.1	0.423	0.846	0.819	137.1	1.094	<0.001

		Eq.9	5.148	172.1	0.826			59.6	0.678	0.604	0.737	38.09	1.259	<0.001
		Eq.11*		-63.9	149.8	78.6		270.1	32.9	0.917	0.917	132.3		<0.001
		Eq.12		-85.6	1.173	113.4		278.1	38.2	0.888	0.888	95.44		<0.001
		Eq.7	2.115	8.3	0.820			61.7	0.705	0.299	0.368	10.68	1.282	0.003
	BGB	Eq.8	-9.398	8.3E-05	2.535			42.6	0.495	0.655	0.390	47.47	1.130	<0.001
	(27)	Eq.13		-16.6	23.5	0.230	-106.3	182.0	6.343	0.915	0.915	82.47		<0.001
		Eq.17*	-9.757	5.8E-05	1.274	2.211	-1.04	37.8	0.439	0.750	0.888	23.05	1.101	<0.001
		Eq.1		-22.0	35.6			236.2	17.8	0.827	0.827	119.8		<0.001
		Eq.2		-79.0	1.051			266.6	31.4	0.466	0.466	21.8		<0.001
		Eq.7	2.741	15.5	1.150			51.2	0.581	0.553	0.679	30.96	1.184	<0.001
	AGB	Eq.8	-10.306	3.3E-05	2.884			30.1	0.393	0.796	0.480	97.53	1.080	<0.001
	(27)	Eq.9	4.384	80.2	0.916			59.8	0.681	0.387	0.194	15.81	1.261	0.001
		Eq.14	-7.462	5.7E-04	0.588	2.239		12.7	0.280	0.901	0.843	108.7	1.040	<0.001
		Eq.15	-7.907	3.7E-04	2.489	0.382		24.1	0.346	0.848	0.580	67.06	1.062	<0.001
Spiraea		Eq.17*	-8.357	2.3E-04	1.166	2.212	-0.59	7.8	0.252	0.923	0.987	92	1.032	<0.001
fritschiana		Eq.1		-22.0	35.6			236.2	17.8	0.827	0.827	119.8		<0.001
D(cm):		Eq.2		-79.0	1.051			266.6	31.4	0.466	0.466	21.8		<0.001
0.505-5.893		Eq.7	3.185	24.2	1.041			52.8	0.598	0.490	0.588	23.97	1.196	<0.001
H(cm):	TB	Eq.8	-9.390	8.4E-05	2.776			27.9	0.377	0.797	0.465	97.98	1.074	<0.001
60-160	(27)	Eq.9	4.630	102.6	0.801			60.5	0.690	0.320	0.154	11.77	1.269	0.002
CA(m^2):		Eq.14	-7.094	8.3E-04	0.474	2.256		17.8	0.308	0.870	0.755	80.51	1.048	<0.001
0.045-1.035		Eq.17*	-8.188	2.8E-04	1.181	2.223	-0.72	10.9	0.267	0.907	0.971	74.43	1.036	<0.001
		Eq.2		-34.4	0.579			156.5	16.8	0.784	0.784	58.21		<0.001
	BGB	Eq.7*	2.888	18.0	1.624			23.1	0.413	0.903	0.821	148.1	1.089	<0.001
		Eq.8	-7.789	4.1E-04	2.300			27.7	0.469	0.874	0.826	111.3	1.116	<0.001
Lonicera	(18)	Eq.9	3.805	44.9	1.039			38.9	0.640	0.765	0.628	52.21	1.228	<0.001
chrysantha		Eq.15	-4.296	1.4E-02	1.621	0.404		22.9	0.401	0.914	0.892	79.4	1.084	<0.001
D(cm):		Eq.2		-88.4	1.473			193.1	46.4	0.756	0.756	49.47		<0.001
0.318-3.487	AGB	Eq.7*	3.655	38.6	1.846			21.2	0.391	0.930	0.625	213.1	1.080	<0.001
H(cm):		Eq.8	-8.015	3.3E-04	2.515			36.8	0.604	0.834	0.699	80.18	1.200	<0.001
30-240	(18)	Eq.9	4.738	114.2	1.236			33.1	0.546	0.864	0.703	101.8	1.160	<0.001
CA(m^2):		Eq.2		-122.8	2.052			202.5	60.3	0.780	0.780	56.7		<0.001
0.094-1.649	TB	Eq.7*	4.055	57.7	1.767			17.6	0.355	0.937	0.705	237.6	1.065	<0.001
	(18)	Eq.8	-7.255	7.1E-04	2.437			31.9	0.527	0.861	0.757	98.98	1.149	<0.001
		Eq.9	5.080	160.7	1.168			33.5	0.551	0.848	0.699	0.848	1.164	<0.001
Ribes		Eq.1		-5.4	23.5			166.7	2.849	0.666	0.666	61.76		<0.001
maximoviczian	BGB	Eq.7*	3.154	23.4	2.165			45.9	0.457	0.675	0.464	64.3	1.110	<0.001
um	(22)	Eq.8	-5.418	4.4E-03	1.566			62.7	0.589	0.460	0.399	26.37	1.190	<0.001
D(cm):		Eq.9	2.676	14.5	0.371			64.8	0.608	0.424	0.264	22.85	1.203	<0.001
0.383-2.767		Eq.1		-27.3	78.7			217.9	6.186	0.826	0.826	146.7		<0.001
H(cm):		Eq.2		-14.5	0.294			258.2	11.4	0.408	0.408	21.32		<0.001
67-160	AGB	Eq.3		5.4	59.8			240.7	8.749	0.651	0.651	57.86		<0.001
CA(m^2):	(22)	Eq.7	4.184	65.6	2.788			17.8	0.628	0.512	0.827	32.49	1.218	<0.001
0.008-1.225		Eq.8	-7.362	6.3E-04	2.128			53.4	0.512	0.675	0.381	64.47	1.140	<0.001

		Eq.9	3.513	33.5	0.456			66.9	0.299	0.890	0.469	250.1	1.046	<0.001
		Eq.11*		-20.3	57.6	28.1		198.1	4.520	0.910	0.910	151.4		<0.001
		Eq.12		-11.3	0.186	49.3		225.4	6.837	0.794	0.794	57.74		<0.001
		Eq.15	-4.311	1.3E-02	1.616	0.271		36.5	0.391	0.817	0.680	66.95	1.079	<0.001
		Eq.16	4.252	70.3	2.457	0.109		14.4	0.280	0.906	0.874	145.3	1.040	<0.001
		Eq.1		-32.7	102.3			222.7	6.7	0.873	0.873	213.9		<0.001
		Eq.2		-17.5	0.396			270.4	13.7	0.463	0.463	26.72		<0.001
		Eq.3		10.5	71.937			261.5	12.0	0.590	0.590	44.62		<0.001
		Eq.7	4.503	90.3	2.582			15.6	0.289	0.881	0.810	229	1.043	<0.001
		Eq.8	-5.974	2.5E-03	1.923			52.4	0.504	0.637	0.437	54.35	1.136	<0.001
	TB	Eq.9	3.888	48.8	0.425			62.1	0.584	0.513	0.484	32.59	1.186	<0.001
	(22)	Eq.11*		-26.1	82.2	26.7		209.2	5.347	0.921	0.921	174.6		<0.001
		Eq.12		-13.8	0.272	56.5		242.7	8.893	0.781	0.781	53.56		<0.001
		Eq.13		-28.2	70.707	0.080	28.42	206.6	5.074	0.931	0.931	130.7		<0.001
		Eq.15	-3.036	4.8E-02	1.430	0.261		36.5	0.391	0.789	0.712	55.91	1.079	<0.001
		Eq.16	4.568	96.4	2.262	0.105		12.2	0.271	0.899	0.846	133.1	1.037	<0.001
	BGB	Eq.7*	2.885	17.9	1.598			33.3	0.607	0.824	0.656	65.69	1.203	<0.001
	(16)	Eq.8	-11.242	1.3E-05	3.071			44.3	0.856	0.651	0.139	26.16	1.442	<0.001
Lonicera		Eq.9	4.161	64.1	1.584			42.0	0.798	0.697	0.146	32.19	1.374	<0.001
maackii		Eq.7	4.306	74.1	1.498			26.3	0.488	0.865	0.346	89.33	1.127	<0.001
D(cm):	AGB	Eq.8	-10.491	2.8E-05	3.174			29.9	0.546	0.830	0.557	68.54	1.161	<0.001
0.767-9.514	(16)	Eq.9	5.433	228.8	1.627			24.7	0.464	0.878	0.461	100.6	1.113	<0.001
H(cm):		Eq.16*	4.739	114.3	0.806	0.932		5.3	0.247	0.968	0.914	195.6	1.031	<0.001
80-280		Eq.7	4.521	92.0	1.532			25.4	0.474	0.876	0.486	99.07	1.119	<0.001
CA(m^2):	TB	Eq.8	-10.165	3.8E-05	3.161			33.2	0.606	0.798	0.457	55.33	1.201	<0.001
0.330-5.718	(16)	Eq.9	5.693	296.8	1.625			28.7	0.526	0.848	0.353	77.88	1.148	<0.001
		Eq.16*	4.913	136.0	0.907	0.842		10.1	0.287	0.958	0.904	148.2	1.042	<0.001
		Eq.7	2.575	13.1	1.527			25.0	0.635	0.805	0.608	37.11	1.223	<0.001
	BGB	Eq.8	-11.348	1.2E-05	2.954			33.5	0.933	0.578	0.071	12.35	1.546	<0.001
	(23)	Eq.9	4.239	69.3	0.986			28.1	0.732	0.741	0.804	25.71	1.307	<0.001
		Eq.10*		-54.8	26.7	0.383		91.8	12.8	0.979	0.979	183		<0.001
Viburnum		Eq.12		-51.8	0.413	79.2		102.3	20.6	0.944	0.435	67.69		<0.001
burejaeticum		Eq.7	3.451	31.5	1.453			25.6	0.651	0.780	0.097	31.97	1.236	<0.001
D(cm):		Eq.8	-10.579	2.5E-05	2.972			31.4	0.849	0.627	0.798	15.11	1.434	<0.001
0.585-9.328	AGB	Eq.9	5.035	153.8	0.938			28.3	0.737	0.719	0.719	22.98	1.312	<0.001
H(cm):	(23)	Eq.10*		-124.2	48.4	1.006		110.1	29.5	0.970	0.970	131.2		<0.001
80-280		Eq.12		-118.4	1.044	147.2		111.4	31.2	0.967	0.967	116.6		<0.001
CA(m^2):		Eq.7	3.751	42.6	1.463			26.1	0.666	0.775	0.303	30.94	1.248	0.000
0.063-2.827		Eq.8	-10.773	2.1E-05	3.075			30.7	0.822	0.657	0.095	17.26	1.401	0.002
	TB	Eq.9	5.330	206.5	0.933			29.4	0.773	0.696	0.768	20.64	1.349	0.001
	(23)	Eq.10		-181.7	61.9	1.523		118.5	43.1	0.965	0.965	109.6		<0.001
		Eq.12*		-174.2	1.566	189.3		117.7	41.5	0.967	0.967	118.8		<0.001
Lonicera	BGB	Eq.7	2.956	19.2	1.620			60.2	0.782	0.744	0.355	63.77	1.358	<0.001
praeflorens	(24)	Eq.8	-14.915	3.3E-07	3.706			54.3	0.691	0.800	0.465	87.84	1.270	<0.001

D(cm):		Eq.9	4.239	69.3	1.381			53.1	0.674	0.810	0.552	93.59	1.255	<0.001
0.322-5.672		Eq.16*	3.740	42.1	0.695	0.909		49.0	0.608	0.852	0.591	60.49	1.203	<0.001
H(cm):		Eq.2		-544.0	5.352			325.6	196.9	0.680	0.680	46.76		<0.001
70-255		Eq.7	3.994	54.2	1.936			44.3	0.561	0.890	0.464	177.4	1.170	<0.001
CA(m^2):	AGB	Eq.8	-17.108	3.7E-08	4.378			31.8	0.432	0.934	0.617	313.4	1.098	<0.001
0.090-2.270	(24)	Eq.9	5.499	244.3	1.585			43.5	0.552	0.893	0.723	184.1	1.164	<0.001
		Eq.14	-9.357	8.6E-05	0.827	2.760		15.7	0.304	0.969	0.797	329.8	1.047	<0.001
		Eq.16*	4.748	115.3	1.047	0.874		11.8	0.280	0.974	0.753	390.2	1.040	<0.001
		Eq.2		-682.4	6.787			336.4	246.4	0.686	0.686	48.01		<0.001
		Eq.7	4.331	76.0	1.846			46.1	0.583	0.872	0.477	149.5	1.185	<0.001
	TB	Eq.8	-15.873	1.3E-07	4.192			33.9	0.452	0.923	0.619	263.3	1.107	<0.001
	(24)	Eq.9	5.773	321.5	1.528			41.5	0.530	0.894	0.724	185.4	1.151	<0.001
		Eq.14	-8.778	1.5E-04	0.757	2.710		23.3	0.356	0.954	0.786	219.1	1.065	<0.001
		Eq.16*	5.095	163.2	0.946	0.886		17.1	0.313	0.965	0.768	287	1.050	<0.001
		Eq.1		-120.2	113.0			3081.8	212.8	0.572	0.572	300.4		<0.001
		Eq.2		-369.4	3.280			3072.7	208.6	0.589	0.589	321.8		<0.001
		Eq.3		-36.3	143.7			3026.2	188.3	0.665	0.665	446		<0.001
		Eq.4		58.7	-40.1	13.758		2784.7	110.4	0.885	0.885	864.3		<0.001
		Eq.5		65.3	-1.294	0.008		2707.8	93.2	0.918	0.918	1258		<0.001
		Eq.7	2.906	18.3	1.564			538.5	0.785	0.743	0.620	651.8	1.361	<0.001
		Eq.8	-10.195	3.7E-05	2.783			593.2	0.886	0.674	0.907	464.2	1.481	<0.001
	BGB	Eq.9	4.171	64.8	0.874			608.8	0.917	0.650	0.334	418.2	1.523	<0.001
	(206)	Eq.10		-297.8	61.2	1.949		3031.7	190.2	0.660	0.660	216.9		<0.001
		Eq.11		-95.4	52.2	99.2		2985.0	171.6	0.723	0.723	292.1		<0.001
		Eq.12		-175.5	1.258	100.8		3008.9	180.8	0.692	0.692	251.7		<0.001
Total Typical		Eq.13		-153.4	45.1	0.597	84.87	2982.8	170.4	0.728	0.728	198.9		<0.001
Shrubs		Eq.14*	-3.125	4.4E-02	1.030	1.271		486.9	0.700	0.797	0.950	440.7	1.277	<0.001
D(cm):		Eq.15	-4.312	1.3E-02	1.665	0.465		535.2	0.778	0.749	0.890	334.8	1.353	<0.001
0.284-18.782		Eq.16	3.379	29.3	1.091	0.355		502.7	0.724	0.783	0.689	403.5	1.300	<0.001
H(cm):		Eq.17	-1.549	0.213	0.836	1.004	0.230	472.6	0.676	0.812	0.938	320	1.257	<0.001
13-810		Eq.1		-452.3	370.8			3713.5	855.5	0.471	0.471	200.2		<0.001
CA(m^2):		Eq.2		-1366.2	11.441			3678.0	791.3	0.547	0.547	272		<0.001
0.008-19.635		Eq.3		-221.6	519.7			3609.9	681.1	0.665	0.665	445.9		<0.001
		Eq.4		282.1	-257.4	56.5		3388.6	417.4	0.875	0.875	781.1		<0.001
		Eq.5		391.9	-7.056	0.034		3132.1	237.2	0.960	0.960	2653		<0.001
		Eq.7	3.545	34.6	1.779			497.0	0.717	0.818	0.583	1013	1.293	<0.001
	AGB	Eq.8	-11.828	7.3E-06	3.262			532.8	0.776	0.787	0.866	832.3	1.351	<0.001
	(206)	Eq.9	5.017	150.9	1.027			556.1	0.816	0.764	0.343	729.3	1.395	<0.001
		Eq.10		-1180.8	158.6	7.993		3661.0	760.5	0.584	0.584	157		<0.001
		Eq.11		-345.5	109.5	426.3		3598.3	662.3	0.684	0.684	242.7		<0.001
		Eq.12		-577.1	3.215	410.1		3602.5	668.5	0.678	0.678	236.2		<0.001
		Eq.14	-4.507	1.1E-02	1.066	1.697		363.2	0.533	0.900	0.909	1009	1.152	<0.001
		Eq.15	-4.842	7.9E-03	1.935	0.553		408.3	0.588	0.878	0.966	806.7	1.189	<0.001

	Eq.16	4.203	66.9	1.120	0.494		398.7	0.576	0.883	0.699	846.4	1.180	<0.001
	Eq.17*	-2.240	1.1E-01	0.787	1.312	0.33	300.2	0.463	0.925	0.970	916.2	1.113	<0.001
	Eq.1		-572.1	483.1			3812.3	1063.0	0.494	0.494	219.8		<0.001
	Eq.2		-1736.9	14.723			3780.3	991.2	0.561	0.561	287.1		<0.001
	Eq.3		-258.8	663.2			3715.6	859.6	0.670	0.670	455.8		<0.001
	Eq.4		341.4	-298.5	70.2		3486.3	517.6	0.881	0.881	826.9		<0.001
	Eq.5		456.2	-8.350	0.042		3252.9	309.5	0.957	0.957	2513		<0.001
	Eq.7	4.009	55.1	1.697			487.9	0.703	0.810	0.583	958.9	1.280	<0.001
TB	Eq.8	-10.605	2.5E-05	3.102			526.8	0.765	0.774	0.917	772.3	1.340	<0.001
(206)	Eq.9	5.405	222.5	0.972			554.4	0.813	0.745	0.339	658.1	1.392	<0.001
	Eq.10		-1482.1	217.9	9.984		3759.2	944.1	0.603	0.603	170.2		<0.001
	Eq.11		-440.2	160.4	526.4		3699.1	827.0	0.696	0.696	255.8		<0.001
	Eq.12		-755.3	4.490	510.2		3706.0	839.8	0.686	0.686	244.7		<0.001
	Eq.14	-3.552	2.9E-02	1.027	1.594		369.0	0.540	0.888	0.953	891.9	1.157	<0.001
	Eq.15	-4.095	1.7E-02	1.865	0.515		420.0	0.604	0.860	0.961	689.7	1.200	<0.001
	Eq.16	4.610	100.5	1.095	0.452		405.7	0.585	0.869	0.686	741.9	1.187	<0.001
	Eq.17*	-1.524	2.2E-01	0.778	1.249	0.30	322.0	0.485	0.910	0.978	752.5	1.125	<0.001

Those equations were listed in this table when all model parameters were significant at $p<0.01$ level. The models forms of Eq.1-17 were listed in Table1 in original manuscript.

* was the best fit equations which were chosen in manuscript.