Appendix A: Supplementary information

Table S1. Summary of the variables used in the study

Variable	Unit	Mean	S.D.	Range
Small scale, 20 m × 20 m scale, 1000 quadrats				
Elevation	m	818	117	659-1049
TCH (Mean top canopy height)	m	23.4	7.4	6.6-49.7
Stem size variation	unitless	1.42	0.36	0.47-3.39
Stem abundance	N ha^{-1}	4125	1375	450-8800
Species richness	unitless	43	9	10-78
AGB (Aboveground biomass)	Mg ha^{-1}	317.9	224.8	30.4 - 1557
Large scale, 50 m × 50 m scale, 160 quadrats				
Elevation	unitless	818	117	659-1049
TCH (Mean top canopy height)	m	23.4	6.0	12.1-42.9
Stem size variation	unitless	1.54	0.24	0.92-2.22
Stem abundance	N ha^{-1}	4244	1116	1956-7380
Species richness	unitless	107	18	68-149
AGB (Aboveground biomass)	Mg ha^{-1}	262.4	127.9	48.9-719.1

Note: original variables are shown here, whereas transformed datasets are used in analysis.

Table S2. Direct, indirect and total standardized effects of predictors on AGB (aboveground biomass) at scale of 20 m × 20 m, based on the structural equation model. Significant effects (P < 0.05) are indicated in bold. Abbreviations are explained in Table S1. See model in Fig. 2a

Response variable	Mediator variable	Predictor variable	Effect	Beta	S.E.	*Z-value*	*P-value*
AGB		Elevation	Direct	0.10	0.02	5.95	**0.000**
AGB		TCH	Direct	0.21	0.02	10.43	**0.000**
AGB		Stem abundance	Direct	0.17	0.02	8.17	**0.000**
AGB		Stem size variation	Direct	0.71	0.02	35.00	**0.000**
AGB		Species richness	Direct	0.04	0.02	1.90	0.057
TCH		Elevation	Direct	-0.22	0.03	-7.11	**0.000**
Stem abundance		Elevation	Direct	0.20	0.03	6.49	**0.000**
Stem size variation		Elevation	Direct	-0.05	0.03	-1.77	0.077
Species richness		Elevation	Direct	0.03	0.03	1.18	0.237
Stem size variation		TCH	Direct	0.62	0.03	24.68	**0.000**
Species richness		TCH	Direct	0.04	0.03	1.28	0.200
Stem size variation		Stem abundance	Direct	-0.03	0.03	-1.29	0.199
Species richness		Stem size variation	Direct	0.09	0.03	3.02	**0.002**
AGB	TCH	Elevation	Indirect	-0.05	0.01	-5.88	**0.000**
AGB	Stem abundance	Elevation	Indirect	0.04	0.01	5.08	**0.000**
AGB	Stem size variation	Elevation	Indirect	-0.03	0.02	-1.76	0.078
AGB	Species richness	Elevation	Indirect	0.00	0.00	1.00	0.315
AGB	Stem size variation	TCH	Indirect	0.44	0.02	20.17	**0.000**
AGB	species richness	TCH	Indirect	0.00	0.00	1.06	0.288
AGB	Stem size variation	Stem abundance	Indirect	0.00	0.00	-1.06	0.287
AGB	Species richness	Stem abundance	Indirect	0.03	0.01	1.90	0.058
AGB	Species richness	Stem size variation	Indirect	0.00	0.00	1.61	0.108
AGB	TCH Species richness Stem abundance Stem size variation	Elevation	Indirect	-0.04	0.02	-2.06	**0.039**
AGB	Species richness Stem size variation	TCH	Indirect	0.44	0.02	20.24	**0.000**
AGB	Species richness Stem size variation	Stem abundance	Indirect	0.00	0.02	0.15	0.881
AGB	Species richness	Stem size variation	Indirect	0.00	0.00	1.61	0.108
AGB	TCH Stem abundance Stem size variation Species richness	Elevation	Total	0.06	0.03	2.12	**0.034**
AGB	Stem abundance TCH Stem size variation	TCH	Total	0.66	0.02	27.20	**0.000**

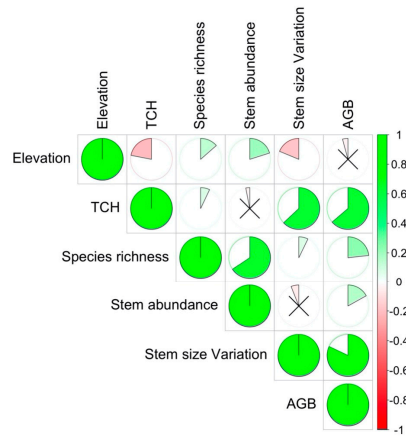|							
AGB	Species richness Species richness Stem size variation	Stem abundance	Total	0.18	0.02	7.36	**0.000**
AGB	Species richness TCH	Stem size variation	Total	0.72	0.02	35.28	**0.000**
Species richness	Stem abundance Stem size variation	Elevation	Total	0.15	0.03	4.71	**0.000**
Species richness	Stem size variation	TCH	Total	0.10	0.02	3.97	**0.000**
Stem size variation	TCH	Elevation	Total	-0.19	0.03	-6.04	**0.000**

Table S3. Direct, indirect and total standardized effects of predictors on AGB (aboveground biomass) at scale of 50 m × 50 m, based on the structural equation model. Significant effects (P < 0.05) are indicated in bold. Abbreviations are explained in Table S1. See model in Fig. 3a,

Response variable	Mediator variable	Predictor variable	Effect	Beta	S.E.	*Z-value*	*P-value*
AGB	--	Elevation	Direct	0.12	0.04	3.23	**0.001**
AGB	--	TCH	Direct	0.55	0.06	9.79	**0.000**
AGB	--	Stem abundance	Direct	0.30	0.04	6.64	**0.000**
AGB	--	Stem size variation	Direct	0.44	0.06	7.74	**0.000**
AGB	--	Species richness	Direct	-0.11	0.04	-2.58	**0.010**
TCH	--	Elevation	Direct	-0.29	0.08	-3.84	**0.000**
Stem abundance	--	Elevation	Direct	0.20	0.08	2.59	**0.010**
Stem size variation	--	Elevation	Direct	-0.05	0.05	-0.95	0.342
Species richness	--	Elevation	Direct	-0.03	0.07	-0.51	0.614
Stem size variation	--	TCH	Direct	0.75	0.05	14.84	**0.000**
Species richness	--	TCH	Direct	-0.04	0.10	-0.40	0.691
Stem size variation	--	Stem abundance	Direct	-0.11	0.05	-2.29	**0.022**
Species richness	--	Stem size variation	Direct	-0.07	0.10	-0.66	0.507
AGB	TCH	Elevation	Indirect	-0.16	0.04	-3.58	**0.000**
AGB	Stem abundance	Elevation	Indirect	0.06	0.02	2.41	**0.016**
AGB	Stem size variation	Elevation	Indirect	-0.02	0.02	-0.94	0.346
AGB	Species richness	Elevation	Indirect	0.00	0.01	0.50	0.620
AGB	Stem size variation	TCH	Indirect	0.33	0.05	6.86	**0.000**
AGB	species richness	TCH	Indirect	0.01	0.01	0.39	0.695
AGB	Stem size variation	Stem abundance	Indirect	0.01	0.01	1.71	0.087
AGB	Species richness	Stem abundance	Indirect	-0.07	0.03	-2.49	0.013
AGB	Species richness	Stem size variation	Indirect	0.01	0.01	0.64	0.521
AGB	TCH Species richness Stem abundance Stem size variation	Elevation	Indirect	-0.12	0.06	-2.10	**0.036**
AGB	Species richness Stem size variation	TCH	Indirect	0.33	0.05	6.77	**0.000**
AGB	Species richness Stem size variation	Stem abundance	Indirect	-0.12	0.04	-3.34	**0.001**
AGB	Species richness	Stem size variation	Indirect	0.01	0.01	0.64	0.521
AGB	TCH Stem abundance Stem size variation Species richness	Elevation	Total	0.00	0.07	0.03	0.976
AGB	Stem abundance, Stem size variation	TCH	Total	0.88	0.04	20.00	**0.000**

	Species richness						
AGB	Species richness Stem size variation	Stem abundance	Total	0.18	0.04	4.23	**0.000**
AGB	Species richness TCH	Stem size variation	Total	0.45	0.06	7.73	**0.000**
Species richness	Stem abundance Stem size variation	Elevation	Total	0.10	0.08	1.24	0.217
Species richness	Stem size variation	TCH	Total	-0.09	0.07	-1.39	0.165
Stem size variation	TCH	Elevation	Total	-0.29	0.08	-3.86	**0.000**

Fig. S1. Pearson's correlation coefficient between all pairs of variables at scale used in this meta-analysis. Red to green color indicates negative to positive correlation, the shade extents of circles represent correlation coefficient (*r*) size, and insignificant correlations (*P* > 0.05) include crosses inside the circles. Abbreviations for variables are explained in Table S1.

(a) 20 m × 20 m scale

(b) 50 m × 50 m scale