

Supplementary Materials

Table S1_1 Rho values of spearman correlations between seedling traits of all woody species (liana and tree combined). Asterisks indicate significance level of the correlation (*p<0.05, **p<0.01, ***p<0.001). LA is leaf area, LDMC is leaf dry matter content, SLA is specific leaf area, LAR is leaf area ratio, LMF is leaf mass fraction, SDMC is stem dry matter content, SMF is stem mass fraction, SSL is specific stem length, RDMC is root dry matter content, RMF is root mass fraction, SRL is specific root length.

	LMF	SMF	RMF	LAR	SDMC	RDMC	SSL	SRL	LDMC	SLA
LA	0.05	0	-0.02	-0.19*	-0.05	-0.06	-0.52***	-0.48***	-0.15	-0.24**
LMF		-0.45***	-0.77***	0.57***	-0.22**	-0.10	0.30***	0.38***	-0.17*	-0.09
SMF			-0.20*	-0.20*	0.10	0.07	-0.14	0	0.12	0.14
RMF				-0.51***	0.18*	0.06	-0.25**	-0.43***	0.11	-0.02
LAR					-0.58***	-0.35***	0.66***	0.66***	-0.4***	0.72***
SDMC						0.82***	-0.30***	-0.21**	0.71***	-0.51***
RDMC							-0.18*	-0.06	0.59***	-0.37***
SSL								0.85***	-0.02	0.46***
SRL									-0.05	0.44***
LDMC										-0.40***

Table S1_2 Rho values of spearman correlations between seedling traits of tree species. Asterisks indicate significance level of the correlation (*p<0.05, **p<0.01, ***p<0.001). LA is leaf area, LDMC is leaf dry matter content, SLA is specific leaf area, LAR is leaf area ratio, LMF is leaf mass fraction, SDMC is stem dry matter content, SMF is stem mass fraction, SSL is specific stem length, RDMC is root dry matter content, RMF is root mass fraction, SRL is specific root length.

	LMF	SMF	RMF	LAR	SDMC	RDMC	SSL	SRL	LDMC	SLA
LA	0.13	-0.04	-0.08	-0.07	-0.15	-0.17	-0.45***	-0.44***	-0.29**	-0.16
LMF		-0.47***	-0.76***	0.54***	-0.09	0.02	0.27**	0.36***	0.01	-0.19
SMF			-0.19	-0.19	0.05	0	-0.16	0	0.06	0.19
RMF				-0.50***	0.06	-0.02	-0.22*	-0.41***	-0.05	0.03
LAR					-0.51***	-0.34***	0.60***	0.61***	-0.27**	0.65***
SDMC						0.83***	-0.27**	-0.19	0.63***	-0.50***
RDMC							-0.22*	-0.13	0.51***	-0.40***
SSL								0.87***	0.12	0.33***
SRL									0.08	0.31**
LDMC										-0.39***

Table S1_3 Rho values of spearman correlations between seedling traits of liana species. Asterisks indicate significance level of the correlation (*p<0.05, **p<0.01, ***p<0.001). LA is leaf area, LDMC is leaf dry matter content, SLA is specific leaf area, LAR is leaf area ratio, LMF is leaf mass fraction, SDMC is stem dry matter content, SMF is stem mass fraction, SSL is specific stem length, RDMC is root dry matter content, RMF is root mass fraction, SRL is specific root length.

	LMF	SMF	RMF	LAR	SDMC	RDMC	SSL	SRL	LDMC	SLA
LA	-0.14	-0.08	0.23	-0.27	0.01	0.03	-0.61***	-0.55***	0.06	-0.26
LMF		-0.4**	-0.81***	0.64***	-0.44***	-0.26	0.38**	0.42**	-0.43**	0.04
SMF			-0.19	-0.12	0.15	0.13	0.06	0.11	0.19	0.19
RMF				-0.64***	0.42**	0.23	-0.45***	-0.54***	0.37**	-0.2
LAR					-0.62***	-0.30*	0.66***	0.65***	-0.55***	0.76***
SDMC						0.79***	-0.26	-0.15	0.81***	-0.48***

RDMC	0.04	0.13	0.7***	-0.22
SSL		0.84***	-0.18	0.56***
SRL			-0.14	0.52***
LDMC				-0.4**

Table S2 Linear mixed model results for the differences between lianas and tree. The Chi-Squared value and p-values are given for the differences between the two group. For the random effects, we report the standard deviation (which is a measure for the variability for each random effect added to the model). We considered the following traits: LA is leaf area in cm², LDMC is leaf dry matter content in g g⁻¹, SLA is specific leaf area in cm² g⁻¹, LAR is leaf area ratio in cm² g⁻¹, LMF is leaf mass fraction in g g⁻¹, SDMC is stem dry matter content in g g⁻¹, SMF is stem mass fraction g g⁻¹, SSL is specific stem length in cm g⁻¹, RDMC is root dry matter content in g g⁻¹, RMF is root mass fraction in g g⁻¹, SRL is specific root length cm g⁻¹.

Trait	Species random effect (s.d.)	Fixed effect			
		Individual size		Functional group	
		χ^2	p-value	χ^2	p-value
LA	0.47	4634.71	<0.001	1.01	0.314
LDMC	0.26	60.07	<0.001	0.86	0.353
SLA	0.23	424.55	<0.001	11.36	0.001
LAR	0.24	1037.98	<0.001	2.69	0.101
LMF	0.22	377.01	<0.001	2.52	0.110
SDMC	0.19	211.75	<0.001	1.19	0.275
SMF	0.14	368.89	<0.001	1.44	0.231
SSL	0.18	8775.62	<0.001	54.46	<0.001
RDMC	0.17	104.87	<0.001	2.70	0.100
RMF	0.26	0.03	0.871	0.05	0.814
SRL	0.20	9676.98	<0.001	0.70	0.402

Table S3 Linear mixed model results for the differences between multivariate clusters. The Chi-Squared value and p-values are given for the differences between the clusters. For the random effects, we report the standard deviation (which is a measure for the variability for each random effect added to the model). We considered the following traits: LA is leaf area, LDMC is leaf dry matter content, SLA is specific leaf area, LAR is leaf area ratio, LMF is leaf mass fraction, SDMC is stem dry matter content, SMF is stem mass fraction, SSL is stem length ratio, RDMC is root dry matter content, RMF is root mass fraction, and SRL is specific root length.

trait	Species random effect (s.d.)	Fixed effect			
		Individual size		Cluster	
		χ^2	p-value	χ^2	p-value
LA	0.47	4632.00	<0.001	1.45	=0.229
LDMC	0.23	53.08	<0.001	29.76	<0.001
SLA	0.20	405.95	<0.001	65.44	<0.001
LAR	0.19	957.15	<0.001	69.71	<0.001
LMF	0.22	355.38	<0.001	1.03	=0.310
SDMC	0.17	193.76	<0.001	35.79	<0.001
SMF	0.14	369.03	<0.001	3.24	=0.070
SSL	0.20	8460.14	<0.001	23.87	<0.001
RDMC	0.16	96.22	<0.001	19.49	<0.001

RMF	0.25	0.54	0.462	14.95	<0.001
SRL	0.19	9410.82	<0.001	12.24	<0.001

Table S4. Summaries of species collected for functional traits. Cluster indicates the results of multivariate clusters, 1 is tree dominated cluster and 2 is liana dominated cluster, OG indicates species classified as specialist of old-growth forest, SG indicates species classified as specialist of secondary-growth forest, Generalist indicates species, Too_rare indicates species which do not have enough individuals for classification. The habitat affinity classification (speciall)used the data of trees and lianas (W. Chanthorn, unpublished data) from second-growth forest plots located in the same landscape as the MSP. Total_OF and Total_SF refer to individuals of same species found in old-growth forest and secondary forest respectively.

Species name	Family	Functional group	Cluster	Total_OF	Total_SF	Habitat affinity
Actinodaphne angustifolia	Lauraceae	Tree	1	563	1	Specialist_OF
Aglaia elaeagnoides	Meliaceae	Tree	1	4500	11	Specialist_OF
Aglaia lawii	Meliaceae	Tree	1	1036	1	Specialist_OF
Alchornea rugosa	Euphorbiaceae	Tree	1	1892	5	Specialist_OF
Alphonsea boniana	Annonaceae	Tree	1	600	0	Specialist_OF
Anaxagorea luzonensis	Annonaceae	Tree	1			Too_rare
Antiaris toxicaria	Moraceae	Tree	1	126	0	Specialist_OF
Antidesma montanum	Phyllanthaceae	Tree	1	308	0	Specialist_OF
Antidesma sootepense	Phyllanthaceae	Tree	1	223	0	Specialist_OF
Aphanamixis polystachya	Meliaceae	Tree	1	2263	11	Specialist_OF
Aphananthe cuspidata	Ulmaceae	Tree	1	98	0	Specialist_OF
Aporosa octandra	Euphorbiaceae	Tree	1	1867	0	Specialist_OF
Ardisia nervosa	Myrsinaceae	Tree	1	2796	0	Specialist_OF
Ardisia sanguinolenta	Myrsinaceae	Tree	1	7272	70	Specialist_OF
Baccaurea ramiflora	Phyllanthaceae	Tree	1	1191	7	Specialist_OF
Beilschmiedia aff.intermedia	Lauraceae	Tree	1	667	1	Specialist_OF
Beilschmiedia glauca	Lauraceae	Tree	1	3530	1	Specialist_OF
Beilschmiedia maingayi	Lauraceae	Tree	1	1606	0	Specialist_OF
Camellia oleifera	Theaceae	Tree	1	1282	1	Specialist_OF
Canthium coffeoides	Rubiaceae	Tree	1	186	34	Generalist
Casearia grewiaefolia	Salicaceae	Tree	1	440	2	Specialist_OF

Chionanthus ramiflorus	Oleaceae	Tree	1	292	1	Specialist_OF
Chukrasia tabularis	Meliaceae	Tree	1	39	0	Too_rare
Cinnamomum iners	Lauraceae	Tree	1	75	171	Specialist_SF
Cinnamomum subavenium	Lauraceae	Tree	1	17035	126	Specialist_OF
Clausena excavata	Rutaceae	Tree	1	27	2341	Specialist_SF
Daphniphyllum beddomei	Daphniphyllaceae	Tree	1	82	26	Generalist
Dasymaschalon acuminatum	Annonaceae	Tree	1	1662	4	Specialist_OF
Dipterocarpus gracilis	Dipterocarpaceae	Tree	1	4047	8	Specialist_OF
Dysoxylum cyrtobotryum	Meliaceae	Tree	1	922	8	Specialist_OF
Eugenia cerasoides	Myrtaceae	Tree	1	1923	1731	Specialist_SF
Eugenia siamensis	Myrtaceae	Tree	1	1563	3	Specialist_OF
Eugenia syzygioides	Myrtaceae	Tree	1	1245	1549	Specialist_SF
Excoecaria oppositifolia	Euphorbiaceae	Tree	1	1001	1	Specialist_OF
Ficus vasculosa	Moraceae	Tree	1	103	0	Specialist_OF
Garcinia benthamii	Clusiaceae	Tree	1	937	21	Specialist_OF
Glycosmis cochinchinensis	Rutaceae	Tree	1	166	0	Specialist_OF
Glycosmis mauritiana	Rutaceae	Tree	1	1459	0	Specialist_OF
Gonocaryum lobbianum	Cardiopteridaceae	Tree	1	8021	533	Specialist_OF
Helicia formosana	Proteaceae	Tree	1	1634	17	Specialist_OF
Hibiscus macrophyllus	Malvaceae	Tree	1	10	81	Specialist_SF
Horsfieldia amygdalina	Myristicaceae	Tree	1	80	6	Generalist
Knema elegans	Myristicaceae	Tree	1	11563	10	Specialist_OF
Lasianthus hirsutus	Myristicaceae	Tree	1	152	0	Specialist_OF
Lasianthus kurzii	Myristicaceae	Tree	1	1617	5	Specialist_OF
Lasianthus lucidus	Myristicaceae	Tree	1	453	0	Specialist_OF
Lasianthus sp.	Myristicaceae	Tree	1	141	0	Specialist_OF
Lasianthus wallichii	Myristicaceae	Tree	1	344	0	Specialist_OF

Lithocarpus eucalyptifolius	Fagaceae	Tree	1	1898	1	Specialist_OF
Litsea beusekomii	Lauraceae	Tree	1	644	0	Specialist_OF
Litsea martiniana	Lauraceae	Tree	1	302	2	Specialist_OF
Litsea umbellata	Lauraceae	Tree	1	351	12	Specialist_OF
Litsea verticillata	Lauraceae	Tree	1	1648	3	Specialist_OF
Machilus gamblei	Lauraceae	Tree	1	544	1461	Specialist_SF
Memecylon edule	Melastomataceae	Tree	1	1491	1031	Specialist_SF
Memecylon lilacinum	Melastomataceae	Tree	1	3877	634	Generalist
Memecylon ovatum	Melastomataceae	Tree	1	11	0	Too_rare
Microtropis pallens	Celastraceae	Tree	1	5	0	Too_rare
Miliusa lineata	Annonaceae	Tree	1	1449	1	Specialist_OF
Mischocarpus pentapetalus	Sapindaceae	Tree	1	742	20	Specialist_OF
Monoon simiarum	Annonaceae	Tree	1	3340	1	Specialist_OF
Nephelium mel-liferum	Sapindaceae	Tree	1	2279	0	Specialist_OF
Nothapodytes montana	Icacinaceae	Tree	1	115	40	Generalist
Olea brachiata	Oleaceae	Tree	1	332	1217	Specialist_SF
Pavetta indica	Rubiaceae	Tree	1	119	4	Specialist_OF
Phoebe lanceolata	Lauraceae	Tree	1	1959	100	Specialist_OF
Phyllanthus acutissimus	Phyllanthaceae	Tree	1	2159	0	Specialist_OF
Podocarpus imbricatus	Podocarpaceae	Tree	1	4	0	Too_rare
Podocarpus nerriifolius	Podocarpaceae	Tree	1	87	2	Specialist_OF
Polyalthia khaoyaiensis	Annonaceae	Tree	1	53214	0	Specialist_OF
Prismatomeris tetrandra	Rubiaceae	Tree	1	410	0	Specialist_OF
Prunus javanica	Rosaceae	Tree	1	213	0	Specialist_OF
Psychotria ophi-oxyloides	Rubiaceae	Tree	1	89	0	Specialist_OF
Psychotria rubra	Rubiaceae	Tree	1	59	0	Specialist_OF
Saprosma longi-folium	Rubiaceae	Tree	1	2709	0	Specialist_OF
Schima wallichii	Theaceae	Tree	1	831	3210	Specialist_SF
Walsura robusta	Meliaceae	Tree	1	3051	2	Specialist_OF
Aglaia edulis	Meliaceae	Tree	2	71	14	Generalist
Aidia densiflora	Rubiaceae	Tree	2	925	3	Specialist_OF

Allophyllus cobbe	Sapindaceae	Tree	2	373	0	Specialist_OF
Aquilaria crassna	Thymelaeaceae	Tree	2	2849	104	Specialist_OF
Balakata baccata	Euphorbiaceae	Tree	2	66	6	Generalist
Bridelia insulana	Phyllanthaceae	Tree	2	148	2	Specialist_OF
Choerospondias axillaris	Anacardiaceae	Tree	2	218	51	Generalist
Elaeocarpus sphaericus	Elaeocarpaceae	Tree	2	534	0	Specialist_OF
Excoecaria cochinchinensis	Euphorbiaceae	Tree	2	19	0	Too_rare
Gironniera ner- vosa	Cannabaceae	Tree	2	1438	0	Specialist_OF
Gomphandra tetrandra	Stemonuraceae	Tree	2	215	277	Specialist_SF
Hopea odorata	Dipterocarpaceae	Tree	2	1	0	Too_rare
Lasianthus chinensis	Rubiaceae	Tree	2	81	0	Specialist_OF
Leea indica	Vitaceae	Tree	2	153	3	Specialist_OF
Macaranga den- ticulata	Euphorbiaceae	Tree	2	3	0	Too_rare
Mastixia pentan- dra	Nyssaceae	Tree	2	3475	22	Specialist_OF
Melastoma ori- entale	Melastomataceae	Tree	2	754	222	Generalist
Melicope ptelei- folia	Rutaceae	Tree	2	4668	1147	Generalist
Polyosma cf. in- tegrifolia	Polyosmaceae	Tree	2	852	0	Specialist_OF
Sandoricum koetjape	Meliaceae	Tree	2	53	0	Specialist_OF
Sarcosperma ar- boreum	Sapotaceae	Tree	2	493	7	Specialist_OF
Saurauia rox- burghii	Actinidiaceae	Tree	2	160	0	Specialist_OF
Symplocos cochinchinensis	Symplocaceae	Tree	2	7031	903	Generalist
Aganosma schlechteriana	Apocynaceae	Liana	1	11	43	Specialist_SF
Anodendron af- fine	Apocynaceae	Liana	1	13	0	Too_rare
Celastrus ap- proximata	Celastraceae	Liana	1	202	0	Specialist_OF
Desmos du- mosus	Annonaceae	Liana	1	142	1241	Specialist_SF
Elaeagnus con- ferta	Elaeagnaceae	Liana	1	65	0	Specialist_OF
Erycibe elliptil- imba	Convolvulaceae	Liana	1	170	0	Specialist_OF
Erycibe subspi- cata	Convolvulaceae	Liana	1	94	10	Generalist

Fissistigma oblongum	Annonaceae	Liana	1	103	104	Generalist
Gnetum macrostachyum	Gnetaceae	Liana	1	52	5	Generalist
Gnetum montanum	Gnetaceae	Liana	1	65	21	Generalist
Grewia acuminata	Tileaceae	Liana	1	27	1	Specialist_OF
Jasminum scandens	Oleaceae	Liana	1	0	403	Specialist_SF
Linostoma pauciflorum	Thymelaeaceae	Liana	1	50	0	Specialist_OF
Oxyceros longiflora	Rubiaceae	Liana	1	100	0	Specialist_OF
Paramignya scandens	Rutaceae	Liana	1	6	1	Too_rare
Reissentia indica	Celastraceae	Liana	1	43	1	Specialist_OF
Rourea minor	Connaraceae	Liana	1	74	4	Specialist_OF
Salacia chinensis	Celastraceae	Liana	1	137	125	Generalist
Sphenodesme mollis	Verbenaceae	Liana	1	29	19	Generalist
Strychnos lanata	Loganiaceae	Liana	1	8	0	Too_rare
Tetracera indica	Dilleniaceae	Liana	1	528	11	Specialist_OF
Uvaria concova	Annonaceae	Liana	1	114	1	Specialist_OF
Uvaria littoralis	Annonaceae	Liana	1	81	11	Generalist
Uvaria micrantha	Annonaceae	Liana	1	201	262	Specialist_SF
Ventilago leiocarpa	Rhamnaceae	Liana	1	22	0	Too_rare
Caelospermum truncatum	Rubiaceae	Liana	2	209	8	Specialist_OF
Chilocarpus denudatus	Apocynaceae	Liana	2	85	0	Specialist_OF
Chonemorpha fragrans	Apocynaceae	Liana	2	180	6	Specialist_OF
Coptosapelta flavescens	Rubiaceae	Liana	2	67	63	Generalist
Diplectria barbata	Melastomataceae	Liana	2	171	0	Specialist_OF
Diploclisia glaucescens	Menispermaceae	Liana	2	144	0	Specialist_OF
Embelia cf. kerrii	Myrsinaceae	Liana	2	19	1	Too_rare
Ficus punctata	Moraceae	Liana	2	24	0	Specialist_OF
Ficus villosa	Moraceae	Liana	2	18	0	Too_rare
Gymnema latifolium	Asclepiadaceae	Liana	2	4	0	Too_rare
Hypserpa nitida	Menispermaceae	Liana	2	71	32	Generalist
Illigera pierrei	Hernandiaceae	Liana	2	117	0	Specialist_OF
Melodinus fusiformis	Apocynaceae	Liana	2	110	0	Specialist_OF
Morinda villosa	Rubiaceae	Liana	2	221	19	Specialist_OF

Naravelia laurifolia	Ranunculaceae	Liana	2	4	0	Too_rare
Neuropeltis racemosa	Convolvulaceae	Liana	2	164	0	Specialist_OF
Piper retrofractum	Piperaceae	Liana	2	38	0	Specialist_OF
Piper ribesoides	Piperaceae	Liana	2	34	0	Specialist_OF
Sabia limoniacea	Sabiaceae	Liana	2	338	1	Specialist_OF
Spatholobus harmandii	Sapindaceae	Liana	2	232	150	Generalist
Tetrastigma erubescens	Vitaceae	Liana	2	236	0	Specialist_OF
Tetrastigma godefroyanum	Vitaceae	Liana	2	99	0	Specialist_OF
Toddalia asiatica	Rutaceae	Liana	2	63	11	Generalist
Toxocarpus villosus	Apocynaceae	Liana	2	1	0	Too_rare
Uncaria scandens	Rubiaceae	Liana	2	665	0	Specialist_OF
Urceola micrantha	Apocynaceae	Liana	2	86	46	Generalist
Ventilago denticulata	Rhamnaceae	Liana	2	115	1	Specialist_OF
Ziziphus atropensis	Rhamnaceae	Liana	2	24	2	Generalist

Figure S1. PCA analysis of traits for both lianas and tree seedling species. Names indicated species of lianas and trees. Read names in the figure correspond to abbreviation of traits measured. LA is leaf area in cm², LDMC is leaf dry matter content in g g⁻¹, SLA is specific leaf area in cm² g⁻¹, LAR is leaf area ratio in cm² g⁻¹, LMF is leaf mass fraction in g g⁻¹, SDMC is stem dry matter content in g g⁻¹, SMF is stem mass fraction g g⁻¹, SSL is specific stem length in cm g⁻¹, RDMC is root dry matter content in g g⁻¹, RMF is root mass fraction in g g⁻¹, SRL is specific root length cm g⁻¹.

