

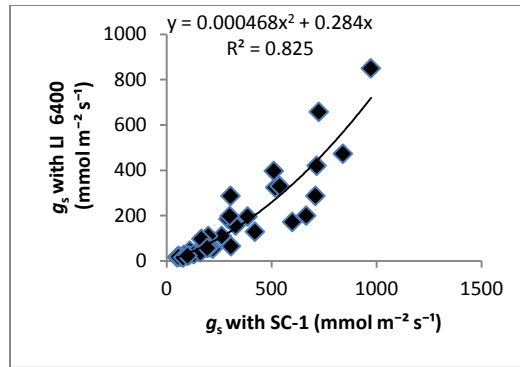


Figure S1. Relationship between g_s measured by LI6400 and SC-1 instruments

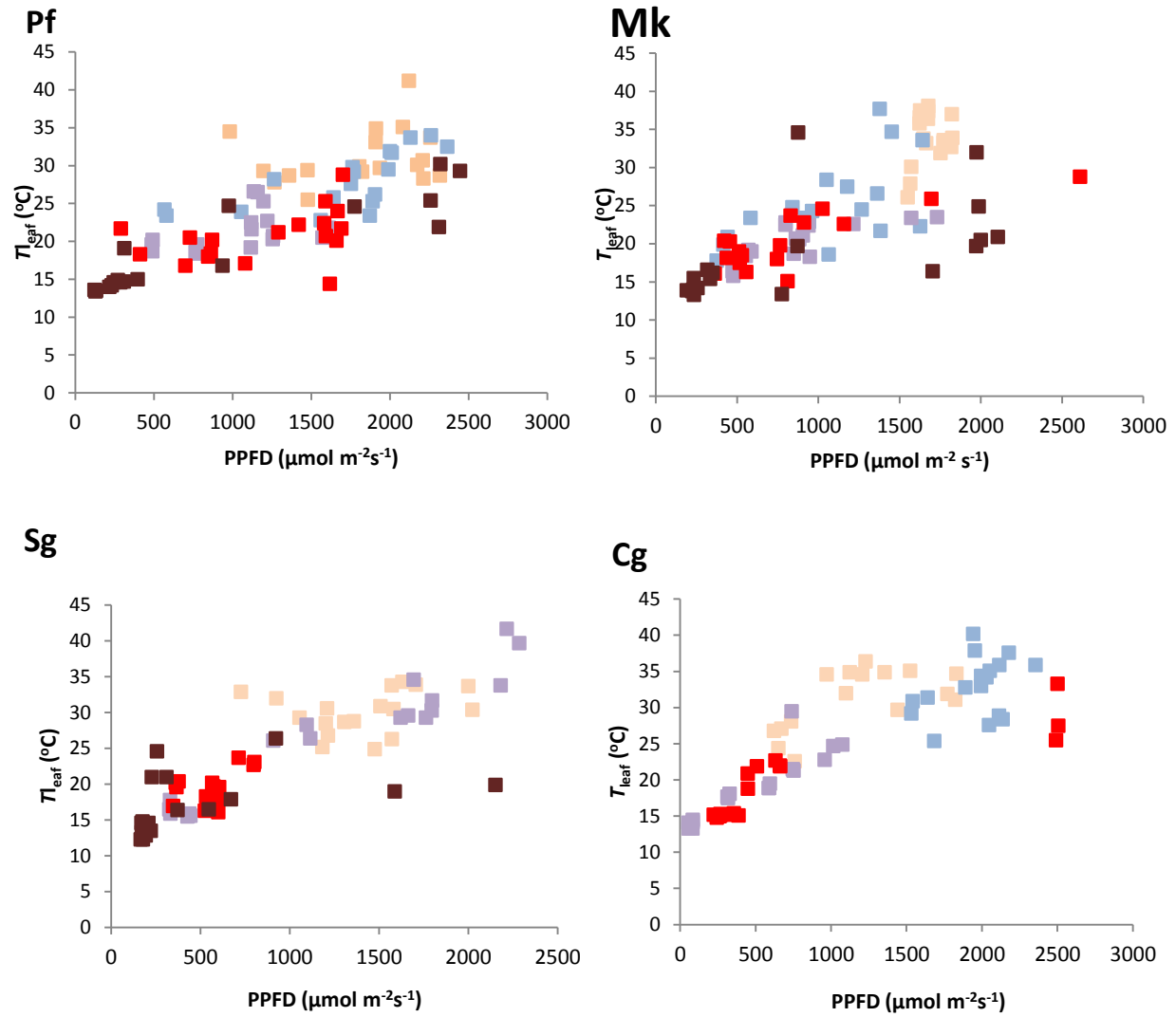


Figure S2. Relationship between leaf temperature (T_{leaf}) and photosynthetic photon flux density (PPFD) for all species at five sites along an elevation gradient in the wet season 2017. Species abbreviations are based on first letters in genus and species: Pf = *Polyscias fulva*; Mk = *Macaranga kilimandscharica*; Sg = *Syzygium guineense*; Cg = *Carapa grandiflora*. Explanations of site abbreviations are provided in Table 1

Table S1. Structural traits (Mean $\pm$ SD) of four species at five sites along an elevation gradient (n=6). Explanations of site abbreviations are provided in Table 1; the order follows increasing elevation from left to right. Species abbreviations represent first letters in genus and species.

Species	Sites	DBH(cm)	Height (m)	Wood density (g cm ³)	LMA (g m ⁻²)
<i>Pf</i>	A	22 $\pm$ 5.2	23 $\pm$ 2	0.35 $\pm$ 0.03	118 $\pm$ 1
	C	39 $\pm$ 21	23 $\pm$ 2	0.36 $\pm$ 0.05	131 $\pm$ 7
	N1	27 $\pm$ 17	18 $\pm$ 5	0.32 $\pm$ 0.07	134 $\pm$ 1
	N2	48 $\pm$ 17	24 $\pm$ 4	0.37 $\pm$ 0.05	126 $\pm$ 2
	N3	8 $\pm$ 2	7 $\pm$ 7	0.29 $\pm$ 0.03	95 $\pm$ 4
<i>Mk</i>	A	17 $\pm$ 6	15 $\pm$ 3	0.52 $\pm$ 0.08	97 $\pm$ 8
	C	23 $\pm$ 9	19 $\pm$ 5	0.44 $\pm$ 0.03	93 $\pm$ 2
	N1	20 $\pm$ 4	15 $\pm$ 2	0.49 $\pm$ 0.04	111 $\pm$ 1
	N2	21 $\pm$ 9	19 $\pm$ 5	0.45 $\pm$ 0.03	104 $\pm$ 10
	N3	30 $\pm$ 11	19 $\pm$ 2	0.43 $\pm$ 0.05	135 $\pm$ 2
<i>Cg</i>	A	25 $\pm$ 5	19 $\pm$ 2	0.61 $\pm$ 0.03	109 $\pm$ 10
	C	29 $\pm$ 18	11 $\pm$ 4	0.68 $\pm$ 0.05	100 $\pm$ 2
	N1	17 $\pm$ 5	17 $\pm$ 6	0.59 $\pm$ 0.06	122 $\pm$ 2
	N2	25 $\pm$ 7	15 $\pm$ 2	0.58 $\pm$ 0.06	137 $\pm$ 1
	N3	-	-	-	-
<i>Sg</i>	A	15 $\pm$ 2	11 $\pm$ 2	0.64 $\pm$ 0.02	127 $\pm$ 2
	C				
	N1	19 $\pm$ 5	13 $\pm$ 3	0.59 $\pm$ 0.06	133 $\pm$ 3
	N2	38 $\pm$ 27	18 $\pm$ 7	0.61 $\pm$ 0.03	132 $\pm$ 2
	N3	31 $\pm$ 25	12 $\pm$ 4	0.62 $\pm$ 0.01	132 $\pm$ 1

Table S2. Statistical analyses for all leaf traits; physiological, structural and chemical traits as well as post hoc comparisons among sites

Physiological traits													
		<i>g_s</i> (dry season)			<i>g_s</i> (wet season)			<i>E</i> (dry season)			<i>E</i> (wet season)		
		df	F	<i>P</i> value	df	F	<i>P</i> value	df	F	<i>P</i> value	df	F	<i>P</i> value
Site		4	18	<0.001	4	17	<0.001	4	7	<0.001	4	6.8	<0.001
Species		3	8.7	<0.001	3	34	<0.001	3	2	0.110	3	21	<0.001
Site*Species		10	3.6	<0.001	10	10	<0.001	10	4	<0.001	10	2.3	0.015
Post hoc multi-site comparisons													
1700m	1850m			0.555			0.090			0.113			0.164
	1950m			<0.001			<0.001			<0.001			0.998
	2500m			<0.001			0.966			0.047			0.568
	2700m			<0.001			0.560			<0.001			0.252
1850m	1950m			0.004			0.001			0.553			0.285
	2500m			0.080			0.301			1.000			0.004
	2700m			<0.001			0.868			0.071			0.001
1950m	2500m			0.787			<0.001			0.582			0.374
	2700m			0.011			<0.001			0.686			0.142
2500m	2700m			<0.001			0.893			0.066			0.964
Post hoc multi-species comparisons													
Sg	Pf			0.026			<0.001			0.778			<0.001
	Cg			0.040			0.123			0.275			0.171
	Mk			0.302			0.522			0.842			0.556
Pf	Cg			<0.001			<0.001			0.027			<0.001
	Mk			0.639			<0.001			0.999			0.001
Cg	Mk			<0.001			0.002			0.037			0.004
		<i>A_{sat}</i> (dry season)			<i>A_{sat}</i> (wet season)			WUE (dry season)			WUE (wet season)		
		df	F	<i>P</i> value	df	F	<i>P</i> value	df	F	<i>P</i> value	df	F	<i>P</i> value
Site		4	13	<0.001	4	5	0.001	4	21	<0.001	4	7.9	<0.001
Species		3	4.5	0.005	3	29	<0.001	3	1.1	0.330	3	6	0.001
Site*Species		10	2.8	0.004	10	6	<0.001	10	4.5	<0.001	10	1.8	0.067
Post hoc multi-site comparisons													
1700m	1850m			0.471			0.009			0.004			0.332
	1950m			<0.001			0.320			0.062			0.822
	2500m			<0.001			0.033			<0.001			0.591
	2700m			<0.001			0.887			0.997			0.001
1850m	1950m			0.149			0.498			0.774			0.897
	2500m			0.003			0.967			<0.001			0.014
	2700m			<0.001			0.158			0.022			<0.001
1950m	2500m			0.535			0.839			<0.001			0.093
	2700m			0.128			0.916			0.210			<0.001
2500m	2700m			0.874			0.379			<0.001			0.079
Post hoc multi-species comparisons													
Sg	Pf			0.555			<0.001			0.868			<0.001
	Cg			0.053			0.029			0.944			0.003
	Mk			0.756			0.012			0.995			<0.001

Pf	Cg		0.001		<0.001		0.530		0.953	
	Mk		0.986		0.061		0.703		1.000	
Cg	Mk		0.002		<0.001		0.987		0.922	
		iWUE (dry season)			iWUE (wet season)			iWUE from isotopes		
		df	F	P value	df	F	P value	df	F	P value
Site		4	16	<0.001	4	8	<0.001	4	8.8	<0.001
Species		3	6.9	<0.001	3	6	0.002	3	15	<0.001
Site*Species		10	3.6	<0.001	10	3	0.002	10	2.1	0.031
Post hoc	multi-site									
comparisons										
1700m	1850m		0.035		0.966		<0.001			
	1950m		<0.001		0.001		0.365			
	2500m		0.094		0.792		0.005			
	2700m		<0.001		0.592		0.002			
1850m	1950m		0.021		0.014		0.044			
	2500m		0.978		0.443		0.722			
	2700m		0.001		0.943		0.962			
1950m	2500m		0.001		<0.001		0.428			
	2700m		0.641		0.116		0.220			
2500m	2700m		<0.001		0.099		0.984			
Post hoc multi-species										
comparisons										
Sg	Pf		0.673		0.069		<0.001			
	Cg		0.001		0.452		0.971			
	Mk		0.900		0.980		0.447			
Pf	Cg		<0.001		0.001		<0.001			
	Mk		0.222		0.124		0.003			
Cg	Mk		0.003		0.214		0.213			

Structural traits													
		DBH			Height			Wood density			LMA		
		df	F	P value	df	F	P value	df	F	P value	df	F	P value
Site		4	3.7	0.008	4	8	<0.001	4	6	<0.001	4	18	<0.001
Species		3	1.1	0.336	3	10	<0.001	3	197	<0.001	3	25	<0.001
Site*Species		10	2.5	0.007	10	7	<0.001	10	3.7	<0.001	10	13	<0.001
Post hoc multi-site comparisons													
1700m	1850m			0.204			0.977			0.004			<0.001
	1950m			0.999			0.993			0.005			0.518
	2500m			0.017			0.188			0.005			0.242
	2700m			0.943			0.014			<0.001			0.609
1850m	1950m			0.309			0.853			0.997			<0.001
	2500m			0.852			0.491			0.998			<0.001
	2700m			0.725			0.003			0.103			<0.001
1950m	2500m			0.033			0.075			1.000			0.988
	2700m			0.983			0.043			0.028			0.038
2500m	2700m			0.198			<0.001			0.035			0.010
Post hoc multi-species comparisons													
Sg	Pf			0.821			<0.001			<0.001			<0.001
	Cg			0.980			0.309			0.874			<0.001

	Mk	0.817	0.006	<0.001	<0.001
Pf	Cg	0.625	0.014	<0.001	0.442
	Mk	0.306	0.306	<0.001	0.007
Cg	Mk	0.971	0.482	<0.001	<0.001

Chemical traits																				
			P _m			N _m			P _a			N _a								
			df	F	Pvalue	df	F	Pvalue	df	F	Pvalue	df	F	Pvalue						
Site			4	0.4	0.775	4	0.7	0.578	4	2.6	0.040	4	2.5	0.048						
Species			3	8.6	<0.001	3	6.5	<0.001	3	6	<0.001	3	5.1	0.002						
Site*Species			10	1.1	0.331	10	2.5	0.011	10	1.8	0.064	10	3.6	0.001						
Post hoc multi-site comparisons																				
1700m			1850m						0.783			0.996			0.696			0.165		
			1950m						0.897			0.994			0.681			0.981		
			2500m						1.000			0.954			1.000			0.987		
			2700m						0.999			0.784			0.436			0.934		
1850m			1950m						0.998			0.946			0.097			0.050		
			2500m						0.810			0.998			0.747			0.057		
			2700m						0.682			0.950			0.995			0.637		
1950m			2500m						0.917			0.798			0.623			1.000		
			2700m						0.809			0.553			0.034			0.693		
2500m			2700m						0.998			0.988			0.488			0.721		
Post hoc multi-species comparisons																				
Sg			Pf						<0.001			<0.001			0.149			0.694		
			Cg						0.292			0.574			0.772			0.951		
			Mk						0.560			0.552			0.283			0.084		
Pf			Cg						0.017			0.028			0.675			0.950		
			Mk						0.002			0.015			<0.001			0.002		
Cg			Mk						0.943			1.000			0.031			0.020		
			N:P ratio			B:N ratio			Ca:N ratio			Cu:N ratio								
			df	F	Pvalue	df	F	Pvalue	df	F	Pvalue	df	F	Pvalue						
Site			4	2	0.101	4	2	0.086	4	7.9	<0.001	4	9.4	<0.001						
Species			3	0.3	0.794	3	0.8	0.487	3	1.6	0.184	3	2.9	0.039						
Site*Species			10	2.4	0.015	10	2.2	0.024	10	2.7	0.005	10	3.5	<0.001						
Post hoc multi-site comparisons																				
1700m			1850m						0.761			0.997			0.174			0.914		
			1950m						0.751			0.344			0.252			<0.001		
			2500m						0.986			0.134			<0.001			0.761		
			2700m						0.632			0.472			0.063			0.985		
1850m			1950m						1.000			0.630			0.997			<0.001		
			2500m						0.468			0.344			0.039			0.301		
			2700m						0.121			0.731			0.993			0.998		
1950m			2500m						0.434			0.987			0.007			0.003		
			2700m						0.098			1.000			0.931			<0.001		
2500m			2700m						0.886			0.982			0.118			0.491		
Post hoc multi-species comparisons																				
Sg			Pf						0.587			0.936			0.620			0.214		
			Cg						0.612			1.000			0.988			0.979		

	Mk			0.927			0.598			0.873			0.067
Pf	Cg			1.000			0.963			0.410			0.091
	Mk			0.901			0.896			0.164			0.938
Cg	Mk			0.901			0.662			0.976			0.023
		Fe:N ratio			K:N ratio			Mg:N ratio			Mn:N ratio		
		df	F	Pvalue	df	F	Pvalue	df	F	Pvalue	df	F	Pvalue
Site		4	2.8	0.030	4	5.1	0.001	4	12	<0.001	4	6.7	<0.001
Species		3	6.9	<0.001	3	17	<0.001	3	3.3	0.021	3	8.1	<0.001
Site*Species		10	0.7	0.733	10	2.9	0.003	10	3.4	0.001	10	7.9	<0.001
Post hoc multi-site comparisons													
1700m	1850m			0.373			0.001			<0.001			0.278
	1950m			0.699			0.999			0.004			0.547
	2500m			0.505			0.214			<0.001			<0.001
	2700m			0.352			1.000			0.009			0.239
1850m	1950m			0.972			0.002			0.125			0.978
	2500m			0.997			0.262			0.999			0.077
	2700m			0.008			0.003			0.175			1.000
1950m	2500m			0.998			0.320			0.038			0.008
	2700m			0.025			1.000			1.000			0.964
2500m	2700m			0.011			0.296			0.066			0.094
Post hoc multi-species comparisons													
Sg	Pf			<0.001			<0.001			1.000			0.376
	Cg			<0.001			0.583			0.102			0.312
	Mk			0.001			0.604			0.081			0.036
Pf	Cg			0.997			0.001			0.065			0.005
	Mk			0.938			<0.001			0.048			0.626
Cg	Mk			0.873			0.055			1.000			<0.001
		Mo:N ratio			S:N ratio			Zn:N ratio			SPAD		
		df	F	Pvalue	df	F	Pvalue	df	F	Pvalue	df	F	Pvalue
Site		4	4.3	0.003	4	13	<0.001	4	5	0.001	4	10	<0.001
Species		3	5.9	0.001	3	25	<0.001	3	22	<0.001	3	269	<0.001
Site*Species		10	1.4	0.187	10	1.1	0.350	10	4.2	<0.001	10	12.7	<0.001
Post hoc multi-site comparisons													
1700m	1850m			0.964			0.004			0.999			0.295
	1950m			0.004			0.071			0.199			0.073
	2500m			0.254			<0.001			0.731			0.652
	2700m			0.999			<0.001			0.263			<0.001
1850m	1950m			0.247			0.737			0.164			<0.001
	2500m			0.976			0.136			0.902			0.015
	2700m			0.865			0.027			0.468			<0.001
1950m	2500m			0.512			0.002			0.008			0.712
	2700m			0.021			<0.001			0.001			<0.001
2500m	2700m			0.478			0.909			0.903			<0.001
Post hoc multi-species comparisons													
Sg	Pf			0.110			0.106			<0.001			0.287
	Cg			0.352			<0.001			0.001			<0.001
	Mk			0.001			0.087			<0.001			<0.001
Pf	Cg			0.951			<0.001			0.001			<0.001

	Mk	0.247	1.000	<0.001	0.002
Cg	Mk	0.106	<0.001	0.114	<0.001