

Supplementary Material

Fig. S1 - Venn diagram showing the species in common between the analyzed phytophysiognomies.

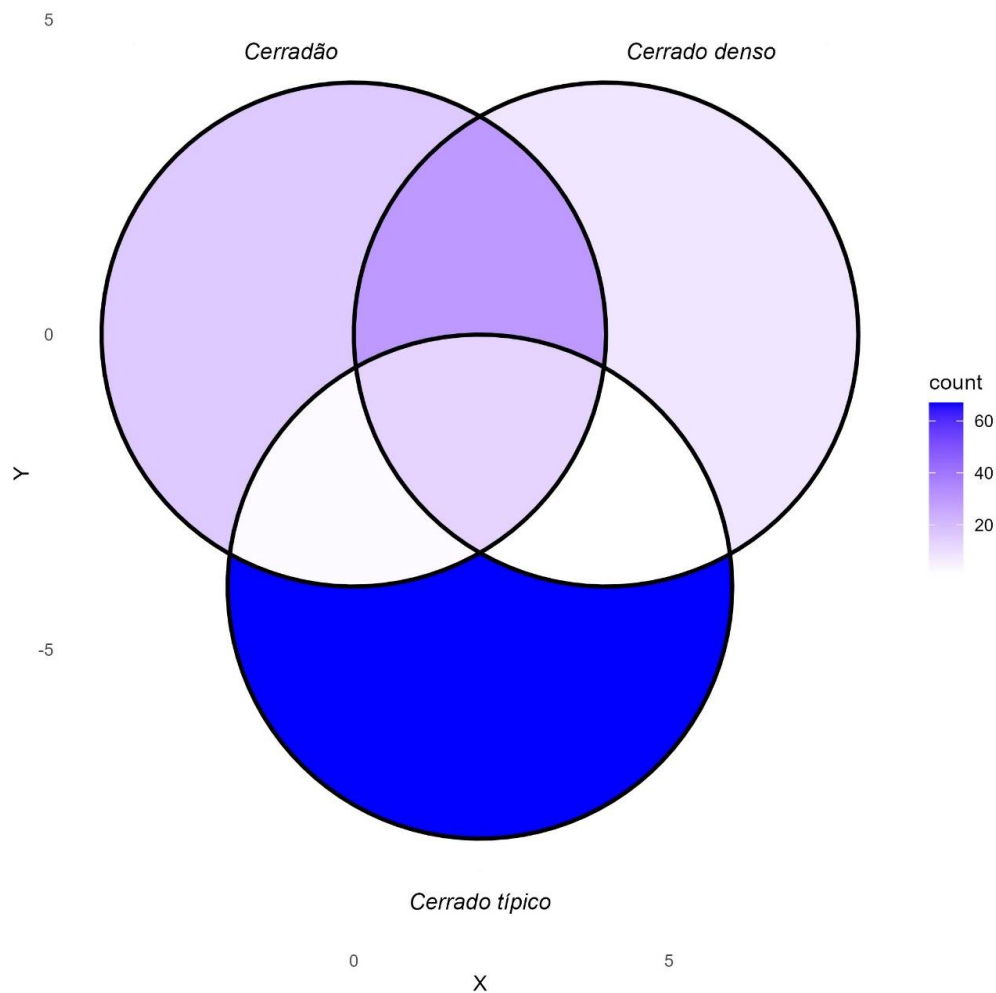


Fig. S2 - Ten species with the highest IVI (a, c, e) and biomass (b, d, f) by phytophysiognomy. Where: (a, b) - *Cerradão*; (c, d) - *Cerrado Denso*; (e, f) - *Cerrado Típico*. Colors: blue = Relative Frequency; green = Relative Density; pink = Relative Dominance.

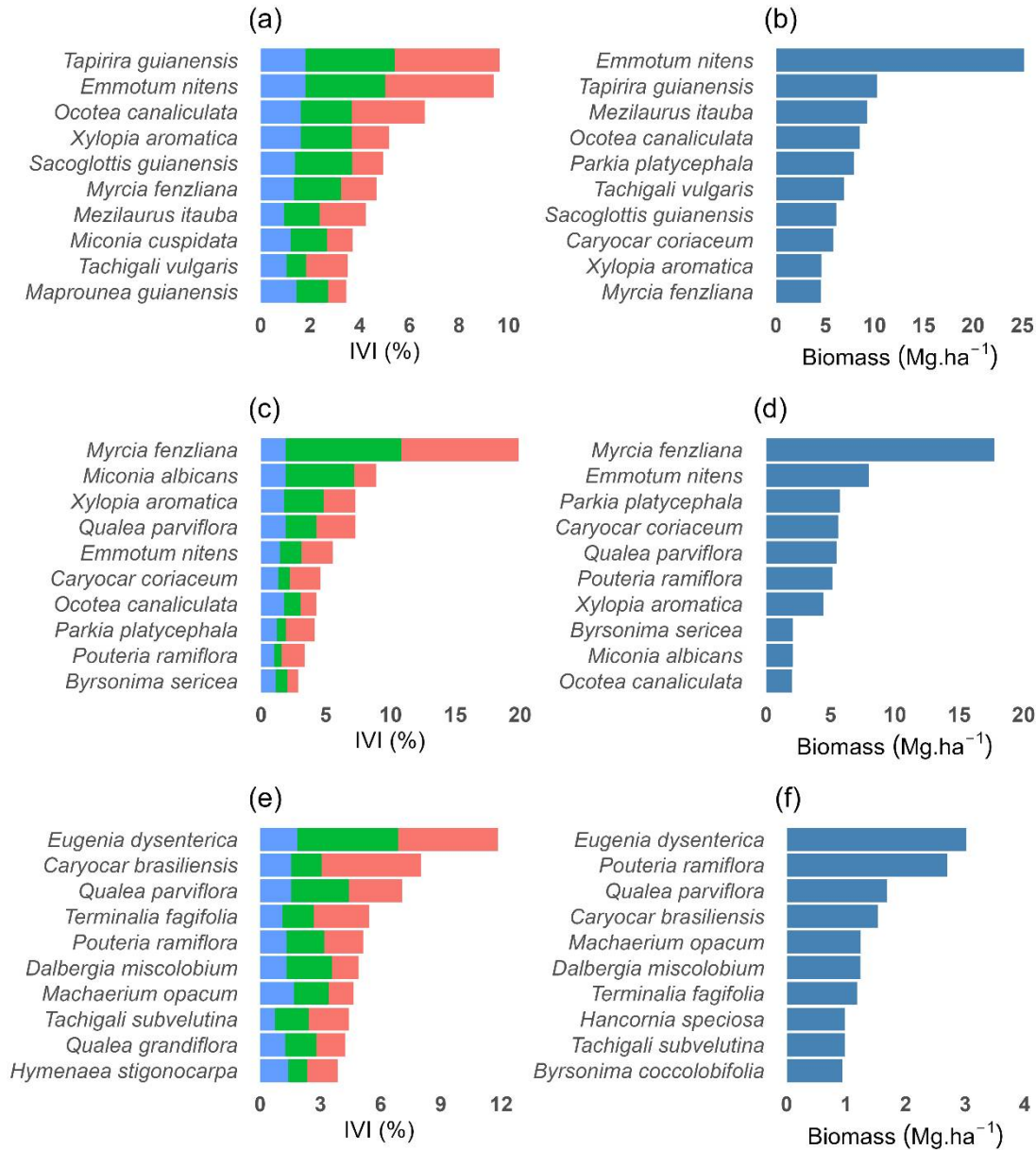


Fig. S3 - Spearman's correlation between functional traits and metrics and aboveground biomass of sampled woody communities. *: significant correlation at 95% probability; ** or ***: significant correlation of at least 99% probability. Where: Htmax = maximum height (m); CA = crown area (m²); Dmax = maximum diameter (cm); SLA = specific leaf area (mm².mg⁻¹); WD = wood density (g.cm⁻³); Fric = Functional Richness; FEve = Functional Evenness; FDiv = Functional Divergence; FDis = Functional Dispersion; RaoQ = Rao's Quadratic Entropy; Biom = Aboveground biomass (Mg.ha⁻¹). Colors: blue (CT) = *Cerrado Típico*; green (CD) = *Cerrado Denso*; pink (Ca) = *Cerradão*.

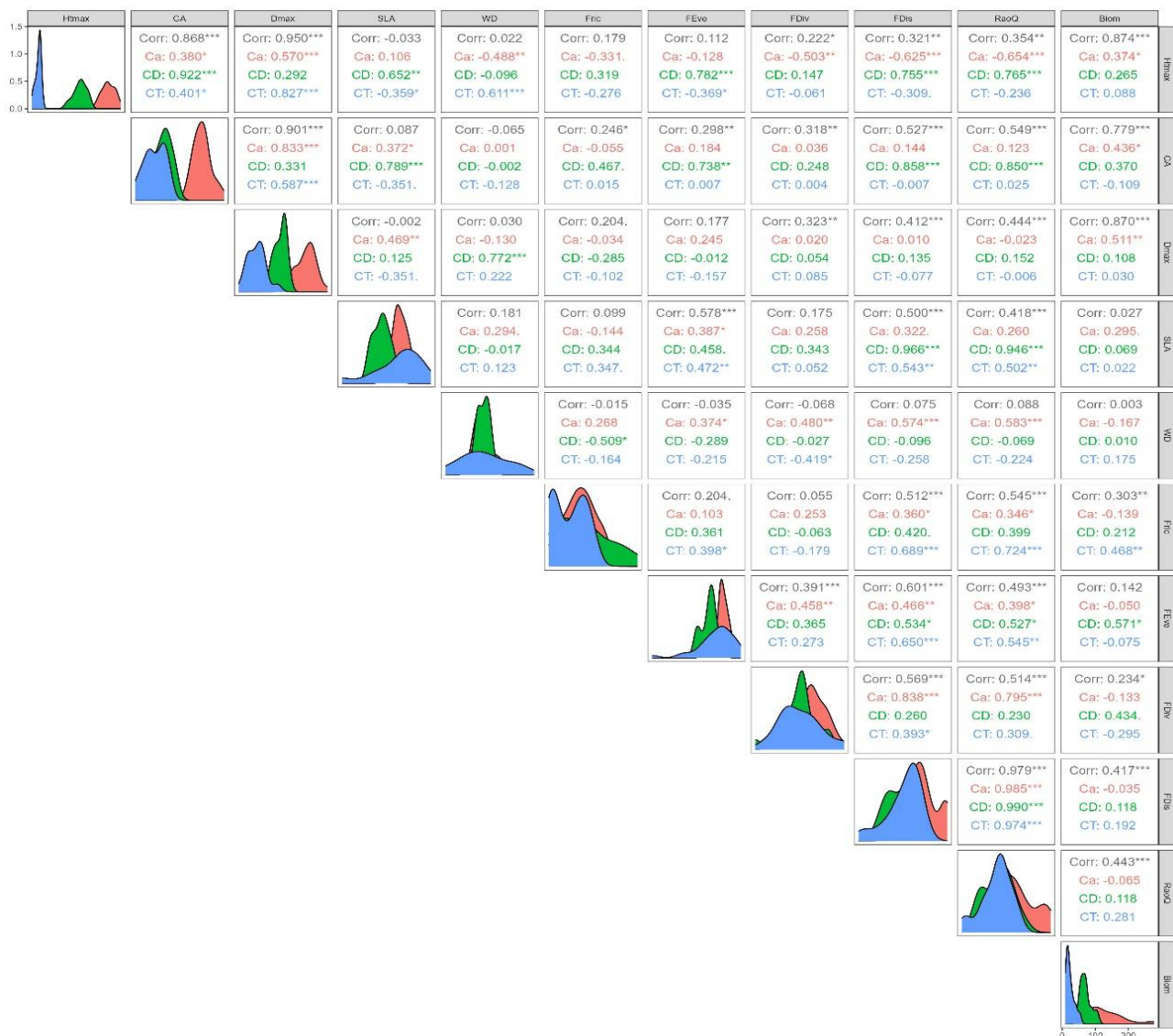
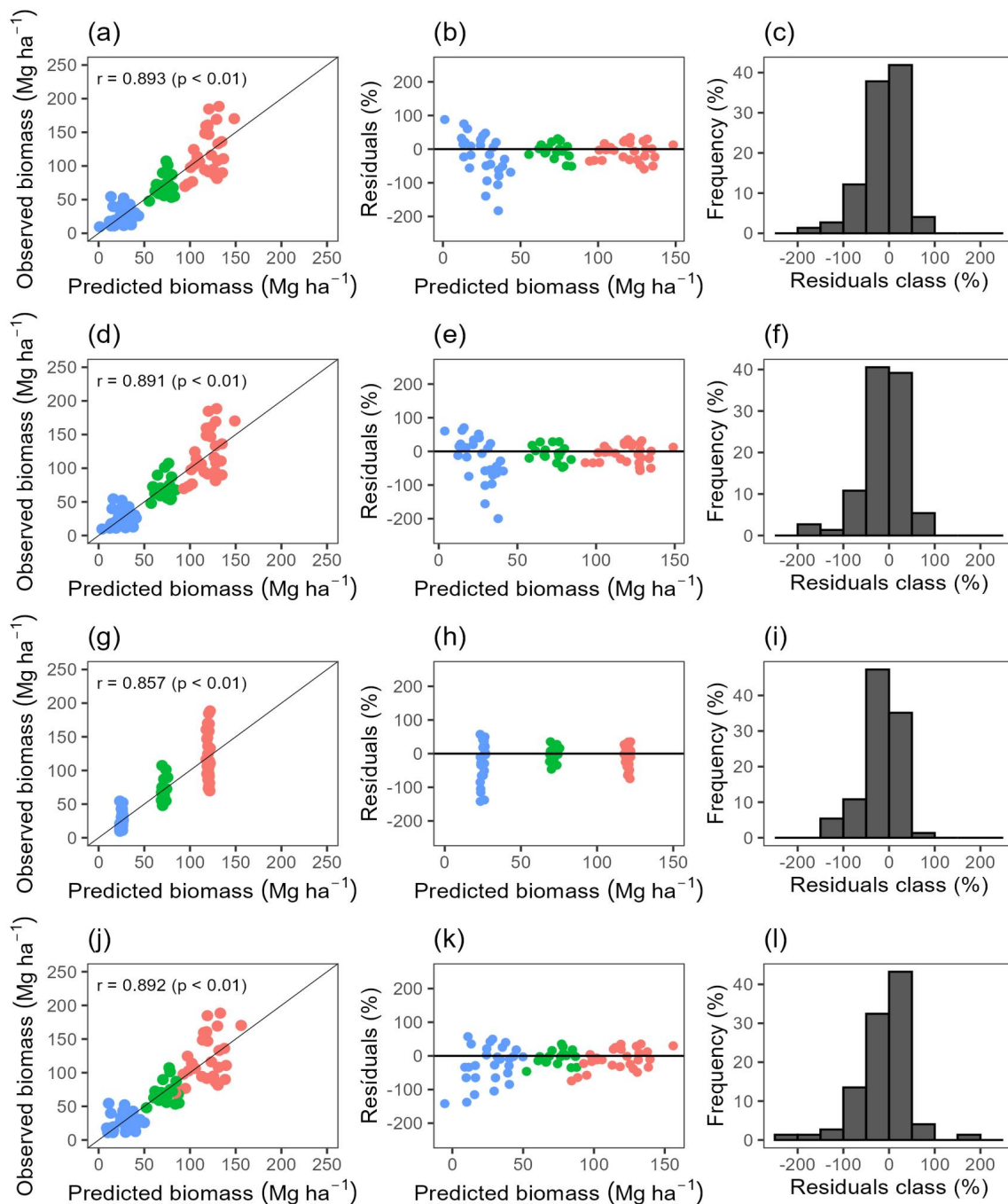


Fig. S4 - Relation between observed x estimates (a, d, g, j), residual plot (b, e, h, k) and residual class distribution (c, f, i, l) of mixed-effect biomass equations. Where: (a, b, c) = Model 11; (d, e, f) = Model 12; (g, h, i) = Model 13; (j, k, l) = Model 14. Colors: blue (CT) = *Cerrado Típico*; green (CD) = *Cerrado Denso*; pink (Ca) = *Cerradão*.



Tab. S1 - Data from the tree species collected with functional and structural traits. Where: DA = absolute density of tree individuals; Bio = aboveground biomass; Htmax = maximum height; CA = crown area; Dmax = maximum diameter; SLA = specific leaf area; WD = basic wood density.

Physio- gnomy	Species	DA (ind.ha ⁻¹)	Bio. (Mg.ha ⁻¹)	Htmax (m)	CA (m ²)	Dmax (cm)	SLA (mm ² .mg ⁻¹)	WD (g.cm ⁻³)
Cerradão	<i>Bocageopsis multiflora</i>	48.5	2.664	16.00	10.74	26.80	107.71	0.61
	<i>Byrsonima sericea</i>	35.6	3.524	14.00	41.28	28.07	78.91	0.72
	<i>Emmotum nitens</i>	114	25.196	16.00	52.42	53.00	164.34	0.93
	<i>Erythroxylum squamatum</i>	31.8	0.404	8.00	17.82	12.84	120.95	0.71
	<i>Maprounea guianensis</i>	46.2	2.433	13.85	21.43	39.00	128.50	0.70
	<i>Mezilaurus itauba</i>	52.3	9.242	16.40	40.46	55.10	101.90	0.73
	<i>Miconia albicans</i>	53.8	0.480	7.00	6.83	12.30	100.78	0.69
	<i>Miconia cuspidata</i>	53.8	3.718	16.00	30.27	22.50	101.88	0.88
	<i>Myrcia fenzliana</i>	65.9	4.549	9.95	10.03	28.27	66.47	0.73
	<i>Ocotea canaliculata</i>	73.5	8.531	15.50	36.69	45.40	80.98	0.48
	<i>Parkia platycephala</i>	19.7	7.870	14.75	63.99	51.94	103.79	0.69
	<i>Qualea parviflora</i>	34.8	2.364	11.45	15.43	40.00	67.40	0.73
	<i>Sacoglottis guianensis</i>	71.2	6.106	14.00	32.77	37.00	73.81	0.67
	<i>Simarouba versicolor</i>	27.3	2.404	16.60	25.55	39.40	60.81	0.44
	<i>Tachigale vulgaris</i>	28.8	6.909	19.10	58.93	40.50	63.19	0.74
	<i>Tapirira guianensis</i>	117	10.244	15.00	37.11	48.83	92.11	0.57
Cerrado denso	<i>Xylopia aromatica</i>	73.5	4.598	14.65	18.75	22.01	78.50	0.59
	<i>Byrsonima sericea</i>	36.8	2.108	14.00	41.28	28.07	78.91	0.72
	<i>Caryocar coriaceum</i>	36.8	5.583	15.40	32.99	51.00	88.10	0.69
	<i>Emmotum nitens</i>	70.6	8.003	16.00	52.42	53.00	164.34	0.93
	<i>Miconia albicans</i>	211.8	2.088	7.00	6.83	12.30	100.78	0.69
	<i>Myrcia fenzliana</i>	364.7	17.711	9.95	10.03	28.27	66.47	0.73
	<i>Ocotea canaliculata</i>	51.5	2.006	15.50	36.69	45.40	80.98	0.48
	<i>Ouratea hexasperma</i>	25.0	0.447	6.45	6.07	19.33	81.73	0.63
	<i>Parkia platycephala</i>	27.9	5.728	14.75	63.99	51.94	103.79	0.69
	<i>Qualea parviflora</i>	102.9	5.183	11.45	15.43	40.00	67.40	0.73
	<i>Simarouba versicolor</i>	23.5	5.482	16.60	25.55	39.40	60.81	0.44
	<i>Vochysia gardneri</i>	27.9	0.521	9.55	10.66	14.80	58.01	0.38
Cerrado típico	<i>Xylopia aromatica</i>	129.4	4.426	14.65	18.75	22.01	78.50	0.59
	<i>Byrsonima coccolobifolia</i>	28.44	0.386	5.88	4.72	14.43	139.68	0.62
	<i>Caryocar brasiliensis</i>	27.5	3.543	7.60	29.16	39.25	65.32	0.65
	<i>Dalbergia miscolobium</i>	41.25	0.741	6.26	9.49	12.85	122.82	0.79
	<i>Eugenia dysenterica</i>	91.56	3.251	7.20	8.75	20.81	92.92	0.82
	<i>Hancornia speciosa</i>	17.19	0.667	5.88	21.43	18.50	147.93	0.36
	<i>Hymenaea stigonocarpa</i>	17.19	1.656	7.30	13.56	26.94	88.24	0.90
	<i>Kielmeyera coriacea</i>	11.56	0.166	5.52	2.87	12.48	78.64	0.59
	<i>Leptolobium dasycarpum</i>	21.88	0.254	4.97	7.29	12.44	116.44	0.44

Physio- gnomy	Species	DA (ind.ha ⁻¹)	Bio. (Mg.ha ⁻¹)	Htmax (m)	CA (m ²)	Dmax (cm)	SLA (mm ² .mg ⁻¹)	WD (g.cm ⁻³)
	<i>Machaerium opacum</i>	31.56	0.952	6.93	18.88	17.67	151.93	0.80
	<i>Pouteria ramiflora</i>	33.75	1.272	7.08	19.55	21.32	75.89	0.69
	<i>Qualea grandiflora</i>	28.44	0.926	7.30	12.00	21.68	85.51	0.65
	<i>Qualea parviflora</i>	52.19	1.521	6.47	23.02	24.38	86.31	0.65
	<i>Senna cana</i>	9.063	0.099	5.62	13.18	6.80	57.87	0.60
	<i>Tachigali subvelutina</i>	30.31	1.097	6.81	16.37	16.23	43.49	0.58
	<i>Terminalia fagifolia</i>	28.75	2.739	7.75	26.30	27.53	151.66	1.00
	<i>Vochysia thyrsoidea</i>	16.56	1.080	7.05	21.35	30.61	36.72	0.58

Tab. S2 – Summary statistics for community weighted means (CWMs) and functional diversity metrics. Htmax = maximum height (m); CA = crown area (m²); Dmax = maximum diameter (cm); SLA = specific leaf area (mm².mg⁻¹); WD = wood density (g.cm⁻³); Fric = Functional Richness; FEve = Functional Evenness; FDiv = Functional Divergence; FDis = Functional Dispersion; RaoQ = Rao's Quadratic Entropy.

Parameter	Min	Max	Mean	SD
CWM Htmax	6.05	15.53	10.67	3.40
CWM CA	9.38	38.05	22.51	7.91
CWM Dmax	15.22	44.53	29.34	7.93
CWM SLA	53.50	121.86	94.96	13.10
CWM WD	0.58	0.83	0.69	0.05
Fric	0.01	1.00	0.32	0.22
FEve	0.10	0.89	0.68	0.12
FDiv	0.51	0.92	0.74	0.09
FDis	0.66	2.48	1.73	0.37
RaoQ	0.86	6.63	3.72	1.27

Tab. S3 - Data from estimates of functional metrics and CWMs of functional traits per plot. Where: Plot = plot number; Htmax = maximum height (m); CA = crown area (m²); Dmax = maximum diameter (cm); SLA = specific leaf area (mm².mg⁻¹); WD = basic wood density (g.cm⁻³); FRic = Functional Richness; FEve = Functional Evenness; FDiv = Functional Divergence, FDisp = Functional Dispersion; RaoQ = Rao's Quadratic Entropy; Bio = aboveground biomass (Mg.ha⁻¹); Physio = phytophysiognomy; Ca = *Cerradão*; CD = *Cerrado Denso*; CT = *Cerrado Típico*.

Plot	Htmax	AC	Dmax	SLA	WD	Fric	FEve	FDiv	FDis	RaoQ	Bio	Physio
1	14.70	32.46	40.32	101.64	0.63	0.03	0.72	0.63	1.70	3.87	160.87	Ca
2	15.53	31.07	39.19	89.06	0.59	0.01	0.71	0.75	1.30	1.94	116.13	Ca
3	13.37	30.05	36.93	98.59	0.65	0.21	0.60	0.82	1.94	4.49	148.55	Ca
4	13.18	30.43	36.83	110.63	0.73	0.43	0.86	0.83	2.48	6.61	158.29	Ca
5	13.66	32.40	38.92	110.59	0.76	0.14	0.81	0.84	2.42	6.19	94.95	Ca
6	14.11	31.91	39.11	101.27	0.66	0.46	0.69	0.84	2.02	4.78	169.31	Ca
7	15.00	32.72	37.73	93.19	0.68	0.13	0.60	0.67	1.70	3.66	146.84	Ca
8	14.36	28.37	34.64	105.45	0.70	0.19	0.89	0.77	1.81	3.66	106.39	Ca
9	15.05	31.18	41.06	99.50	0.71	0.62	0.73	0.77	1.85	3.89	110.76	Ca
10	14.27	28.94	36.91	104.25	0.67	0.32	0.70	0.75	1.78	3.59	159.57	Ca
11	14.64	31.10	39.02	95.63	0.67	0.29	0.79	0.81	1.67	3.17	86.45	Ca
12	14.99	31.76	39.10	102.06	0.68	0.63	0.72	0.74	1.90	4.22	133.05	Ca
13	13.35	29.37	36.06	102.43	0.74	0.43	0.79	0.87	2.42	6.49	94.46	Ca
14	14.14	32.74	38.87	93.70	0.68	0.65	0.73	0.75	1.91	4.19	278.08	Ca
15	14.30	30.64	40.39	98.55	0.69	0.39	0.80	0.82	2.06	4.98	89.99	Ca
16	13.98	32.79	39.71	97.38	0.69	0.62	0.69	0.75	1.91	4.34	188.47	Ca
17	13.94	32.65	36.73	96.18	0.67	0.25	0.68	0.77	1.89	4.25	48.86	Ca
18	14.10	25.93	32.58	88.72	0.66	0.43	0.67	0.68	1.68	3.34	76.67	Ca
19	14.96	38.05	44.53	101.47	0.66	0.24	0.64	0.66	1.57	3.13	170.21	Ca
20	14.69	32.36	39.09	100.64	0.66	0.52	0.73	0.76	1.87	4.14	81.49	Ca
21	15.23	36.98	42.17	106.95	0.72	0.14	0.70	0.75	1.89	4.04	267.37	Ca
22	13.62	31.34	36.99	105.71	0.74	0.46	0.74	0.91	2.46	6.45	91.44	Ca
23	14.08	35.58	39.63	96.13	0.70	0.51	0.78	0.79	2.24	5.76	107.99	Ca
24	13.14	27.28	31.90	86.04	0.68	0.36	0.57	0.65	1.67	3.77	73.03	Ca
25	13.95	30.15	33.96	92.40	0.73	0.50	0.63	0.76	1.93	4.46	113.96	Ca
26	14.14	28.10	34.00	89.00	0.67	0.34	0.65	0.68	1.57	3.27	102.81	Ca
27	15.00	27.80	34.06	96.48	0.66	0.27	0.56	0.68	1.58	2.90	124.50	Ca
28	15.13	34.50	41.30	106.83	0.68	0.09	0.71	0.77	1.96	4.44	222.48	Ca
29	12.73	27.55	33.57	95.90	0.69	0.34	0.68	0.87	2.42	6.46	107.34	Ca
30	14.79	35.78	41.25	99.64	0.65	0.30	0.78	0.73	1.98	4.78	136.14	Ca
31	11.29	19.21	30.36	86.30	0.71	0.70	0.58	0.68	1.69	3.93	54.90	CD
32	12.02	25.57	30.76	89.76	0.69	0.94	0.67	0.73	1.94	4.43	101.29	CD
33	10.94	16.79	26.06	83.49	0.67	1.00	0.66	0.75	1.60	3.35	72.62	CD

Plot	Htmax	AC	Dmax	SLA	WD	Fric	FEve	FDiv	FDis	RaoQ	Bio	Physio
34	11.49	19.79	27.18	83.91	0.66	0.44	0.69	0.75	1.77	3.78	62.65	CD
35	13.00	26.91	32.12	93.39	0.71	0.34	0.77	0.83	2.41	6.63	97.71	Ca
36	14.05	31.40	37.32	93.18	0.69	0.42	0.72	0.85	2.31	6.05	184.67	Ca
37	10.49	15.35	29.85	81.96	0.70	0.07	0.51	0.64	1.42	2.92	67.22	CD
38	9.98	16.79	28.90	84.55	0.71	0.18	0.59	0.77	1.54	3.27	58.92	CD
39	10.16	14.88	26.86	79.09	0.70	0.23	0.56	0.71	1.34	2.45	47.88	CD
40	11.19	18.59	30.51	84.55	0.68	0.47	0.57	0.68	1.66	3.40	53.27	CD
41	12.24	23.92	33.63	96.73	0.74	0.20	0.65	0.78	2.13	5.19	67.76	CD
42	11.95	21.47	27.70	93.70	0.67	0.24	0.68	0.83	1.86	4.17	59.98	CD
43	10.98	19.21	26.10	90.27	0.68	0.79	0.68	0.74	1.74	3.62	89.73	CD
44	12.07	22.55	30.99	90.27	0.71	0.42	0.73	0.75	1.84	4.17	87.07	CD
45	11.88	19.31	27.86	84.04	0.69	0.40	0.59	0.64	1.57	3.32	70.71	CD
46	13.57	28.67	30.51	86.32	0.68	0.57	0.70	0.81	2.10	5.13	69.69	Ca
47	11.00	17.83	29.57	75.09	0.70	0.37	0.57	0.64	1.18	1.91	72.39	CD
48	10.79	16.66	30.11	77.91	0.69	0.12	0.68	0.86	1.27	2.14	107.31	CD
49	10.57	13.58	29.62	74.05	0.70	0.04	0.48	0.51	0.99	1.78	55.73	CD
50	11.09	17.73	30.62	74.56	0.71	0.18	0.76	0.89	1.13	1.84	75.10	CD
51	6.17	12.54	18.68	116.47	0.58	0.28	0.77	0.86	1.98	4.43	12.29	CT
52	7.13	19.55	23.33	121.86	0.83	0.15	0.82	0.78	1.90	3.83	28.21	CT
53	6.83	17.95	22.75	106.10	0.71	0.41	0.74	0.66	1.88	4.31	23.74	CT
54	7.24	10.76	22.37	90.58	0.80	0.02	0.41	0.68	0.66	1.21	27.84	CT
55	6.50	9.50	15.22	114.34	0.79	0.02	0.10	0.55	0.77	0.86	12.39	CT
56	6.81	9.38	18.24	100.89	0.79	0.01	0.36	0.65	0.95	1.15	42.65	CT
57	7.12	13.76	23.60	92.89	0.75	0.01	0.49	0.75	1.53	3.24	15.07	CT
58	6.85	20.57	22.62	98.44	0.65	0.40	0.69	0.73	1.94	4.47	21.29	CT
59	6.70	17.50	17.71	68.63	0.64	0.08	0.58	0.72	1.30	2.38	21.50	CT
60	7.01	16.47	23.35	92.92	0.73	0.40	0.59	0.57	1.64	3.35	32.22	CT
61	6.30	12.49	17.31	98.85	0.68	0.41	0.82	0.80	1.83	3.47	13.79	CT
62	6.95	17.47	23.97	87.62	0.70	0.27	0.71	0.68	1.62	3.19	32.55	CT
63	7.00	18.25	23.03	107.92	0.77	0.06	0.85	0.70	1.49	2.39	11.98	CT
64	6.98	19.04	27.92	53.50	0.62	0.02	0.54	0.92	1.15	2.09	11.84	CT
65	6.78	19.84	20.64	78.59	0.65	0.25	0.59	0.64	1.42	2.79	31.16	CT
66	6.79	13.72	20.55	102.11	0.72	0.45	0.74	0.62	1.71	3.56	45.98	CT
67	6.58	19.31	21.55	102.18	0.66	0.14	0.73	0.64	1.36	2.52	13.26	CT
68	6.95	15.09	22.40	101.93	0.73	0.37	0.63	0.73	1.75	3.78	39.57	CT
69	6.57	13.24	19.75	101.73	0.63	0.48	0.78	0.66	1.76	3.49	36.89	CT
70	6.81	13.79	21.54	82.30	0.70	0.08	0.87	0.77	1.73	3.32	15.16	CT
71	7.00	17.40	21.98	109.19	0.78	0.37	0.65	0.78	1.82	3.76	32.85	CT
72	6.89	20.70	21.54	82.63	0.68	0.05	0.70	0.65	1.52	3.11	13.60	CT
73	6.40	14.84	19.68	103.30	0.62	0.50	0.73	0.67	1.77	3.44	24.56	CT
74	6.19	14.33	18.59	115.06	0.58	0.31	0.86	0.83	2.11	4.80	18.87	CT
75	6.93	15.45	21.06	111.79	0.74	0.51	0.66	0.63	1.69	3.45	27.26	CT

Caldeira RFL, Miguel EP, Santos JA, Santos ML, Azevedo GB, Matricardi EAT, Scariot A, Martins MS (2026). **Functional traits and functional diversity metrics in aboveground biomass estimation in different physiognomies of Cerrado**
iForest – Biogeosciences and Forestry – doi: [10.3832/ifor4984-019](https://doi.org/10.3832/ifor4984-019)

Plot	Htmax	AC	Dmax	SLA	WD	Fric	FEve	FDiv	FDis	RaoQ	Bio	Physio
76	6.94	19.50	24.39	97.50	0.69	0.49	0.65	0.73	1.94	4.46	25.02	CT
77	6.98	19.04	27.92	53.50	0.62	0.02	0.54	0.92	1.15	2.09	12.36	CT
78	6.68	17.86	18.20	75.50	0.66	0.08	0.63	0.70	1.43	2.73	21.67	CT
79	6.63	14.41	18.99	110.19	0.68	0.06	0.83	0.77	1.68	3.17	12.72	CT
80	6.05	11.47	17.48	118.19	0.58	0.28	0.71	0.83	1.85	3.94	12.02	CT
81	6.37	11.10	17.95	110.76	0.67	0.37	0.74	0.76	1.92	4.03	46.23	CT

Tab. S4 – Fixed-effect parameters and accuracy measures for sensitivity analysis of wood density. WD = wood density; SE = standard error; r_{xy} = Spearman’s correlation; RMSPE = root mean square percentage error (%).

Physiognomy	WD value	Parameter	SE	r_{xy}	RMSPE
<i>Cerradão</i>	Fixed mean	$\beta_0 = 387.8$	116.2	0.443	27.435
		$\beta_1 = -395.8$	169.6		
	Species-specific	$\beta_0 = -12.515$	82.094	0.376	29.966
		$\beta_1 = 5.335$	1.933		
<i>Cerrado Denso</i>	Fixed mean	$\beta_0 = 489.3$	284.6	0.431	38.131
		$\beta_1 = -600.8$	414.3		
	Species-specific	$\beta_0 = 653.2$	385.2	0.400	33.036
		$\beta_1 = -776.7$	560.8		