

Supplementary Material

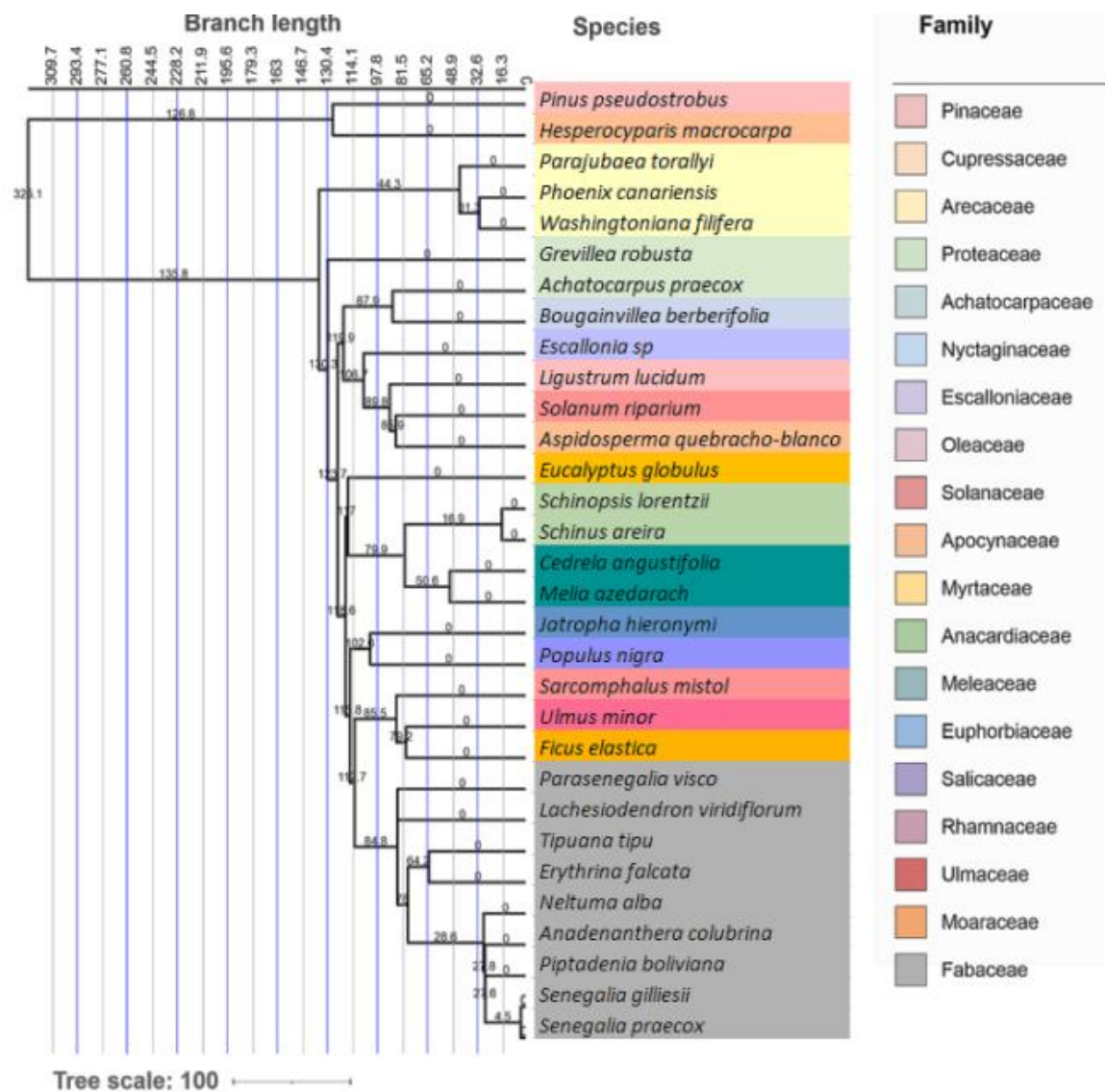


Figure S1. Phylogenetic relationships: Branch length (millions of years ago), species, and botanical families of the study habitats in the urban-rural ecosystem.

Table S3

Evolutionary divergence: list of species and divergence in millions of years ago from GBOTB.extended.TPL.tre in V.PhyloMaker2

Species	MYA	Species	MYA
<i>Escallonia_sp</i>	121.35158	<i>Senegalia_praecox</i>	20.02573
<i>Ligustrum_lucidum</i>	105.55132	<i>Senegalia_gilliesii</i>	20.02573
<i>Aspidosperma_quebracho_blanco</i>	95.73223	<i>Piptadenia_boliviana</i>	35.56052
<i>Solanum_riparium</i>	95.73223	<i>Anadenanthera_colubrina</i>	43.53695
<i>Bougainvillea_berberidifolia</i>	111.90618	<i>Neltuma_alba</i>	59.28966
<i>Achatocarpus_praecox</i>	111.90618	<i>Ficus_elastica</i>	90.74004
<i>Lachesiodendron_viridiflorum</i>	101.9444	<i>Ulmus_minor</i>	90.74004
<i>Parasenegalia_visco</i>	101.9444	<i>Sarcomphalus_mistol</i>	102.30944
<i>Erythrina_falcata</i>	77.08486	<i>Populus_nigra</i>	114.07875
<i>Tipuana_tipu</i>	77.08486	<i>Jatropha_hieronymi</i>	114.07875
<i>Melia_azedarach</i>	76.83494	<i>Grevillea_robusta</i>	180.36429
<i>Cedrela_angustifolia</i>	76.83494	<i>Parajubaea_torallyi</i>	137.36824
<i>Schinus_areira</i>	59.9662	<i>Washingtonia_filifera</i>	84.33457
<i>Schinopsis_lorentzii</i>	59.9662	<i>Phoenix_canariensis</i>	84.33457
<i>Eucalyptus_globulus</i>	126.15356	<i>Hesperocyparis_macrocarpa</i>	225.93639
<i>Pinus_pseudostrobus</i>	225.93639		

Table S4

Functional Traits Matrix of Species: Eight key characteristics including wood type, growth form, leaf type, fruit type, preferred habitat, root type, shade tolerance, and pollination type

Species	Woodiness	Growth Form	Leaf type	Fruit type	Preferred habitat	Root type	Shade tolerance	Pollination type
sp1	woody	shrub	broadleaved	legume	dry	superficial	high	insects
sp2	woody	tree	broadleaved	legume	dry	superficial	half	insects
sp3	woody	shrub	broadleaved	drupe	dry	superficial	low	insects
sp4	woody	tree	broadleaved	legume	dry	deep	high	insects
sp5	woody	tree	broadleaved	capsule	dry	deep	high	wind
sp6	semi-woody	climber	broadleaved	bract	dry	superficial	high	insects
sp7	woody	tree	broadleaved	capsule	semi-humid	deep	high	insects
sp8	woody	tree	scale-shaped	cone	semi-humid	deep	high	wind
sp9	woody	tree	broadleaved	legume	semi-humid	deep	high	birds
sp10	woody	tree	broadleaved	capsule	dry	superficial	high	insects
sp11	woody	tree	broadleaved	capsule	humid	deep	low	wind
sp12	woody	tree	broadleaved	syconium	semi-humid	deep	high	insects
sp13	woody	tree	broadleaved	follicle	semi-humid	deep	high	insects
sp14	semi-woody	shrub	broadleaved	drupe	dry	superficial	half	insects
sp15	woody	tree	broadleaved	berry	semi-humid	superficial	high	insects
sp16	woody	tree	broadleaved	drupe	semi-humid	deep	low	insects
sp17	semi-woody	palm	broadleaved	dates	semi-humid	superficial	low	insects
sp18	woody	palm	broadleaved	dates	semi-humid	superficial	half	insects
sp19	woody	tree	needleleaved	cone	humid	deep	high	wind
sp20	woody	tree	broadleaved	legume	dry	deep	low	insects
sp21	woody	tree	broadleaved	legume	dry	superficial	high	insects
sp22	woody	tree	broadleaved	capsule	semi-humid	deep	high	wind
sp23	woody	tree	broadleaved	legume	dry	deep	high	insects
sp24	woody	tree	broadleaved	legume	dry	deep	high	wind
sp25	woody	tree	broadleaved	drupe	dry	deep	half	insects
sp26	semi-woody	shrub	broadleaved	legume	dry	superficial	high	insects
sp27	semi-woody	shrub	broadleaved	berry	dry	superficial	high	insects
sp28	woody	tree	broadleaved	legume	dry	deep	high	insects
sp29	woody	tree	broadleaved	drupe	dry	deep	half	wind
sp30	semi-woody	palm	broadleaved	dates	semi-humid	superficial	half	insects
sp31	woody	tree	broadleaved	drupe	dry	deep	low	insects

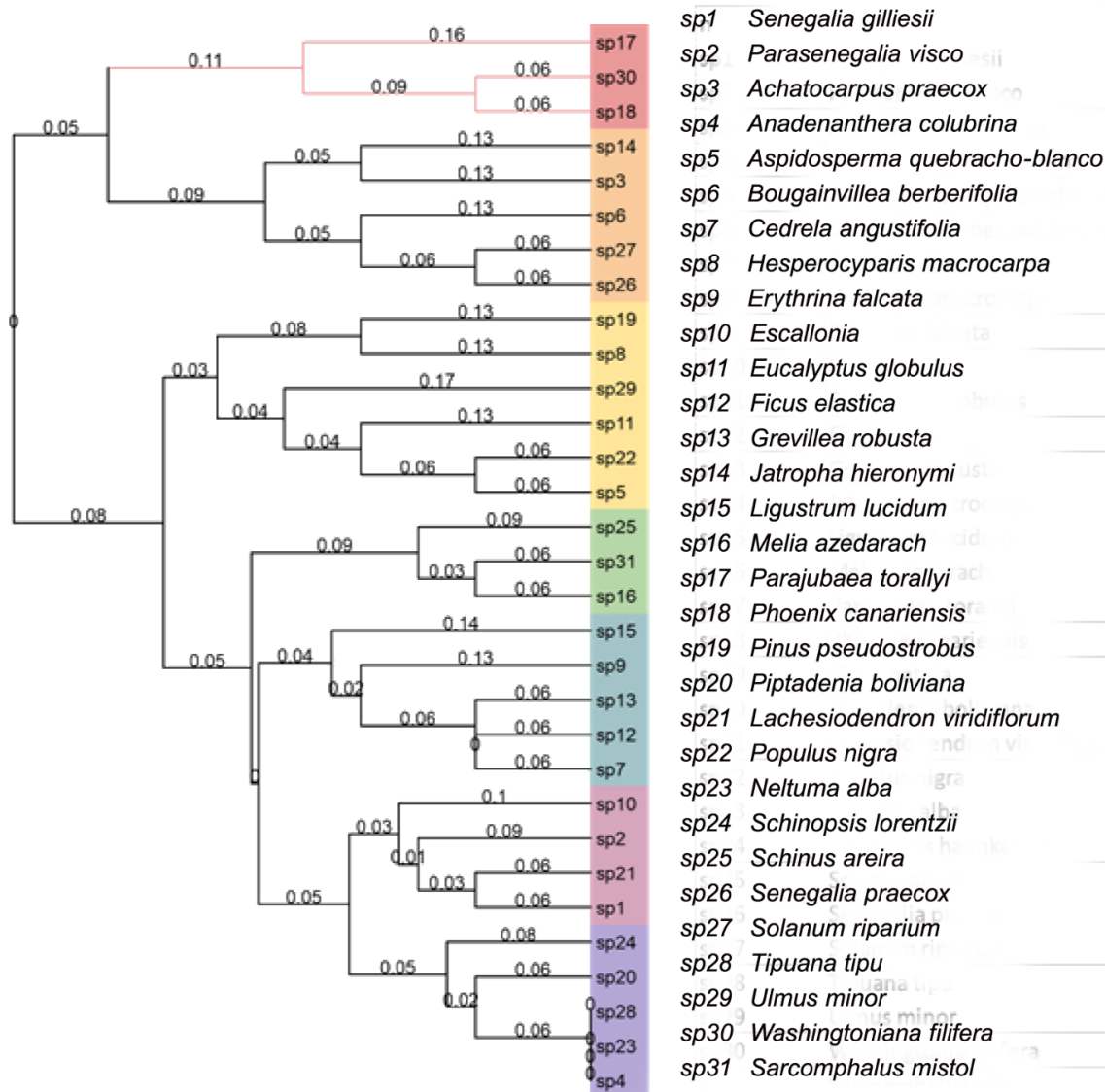


Figure S2. Functional dendrogram generated from the species and functional traits matrix, utilizing the Gower distance method (Pavoine & Bonsall, 2009) for both continuous and categorical data. The UPGMA clustering method was employed for grouping

Table S5

Estimated aboveground biomass (AGB) models in three habitat types: Local model (wood density), Latin America model (wood density + averaged height diameter), and Adjusted model (wood density + height values and their errors)

Local model (wood density)			
Habitat type	AGB	Cred_2.5	Cred_97.5
NF	39.62981	33.58408	47.83742
EF	159.83893	140.41844	182.08912
UF	276.65450	233.95411	330.05513
Latinamerica model (wood density + HD averaged)			
NF	63.76593	55.79855	72.83258
EF	252.61418	230.64104	277.62001
UF	463.01104	409.96136	527.86936
Adjusted model (wood density + height values and their errors)			
NF	39.6271	35.35989	44.7871
EF	159.5416	146.03060	174.6993
UF	276.7544	245.80167	308.8262

Table S6

Generalized Linear Model (GLM) result for the impact of habitat type on above-ground carbon stock of trees, and pairwise comparison between habitat types (Tukey post-hoc tests)

Predictor	Response	Model	Estimate	SE	t value	p(> t)
Habitat type	Carbon storage	(Intercept)	2.5885	0.1611	16.07	< 2e-16 ***
		Native Forest (FN)	-1.3964	0.2663	-5.243	1.58E-07***
		Urban Forest (FU)	0.5483	0.2219	2.471	0.0135*
Tukey post-hoc test		Parameter	Estimate	SE	z value	p(> t)
Habitat type	Carbon storage	NF-EF	-1.3964	0.2663	-5.243	<0.001 ***
		UF-EF	0.5483	0.2219	2.471	0.0354 *
		UF-NF	1.9447	0.2613	7.442	<0.001 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S7

Analysis of the relationship between the predictor and response values: AGB ~ habitat, AGB ~ temperature, AGB ~ precipitation and AGB ~ Altitude

Predictor	Response	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Habitat	AGB	2	2337.3	1168.65	17.49	6.626e-06 ***
		33	2205.1	66.82		
Temperature	AGB	1	954.6	954.56	9.046	0.004927 **
		34	3587.8	105.52		
Precipitation	AGB	1	1392.7	1392.72	15.034	0.0004595 ***
		34	3149.6	92.64		
Altitude	AGB	1	907.5	907.50	8.4887	0.006276 **
		34	3634.9	106.91		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S8

Generalized Linear Model (GLM) result for the impact of habitat type on taxonomic diversity, and pairwise comparison between habitat types (Tukey post-hoc tests)

Predictor	Response	Model	Estimate	SE	t value	p(> t)
Habitat type	Taxonomic diversity	(Intercept)	1.6667	0.3257	5.118	0.000013***
		Native Forest (FN)	1.6667	0.4606	3.619	0.000979***
		Urban Forest (FU)	2	0.4606	4.342	0.000126*
Tukey post-hoc test		Parameter	Estimate	SE	z value	p(> t)
Habitat type	Taxonomic diversity	NF-EF	1.6667	0.4606	3.619	0.000807***
		UF-EF	2	0.4606	4.342	< 0.0001***
		UF-NF	0.3333	0.4606	0.724	< 0.749407

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S9

Analysis of the relationship between the predictor and response values: TD ~ habitat, TD ~ temperature, TD ~ precipitation and TD ~ Altitude

Predictor	Response	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Habitat	Taxonomic diversity	2	27.556	13.7778	10.825	0.0002427 ***
		33	42	1.2727		
Temperature	Taxonomic diversity	1	11.75	11.7499	6.911	0.01277 *
		34	57.806	1.7002		
Precipitation	Taxonomic diversity	1	3.809	3.8093	1.9699	0.1695
		34	65.746	1.9337		
Altitude	Taxonomic diversity	1	12.892	12.8916	7.7353	0.008767 **
		34	56.664	1.6666		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S10

Generalized Linear Model (GLM) result for the impact of habitat type on phylogenetic diversity and pairwise comparison between habitat types (Tukey post-hoc tests)

Predictor	Response	Model	Estimate	SE	t value	p(> t)
Habitat type	Phylogenetic diversity	(Intercept)	6.42566	0.06391	100.538	<2.00E-16 ***
		Native Forest (FN)	0.02506	0.09037	0.277	0.782
		Urban Forest (FU)	0.38582	0.09015	4.28	1.87E-05 ***
Tukey post-hoc test		Parameter	Estimate	SE	z value	p(> t)
Habitat type	Phylogenetic diversity	NF-EF	0.02506	0.09037	0.277	0.958504
		UF-EF	0.38582	0.09015	4.28	< 1.00E-04 ***
		UF-NF	0.36076	0.09013	4.003	0.000177 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

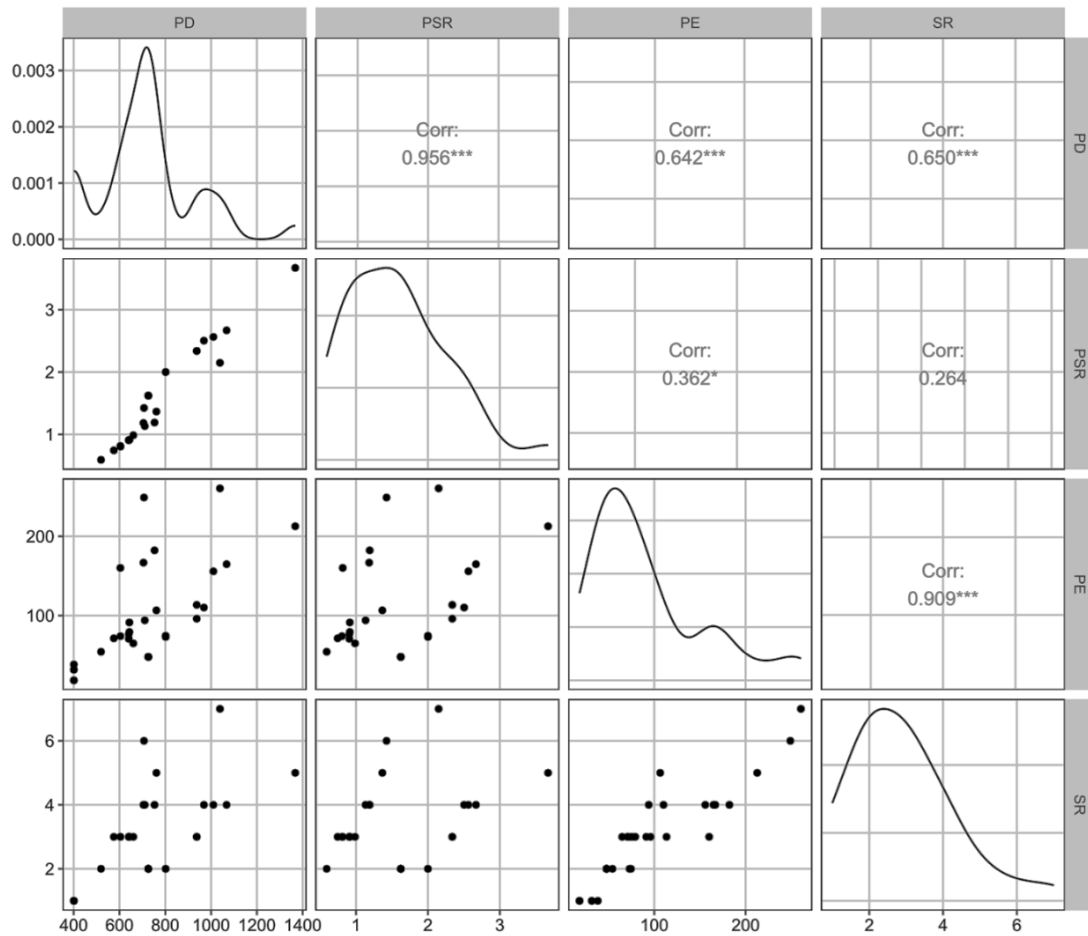


Figure S3: Correlation between metrics of phylogenetic alpha diversity richness

Table S11

Analysis of the relationship between the predictor and response values: PD ~ habitat, PD ~ temperature, PD ~ precipitation and PD ~ Altitude

Predictor	Response	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Habitat	Phylogenetic diversity	2	372673	186337	8.7496	0.0008939***
		33	702784	21296		
Temperature	Phylogenetic diversity	1	1851	1851	0.0413	0.8401
		34	1522523	44780		
Precipitation	Phylogenetic diversity	1	108805	108805	2.6134	0.1152
		34	1415569	41634		
Altitude	Phylogenetic diversity	1	4028	4028	0.0901	0.7659
		34	1520347	44716		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S12

Analysis of the relationship between the predictor and response values: PSR ~ temperature, PSR ~ precipitation and PSR ~ Altitude

Predictor	Response	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Temperature	Phylogenetic Species	1	3.9246	3.9246	10.803	0.002656 **
	Richness	29	10.5359	0.3633		
Precipitation	Phylogenetic Species	1	5.7489	5.7489	19.138	0.0001435 ***
	Richness	29	8.7116	0.3004		
Altitude	Phylogenetic Species	1	4.1083	4.1083	11.509	0.00202 ***
	Richness	29	10.3523	0.357		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S13

Analysis of the relationship between the predictor and response values: PE ~ temperature, PE ~ precipitation and PE ~ Altitude

Predictor	Response	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Temperature	Phylogenetic Endemism	1	17077	17078	3.8136	0.05911
		34	152252	4478		
Precipitation	Phylogenetic Endemism	1	5415	5414.9	1.1232	0.2967
		34	163915	4821		
Altitude	Phylogenetic Endemism	1	21342	21341.6	4.9032	0.03361*
		34	147988	4352.6		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S14

Analysis of the relationship between the predictor and response values: FD ~ habitat, FD ~ temperature, FD ~ precipitation and FD ~ Altitude

Predictor	Response	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Habitat	Functional diversity	2	1.0864	0.54318	13.626	4.85E-05 ***
		33	1.3155	0.03986		
Temperature	Functional diversity	1	0.30422	0.304222	4.9312	0.03314*
		34	2.09758	0.061694		
Precipitation	Functional diversity	1	0.05193	0.051928	0.7513	0.3921
		34	2.34988	0.069114		
Altitude	Functional diversity	1	0.3362	0.3362	5.5338	0.02458*
		34	2.0656	0.06075		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S15

Generalized Linear Model (GLM) result for the impact of habitat type on functional diversity and pairwise comparison between habitat types (Tukey post-hoc tests)

Predictor	Response	Model	Estimate	SE	t value	p(> t)
Habitat type	Functional diversity	(Intercept)	0.44928	0.05764	7.795	5.55E-09 ***
		Native Forest (FN)	0.28051	0.08151	3.442	0.00159 **
		Urban Forest (FU)	0.41735	0.08151	5.12	1.29E-05 ***
Tukey post-hoc test		Parameter	Estimate	SE	z value	p(> t)
Habitat type	NF-EF	0.28051	0.08151	3.442	0.00174 **	
	UF-EF	0.41735	0.08151	5.12	< 0.001***	
	UF-NF	0.13683	0.08151	1.679	0.21332	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Table S16

The species dominance in the habitat set encompasses a total of 31 species

Group	Species	rank	abundance	proportion	plower	pupper	accumfreq	logabun	rankfreq
EF	<i>Pinus_pseudostrobus</i>	1	195	74.1	54.5	93.8	74.1	2.3	50
EF	<i>Eucalyptus_globulus</i>	2	68	25.9	6.2	45.5	100	1.8	100
NF	<i>Senegalia_gilliesii</i>	1	48	34.5	12	57.1	34.5	1.7	6.7
NF	<i>Escallonia_sp</i>	2	21	15.1	-8.6	38.8	49.6	1.3	13.3
NF	<i>Jatropha_hieronymi</i>	3	15	10.8	3.5	18.1	60.4	1.2	20
NF	<i>Schinopsis_lorentzii</i>	4	13	9.4	-1.6	20.3	69.8	1.1	26.7
NF	<i>Neltuma_alba</i>	5	11	7.9	-6.9	22.7	77.7	1	33.3
NF	<i>Bougainvillea_berberidifolia</i>	6	7	5	-0.3	10.4	82.7	0.8	40
NF	<i>Achatocarpus_praecox</i>	7	5	3.6	0.4	6.8	86.3	0.7	46.7
NF	<i>Anadenanthera_colubrina</i>	8	4	2.9	-1	6.8	89.2	0.6	53.3
NF	<i>Lachesiodendron_viridiflorum</i>	9	4	2.9	-1.3	7	92.1	0.6	60
NF	<i>Sarcomphalus_mistol</i>	10	3	2.2	-2.4	6.8	94.2	0.5	66.7
NF	<i>Senegalia_praecox</i>	11	3	2.2	-1.1	5.4	96.4	0.5	73.3
NF	<i>Piptadenia_boliviana</i>	12	2	1.4	-1.9	4.8	97.8	0.3	80
NF	<i>Solanum_riparium</i>	13	1	0.7	-0.9	2.4	98.6	0	86.7
NF	<i>Tipuana_tipu</i>	14	1	0.7	-0.9	2.4	99.3	0	93.3
NF	<i>Aspidosperma_quebracho_blanco</i>	15	1	0.7	-0.9	2.4	100	0	100
UF	<i>Hesperocyparis_macrocarpa</i>	1	81	51.9	28	75.9	51.9	1.9	6.2
UF	<i>Ligustrum_lucidum</i>	2	25	16	3	29	67.9	1.4	12.5
UF	<i>Washingtonia_filifera</i>	3	10	6.4	-0.2	13.1	74.4	1	18.8
UF	<i>Erythrina_falcata</i>	4	10	6.4	-0.9	13.7	80.8	1	25
UF	<i>Grevillea_robusta</i>	5	7	4.5	-3.2	12.2	85.3	0.8	31.2
UF	<i>Parasenegalia_visco</i>	6	4	2.6	-0.3	5.4	87.8	0.6	37.5
UF	<i>Phoenix_canariensis</i>	7	4	2.6	-0.8	5.9	90.4	0.6	43.8
UF	<i>Ficus_elastica</i>	8	3	1.9	-1.3	5.2	92.3	0.5	50
UF	<i>Ulmus_minor</i>	9	2	1.3	-1.7	4.2	93.6	0.3	56.2
UF	<i>Parajubaea_torallyi</i>	10	2	1.3	-0.8	3.3	94.9	0.3	62.5
UF	<i>Pinus_pseudostrobus</i>	11	2	1.3	-1.4	3.9	96.2	0.3	68.8
UF	<i>Populus_nigra</i>	12	2	1.3	-1.6	4.2	97.4	0.3	75
UF	<i>Melia_azedarach</i>	13	1	0.6	-0.8	2.1	98.1	0	81.2
UF	<i>Schinus_areira</i>	14	1	0.6	-0.7	2	98.7	0	87.5
UF	<i>Cedrela_angustifolia</i>	15	1	0.6	-0.8	2.1	99.4	0	93.8
UF	<i>Eucalyptus_globulus</i>	16	1	0.6	-0.7	2	100	0	100

Note: rank = Rk; abundance = Ab; proportion = Prop; plower = Plo; pupper = Pup; accumfreq = AF; logabun = LogAb; rankfreq = Rf