

Supplementary Materials:

Diversity of legumes in the cashew agroforestry system in East Timor (Southeast Asia)

Lara Guterres^{1,2†}; Maria Cristina Duarte^{3†}; Silvia Catarino⁴; Guilherme Roxo¹; João Barnabé¹; Mónica Sebastiana⁵; Filipa Monteiro^{1,3}; Maria Manuel Romeiras^{1,3*}

¹ LEAF—Linking Landscape, Environment, Agriculture and Food Research Center, Associated Laboratory TERRA, Instituto Superior de Agronomia, Universidade de Lisboa, Tapada da Ajuda, 1349-017 Lisboa, Portugal

² Faculdade de Ciências Exatas, Universidade Nacional Timor Lorosa'e, Avenida Cidade de Lisboa, Dili, Timor-Leste

³ cE3c - Center for Ecology, Evolution and Environmental Change & CHANGE - Global Change and Sustainability Institute, Faculdade de Ciências, Universidade de Lisboa, Campo Grande 1749-016 Lisboa, Portugal

⁴ Forest Research Center (CEF), Associated Laboratory TERRA, Instituto Superior de Agronomia, Universidade de Lisboa, Tapada da Ajuda, 1349-017 Lisboa, Portugal

⁵ BioISI - Biosystems and Integrative Sciences Institute, Faculdade de Ciências, Universidade de Lisboa, Campo Grande 1749-016 Lisboa, Portugal

† The authors contributed equally to this work

*Correspondence: mmromeiras@isa.ulisboa.pt

Table S1: Median values (mg/kg wet weight) and standard deviations (SD) of mineral contents of legume seeds from six species (grey rows) and their colour types (white rows) found in East Timor cashew agroforestry system. For species with more than one colour type, the presented values (grey rows) correspond to the median values of all the individual samples. Different letters indicate significant differences among the seed colour types.

		B	Ca	Cu	Fe	K	Mg	Mn	P	S	Zn
<i>Cajanus cajan</i>	n.q.		763.541	1.947	17.158	10233.612	763.173	1.684	2130.565	1172.175	12.760
			± 69.482 a	± 0.486 a	± 5.142 a	± 383.899 a	± 48.714 a	± 0.800 a	± 229.839 a	± 60.129 a	± 1.294 a
Black	n.q.		783.154 ± 47.045 ab	2.196 ± 0.346 a	16.418 ± 2.725 a	10312.38 ± 445.247 ab	779.470 ± 44.328 ab	1.653 ± 0.311 a	2128.167 ± 99.235 ab	1173.505 ± 56.142 a	12.250 ± 1.254 a
Brownish	n.q.		723.994 ± 53.587 c	1.612 ± 0.410 b	16.467 ± 5.180 a	10143.8 ± 425.555 ab	747.418 ± 65.300 ab	1.572 ± 0.423 a	2108.035 ± 102.597 a	1133.68 ± 63.431 a	12.066 ± 1.171 a
Cream	n.q.		751.462 ± 59.903 ac	2.209 ± 0.498 a	18.292 ± 6.811 a	10025.79 ± 342.415 a	792.826 ± 49.112 a	1.610 ± 0.639 a	2022.974 ± 91.920 b	1219.653 ± 40.269 b	13.865 ± 0.915 b
Cream-brownish /Purple	n.q.		788.725 ± 87.850 b	1.593 ± 0.340 b	16.661 ± 4.555 a	10346.264 ± 246.135 b	750.177 ± 22.582 b	1.992 ± 1.156 b	2537.865 ± 90.150 c	1130.144 ± 39.508 a	12.760 ± 1.165 a
<i>Phaseolus lunatus</i>		25.224	420.501	2.152	45.653	12770.371	1550.581 ± 175.272 b	12.488	3151.540	1108.567	15.067
		± 5.310 b	± 70.300 b	± 2.031 a	± 7.069 b	± 701.176 b	± 1.651 b	± 632.574 b	± 150.129 a	± 2.779 b	
Brownish		24.308 ± 2.145 a	419.767 ± 42.942 a	2.541 ± 0.285 a	49.892 ± 3.287 a	13228.714 ± 329.229 a	1650.549 ± 65.280 a	14.572 ± 0.722 a	4150.112 ± 178.210 a	1237.106 ± 51.592 a	18.010 ± 0.898 a
Cream-purple		24.606 ± 1.643 a	393.313 ± 32.615 a	3.696 ± 0.259 a	51.177 ± 6.056 a	13519.906 ± 223.489 a	1653.021 ± 66.088 a	14.232 ± 0.436 a	4296.713 ± 183.878 a	1496.522 ± 55.818 a	19.805 ± 0.718 a
Purple-white		26.484 ± 6.361 a	422.893 ± 80.714 a	1.918 ± 2.455 b	42.873 ± 7.352 b	12391.021 ± 631.721 b	1495.259 ± 167.006 b	12.087 ± 1.245 b	3036.148 ± 248.212 b	1071.721 ± 79.143 b	14.372 ± 2.452 b
<i>Phaseolus vulgaris</i>		11.462	858.809	6.853	63.326	11746.533	1299.074	8.990	4475.780	1618.124	27.047
		± 1.299 c	± 145.896 ac	± 0.792 b	± 9.033 c	± 1179.656 b	± 58.706 c	± 1.373 c	± 289.892 c	± 100.161 b	± 2.669 cd
<i>Vigna angularis</i>		5.896	2916.046	7.622	47.600	7084.165	1777.535	21.091	2370.304	1728.361	26.810

Supplementary Materials: Diversity of legumes in the cashew agroforestry system in East Timor

	± 1.824 d	± 62.443 c	± 0.653 bc	± 4.145 b	± 242.509 c	± 61.257 d	± 5.435 d	± 100.535 ad	± 72.659 bc	± 1.088 cd
<i>Vigna radiata</i>	2.528	672.647	7.803	34.921	5604.853	1262.969	9.804	2590.765	1660.765	25.588
	± 2.232 d	± 62.443 d	± 0.713 bc	± 5.471 d	± 198.382 d	± 59.784 c	± 0.415 c	± 63.918 d	± 48.119 bc	± 0.778 c
<i>Vigna unguiculata</i>	10.286	524.547	8.141	48.944	6954.175	1626.304	12.977	3422.431	1862.081	29.564
	± 4.319 c	± 69.278 e	± 0.692 c	± 7.086 b	± 979.536 c	± 96.119 b	± 1.080 b	± 167.764 b	± 194.575 c	± 4.395 d
Black	10.497 ±	484.466 ±	8.251 ±	49.444 ±	6578.416 ±	1607.647 ±	12.323 ±	3459.091 ±	1990.741 ±	29.348 ±
	2.152 a	59.145 a	0.579 a	9.364 a	1219.403 a	96.680 a	1.259 a	164.341 a	88.192 a	1.168 a
Bordeaux	9.417 ±	552.624 ±	7.975 ±	48.358 ±	7377.762 ±	1671.554 ±	13.166 ±	3407.530 ±	1626.870 ±	29.601 ±
	5.703 a	53.036 b	0.782 a	3.136 a	668.799 a	76.952 b	0.700 b	168.864 a	135.283 b	5.731 a

n.q. - not quantified

Table S2: Eigenvalues, proportion of variability and variables that contributed to the first four PCs (PCA) based on the mineral content of the different legume species (*Cajanus cajan*, *Phaseolus lunatus*, *P. vulgaris*, *Vigna angularis*, *V. radiata* and *V. unguiculata*).

Component	PCA1	PCA2	PCA3	PCA4
Eigenvalues	5,15085762	2,57970177	1,25946373	0,54337349
% Explained variance	51,5085762	25,7970177	12,5946373	5,4337349
% Cumulative explained variance	51,50858	77,30559	89,90023	95,33397
Correlation coefficients				
K	-0,2042456	-0,49114524	0,1148628	-0,46110216
Ca	0,1519788	0,29732554	0,62524158	-0,51998907
Mg	0,3870261	-0,15450615	0,24833578	0,3085484
P	0,2373157	-0,41496518	-0,33638731	-0,37153368
S	0,3747808	0,20935797	-0,24533918	-0,01787668
Fe	0,3702763	-0,28016801	-0,04518703	-0,25946593
Cu	0,3858888	0,2000293	-0,22687488	0,02937041
Zn	0,3996097	0,11889458	-0,21294956	-0,13685154
Mn	0,3578849	-0,05742644	0,48190988	0,13496684
B	0,1217922	-0,54271108	0,17251776	0,42226486

Table S3: Eigenvalues, proportion of variability and variables that contributed to the first four PCs (PCA) based on the mineral content of the different types of *Cajanus cajan*.

Component	PCA1	PCA2	PCA3	PCA4
Eigenvalues	2.7252778	2.2922557	1.399241	0.955092
% Explained variance	30.280864	25.469508	15.54712	10.61214
% Cumulative explained variance	30.28086	55.75037	71.29749	81.90963
Correlation coefficients				
K	0.18809602	0.424218607	-0.35493427	0.3737227
Ca	0.25281845	0.346925792	-0.12192321	-0.6586395
Mg	0.47499067	-0.068676705	-0.37914222	0.1840965
P	-0.03249576	0.603887216	-0.02130567	-0.1853891
S	0.48820578	-0.141306001	-0.23834102	0.16345
Fe	0.38172683	0.000795477	0.50769758	0.2950587
Cu	0.1509504	-0.440465677	0.09526866	-0.3138744
Zn	0.48888341	-0.073606493	0.17225706	-0.3464051
Mn	0.16786108	0.332999794	0.60136657	0.1611693
B	0.18809602	0.424218607	-0.35493427	0.3737227

Table S4: Eigenvalues, proportion of variability and variables that contributed to the first four PCs (PCA) based on the mineral content of the different types of *Phaseolus lunatus*.

Component	PCA1	PCA2	PCA3	PCA4
Eigenvalues	5.41988002	1.61145208	1.50970507	0.716443
% Explained variance	54.1988002	16.1145208	15.0970507	7.164432
% Cumulative explained variance	54.1988	70.31332	85.41037	92.5748
Correlation coefficients				
K	-0.30608717	0.45967335	0.099701173	-0.11798947
Ca	-0.11131036	-0.74721292	0.004091644	-0.10608628
Mg	-0.33893873	-0.37211719	0.066080438	-0.37358354
P	-0.40060961	0.01817444	-0.015106266	-0.28919457
S	-0.38644279	0.22077434	0.010668086	-0.07724913
Fe	-0.38468085	0.08177945	0.105362472	0.07705894
Cu	-0.17233469	-0.11976925	-0.622178153	0.523934
Zn	-0.37785889	-0.00111809	-0.257363146	0.32027415
Mn	-0.38393072	-0.07753808	0.227308109	0.15061395
B	-0.03682862	-0.12563635	0.684998272	0.58305538

Table S5: Eigenvalues, proportion of variability and variables that contributed to the first four PCs (PCA) based on the mineral content of the different types of *Vigna unguiculata*.

Component	PCA1	PCA2	PCA3	PCA4
Eigenvalues	3.81119843	1.8982127	1.51015692	1.14062126
% Explained variance	38.1119843	18.982127	15.1015692	11.4062126
% Cumulative explained variance	38.11198	57.09411	72.19568	83.60189
Correlation coefficients				
K	0.29136583	0.106738872	-0.19949227	0.67331383
Ca	-0.34466944	-0.382042937	-0.04255544	0.26564609
Mg	-0.41772232	-0.266608758	-0.1456331	-0.19766343
P	-0.31722386	0.177123657	-0.21199346	-0.42934605
S	-0.02624372	0.622563804	0.31678263	-0.0542081
Fe	-0.07891853	0.38945518	-0.54914554	-0.01347522
Cu	-0.34686594	0.42186394	-0.01133572	0.1262259
Zn	0.41960228	0.068098906	-0.30094484	-0.16885223
Mn	-0.2656914	0.004512164	-0.52303242	0.27212493
B	-0.38379054	0.135310589	0.3550639	0.36201609