

Supplementary Material

Scaling of indirect defenses in Central American swollen-thorn acacias

Amador-Vargas S., González Y., Guevara M & F. Gijssman

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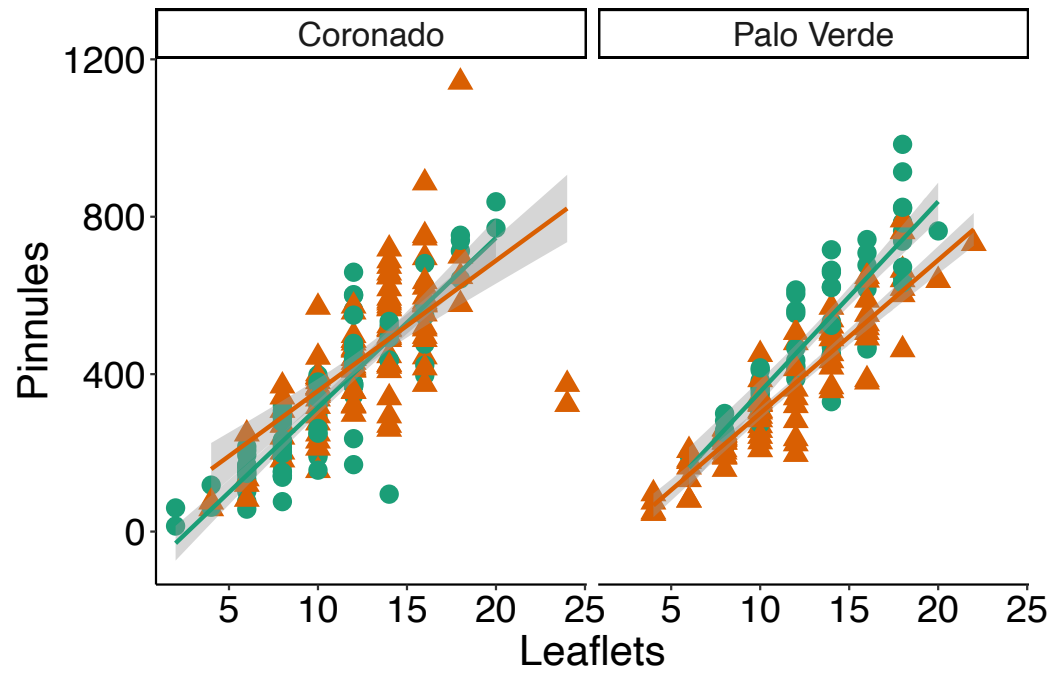


Figure S1. The number of leaflets strongly correlates with the number of pinnules per leaf for trees with both ant species (*Crematogaster crinosa* in green circles; *Pseudomyrmex spinicola* in orange triangles) in both study sites. The line shows a linear fit and the shaded area represents the 95% CI.

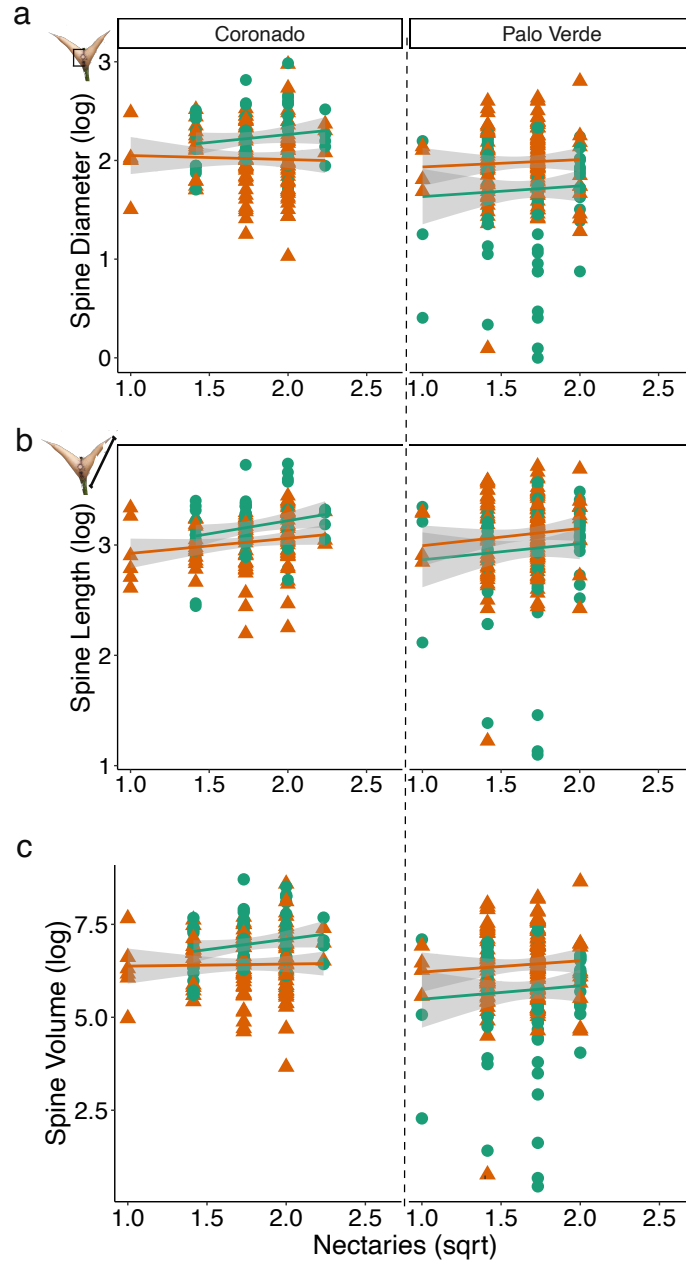


Figure S2. Relation between the number of nectaries and **(a)** spine diameter, **(b)** length of the spine, or **(c)** spine volume. *Crematogaster crinosa* (green circles) or *Pseudomyrmex spinicola* (orange triangles). The line shows a linear fit and the shaded area represents the 95% CI.

Table S1. Linear model testing whether spine diameter was associated with tree diameter.*Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	t-value	P-value
(Intercept)	0.44	0.17	2.62	0.011
Tree diameter (log)	0.32	0.11	2.79	0.0066
Ant <i>P. spinicola</i>	0.34	0.19	1.80	0.076
Location Palo Verde	-0.12	0.035	-3.59	0.00056
Tree diameter (log): ant <i>P. spinicola</i>	-0.21	0.14	-1.50	0.14

Table S2. Linear model testing whether spine length was associated with tree diameter.*Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	t-value	P-value
(Intercept)	1.004	0.14	6.98	<0.0001
Tree diameter (log)	0.21	0.098	2.18	0.033
Ant <i>P. spinicola</i>	0.20	0.17	1.26	0.21
Location Palo Verde	0.0013	0.030	0.045	0.96
Tree diameter (log): ant <i>P. spinicola</i>	-0.13	0.12	-1.08	0.28

Table S3. Linear model testing whether spine volume was associated with tree diameter.*Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	t-value	P-value
(Intercept)	1.63	0.42	3.87	0.00022
Tree diameter (log)	0.87	0.29	3.04	0.0031
Ant <i>P. spinicola</i>	0.87	0.48	1.83	0.071
Location Palo Verde	-0.24	0.087	-2.73	0.0078
Tree diameter (log): ant <i>P. spinicola</i>	-0.54	0.34	-1.59	0.12

Table S4. Generalized linear model testing whether the mean number of nectaries per leaf was associated with tree diameter. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	Z-value	P-value
(Intercept)	1.062	0.73	1.45	0.15
Tree diameter (log)	-0.043	0.50	-0.086	0.93
Ant <i>P. spinicola</i>	-0.35	0.84	-0.42	0.68
Location Palo Verde	-0.0060	0.15	-0.040	0.97
Tree diameter (log): ant <i>P. spinicola</i>	0.25	0.60	0.41	0.68

Table S5. Test statistic and P-values of the pairwise comparisons between SMA slopes of spine length and spine diameter.

	<i>C. crinosa</i> at Coronado	<i>P. spinicola</i> at Coronado	<i>C. crinosa</i> at Palo Verde
<i>C. crinosa</i> at Coronado	-		
<i>P. spinicola</i> at Coronado	2.92; 0.087	-	
<i>C. crinosa</i> at Palo Verde	0.018; 0.89	4.2; 0.04	-
<i>P. spinicola</i> at Palo Verde	0.25; 0.61	8.14; 0.004	0.78; 0.37

Table S6. Random effects model to test whether the number of pinnulas was associated with the number of nectaries. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	df	t-value	P-value
(Intercept)	10.21	2.18	316.11	4.67	< 0.0001
Nectaries (sqrt)	5.54	1.19	353.82	4.64	< 0.0001
Ant <i>P. spinicola</i>	-1.28	2.97	341.23	-0.43	0.67
Location Palo Verde	0.83	1.08	43.46	0.77	0.44
Nectaries (sqrt): ant <i>P. spinicola</i>	0.64	1.68	354.42	0.38	0.70

Table S7. Random effects model to test whether the spine diameter was associated with the number of nectaries. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	df	t-value	P-value
(Intercept)	0.82	0.095	407.24	8.66	< 0.0001
Nectaries (sqrt)	0.039	0.052	421.55	0.75	0.45
Ant <i>P. spinicola</i>	0.17	0.12	421.09	1.47	0.14
Location Palo Verde	-0.15	0.034	68.88	-4.36	< 0.0001
Nectaries (sqrt): ant <i>P. spinicola</i>	-0.065	0.068	421.23	-0.96	0.34

Table S8. Random effects model to test whether the spine length was associated with the number of nectaries. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	df	t-value	P-value
(Intercept)	1.26	0.083	405.70	15.08	< 0.0001
Nectaries (sqrt)	0.034	0.046	422.42	0.73	0.46
Aant <i>P. spinicola</i>	0.049	0.10	420.12	0.47	0.64
Location Palo Verde	-0.033	0.029	64.94	-1.11	0.27
Nectaries (sqrt): ant <i>P. spinicola</i>	-0.011	0.060	422.27	-0.18	0.86

Table S9. Random effects model to test whether the spine volume was associated with the number of nectaries. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	df	t-value	P-value
(Intercept)	2.62	0.26	407.05	10.26	<0.0001
Nectaries (sqrt)	0.11	0.14	422.11	0.81	0.42
Ant <i>P. spinicola</i>	0.40	0.32	420.69	1.26	0.21
Location Palo Verde	-0.33	0.09	68.93	-3.65	0.00051
Nectaries (sqrt): ant <i>P. spinicola</i>	-0.14	0.18	421.90	-0.78	0.44

Table S10. Random effects model to test whether the spine diameter was associated with the number of pinnules. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	df	t-value	P-value
(Intercept)	0.94	0.070	140.9	13.37	<0.0001
Pinnules (sqrt)	0.00018	0.0032	163.1	0.055	0.96
Ant <i>P. spinicola</i>	0.15	0.094	162.5	1.57	0.12
Location Palo Verde	-0.084	0.028	46.32	-2.94	0.0051
Pinnules (sqrt): ant <i>P. spinicola</i>	-0.0071	0.0044	178.6	-1.62	0.11

Table S11. Random effects model to test whether the spine volume was associated with the number of pinnules. *Crematogaster crinosa* (ant) and Coronado (location) were the reference groups.

	Estimate	Std. Error	df	t-value	P-value
(Intercept)	3.016	0.18	149.74	16.60	<0.0001
Pinnules (sqrt)	-0.0026	0.0084	174.14	-0.31	0.76
Ant <i>P. spinicola</i>	0.39	0.24	171.057	1.62	0.11
Location Palo Verde	-0.19	0.077	46.89	-2.41	0.019
Pinnules (sqrt): ant <i>P. spinicola</i>	-0.020	0.011	186.19	-1.74	<i>0.083</i>