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Appendix 1

ANOVA tables for temporal block effects on the mean relative growth rates of (A) *Manduca sexta,* (B) *Leptinotarsa juncta*, (C) *Spodoptera exigua*, and (D) *Schistocerca americana*) on *Solanum* diet.

(A) *Manduca*	SS	DF	F	p
Intercept	1.226	1	118.309	<0.001
Latitude (linear)	0.002	1	0.215	0.644
Latitude (polynomial)	0.092	1	8.878	0.004
Block	0.020	1	1.910	0.171
Residuals	0.715	69		

(B) *Leptinotarsa*	SS	DF	F	p
Intercept	0.540	1	39.475	<0.001
Latitude (linear)	0.015	1	1.064	0.306
Latitude (polynomial)	0.007	1	0.520	0.473
Block	0.007	1	0.529	0.470
Residuals	0.931	68		

(C) *Spodoptera*	SS	DF	F	p
Intercept	0.997	1	28.431	<0.001
Latitude (linear)	0.101	1	2.872	0.095
Latitude (polynomial)	0.544	1	15.512	<0.001
Block	0.049	1	1.391	0.242
Residuals	2.384	68		

(D) *Schistocerca*	SS	DF	F	p
Intercept	0.043	1	6.627	0.013
Latitude (linear)	0.016	1	2.450	0.125
Latitude (polynomial)	0.019	1	3.012	0.090
Block	0.000	1	0.001	0.983
Residuals	0.283	44		

Appendix 2

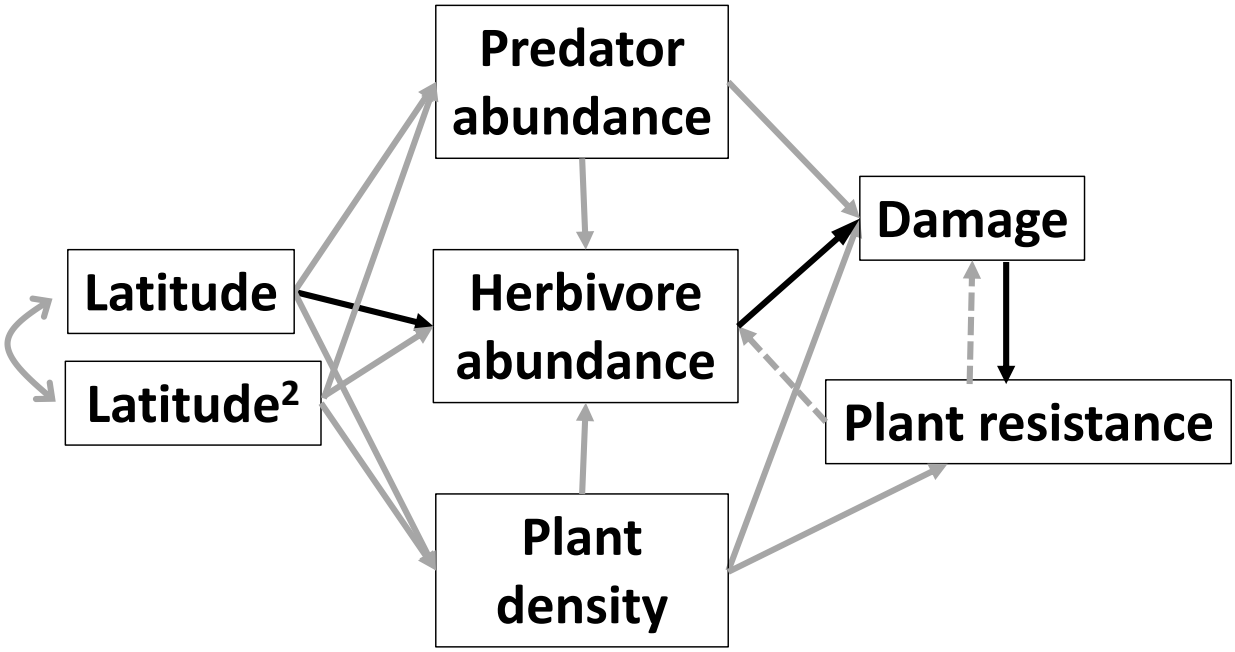
ANOVA tables for temporal block effects on the mean relative growth rates of herbivores on *Solidago* diet (*Spodoptera exigua*, and *Schistocerca americana*).

(A) *Spodoptera*	SS	DF	F	p
Intercept	1.105	1	34.481	<0.001
Latitude (linear)	0.001	1	0.021	0.884
Latitude (polynomial)	0.123	1	3.852	0.054
Block	0.115	1	3.585	0.063
Residuals	2.179	68		

(B) *Schistocerca*	SS	DF	F	p
Intercept	0.065	1	2.164	0.148
Latitude (linear)	0.001	1	0.022	0.884
Latitude (polynomial)	0.001	1	0.031	0.862
Block	0.014	1	0.455	0.504
Residuals	1.327	44		

Appendix 3

Initial form of the structural equation models. Black, solid arrows represent relationships described by the traditional latitudinal gradient in plant defenses hypothesis (LGPD model). Gray arrows represent an alternative model where top–down and bottom–up processes and feedback loops are considered (Alternative model). Dashed arrows represent feedbacks.



Appendix 4

Model fit and comparison results for *Solanum* herbivores. LGPD model represents the black, solid paths in Fig. 1. Final alternative models represent final models presented in Fig. 7. Δ AIC and Δ DIC compare the two competing models (alternative versus LGPD, respectively). * indicate models with good fit; † indicate moderate fit.

Herbivore species	Model type	χ^2	DF	p	Sample size	No. of paths	R^2 for herbivore density, damage, resistance	CFI	RMSEA	AIC (DIC)	ΔAIC (Δ DIC)
Manduca	Alternative	13.2	15	0.59*	18	6	0.55, 0.64, 0.31	1.00*	0.00*	53.2 (56.5)	15.9 (16.0)
	LGPD	35.1	18	0.01	18	3	0.39, 0.64, 0.01	0.58	0.24	69.1 (72.5)	
Leptinotarsa	Alternative	15.0	15	0.45*	18	6	0.55, 0.64, 0.38	1.00*	0.04*	55.0 (58.4)	15.1 (15.8)
	LGPD	36.1	18	0.01	18	3	0.39, 0.64, 0.01	0.56	0.24	70.1 (74.1)	
Spodoptera	Alternative	14.2	15	0.44*	18	6	0.55, 0.64, 0.42	1.00*	0.03*	56.2 (59.9)	18.7 (19.6)
	LGPD	40.9	18	<0.01	18	3	0.39, 0.64, 0.00	0.50	0.27	74.9 (79.5)	
Schistocerca	Alternative	11.6	16	0.77*	12	5	0.72, 0.92, 0.40	1.00*	0.00*	49.6 (53.9)	12.2 (12.9)
	LGPD	27.8	18	0.06	12	3	0.49, 0.92, 0.04	0.76	0.22	61.8 (66.8)	

Appendix 5

Model fit and comparison results for *Solidago* herbivores. LGPD model represents the black, solid paths in Fig. 1. Final alternative models represent final models presented in Fig. 8. Δ AIC and Δ DIC compare the two competing models (alternative versus LGPD, respectively). * indicate models with good fit; † indicate moderate fit.

Herbivore species	Model type	χ^2	DF	p	Sample size	No. of paths	R^2 for herbivore density, damage, resistance	CFI	RMSEA	AIC (DIC)	Δ AIC (Δ DIC)
Trirhabda	Alternative	14.4	14	0.42*	9	6	0.82, 0.18, 0.91	0.99*	0.06†	56.4 (62.4)	43.3 (48.2)
	LGPD	65.7	18	<0.01	9	3	0.66, 0.43, 0.19	0.19	0.57	99.7 (110.6)	
Spodoptera	Alternative	8.3	13	0.82*	18	8	0.55, 0.78, 0.41	1.00*	0.00*	52.3 (56.58)	25.58 (25.47)
	LGPD	43.9	18	<0.01	18	3	0.39, 0.19, 0.14	0.31	0.29	77.9 (82.0)	
Schistocerca	Alternative	14.3	13	0.35*	12	8	0.72, 0.69, 0.75	0.97*	0.09†	58.3 (64.7)	26.60 (27.00)
	LGPD	50.9	18	<0.01	12	3	0.49, 0.24, 0.02	0.19	0.41	84.9 (91.7)	

Appendix 6

Standardized path coefficients from *Solanum* SEMs (Fig. 7). Coefficients estimated using Bayesian methods. Coefficients represent the direct, indirect and total effects respectively.

(A) *Manduca*	Latitude (linear)	Predator abundance	Herbivore abundance
Predator abundance	0.51, 0, 0.51	0, 0, 0	0, 0, 0
Herbivore abundance	0.81, -0.25, 0.56	-0.47, 0, -0.47	0, 0, 0
Manduca resistance	0, 0, 0	0, 0, 0	0, 0, 0
Solanum density	0, 0, 0	0, 0, 0	0, 0, 0
Solanum damage	0, -0.44, -0.44	0, 0.37, 0.37	-0.79, 0, -0.79

(B) *Leptinotarsa*	Latitude (linear)	Predator abundance	Herbivore abundance	*Solanum* density
Predator abundance	0.51, 0, 0.51	0, 0, 0	0, 0, 0	0, 0, 0
Herbivore abundance	0.81, -0.25, 0.56	-0.46, 0, -0.46	0, 0, 0	0, 0, 0
Leptinotarsa resistance	0, 0, 0	0, 0, 0	0, 0, 0	0.48, 0, 0.48
Solanum density	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Solanum damage	0, -0.44, -0.44	0, 0.37, 0.37	-0.79, 0, -0.79	0, 0, 0

(C) *Spodoptera*	Latitude (linear)	Predator abundance	Herbivore abundance
Predator abundance	0.53, 0, 0.53	0, 0, 0	0, 0, 0
Herbivore abundance	0.80, -0.25, 0.55	-0.47, 0, -0.47	0, 0, 0
Spodoptera resistance	0, 0, 0	0, 0, 0	0, 0, 0
Solanum density	0, 0, 0	0, 0, 0	0, 0, 0
Solanum damage	0, -0.44, -0.44	0, 0.37, 0.37	-0.79, 0, -0.79

(D) *Schistocerca*	Latitude (linear)	Predator abundance	Herbivore abundance	*Solanum* density
Predator abundance	0.53, 0, 0.53	0, 0, 0	0, 0, 0	0, 0, 0
Herbivore abundance	0.92, -0.32, 0.60	-0.57, 0, -0.57	0, 0, 0	0, 0, 0
Schistocerca resistance	0, 0, 0	0, 0, 0	0, 0, 0	-0.56, 0, -0.56
Solanum damage	0, -0.58, -0.58	0, 0.54, 0.54	-0.95, 0, -0.95	0, 0, 0

Appendix 7

Standardized path coefficients from *Solidago* SEMs (Fig. 8). Coefficients estimated using Bayesian methods. Coefficients represent the direct, indirect and total effects respectively.

(A) *Trirhabda*	Latitude (linear)	Latitude (poly)	Predator abundance	Herbivore abundance	*Solidago* density
Predator abundance	0.55, 0, 0.55	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Herbivore abundance	1.03, -0.38, 0.66	0, 0, 0	-0.63, 0, -0.63	0, 0, 0	0, 0, 0
Trirhabda resistance	0, -0.54, -0.54	0, 0, 0	0, 0.51, 0.50	-0.81, 0, -0.81	-0.38, 0, -0.38
Solidago damage	0, 0, 0	0.34, 0, 0.34	0, 0, 0	0, 0, 0	0, 0, 0

(B) *Spodoptera*	Latitude (linear)	Latitude (poly)	Predator abundance	Herbivore abundance	*Solidago* density
Predator abundance	0.51, 0, 0.51	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Herbivore abundance	0.81, -0.25, 0.56	0, 0, 0	-0.47, 0, -0.47	0, 0, 0	0, 0, 0
Spodoptera resistance	0, 0, 0	0.60, 0, 0.60	0, 0, 0	0, 0, 0	0, 0, 0
Solidago damage	0, 0.40, 0.40	0.43, 0, 0.43	0.30, -0.20, 0.10	0.43, 0, 0.43	0.44, 0, 0.44

(C) *Schistocerca*	Latitude (linear)	Latitude (poly)	Predator abundance	Herbivore abundance	*Solidago* density
Predator abundance	0.53, 0, 0.53	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Herbivore abundance	0.93, -0.32, 0.61	0, 0, 0	-0.57, 0, -0.57	0, 0, 0	0, 0, 0
Schistocerca resistance	0.64, 0, 0.64	-0.46, 0, -0.46	0, 0, 0	0, 0, 0	0, 0, 0
Solidago damage	0, 0.26, 0.26	0.29, 0, 0.29	0, -0.24, -0.24	0.43, 0, 0.43	0.47, 0, 0.47