Oikos

OIK-00457

Lemoine, N. P., Drews, W. A., Burkepile, D. E. and Parker, J. D. 2013 .Increased temperature alters feeding behavior of a generalist herbivore. – Oikos 000: 000–000.

Appendix A1

Table A1. Temperature data for each growth chamber, collected by HOBO pendant temperature loggers (HOBO UA-002 pendant loggers, Onset Computer Corporation, Bourne MA). Data are presented as mean ± 1 SD.

Set temperature (°C)	Mean temperature (°C)	Mean daytime light intensity (Lux)
20°	19.59 ± 0.53°	2115.5 ± 78.3
25°	26.14 ± 0.26°	3903.7 ± 429.7
30°	28.58 ± 1.89°	4776.3 ± 313.7
35°	34.63 ± 2.05°	2959.4 ± 499.9

Table A2. Regression equations used to correct for autogenic change for each leaf species, where y is the correction factor and $Mass_i$ is the initial leaf mass. The response variable is change in leaf weight in the absence of herbivory.

Plant species	Equation	R^2
Acer negundo	$y = -0.01 + 0.114 \times Mass_i$	0.683
Acer rubrum	$y = -0.01 + 0.057 \times Mass_i$	0.446
Liquidambar styraciflua	$y = 0$	
Plantanus occidentalis	$y = -0.002 + 0.075 \times Mass_i$	0.847
Rosa multiflora	$y = 0.0002 + 0.104 \times Mass_i$	0.787
Rubus allegheniensis	$y = 0.001 + 0.081 \times Mass_i$	0.618
Rubus phoenicolasius	$y = 0.018$	
Viburnum prunifolium	$y = 0.001 + 0.042 \times Mass_i$	0.161
Vitis vulpina	$y = -0.008 + 0.039 \times Mass_i$	0.596

Table A3. Significance of phylogenetic signal for each trait. Estimates of λ were compared to a null model of no phylogenetic signal (λ = 0) using a log-likelihood ratio test.

Trait	p-value
% carbon	1.00
% nitrogen	1.00
% phosphorus	1.00
% water	1.00
% protein	1.00
Toughness	0.22

Table A4. Post hoc comparisons for consumption and mass change among plant species within each temperature during no-choice assays. Letters denote statistically similar groups. Letters are decreasing order of consumption and growth rates, with 'A' representing plants with the highest consumption and growth.

Consumption				
Plant species	20°	25°	30°	35°
Acer negundo	C	B	BCD	BC
Acer rubrum	BC	B	ABC	ABC
Liquidambar styraciflua	BC	B	CDE	C
Plantanus occidentalis	AB	B	AB	A
Rosa multiflora	A	A	A	AB
Rubus allegheniensis	C	C	E	BC
Rubus phoenicolasius	C	BC	E	BC
Viburnum prunifolium	C	BC	DE	C
Vitis vulpina	A	B	AB	AB

Mass change				
Plant species	20°	25°	30°	35°
Acer negundo	B	B	BC	CD
Acer rubrum	B	B	C	DE
Liquidambar styraciflua	B	BC	C	DE
Plantanus occidentalis	B	BC	B	BC
Rosa multiflora	A	A	A	A
Rubus allegheniensis	B	C	BC	B
Rubus phoenicolasius	B	BC	C	D
Viburnum prunifolium	B	BC	C	E
Vitis vulpina	B	BC	BC	DE

Table A5. Post hoc comparisons for consumption of plants during choice assays. Letters denote statistically similar groups. Letters are decreasing order of consumption and growth rates, with 'A' representing plants with the highest consumption and growth.

Plant species	25°	35°
Acer negundo	AB	BC
Acer rubrum	BC	C
Liquidambar styraciflua	AB	C
Plantanus occidentalis	BC	C
Rosa multiflora	A	A
Rubus allegheniensis	BC	C
Rubus phoenicolasius	AB	BC
Viburnum prunifolium	BC	C
Vitis vulpina	C	AB

Table A6. Principle components analysis of plant traits for both consumption and growth analyses. Loadings with values near zero have been omitted from the table.

Principle component loadings			
	PC 1	PC 2	PC 3
Eigenvalue	1.56	1.21	1.12
Proportion of variance	0.41	0.24	0.21
Cumulative variance	0.41	0.65	0.86
Loadings			
% carbon		0.625	–0.505
% nitrogen	–0.237	–0.378	–0.643
% phosphorus	–0.475	0.277	–0.357
% water	–0.608	–0.102	0.222
% protein	0.505	0.242	
Toughness	–0.302	0.567	0.383

Table A7. Coefficient table of multiple regression of plant traits on consumption and RGR. Statistically significant relationships are in bold.

Consumption				
Parameter	Estimate	Std. error	*t*-statistic	p-value
Intercept	-0.117	0.246	-0.475	0.639
PC 1	-0.035	0.119	-0.297	0.769
PC 2	0.124	0.186	0.667	0.510
PC 3	0.177	0.159	1.111	0.276
Temp	0.017	0.009	1.860	0.073
Temp × PC1	0.005	0.004	1.263	0.217
Temp × PC2	-0.007	0.007	-0.996	0.328
Temp × PC3	-0.010	0.006	-1.861	0.073

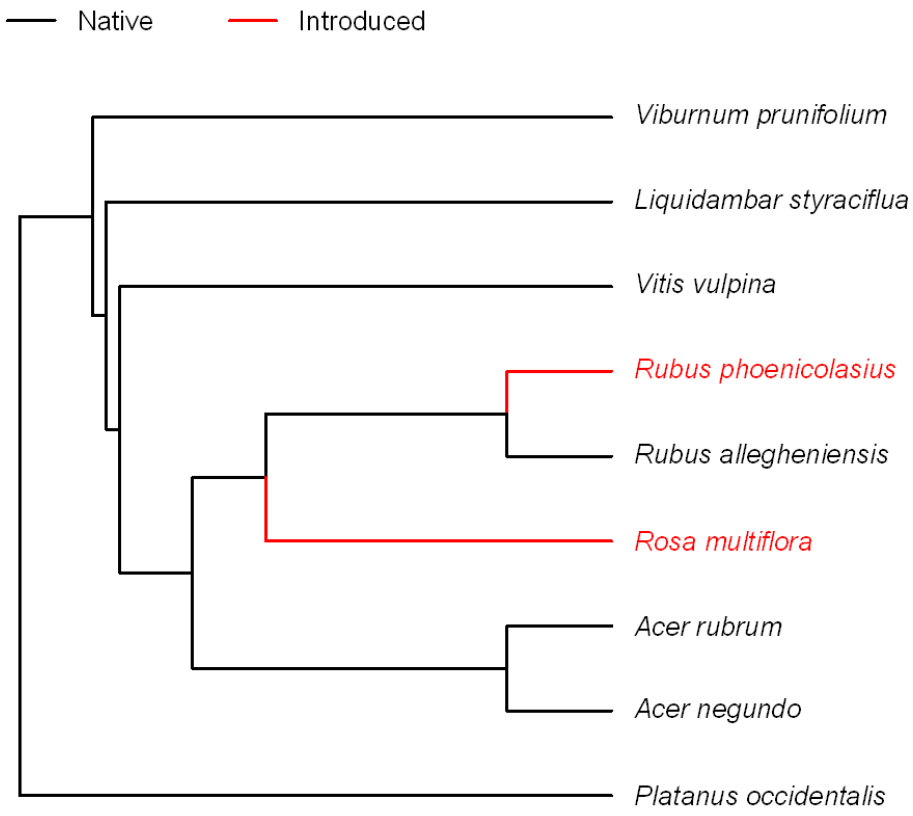
Growth				
Parameter	Estimate	Std. error	*t*-statistic	p-value
Intercept	–0.0002	0.0044	–0.0409	0.9677
PC 1	–0.0019	0.0015	–1.2689	0.2166
PC 2	0.0043	0.0033	1.2851	0.2110
PC 3	**0.0047**	**0.0023**	**2.0156**	**0.0552**
Temp	0.0002	0.0002	1.0278	0.3143
Temp × PC1	0.0001	0.0001	1.9743	0.0600
Temp × PC2	–0.0001	0.0001	–1.2004	0.2417
Temp × PC3	**–0.0003**	**0.0001**	**–3.3156**	**0.0029**

Table A8. Coefficient table of multiple regression of *P. japonica* feeding preferences during chemical extract bioassays. Statistically significant relationships are in bold.

25°C				
Plant species	Estimate	Std. error	*t*-value	p-value
Acer negundo	–0.094	0.042	–2.259	0.028
Acer rubrum	–0.186	0.181	–1.030	0.308
Liquidambar styraciflua	–0.115	0.448	–0.257	0.798
Plantanus occidentalis	0.177	0.217	0.816	0.418
Rosa multiflora	0.230	0.428	0.537	0.594
Rubus allegheniensis	0.160	0.113	1.421	0.161
Rubus phoenicolasius	0.204	0.200	1.020	0.312
Viburnum prunifolium	0.066	0.054	1.227	0.225
Vitis vulpina	0.287	0.251	1.145	0.257

35°C				
Plant species	Estimate	Std. error	*t*-value	p-value
Acer negundo	–0.532	0.352	–1.513	0.136
Acer rubrum	–0.329	0.259	–1.270	0.210
Liquidambar styraciflua	–0.089	0.421	–0.212	0.833
Plantanus occidentalis	–0.513	0.583	–0.880	0.383
Rosa multiflora	**1.265**	**0.287**	**4.408**	**0.000**
Rubus allegheniensis	–0.125	0.324	–0.386	0.701
Rubus phoenicolasius	**–1.093**	**0.299**	**–3.656**	**0.001**
Viburnum prunifolium	–0.043	0.449	–0.095	0.925
Vitis vulpina	**0.766**	**0.349**	**2.198**	**0.032**

Figure B1. Phylogenetic tree for plant species used in feeding assays. Phylogenetic tree was constructed using an APG3 megatree accessed via Phylomatic (<http://phylodiversity.net/phylomatic/>). We used Phylocom software (Webb et al. 2008) to apply dates for nodes (Wikström et al. 2001). When dates for divergence were unavailable, we assumed a branch length of 1.



References

Webb, C. et al. 2008. Phylocom: software for the analysis of phylogenetic community structure and trait evolution. – Bioinformatics 24: 2098–2100.

Wikström, N. et al. 2001. Evolution of the angiosperms: calibrating the family tree. – Proc. R. Soc. B 268: 2211–2220.

Figure B2. Relationship between temperature and variance of *P. japonica* consumption rates among plant species. Variance at each temperature was calculated as the variance of mean consumption of each plant species.

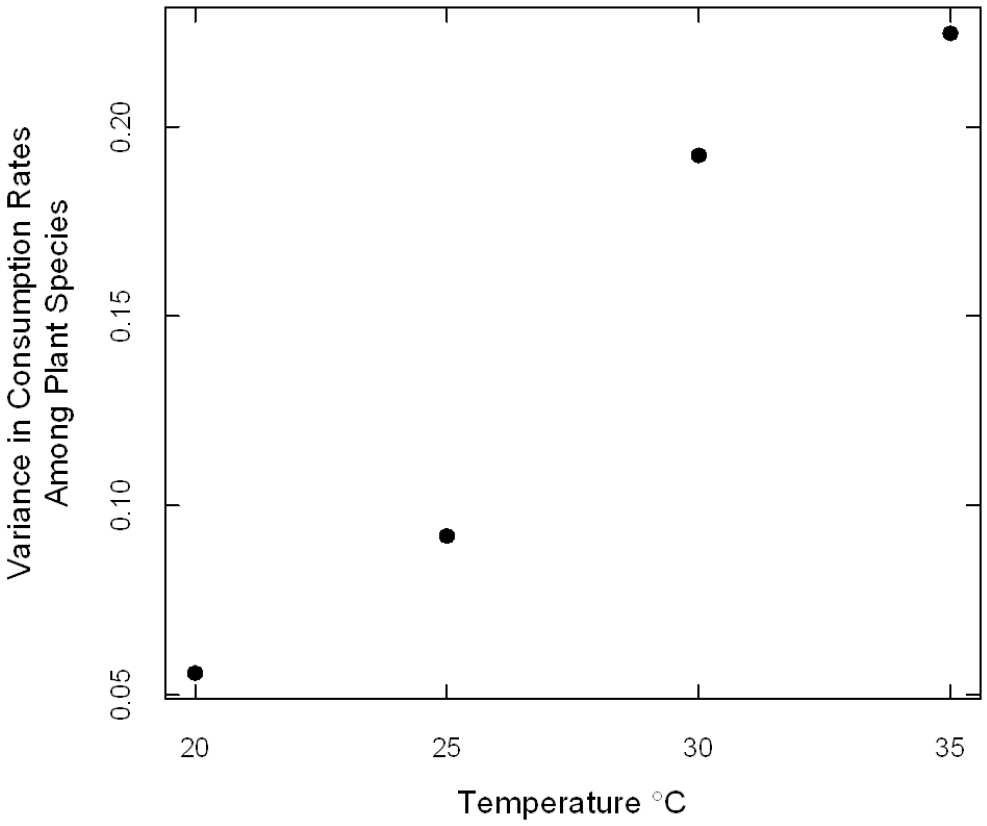


Figure B3. Relationship between temperature and variance of *P. japonica* mass changes among plant species. Variance at each temperature was calculated as the variance of mean mass changes on each plant species.