

Ecography

ECOG-00466

Rosauer, D. F., Ferrier, S., Williams, K. J., Manion, G., Keogh, J. S. and Laffan, S. W. 2013. Phylogenetic generalised dissimilarity modelling: a new approach to analysing and predicting spatial turnover in the phylogenetic composition of communities. – *Ecography* 36: xxx–xxx.

Supplementary material

Appendix 1

Table A1: Predictors selected for the final GDM models

Group	Predictor Description	Percentage contribution			
		Myobatrachidae species	Myobatrachidae phylo 0.4	Hylidae species	Hylidae phylo 0.6
Climate -growth-index	Growth Index C3 Microtherm Plants	6.4	6.7	10.4	10.7
	Growth Index C3 Mesotherm Plants	7.8	8.8	8.7	8.0
	Growth Index C3 Megatherm Plants			2.9	9.7
	Growth Index C4 Plants	4.8	4.1	2.3	1.9
Climate -humidity	Relative Humidity - Maximum	5.5	6.7		
Climate –moisture	Aridity Index - Maximum	0.9	0.2		
	Monthly Evaporation - Minimum			4.5	6.3
	Rainfall Change - Maximum	5.0	7.8	3.1	4.4
	Rainfall Change - Minimum			10.7	9.9
	Rainfall Seasonality (Oct-Mar, Apr-Sep)			4.3	1.5
	Rainfall Seasonality - Summer-Winter (Dec-Feb, Jun-Aug)	24.5	17.8	15.1	12.8
	Rainfall Seasonality - Spring-Autumn	5.9	3.1		
Climate -soil-water balance	Maximum Soil Water Potential			0.1	0.8
Climate – solar radiation	Minimum Solar Radiation	4.7	7.9	11.4	8.5
	Maximum Solar Radiation	6.0	5.8		
Climate –temperature	Warmest Overnight Temperature	1.9	3.6		
	Change in Minimum Temperature - Maximum			6.4	6.6
	Change in Minimum Temperature - Minimum			3.1	1.7
	Change Maximum Temperature - Minimum	3.7	1.7		
Distance	Distance to Permanent Water, up to 1 degree	1.9	2.4		
Geophysics	Bouguer Gravity Anomalies	4.7	2.5		
Geology	Geological Age Range	2.6	2.5		
Soil nutrients	Mean Soil Mineral Nitrogen	5.1	6.9		
	Mean Soil Plant Available Nitrogen			3.2	3.4
	Mean Concentration of Dissolved Phosphorous in Soil Water			4.6	5.8
	Mean Plant Available Mineral Phosphorous in Soil			2.6	2.0
Terrain	Relative Relief			5.3	4.3
	Proportion of Flat Ridgetop Terrain	1.3	1.5		
	Mean % Slope	5.8	8.4	1.3	1.9
Vegetation	Canopy Cover Range of the Tallest Stratum	1.4	1.6		

Key to colours:

- Red = top ranking predictor
- Pink = rank 2 to 3
- Grey = rank 4 to 6

Table S1. These predictors were selected for each frog family using the stepwise backwards elimination process described in the methods. The relative contribution is the proportion of ecological distance predicted by the model, which is attributed to the full range of variation in values for this predictor. The higher the value the more compositional turnover is attributed to changes in this aspect of the environment.

Table A2. Correlations between the environmental predictors selected for the Myobatrachid or Hylid generalized dissimilarity models.

	Myobatrachid model	Hylid model	GI C3 Microtherm Plants	GI C3 Mesotherm Plants	GI C3 Megatherm Plants	GI C4 Plants	Maximum Relative Humidity	Aridity Index - Maximum	Monthly Evaporation - Minimum	Rainfall Change - Maximum	Rainfall Change - Minimum	Rainfall Seasonality (Oct-Mar, Apr-Sep)	Rainfall Seasonality - Summer-Winter (Dec-Feb, Jun-Aug)	Rainfall Seasonality - Spring-Autumn	Maximum Soil Water Potential	Minimum Solar Radiation	Maximum Solar Radiation	Warmest Overnight Temperature	Change in Minimum Temperature - Maximum	Change in Minimum Temperature - Minimum	Change Maximum Temperature - Minimum	Distance to Permanent Water, up to 1 degree	Bouguer Gravity Anomaly	Geological Age Range	Mean Soil Mineral Nitrogen	Mean Soil Plant Available Nitrogen	Mean Concentration of Dissolved Phosphorous in Soil Water	Concentration of Dissolved Phosphorous in Soil Water	Relative Relief	Proportion of Flat Ridgetop Terrain	Mean % Slope	Canopy Cover Range of the Tallest Stratum	
Plant growth index (GI)	GI C3 Microtherm Plants	•	1																														
	GI C3 Mesotherm Plants	•	0.603	1																													
	GI C3 Megatherm Plants	•	-0.227	0.435	1																												
	GI C4 Plants	•	-0.277	0.344	0.993	1																											
Moisture	Maximum Relative Humidity	•	0.744	0.676	0.153	0.097	1																										
	Aridity Index - Maximum	•	0.632	0.542	0.316	0.294	0.611	1																									
	Monthly Evaporation - Minimum	•	-0.747	-0.516	0.354	0.43	0.744	0.283	1																								
	Rainfall Change - Maximum	•	-0.179	0.288	0.861	0.876	0.122	0.421	0.454	1																							
	Rainfall Change - Minimum	•	0.253	-0.249	-0.92	-0.94	-0.05	0.364	0.508	0.931	1																						
	Rainfall Seasonality (Oct-Mar, Apr-Sep)	•	-0.541	-0.22	0.636	0.693	0.478	0.026	0.816	0.622	0.731	1																					
	Rainfall Seasonality - Summer-Winter (Dec-Feb, Jun-Aug)	•	-0.452	-0.137	0.727	0.784	0.266	0.094	0.707	0.679	0.818	0.905	1																				
	Rainfall Seasonality - Spring-Autumn	•	0.353	0.263	0.067	0.102	0.316	0.138	0.461	0.225	0.14	0.125	0.126	1																			
	Maximum Soil Water Potential	•	0.511	0.661	0.586	0.56	0.654	0.713	0.192	0.572	0.568	0.11	0.286	0.120	1																		
Solar radiation	Minimum Solar Radiation	•	-0.791	-0.414	0.499	0.562	0.721	0.293	0.937	0.499	0.596	0.848	0.771	0.349	0.145	1																	
	Maximum Solar Radiation	•	-0.536	-0.741	0.549	0.506	0.524	-0.68	0.249	0.418	0.447	0.208	0.254	0.389	0.638	0.168	1																
Temperature	Warmest Overnight Temperature	•	-0.849	-0.499	0.328	0.389	0.778	0.432	0.89	0.354	0.409	0.669	0.577	0.532	0.302	0.894	0.405	1															
	Change in Minimum Temperature - Maximum	•	-0.577	-0.481	0.069	0.034	-0.79	0.531	0.514	0.148	0.056	0.423	0.24	0.061	0.547	0.591	0.312	0.654	1														
	Change in Minimum Temperature - Minimum	•	0.451	0.543	0.43	0.409	0.673	0.601	0.234	0.464	0.423	0.017	0.154	0.26	0.664	0.235	0.612	0.491	0.779	1													
	Change Maximum Temperature - Minimum	•	0.006	0.463	0.851	0.849	0.3	0.456	0.243	0.793	0.822	0.546	0.623	0.082	0.628	0.322	0.652	0.067	0.308	0.733	1												
Distance	Distance to Permanent Water, up to 1 degree	•	-0.252	-0.418	-0.42	0.404	0.301	0.367	0.061	0.367	0.36	0.181	0.215	0.044	0.443	0.017	0.449	0.042	0.112	-0.28	0.432	1											
Geology & Geophysics	Bouguer Gravity Anomaly	•	0.03	0.323	0.52	0.513	0.247	0.252	0.108	0.461	0.472	0.292	0.337	0.037	0.374	0.101	0.393	0.07	-0.2	0.403	0.564	0.508	1										
	Geological Age Range	•	0.029	0.093	0.18	0.181	0	0.137	0.078	0.181	0.183	0.134	0.129	0.027	0.142	0.124	0.154	0.054	0.066	0.052	0.152	0.177	0.079	1									
Soil nutrients	Mean Soil Mineral Nitrogen	•	0.722	0.694	0.125	0.067	0.589	0.657	0.496	0.109	0.061	-0.23	0.179	0.243	0.510	0.484	0.663	0.564	0.408	0.389	0.228	0.330	0.161	0.06	1								
	Mean Soil Plant Available Nitrogen	•	0.797	0.588	0.005	0.042	0.615	0.719	0.544	0.015	0.027	0.274	0.221	0.27	0.501	0.551	0.638	0.657	0.448	0.398	0.152	0.303	0.102	0.055	0.889	1							
	Concentration of Dissolved Phosphorous in Soil Water	•	0.783	0.517	0.355	0.424	0.684	0.297	0.873	0.407	0.466	0.721	0.644	0.438	0.221	0.864	0.290	0.867	0.522	0.292	0.193	0.041	0.101	0.074	0.613	0.660	1						
	Mean Plant Available Mineral Phosphorous in Soil	•	0.724	0.696	0.124	0.065	0.59	0.655	0.498	0.107	0.059	0.232	0.181	0.244	0.51	0.486	0.663	0.566	0.409	0.39	0.227	0.329	0.16	0.06	1	0.889	0.616	1					
Terrain	Relative Relief	•	0.428	0.462	0.164	0.127	0.318	0.487	0.227	0.155	0.136	0.047	0.036	0.093	0.38	0.189	0.468	0.312	0.217	0.233	0.188	0.218	0.06	0.247	0.549	0.557	0.295	0.549	1				
	Proportion of Flat Ridgetop Terrain	•	-0.085	-0.114	0.048	-0.04	0.106	-0.08	0.071	0.028	0.023	0.019	0.017	0.061	0.089	0.073	0.102	0.077	0.071	0.084	0.075	0.146	0.103	0.014	-0.1	0.104	0.081	-0.1	0.116	1			
	Mean % Slope	•	0.453	0.471	0.158	0.121	0.333	0.509	0.239	0.151	0.131	0.054	0.041	0.098	0.393	0.206	0.484	0.329	0.232	0.245	0.192	0.225	0.064	0.247	0.568	0.579	0.31	0.568	0.978	0.119	1		
Vegetation	Canopy Cover Range of the Tallest Stratum	•	-0.062	-0.083	0.065	0.062	0.094	0.102	0.106	0.102	0.095	0.107	0.061	0.06	-0.08	0.113	0.125	0.077	0.094	0.02	0.035	0.032	-0.02	0.029	0.124	0.117	0.03	0.124	0.097	0.025	0.099	1	

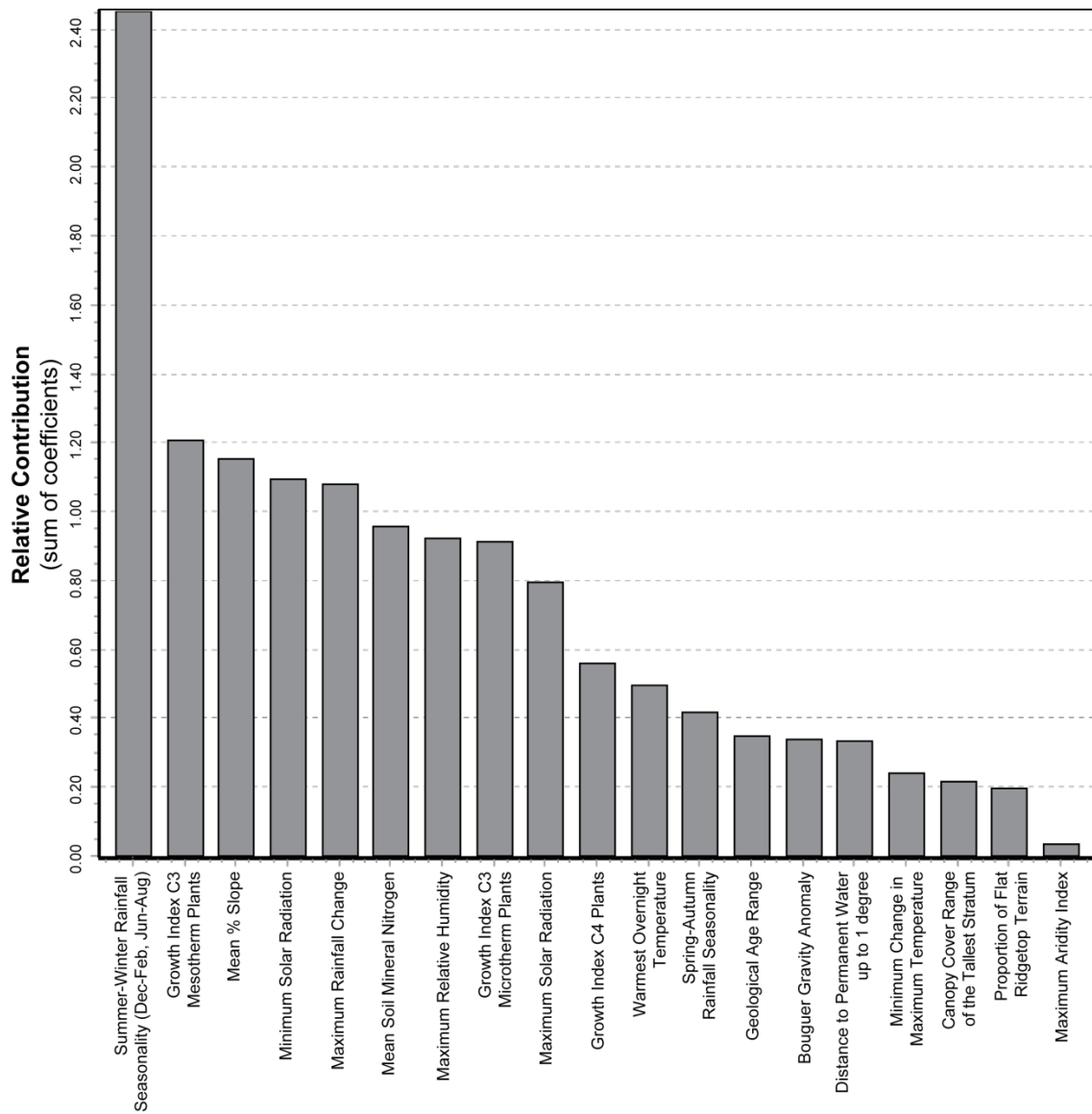


Figure A1. Relative contribution by predictors of compositional turnover in the Myobatrachidae phylogenetic GDM model. The y axis represents the sum of coefficients from the spline function for each predictor, which is the contribution to ecological distance across the full range of the predictor.