Oikos

Appendix 1

Table A1. Results of LMM (mean±SE) on climatic variables testing the effect matrix type (natural, path and road substrates), on the temperature and the luminosity during day (8 a.m. to 8 p.m.) and night (8 p.m. to 8 a.m.) in the experimental system. Tank identity was included as a random intercept in the models. Significant effects are highlighted in bold.

Climatic variables	Matrix types	Period	
		Day	Night
Temperature (T°C)	Natural matrix	19.698±0.126	13.722±0.062
	Path matrix	23.791±0.222	12.234±0.080
	Road matrix	26.394±0.248	12.927±0.083
	Statistics	$\chi^2_2 = 58.707$, p < 0,001	$\chi^2_2 = 18.385$, p < 0,001
Luminosity (lux)	Natural matrix	4051±188	9.132±1.283
	Path matrix	47772±1201	96.542±9.277
	Road matrix	54834±1262	86.898±8.257
	Statistics	$\chi^2_2 = 94.788$, p < 0,001	$\chi^2_2 = 116.73$, p < 0,001

Table A2. Results of LMM testing the impact of predation risk, matrix type and movement status (movers versus residents) on toad phenotypic traits (body and relative leg length). Significant and marginal effects are respectively highlighted in bold and underlined.

Factors	Phenotypic traits							
	Body length				Relative leg length			
	χ^2	df	p	p-adjust*	χ^2	df	p	p-adjust*
Predation	1.495	1	0.221	0.221	2.307	1	0.129	0.221
Matrix type	0.8	2	0.67	0.77	0.522	2	0.77	0.77
Movement status	5.99	1	**0.014**	**0.028**	3.646	1	<u>0.056</u>	<u>0.056</u>
Predation × Matrix type	0.06	2	0.971	0.971	0.611	2	0.737	0.971
Predation × Movement status	0.038	1	0.845	0.845	1.105	1	0.293	0.586
Matrix type × Movement status	1.459	2	0.482	0.482	2.507	2	0.285	0.482
Predation × Matrixtype × Movement status	0.443	2	0.802	0.802	7.266	2	**0.026**	<u>0.052</u>

* Given we analyzed differences in two phenotypic traits, even if they are made independent by using relative leg length, we applied a family wise correction using a FDR adjusted p-value in analysis on phenotypic traits to decrease false discovery rate.

Table A3. Results of LMM testing the effect of predation risk (yes *versus* no) and movement status (residents *versus* movers) on phenotypic trait (body length and relative leg length) and cost (body mass) in each matrix type (natural, path and road substrates). Significant effects are highlighted in bold.

Phenotypes	Matrix	Factors	Sdt. estimate	SE	95% CI	χ^2_1	p
Phenotypic trait: Body length	Natural	Movement status	-0.612	0.365	-1.328, 0.104	3.659	0.056
		Predation	-0.329	0.371	-1.056, 0.397	0.633	0.426
		Movement status × Predation	0.184	0.403	-0.607, 0.974	0.207	0.649
	Path	Movement status	-0.182	0.455	-1.073, 0.709	1.036	0.309
		Predation	-0.096	0.465	-1.008, 0.815	0.459	0.498
		Movement status × Predation	-0.154	0.509	-1.151, 0.843	0.092	0.762
	Road	Movement status	-0.066	0.383	-0.817, 0.685	0.737	0.391
		Predation	-0.026	0.386	-0.782, 0.729	0.338	0.561
		Movement status × Predation	-0.259	0.449	-1.138, 0.621	0.332	0.564
Phenotypic trait: Relative leg length	Natural	Movement status	-0.237	0.361	-0.945, 0.472	1.915	0.166
		Predation	-0.304	0.454	-1.195, 0.587	1.366	0.243
		Movement status × Predation	-0.188	0.404	-0.98, 0.604	0.216	0.642
	Path	Movement status	-1.004	0.348	-1.687, -0.322	3.082	0.079
		Predation	-0.741	0.352	-1.43, -0.052	0.303	0.582
		Movement status × Predation	0.890	0.389	0.128, 1.162	5.246	**0.022**
	Road	Movement status	0.15	0.368	-0.57, 0.871	0.001	0.977
		Predation	-0.015	0.383	-0.767, 0.736	0.258	0.612
		Movement status × Predation	-0.255	0.431	-1.1, 0.59	0.351	0.554

			Estimate	SE	CI		p
Movement cost: Body mass	Natural	Movement status	0.416	0.178	0.066, 0.766	0.339	0.56
		Predation	0.939	0.52	-0.079, 1.957	1.344	0.246
		Initial body mass	-1.47	0.514	-2.477, -0.463	8.189	**0.004**
		Leg length	1.636	0.41	0.833, 2.439	15.935	**<0.001**
		Body size	-0.231	0.589	-1.386, 0.924	0.154	0.695
		Movement status × Predation	-0.489	0.178	-0.839, -0.14	7.517	**0.006**
	Path	Movement status	-1.071	0.709	-2.461, 0.319	1.702	0.192
		Predation	-1.158	0.735	-2.597, 0.282	1.203	0.197
		Initial body mass	1.089	1.627	-2.099, 4.277	0.448	0.503
		Leg length	-1.484	0.791	-3.035, 0.068	3.514	0.061
		Body size	0.069	1.316	-2.51, 2.648	0.003	0.958
		Movement status × Predation	1.561	0.69	0.209, 2.914	5.119	**0.024**
	Road	Movement status	0.612	0.287	0.05, 1.173	11.971	**0.001**
		Predation	0.117	0.289	-0.45, 0.684	0.481	0.488
		Initial body mass	-0.914	1.035	-2.941, 1.114	1.184	0.277
		Leg length	1.158	0.55	0.079, 2.236	4.812	**0.028**
		Body size	-0.154	0.948	-2.011, 1.703	0.005	0.946
		Movement status × Predation	0.078	0.363	-0.633, 0.79	0.047	0.829