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## Climatic niche evolution is not slower in threatened species

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### *Supplementary Material*

**Sup. Mat. 1. Rate of niche evolution is not slower for the species threatened compared to non-threatened species.** In this analysis, phylogenetic least squares regressions were performed using the variance-covariance matrix corresponding to each phylogenetic tree. Even if some p-values were significant, the slopes were not consistent between clades and the overall proportion of variance explained by IUCN was very low  $R^2_{\text{adjust}} < 0.005$ .

Clade	Method	Estimate	Std. Error	t value	P-value		$R^2_{\text{adjust}}$
Birds	method 1	2.45	1.078	2.273	0.023	*	0.001
	method 2	$2.64 \times 10^{-4}$	0.001	0.249	0.804		$-1.61 \times 10^{-4}$
	method 3	0.335	0.296	1.132	0.258		$4.82 \times 10^{-5}$
Mammals	method 1	-0.748	0.238	-3.142	0.002	**	0.003
	method 2	$-3.48 \times 10^{-3}$	0.002	-1.589	0.112		0.001
	method 3	-0.159	0.081	-1.959	0.050		0.001
Amphibians	method 1	$-5.78 \times 10^{-2}$	0.046	-1.25	0.211		0.001
	method 2	$8.87 \times 10^{-4}$	0.001	0.806	0.421		$-3.12 \times 10^{-4}$
	method 3	$2.09 \times 10^{-2}$	0.022	0.963	0.336		$-6.53 \times 10^{-5}$
Squamates	method 1	0.197	0.074	2.672	0.008	**	$6.19 \times 10^{-3}$
	method 2	$8.65 \times 10^{-3}$	0.005	1.89	0.059		$2.60 \times 10^{-3}$
	method 3	$5.47 \times 10^{-2}$	0.028	1.979	0.048	*	$2.95 \times 10^{-3}$

417 **Sup. Mat. 2. Rate of niche evolution is not slower for the species threatened by climate**  
 418 **change compared to non-threatened species.** In this analysis, phylogenetic least squares  
 419 regressions were performed using the variance-covariance matrix corresponding to each  
 420 phylogenetic tree. The slope were not consistent between clades and the overall proportion of  
 421 variance explained by IUCN was very low  $R^2_{\text{ajust}} < 0.005$ .

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Clade	Method	Estimate	Std. Error	t value	P-value	$R^2_{\text{ajust}}$
Birds	method 1	-0.8984	1.5726	-0.571	0.568	0.000
	method 2	0.00014	0.00164	0.087	0.931	0.000
	method 3	0.03013	0.43956	0.069	0.945	0.000
Mammals	method 1	-0.649	0.3728	0.0818	0.082	0.001
	method 2	-0.002743	0.00384	-0.714	0.476	0.000
	method 3	-0.06018	0.13729	-0.438	0.661	0.000
Amphibians	method 1	-0.04981	0.11777	-0.423	0.672	-0.001
	method 2	-0.00406	0.00241	-1.683	0.093	0.002
	method 3	-0.02363	0.03634	-0.65	0.516	-0.001
Squamates	method 1	0.005235	0.166281	0.031	0.975	-0.001
	method 2	0.004747	0.011079	0.428	0.668	-0.001
	method 3	-0.01581	0.06498	-0.243	0.808	-0.001

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434 **Sup. Mat. 3. Table showing the association between rate of niche evolution and IUCN**  
 435 **status.** In this analysis, we considered “Data Deficient” species as threatened species, and it  
 436 did not change the results presented in the main text of the manuscript (Table 1).

		Non-threatened species			Threatened species (all)					Threatened species (climate)				
		Mean	Median	sd	Mean	Median	sd	F-Value	P-value	Mean	Median	sd	F-Value	P-value
Method 1	Birds	3.73	0.74	58.5	4.56	0.83	33.93	<b>0.09</b>	<b>0.95</b>	3.23	0.95	14.64	<b>0.01</b>	<b>0.979</b>
	Mammals	2.97	0.76	14.9	2.82	0.67	10.17	<b>0.05</b>	<b>0.918</b>	2.71	0.73	8.64	<b>0.02</b>	<b>0.923</b>
	Amphibians	0.59	0.31	3.21	0.43	0.28	0.55	<b>0.69</b>	<b>0.741</b>	0.4	0.2	0.7	<b>0.15</b>	<b>0.878</b>
	Squamates	0.8	0.36	2.37	0.55	0.29	1.3	<b>1.29</b>	<b>0.627</b>	0.97	0.65	1.23	<b>0.04</b>	<b>0.883</b>
Method 2	Birds	0.91	0.88	0.3	0.92	0.88	0.52	<b>0.79</b>	<b>0.826</b>	0.95	0.88	0.43	<b>2.65</b>	<b>0.606</b>
	Mammals	1.02	0.93	0.43	0.92	0.74	0.41	<b>25.05</b>	<b>0.028</b>	0.95	0.85	0.47	<b>2.12</b>	<b>0.384</b>
	Amphibians	0.56	0.49	0.16	0.55	0.49	0.15	<b>1.52</b>	<b>0.637</b>	0.48	0.47	0.13	<b>9.99</b>	<b>0.093</b>
	Squamates	0.64	0.6	0.29	0.66	0.56	0.33	<b>0.25</b>	<b>0.825</b>	0.92	0.6	0.5	<b>6.16</b>	<b>0.057</b>
Method 3	Birds	3.25	2.11	16.2	3.4	2.16	9.24	<b>0.04</b>	<b>0.954</b>	3.11	2.32	4.34	<b>0.01</b>	<b>0.975</b>
	Mammals	5.08	2.6	8.41	4.86	2.27	7.87	<b>0.29</b>	<b>0.832</b>	3.64	1.93	5.47	<b>2.19</b>	<b>0.364</b>
	Amphibians	1.21	0.85	1.24	1.26	0.83	1.31	<b>0.34</b>	<b>0.836</b>	1.4	0.85	1.09	<b>0.96</b>	<b>0.665</b>
	Squamates	1.13	0.95	0.91	1.02	0.91	0.57	<b>1.42</b>	<b>0.609</b>	1.21	1.05	0.54	<b>0.06</b>	<b>0.857</b>

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454 **Sup. Mat. 4. Strong phylogenetic signal in extinction risk.** Phylogenetic signal (Pagel's  
455 lambda) was computed for the four phylogenies using the continuous values of IUCN  
456 conservation status at the tips. We used the *phylosig* function of the *R* package *phytools* to test  
457 whether lambda estimated from the data was significantly different than 0. LogL is the log-  
458 likelihood for lambda estimated from the data and LogL0 is the log-likelihood for Lambda=0.  
459 Our results suggest that Lambda is significantly different than 0 in all clades (P<0.001), and  
460 thus that there is a strong phylogenetic signal in species vulnerability.

Clade	Lambda	LogL	LogL0	P-value
Birds	0.473	-7965.9	-8256.7	$1.67 \times 10^{-128}$
Mammals	0.548	-8448.1	-8708.1	$4.43 \times 10^{-115}$
Amphibians	0.728	-1969.3	-2102.8	$4.91 \times 10^{-60}$
Squamates	0.393	-1462.8	-1507.7	$2.79 \times 10^{-21}$

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