

Supplementary Material to “Evolutionary patterns in squamate mitogenomes: are selective regimes associated with fossoriality and limblessness?”

Table S4 – Selection analyses of mitochondrial genes in selected squamate species based on PAML and ETE3 lineage-specific ω estimates. (a) Results of the one-rate model (M0), in which a single ω value is shared among all species, and (b) the neutral one-rate model (M0, $\omega = 1$), in which all species are constrained to have $\omega = 1$. The remaining sections show the results within each ecological category: (c) limbless and (d) fossorial. Abbreviations: ω (omega) = ratio of non-synonymous to synonymous substitutions (dN/dS); np = number of parameters; LnL = log-likelihood; BACK = background group; LRT = likelihood ratio test; b_free = alternative model; $\ln(\omega_F)$ = natural logarithm of ω estimated for foreground lineages; $\ln(\omega_B)$ = natural logarithm of ω estimated for background lineages; *Pegregius* = *Plestiodon egregius*. Significant p-values ($p < 0.05$) are highlighted in gray, and $\ln(\omega_F)/\ln(\omega_B)$ values > 1 are shown in bold, indicating lineages in which ω is higher than in the background.

a.				b.				
M0				M0 ($\omega = 1$)				
	ω	np	LnL		ω	np	LnL	LRT
ALL	0.0814	110	-362213.844	ALL	1.0000	109	-409525.950	94624.210
ATP6	0.0779	110	-23285.996	ATP6	1.0000	109	-25910.314	5248.636
ATP8	0.2925	110	-7294.318	ATP8	1.0000	109	-7470.471	352.305
COX1	0.0257	110	-37128.356	COX1	1.0000	109	-47698.641	21140.570
COX2	0.0432	110	-18363.986	COX2	1.0000	109	-22014.304	7300.638
COX3	0.0449	110	-20693.125	COX3	1.0000	109	-25159.226	8932.202
								pval

CYTB	0.0565	110	-33300.010
ND1	0.0480	110	-27583.924
ND2	0.0768	110	-36018.826
ND3	0.0723	110	-11630.569
ND4	0.0725	110	-45633.625
ND4L	0.0900	110	-10282.854
ND5	0.0778	110	-62362.039
ND6	0.0952	110	-19991.605

CYTB	1.0000	109	-38961.215	11322.409	<0.0001
ND1	1.0000	109	-32721.554	10275.259	<0.0001
ND2	1.0000	109	-39994.038	7950.424	<0.0001
ND3	1.0000	109	-13012.318	2763.500	<0.0001
ND4	1.0000	109	-51291.055	11314.859	<0.0001
ND4L	1.0000	109	-11322.576	2079.444	<0.0001
ND5	1.0000	109	-69572.705	14421.331	<0.0001
ND6	1.0000	109	-21360.994	2738.779	<0.0001

C.

LIMBLESS													
	ω (b_free)					b_free x M0				LN(ω F)/LN(ω B)			
	BACK	Amphisbaenia	<i>Isopachys</i>	Serpentes	Anguinae	np	LnL	LRT	pval	Amphisbaenia	<i>Isopachys</i>	Serpentes	Anguinae
ALL	0.0785	0.0738	0.0503	0.0880	0.0833	114	-362174.324	79.040	<0.0001	1.0242	1.1750	0.9549	0.9764
ATP6	0.0680	0.0602	0.0080	0.0842	0.1060	114	-23273.609	24.774	0.0001	1.0451	1.7947	0.9203	0.8349
ATP8	0.3176	0.2823	0.0339	0.3326	0.2113	114	-7290.095	8.446	0.0765	1.1025	2.9500	0.9598	1.3552
COX1	0.0241	0.0199	0.0160	0.0326	0.0230	114	-37111.030	34.652	<0.0001	1.0511	1.1100	0.9188	1.0129
COX2	0.0438	0.0312	0.0361	0.0455	0.0550	114	-18358.236	11.500	0.0215	1.1080	1.0616	0.9878	0.9269
COX3	0.0413	0.0340	0.0310	0.0506	0.0580	114	-20684.026	18.198	0.0011	1.0610	1.0905	0.9361	0.8935
CYTB	0.0500	0.0512	0.0291	0.0662	0.0604	114	-33289.161	21.699	0.0002	0.9919	1.1802	0.9061	0.9366
ND1	0.0561	0.0378	0.0306	0.0436	0.0589	114	-27573.631	20.586	0.0004	1.1375	1.2107	1.0874	0.9831
ND2	0.0879	0.0415	0.0221	0.0810	0.0773	114	-35999.454	38.743	<0.0001	1.3088	1.5673	1.0337	1.0531
ND3	0.0751	0.0383	0.0351	0.0843	0.0731	114	-11623.534	14.070	0.0071	1.2599	1.2939	0.9553	1.0104
ND4	0.0763	0.0533	0.0366	0.0710	0.0928	114	-45620.005	27.241	<0.0001	1.1396	1.2859	1.0279	0.9238
ND4L	0.0921	0.0548	0.0101	0.1036	0.1125	114	-10271.854	22.001	0.0002	1.2173	1.9286	0.9506	0.9158
ND5	0.0645	0.0649	0.0440	0.0889	0.0971	114	-62338.990	46.098	<0.0001	0.9978	1.1393	0.8832	0.8509
ND6	0.0904	0.0420	0.0151	0.0898	0.1654	114	-19973.670	35.869	<0.0001	1.3191	1.7457	1.0031	0.7489

d.

	FOSSORIAL														
	ω (b_free)											b_free x M0			
					Serpentes										
	BACK	Amphisbaenia	<i>Isopachys</i>	Pegregius	Scolecophidia	<i>Anilius</i>	<i>Cylindrophis</i>	<i>Xenopeltis</i>	<i>Achalinus</i>	<i>Micrurus</i>	<i>Calamaria</i>	np	LnL	LRT	pval
ALL	0.0846	0.0738	0.0496	0.0606	0.0775	0.0668	0.0689	0.0596	0.0962	0.0780	0.0939	120	-362156.500	114.690	<0.0001
ATP6	0.0841	0.0601	0.0073	0.0429	0.0493	0.0446	0.0451	0.0294	0.1217	0.1398	0.0567	120	-23264.660	42.672	<0.0001
ATP8	0.3025	0.2802	0.1003	0.0636	0.4794	0.5044	0.2311	0.1273	0.4163	0.3270	0.0058	120	-7283.279	22.078	0.0147
COX1	0.0279	0.0199	0.0159	0.0162	0.0337	0.0239	0.0225	0.0166	0.0293	0.0214	0.0358	120	-37115.173	26.367	0.0033
COX2	0.0489	0.0310	0.0354	0.0367	0.0168	0.0468	0.0508	0.0136	0.0436	0.0991	0.0607	120	-18343.570	40.832	<0.0001
COX3	0.0486	0.0342	0.0285	0.0319	0.0409	0.0394	0.0179	0.0261	0.0593	0.0660	0.0618	120	-20680.006	26.237	0.0034
CYTB	0.0558	0.0510	0.0290	0.0817	0.0549	0.0587	0.0690	0.0466	0.0719	0.0879	0.0804	120	-33291.706	16.608	0.0835
ND1	0.0539	0.0379	0.0306	0.0956	0.0443	0.0255	0.0248	0.0506	0.0383	0.0287	0.0628	120	-27569.547	28.754	0.0014
ND2	0.0857	0.0416	0.0220	0.0872	0.0489	0.0343	0.0430	0.0403	0.1140	0.0848	0.0755	120	-35986.256	65.140	<0.0001
ND3	0.0784	0.0383	0.0348	0.0733	0.0664	0.0329	0.0436	0.1109	0.1173	0.1782	0.0265	120	-11618.226	24.685	0.0060
ND4	0.0807	0.0533	0.0358	0.0656	0.0367	0.0232	0.0561	0.0444	0.0954	0.0690	0.0662	120	-45603.902	59.446	<0.0001
ND4L	0.1072	0.0547	0.0117	0.0448	0.1121	0.1347	0.0784	0.0293	0.1627	0.0380	0.0016	120	-10258.273	49.163	<0.0001
ND5	0.0783	0.0654	0.0438	0.0638	0.0391	0.0480	0.0778	0.0666	0.1240	0.1023	0.0843	120	-62336.366	51.348	<0.0001
ND6	0.1096	0.0422	0.0168	0.0707	0.0932	0.0313	0.0076	0.0648	0.0983	0.0699	0.1601	120	-19976.244	30.721	0.0007

d.

FOSSORIAL (cont.)										
LN(ω F)/LN(ω B)										
				Serpentes						
	Amphisbaenia	<i>Isopachys</i>	Pegregius	Scolecophidia	<i>Anilius</i>	<i>Cylindrophis</i>	<i>Xenopeltis</i>	<i>Achalinus</i>	<i>Micrurus</i>	<i>Calamaria</i>
ALL	1.0556	1.2167	1.1350	1.0357	1.0959	1.0835	1.1418	0.9480	1.0333	0.9580
ATP6	1.1357	1.9875	1.2724	1.2161	1.2564	1.2521	1.4243	0.8510	0.7950	1.1592
ATP8	1.0640	1.9237	2.3041	0.6149	0.5724	1.2253	1.7239	0.7330	0.9350	4.3116
COX1	1.0941	1.1570	1.1523	0.9469	1.0428	1.0596	1.1451	0.9855	1.0735	0.9303
COX2	1.1509	1.1074	1.0952	1.3548	1.0145	0.9872	1.4238	1.0381	0.7659	0.9285
COX3	1.1158	1.1767	1.1388	1.0568	1.0691	1.3294	1.2050	0.9340	0.8989	0.9206
CYTB	1.0315	1.2273	0.8682	1.0055	0.9824	0.9263	1.0629	0.9124	0.8428	0.8735
ND1	1.1207	1.1935	0.8036	1.0670	1.2562	1.2662	1.0217	1.1170	1.2162	0.9473
ND2	1.2940	1.5540	0.9932	1.2287	1.3725	1.2813	1.3077	0.8840	1.0042	1.0516
ND3	1.2814	1.3195	1.0263	1.0651	1.3407	1.2300	0.8638	0.8417	0.6774	1.4263
ND4	1.1652	1.3228	1.0824	1.3127	1.4948	1.1448	1.2378	0.9336	1.0622	1.0786
ND4L	1.3013	1.9909	1.3907	0.9801	0.8977	1.1402	1.5809	0.8133	1.4645	2.8944
ND5	1.0705	1.2282	1.0806	1.2725	1.1923	1.0025	1.0634	0.8194	0.8952	0.9713
ND6	1.4312	1.8491	1.1981	1.0732	1.5666	2.2086	1.2378	1.0493	1.2030	0.8285