

Supporting Information

Table 1. Geographic range, biogeographic pattern, niche overlap and degree of niche conservatism with scaled RTR outputs among 28 sister pairs of endemic lizards of Madagascar, ranked by genus and degree of niche conservatism. Data on age of speciation was obtained from Zheng and Wiens (2016). Relative occurrence area refers to the proportion of the total island that is occupied by the minimum convex polygon of the sister pair.

Genus	Species #1	Species #2	Estimated Age of Speciation Event (MYBP)	Relative occurrence area	Isolation distance (km)	Range overlap	Climatic niche overlap	Scaled climatic niche overlap	Scaled RTR 50% quantile	Scaled RTR 2.5% quantile	Scaled RTR 97.5% quantile	Degree of niche conservatism
<i>Amphiglossus</i>	<i>A. mandokava</i>	<i>A. tanysona</i>	7.88	0.067	0.000	0.018	0.132	-1.402	-0.057	-1.761	2.100	0.074
<i>Amphiglossus</i>	<i>A. punctatus</i>	<i>A. frontoparietalis</i>	9.64	0.153	0.000	0.819	0.645	-1.712	0.058	-1.955	1.762	0.058
<i>Brookesia</i>	<i>B. dentata</i>	<i>B. exarmata</i>	27.55	0.013	290.840	0.000	0.134	2.017	-0.421	-0.623	2.806	0.955
<i>Brookesia</i>	<i>B. minima</i>	<i>B. tuberculata</i>	32.92	0.012	96.134	0.000	0.466	1.692	-0.167	-1.453	2.270	0.930
<i>Brookesia</i>	<i>B. thieli</i>	<i>B. vadoni</i>	10.47	0.130	0.000	0.034	0.617	0.926	0.061	-1.780	1.910	0.823
<i>Brookesia</i>	<i>B. therezieni</i>	<i>B. superciliaris</i>	19.04	0.174	0.000	0.983	0.460	-1.154	0.095	-1.997	1.921	0.134
<i>Brookesia</i>	<i>B. betschi</i>	<i>B. lineata</i>	11.53	0.008	0.000	0.153	0.162	-1.251	-0.046	-1.668	2.078	0.110
<i>Calumma</i>	<i>C. hilleniusi</i>	<i>C. guibei</i>	13.21	0.034	613.034	0.000	0.164	5.828	-0.460	-0.467	2.925	0.997
<i>Calumma</i>	<i>C. furcifer</i>	<i>C. gastrotaenia</i>	16.48	0.093	0.000	0.091	0.418	0.648	-0.118	-1.640	2.169	0.747
<i>Calumma</i>	<i>C. tsaratananense</i>	<i>C. brevicorne</i>	4.48	0.097	39.492	0.000	0.189	0.356	-0.110	-1.275	2.144	0.658
<i>Calumma</i>	<i>C. boettgeri</i>	<i>C. nasutum</i>	4.32	0.283	5.500	0.000	0.312	-1.992	-0.142	-1.658	1.825	0.004
<i>Furcifer</i>	<i>F. willsii</i>	<i>F. petteri</i>	19.41	0.358	141.509	0.000	0.409	-0.374	0.226	-1.965	1.469	0.308
<i>Furcifer</i>	<i>F. labordi</i>	<i>F. antimena</i>	4.31	0.107	0.000	0.244	0.210	-1.449	-0.083	-1.609	2.057	0.051
<i>Lygodactylus</i>	<i>L. guibei</i>	<i>L. miops</i>	19.62	0.255	0.000	0.546	0.597	2.709	-0.022	-1.951	2.015	0.996
<i>Lygodactylus</i>	<i>L. pictus</i>	<i>L. mirabilis</i>	25.71	0.024	60.206	0.000	0.040	0.237	-0.302	-0.935	2.995	0.724
<i>Madascincus</i>	<i>M. stumpffi</i>	<i>M. polleni</i>	4.76	0.343	304.155	0.000	0.303	1.774	-0.243	-1.214	2.544	0.926
<i>Oplurus</i>	<i>O. fierinensis</i>	<i>O. grandidieri</i>	8.78	0.068	185.458	0.000	0.051	-2.568	0.022	-1.794	1.894	0.000
<i>Paroedura</i>	<i>P. androyensis</i>	<i>P. picta</i>	43.75	0.220	0.000	0.796	0.604	-0.323	-0.031	-1.861	2.328	0.390
<i>Paroedura</i>	<i>P. oviceps</i>	<i>P. karstophila</i>	27.98	0.039	0.000	0.085	0.118	-2.109	-0.046	-1.769	2.000	0.014
<i>Phelsuma</i>	<i>P. quadriocellata</i>	<i>P. antanosy</i>	16.14	0.185	0.000	0.548	0.174	-0.285	-0.429	-1.071	2.463	0.552
<i>Phelsuma</i>	<i>P. dubia</i>	<i>P. ravenala</i>	10.73	0.376	274.942	0.000	0.012	-1.753	-0.071	-1.878	1.879	0.031
<i>Tracheloptychus</i>	<i>T. madagascariensis</i>	<i>T. petersi</i>	17.04	0.097	0.000	0.047	0.353	2.235	-0.218	-1.296	2.325	0.970
<i>Trachylepis</i>	<i>T. dumasi</i>	<i>T. aureopunctata</i>	7.55	0.284	0.000	0.804	0.571	-1.172	0.167	-1.860	1.592	0.172
<i>Uroplatus</i>	<i>U. fimbriatus</i>	<i>U. giganteus</i>	14.14	0.246	35.756	0.000	0.692	2.678	-0.154	-1.706	1.975	0.997
<i>Uroplatus</i>	<i>U. malahelo</i>	<i>U. guentheri</i>	56.83	0.366	276.172	0.000	0.123	-1.056	-0.030	-1.283	1.723	0.200
<i>Uroplatus</i>	<i>U. pietschmanni</i>	<i>U. alluaudi</i>	41.43	0.052	428.676	0.000	0.060	-2.212	-0.092	-1.586	2.010	0.000
<i>Voeltzkowia</i>	<i>V. rubrocaudata</i>	<i>V. lineata</i>	0.01	0.165	34.615	0.000	0.341	0.454	0.019	-1.830	1.864	0.667
<i>Zonosaurus</i>	<i>Z. trilineatus</i>	<i>Z. quadrilineatus</i>	4.57	0.046	0.000	0.122	0.097	0.509	-0.260	-1.159	2.858	0.792

Table 2. Geographic range, biogeographic pattern, niche overlap and degree of niche conservatism with scaled RTR outputs among 28 sister pairs of endemic lizards of Madagascar, ranked by genus and degree of niche conservatism. Data on age of speciation was obtained from Zheng and Wiens (2016). Relative occurrence area refers to the proportion of the total island that is occupied by the minimum convex polygon of the sister pair.

Genus	Species #1	Species #2	Estimated Age of Speciation Event (MYBP)	Relative occurrence area	Isolation distance (km)	Range overlap	Climatic niche overlap (MO metric)	Results from RTR test	Climatic niche overlap (D metric)	Results from Similarity test
<i>Amphiglossus</i>	<i>A. mandokava</i>	<i>A. tanysona</i>	7.88	0.067	0.000	0.018	0.132	0.074	0.000	0.00/0.00 (PND)
<i>Amphiglossus</i>	<i>A. punctatus</i>	<i>A. frontoparietalis</i>	9.64	0.153	0.000	0.819	0.645	0.058	0.521	0.98/0.97 (PNC)
<i>Brookesia</i>	<i>B. dentata</i>	<i>B. exarmata</i>	27.55	0.013	290.840	0.000	0.134	0.955	0.00	0.00/0.00 (PND)
<i>Brookesia</i>	<i>B. minima</i>	<i>B. tuberculata</i>	32.92	0.012	96.134	0.000	0.466	0.930	0.000	0.00/0.00 (PND)
<i>Brookesia</i>	<i>B. thieli</i>	<i>B. vadoni</i>	10.47	0.130	0.000	0.034	0.617	0.823	0.352	0.9/0.88
<i>Brookesia</i>	<i>B. therezieni</i>	<i>B. superciliaris</i>	19.04	0.174	0.000	0.983	0.460	0.134	0.391	0.99/0.99 (PNC)
<i>Brookesia</i>	<i>B. betschi</i>	<i>B. lineata</i>	11.53	0.008	0.000	0.153	0.162	0.110	0.000	0.00/0.00 (PND)
<i>Calumma</i>	<i>C. furcifer</i>	<i>C. gastrotaenia</i>	16.48	0.093	0.000	0.091	0.418	0.747	0.276	0.85/0.9
<i>Calumma</i>	<i>C. tsaratananense</i>	<i>C. brevicorne</i>	4.48	0.097	39.492	0.000	0.189	0.658	0.006	0.26/0.32
<i>Calumma</i>	<i>C. boettgeri</i>	<i>C. nasutum</i>	4.32	0.283	5.500	0.000	0.312	0.004 (PND)	0.042	0.51/0.98 (PNC)
<i>Calumma</i>	<i>C. hilleniusi</i>	<i>C. guibei</i>	13.21	0.034	613.034	0.000	0.164	0.997 (PNC)	0.014	0.59/0.76
<i>Furcifer</i>	<i>F. willsii</i>	<i>F. petteri</i>	19.41	0.358	141.509	0.000	0.409	0.308	0.015	0.42/0.21
<i>Furcifer</i>	<i>F. labordi</i>	<i>F. antimena</i>	4.31	0.107	0.000	0.244	0.210	0.051	0.010	0.88/0.85
<i>Lygodactylus</i>	<i>L. guibei</i>	<i>L. miops</i>	19.62	0.255	0.000	0.546	0.597	0.996 (PNC)	0.133	0.99/0.99 (PNC)
<i>Lygodactylus</i>	<i>L. pictus</i>	<i>L. mirabilis</i>	25.71	0.024	60.206	0.000	0.040	0.724	0.000	0.00/0.00 (PND)
<i>Madascincus</i>	<i>M. stumpffi</i>	<i>M. polleni</i>	4.76	0.343	304.155	0.000	0.303	0.926	0.073	0.18/0.68
<i>Oplurus</i>	<i>O. fierinensis</i>	<i>O. grandidieri</i>	8.78	0.068	185.458	0.000	0.051	0.000 (PND)	0.094	0.41/0.81
<i>Paroedura</i>	<i>P. androyensis</i>	<i>P. picta</i>	43.75	0.220	0.000	0.796	0.604	0.390	0.147	0.64/0.22
<i>Paroedura</i>	<i>P. oviceps</i>	<i>P. karstophila</i>	27.98	0.039	0.000	0.085	0.118	0.014 (PND)	0.002	0.13/0.51
<i>Phelsuma</i>	<i>P. quadriocellata</i>	<i>P. antanosy</i>	16.14	0.185	0.000	0.548	0.174	0.552	0.004	0.74/0.62
<i>Phelsuma</i>	<i>P. dubia</i>	<i>P. ravenala</i>	10.73	0.376	274.942	0.000	0.012	0.031 (PND)	0.000	0.00/0.00 (PND)
<i>Tracheloptychus</i>	<i>T. madagascariensis</i>	<i>T. petersi</i>	17.04	0.097	0.000	0.047	0.353	0.970	0.201	0.57/0.84
<i>Trachylepis</i>	<i>T. dumasi</i>	<i>T. aureopunctata</i>	7.55	0.284	0.000	0.804	0.571	0.172	0.119	0.63/0.58
<i>Uroplatus</i>	<i>U. fimbriatus</i>	<i>U. giganteus</i>	14.14	0.246	35.756	0.000	0.692	0.997 (PNC)	0.272	0.85/0.94
<i>Uroplatus</i>	<i>U. malahelo</i>	<i>U. guentheri</i>	56.83	0.366	276.172	0.000	0.123	0.200	0.000	0.00/0.00 (PND)
<i>Uroplatus</i>	<i>U. pietschmanni</i>	<i>U. alluaudi</i>	41.43	0.052	428.676	0.000	0.060	0.000 (PND)	0.000	0.00/0.00 (PND)
<i>Voeltzkowia</i>	<i>V. rubrocaudata</i>	<i>V. lineata</i>	0.01	0.165	34.615	0.000	0.341	0.667	0.144	0.93/0.96
<i>Zonosaurus</i>	<i>Z. trilineatus</i>	<i>Z. quadrilineatus</i>	4.57	0.046	0.000	0.122	0.097	0.792	0.004	0.56/0.32

Table 3: Fitting generalized (gaussian/identity) linear model: Climatic niche overlap ~ Isolation distance + Range overlap + Relative occurrence area + Speciation age

Variable	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.2259	0.07336	3.08	0.0053
Isolation distance	-3.924e-07	2.522e-07	-1.556	0.1334
Range overlap	0.2399	0.1257	1.908	0.0689
Relative occurrence area	0.444	0.2979	1.491	0.1496
Speciation age	9.465e-05	0.0027	0.035	0.9724

Table 4: Fitting generalized (gaussian/identity) linear model: Degree of niche conservatism ~ Isolation distance + Range overlap + Relative occurrence area + Speciation age

Variable	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	0.589	0.1673	3.521	0.0018
Isolation distance	1.089e-07	5.751e-07	0.189	0.8515
Range overlap	-0.2402	0.2866	-0.838	0.4106
Relative occurrence area	-0.3724	0.6791	-0.548	0.5888
Speciation age	-0.0013	0.0062	-0.218	0.8294

Table 5: Fitting generalized (gaussian/identity) linear model: Speciation Age ~ Isolation distance + Range overlap + Relative occurrence area + Degree of niche conservatism

Variable	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	13.97	6.381	2.189	0.03902
Isolation distance	2.966e-05	1.844e-05	1.608	0.1215
Range overlap	7.546	9.706	0.7774	0.4448
Relative occurrence area	-3.019	23.1	-0.1307	0.8971
Degree of niche conservatism	-1.535	7.04	-0.218	0.8294