

Table S2: Tracer summary statistics for DSCAM1 phylogeny

Summary Statistic	posterior	likelihood	prior	treeLikelihood
mean	-117950.511	-117805.034	-145.4769	-117805.034
stderr of mean	0.0601	0.0576	0.0116	0.0576
stdev	6.4957	6.3371	1.4573	6.3371
variance	42.1939	40.159	2.1238	40.159
median	-117950.1775	-117804.6835	-145.4192	-117804.6835
value range	[-117981.6562, -117928.1411]	[-117836.532, -117783.9076]	[-154.9942, -139.4719]	[-117836.532, -117783.9076]
geometric mean	n/a	n/a	n/a	n/a
95% HPD interval	[-117963.2766, -117938.083]	[-117817.5734, -117792.9693]	[-148.3554, -142.6755]	[-117817.5734, -117792.9693]
auto-correlation time (ACT)	3855.4271	3715.2781	2835.3834	3715.2781
effective sample size (ESS)	11672.1	12112.4	15871.2	12112.4
number of samples	45001	45001	45001	45001

Summary Statistic	Tree.height	Tree.treeLength	mutationRate	proportionInvariant
mean	0.8045	13.6806	1	0.2888
stderr of mean	2.58E-04	2.69E-03	0	1.56E-04
stdev	0.0288	0.2858	0	8.95E-03
variance	8.28E-04	0.0817	0	8.01E-05
median	0.8034	13.6766	0	0.2889
value range	[0.7018, 0.9567]	[12.4091, 14.9816]	[1, 1]	[0.2545, 0.3219]
geometric mean	0.804	13.6777	n/a	0.2887
95% HPD interval	[0.7493, 0.8612]	[13.1332, 14.2479]	n/a	[0.2716, 0.3067]
auto-correlation time (ACT)	3620.848	3997.2203	n/a	13678.3421
effective sample size (ESS)	12428.3	11258.1	n/a	3289.9
number of samples	45001	45001	45001	45001

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Summary Statistic	rateAC	rateAG	rateAT	rateCG	rateGT
mean	0.2205	0.8165	0.2025	0.2181	0.1527
stderr of mean	1.62E-04	1.02E-03	1.79E-04	1.87E-04	1.59E-04
stdev	7.66E-03	0.0324	7.89E-03	8.87E-03	7.94E-03
variance	5.86E-05	1.05E-03	6.23E-05	7.87E-05	6.31E-05
median	0.2205	0.8153	0.2024	0.218	0.1526
value range	[0.1907, 0.2484]	[0.7027, 0.9358]	[0.1745, 0.2372]	[0.1879, 0.2587]	[0.1224, 0.1873]
geometric mean	0.2203	0.8158	0.2024	0.2179	0.1525
95% HPD interval	[0.2051, 0.2354]	[0.7554, 0.8818]	[0.1873, 0.2181]	[0.2013, 0.236]	[0.137, 0.1677]
auto-correlation time (ACT)	20226.6123	44656.4023	23235.5544	19915.0683	18123.5213
effective sample size (ESS)	2224.8	1007.7	1936.7	2259.6	2483
number of samples	45001	45001	45001	45001	45001

Summary Statistic	freqParameter.1	freqParameter.2	freqParameter.3	freqParameter.4
mean	0.2883	0.2551	0.1778	0.2789
stderr of mean	1.08E-04	8.42E-05	8.35E-05	9.80E-05
stdev	3.82E-03	3.19E-03	3.00E-03	3.35E-03
variance	1.46E-05	1.02E-05	9.02E-06	1.12E-05
median	0.2882	0.2551	0.1778	0.2788
value range	[0.274, 0.3034]	[0.2444, 0.266]	[0.1672, 0.189]	[0.2664, 0.2919]
geometric mean	0.2882	0.2551	0.1778	0.2788
95% HPD interval	[0.281, 0.296]	[0.2492, 0.2615]	[0.1719, 0.1835]	[0.2724, 0.2854]
auto-correlation time (ACT)	36109.573	31350.2672	34807.0213	38466.5824
effective sample size (ESS)	1246.2	1435.4	1292.9	1169.9
number of samples	45001	45001	45001	45001

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Summary Statistic	gammaShape	popSize	CoalescentConstant
mean	0.6708	3.1182	-138.3727
stderr of mean	3.14E-04	1.91E-03	0.0108
stdev	0.0182	0.3972	1.4377
variance	3.33E-04	0.1578	2.067
median	0.671	3.0859	-138.3172
value range	[0.5923, 0.7344]	[1.8826, 5.3474]	[-147.3594, -132.0977]
geometric mean	0.6705	3.0934	n/a
95% HPD interval	[0.6352, 0.7064]	[2.3923, 3.9274]	[-141.245, -135.6519]
auto-correlation time (ACT)	13281.9534	1037.0859	2527.4435
effective sample size (ESS)	3388.1	43391.8	17804.9
number of samples	45001	45001	45001

Table S3: Tracer summary statistics for mitochondrial phylogeny

Summary Statistic	posterior	likelihood	prior	treeLikelihood
mean	-269591.3594	-269427.1846	-164.1748	-269427.1846
stderr of mean	0.1047	0.0987	0.0205	0.0987
stdev	6.6717	6.6404	1.4765	6.6404
variance	44.5113	44.0953	2.18	44.0953
median	-269590.9921	-269426.8204	-164.1173	-269426.8204
value range	[-269629.4875, -269569.3236]	[-269463.8674, -269404.7759]	[-172.6744, -158.3592]	[-269463.8674, -269404.7759]
geometric mean	n/a	n/a	n/a	n/a
95% HPD interval	[-269604.6962, -269578.7035]	[-269440.1793, -269414.5197]	[-167.0009, -161.2577]	[-269440.1793, -269414.5197]
auto-correlation time (ACT)	11083.814	9939.95	8633.7978	9939.95
effective sample size (ESS)	4060.1	4527.3	5212.2	4527.3
number of samples	45001	45001	45001	45001

Summary Statistic	Tree.height	Tree.treeLength	gammaShape	popSize	CoalescentConstant
mean	1.393	14.6822	0.7097	3.5825	-152.0151
stderr of mean	6.76E-04	4.95E-03	1.99E-04	2.25E-03	0.021
stdev	0.0546	0.2726	7.94E-03	0.4492	1.4622
variance	2.98E-03	0.0743	6.30E-05	0.2018	2.1381
median	1.3914	14.679	0.7097	3.5453	-151.9674
value range	[1.1735, 1.6266]	[13.589, 15.8517]	[0.6809, 0.7413]	[2.2235, 5.9371]	[-160.0824, -146.332]
geometric mean	1.3919	14.6797	0.7096	3.5549	n/a
95% HPD interval	[1.2863, 1.4997]	[14.1521, 15.2219]	[0.6948, 0.7258]	[2.7617, 4.4958]	[-154.8529, -149.16]
auto-correlation time (ACT)	6907.3125	14860.1809	28204.3786	1130.6842	9243.7043
effective sample size (ESS)	6515	3028.3	1595.5	39799.8	4868.3
number of samples	45001	45001	45001	45001	45001

Table S3: Tracer summary statistics for mitochondrial phylogeny

Summary Statistic	rateAC	rateAG	rateAT	rateCG	rateGT
mean	0.167	0.8814	0.1508	0.7294	0.1358
stderr of mean	7.60E-05	6.60E-04	1.15E-04	4.43E-04	1.25E-04
stdev	4.95E-03	0.0253	3.70E-03	0.0263	7.08E-03
variance	2.45E-05	6.39E-04	1.37E-05	6.89E-04	5.02E-05
median	0.167	0.8813	0.1508	0.7287	0.1358
value range	[0.1478, 0.1853]	[0.7857, 0.9845]	[0.1374, 0.1653]	[0.6343, 0.8309]	[0.1088, 0.1615]
geometric mean	0.1669	0.881	0.1508	0.7289	0.1356
95% HPD interval	[0.1574, 0.1768]	[0.8318, 0.9308]	[0.1437, 0.1581]	[0.678, 0.781]	[0.1221, 0.1499]
auto-correlation time (ACT)	10602.4354	30698.1125	43304.0417	12823.3278	14094.2739
effective sample size (ESS)	4244.4	1465.9	1039.2	3509.3	3192.9
number of samples	45001	45001	45001	45001	45001

Summary Statistic	freqParameter.1	freqParameter.2	freqParameter.3	freqParameter.4
mean	0.434	0.1037	0.047	0.4153
stderr of mean	5.39E-05	2.42E-05	1.48E-05	4.32E-05
stdev	2.39E-03	9.81E-04	6.15E-04	2.21E-03
variance	5.69E-06	9.63E-07	3.78E-07	4.90E-06
median	0.4341	0.1037	0.047	0.4153
value range	[0.4246, 0.4436]	[0.0999, 0.1075]	[0.0446, 0.0493]	[0.4062, 0.4241]
geometric mean	0.434	0.1037	0.047	0.4153
95% HPD interval	[0.4293, 0.4386]	[0.1018, 0.1056]	[0.0458, 0.0482]	[0.4111, 0.4197]
auto-correlation time (ACT)	22945.9691	27310.1916	26028.9715	17165.6144
effective sample size (ESS)	1961.2	1647.8	1728.9	2621.6
number of samples	45001	45001	45001	45001