Supplemental Table 6. Maximum Likelihood fits of 24 different nucleotide substitution models

Paramete	BIC	AICc	lnL	(+ <i>I</i>)	(+G)	R	f(A)	$f(\mathbf{T})$	<i>f</i> (C)	$f(\mathbf{G})$	r (AT)	r(AC)	r (AG)	r (TA)	r(TC)	r (TG)	r(CA)	<i>r</i> (CT)	r(CG)	r (GA)	r (GT)	r(GC)
180	12862 501	11345 72	5/01 0	n/a	0.37	2 53	0.271	0.271	0.220	0.220	0.038	0.032	0.164	0.038	0.164	0.032	0.038	0.105	0.032	0.105	0.038	0.032
181	12802.391	11345.868	5400.06	0.04	0.37	2.55	0.271	0.271	0.229	0.229	0.038	0.032	0.164	0.038	0.164	0.032	0.038	0.195	0.032	0.195	0.038	0.032
170	12877.38	11368 025	5504 51	n/a	0.37	2.55	0.271	0.271	0.229	0.229	0.035	0.032	0.104	0.035	0.104	0.032	0.035	0.170	0.032	0.170	0.035	0.032
196	12877.58	11214.066	5470.01	n/a	0.37	2.33	0.23	0.25	0.25	0.23	0.055	0.035	0.174	0.035	0.152	0.033	0.035	0.179	0.035	0.179	0.035	0.035
180	12886.18	11369 300	5503 7	0.04	0.37	2.44	0.25	0.308	0.210	0.242	0.005	0.030	0.174	0.049	0.170	0.032	0.035	0.219	0.012	0.170	0.041	0.011
187	12800.18	11314 542	5469.24	0.04	0.39	2.33	0.23	0.25	0.25	0.23	0.055	0.035	0.174	0.033	0.179	0.032	0.030	0.179	0.035	0.179	0.035	0.035
187	12890.323	11436 739	-5535 39	n/a	0.39	2.44	0.234	0.308	0.210	0.242	0.003	0.030	0.174	0.049	0.154	0.032	0.032	0.22	0.012	0.169	0.041	0.011
183	12980.81	11438 69	-5535.35	n/a	0.38	2.0	0.234	0.308	0.216	0.242	0.042	0.03	0.173	0.032	0.150	0.033	0.032	0.224	0.033	0.167	0.042	0.03
183	12007.01	11456.09	5548.0	0.04	0.50	2.0	0.234	0.308	0.216	0.242	0.042	0.03	0.175	0.032	0.156	0.033	0.032	0.227	0.033	0.160	0.042	0.03
184	13018 078	11467 542	-5548 77	0.04	0.4	2.59	0.234	0.308	0.210	0.242	0.043	0.03	0.175	0.032	0.150	0.033	0.032	0.223	0.033	0.165	0.043	0.03
178	13368 540	11868 511	5755 32	n/a	0.39	0.5	0.25	0.308	0.210	0.242	0.043	0.05	0.171	0.032	0.139	0.055	0.032	0.228	0.033	0.105	0.043	0.05
170	13431 587	11003.511	-5781.62	0.07	0.38	0.5	0.25	0.25	0.25	0.25	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
190	12666 204	12140 522	-5781.02	0.07	0.42 n/o	0.5	0.25	0.23	0.25	0.25	0.003	0.005	0.005	0.003	0.005	0.035	0.005	0.085	0.005	0.085	0.085	0.035
186	13678 070	12149.525	-3693.0	0.16	n/a	2.2	0.271	0.271	0.229	0.229	0.042	0.030	0.156	0.042	0.156	0.030	0.042	0.187	0.030	0.167	0.042	0.030
170	12670.24	12111.011	-5005.78	0.16	n/a	2.10	0.234	0.308	0.210	0.242	0.008	0.039	0.101	0.032	0.134	0.030	0.042	0.22	0.015	0.133	0.040	0.015
19	12670 844	12170.885	-5905.49	0.16	n/a	2.21	0.23	0.25	0.25	0.23	0.039	0.039	0.172	0.039	0.172	0.039	0.039	0.172	0.039	0.172	0.039	0.039
102	13689 514	12140.14	-3890.09 5880 71	0.16	n/a	2.21	0.234	0.308	0.210	0.242	0.048	0.033	0.167	0.030	0.149	0.037	0.030	0.213	0.037	0.101	0.048	0.033
170	13089.514	12147.394	-5067.62	0.10	n/a	2.21	0.234	0.308	0.210	0.242	0.040	0.035	0.101	0.030	0.154	0.037	0.030	0.22	0.037	0.195	0.043	0.035
1/9	13803.004	12295.15	-5967.05 5963.05	n/a	n/a	2.15	0.271	0.271	0.229	0.229	0.043	0.030	0.150	0.043	0.130	0.030	0.045	0.185	0.030	0.165	0.043	0.030
179	13817.129	12291.042	-5903.95	n/a	n/a	2.14	0.234	0.308	0.210	0.242	0.049	0.034	0.100	0.037	0.146	0.038	0.037	0.211	0.038	0.10	0.049	0.034
192	13824.903	12324.927	-5965.55	n/a	n/a	2.15	0.23	0.25	0.25	0.23	0.04	0.04	0.17	0.04	0.17	0.04	0.04	0.17	0.04	0.17	0.04	0.04
102	13820.001	12292.298	-5905.17	n/a	n/a	2.15	0.234	0.308	0.210	0.242	0.049	0.034	0.157	0.037	0.155	0.038	0.037	0.221	0.038	0.152	0.049	0.034
103	13620.701	12207.749	-374/.00	0.16	11/a	2.14	0.254	0.308	0.210	0.242	0.005	0.04	0.138	0.048	0.133	0.058	0.044	0.222	0.017	0.132	0.049	0.015
1/8	14132.30/	12032.329	-014/.23	0.10	n/a	0.5	0.25	0.25	0.25	0.25	0.085	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.085
	Paramete rs 180 181 179 186 180 187 182 183 183 184 178 179 180 186 179 180 186 179 182 183 179 181 178 178 178	Paramete rs BIC 180 12862.591 181 12871.156 179 12877.38 186 12881.434 180 12886.18 187 12890.325 182 12970.442 183 12980.81 183 13007.91 184 13018.078 179 13431.587 180 13666.394 186 13679.34 181 13689.514 179 13639.514 179 13803.604 181 13817.129 178 13824.965 182 13826.001 185 13826.011 185 13826.011 178 13826.011 185 13826.72 177 14297.278	Paramete rs BIC AICc 180 12862.591 11345.72 181 12871.156 11345.86 179 12877.38 11368.925 186 12881.434 11314.666 180 12886.18 11369.309 187 12890.325 11314.542 182 12970.442 11436.739 183 12980.81 11465.79 184 13018.078 11467.542 178 13368.549 11868.511 179 13431.587 11923.132 180 13666.394 12149.523 186 13678.979 12111.611 179 13431.587 11923.132 180 13666.394 12149.523 186 13678.979 12111.611 179 13607.8.41 12140.14 183 13689.514 12147.394 179 13803.604 12291.842 178 13824.965 12324.927 181 13817.129 12291.842<	Paramete rs BIC AICc InL 180 12862.591 11345.72 -5491.9 181 12871.156 11345.868 -5490.96 179 12877.38 11368.925 -5504.51 186 12881.434 11314.066 -5470.01 180 12886.18 11369.309 -5503.7 187 12890.325 11314.542 -5469.24 182 12970.442 11436.739 -5535.39 183 12980.81 11465.79 -5548.71 178 13368.549 11868.511 -5755.32 179 13431.587 11923.132 -5781.62 180 13666.394 12149.523 -5893.8 186 13679.34 12111.611 -5868.78 179 13603.604 12295.15 -5905.49 182 13679.844 1214.7394 -5889.71 179 13803.604 12295.15 -5967.63 181 13817.129 12291.842 -5963.95 17	Paramete rs BIC AICc InL (+I) 180 12862.591 11345.72 -5491.9 n/a 181 12871.156 11345.72 -5491.9 n/a 181 12871.156 11345.868 -5490.96 0.04 179 12877.38 11368.925 -5504.51 n/a 186 12881.434 11314.066 -5470.01 n/a 180 12880.18 11369.309 -5503.7 0.04 187 12890.325 11314.542 -5469.24 0.04 182 12970.442 11436.79 -5535.35 n/a 183 12980.81 11465.79 -5548.9 0.04 184 13018.078 11467.542 -5548.77 0.04 178 13368.549 11868.511 -5755.32 n/a 179 13431.587 11923.132 -5781.62 0.07 180 13666.394 12149.523 -5893.8 0.16 179 13679.34 12170.885	Paramete rsBICAICc lnL $(+I)$ $(+G)$ 18012862.59111345.72-5491.9 $n'a$ 0.3718112871.15611345.868-5490.960.040.3917912877.3811368.925-5504.51 n/a 0.3718612881.43411314.066-5470.01 $n'a$ 0.3718612881.43411314.066-5470.01 $n'a$ 0.3718012886.1811369.309-5503.70.040.3918712890.32511314.542-5469.240.040.3918212970.44211436.739-5535.39 $n'a$ 0.3818312980.8111465.79-5548.90.040.418413018.07811467.542-5548.770.040.3917813368.54911868.511-5755.32 $n'a$ 0.3817913431.58711923.132-5781.620.070.4218013666.39412149.523-5893.80.16 $n'a$ 17913679.3412170.885-5905.490.16 $n'a$ 18213679.51412147.394-5889.710.16 $n'a$ 18113817.12912291.842-5963.95 $n'a$ $n'a$ 18213826.00112292.298-5963.17 $n'a$ $n'a$ 18313826.00112292.2985963.17 $n'a$ $n'a$ 18513826.00112292.298-5963.17 $n'a$ $n'a$ 18513826.001<	Paramete rsBICAICc lnL $(+I)$ $(+G)$ R 18012862.59111345.72-5491.9 n/a 0.372.5318112871.15611345.868-5490.960.040.392.5317912877.3811368.925-5504.51 n/a 0.372.4418012886.1811340.66-5470.01 n/a 0.372.4418012886.1811369.309-5503.70.040.392.5318712890.32511314.542-5469.240.040.392.4418212970.44211436.739-5535.35 n/a 0.382.618312980.8111465.79-5548.90.040.42.5918413018.07811467.542-5548.770.040.392.5918413018.07811467.542-5548.770.040.392.5918413018.07811467.542-5548.770.040.392.591841306.781123.132-5781.620.070.420.518013666.39412149.523-5893.80.16 n/a 2.21180136678.97912111.611-5868.780.16 n/a 2.2118213679.51412147.394-5890.710.16 n/a 2.211831368.51412147.394-5880.710.16 n/a 2.1318113817.12912291.842-5963.95 n/a n/a 2.131	Paramete rsBICAICc lnL $(+I)$ $(+G)$ R $f(A)$ 18012862.59111345.72-5491.9 n/a 0.372.530.27118112871.15611345.868-5490.960.040.392.530.27117912877.3811368.925-5504.51 n/a 0.372.440.23418612886.1811369.309-5503.70.040.392.530.2518712890.32511314.542-5469.240.040.392.440.23418212970.44211436.739-5535.35 n/a 0.382.60.23418312980.8111465.79-5548.90.040.42.590.23418413018.07811467.542-5548.970.040.392.590.23417813368.54911868.511-575.532 $n'a$ 0.380.50.2517913431.58711923.132-5781.620.070.420.50.2518013666.39412149.523-5893.80.16 n/a 2.210.23417913679.3412170.885-5905.490.16 n/a 2.210.23417913679.51412147.394-5889.710.16 n/a 2.210.23417913679.54412146.14-5890.090.16 n/a 2.210.23417913679.54412147.394-5889.710.16 n/a 2.210.234179<	Paramete rsBICAICc lnL $(+I)$ $(+G)$ R $f(A)$ $f(T)$ 18012862.59111345.72-5491.9 $n'a$ 0.372.530.2710.27118112871.15611345.868-5490.960.040.392.530.2710.27117912877.3811368.925-5504.51 n/a 0.372.440.2340.30818612881.43411314.066-5470.01 $n'a$ 0.372.440.2340.30818012886.1811369.309-5503.70.040.392.530.250.2518712890.32511314.542-5469.240.040.392.440.2340.30818212970.44211436.739-5535.35 $n'a$ 0.382.60.2340.30818312980.8111465.79-5548.970.040.42.590.2340.30818313007.9111467.542-5548.770.040.392.590.2340.30817813368.54911868.511-575.532 $n'a$ 0.380.50.250.2517913431.58711923.132-5781.620.070.420.50.250.2518013666.39412149.523-5893.80.16 $n'a$ 2.160.2340.30817913679.3412170.885-5905.490.16 $n'a$ 2.210.2540.30817913679.34121470.394-5889.71	Paramete rsBICAICc lnL $(+I)$ $(+G)$ R $f(A)$ $f(T)$ $f(C)$ 18012862.59111345.72-5491.9 $n'a$ 0.372.530.2710.2710.22918112871.15611345.868-5490.960.040.392.530.2710.2710.22917912877.3811368.925-5504.51 n/a 0.372.440.2340.3080.21618612881.43411314.066-5470.01 $n'a$ 0.372.440.2340.3080.21618012886.1811369.309-5503.70.040.392.530.250.250.2518712890.32511314.542-5469.240.040.392.440.2340.3080.21618212970.44211436.739-5535.35 $n'a$ 0.382.60.2340.3080.21618312980.8111465.79-5548.90.040.42.590.2340.3080.21618313007.9111465.79-5548.770.040.392.590.2340.3080.21617813368.54911868.511-575.32 $n'a$ 0.380.50.250.250.2517913431.58711923.132-5781.620.070.420.50.250.250.2518013666.39412149.523-5893.80.16 $n'a$ 2.160.2340.3080.21617913679.34	Paramete rsBICAICc lnL $(+I)$ $(+G)$ R $f(A)$ $f(T)$ $f(C)$ $f(G)$ 18012862.59111345.72-5491.9 n/a 0.372.530.2710.2710.2290.22918112871.15611345.868-5490.960.040.392.530.2710.2710.2290.22917912877.3811368.925-5504.51 n/a 0.372.530.250.250.250.2518612881.43411314.066-5470.01 n/a 0.372.440.2340.3080.2160.24218012886.1811369.309-5503.70.040.392.530.250.250.250.2518712890.32511314.542-5469.240.040.392.440.2340.3080.2160.24218312980.8111436.79-5535.39 n/a 0.382.60.2340.3080.2160.24218313007.9111465.79-5548.70.040.42.590.2340.3080.2160.24218413018.07811467.542-5548.770.040.392.590.2340.3080.2160.24217813368.54911868.511-5755.32 n/a 0.380.50.250.250.250.2517913431.58711923.132-5781.620.070.420.50.250.250.250.2518013666.394	Paramete rsBICAICc hL $(+I)$ $(+G)$ R $f(A)$ $f(T)$ $f(C)$ $f(G)$ $r(AT)$ 18012862.59111345.72-5491.9 n/a 0.37 2.53 0.271 0.271 0.229 0.229 0.038 18112871.15611345.868-5490.96 0.04 0.39 2.53 0.271 0.271 0.229 0.229 0.038 17912877.3811368.925-5504.51 n/a 0.37 2.53 0.25 0.25 0.25 0.25 0.025 0.035 18612881.43411314.066-5470.01 n/a 0.37 2.44 0.234 0.308 0.216 0.242 0.065 18012880.32511314.542-5469.24 0.04 0.39 2.53 0.25 0.25 0.25 0.25 0.024 18112970.44211436.79-5535.39 n/a 0.38 2.6 0.234 0.308 0.216 0.242 0.042 18312980.8111465.79-5548.9 0.04 0.4 2.59 0.234 0.308 0.216 0.242 0.042 18313007.9111465.742-5548.77 0.04 0.39 2.59 0.234 0.308 0.216 0.242 0.043 17813368.54911868.511-5755.32 n/a 0.38 0.5 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0.25	Paramete rs BIC AICc InL (+I) (+G) R f(A) f(T) f(C) f(G) r(AT) r(AC) 180 12862.591 11345.72 -5491.9 n/a 0.37 2.53 0.271 0.229 0.229 0.038 0.032 181 12871.156 11345.88 5504.51 n/a 0.37 2.53 0.25 0.25 0.25 0.035 0.035 186 12881.434 11314.066 -5470.01 n/a 0.37 2.44 0.234 0.308 0.216 0.242 0.065 0.036 180 12886.18 11369.309 -5503.7 0.04 0.39 2.44 0.234 0.308 0.216 0.242 0.065 0.036 181 12890.325 11314.542 -5469.24 0.04 0.39 2.44 0.234 0.308 0.216 0.242 0.042 0.03 183 12970.442 11436.79 -5548.77 0.04 0.39 2.59 <td>Paramete rsBICAICc<i>inL</i>(+f)(+G)R$f(A)$$f(T)$$f(C)$$f(G)$$r(AT)$$r(AC)$$r(AG)$18012862.59111345.72-5491.9n'a0.372.530.2710.2290.2290.0380.0320.16418112871.15611345.868-5490.960.040.392.530.2710.2710.2290.2290.0380.0320.16417912877.3811368.925-5504.51n'a0.372.530.250.250.250.250.0350.0350.17918612881.4811369.309-5503.70.040.392.530.250.250.250.250.0350.0360.17418012880.1811369.309-5533.39n'a0.382.60.2340.3080.2160.2420.0650.0360.17418212970.44211465.79-5548.90.040.42.590.2340.3080.2160.2420.0420.030.1751831307.9111465.79-5548.90.040.42.590.2340.3080.2160.2420.0430.030.17518413018.07811467.542-5548.770.040.392.590.2340.3080.2160.2420.0430.030.17518413018.07811467.542-5548.90.040.42.590.250.250.250.250.250</td> <td>Paramete rsBICAICc<i>InL</i>(+1)(+G)$R$$f(\Lambda)$$f(T)$$f(C)$$f(G)$$r(\Lambda T)$$r(\Lambda C)$$r(\Lambda G)$$r(\Lambda G)$$r(\Lambda G)$$r(\Lambda G)$18012862.59111345.72-5491.9$n'a$0.372.530.2710.2710.2290.2290.0380.0320.1640.03817912877.3811368.925-5504.51$n'a$0.372.530.250.250.250.250.0350.0350.1790.03518612881.43411314.066-5470.01$n'a$0.372.440.2340.3080.2160.2420.0650.0360.1740.04918012886.1811345.73-5535.39$n'a$0.382.60.2340.3080.2160.2420.0650.0360.1740.04918212970.4421143.6739-5534.53$n'a$0.382.60.2340.3080.2160.2420.0420.030.1750.03218313007.9111465.79-5548.90.040.42.590.2340.3080.2160.2420.0430.030.1750.0321841301.868.511-575.52$n'a$0.380.250.250.250.250.0550.0830.0830.08318513007.9111465.79-5548.970.040.392.590.2340.3080.2160.2420.0430.030.1750.032184<</td> <td>Paramete rs BIC AICc InL (+I) (+G) R f(A) f(T) f(C) f(G) r(AC) r(AC)<!--</td--><td>Parameters BIC AICc hnL (+I) (+G) R f(A) f(T) f(C) f(G) r(AC) r(AG) r(TA) r(TC) r(TG) 180 12862.591 11345.72 -5491.9 n/a 0.37 2.53 0.271 0.271 0.229 0.038 0.032 0.164 0.038 0.164 0.032 181 12871.156 11345.86 5490.96 0.04 0.39 2.53 0.271 0.229 0.229 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.179 0.035 0.174 0.049 0.154 0.032 0.156 0.033 183 1290.042<td>Parameters BIC AICc <i>hL</i> (+f) (+G) <i>R</i> $f(A)$ $f(T)$ $f(C)$ $f(A)$ $r(AC)$ $r(AC)$ $r(A)$ $r(T)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(TC)$ $r(CA)$ 180 12862.591 11345.72 -5491.9 $n'a$ 0.37 2.53 0.271 0.229 0.229 0.038 0.032 0.164 0.038 0.164 0.038 0.164 0.038 0.164 0.038 0.164 0.038 0.164 0.038 0.164 0.038 0.164 0.038 0.164 0.038 0.179 0.035 0.035 0.0179 0.035 0.035 0.0179 0.035 0.035 0.0179 0.035 0.035 0.0179 0.035 0.035 0.0174 0.049 0.154 0.032 0.036 0.174 0.049 0.154 0.032 0.036 0.174 0.049 0.154 0.032 0.156 0.033</td><td>Parameters BIC AICc InL (+I) (+G) R f(A) f(T) f(C) f(G) r(AT) r(AG) r(A) r(TC) r(TC) r(CA) r(CC) r(CC)<td>Parameters BIC AICc <i>hL</i> (+<i>I</i>) (+<i>G</i>) <i>R f</i>(A) <i>f</i>(T) <i>f</i>(C) <i>r</i>(AC) <i>r</i>(AC) <i>r</i>(AC) <i>r</i>(TC) <i>r</i>(TC) <i>r</i>(CC) <i>r</i>(CC)</td><td>Parametric BIC AICc hL (+I) (+G) R f(A) f(T) f(C) f(G) r(A) r(A) r(C) r(C)</td><td>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</td></td></td></td>	Paramete rsBICAICc <i>inL</i> (+f)(+G)R $f(A)$ $f(T)$ $f(C)$ $f(G)$ $r(AT)$ $r(AC)$ $r(AG)$ 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NOTE.-- Models with the lowest BIC scores (Bayesian Information Criterion) are considered to describe the substitution pattern the best. For each model, AICc value (Akaike Information Criterion, corrected), Maximum Likelihood value (InL), and the number of parameters (including branch lengths) are also presented [1]. Non-uniformity of evolutionary rates among sites may be modeled by using a discrete Gamma distribution (+G) with 5 rate categories and by assuming that a certain fraction of sites are evolutionarily invariable (+I). Whenever applicable, estimates of gamma shape parameter and/or the estimated fraction of invariant sites are shown. Assumed or estimated values of transition/transversion bias (R) are shown for each model, as well. They are followed by nucleotide frequencies (f) and rates of base substitutions (r) for each model. For estimating ML values, a tree topology was automatically computed. The analysis involved **90** nucleotide sequences. Codon positions included were 1st+2nd+3rd+Noncoding. All positions with less than 95% site coverage were eliminated. That is, fewer than 5% alignment gaps, missing data, and ambiguous bases were allowed at any position. There were a total of 382 positions in the final dataset. Evolutionary analyses were conducted in MEGA5 [2].

Abbreviations: GTR: General Time Reversible; HKY: Hasegawa-Kishino-Yano; TN93: Tamura-Nei; T92: Tamura 3-parameter; K2: Kimura 2-parameter; JC: Jukes-Cantor.

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2. Tamura K., Peterson D., Peterson N., Stecher G., Nei M., and Kumar S. (2011). MEGA5: Molecular Evolutionary Genetics Analysis using Maximum Likelihood, Evolutionary Distance, and Maximum Parsimony Methods. Molecular Biology and Evolution (In Press).

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