Table S3: Model parameter priors and estimated values (θ = 0.8)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior			-46413 (-46465 -46358)	-46425 (-46483 -46357)	-46406 (-46469 -46343)	-46401 (-46462 -46347)	-46421 (-46481 -46360)
Tree height			0.377 (0.326 0.443)	0.384 (0.330 0.455)	0.367 (0.323 0.434)	0.356 (0.322 0.413)	0.358 (0.323 0.426)
Clock rate	Uniform(5.0e-4, 2.0e-3)		7.37e-04 (6.10e-04 8.83e-04)	7.36e-04 (6.07e-04 8.87e-04)	7.81e-04 (6.22e-04 9.26e-04)	8.09e-04 (6.84e-04 9.24e-04)	7.68e-04 (6.57e-04 8.87e-04)
κ	Lognormal(M=1.0, SD=1.25)		3.719 (3.111 4.484)	3.738 (3.076 4.463)	3.702 (3.028 4.422)	3.720 (3.125 4.499)	3.710 (3.061 4.444)
γ	Exponential(M=1.0)		3.51e-02 (1.05e-03 8.99e-02)	3.53e-02 (1.02e-03 8.85e-02)	3.90e-02 (1.08e-03 9.32e-02)	3.78e-02 (1.59e-03 8.75e-02)	3.71e-02 (1.01e-03 8.85e-02)
R_0	Lognormal(M=1.5, SD=0.5)		2.52 (2.21 2.86)	2.31 (2.05 2.56)	2.11 (1.87 2.40)	2.04 (1.86 2.24)	2.11 (1.89 2.33)
α	Uniform(0.0, 2.0)		0.27 (0.10 0.54)	0.25 (0.09 0.51)	0.25 (0.07 0.52)	0.20 (0.05 0.43)	0.15 (0.03 0.34)
E_{init}	Expoenential(M=1.0)		12.06 (6.42 19.44)	10.19 (5.80 15.62)	8.80 (4.59 13.85)	4.60 (2.52 7.46)	3.25 (1.90 5.15)
Y_{init}	Exponential(M=1.0)		6.61e-03 (1.88e-03 1.64e-02)	6.72e-03 (2.34e-03 1.40e-02)	3.44e-03 (1.52e-03 1.49e-02)	2.89e-03 (1.87e-03 4.48e-03)	3.35e-03 (2.17e-03 6.23e-03)

Table S4: Model parameter priors and estimated values (θ = 0.9)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46384 (-46439 -46323)	-46395 (-46458 -46334)	-46419 (-46473 -46363)	-46388 (-46454 -46326)	-46396 (-46466 -46335)	-46392 (-46451 -46325)
Tree height		0.361 (0.323 0.430)	0.370 (0.323 0.428)	0.380 (0.325 0.445)	0.362 (0.323 0.426)	0.360 (0.323 0.426)	0.360 (0.322 0.421)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.74e-04 (6.21e-04 8.97e-04)	7.84e-04 (6.63e-04 9.06e-04)	7.37e-04 (6.18e-04 8.63e-04)	8.13e-04 (6.91e-04 9.53e-04)	8.03e-04 (6.83e-04 9.24e-04)	7.98e-04 (6.94e-04 9.16e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.738 (3.104 4.464)	3.743 (3.148 4.552)	3.704 (3.057 4.493)	3.694 (3.093 4.511)	3.732 (3.040 4.401)	3.712 (3.090 4.425)
γ	Exponential(M=1.0)	3.55e-02 (1.00e-03 8.73e-02)	3.80e-02 (1.16e-03 8.87e-02)	3.83e-02 (1.00e-03 8.83e-02)	3.55e-02 (1.01e-03 8.91e-02)	3.97e-02 (1.90e-03 8.98e-02)	3.84e-02 (1.02e-03 9.09e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.84 (2.52 3.26)	2.36 (2.10 2.63)	2.30 (2.05 2.57)	2.06 (1.84 2.31)	2.04 (1.83 2.31)	2.07 (1.87 2.28)
α	Uniform(0.0, 2.0)	0.27 (0.10 0.55)	0.24 (0.11 0.49)	0.27 (0.09 0.55)	0.21 (0.07 0.41)	0.17 (0.03 0.38)	0.11 (0.03 0.27)
E_{init}	Expoenential(M=1.0)	12.47 (6.68 19.79)	15.30 (9.03 23.18)	10.47 (5.76 16.18)	8.42 (4.88 12.97)	4.27 (1.85 7.04)	2.90 (1.54 4.79)
Y_{init}	Exponential(M=1.0)	5.39e-03 (3.01e-03 1.23e-02)	4.56e-03 (2.50e-03 8.35e-03)	6.79e-03 (2.41e-03 1.45e-02)	3.26e-03 (1.70e-03 7.37e-03)	3.27e-03 (1.96e-03 5.16e-03)	3.35e-03 (2.24e-03 4.93e-03)

Table S5: Model parameter priors and estimated values (θ = 1.0)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46363 (-46426 -46311)	-46370 (-46436 -46310)	-46392 (-46441 -46330)	-46374 (-46436 -46325)	-46396 (-46455 -46339)	-46347 (-46442 -46276)
Tree height		0.368 (0.323 0.437)	0.358 (0.323 0.429)	0.360 (0.322 0.420)	0.359 (0.322 0.414)	0.361 (0.323 0.420)	0.360 (0.323 0.420)
Clock rate	Uniform(5.0e-4, 2.0e-3)	8.01e-04 (6.49e-04 9.37e-04)	8.24e-04 (6.73e-04 9.97e-04)	7.87e-04 (6.82e-04 8.98e-04)	8.41e-04 (7.21e-04 9.55e-04)	7.98e-04 (6.82e-04 9.03e-04)	8.35e-04 (7.04e-04 9.62e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.770 (3.041 4.455)	3.737 (3.055 4.444)	3.743 (3.099 4.500)	3.710 (2.982 4.388)	3.704 (3.087 4.432)	3.732 (3.067 4.526)
γ	Exponential(M=1.0)	3.76e-02 (1.01e-03 9.23e-02)	3.81e-02 (1.05e-03 9.01e-02)	3.79e-02 (1.10e-03 9.37e-02)	3.91e-02 (1.04e-03 8.88e-02)	3.89e-02 (1.14e-03 8.76e-02)	3.56e-02 (1.04e-03 8.58e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.66 (2.36 3.06)	2.29 (1.96 2.62)	2.16 (1.94 2.40)	1.97 (1.78 2.18)	1.99 (1.78 2.22)	1.98 (1.69 2.35)
α	Uniform(0.0, 2.0)	0.25 (0.10 0.45)	0.29 (0.12 0.53)	0.26 (0.09 0.50)	0.26 (0.08 0.52)	0.15 (0.03 0.38)	0.05 (0.02 0.21)
E_{init}	Expoenential(M=1.0)	15.33 (7.65 24.34)	15.92 (7.50 26.28)	13.07 (7.63 19.05)	9.60 (5.76 13.70)	4.79 (2.82 7.16)	2.27 (0.44 3.94)
Y_{init}	Exponential(M=1.0)	5.77e-03 (2.51e-03 1.33e-02)	4.38e-03 (2.34e-03 9.65e-03)	4.56e-03 (2.70e-03 8.19e-03)	3.22e-03 (1.98e-03 5.29e-03)	3.64e-03 (2.42e-03 5.72e-03)	3.84e-03 (2.36e-03 5.96e-03)

Table S6: Model parameter priors and estimated values (θ = 1.1)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46359 (-46429 -46296)	-46375 (-46426 -46320)	-46382 (-46434 -46333)	-46383 (-46439 -46335)	-46379 (-46444 -46298)	-46372 (-46434 -46305)
Tree height		0.394 (0.338 0.465)	0.375 (0.327 0.432)	0.371 (0.325 0.430)	0.363 (0.324 0.427)	0.362 (0.323 0.425)	0.369 (0.326 0.431)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.60e-04 (6.23e-04 8.93e-04)	7.83e-04 (6.87e-04 8.96e-04)	7.83e-04 (6.74e-04 9.16e-04)	8.10e-04 (6.85e-04 9.33e-04)	7.97e-04 (6.79e-04 9.12e-04)	7.72e-04 (6.74e-04 8.82e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.741 (3.068 4.507)	3.739 (3.114 4.505)	3.708 (3.116 4.532)	3.704 (3.066 4.392)	3.733 (3.044 4.530)	3.765 (3.086 4.450)
γ	Exponential(M=1.0)	3.52e-02 (1.03e-03 8.89e-02)	3.61e-02 (1.02e-03 8.48e-02)	3.81e-02 (1.04e-03 8.99e-02)	3.60e-02 (1.07e-03 9.15e-02)	3.50e-02 (1.24e-03 8.81e-02)	3.51e-02 (1.02e-03 8.78e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.74 (2.47 3.13)	2.32 (2.11 2.56)	2.10 (1.90 2.31)	1.97 (1.80 2.14)	1.96 (1.71 2.17)	2.08 (1.81 2.44)
α	Uniform(0.0, 2.0)	0.25 (0.11 0.49)	0.26 (0.09 0.47)	0.28 (0.12 0.52)	0.26 (0.07 0.56)	0.12 (0.02 0.36)	0.05 (0.02 0.26)
E_{init}	Expoenential(M=1.0)	14.42 (6.51 23.58)	17.19 (9.51 25.18)	16.01 (10.05 22.30)	10.34 (6.67 14.68)	4.15 (1.98 6.47)	1.77 (0.37 3.36)
Y_{init}	Exponential(M=1.0)	9.11e-03 (4.69e-03 1.67e-02)	6.40e-03 (3.83e-03 1.02e-02)	5.38e-03 (2.87e-03 8.66e-03)	4.64e-03 (2.82e-03 7.46e-03)	4.63e-03 (3.01e-03 6.83e-03)	6.03e-03 (3.66e-03 9.42e-03)

Table S7: Model parameter priors and estimated values (θ = 1.2)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46351 (-46400 -46310)	-46378 (-46435 -46321)	-46385 (-46436 -46331)	-46355 (-46415 -46297)	-46346 (-46427 -46274)	-46406 (-46456 -46358)
Tree height		0.422 (0.368 0.488)	0.407 (0.354 0.474)	0.392 (0.337 0.456)	0.379 (0.329 0.437)	0.367 (0.327 0.422)	0.381 (0.338 0.437)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.46e-04 (6.52e-04 8.41e-04)	7.43e-04 (6.39e-04 8.65e-04)	7.60e-04 (6.55e-04 8.94e-04)	7.82e-04 (6.78e-04 9.09e-04)	7.52e-04 (6.44e-04 8.81e-04)	6.92e-04 (5.96e-04 8.01e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.686 (3.062 4.395)	3.683 (3.043 4.458)	3.713 (3.091 4.422)	3.717 (3.029 4.462)	3.689 (3.012 4.392)	3.669 (3.016 4.399)
γ	Exponential(M=1.0)	3.88e-02 (1.13e-03 8.46e-02)	3.76e-02 (1.09e-03 8.78e-02)	3.67e-02 (1.04e-03 9.03e-02)	3.75e-02 (1.01e-03 9.39e-02)	3.61e-02 (1.31e-03 8.70e-02)	3.73e-02 (1.12e-03 9.24e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.80 (2.51 3.13)	2.33 (2.11 2.62)	2.14 (1.91 2.37)	1.91 (1.69 2.13)	2.33 (1.75 2.70)	2.54 (2.11 3.18)
α	Uniform(0.0, 2.0)	0.27 (0.13 0.52)	0.30 (0.13 0.56)	0.32 (0.12 0.60)	0.15 (0.03 0.40)	0.06 (0.02 0.23)	0.12 (0.02 0.29)
E_{init}	Expoenential(M=1.0)	13.47 (6.82 21.96)	17.31 (9.80 26.52)	14.30 (8.12 21.25)	10.54 (6.14 15.98)	0.98 (0.28 3.87)	0.60 (0.04 1.83)
Y_{init}	Exponential(M=1.0)	1.38e-02 (9.24e-03 1.98e-02)	1.15e-02 (6.26e-03 1.91e-02)	8.82e-03 (4.80e-03 1.35e-02)	7.10e-03 (3.68e-03 1.08e-02)	8.02e-03 (4.16e-03 1.41e-02)	9.90e-03 (5.60e-03 1.88e-02)

Table S8: Model parameter priors and estimated values (η = 10)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46404 (-46444 -46360)	-46403 (-46459 -46341)	-46376 (-46428 -46302)	-46318 (-46398 -46257)	-46355 (-46406 -46301)	-46344 (-46384 -46299)
Tree height		0.394 (0.344 0.448)	0.377 (0.330 0.438)	0.407 (0.357 0.453)	0.445 (0.387 0.500)	0.473 (0.419 0.529)	0.450 (0.403 0.496)
Clock rate	Uniform(5.0e-4, 2.0e-3)	6.75e-04 (5.60e-04 7.81e-04)	7.29e-04 (5.81e-04 8.75e-04)	6.62e-04 (5.68e-04 7.53e-04)	6.16e-04 (5.34e-04 6.91e-04)	5.46e-04 (5.00e-04 6.20e-04)	6.31e-04 (5.66e-04 7.05e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.709 (3.074 4.455)	3.746 (3.119 4.534)	3.727 (3.068 4.507)	3.718 (3.045 4.478)	3.694 (3.139 4.518)	3.683 (3.090 4.525)
γ	Exponential(M=1.0)	3.56e-02 (1.10e-03 8.78e-02)	3.37e-02 (1.28e-03 8.77e-02)	3.76e-02 (1.03e-03 9.27e-02)	3.76e-02 (1.00e-03 8.98e-02)	3.46e-02 (1.23e-03 8.77e-02)	3.57e-02 (1.64e-03 9.15e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	3.03 (2.64 3.56)	2.52 (2.16 2.94)	2.09 (1.88 2.35)	2.25 (2.09 2.56)	2.20 (1.96 2.47)	2.16 (2.02 2.29)
α	Uniform(0.0, 2.0)	0.26 (0.06 0.78)	0.24 (0.08 0.51)	0.22 (0.08 0.47)	0.24 (0.08 0.49)	0.18 (0.04 0.44)	0.14 (0.04 0.31)
E_{init}	Expoenential(M=1.0)	11.29 (5.93 18.48)	10.61 (5.33 17.85)	21.86 (17.25 25.48)	8.13 (4.73 12.73)	5.59 (3.58 8.27)	3.12 (2.83 3.66)
Y_{init}	Exponential(M=1.0)	1.14e-02 (4.64e-03 2.60e-02)	7.76e-03 (2.49e-03 2.41e-02)	1.38e-02 (6.91e-03 2.49e-02)	3.29e-02 (1.32e-02 7.50e-02)	6.82e-02 (2.18e-02 1.74e-01)	4.82e-02 (2.75e-02 8.72e-02)

Table S9: Model parameter priors and estimated values (η = 100)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46392 (-46447 -46341)	-46339 (-46399 -46293)	-46389 (-46435 -46316)	-46373 (-46436 -46321)	-46379 (-46424 -46334)	-46379 (-46431 -46324)
Tree height		0.375 (0.329 0.431)	0.435 (0.338 0.494)	0.398 (0.344 0.483)	0.397 (0.343 0.460)	0.421 (0.362 0.488)	0.471 (0.410 0.544)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.06e-04 (5.94e-04 8.61e-04)	6.03e-04 (5.17e-04 8.14e-04)	6.20e-04 (5.00e-04 7.27e-04)	6.33e-04 (5.42e-04 7.35e-04)	6.04e-04 (5.12e-04 6.88e-04)	5.38e-04 (5.00e-04 5.97e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.699 (3.055 4.405)	3.718 (3.009 4.404)	3.724 (3.077 4.515)	3.739 (3.098 4.454)	3.691 (2.991 4.433)	3.703 (3.061 4.438)
γ	Exponential(M=1.0)	3.50e-02 (1.03e-03 8.47e-02)	3.59e-02 (1.39e-03 8.92e-02)	3.53e-02 (1.06e-03 8.63e-02)	3.72e-02 (1.14e-03 8.99e-02)	3.52e-02 (1.27e-03 9.11e-02)	3.39e-02 (1.03e-03 8.23e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	2.94 (2.57 3.31)	2.57 (2.29 2.85)	2.25 (2.00 2.72)	2.13 (1.95 2.34)	2.14 (1.95 2.31)	2.22 (2.07 2.42)
α	Uniform(0.0, 2.0)	0.27 (0.08 0.57)	0.29 (0.08 0.69)	0.28 (0.10 0.62)	0.18 (0.04 0.38)	0.15 (0.05 0.33)	0.15 (0.04 0.37)
E_{init}	Expoenential(M=1.0)	11.22 (6.25 17.19)	18.17 (8.53 24.04)	19.96 (16.05 25.55)	11.80 (7.88 14.31)	5.33 (4.11 6.61)	4.17 (3.75 4.71)
Y_{init}	Exponential(M=1.0)	8.85e-03 (2.72e-03 2.13e-02)	4.56e-02 (2.61e-03 1.35e-01)	1.78e-02 (5.16e-03 1.12e-01)	1.57e-02 (3.12e-03 5.08e-02)	2.84e-02 (8.84e-03 8.63e-02)	9.58e-02 (3.68e-02 2.90e-01)

Table S10: Model parameter priors and estimated values (η = 1000)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46378 (-46419 -46325)	-46356 (-46409 -46309)	-46361 (-46414 -46297)	-46373 (-46435 -46296)	-46405 (-46464 -46317)	-46481 (-46545 -46395)
Tree height		0.365 (0.336 0.400)	0.351 (0.325 0.380)	0.337 (0.323 0.366)	0.338 (0.323 0.358)	0.335 (0.322 0.350)	0.342 (0.322 0.366)
Clock rate	Uniform(5.0e-4, 2.0e-3)	6.80e-04 (5.94e-04 8.04e-04)	7.55e-04 (6.50e-04 8.52e-04)	7.89e-04 (6.73e-04 9.25e-04)	7.82e-04 (6.59e-04 9.04e-04)	7.63e-04 (6.65e-04 8.81e-04)	6.63e-04 (5.53e-04 7.97e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.732 (3.088 4.535)	3.710 (3.079 4.476)	3.737 (3.064 4.491)	3.724 (3.049 4.480)	3.719 (3.081 4.480)	3.726 (3.053 4.414)
γ	Exponential(M=1.0)	3.53e-02 (1.00e-03 9.50e-02)	3.64e-02 (1.28e-03 9.05e-02)	3.56e-02 (1.12e-03 8.55e-02)	3.40e-02 (1.12e-03 8.97e-02)	3.71e-02 (1.07e-03 8.64e-02)	3.57e-02 (1.11e-03 8.62e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	3.15 (2.77 3.53)	2.57 (2.32 2.84)	2.20 (1.98 2.44)	2.06 (1.84 2.32)	1.94 (1.70 2.30)	2.07 (1.79 2.36)
α	Uniform(0.0, 2.0)	0.30 (0.08 0.81)	0.27 (0.13 0.51)	0.27 (0.12 0.49)	0.24 (0.11 0.47)	0.21 (0.12 0.36)	0.21 (0.10 0.40)
E_{init}	Expoenential(M=1.0)	8.41 (5.17 14.35)	8.98 (5.18 13.40)	10.20 (5.42 16.84)	7.38 (4.43 10.23)	3.96 (1.25 6.39)	3.43 (0.78 5.47)
Y_{init}	Exponential(M=1.0)	1.18e-02 (6.39e-03 2.03e-02)	8.61e-03 (4.53e-03 1.44e-02)	5.91e-03 (3.89e-03 1.05e-02)	5.87e-03 (3.52e-03 1.00e-02)	6.36e-03 (4.12e-03 9.45e-03)	8.74e-03 (4.48e-03 1.69e-02)

Table S11: Model parameter priors and estimated values (η = 2500)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46338 (-46385 -46296)	-46323 (-46371 -46275)	-46335 (-46400 -46275)	-46335 (-46412 -46262)	-46452 (-46525 -46388)	-46448 (-46510 -46390)
Tree height		0.348 (0.326 0.369)	0.341 (0.323 0.362)	0.340 (0.323 0.366)	0.340 (0.325 0.359)	0.417 (0.391 0.443)	0.417 (0.391 0.444)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.70e-04 (6.52e-04 8.90e-04)	7.81e-04 (6.84e-04 8.94e-04)	7.82e-04 (6.62e-04 9.20e-04)	7.68e-04 (6.39e-04 8.91e-04)	5.19e-04 (5.00e-04 5.79e-04)	5.15e-04 (5.00e-04 5.54e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.739 (3.015 4.377)	3.721 (3.105 4.471)	3.713 (3.055 4.429)	3.686 (3.076 4.435)	3.681 (3.046 4.429)	3.688 (2.975 4.359)
γ	Exponential(M=1.0)	3.53e-02 (1.17e-03 8.13e-02)	3.56e-02 (1.05e-03 9.57e-02)	3.78e-02 (1.01e-03 9.14e-02)	3.79e-02 (1.23e-03 9.21e-02)	3.68e-02 (1.02e-03 9.42e-02)	3.75e-02 (1.08e-03 8.69e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	2.83 (2.58 3.17)	2.44 (2.18 2.69)	2.17 (1.91 2.38)	2.05 (1.79 2.37)	1.01 (1.00 1.05)	1.06 (1.00 1.14)
α	Uniform(0.0, 2.0)	0.27 (0.11 0.54)	0.27 (0.14 0.48)	0.30 (0.15 0.50)	0.29 (0.17 0.44)	0.55 (0.38 0.74)	0.41 (0.25 0.59)
E_{init}	Expoenential(M=1.0)	10.88 (6.51 15.44)	10.56 (6.93 15.36)	9.31 (4.64 13.16)	4.80 (2.38 8.79)	2.01 (1.40 2.63)	1.82 (1.27 2.39)
Y_{init}	Exponential(M=1.0)	1.46e-02 (8.50e-03 2.38e-02)	1.10e-02 (6.63e-03 1.60e-02)	1.01e-02 (5.00e-03 1.75e-02)	9.90e-03 (5.06e-03 1.87e-02)	8.67e-02 (4.53e-02 1.38e-01)	9.12e-02 (5.60e-02 1.36e-01)

Table S12: Model parameter priors and estimated values (η = 5000)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior		-46335 (-46377 -46289)	-46327 (-46379 -46279)	-46326 (-46382 -46263)	-46306 (-46363 -46253)	-46365 (-46424 -46315)	-46428 (-46478 -46380)
Tree height		0.355 (0.327 0.381)	0.348 (0.328 0.370)	0.344 (0.326 0.364)	0.444 (0.425 0.466)	0.436 (0.412 0.464)	0.439 (0.414 0.463)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.21e-04 (6.21e-04 8.30e-04)	7.66e-04 (6.57e-04 8.80e-04)	7.87e-04 (6.71e-04 9.08e-04)	5.07e-04 (5.00e-04 5.30e-04)	5.07e-04 (5.00e-04 5.29e-04)	5.05e-04 (5.00e-04 5.22e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.712 (3.017 4.416)	3.726 (3.050 4.425)	3.725 (3.073 4.472)	3.696 (3.057 4.427)	3.682 (3.055 4.400)	3.700 (3.058 4.495)
γ	Exponential(M=1.0)	3.96e-02 (1.12e-03 9.39e-02)	3.38e-02 (1.15e-03 8.39e-02)	3.49e-02 (1.26e-03 8.90e-02)	3.69e-02 (1.16e-03 9.11e-02)	3.67e-02 (1.02e-03 8.53e-02)	3.47e-02 (1.01e-03 8.95e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	2.86 (2.58 3.19)	2.39 (2.14 2.68)	2.25 (1.95 2.52)	1.02 (1.00 1.06)	1.03 (1.00 1.09)	1.11 (1.03 1.18)
α	Uniform(0.0, 2.0)	0.27 (0.11 0.52)	0.32 (0.16 0.54)	0.32 (0.19 0.54)	0.82 (0.62 0.99)	0.68 (0.49 0.88)	0.49 (0.34 0.68)
E_{init}	Expoenential(M=1.0)	11.61 (6.50 17.27)	10.88 (4.52 17.09)	5.95 (2.84 9.63)	2.55 (2.12 2.82)	2.04 (1.51 2.60)	1.57 (1.14 2.10)
Y_{init}	Exponential(M=1.0)	2.22e-02 (1.37e-02 3.43e-02)	1.79e-02 (9.95e-03 2.86e-02)	1.27e-02 (8.02e-03 1.83e-02)	1.65e-01 (1.09e-01 2.48e-01)	1.49e-01 (9.60e-02 2.29e-01)	1.49e-01 (9.54e-02 2.21e-01)