SM 2

a) Best fitted evolutionary model results

Sample-size corrected Akaike information criterion (AIC) for the Equal-rates model (ER), symmetric model (SYM), and All-Rates-Different model (ARD), using the "fitDiscrete" function from the "Geiger" library version 2.0.6.2 for each parameter:

	ER	ARD	SYM
Size	1336.081	**1189.570**	1212.930
Loco	599.3784	**564.2022**	599.3784
Eco	916.9169	**876.9171**	916.9169

The best model corresponds to the model with the lowest AIC scores. Here it is the All-Rates-Different model for each of the tested parameter.

b) Analysis on multiple trees
- Size

1000 trees with a mapped discrete character with states: large, medium, small

The trees have 209.335 changes between states on average

Changes are of the following types:

large,medium	large,small	medium,large	medium,small	small,large	small,medium
75.803	0.251	12.697	49.051	0	71.533

Mean total time spent in each state is:

	large	medium	small	total
raw	2805.9561813	1.087159e+04	8333.039577	22010.59
prop	0.1275097	4.939993e-01	0.378491	1.00

If we compare these results to the 500 simulations on the consensus tree:

500 trees with a mapped discrete character with states: large, medium, small

The trees have 207.742 changes between states on average

Changes are of the following types:

large,medium	large,small	medium,large	medium,small	small,large	small,medium
76.226	0	11.166	51.708	0	68.642

Mean total time spent in each state is:

	large	medium	small	total

raw	2842.9959787	1.101899e+04	8367.1391505	22229.13
prop	0.1278951	4.957006e-01	0.3764043	1.00

- Locomotion

1000 trees with a mapped discrete character with states: large, medium, small

The trees have 89.43 changes between states on average

Changes are of the following types:

hopping,walking	walking,hopping
78.86	10.57

Mean total time spent in each state is:

	hopping	walking	total
raw	1.005399e+04	1.195660e+04	22010.59
prop	4.566848e-01	5.433152e-01	1.00

500 trees with a mapped discrete character with states: large, medium, small

The trees have 89.224 changes between states on average

Changes are of the following types:

hopping,walking	walking,hopping
78.312	10.912

Mean total time spent in each state is:

	hopping	walking	total
raw	1.011909e+04	1.211004e+04	22229.13
prop	4.552176e-01	5.447824e-01	1.00

- Ecology

1000 trees with a mapped discrete character with states: large, medium, small

The trees have 186.046 changes between states on average

Changes are of the following types:

Ground,Tree	Tree,Ground
46.66	139.386

Mean total time spent in each state is:

	Ground	Tree	total
raw	1.250389e+04	9506.6967852	22010.59
prop	5.681275e-01	0.4318725	1.00

500 trees with a mapped discrete character with states: large, medium, small

The trees have 185.462 changes between states on average

Changes are of the following types:

Ground,Tree	Tree,Ground
48.268	137.194

Mean total time spent in each state is:

	Ground	Tree	total
raw	1.273092e+04	9498.2065161	22229.13
prop	5.727135e-01	0.4272865	1.00

Conclusion: The overall results are similar between the stochastic mapping of 10 simulations over the 100 trees and the 500 simulations over the consensus tree.