**Brain to Body Mass Ratio and its Rate of Evolution Correlate with Species Diversification Across Mammals.**

**Hypothesis:**

Lineages of mammals with larger brains to body mass ratio have higher diversification rates.

First, rates of speciation (λ), extinction (μ) and Ratio of brain mass/body evolution were calculated by using Bayesian Analysis of Macroevolutionary Mixtures (BAMM).

speciation associated with rate of trait evolution (Spearman’s )

extinction rates associated with rate of trait evolution (Spearman’s )

net outcome of λ−μ = diversification rates were with phenotypic change.

We also identified an association between seed size and both speciation (ρ = −0.17, p-value = 0.003; Fig 2D), and extinction rates (ρ = −0.17, p-value = 0.003, Fig 2E). As the correlations with speciation and extinction were in the same direction and of comparable magnitude, and estimates of extinction rates were relatively variable (Fig 2E), net diversification rates did not change with seed size (ρ = −0.12, p-value = 0.077; Fig 2F). Generally, the observed correlations arose from many phenotypically fast-evolving clades distributed across the phylogeny (S1 Fig) and were robust to prior choice in the BAMM analyses (S2 Fi