

## “Inferring macroevolutionary processes from phylogenies and fossils”

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### Abstract

Present biodiversity represents a snapshot of a very long and complex evolutionary history, during which species and entire clades have originated, diversified and –to a large extent– gone extinct. Reliable estimates of the processes that have shaped diversity through time and in space are crucial to understanding present biodiversity patterns. Here, I present a suite of Bayesian models to infer different macroevolutionary processes including the dynamics of speciation, extinction and dispersal and the evolution of quantitative traits. These methods show that both phylogenies of extant taxa and the fossil record provide valuable information about past and present biodiversity, although their integration remains challenging. Future developments should use an interdisciplinary approach interfacing earth sciences, paleontology, and evolutionary biology to further improve our understanding of the processes driving the evolution of taxonomic and phenotypic diversity.