

COEVOL COÉVOLUTION MULTI-ECHELLES

EQUIPE LE COCON

BAILEY Nicholas

POST-DOC

CNRS

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I have a broad interest in evolutionary genetics and bioinformatics. I am especially interested in basic theory of evolutionary genetics fields such as population genetics and phylogenetics, in their application to study phenomena such as hybridization and speciation, and developing bioinformatic programs to improve the rigor of these applications.

Currently, I am working on modeling polymorphism in phylogenetics. Phylogenetic models typically assume instantaneous fixation of mutations in populations and consequently applications of phylogenetic models (e.g. estimating phylogenies or selection measured by methods like dN/dS) typically can only utilize a single individual to represent a whole population or species. My work applies novel theory on the effects of polymorphism in dN/dS to population genetic simulations along multiple branches in a species phylogeny to improve dN/dS estimation with planned application to antiviral genes in bats (order Chiroptera).

During my PhD at Auburn University, Alabama, United States, I conducted bioinformatic analyses on genomic data from macaques (genus *Macaca*) to study hybridization and speciation. Macaques are a relatively species diverse genus of primates that have also experienced extensive introgression between different lineages, making them an interesting system to study these two phenomena. During this time, I had a special interest in mitonuclear coevolution, where interacting mitochondrial- and nuclear-encoded genes coevolve to repair hybrid dysfunction, and reinforcement speciation, where selection against hybridization increases species divergence. Also during this time I constantly improved upon my methods and became interested in methods development. Consequently, I am still working on improving calculations of genetic diversity and neutrality tests biased by missing data begun during this time.

During my time as a lab technician in the University of Memphis, Tennessee, United States and my time as an undergraduate at Mississippi State University, Mississippi, United States, I conducted wet lab work in asterid (family Asteraceae) and orchid (family Orchidaceae) phylogenetics.