

Research Project

Evolution in Sky Islands: Eastern Afromontane hotspot

Third-party funded project

Project title Evolution in Sky Islands: Eastern Afromontane hotspot

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Speciation, or the process by which new species arise, is a fundamental topic in biology. Despite over a century of study it still remains relatively poorly understood, particularly in terms of the main mechanisms that determine how populations become reproductively isolated. With the advent of phylogeography and fine scale spatial tools, such as Geographic Information System (GIS) data, complemented by phenotypic data, we can now conduct comparative analyses into the main causal factors that drive speciation. In order to understand whether specific speciation patterns are pervasive in a system, analyses of independently derived species are necessary to see whether common patterns can be observed.

Tropical rainforests are interesting systems as they hold a relatively high proportion of species diversity, and understanding what are the main processes that have created this hyper-diversity can be informative for explaining common mechanisms. We propose to undertake studies of speciation in African amphibians in the “Sky Island” system of the Eastern Arc Mountains (EAM). Sky Islands are terrestrial analogues of Islands in Oceans.

The EAM system is an ideal study area as it is a global biodiversity hotspot (high diversity) and has species with apparently widespread distributions across isolated mountains – and therefore good candidates for species in the process of splitting into new species. We plan to study widely divergent amphibian groups which are restricted to forest habitats, but which show characteristic differences in their ecology and life history strategies. Congruence of speciation patterns between widely divergent species, occupying different niches within the same area should inform us of more general speciation patterns. Overall we plan to reveal the main processes by which species change (speciate) in this “Sky Island” system, which we expect will be important for elucidating the main mechanisms of speciation in this remarkable African biodiversity hotspot.

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