
Dispersal, niche and topoclimatic variation: speciation consequences for island invertebrates

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Abstract

Understanding speciation as a process on islands, particularly speciation within individual islands, is key to explain the high levels of invertebratespeciation that characterise many oceanic islands and archipelagos. Radiations of invertebrategenera, whether presumed to be adaptive or non-adaptive, have been the subject of a rich history of molecular phylogenetic analysis, revealing both the geography and timing of speciation at the archipelago scale. However, there has been rather less focus on the process of speciation itself, particularly speciation within islands. A key focus of our research in recent years has been to investigate how spatial variation in climate within islands can catalyse speciation by disrupting gene flow. In this talk I will present results from two mutually informative studies led by our group. The first is a clade-level approach within a diversified weevil genus across the island of Gran Canaria. The second is a community-level approach at a much smaller spatial scale within the laurel forest of Tenerife. Results from both studies emphasise the interaction of topography and changes in climate throughout the Quaternary as a driver of speciation, mediated by species-specific dispersal and niche characteristics. By combining RAD-seq data with high resolution climate models, we show that when dispersal ability and ecological tolerances are restricted, microclimatic variation over distances of only a few kilometres can maintain strong geographic isolation and drive speciation.

Keywords: Quaternary, diversification, insect, arthropod, RAD, seq, population genetics

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