

Microgeographic evolution of snail shell shape and predator behavior

Abstract

Genetic divergence in geographically isolated populations is a prerequisite for allopatric speciation, one of the most common modes of speciation. In ecologically equivalent populations existing within a small, environmentally homogeneous area, an important role for environmentally neutral divergence is often found or inferred. We studied a species complex of conspicuously shaped *Opisthostomaland* snails on scattered limestone outcrops within a small area of lowland rainforest in Borneo. We used shell morphometrics, mitochondrial and nuclear DNA sequences, and marks of predation to study the factors involved in allopatric divergence. We found that a striking geographic divergence exists in shell morphology, which is partly associated with neutral genetic divergence. We also found geographic differentiation in the behavior of the snails' invertebrate predator and evidence of an evolutionary interaction between aspects of shell shape and predator behavior. Our study shows that adaptation to biotic aspects of the environment may play a more important role in allopatric speciation than previously suspected, even on a geographically very small scale.