

Taylor, M. S. and M. E. Hellberg. 2005. Marine radiations at small geographic scales: speciation in neotropical reef gobies (*Elacatinus*). *Evolution* 59: 374-385.

Studies of speciation in the marine environment have historically compared broad-scale distributions and estimated larval dispersal potential to infer the geographic barriers responsible for allopatric speciation. However, many marine clades show high species diversity in geographically restricted areas where barriers are not obvious and estimated dispersal potential should bring many sister taxa into contact. Genetic differentiation at small (separation < 1000 km) spatial scales could facilitate speciation by mechanisms other than the gradual accumulation of reproductive isolation during extended allopatry, such as ecological adaptation to local environmental conditions or the rapid evolution of genes tied to mate recognition, but the role of each of these possibilities has not been simultaneously explored for any species-rich marine taxon. Here, we develop a robust phylogenetic framework for 31 taxa from a species-rich group of Neotropical reef fishes (Gobiidae: *Elacatinus*) using 3230 bp from one mitochondrial and two nuclear gene regions. We use this framework to explore the contribution of large- and small-scale geographic isolation, ecological differentiation, and coloration toward the formation and maintenance of species. Although species of *Elacatinus* occur on both sides of the Isthmus of Panama, no sister species are separated by this barrier. Instead, our results indicate that sister taxa occur within oceans. Sister taxa usually differ by coloration, and more distantly related sympatric species frequently differ by resource use. This suggests that some combination of coloration and ecological differences may facilitate assortative mating at range boundaries or in sympatry. Overall, speciation in *Elacatinus* is consistent with a model of recurring adaptive radiations in stages taking place at small geographic scales.