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Island Reptiles Buck an Evolutionary Trend

by Adam Mann on April 29, 2010 5:00 PM | [Permanent Link](#) | [0 Comments](#)

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The Caribbean island of Martinique has a lot to offer: beautiful beaches, tropical weather, and a perfect place to challenge notions about how new species arise. When anole lizards (*Anolis roquet*) arrived on Martinique more than 8 million years ago, there were four separate, smaller islands. Over time, this physical isolation should have allowed the lizards to evolve into different species, according to conventional evolutionary wisdom. But that's not what happened.

One of the best ways to split a species is allopatric speciation. That's when some sort of physical barrier separates individuals from the same population, causing them to eventually become so genetically distinct that they can no longer interbreed. A famous example is [Darwin's finches](#), which started out as a single species but adapted over millions of years to the various environments of the Galápagos Islands, eventually becoming 13 species.

Not so for Martinique's lizards. Evolutionary biologist Roger Thorpe of Bangor University in the United Kingdom and colleagues analyzed the DNA of individual lizards from all over the island to uncover how much they had diverged during isolation. Using a molecular clock—short segments of DNA that accumulate mutations at a steady rate—the researchers identified four genetic sequences corresponding to unique lizard populations on Martinique's island predecessors. The analysis, [reported](#) today in *PLoS Genetics*, shows that the isolated lizard populations diverged for 8 million years after they arrived on the precursor islands. But they didn't accumulate enough mutations to become separate species before volcanic flows connected the islands together and the populations were reunited.

Surprisingly, there may be a better chance of that happening now that Martinique is a single island, Thorpe and colleagues found. The anole lizards have segregated themselves along the island's various habitats, including

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Origin of species. Anole lizards living in different habitats on the island of Martinique show distinct shapes and colors, suggesting that they are diverging into new species.

Credit: Roger Thorpe

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forests, shoreline, and dry scrubland. Although the lizards in these habitats live in close proximity and have the opportunity to mate, the team's DNA analysis indicates that these animals seldom interbreed. The separated lizards also exhibit distinct shapes and color patterns, all of which suggests that these anoles are in the process of diverging into separate species.

Thorpe says the results “really surprised” him. That animals living side by side would diverge more than those separated by ocean challenges the traditional view of how species evolve, he says. “People need to rethink their assumptions.”

The paper contains “one of those unusual natural experiments that you don't often see,” says evolutionary biologist Barry Sinervo of the University of California, Santa Cruz. He says the results show that allopatric speciation is important but can't necessarily create new species by itself, even after millions of years. Rather, ecological separation might be needed to complete the process.

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