

Catalina Island Giants and Dwarfs

By the Catalina Island Conservancy Education Department



The Catalina California ground squirrel is a giant compared to its distant relatives on the mainland. Courtesy Catalina Island Conservancy.

AVALON, CA, 21 February 2014 -- One fascinating thing about isolated islands, like Catalina Island, is that the average body size of certain resident species can change, and sometimes dramatically. How and why size changes occur can be driven by different physical challenges posed by the environment.

The island can have a scarcity or unusual bounty of food resources. There's usually a limited gene flow on an island, because new blood rarely arrives. And the changes happen over time - lots of time ... generations, centuries, and eons. As a practical matter, gigantism and dwarfism is driven by the interplay of all these factors.

Island gigantism and dwarfism is a very real evolutionary factor. That means it's not an exaggeration to say that, like the local ground squirrel, the Catalina California quail is an actual giant.

All plants and animals move toward equilibrium within their environment. They develop the size, speed, agility and diet that will maximize their odds of survival. Since the environment is different on Catalina than on the mainland, equilibrium here is different, too. For squirrels, bigger was better.

But why do some species get big and others small? Let's take a look at the Catalina Island fox, an actual dwarf. A lot of the same factors that favored big squirrels and big quail on Catalina also favor small foxes. For a fox or any other species arriving on Catalina, it would have found ongoing changes from the mainland in habitats, food availability, competition, predation and genetics.

But foxes got smaller, not bigger. Why is that? The answer is simple: Foxes aren't squirrels. They need different things to survive, and they behave differently. That would have meant Catalina would have presented a very different set of opportunities and challenges for them.

What if, on the mainland, the fox was being "pushed" as a species to be bigger in order to fend off competitors, such as coyotes? What if the best defense against predators there was to be big and fierce enough to fight, instead of to run and hide, like a squirrel? Pressures like that would have favored bigger foxes.

Like the Catalina California ground squirrel, the fox's arrival on Catalina led to the discovery that it was the only fox in town. It had plenty to eat and not much in the way of predators. In this case, though, investing all that energy in being bigger and fiercer wasn't necessary anymore. Energy formerly expended in that direction could be put toward raising young.

Another discovery was that a lot of food and prey on the mainland simply wasn't on the Island. The diet would have to be altered, and was. Foxes went more veggie. The combination of no competition and a more vegetarian diet favored a leaner, smaller animal that could get around the Island eating cactus fruit and pouncing on beetles instead of small squirrels. All of this (and more) almost certainly happened.

And, as with the chubbier squirrel, just being a skinny fox wasn't the only factor making the Catalina Island fox a dwarf. Over time, for a combination of reasons, nature favored the lean-framed animals here and those foxes lived to pass on their genes. Meanwhile, bigger, less nimble foxes probably didn't make nature's cut.