

How These Cute Creatures Confound Evolutionary Theory

We often hear that opposing the “scientific consensus” on this-or-that topic is benighted. Sometimes it can be that. But sometimes it isn’t—especially when scientific findings themselves contradict an established scientific consensus.

For at least a century, biologists have believed that the more “genetic diversity” there is within a species, the better able that species is to adapt to environmental change, and thus thrive over time instead of becoming extinct because of such change.

But Prof. Dan Graur, author of a new biology textbook called [Molecular and Genome Evolution](#), [explains](#) why he believes this is untrue. He focuses on two impressive counter-examples. The first is a species of island foxes living off the coast of Southern California.

Graur discusses an [article](#) in last month’s *New York Times*?, which noted that the pesky creatures continue to thrive despite being devoid of genetic diversity. Both the *Times* writer, Carl Zimmer, and the scientists who had made the discovery are puzzled. “How can the island foxes get away with it?” asked Dr. Oliver A. Ryder, the director of genetics at the San Diego Zoo Institute for Conservation Research.

The scientific consensus implies that zero genetic diversity is a formula for extinction. But those adorable (if genetically dull) foxes have been around for thousands of years.

The other example is that of orangutans, which are about three times more genetically variable than humans. Yet humans “are increasing their population size like rabbits” while

orangutans are facing the process of extinction.

Are these simply exceptions to the rule? Examples that should be treated as anomalies? That is what the *New York Times* suggests. But Graur points out that there are *thousands* of such exceptions.

What's the truth? Graur believes he has the answer:

“Low genetic variability does not lead to small population sizes; small population sizes lead to low genetic variability. The probability of extinction depends on population size, which in turn may have low levels of genetic variation. But genetic variation in itself does not doom a population to extinction.”

In most cases, genetic variation within a species neither improves nor reduces the species' ability to survive over time, he concludes. There is simply no causal connection between lack of genetic variation and extinction.

Why would a seemingly false consensus persist for so long? Perhaps because to most scientists it's *plausible*. If you believe in evolution by natural selection, it's natural to think that the more genetic diversity a species exhibits, the more likely it is to develop mutations that are adaptive within a changing environment. But that doesn't seem to be the case.

So next time somebody gets called a knuckle-dragger for raising questions about a scientific “consensus,” you'll have one more counter-example at the ready.

[Image Credit: Wiki]