

THE ART OF SCIENCE

The porgs in Star Wars are a perfect example of natural selection

Samuel Levin | December 21, 2017



Are porgs possible? The new film *Star Wars: The Last Jedi* has introduced the world to the fantastically cuddly sea birds—inspired by the [real-life puffins that kept wandering onto set](#)—along with [invented animals](#) ranging from crystal-covered foxes to gigantic space horses. Just as physicists have had plenty of fun discussing the plausibility of light sabers and blasters, it seems only fair to consider the flora and fauna of Star Wars from the perspective of evolutionary biology.

One might wonder whether we can expect the laws of natural selection—which have shaped life on Earth—to hold on other planets. The answer is a firm yes. As my colleagues and I argue in a [recent paper](#) published in the *International Journal of Astrobiology*, natural selection is the only way to generate life. The apparent purposefulness of life—its adaptedness—is what sets organisms apart from things like rocks and gases. Trees, bacteria, Ewoks, and now our beloved Porgs are made up of many intricate parts,

working together for the common “purpose” of the survival and reproduction of the organism. The only way to generate this apparent design is through the slow process of natural selection—whether the life in question is here on Earth or in a galaxy far, far away.

We should expect Star Wars creatures to appear designed for the purpose of getting their hereditary material into the next generation. On Earth, that material is DNA. But it could be something else altogether on Jakku. Until we take a microscope to a dead porg, we won't know. But importantly, it doesn't matter if they are carbon-based or silicon, DNA possessing or not—all creatures will undergo natural selection.

The evolutionary biology of porgs

To what degree, then, are the life forms of *The Last Jedi* informed by what we know of evolutionary biology? Quite a bit, it would seem. Environmental adaptedness abounds in the Star Wars universe. Perhaps the most obvious example is Rian Johnson's [crystal critters, or vulptex](#). With their glistening ice-like pelts, they appear both camouflaged to salty tundra and structurally suited to slipping between cracks in the caves that riddle their planet.

Darwinian thinking is at its most exciting on Luke Skywalker's remote planet. He lives on an isolated

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outpost. Second, by quarantining those that do arrive, an island allows its inhabitants to diverge drastically from its mainland counterparts. Neil Scanlan, the man responsible for shaping Star Wars' creatures, [explained the influence of Darwin's in an interview with Inverse](#): “It was very important to try and keep a DNA stream from the Porgs to the Caretakers or any of the creatures who lived on the island. Because the feeling was it was this incredibly isolated place. There was little, if any evolutionary influence coming from anywhere else.”

In *The Last Jedi*, we see that the creatures surrounding Luke are either aquatic, like the caretakers, or aerial, like porgs. This perhaps explains how they arrived on the island in the first place: They either swam there, or they flew.

Of course, other questions arise. Have the caretakers since lost their aquatic lifestyle, retaining their amphibious skin as a vestige of a past habitat? Were the porgs and caretakers separate arrivals, or descendants from a single common ancestor—as the filmmakers have hinted? If so, considering the time it would take for these two creatures to diverge so drastically, why is there not more diversity on the island? The various possibilities leave many open questions for the student of evolutionary biology.

The limits of evolutionary perspective

Unfortunately, these questions bring us up against the limits of our analysis. It's crucial to remember that evolutionary biology is very bad at predicting specific evolutionary trajectories. If a Galapagos finch or Ahch-toian porg arrives on an island, we can't say whether it will, over time, become blue or red, grow horns or scales, lose its flight or gain limbs. That's because the mutations that pop up, upon which selection then acts, are random.

Some researchers have tried to extrapolate about creatures on other planets from convergent evolution on Earth. They argue, for example, that since eyes have evolved so many times on Earth, aliens are likely to have eyes as well. But since life on Earth is all [descended from a single ancestor](#), we have no way of knowing if these independently evolved features are truly independent. If they are, aliens could just as well be eyeless.

This brings us to the most biologically suspicious aspect of Star Wars. The creatures in that distant galaxy are surprisingly Earth-like. Aside from the obviously humanoid characters, even the more wild organisms often have limbs and torsos, with eyes and mouths in their heads, etc. In this way, one of our most imaginative pieces of fiction is somewhat disappointing.

Of course, that is the beauty of science fiction. Unlike pure fantasy, it is rooted in scientific explanation. But unlike works of realism, it doesn't have to be exactly accurate. Science fiction is at its best when it is grounded in scientific understanding, but violates the rules in surprising and subtle ways. From the perspective of evolutionary biology, Star Wars walks that line beautifully.

A deeper connection

And maybe there's an even deeper Darwinian root to the world of Jedis and Sith. Evolutionary biology can't tell us exactly how realistic the porgs or the crystal critters are. The winding route that evolutionary history takes is unpredictable. But all life in Star Wars *will* undergo natural selection, and will have been shaped by natural selection in the past. We can say with confidence we shouldn't find an organism, from Jakku to Naboo, designed *not to* spread its genes—whatever those genes are made of.

In that sense, there *is* a force that unites all life, across the galaxies, from long, long ago to the distant future. It's much less mystical than the force Yoda speaks of. It's a remarkably simple process of replication with varying degrees of success. But for all the wondrous forms that process has created—from panthers to porgs—the force of natural selection is all the more magical.

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