

Research pair find plants on islands produce bigger seeds

May 22 2014, by Bob Yirka



A small Fijian island. Credit: Remember/Wikipedia

(Phys.org) —A pair of biological researchers with Victoria University of Wellington, New Zealand, has found that plants that grow on islands tend to produce bigger seeds than similar plants on the mainland. In their paper published in *Proceedings of the Royal Society B: Biological Sciences*, the two describe how they collected seed samples from several islands around New Zealand and found that they were larger on average than their mainland cousins.

Scientists have known for some time that [plants and animals](#) are different on [islands](#) than they are on the mainland—some are bigger, such as Komodo dragons, certain insects, Kodiak bears, and the Malagasy elephant bird. They grow bigger because food is abundant and they don't have to compete for it and/or they have few to no predators.

On the other hand, some island animals are smaller, such as the dwarf elephant, which grow smaller over time due to limited resources. Plants have also been known to grow woodier and some grow very large leaves. In this new effort, the researchers wondered if there might be size differences between [seeds](#) of plants that grow on islands and their closest relatives on the mainland. To find out, they visited four island groups around New Zealand and collected seeds from 40 different plants that could be matched with published seed descriptions of similar plants on the mainland. In comparing the pairs, the researchers found that the island seeds were consistently larger even after accounting for variations in growth form, mode of dispersal and [evolutionary history](#).

The researchers suggest plants living on islands might produce bigger seeds because that would make the seeds heavier, a means of preventing them from being carried too far by animals, or being blown into the sea. They also suggest because larger seeds produce larger seedlings, the larger size might provide for an edge over competing [plants](#). The finding by the team supports previous studies of gigantism on islands and provides additional evidence of an early evolutionary history. The two researchers also suggest that more study would likely be necessary to truly understand the evolutionary mechanism behind larger seed sizes on islands.

More information: The repeated evolution of large seeds on islands, *Proceedings of the Royal Society B*, Published 21 May 2014 [DOI: 10.1098/rspb.2014.0675](#)

Abstract

Several plant traits are known to evolve in predictable ways on islands. For example, herbaceous species often evolve to become woody and species frequently evolve larger leaves, regardless of growth form. However, our understanding of how seed sizes might evolve on islands lags far behind other plant traits. Here, we conduct the first test for

macroevolutionary patterns of seed size on islands. We tested for differences in seed size between 40 island–mainland taxonomic pairings from four island groups surrounding New Zealand. Seed size data were collected in the field and then augmented by published seed descriptions to produce a more comprehensive dataset. Seed sizes of insular plants were consistently larger than mainland relatives, even after accounting for differences in growth form, dispersal mode and evolutionary history. Selection may favour seed size increases on islands to reduce dispersibility, as long-distance dispersal may result in propagule mortality at sea. Alternatively, larger seeds tend to generate larger seedlings, which are more likely to establish and outcompete neighbours. Our results indicate there is a general tendency for the evolution of large seeds on islands, but the mechanisms responsible for this evolutionary pathway have yet to be fully resolved.

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