

How plants may be evolving to the lack of bees

July 14 2014



Credit: Lilla Frerichs/public domain

Plants which used to have two types of male reproductive organs – to increase their chances for fertilisation – are reverting back to one type. And in some cases, they are becoming self-fertilising.

This "reverse evolution" could provide new hope for people worried about declining numbers of pollinators, such as bees.

Researchers from the University of Stirling and the University of Illinois turned their attention on the buffalo bur, a prickly species from Mexico and North America. It's part of the same family of "nightshade" plants as the tomato and the humble potato.

The bur has evolved unusual [flowers](#) with two types of [male reproductive organs](#) – or anthers.

"One type of feeding anther has evolved to lure pollen-eating bees, whilst another pollinating anther sneaks behind the bees' backs and deposits pollen for fertilising other flowers", says Dr Mario Vallejo-Marín from Stirling's School of Natural Sciences.

"This elaborate pollination strategy has evolved multiple times in bee-pollinated flowers of many plant families, and is an example of how natural selection can produce the similar results from different starting points."

But he adds: "Evolution sometimes reverses on itself. We've discovered that this complicated division of labour within flowers can breakdown repeatedly, and produce species with flowers that revert back towards the ancestral form of only one type of anthers."

In a study, published in the Royal Society journal *Philosophical Transactions of the Royal Society B*, the researchers say this "reversion" to smaller flowers – with one functional type of anthers – may be caused by the loss of pollinators (such as bees) of the right size required to fertilise the flowers.

Competition for pollination between closely related species can also be a factor.

"Plants can dynamically adapt to changing numbers and types of

pollinating bees," says Dr Vallejo-Marín, "A loss of pollinating [bees](#) may favour the evolution of smaller, self-fertilising flowers that don't require pollinators."

The buffalo bur is regarded as a weed – and an invasive species in some countries. But falls in bee numbers are a bigger worry for other crops.

"Whether the reversion towards self-fertilisation can provide an escape route from ecological bee shortages depends on how rapidly plants can evolve. In the current pollinator crisis, understanding how plants adapt to changes in bee numbers and type is essential."

Provided by University of Stirling

Citation: How plants may be evolving to the lack of bees (2014, July 14) retrieved 1 May 2024 from <https://phys.org/news/2014-07-evolving-lack-bees.html>

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