

Close relative of the cultivated tomato is resistant to many insects

April 25 2018, by Dr. Bj (Ben) Vosman



Credit: Wageningen University

A wild tomato species from the Galapagos Islands has been discovered by scientists from Wageningen University & Research to be resistant to a wide range of pest insects. This species is closely related to the cultivated tomato, making the resilience easier to interbreed into the latter and ultimately making it resistant to many different types of insects.

Cultivated tomatoes are far more vulnerable to pests and diseases than some of their wild relatives. The process of breeding modern tomatoes has resulted in the loss of a lot of their [natural resistance](#), while wild species have remained much better at coping with insects.

Scientists have been working to reverse this by reintroducing resistance from wild tomato species via breeding. The problem is that most of these plants are very distant relatives of the cultivated tomato and scientists have yet to successfully interbreed the required traits. The wild tomato from the Galapagos Islands, however, is genetically very similar to the cultivated tomato. Moreover, its resistance is coded within a single chromosome, which should make cross-breeding into existing plants much easier.

Multi-resistant

"We have been busy with this research since 2010," said Ben Vosman, scientist at Wageningen University and Research. "We worked with samples of the wild tomato species *Solanum galapagense* from a gene bank. The first discovery was that this tomato [species](#) is resistant to whiteflies. Then it turned out that it is actually resilient to a lot of other insects too, including the green peach aphid and caterpillars of the beet armyworm. That was a very pleasant surprise."



Credit: Kevin Gepford & Theo Margelony

Cultivated tomatoes are easily affected by [pest insects](#). One is the whitefly, which transmits viruses that infect the plants and eventually kill them. This fly is normally combatted by pesticides. "If we can make cultivated tomatoes resistant to whiteflies, this will directly benefit the environment," Vosman states.

While this problem is still relatively manageable in greenhouses, for example through integrated control, there are pests there too. In field crops, the problems with insects are much bigger. "We expect most of the gain to be in field cultivation and in the tropics," Vosman continues. "We are delighted with this discovery."

More information: Ben Vosman et al. Broad spectrum insect resistance and metabolites in close relatives of the cultivated tomato, *Euphytica* (2018). [DOI: 10.1007/s10681-018-2124-4](https://doi.org/10.1007/s10681-018-2124-4)

Alejandro F Lucatti et al. Differences in insect resistance between tomato species endemic to the Galapagos Islands, *BMC Evolutionary Biology* (2013). [DOI: 10.1186/1471-2148-13-175](https://doi.org/10.1186/1471-2148-13-175)

Syarifin Firdaus et al. Identification and QTL mapping of whitefly resistance components in *Solanum galapagense*, *Theoretical and Applied Genetics* (2013). [DOI: 10.1007/s00122-013-2067-z](https://doi.org/10.1007/s00122-013-2067-z)

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