

Plant neighbors 's(c)ent' to protect

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People and animals are not the only ones who can smell. Plants are also able to perceive odors, but they process them in a very different way . While insects or mammals smell odors within a second of exposure, plants require much longer exposure times to respond. Then using this information, they react effectively to the odors emitted by infected or infested neighboring plants in order to increase their resistance to pest insects or disease. The new study by Sarai Giron-Calva, from the Department of Genetic Engineering at CINVESTAV-Irapuato in Mexico, and colleagues is published online in Springer's *Journal of Chemical Ecology*.

Odors emitted by stressed plants can induce resistance to disease in healthy neighbors. While this so-called 'talking trees' phenomenon was identified more than 20 years ago, the mechanism by which plants smell and process odors remains unclear.

To establish both the dose of odors and length of exposure which are required to induce resistance against [bacterial infection](#) in plants, the authors exposed lima bean plants to different concentrations of two odor compounds - nonanal and [methyl salicylate](#) (MeSA). Both compounds are known to enhance resistance to [bacterial disease](#) in lima beans. They then measured the plants' resistance to the pathogen, after both 6 and 24 hours.

In the case of nonanal, [plant resistance](#) was significantly increased after both 6 and 24 hours. Furthermore, there was no difference in induced resistance between the two concentrations of the odor. In contrast, the

authors found that the lima bean plants mounted a high level of resistance to bacterial infection after exposure to MeSA over an entire day, but not after short exposure of 6 hours. After 24 hours of exposure, the low concentration of MeSA was as effective at inducing resistance to the pathogen as the higher concentrations.

The researchers conclude: "In contrast to insect or mammals which can respond to odors within a second of exposure, the 'nose' of plants works in a fundamentally different way to perceive odors. Plant to plant signaling in this instance is likely to involve the accumulation of odors in the receiving plant over a long period of time."

More information: Girón-Calva PS et al (2012). Volatile dose and exposure time impact perception in neighboring plants. *Journal of Chemical Ecology*. [DOI 10.1007/s10886-012-0072-3](https://doi.org/10.1007/s10886-012-0072-3)

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