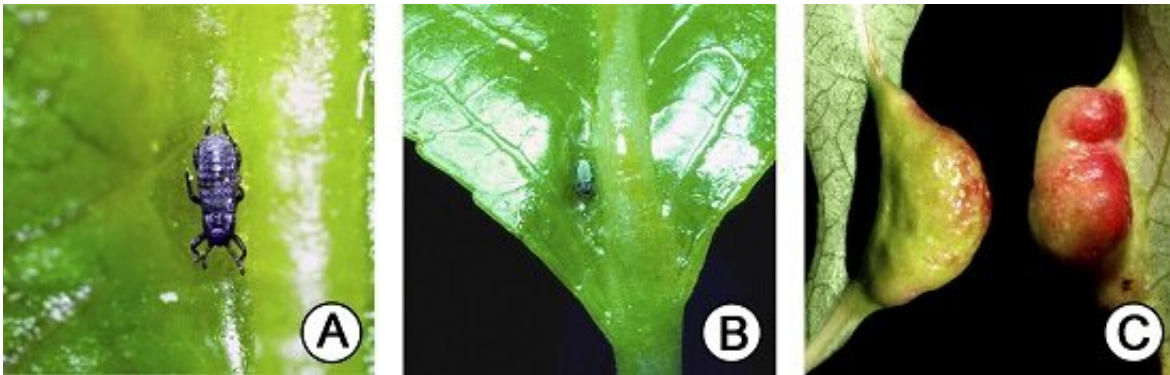


New plant galls research includes most comprehensive study of role of hormones

August 6 2019



A, Fundatrix aphid inducing a gall near the base of the midvein on the upper surface of a poplar leaf. B, Young gall forming near the base of the midvein on the upper leaf surface. The fundatrix (approximately 0.6 mm long) moves back and forth in the gall depression (approximately 3 mm long) adjacent to the midvein continually probing the leaf tissue with her stylet and, within about 3 days, is completely enclosed in gall tissue. C, Side view of fully developed galls that have formed on the underside of the leaf from the activity of the fundatrix on the upper leaf surface. Credit: A and B, Thomas G. Whitham; C, Heidi M. Appel.

Some insects have the ability to manipulate plants to produce new organs known as galls, which manifest as abnormal growths on leaves, branches, or twigs. These galls provide insects and their offspring with food and shelter. Insects are also able to redirect the plant's nutrients, such as sugar, toward their galls, sometimes leaving the plant malnourished.

This competition for nutrition between the gall and the rest of the plant makes some of these [insects](#) a serious pest. In the 1800s, the galling insect phylloxera nearly decimated grapevine in Europe and another, the Hessian fly, caused a severe cereal shortage in the United States. Galling insects are master manipulators with the potential for widespread damage.

A team of scientists from the University of Toledo, University of Missouri and Northern Arizona University studied the relationship between galling insects and [poplar trees](#) and found that poplars that resisted these insects had higher levels of defense hormones. They also found that resistant poplars had a lower amount of a class of growth hormones called cytokinins. Last, they discovered that [hormone](#) changes in response to insect feeding are inherited.

This study, published in *Molecular Plant-Microbe Interactions*, is the most complete study to date about the role of hormones in galls, measuring 15 plant hormones belonging to 5 different classes. These findings can be used as a model for pest management and could help the agriculture and forestry industries better understand what makes [plants](#) resistant to pests.

More information: Mélanie J. A. Body et al, Heritable Phytohormone Profiles of Poplar Genotypes Vary in Resistance to a Galling Aphid, *Molecular Plant-Microbe Interactions* (2018). [DOI: 10.1094/MPMI-11-18-0301-R](#)

Provided by American Phytopathological Society

Citation: New plant galls research includes most comprehensive study of role of hormones (2019, August 6) retrieved 10 April 2024 from <https://phys.org/news/2019-08-galls-comprehensive-role->

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