

HERBIVORY BY A PHLOEM-FEEDING INSECT INHIBITS FLORAL VOLATILE PRODUCTION

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Volatile organic compounds emitted by plants mediate an array of interactions with herbivores, pollinators and predators. Though there is extensive knowledge on the release of volatiles from vegetative tissue and release from flowers, very little is known on how they interact. We studied the effects of aphid and caterpillar damage to vegetative tissues on the emission of floral scents by *Sinapis alba*. Damage by the specialist aphid *Lipaphis erysimi* just prior to anthesis caused a near-total shutdown of volatile emission from flowers after 72 hours and more so after 96 hours. The generalist aphid *Myzus persicae* caused a large reduction, though not as important as *L. erysimi*. Caterpillars of the pyralid moth *Plutella xylostella* caused no reduction in floral volatile emission. There was a linear reduction in volatile emission with increasing *L. erysimi* density over 72 hours. When damage by *L. erysimi* started after anthesis no volatile shutdown was detected, so aphid damage only affects floral volatiles if it occurred before anthesis. Field observations showed no effect of this reduction on the total number of flower visits by pollinators. The responses of two aphid natural enemies, *Coccinella septempunctata* and the parasitoid *Diaeretiella rapae* were studied in the olfactometer to determine whether they detect changes in floral volatiles. *C. septempunctata* was attracted to the vegetative parts of *L. erysimi*-damaged plants, but preferred the flowers of undamaged plants. *D. rapae* on the other hand responded preferentially to the odour of flowers from damaged plants over the odour of flowers from undamaged plants. This is the first unequivocal demonstration of an effect of herbivory to vegetative parts affecting floral volatiles and raises a series of ecological questions in relation to indirect interactions between herbivores and pollinators.

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