

# Settling on leaves or flowers:

## Herbivore feeding site determines the outcome of indirect interactions between herbivores and pollinators

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### Background

For antagonistic and mutualistic community members, indirect interactions can impact community structure and trait evolution, influencing eco-evolutionary dynamics. In nature, antagonistic and mutualistic networks are intertwined, but how trait variation in herbivore species affects plant interactions with mutualists has seldom been explored.

### Methods

Pollinator behavior + aphid performance assays:

At the start of flowering, we infested Black mustard (*Brassica nigra*) plants with one of 3 aphid herbivores on leaves or flowers.

The aphids



One week after flowering, we observed pollinator visitation by two pollinators in two-choice assays (uninfested vs infested plant) and we counted aphid numbers.

The pollinators



Aphid preference assay:

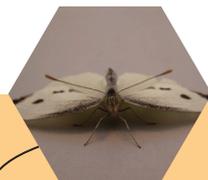
- Plants one week after flowering in meshed cages.
- 20 winged aphids.
- After 24 hours we recorded the position of the aphids.

### Results

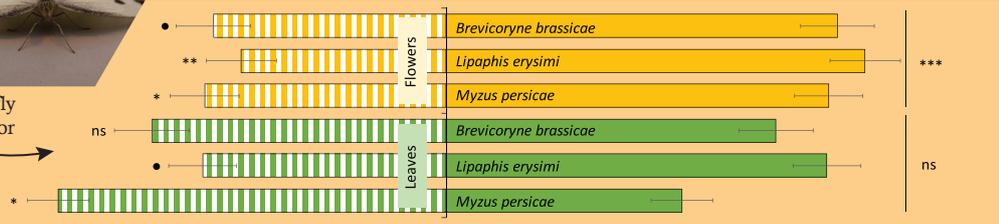
1) Feeding by the three aphid species on flowers had positive effects on the attraction of both butterflies and syrphid flies.

Feeding on leaves had contrasting effects on pollinator attraction depending on aphid and pollinator species.

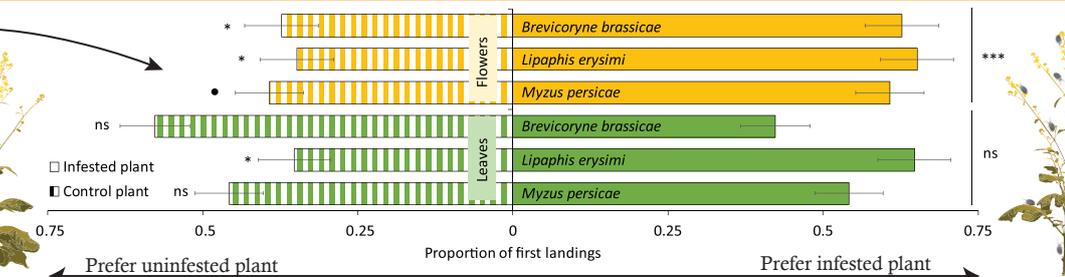
Same results for total visitation time and number of flowers visited on uninfested and infested plants.



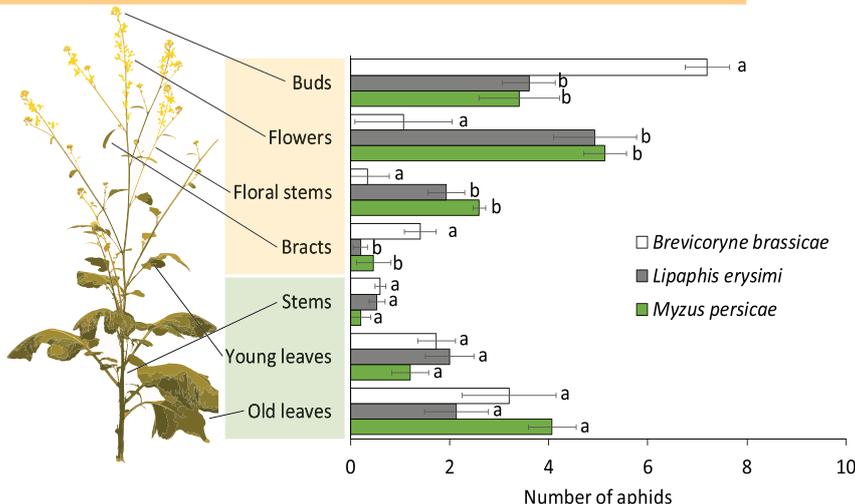
Butterfly behavior



Syrphid fly behavior



2) All three aphid species preferred inflorescence over vegetative tissues. Aphid species preferred different organs within inflorescence or vegetative parts.



3) The two specialist aphids - *L. erysimi* and *B. brassicae* - performed better on flowers compared with leaves, while the generalist aphid - *M. persicae* - performed equally well on both tissues.

