Plant host preferences of native and invasive mirids in Canadian greenhouses (Hemiptera: Miridae)

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Introduction

- Canadian greenhouse production is valued at ~$3.2 billion and faces threats from arthropod pests.[1]
- The use of biological control mitigates non-target effects of pesticides and development of resistance.[2,3]
- Worldwide, mirids - including *Dicyphus hesperus* in North America - serve in biocontrol of greenhouse pests.[4,5]
- This study examines two previously unassessed Canadian mirids - *Dicyphus discrepans* and *D. famelicus.*
- Another mirid, *Nesidiocoris tenuis* has recently established as a pest of cucumber and tomato in Ontario.[6]
- It is unclear whether *N. tenuis* preferentially oviposits - relative to native mirids - on various host plants, including bankers (alyssum, mullein), crops (tomato, cucumber, strawberry) and trap plants (sesame[7,8]).
- Understanding the preferred host plants for both invasive and native mirids can inform management practices.

GOAL: To establish the preferred oviposition host plants for *Dicyphus hesperus, Nesidiocoris tenuis*, *Dicyphus famelicus* and *Dicyphus discrepans*.

D. hesperus

N. tenuis

D. famelicus

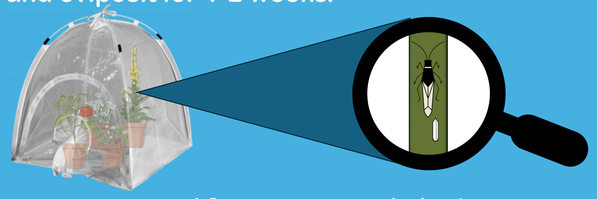
D. discrepans

Methods

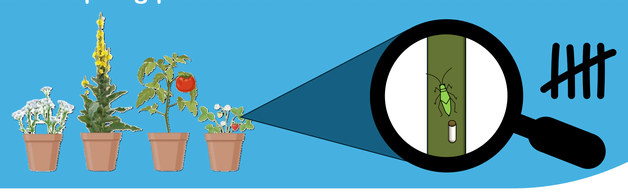
1. One of each host plant was placed in a mesh cage.

1. Mullein - mirid banker
2. Alyssum - banker — Trial 1
3. Strawberry - crop
4. Tomato - crop
5. Cucumber - crop — Trial 2
6. Sesame – possible banker

2. Adult mirids were released onto plants and allowed to mate and oviposit for 1-2 weeks.

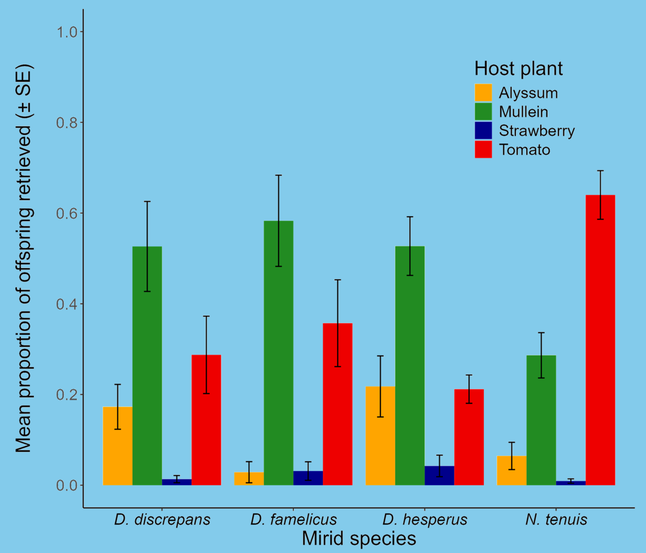


3. Adults were removed from cages and plants were individually contained in mesh sleeves.
4. Eggs were left to hatch for 4 weeks.
5. Total offspring produced were collected and counted.

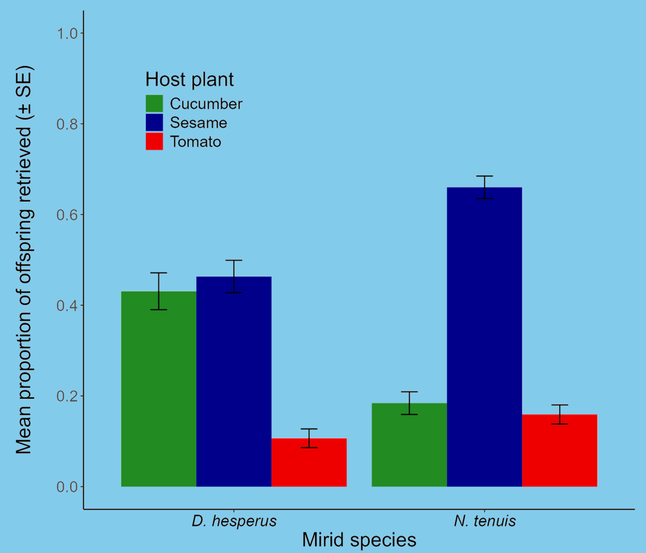


Preliminary Results

Bars indicate mean proportion of nymphs retrieved from each plant type



- *Dicyphus* mirids show a preference for laying on mullein.
- *N. tenuis* preferentially lays on tomato.
- *N. tenuis* produces more total offspring.



- *Dicyphus hesperus* seems to prefer cucumber and sesame to tomato.
- *N. tenuis* preferentially lays on sesame.

Conclusions & Next Steps

- Host plant preference vary between species:
  - *Dicyphus hesperus, D. famelicus* and *D. discrepans* preferentially lay on mullein
  - *N. tenuis* preferentially lays on tomato
- Sesame seems promising as a possible trap plant for *N. tenuis* in tomato and cucumber crops.

- Future work:
  - Elucidate oviposition preferences of these mirids seasonally.
  - Assess the chemical ecology of these mirids in the presence of various host plants. Early detection and mass trapping
  - Conduct commercial greenhouse trials looking at the use of sesame as a trap plant for *N. tenuis* in tomato and cucumber crops.
  - Assess the ability of *N. tenuis* to displace beneficial mirids on bankers

References & Acknowledgements

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