The use of alyssum and calendula in greenhouse crops to increase aphid's biocontrol

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Introduction

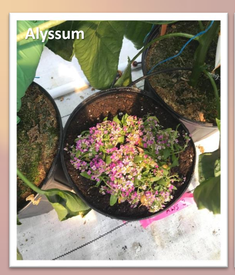
Biocontrol of aphids in greenhouse crops could be challenging, particularly against melon aphid (*Aphis gossypii*) in cucumber, or green peach aphid (*Myzus persicae*) in sweet pepper. In Québec, many biocontrol agents are introduced by greenhouse producers, such as parasitoids (*Aphidius colemani*) or cecidomyid fly (*Aphidoletes aphidimyza*). Other natural enemies are also present in greenhouses and can provide additional control, such as ladybeetles or syrphid flies. The use of attractive plants, such as alyssum or calendula, could help introduced biocontrol agents to survive better, and attract more natural enemies.

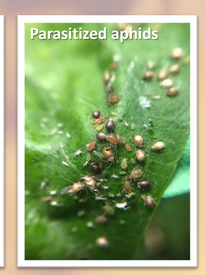
This project aims:

To evaluate the impact of the use of alyssum or calendula on pest control in cucumber and sweet pepper in greenhouse.

Methodology

- 4 greenhouses (2 cucumber, 2 sweet pepper)
- 3 pots of alyssum or calendula between plants in 3 rows/greenhouse
- Two plants of cucumber or sweet pepper observed around each pots of flowers or at control station (8 plants/greenhouses)
- Identity and abundance of pest and biocontrol agents (introduced or natural) noted each week between May and September 2021.





Discussion

- Slight impact of alyssum or calendula flowers have been observed in this preliminary study with presence of some natural enemies or higher parasitism rate around some flowers.
- No reduction of pest abundance have been observed on cucumber or sweet pepper with the presence of alyssum or calendula.
- Number of flowers will be increased in the next step of experiments, as well as the number of greenhouses.

Results

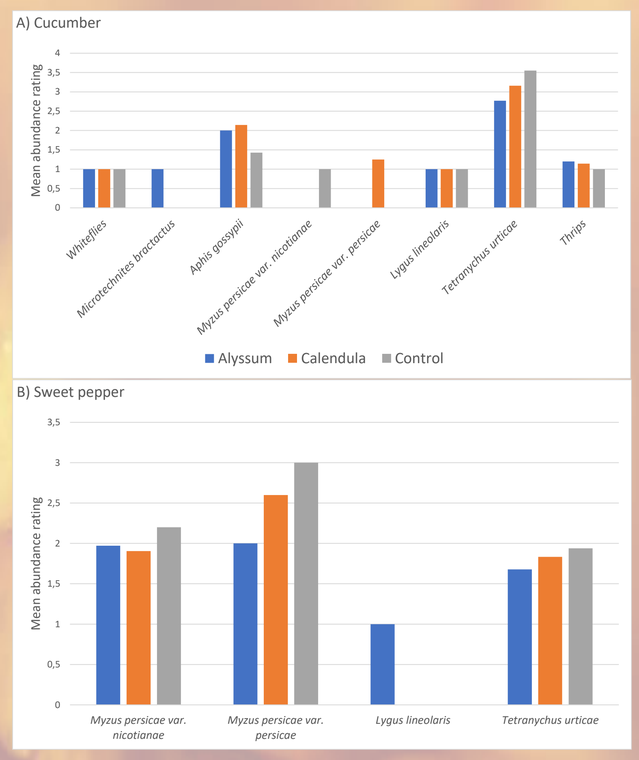


Figure 1. Abundance of pests in A) cucumber and B) sweet pepper plants next to alyssum, calendula or control station. Note: Abundance rating: 1: < 10; 2: 10-49 individuals/plant; 3: 50-199; 4: > 200.

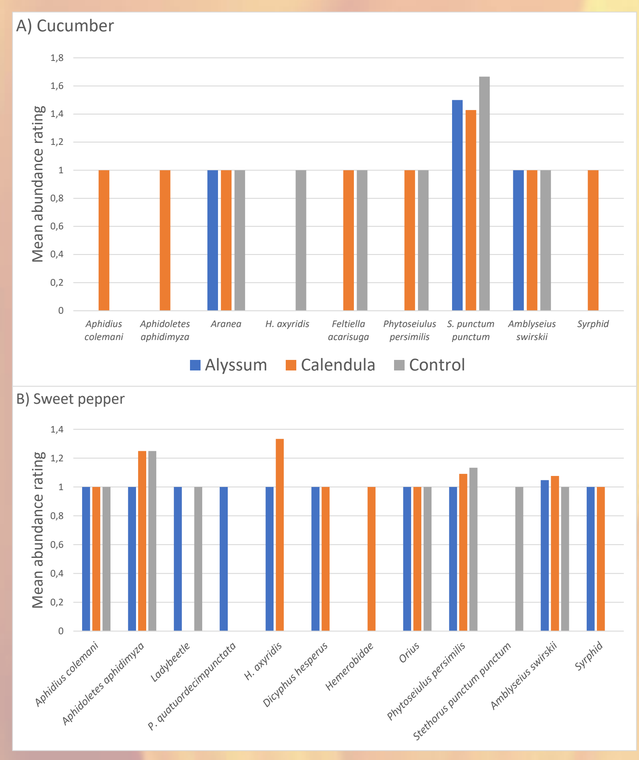


Figure 2. Abundance of natural enemies and biocontrol agents in A) cucumber and B) sweet pepper plants next to alyssum, calendula or control station. Note: Abundance rating: 1: < 10; 2: 10-49 individuals/plant.

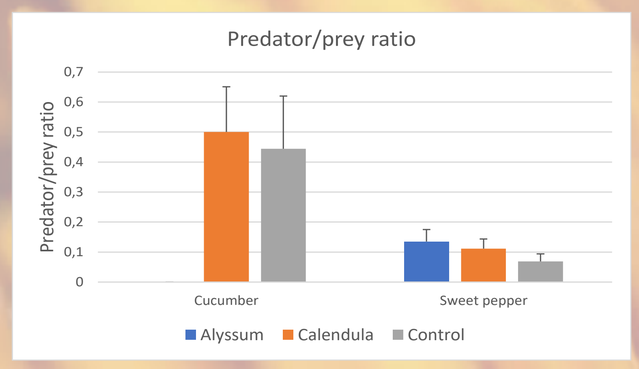


Figure 3. Predator/prey ratio of abundance rating in cucumber or sweet pepper plants next to alyssum, calendula or control station. Note: The highest is the ratio, the more predators are presents for each pest.

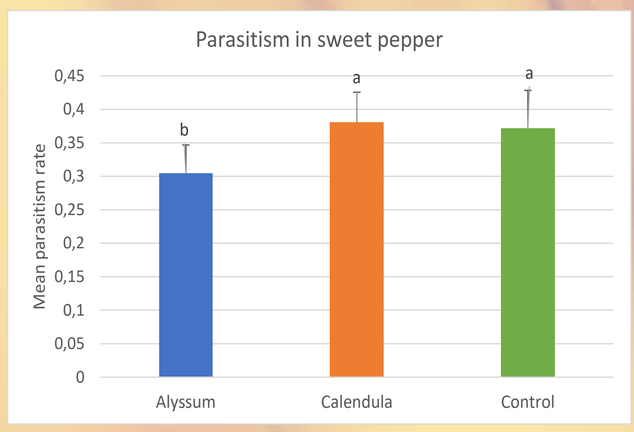


Figure 4. Parasitism of aphids in sweet pepper plants next to alyssum, calendula or control station. $F_{2,16} = 5.71$; $P = 0.01$

- Similar abundance of aphids on cucumber or sweet pepper around flowers or control station (Fig. 1A and B).
- Presence of syrphids only around calendula or alyssum flowers (Fig. 2A) and B)). No differences in abundance of natural enemies or biocontrol agents with the presence of alyssum or calendula.
- No differences have been observed for the prey/predator ratio (Fig. 3), nor the presence/absence of natural enemies on flowers (*P > 0.05).*
- Higher parasitism rate on aphids around calendula and control plants in sweet pepper (Fig. 4).

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