2021 ENTOMOLOGY
Oct. 31 – Nov. 3 | Denver, CO

Behavioural choices of *Lygus lineolaris* in semi-field strawberry arenas with integrated pest management strategies

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Tarnished plant bug

The Tarnished plant bug (TPB) (Hemiptera: Miridae) threats more than 130 crops in North America, among them, strawberry.

Currently, there is no effective control strategy and the complexity of its behavior is not well known.

Resource selection of this omnivorous species could be in response to the following factors:

- Sensory preferences: visual and olfactory
- Nutritional requirements
- Target action: feeding, reproduction
- Environmental: competition, predation, availability

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Understanding TPB feeding and oviposition behavior in the potential presence of predators is needed to apply optimal biological control strategies

Plant host & structure preferences

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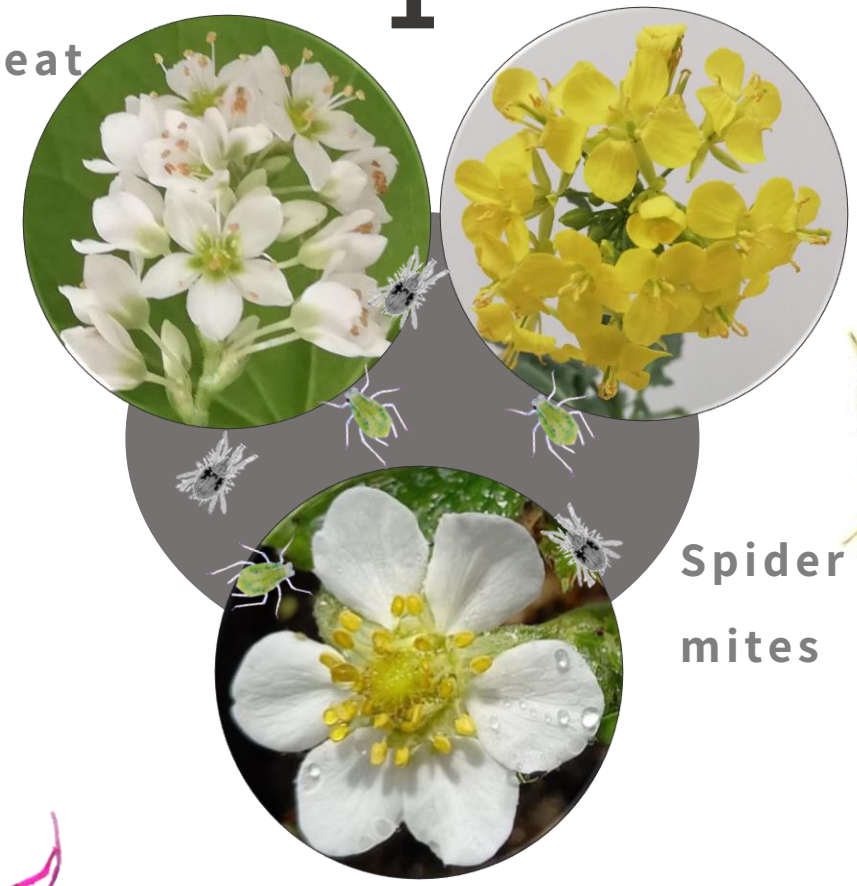
- **TPB**: 30 adults <7days (1:1 sex ratio)
- **Arenas:**
  - Host plants: Strawberry, Canola, Buckwheat
  - Preys (50 ind. each): Spider mites + Aphids
  - Predator: 3 *N. americoferus*
- **Feeding:** 4 observations/day for 3 days
- **Oviposition**: cut plant structures & check L1 emergence
- **Conditions:** 25ºC, 16:8L , 70%HR
- **Replicates**: 10 adults/ 5 L1

Treatments

1

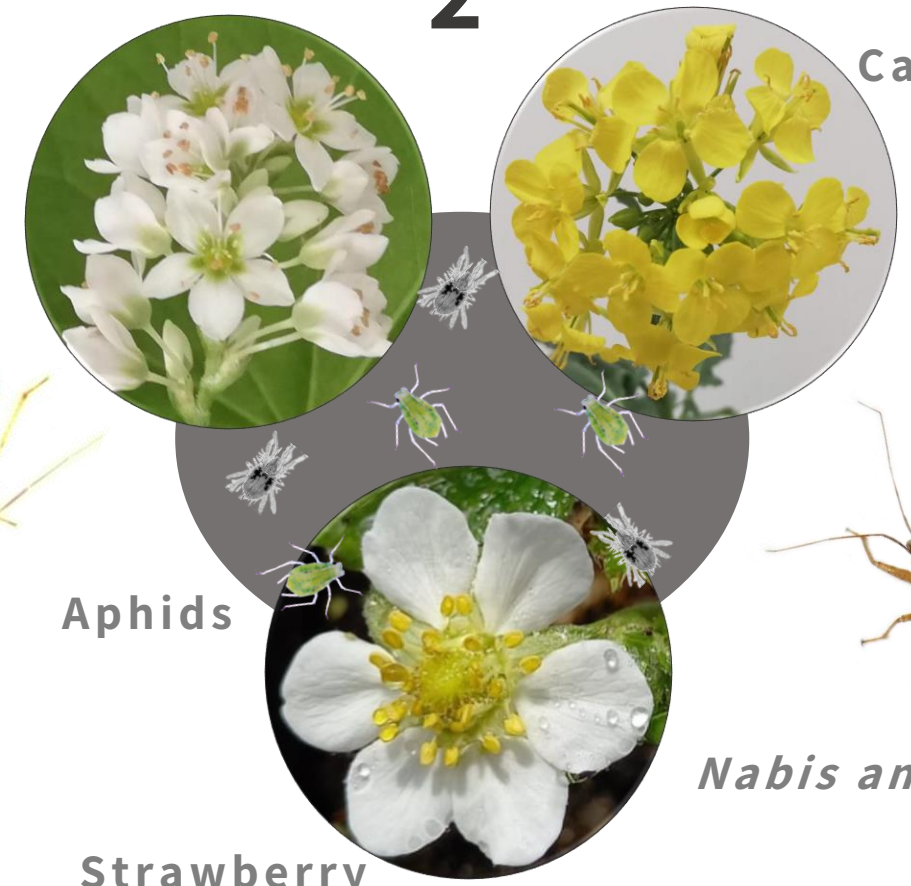
Buckwheat



Spider mites

2

Canola



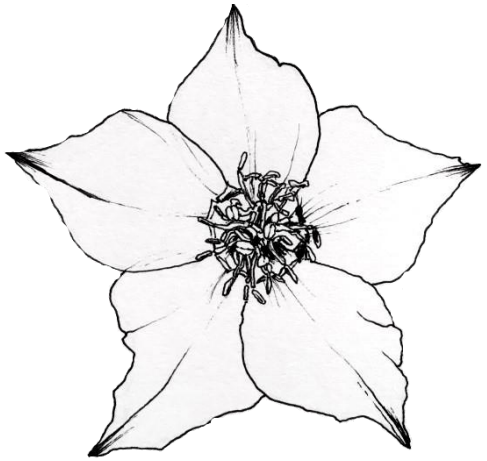
Aphids

Nabis americoferus

Strawberry

Predator

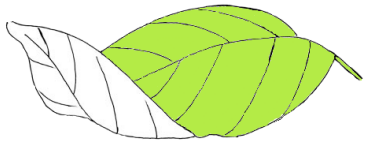
Plant structures



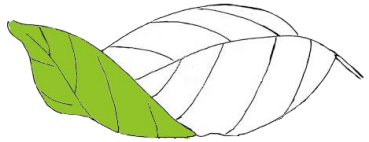
Flower

Stem

Leaf



Adaxial leaf side

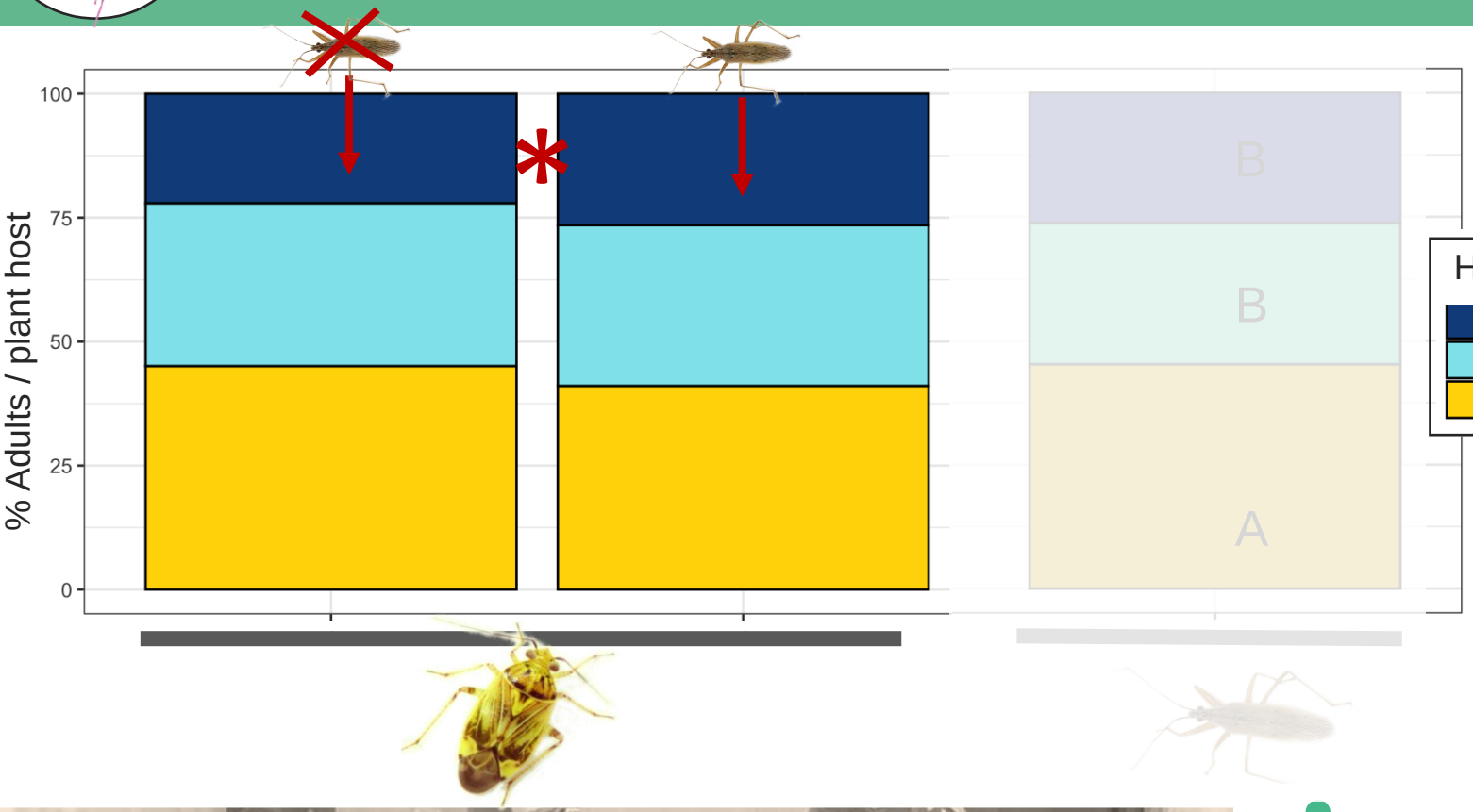


Abaxial leaf side

Host plant preferences

- TPB & Nabis distributes among the 3 plants.
- Trap crops are preferred, specially **canola.**

Host plant preferences

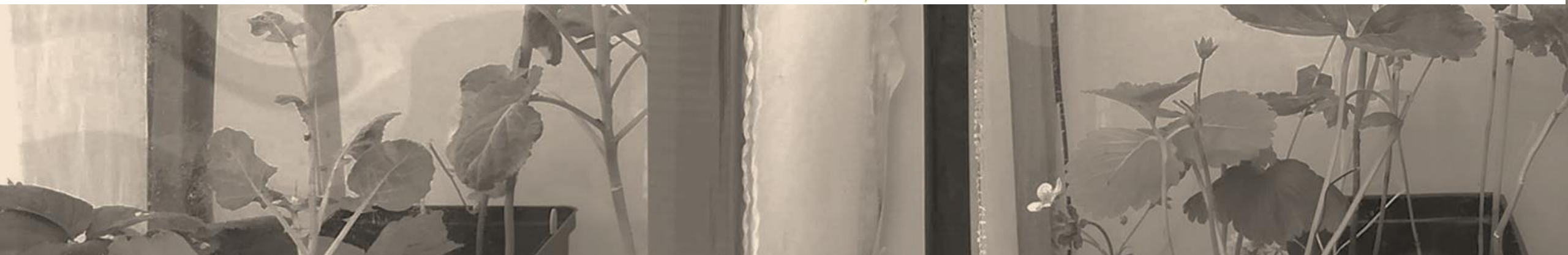


- TPB & Nabis distributes among the 3 plants.
- Trap crops are preferred, specially **canola.**
- **When the predator is present**, the number of TPB in **strawberry** significantly increase.

Plant structure preferences

- For **TPB**, the preferred plant structure is the **flower** while for **Nabis** is the **stem**

  (β = 1,47 ± 0,13; z = 11.73; p < 0,001)



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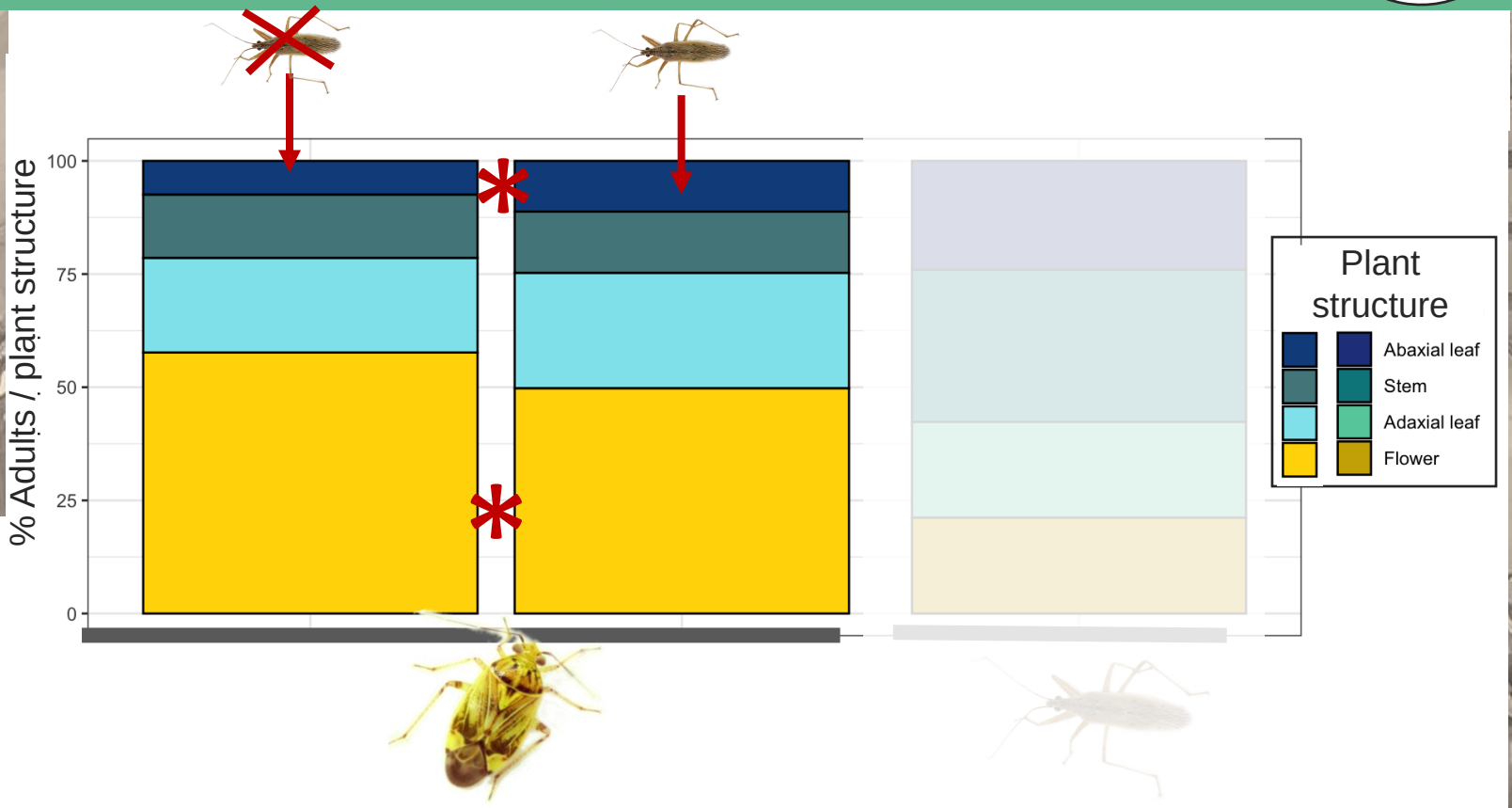

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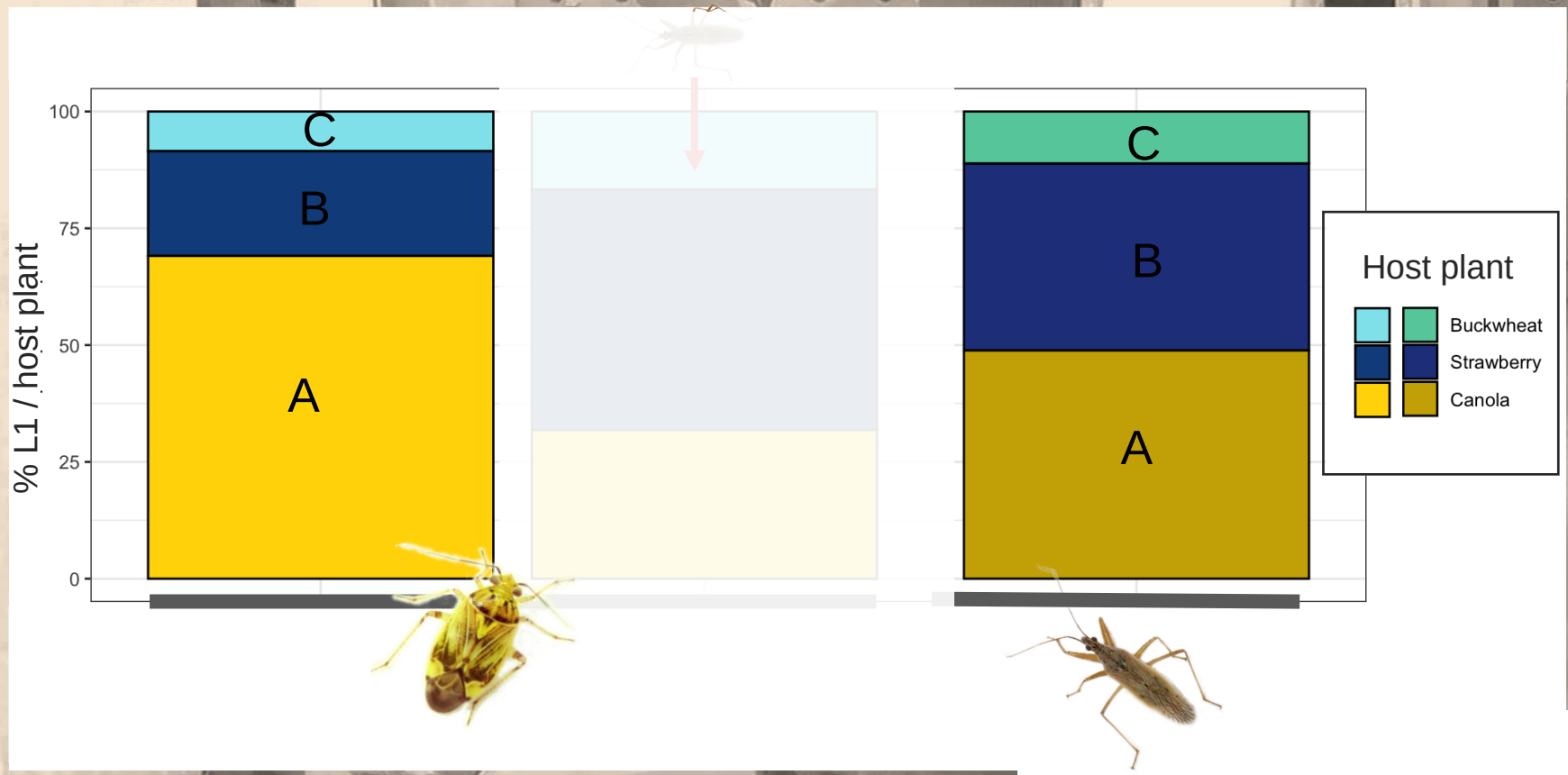
- **When the predator is present**, the number of L1 in the **abaxial leaf side increase** while the number in the **flower decreases**.

(β = 0,44 ± 0,21; z = 2,092; p = 0,03, β = 0,87 ± 0,35; z = 2,49; p = 0,01)

Host plant L1 emergence



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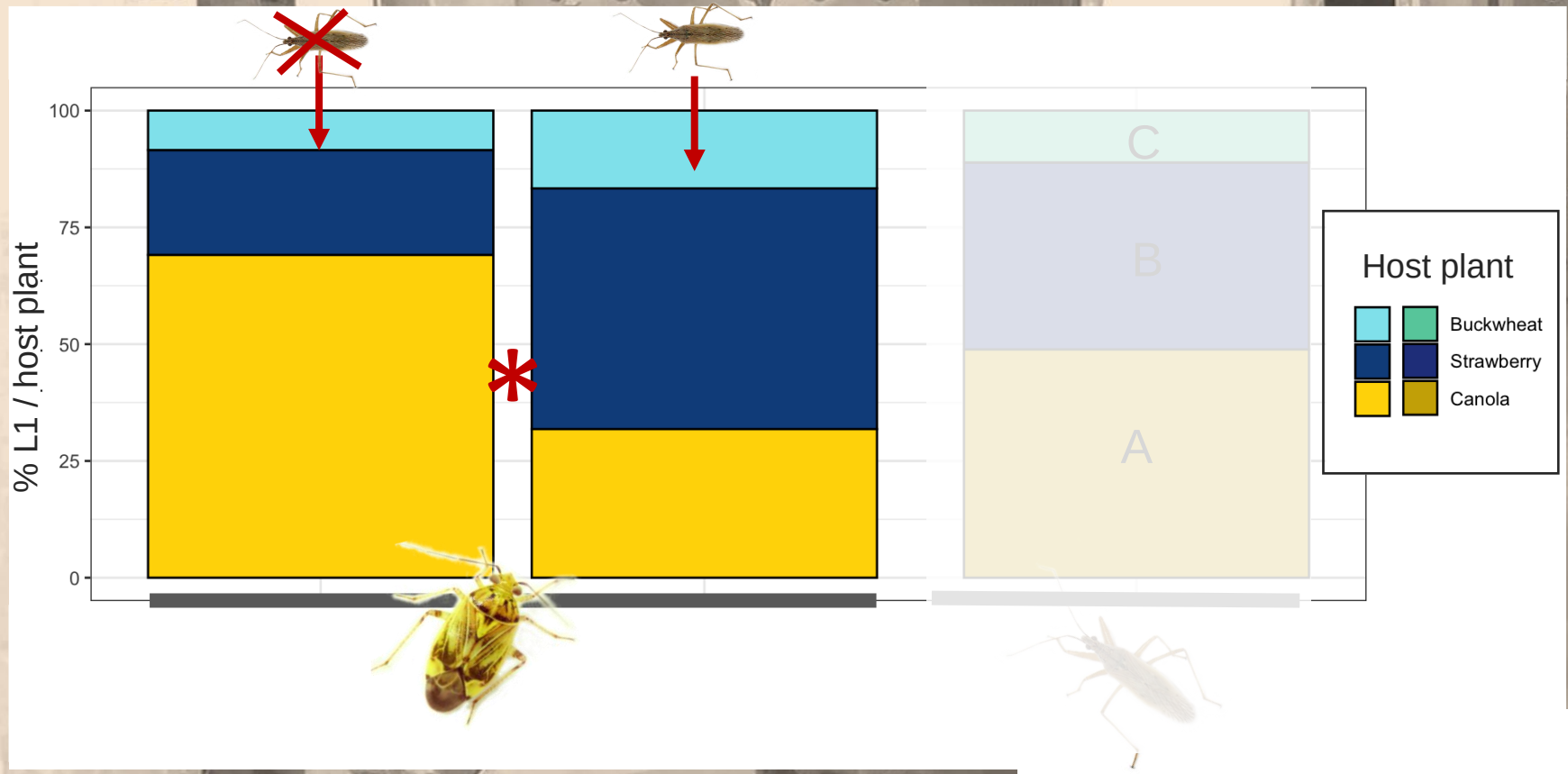
Host plant L1 emergence



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Plant structure L1 emergence

- **Stem** is the preferred TPB & Nabis oviposition plant structure.

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- **Stem** is the preferred TPB & Nabis oviposition plant structure.
- **When the predator is present**, the number of L1 in the **stem** decreases in the detriment of other plant structures.

Conclusions

- The presence of trap crops, specially canola, reduces the pressure on strawberries.
- Plant structure preferences depend on the target action.
- The presence of the predator shifts TPB choices towards less preferred hosts and plant structures.
- Distribution between hosts and plant structures could be in response to the benefits commensurate with polyphagia and to avoid competition and predation.

Thank you

Interns: Anne Ménard, Mélanie Primeau & Chiara Chelo

Founding: MITACS, CRSNG and AAC

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