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Voracity, functional response and prey preference of *Nabis americoferus* feeding on tarnished plant bugs and aphids

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INTRO : The damsel bug, ***Nabis americoferus*** (Carayon) (Hemiptera: Nabidae) is a polyphagous predator commonly found in valuable cultures of North America. Nabis species can feed on several important agricultural pests such as the tarnished plant bug (TPB), ***Lygus lineolaris*** (Palisot de Beauvois) (Hemiptera: Miridae) or aphids such as ***Myzus persicae*** (Sulzer) and ***Aphis gossypii*** (Glover) (Hemiptera: Aphididae). Both pest groups can be often found together in **strawberry** fields and **cucumber** greenhouses. Understanding functional and numerical responses is important for **biological control** purposes. However, few information on *N. americoferus* predatory capacity is available.

Nabis americoferus

Foto credit: Graham Montgomery

OBJECTIVE: To test the level of voracity, the functional response and the prey preference of *N. americoferus* for the control of TPB and aphids under controlled conditions in the laboratory and in the greenhouse.

LABORATORY

METHODS: In each test, one fastened ***N. americoferus*** adult was allowed to feed for 24h on a different density of preys (L3 **TPB** or ***M. persicae***) in a small aerated arena containing a **strawberry** leaf. Then, the number of dead preys were evaluated (when possible, n=15).

RESULTS :

- **Voracity: 10 individuals** when **15** preys were **offered**. It was similar for both species (t=0.408, df=19.231, p.value=0.688).

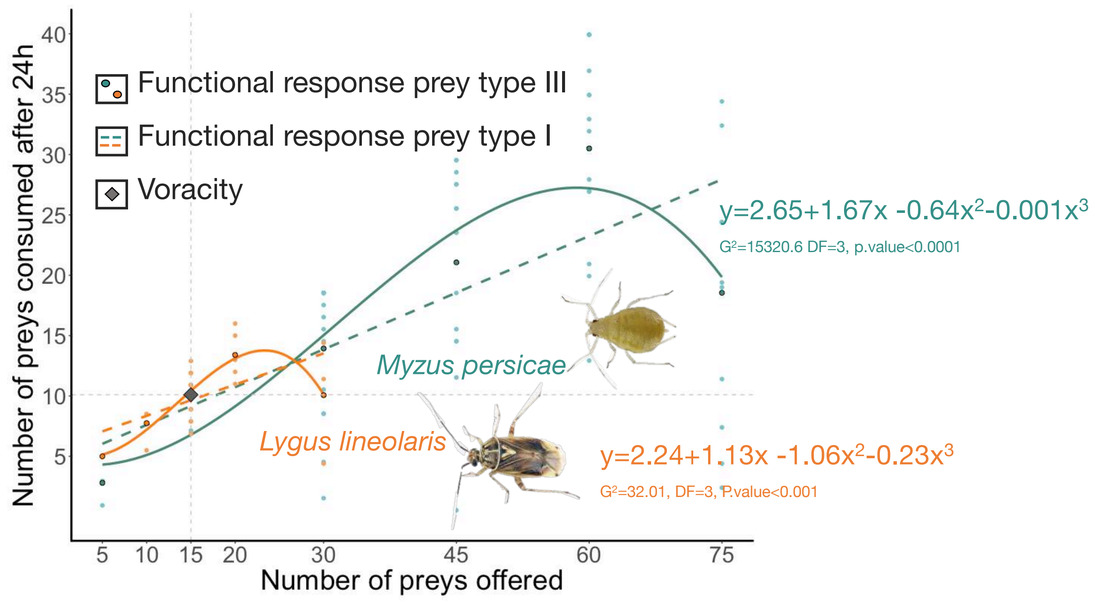


Figure: Functional response and voracity of *N. americoferus* for TPB and aphids.

- **Functional response: TYPE III** for both species.
- **Maximal prey consumption:**
  - **TPB: 13 preys** when **20** TPB were **offered.**
  - **Aphid: 30 preys** when **60** aphids were **offered.**

DISCUSSION: ‘

- Nabis is a highly voracious predator that follows the characteristic sigmodial curve for generalist predators.
- *Nabis* satiates before with L3 TPB than with aphids when showing similar voracity. This suggest higher handling time for TPB.

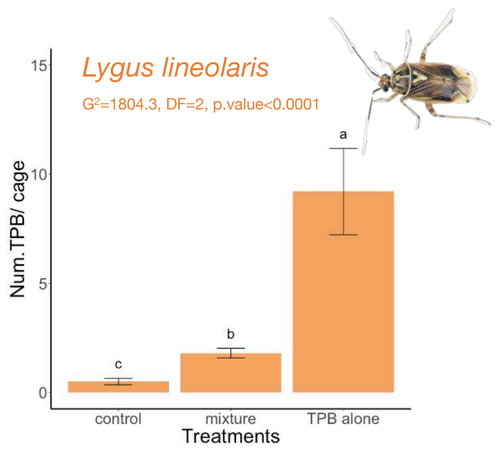
GREENHOUSE

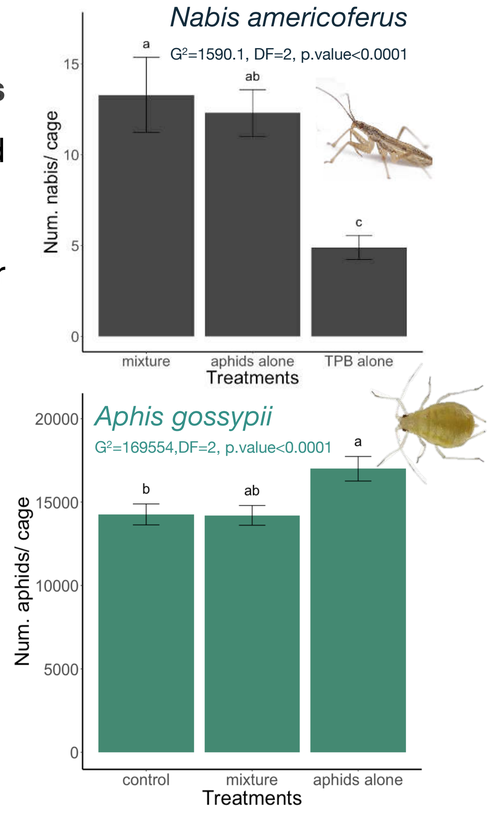
METHODS: Three adult **Nabis** (2 females+1 male) were introduced in a cage with 5 **cucumber** plants initially infested with: **1)** 25 **TPB** (L5 to adult), **2)** 125 ***Aphis gossypii*** or **3) mixture** of both. A **control** treatment with a mixture of preys but without the predator was also prepared. Six weeks later, the three populations were evaluated. Per each treatment, n=15.

RESULTS :

Nabis

- Cages including aphids presented higher Nabis populations. ‘
- Especially, when offered together with TPB.





Figures: Number of insects per cage and treatment after 6 weeks.

TPB

- TPB population was higher when the predator was present.
- Especially, when no aphids were present.

Aphids

- Nabis was not able to control the aphid’s population boom.
- Aphid population was higher in the absence of TPB.

DISCUSSION:

- Nabis might perform better in a system with alternative preys.
- When the predator was present both preys invested in reproduction.
- The initial predator-prey ratio needs to be adjusted.

FUTURE: *Nabis americoferus* has shown to be a good predator susceptible for being used as control agent against TPB and aphids. However, further work is needed to evaluate the functional response when both preys are offered together. Also, further studies in greenhouse and field adjusting the introduction rate are needed.

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