

# Assessing the predatory capacity of *Nabis americanoferus*: a native biological control agent of greenhouse pests

Authors: Andrew LaFlair<sup>1,2</sup>, Sherah Vanlaerhoven<sup>2</sup>, Julia Mlynarek<sup>1</sup>, Roselyne Labbe<sup>1</sup>

<sup>1</sup>Harrow Research and Development Centre, Harrow, ON; <sup>2</sup>University of Windsor, Windsor, ON



## Introduction

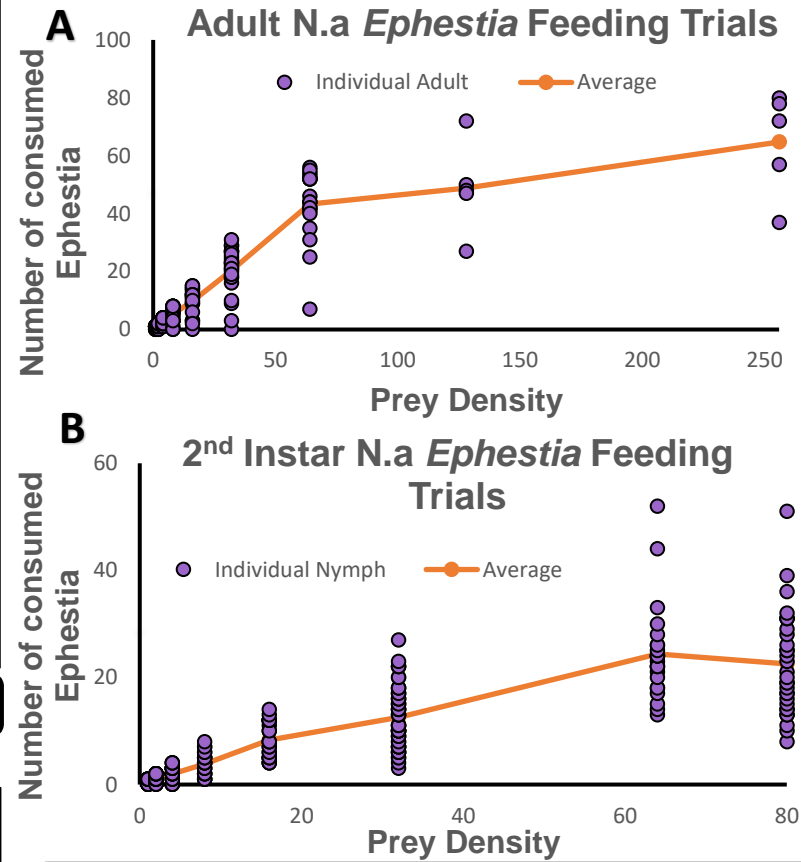
*Tuta absoluta* is a highly invasive leaf mining moth, responsible for devastating greenhouse and field tomato production in many parts of the world. Due to the potential for its invasion into North America, we have surveyed and discovered a native predator, *Nabis americanoferus* (Hemiptera: Nabidae) with a rapid population growth rate on tomato, a long lifespan and a voracious appetite for moth eggs, aphids and many other potential pest prey. Towards characterizing its predatory capacity, we used Holling's (1959) theory of functional response to assess how well predators at two life stages (N2 and adult), consume eggs of the European flour moth, *Ephestia kuehniella*. We showed that *N. americanoferus* exhibits a high rate of egg consumption and a type 2 response curve. Thus, this work represents an important step in the development of *N. americanoferus* as a new potential biological control agent of *T. absoluta* for greenhouse crop protection in Canada.

## Methodology

24h starvation → 24h feeding → data analysis



## Functional Response



**Figure 1:** Functional response of *Nabis americanoferus* adults (A), and 2<sup>nd</sup> instar nymphs (B), as a function of *Ephestia kuehniella* egg number consumed over a 24-hour period – prey density doubling at 1 (maximum 256/80).

## Conclusions

*Nabis americanoferus* is a highly voracious predator, whose adults consume upwards of 80 moth eggs within a 24-hour period, and whose 2<sup>nd</sup> instar nymphs can consume over 40 in the same period. Further work is currently underway which will also determine this predator's ability to consume other tomato crop pests including greenhouse whitefly, green peach aphids and other lepidoptera. Together, this research represents a key step in characterizing *N. americanoferus*, a promising new biocontrol agent for greenhouse crop protection in Canada.

## References

Holling, C. S. (1959). The Components of Predation as Revealed by a Study of Small-Mammal Predation of the European Pine Sawfly. *The Canadian Entomologist*, 91(5), 293–320. <https://doi.org/10.4039/Ent91293-5>

Holling, C. S. (1966). The Functional Response of Invertebrate Predators to Prey Density. *Memoirs of the Entomological Society of Canada*, 98(S48), 5–86. <http://doi.org/10.4039/entm9848fv>

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