



# **PREDATORY EFFICACY OF DICYPHUS ERRANS ON DIFFERENT PREY**

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# INTRODUCTION



The palaeartic *Dicyphus errans* (Heteroptera: Miridae) lives omnivorously on various host plants, preying on small arthropods (including new invasive alien species). These characteristics make it a promising BCA in organic greenhouses.

The functional response of a predator (i.e., how the individual rate of prey consumption changes in response to prey density) is a key component to assess its effectiveness in pest control and the stability of its own populations.

## AIM

To evaluate the effectiveness of *D. errans* on:

- 1) the poinsettia thrips *Echinothrips americanus* (Thysanoptera: Thripidae);
- 2) the greenhouse whitefly *Trialeurodes vaporariorum* (Homoptera: Aleyrodidae);
- 3) the tomato borer *Tuta absoluta* (Lepidoptera: Gelechiidae).



# MATERIAL AND METHODS

Starved females of *D. errans* were exposed to definite prey densities in Petri dishes for 24 h. Different densities were:

- 6 for *E. americanus* (from 5 to 200 adults) on a gerbera leaf disk;
- 10 for *T. vaporariorum* (from 5 to 250 pupae) on a gerbera leaf disk;
- 16 for *T. absoluta* (from 5 to 350 eggs) on tomato leaflets.

After predator female removal, leaves were accurately inspected to count predated items. Five repetitions were done for each treatment.

The best functional response model between Holling's disc equation and random predator equation was selected using AIC test. Values of  $a$  (= attack rate),  $Th$  (= handling time), and  $T/Th$  (= maximum attack rate, i.e. the maximal number of prey that can be consumed) were calculated.



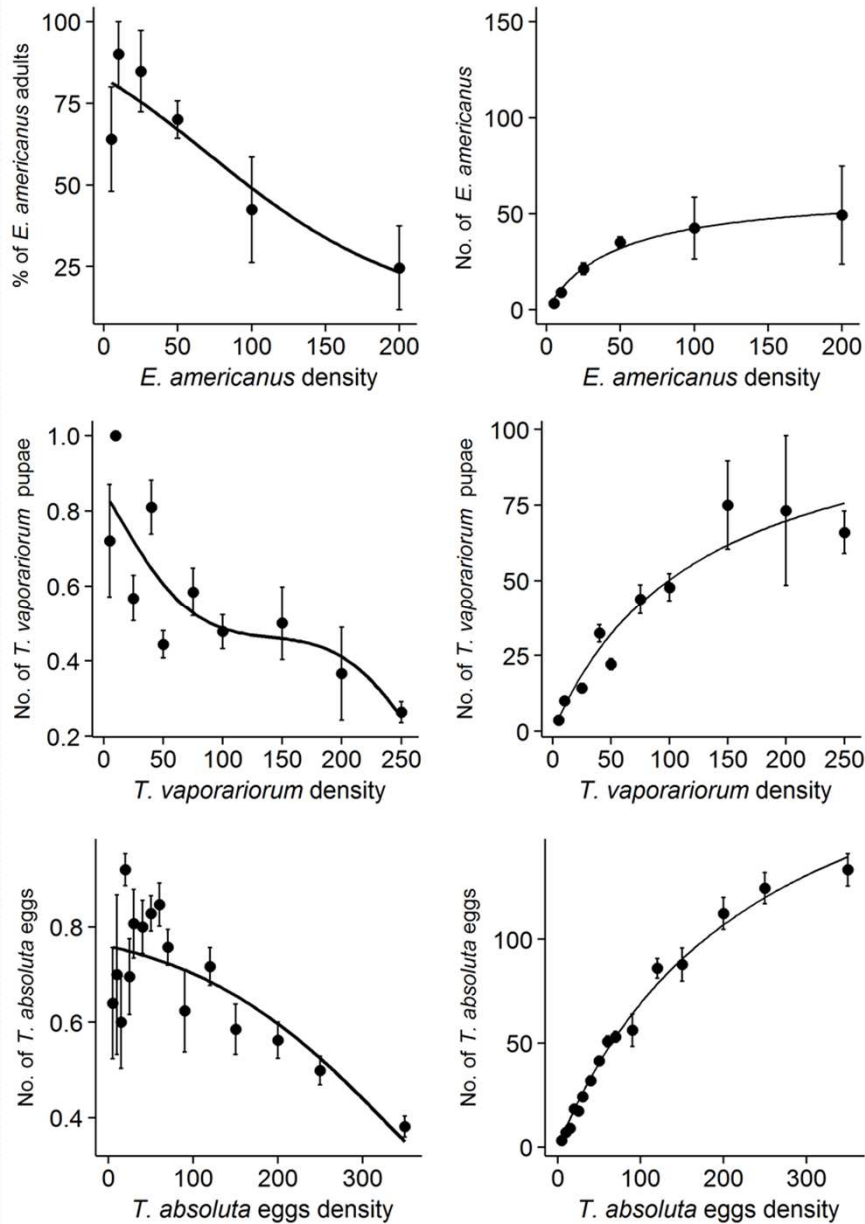
# RESULTS

The predation behaviour of *D. errans* on all three prey species was defined by **Type II functional response curves**.

Theoretical maximum daily predation rate of a female of *D. errans* was estimated as:

- **62 adults of *E. americanus*,**
- **114 pupae of *T. vaporariorum*,**
- **236 eggs of *T. absoluta*.**

**Figure.** Mean ( $\pm$ SE) percentage (on the left) and number (on the right) of consumed prey (*Echinothrips americanus*, *Trialeurodes vaporariorum*, *Tuta absoluta*) on prey density offered to females of *Dicyphus errans*.



# CONCLUSION

*Dicyphus errans* can be an important predator of several pests, and its high efficiency on different prey confirmed its suitability as BCA.

Even if a type II functional response typically shows saturation effects at very high prey densities, high infestation rates may give prey an opportunity to escape from predation. A prior to pest establishment of *D. errans* in cropping systems may prevent this possibility and contribute to effective and stable pest control strategies in organic greenhouses.



Moreover, since simplified laboratory assays do not allow predictions of the growth of mixed populations in realistic habitats, future research on the real efficacy as BCA of *D. errans* in field conditions and on mixed prey should be performed.

