

Life cycle of squash bugs in cucumber greenhouses in Québec, Canada

Geneviève Labrie, Steve Lamothe and Caroline Provost



glabrie@cram-mirabel.com

Context & Objectives

Squash bugs *Anasa tristis* and *A. armigera* (Heteroptera: Coreidae) are sporadic pests in Québec (Canada) cucumber greenhouses. They can cause significant cucumber damages, and the only control method is the manual removal of individuals.

This project aims:

- 1) to determine their **life cycle** in a greenhouse
- 2) to identify possible **natural enemies**
- 3) to determine their **diurnal activity** to optimize detection strategy.

Méthodology

Obj. 1 and 2- Life cycle and natural enemies



- Trapping of squash bugs at 4 places in the greenhouse :
 - Sticky traps (white, blue, yellow)
 - Sticky trap on the soil
 - Squash plant (for attraction)



- Observation of 10 plants/greenhouse for eggs, nymphs, adults and predation.
- Rearing in the laboratory for parasitism.

Obj. 3 – Diurnal activity



- Five plants of cucumber or squash / cages
- Five marked *A. armigera* or *A. tristis* / cage
- Observations each 2h during 8h
- N = 12 each year

Table 1. Abundance and stage of squash bug observed in 3 greenhouses during summer 2019 and 2020

Year	Site	Squash bug species	Abundance of squash bug		
			Eggs	Nymphs	Adults
2019	1	<i>A. tristis</i>	0	0	2
	1	<i>A. armigera</i>	40	10	7
	2	<i>A. armigera</i>	0	0	0
	3	<i>A. armigera</i>	0	0	2
2020	1	<i>A. armigera</i>	0	0	0
	2	<i>A. armigera</i>	10	0	0
	3	<i>A. armigera</i>	28	0	3

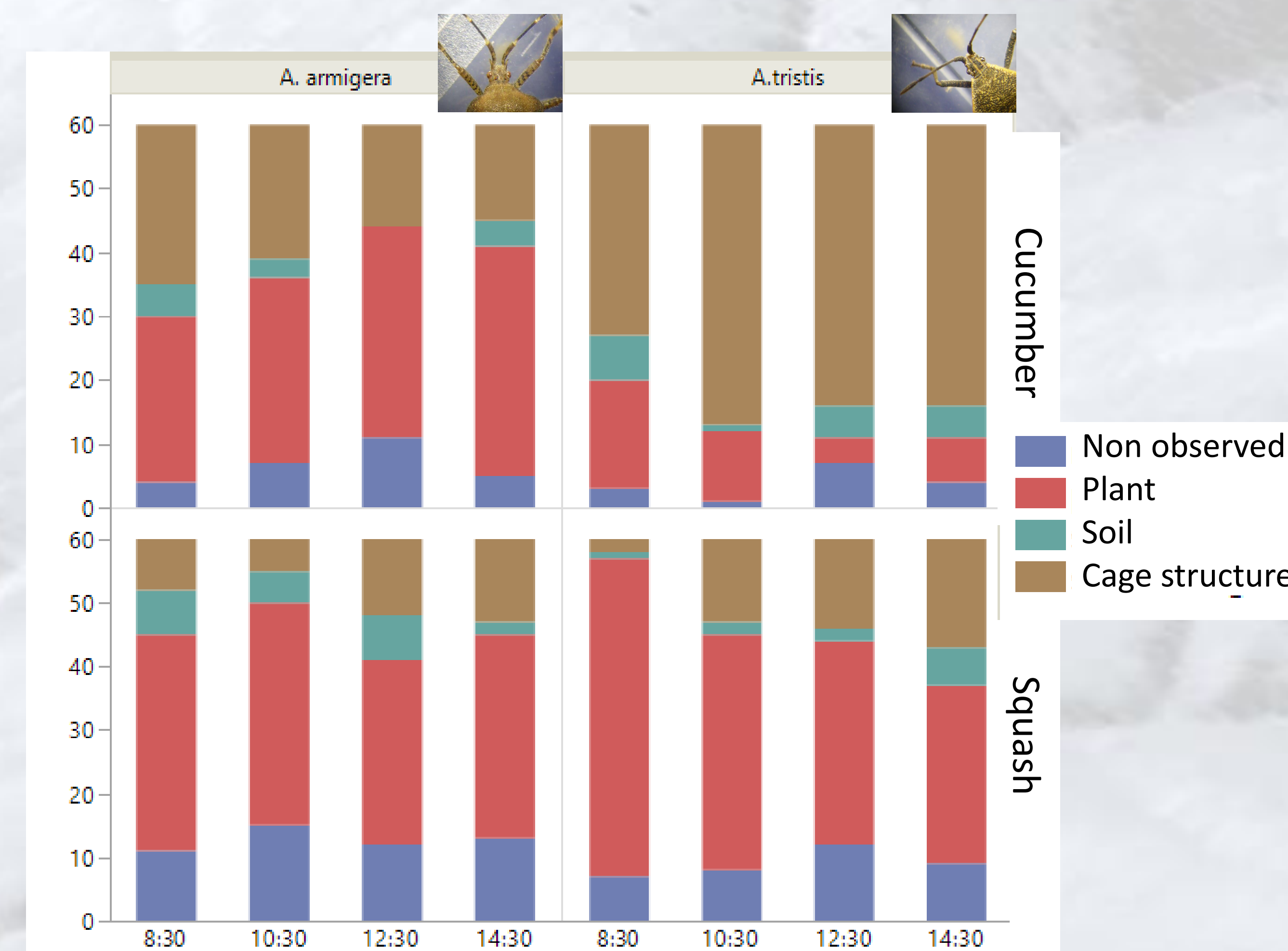


Figure 1. Position in the cages of squash bugs *A. armigera* and *A. tristis* on cucumber or squash during the day in 2020.



- On plants (cucumber or squash) all day long
- Outside plants in cages of cucumber, but on squash plants in cages of squash
- On plants mainly early in the day

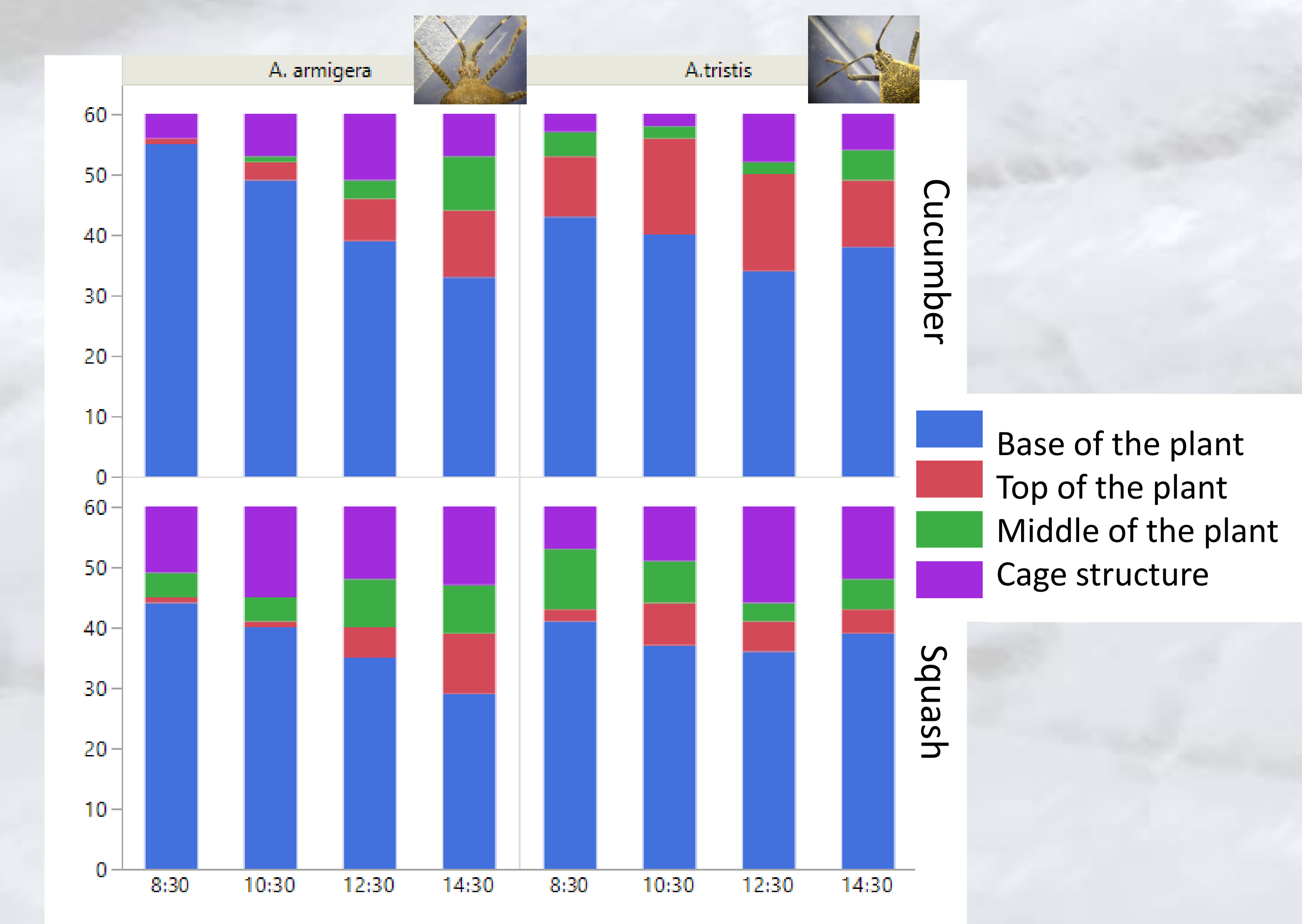
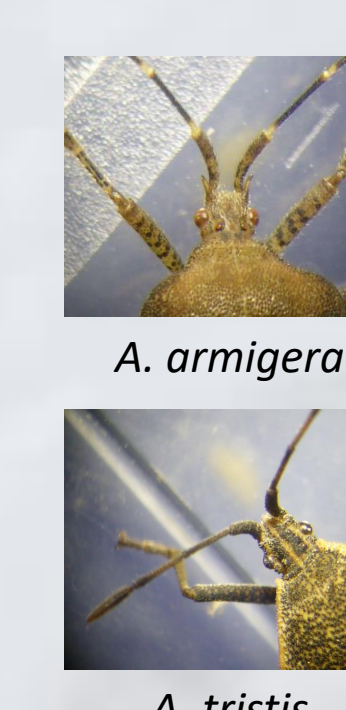


Figure 2. Position on the plant of cucumber or squash for *A. armigera* and *A. tristis* in 2020.



- Base of the plants early in the day. Move to the top for the rest of the day.
- Base of the plants or structure all day long

Results

- Main species of squash bugs observed is horned squash bug (*A. armigera*).
- Very few specimens observed on sticky traps (3 in 2019).
- Visual observations of 10 plants/greenhouse was more successful to observe squash bugs.
- Eggs of *Trichopoda pennipes* (Diptera: Tachinidae) has been observed on 3 *A. armigera* in 2019.



- *A. armigera* main pest species in cucumber greenhouse, while *A. tristis* was observed in squash fields in Québec. IPM strategy must be focused on horned squash bug in cucumber greenhouses.
- The tachinid fly *Trichopoda pennipes* is present in greenhouses. More observations are needed to evaluate its potential as biological control.
- Monitoring strategy by observation of individuals on cucumber plants could be the best strategy for horned squash bug in greenhouses.

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