Fungal endophyte influences on onion thrips behaviour

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INTRODUCTION

Onion thrips, *Thrips tabaci* Lindeman, is the most economically important insect pest of onion. Onion thrips can cause up to 100% yield loss through direct feeding on the plant tissues, and through transmitting tospoviruses. Entomopathogenic fungi (EPF) play various roles in nature, including as endophytes. Endophytes colonise and confer induced systemic resistance to host plants against herbivorous insects and plant pathogens because they produce secondary metabolites with biocidal activity; moreover, little inoculum is required. However, information on use of endophytes in influencing behaviour of onion thrips is unavailable. This study focused on determining the behavioural response of onion thrips on endophyte-inoculated plants (E+).

OBJECTIVE

- Determine the potential of fungal endophytes to influence the behaviour of onion thrips.

METHODS

- Isolation of endophytic fungus, *Hypocrea lixii* F3ST1 was conducted at *icipe*, Nairobi.
- Thrips were reared on snow peas for more than 30 generations in ventilated plastic jars at the *icipe* insectary.
- Surface-sterilised onion seeds were soaked in a conidial suspension of 1 × 10^8 conidia/mL for 10 hrs. In the control, seeds were soaked in sterile distilled water containing 0.05% Triton X 100.
- Choice test using E+ and E- plants was conducted using exclusion cages made of clear Perspex sheets (Fig. 1A).
- Thrips response to E+ or E- plants was also assessed in a Y-tube olfactometer (Fig. 1B).
- Settlement preference experiment of second-instar was performed using leaf discs placed in Petri dishes.

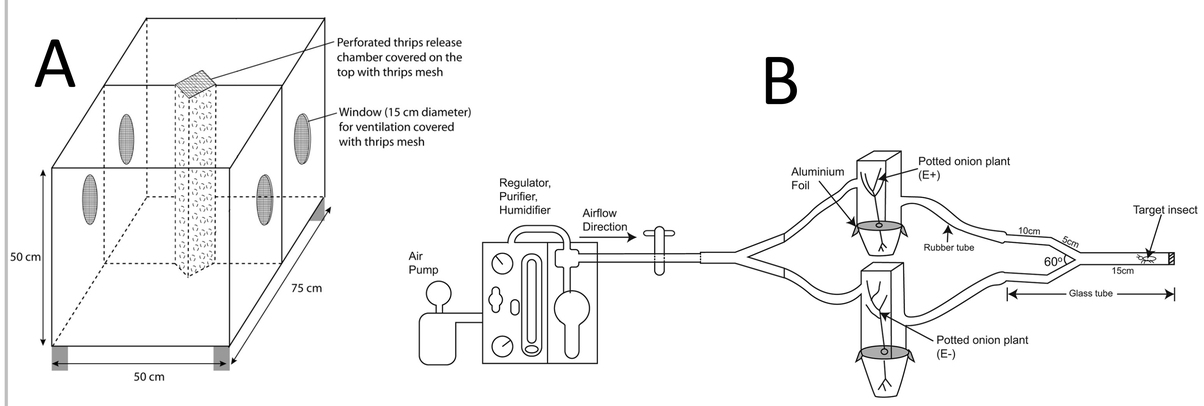

Fig. 1. Cage unit for conducting choice experiment (A); schematic of the Y-tube olfactometer used to measure insect behaviour in the presence of E+ and e E- plants (B)

CONCLUSION

Antixenotic factors, especially volatiles, have a role in repelling *T. tabaci* adults and larvae away from endophyte inoculated plants/leaf sections.

RESULTS

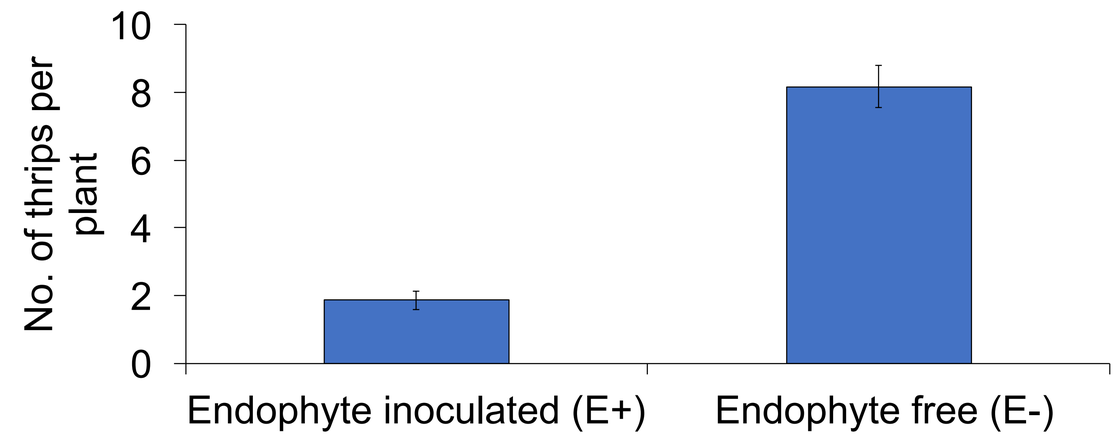

Fig. 2 Number of adult *T. tabaci* recorded on E+ and E- onion plants after 72 hours in a choice test.

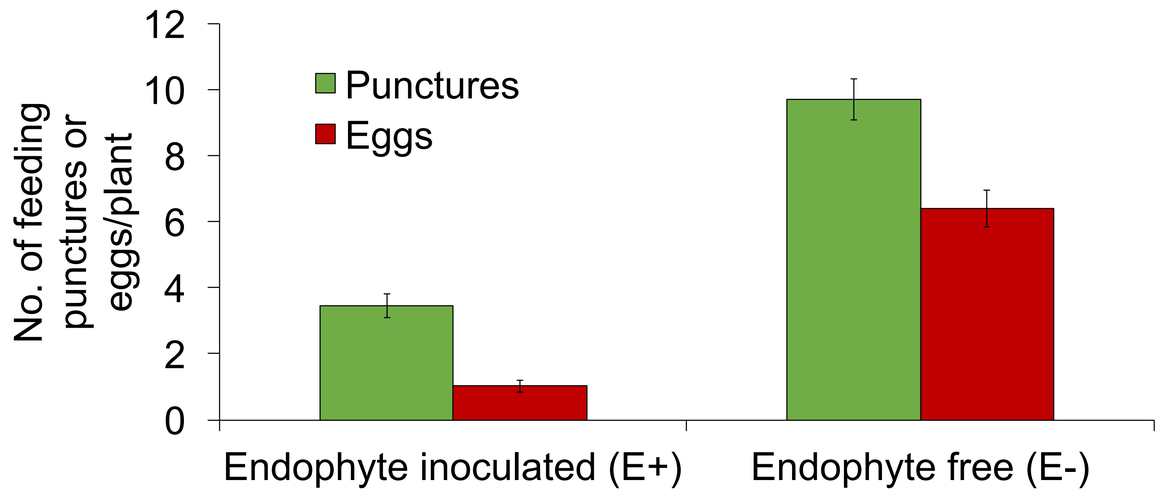

Fig. 3. Number of feeding punctures and eggs laid on E+ and E- onion plants after 72 h in a choice test.

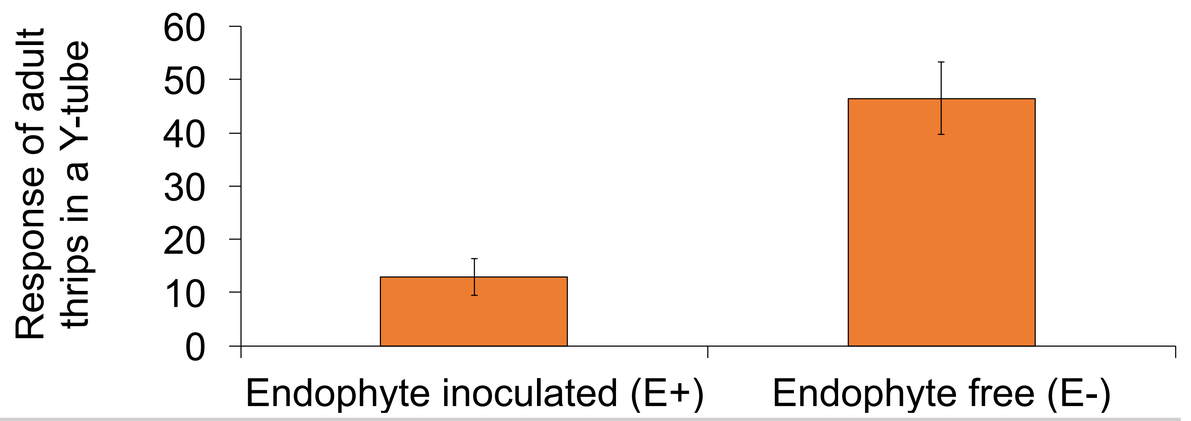

Fig. 4. Mean number of adult *Thrips tabaci* response to E+ and E- plants in a Y-tube olfactometer.

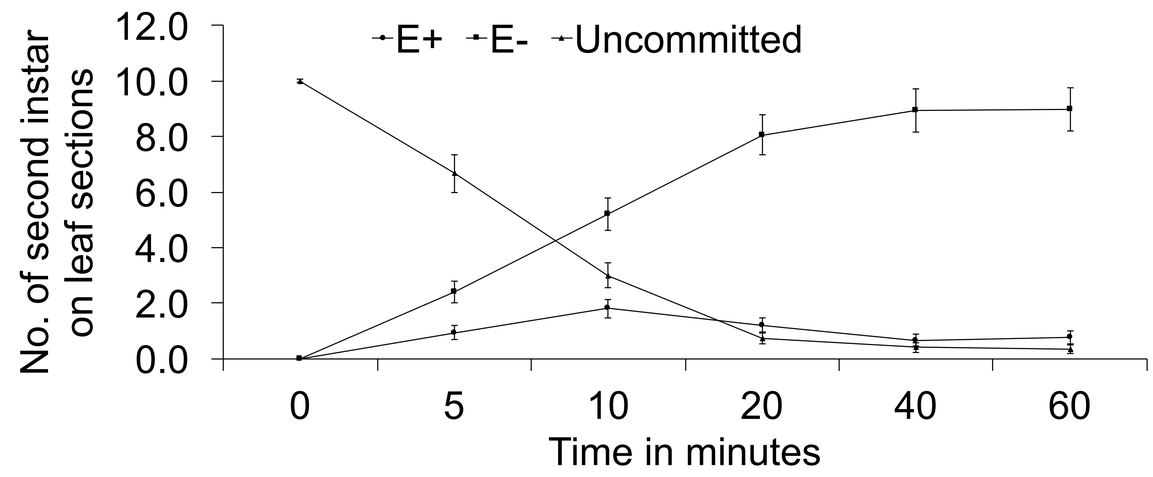

Fig. 5. Mean number of settled second instar on either E+ and E- leaf sections, or uncommitted in the bioassay unit.

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