Resistance traits in tomato genotypes affect the biological performance of natural enemies of *Phthorimaea absoluta*

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Background

Combining host plant resistance and natural enemies is a promising strategy against *Phthorimaea* (*Tuta*) *absoluta*, a major tomato pest. Understanding how plant resistance traits affect natural enemies is key for selecting or breeding tomato genotypes that enhance both pest resistance and biocontrol. In this study, we investigated the efficacy of three biological control agents on six tomato genotypes exhibiting various resistance levels to *P. absoluta*.
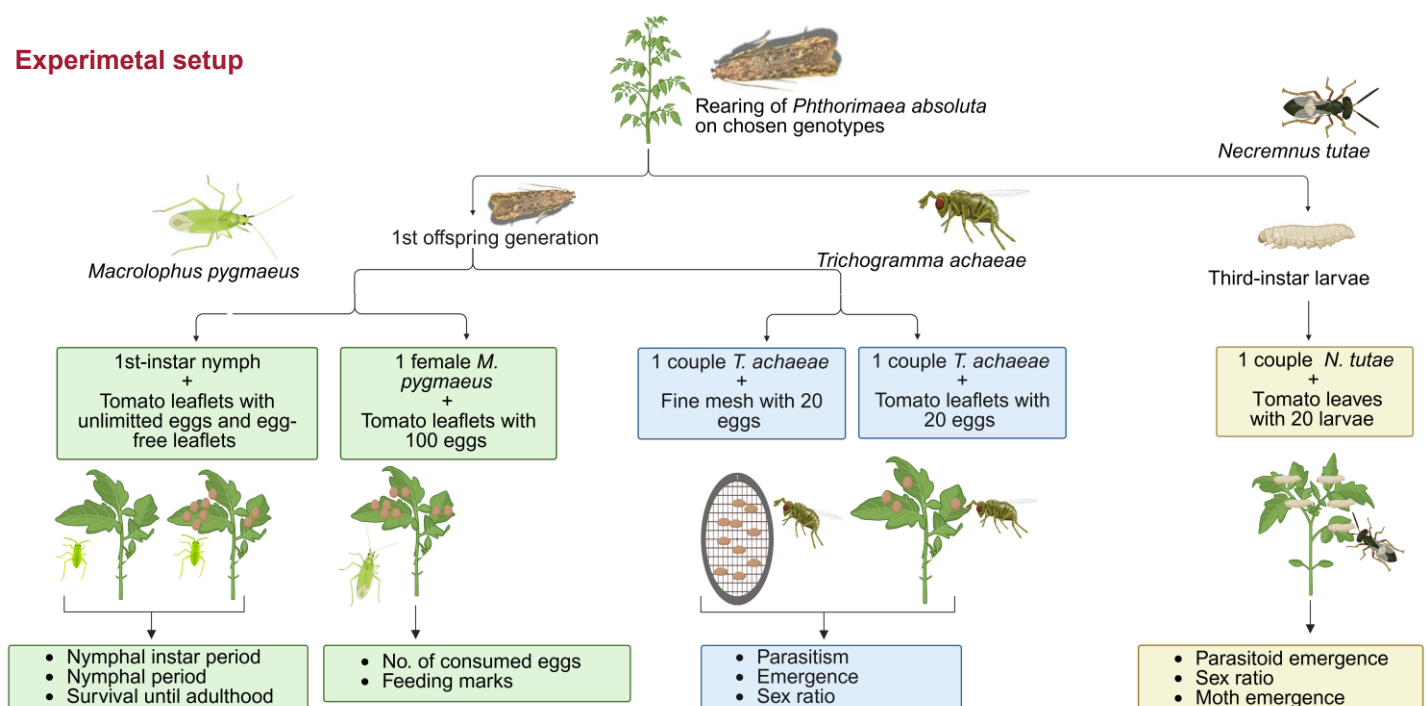
Genotype selection

o **Resistant genotypes:**
Solanum arcanum (high density of glandular trichomes)*; S. neorickii* (low density of glandular trichomes); *S. lycopersicon* var. Corona F1 (low density of glandular trichomes).
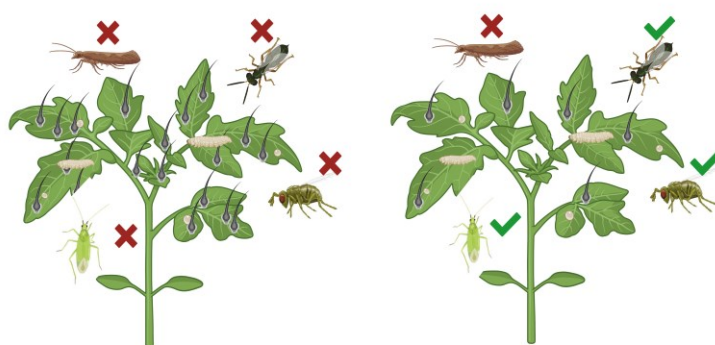
o **Susceptible varieties:**
S. lycopersicon var. Rentita, Noire de Crimée, and Romabelle (low density of glandular trichomes)[1.]

Experimetal setup

- Nymphal instar period
- Nymphal period
- Survival until adulthood

- No. of consumed eggs
- Feeding marks

- Parasitism
- Emergence
- Sex ratio

- Parasitoid emergence
- Sex ratio
- Moth emergence

Results

Resistant tomato with abundant glandular trichomes hindered all natural enemies

Resistant tomato with fewer glandular trichomes promoted the action of all natural enemies

Summary and implications

❖ Commercial tomato Corona F1 is compatible with *N. tutae*, *T. achaeae* and *M. pygmaeus*
➪ **Offers integrated management option**

❖ Wild tomato *S. neorickii* is compatible with *N. tutae*, *T. achaeae* and *M. pygmaeus*
➪ **Offers potential sources for breeding programs**

❖ Wild tomato *S. arcanum* is antagonistic to *N. tutae*, *T. achaeae* and *M. pygmaeus*
➪ **Breeding programs need to weigh desirable traits against their potential impact on natural enemies[2].**

Outlook

❖ Ongoing work explores the chemical aspects underlying the interaction.

References:
[1]Zannou et al. 2025a, *Pest Management Science*, 81, 1345-1359;
[2]Zannou et al. 2025b, *Biological control*, 205, 105772.

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