

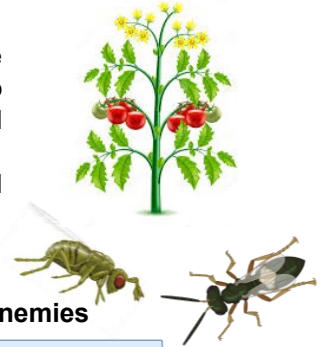
Understanding the interplay of tomato genotypes, *Tuta absoluta*, and natural enemies

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Background

Combining host plant resistance and natural enemies is a promising approach to replace chemical insecticides for the control of *Tuta absoluta*, an invasive pest threatening tomato production worldwide. However, morphological resistance traits, secondary metabolites, and volatiles of tomato can also affect natural enemies and thus the overall level of pest control. This study aims at characterizing the interaction between tomato genotypes, *T. absoluta* and the egg parasitoid *Trichogramma achaeae* and the larval parasitoid *Necremnus tutae*.



Methods

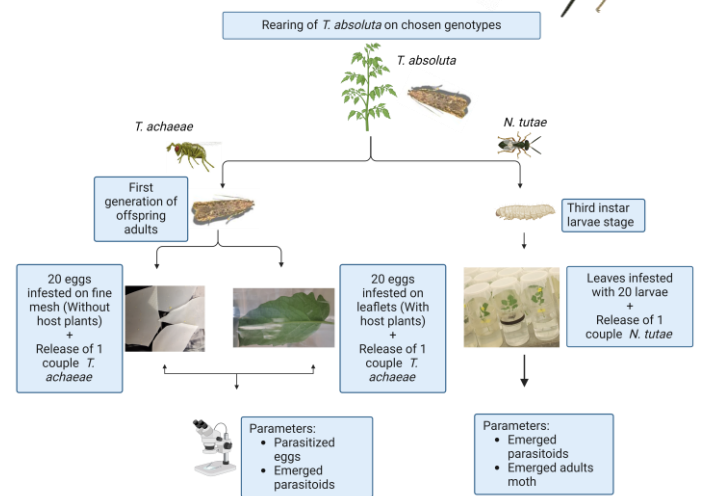
1. Screening against *T. absoluta*

We performed a resistance assessment of 19 tomato genotypes including 16 commercial varieties and 3 wild species



Effect on oviposition Larval performance Trichome density

2. Interaction with natural enemies



Results *T. absoluta*

- Lower fecundity occurred mainly on commercial tomatoes.
- Wild tomatoes *S. arcanum* and *S. neorickii* and the commercial tomato Corona F1 impaired larva development.
- Wild tomatoes *S. arcanum* and *S. neorickii* resulted in the lightest male and female pupae.
- All tomato genotypes exhibited a prevalence of non-glandular over glandular trichomes, except *S. arcanum* which only possessed glandular trichomes

Commercial varieties Romabelle F1, Noire de Crimée, Rentita and Corona F1, and wild species *S. arcanum* and *S. neorickii* were chosen for following assay

Summary and implications

- Commercial tomato Corona F1 is compatible with *N. tutae* and *T. achaeae*
 - Offers integrated management option against *T. absoluta*
- Wild tomato *S. neorickii* is compatible with *N. tutae* and *achaeae*
 - Offers potential sources for breeding programs
- Wild tomato *S. arcanum* is antagonistic to *N. tutae* and *achaeae*
 - Breeding programs need to weigh the benefits of desirable traits in this species

Results parasitoids

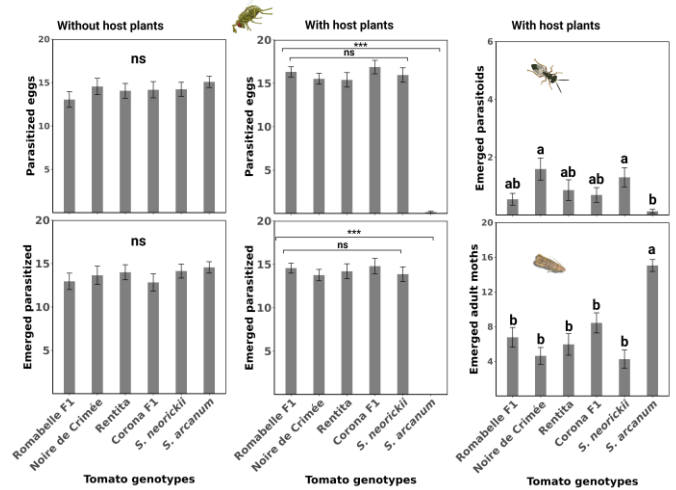


Fig. 1: Effect of tomato genotypes on *T. archaea* (with and without host plants), and *N. tutae* (with host plants)

Results parasitoids

- Commercial tomatoes and the wild tomato *S. neorickii* had no effect on the efficacy of *T. achaeae* and *N. tutae*.
- The wild tomato *S. arcanum* reduced the performance of *N. tutae* and hindered *T. achaeae*.