

Institute of Plant Protection

MASTER-THESIS: Is the predator *Phytoseiulus persimilis* able to suppress spider mites under heat waves?

Heat waves may have contrary effects on natural enemies and their preferred prey, which can result in the failure of the biological control success. For example, the predatory mite *Phytoseiulus persimilis* is a very successful biocontrol agent against the spider mite *Tetranychus urticae* under common summer conditions. Based on our lab studies, the predator seems to be more sensitive against heat waves compared to its prey. Up to now, it is an open question, whether spider mite suppression is really endangered under heat waves in more complex settings (e.g. plant-prey-predator experiments in walk-in climate chambers).



This aspect will be evaluated within the scope of a FWF project in experiments observing population dynamics of *P. persimilis* and *T. urticae* under mild and extreme heat wave conditions.

Our assumptions are: (1) Spider mite control works under mild heat waves, (2) but not under extreme heat waves. Alternatively, the predator avoids the heat exposed upper spider mite infested plant parts during the daily short-term temperature peaks (4-6h) and immigrates to these plant parts under optimal temperatures. Such a strategy may compensate for the low heat resistance of the predator and may also result in a sufficient spider mite control under heat waves.

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Tasks

- Assistance of the lab rearings of *P. persimilis* and *T. urticae*
- Knowledge of the thermal biology of *T. urticae* and *P. persimilis* (literature data)
- Self-dependent execution of the population experiments in close cooperation with the PhD student T. Tscholl
- Data input in the program SPSS and preliminary statistical analyses
- Data are available for publishing within 6-8 months
- Writing of the master thesis
- Start of the thesis: Dezember 2022

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