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**Performance of *Phytoseiulus persimilis* Athias-Henriot
(Acari: Phytoseiidae) on the prey *Tetranychus evansi* Baker
& Pritchard (Acari: Tetranychidae): effects of rearing
history and host plant**



Master Thesis (“Diplomarbeit”)

presented by Doris Betz from Stuttgart
in the study course “Agrarbiologie”

Stuttgart-Hohenheim, November 2007

ABSTRACT

Tomato is one of the most important horticultural crops for smallholder farmers in Kenya. The red spider mite *Tetranychus evansi* Baker and Pritchard (Acari: Tetranychidae) has become a key pest on tomato in Africa. Biological control with the predatory mite *Phytoseiulus persimilis* Athias-Henriot (Acari: Phytoseiidae) appeared not to be successful. The underlying reasons are only vaguely known and the tritrophic interactions are largely unexplored.

Possible antagonistic effects of tomato defence traits on the natural enemy are examined in the present study. Direct host plant effects through trichomes and/or toxic phytochemicals were separated from indirect effects, namely the accumulation of toxic plant compounds in the prey; this was done by evaluating the performance and feeding capacity of the predator fed two different *T. evansi* strains (i.e., either reared on tomato or bean) offered on three different substrates (tomato, bean, artificial). A choice test was established to detect possible predator preferences and deterrent effects. Predator oviposition and feeding rates, offspring survival and female offspring were lower when fed on spider mites previously reared on tomato irrespective of the substrate. A feeding depressant effect was suggested. The juvenile development time of the predator was higher when *T. evansi* was reared on tomato than when fed bean. The choice test did not show any preferences for respective prey strain or host plant. Hence, a negative prey-mediated indirect effect of tomato was suggested rather than a direct effect of the substrate. The weak predator performance indicated a low efficiency of *P. persimilis* as biological control agent of *T. evansi* if the host plant was tomato. However, *T. evansi* cannot be regarded as an unsuitable prey for *P. persimilis* per se. Results and possible implications for a top down (biological control) versus a bottom up (plant breeding) pest management on tomato are discussed.