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DIRECT AND INDIRECT INTERACTIONS ON TOMATO ATTACKED BY *Tetranychus evansi*

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Plants employ an array of direct and indirect strategies of defence against herbivores. Direct defence acts upon the herbivores, while indirect defence benefits the natural enemies of the herbivores. Plants under attack of herbivores are predicted to make use of both direct and indirect defence simultaneously to maximise their fitness. However, some herbivores have adapted to cope with plant defences. The red spider mite *Tetranychus evansi* was found to manipulate the direct defence of tomato plants to their benefit. Here I present results from studies on indirect interactions between tomato plants attacked spider mites and the natural enemies of these herbivores. Even though, some direct interactions among tomato plants, herbivores and predators were also investigated. *Tetranychus evansi* interferes with the indirect defence of tomato plants through induction of volatiles and attraction of predatory mites and other herbivores. The damage by *T. evansi* induces the production of volatile organic compounds that are different from those present in the attractive blend of volatiles induced by *Tetranychus urticae*. The attractiveness of odours from tomato plants infested with *T. evansi* to predatory mites (*Phytoseiulus persimilis*, *Phytoseiulus longipes* and *Phytoseiulus macropilis*) varied with the density of spider mites on the plant. However, the natural enemies attracted to tomato plants have poor performance when feeding on *T. evansi* and are unable to control the populations of the red spider mite. Host plants are known to influence the quality of herbivores to natural enemies. However, tomato seems not to be the explanation for the unsuitability of *T. evansi* as food for the predatory mites. The adverse effect of *T. evansi* on the performance of predatory mites is reversible, indicating the absence of long-term toxic effects of prey on predators. The predatory mite *P. persimilis* exhibits an unusual behaviour when feeding on eggs of *T. evansi*, rarely consuming an entire egg of this prey even after prolonged starvation. Moreover, the web produced by *T. evansi* over its host plant also play an essential role preventing that other herbivores such as whiteflies benefit from the suppressed plants. In conclusion, these results confirm the remarkable ability of *T. evansi* to manipulate the plant defence and circumvent the threat of natural enemies and competitors.

Keywords: Plant volatiles, web, competition, predatory mites, olfactometer.
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