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EFFECT OF THE PREDATORY MITE *Macrocheles embersoni* AND THE FREE-LIVING NON PARASITIC NEMATODE *Rhabditella axei* ON THE BIOCONTROL OF THE HOUSE FLY *Musca domestica*

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A few species of soil predatory mites (SPM) are mass-produced by biocontrol companies as acarine biocontrol agents for the control of thrips, sciarid flies and bulb mites in protected cropping systems. While many species of SPM have been identified in the taxonomic literature, little is known on their nutritional ecology and their ability to feed on alternative food sources available in the soil. One such food source that has recently been given some attention in a number of SPM life table studies, conducted at the Petri dish spatial scale, is the bacteriovorus free-living nematode species *Rhabditella axei*, collected from decomposing vegetable matter in soil fertilized with cow manure. In the present study we hypothesized that the diet used to rear this nematode species could affect the population development of the SPM *Macrocheles embersoni* and consequently the larval control of the house fly *Musca domestica*. To test these hypotheses we evaluated two main effects: 1) Predator – a) presence or b) absence of the SPM *M. embersoni*; 2) Nematode - a) *R. axei* reared on yeasts, b) *R. axei* reared on decomposing bean, c) no nematodes. Experiments were conducted in plastic ventilated 200cc containers, a larger spatial scale than the previously conducted Petri dish studies, containing 50 gms of larval fly diet. At the initiation of the experiment, according to treatment, 4 adult female predatory mites were placed in each container. Three times a week all containers received fly eggs and depending on treatment, 2000 nematodes in an aqueous medium (either reared on yeasts or bean) or water (no nematodes). Fly control was assessed by counting the number of emerging flies every 10 days over a one month period (3 counts). The effect of the three nematodes treatments on predatory mite population development was determined by extracting the mites at the end of the experiment. Surprisingly, fly emergence was most affected by the duration of the experiment, with the most flies emerging after 10 days and no flies emerging after 30 days. Apparently, the fly medium rapidly deteriorated and was no longer suitable for fly development after twenty days. Consequently, the evaluation of the effect of predators, with and without the two nematode treatments, on fly emergence was restricted to the first count. Predators had a very substantial effect on fly emergence but the effect of the nematode treatments were not significant. In contrast, evidently predators continued to develop in the medium, and predator population development was highest in the bean nematode treatment, lowest in the control and intermediate in the yeast treatment. In our next set of experiments, we will attempt to stabilize the conditions for the fly larvae by adding fresh fly larval diet twice a week. In so doing we expect that the fly larvae will continue to develop during the entire duration of the experiment and the predators will move up from the deteriorating medium to feed upon them, just as they would in a real soil system.

Keywords: soil predatory mites, alternative food, population development.

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