

Activity of *Entomophaga maimaiga* in the Field

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Abstract

In long term plots in central New York gypsy moth populations have remained at extremely low densities since 1991. From 1992 to 2001, we collected larvae throughout the field seasons to evaluate prevalence of disease. Each year, we detected infection by the fungal pathogen *Entomophaga maimaiga*, with >70% infection during 5 of the 10 years. However, in MI, *E. maimaiga* has not seemed as effective at controlling gypsy moth. Also, along the northeastern U.S. coast and in central Pennsylvania, gypsy moth populations rebounded during the 2001 field season, causing defoliation.

We established 33 sites throughout Michigan where *E. maimaiga* had been released or had been recorded. To evaluate the effect of site, stand and weather on *E. maimaiga*, we caged larvae over soil to compare infection in the field with infection under optimal conditions in the lab. Levels of infection in the field were much lower than under optimal conditions, but in both instances, infection levels increased from 1999-2001. Counts of resting spores in soil have been compared with results from lab bioassays to develop a bioassay-based method for estimating resting spore density in soil. During this study, *E. maimaiga* was released in some of the plots either as field-collected or lab-produced (in vivo) resting spores. We see a trend toward greater infection at fungal release sites but results are not significantly different due to variability among plots.

To continue our studies of non-target effects of this fungus, counts of resting spores in soil to evaluate persistence of *E. maimaiga* have shown that titers have declined over 4 years, unless epizootics added resting spores to the soil. From 1997-2001, we sampled larval lymantriids in the forests of VA and WV during the gypsy moth field season to evaluate infection in this susceptible group of insects. Seven species of endemic lymantriids (EL) were collected but densities were always very low. Gypsy moth populations were also scarce from 1997-1999 and no infection was found in any larvae during this period. However, during 2000 and 2001, of the six species of EL collected, infection by *E. maimaiga* occurred in three of them, with maximal infection at 33% for *Dasychira obliquata* (5 of the 15 larvae collected over the 2 years) and *D. vagans* (one of three larvae). In summary, *E. maimaiga* infects EL in the field but infections were not found all years; of the total 152 EL collected over the 5 years, only seven individuals were infected.