

Gypsy Moth In North America



Fungal Diseases of the Gypsy Moth in North America

Species in the zygomycetes order are mostly insect pathogens. The entomophthoralean fungus, *Entomophaga maimaiga* is a widespread gypsy moth pathogen in Asia and epizootics (massive reproduction of the pathogen causing widespread disease in its host) are frequent in Japan.

In 1904 efforts were made to introduce this pathogen to control gypsy moth populations in North America. Following its release near Boston, MA in 1910-1911, no infected larvae were recovered and workers concluded that the introduction was a failure.

In 1989 *E. maimaiga* was discovered to be causing extensive epizootics in several New England States. By 1992 this fungus was recovered through out the range of the gypsy moth in N. America. Since then numerous epizootics have been observed and scientists are attempting to determine how *E. maimaiga* will effect the long-term dynamics of the gypsy moth in N. America.

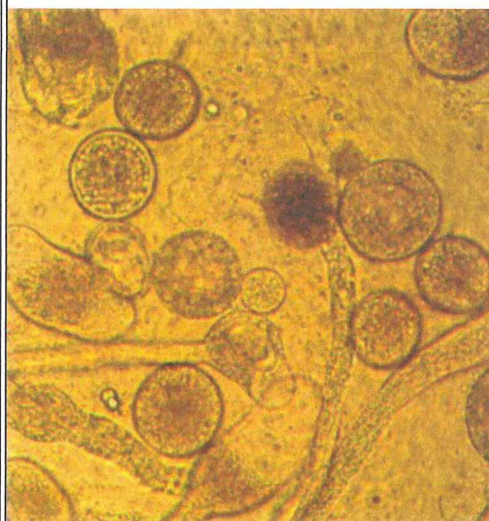
Numerous constraints limit the use of entomopathogenic fungi for use as mycoinsecticides (pest control). Most of these problems relate to the production and application of material.



Cadaver of a late instar gypsy moth filled with *Entomophaga maimaiga* resting spores. Note the remains of some of the conidia attached to larval hairs, the dried appearance of the cadaver, and the vertical position with head down. Photo by D. Specker



Cadaver of a late instar gypsy moth killed by NPV. Note the moist appearance of this older cadaver and inverted the "V" position. Photo by D. Specker



Fungal hyphal bodies and immature resting spores within a recently killed gypsy moth larva.

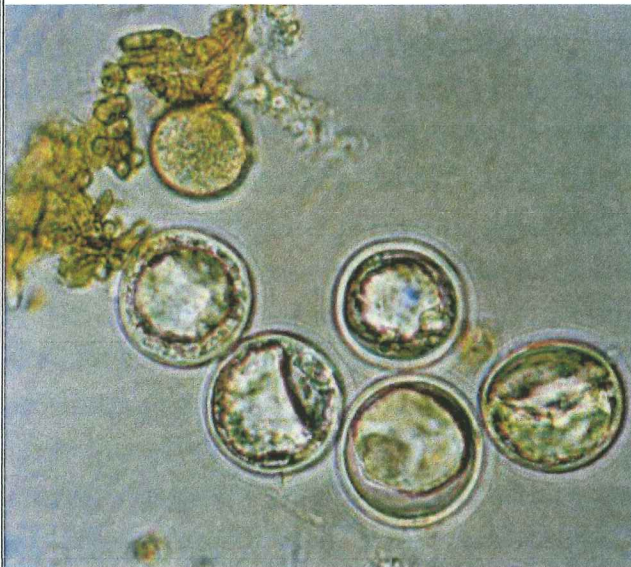
Photo by D. Specker



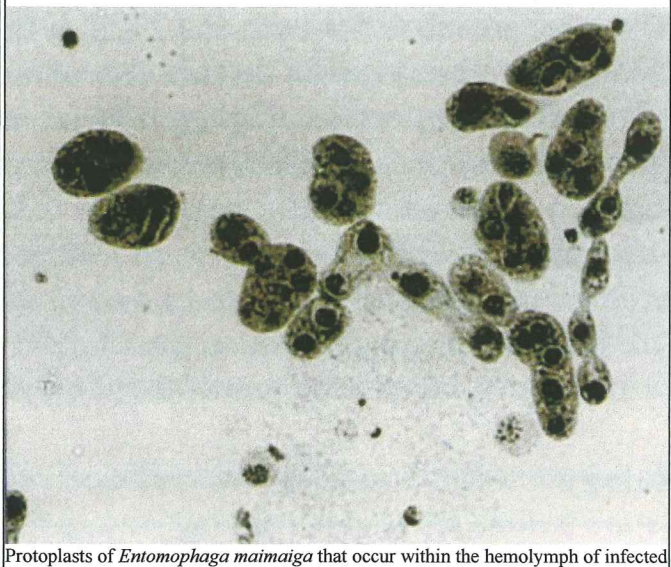
Cadaver of a gypsy moth larva producing abundant conidia, some of which remained attached to larval hairs.



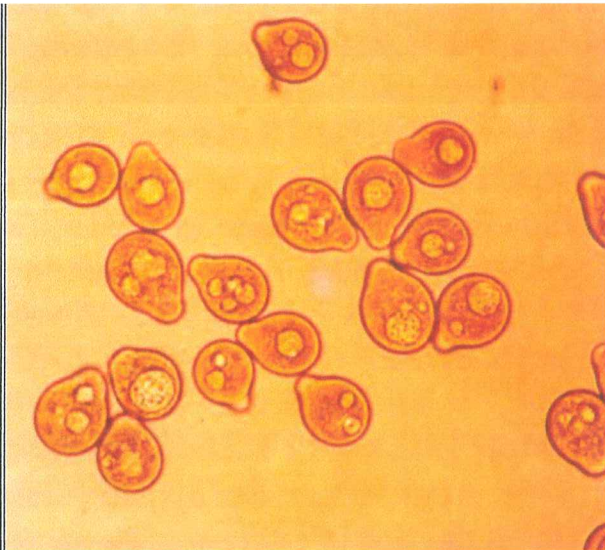
Cadaver of a gypsy moth larva killed by *Entomophaga maimaiga* and still attached to a tree trunk in spring.



Overwintering resting spores (azygospores) of *Entomophaga maimaiga*.



Protoplasts of *Entomophaga maimaiga* that occur within the hemolymph of infected insects.



Conidia of *Entomophaga maimaiga* actively ejected from cadavers to cause infection during the same season.

Return to [Gypsy Moth in NA](#) 

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