

DENSITY-DEPENDENT RESISTANCE OF THE GYPSY MOTH, *LYMANTRIA DISPAR*, TO ITS NUCLEOPOLYHEDROVIRUS

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ABSTRACT

The processes controlling disease resistance can strongly influence the population dynamics of insect outbreaks. Evidence that disease resistance is density-dependent is accumulating, but the exact form of this relationship is highly variable from species to species. It has been hypothesized that insects experiencing high population densities might allocate more energy to disease resistance than those at lower densities, because they are more likely to encounter density-dependent pathogens. In contrast, the increased stress of high-density conditions might leave insects more vulnerable

to disease. Both scenarios have been reported for various outbreak lepidoptera in the literature. We tested the relationship between larval density and disease resistance with the gypsy moth (*Lymantria dispar*) and a nucleopolyhedrovirus (LdNPV), one of its most important density-dependent mortality factors, in a series of bioassays. In this system, resistance to the virus decreased with increasing larval density. Similarly, time to death was faster at high densities than at lower densities. Implications of this relationship for insect-pathogen population dynamics were explored.