

REDUCTION IN REPRODUCTION AND PATHOGEN TRANSMISSION DURING MATING BY ASIAN LONGHORNED BEETLE (*ANOPLOPHORA GLABRIPENNIS*) ADULTS INFECTED WITH *METARHIZIUM ANISOPLIAE*

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Abstract

The Asian longhorned beetle, *Anoplophora glabripennis* is an invasive, exotic pest of hardwoods in the U.S. and Canada. The fungal pathogen *Metarhizium anisopliae* has been shown to readily infect adult beetles in laboratory and field (Dubois 2003, Hajek & Lund, unpubl. data). We designed experiments to 1) test the effect of *M. anisopliae* fungal infection on fecundity of female adult beetles; 2) test the effect of fungal infection on the longevity of adult beetles; 3) determine whether adult females transfer this pathogen to males during mating; and 4) determine whether adult females transfer this pathogen to eggs and larva.

Female beetles were exposed to fungal cultures and then caged with a non-inoculated male beetle, *Acer saccharum* twigs and bolt from an *A. saccharum* sapling for one week. Beetles were checked daily for death and examined weekly for infection. Three weeks after the oviposition week, larvae and unhatched eggs were removed from bolts and counted and larvae were placed on artificial diet. One month later, larvae were checked for death and dead larvae were examined for signs of fungal infection.

Control adult female beetles took longer to die than infected females (25.8 days versus 10.6 days). Nearly 94% of adult male beetles died from infections after being placed with an inoculated adult female beetle. Male beetles paired with infected females died significantly sooner than those paired with control females (19.2 days versus 42.5 days). Average fecundity was lower for infected females after inoculation (4.4 eggs/female) than for control beetles (13.0 eggs/female). Fewer eggs hatched from infected females (70.2%) versus healthy females (77.8%). Larvae from infected beetles experienced greater mortality (74.2 %) and had a higher incidence of infection (37.5 %) than control larvae (48.9 % and 0.4 %). Based on egg hatch and larval survival, on average inoculated females produced 0.8 offspring that survived 6 weeks after oviposition while control females produced 5.2.

In conclusion, *M. anisopliae*-inoculated females have shortened longevity and can pass spores to other adults, as well as to the eggs and larvae it produces. We feel that *M. anisopliae* is a well rounded control agent and not only reduces the adult life span, thus reducing the number of eggs laid, but also lowers the viability of offspring the female produces while she is still alive.