EGG AND LARVAL PARASITOIDS OF EMERALD ASH BORER FROM CHINA: POTENTIAL FOR BIOCONTROL IN NORTH AMERICA

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ABSTRACT

Results of an earlier study on *Agrilus planipennis* natural enemies in a southeastern Michigan woodlot demonstrated relatively few natural enemies attack its immature stages. Mortality factors included fewer than 2% larvae infected with insect pathogenic fungi, fewer than 1% of larvae and fewer than 0.5% of eggs parasitized by insect parasitoids, varying levels of predation by woodpeckers and beetles, cannibalism, starvation, and dehydration. Low mortality rates of *A. planipennis* apparently results from few natural enemies and high susceptibility of North American ash (*Fraxinus* spp.), providing ideal conditions for this invasive buprestid to achieve population densities lethal to our native ash species. The complexity of this problem suggests research on *A. planipennis* population dynamics in Asia may provide solutions for its management in North America.

To this end, we began studying populations of *A. planipennis* in China in 2003. We focused our efforts on forests and parks in northeastern China where *A. planipennis* is not considered a pest (Liu et al. 2003). Since our work began, we have found two new parasitoid species attacking *A. planipennis* in addition to the previously known larval ectoparasitoid, *Spathius agrili* (Braconidae) (Yang et al. 2005). The new species include a gregarious larval endoparasitoid, *Tetrastichus* sp. (Eulophidae) (Liu et al. 2003), and a solitary egg parasitoid, *Oobius agrili* (Encyrtidae) (Zhang et al. 2005). Results from 2005 seasonal sampling of *A. planipennis* in a Jilin Province forest showed *Tetrastichus* sp. parasitism rates of 40% and *O. agrili* rates of 27% by August. We are developing rearing methods and studying these parasitoids' biology and host ranges in our containment laboratory in Michigan. Depending on our findings, these parasitoids may be used for biological control of *A. planipennis* in North America.

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