FIELD HOST RANGE TESTING OF *SPATHIUS AGRILI*, A PARASITOID OF EMERALD ASH BORER: EVALUATING NONTARGET IMPACTS

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ABSTRACT

The introduction of the emerald ash borer (EAB), *Agrilis planipennis* (Coleoptera: Buprestidae), into the Midwest from Asia has had a devastating affect on ash (*Fraxinus* spp.). As the emerald ash borer's ability to spread became better understood and its distribution in the Midwest increased, biocontrol became an increasingly important option. Prior to the identification of emerald ash borer in Michigan, *Spathius agrili* Yang (Hymenoptera: Braconidae) was discovered attacking EAB in its native range in China. Subsequent laboratory host specificity testing with North American woodborers and olfactory testing of various tree volatiles, including ash, indicate *S. agrili* is not predicted to have a significant impact on native North American fauna.

Field releases of *S. agrili* at three sites in Michigan were initiated in the late summer of 2007 to determine ability to establish and to monitor the predicted minimal nontarget impacts. Three woodborers native to North America are being monitored: the twolined chestnut borer (*Agrilus bilineatus* [Weber]), the bronze birch borer (*A. anxius* Gory), and the redheaded ash borer (*Neoclytus acuminatus* [Say]).

Host trees (diameter at breast height ~15 cm) for the nontarget *Agrilus* species were moved to the release sites: pin oak (*Quercus palustris*) for the twolined chestnut borer and European paper birch (*Betula pendula*) for the bronze birch borer. In the laboratory, bolts of host trees infested with these species were placed in rearing tubes and adults collected upon emergence. Adults were held for 10 days, fed with foliage and honey:water, and then released into containment cages around the trunks of the host trees, where it was anticipated that they would lay eggs. The cages also included a sapling of the host tree with foliage and small twigs of foliage with their stems in a moist bag. After two weeks, the cages were removed.

Larvae of the redheaded ash borer were brought to the release sites as larvae feeding in ash logs of 1m long. Three logs were brought to each release site as well as three ash logs infested with emerald ash borer larvae. Pairs of redheaded ash borer-infested and emerald ash borer-infested logs were strapped 1 m high to the trunks of emerald ash borer-infested trees in the immediate area of the planned *S. agrili* releases.

After a sufficient cold period, the transplanted oaks and birches will be cut into sections. These sections and the ash logs infested with EAB and red-headed ash borers will be placed in individual rearing tubes to monitor *Spathius* emergence. A subset of the wood will be debarked to confirm the presence of nontargets and possible parasitism.