
LABORATORY REARING OF EMERALD ASH BORER

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ABSTRACT

The emerald ash borer (EAB), *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae), native to several Asian countries, was identified in 2002 as the cause of ash (*Fraxinus* spp.) mortality throughout southeastern Michigan and southwestern Ontario. More isolated infestations continue to be found throughout Lower Michigan, northern Ohio, Maryland, and Virginia, resulting from transport of infested host materials. An eradication plan is being developed for EAB as this invasive pest threatens ash resources throughout North America. Collaborative research among researchers in Michigan on EAB biology, control, detection, dispersal, host range, and natural enemies required large numbers of healthy insects for bioassay and other experimental treatments. Our methods for mass rearing EAB adults are described below. We are also developing an artificial larval diet and laboratory rearing methods for EAB.

EAB adults are readily reared from infested ash. By winter 2002, the majority of EAB were prepupae in the sapwood or thick outer bark. To provide adequate numbers of EAB adults for our research, infested ash logs and bark were obtained throughout the winter and spring and stored in a 2°C walk-in cold-room. A chill period is not required by EAB and adult production can begin at any time, although emergence from non-chilled logs is less synchronized.

Adults were reared as needed by bringing logs out of cold storage and placing them in large, sealed cardboard tubes with a clear, screw-top collection cup at one end. The tubes were stacked in a greenhouse where adults began emerging after approximately 3 to 6 weeks, depending on ambient temperatures. For comparison, adults emerged in approximately 4 weeks from logs held at 24°C in a growth chamber. Once emergence began, adults were removed daily from the collection cups and maintained on evergreen ash foliage (*F. uhdei*) grown in the greenhouse. As of December 2003, adults continue to emerge from logs cut approximately 10 months ago. Another, more labor intensive method of rearing adults involves removing prepupae from infested logs or bark and placing them on small disks of paper toweling in individual wells of 24-well tissue culture plates stored in a dark incubator at 24°C. After pupation, the naked pupae develop into feeding adults in approximately 25 days.

Adults can be maintained individually or in small groups on ash foliage in cups, petri dishes, cages, etc. For oviposition studies, newly enclosed adults were sexed and placed in individual petri dishes, allowed a minimum of 7 days for maturation feeding; a female and a male were then placed together in a single dish, and observed for mating. Mating occurred within 30 minutes, and successful pairs were maintained in cages with ash foliage for food and an ash log for oviposition until death. Females oviposit in bark crevices and between layers of bark, but also in tight spaces and

narrow cracks found in rearing boxes and cages. Eggs, collected from infested ash trees in the field and placed in petri dishes, hatched in about a week.