

DEVELOPING REARING METHODS FOR *TETRASTICHUS PLANIPENNISI* (HYMENOPTERA: EULOPHIDAE), A LARVAL ENDOPARASITOID OF THE EMERALD ASH BORER (COLEOPTERA: BUPRESTIDAE).

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ABSTRACT

Tetrastichus planipennisi Yong, a gregarious koinobiont endoparasitoid, is one of three hymenopteran parasitoids being released in the U.S. for biological control of the emerald ash borer (*Agilus planipennis* Fairmair, EAB), an invasive beetle from Asia causing mortality of the ash trees (*Fraxinus* spp.) in North America. One critical step in developing a successful biological control program is an efficient rearing method for each biological control agent. Here we report results from two experiments aimed at improving rearing methods for *T. planipennisi*. The first experiment sought to determine which developmental stages of EAB were most suitable or preferable to *T. planipennisi* using both naturally infested large ash logs and artificially infested small ash sticks. The second experiment sought to compare the fecundity of small vs. large *T. planipennisi* females. Findings from these experiments showed that *T. planipennisi*

attacked significantly more third and fourth instars than J-shaped larvae of EAB and did not parasitize EAB pupae. More *T. planipennisi* offspring were produced from large hosts (fourth instars) than small hosts (third instars or younger). While *T. planipennisi* were capable of attacking parasitized J-shaped larvae and prepupae when artificially inserted beneath the bark in ash sticks, these were rarely parasitized in naturally infested logs, likely because these stages are too deep within the sapwood to be reached by ovipositing females. In addition, small and large *T. planipennisi* were equally capable of parasitizing EAB larvae inserted into ash sticks (i.e., exhibiting similar parasitism rates); small females produced fewer offspring than large females. However, the offspring of small females tended to be larger than those of large females. Consequently, small females are not without value to rearing programs.