

HOW LONG DOES IT TAKE TENERAL ADULT ASIAN LONGHORNED BEETLES TO SCLERITIZE AND THEN CHEW OUT OF THE WOOD?

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ABSTRACT

The Asian longhorned beetle (*Anoplophora glabripennis* (Motschulsky)) (Coleoptera: Cerambycidae) is an introduced invasive pest with the potential to devastate hardwood forests (especially *Acer*-dominated forests) in North America. Information on the basic biology of this beetle is critical for providing the biological basis for predicting phenology that can be used to time exclusion and eradication methodologies. Using artificial pupal chambers, we documented the amount of time required by teneral adults at three temperatures (20, 25, and 30 °C), 60-80%RH, and 16:8 light: dark photoperiod to scleritize after eclosion and subsequently chew out through a plug of Norway maple wood. In the study, we used 218 laboratory-reared pupae (within a few days of eclosion) from the Chicago, IL, or Inner Mongolia, China, strains.

The average depth of wood that the beetles chewed through was 7 mm (range 3-11 mm). Females (1.54 ± 0.03 g) weighed significantly more than males (1.12 ± 0.03 g), but the average weights of the beetles emerging at each temperature did not differ. Adult weight was positively correlated with exit hole diameter ($\text{diam.} = 2.2 * \text{weight (g)} + 7.9$). The rate at which beetles chewed through the wood (136, 178, and 168 mm/d at 20, 25, and 30 °C, respectively) significantly differed between temperatures. Heavier adults did not chew significantly faster than lighter adults although that was the trend. Temperature has a significant effect on the time it takes adults to scleritize and chew through Norway maple wood. On average, it took 7, 5, and 4 days to scleritize and 5, 4, and 4 days to chew out at 20, 25, and 30 °C, respectively, suggesting that beetles spend more than a week in the wood even at summer temperatures. These results can be used in a variety of ways to better define beetle behavior and population dynamics.