REPRODUCTIVE BEHAVIORS OF *ANOPLOPHORA GLABRIPENNIS* (COLEOPTERA: CERAMBYCIDAE) IN THE LABORATORY

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ABSTRACT

There is a critical need for information on the reproductive behavior of *Anoplophora glabripennis* (Motschulsky) to provide the biological basis for predicting population dynamics, especially as the population size declines due to eradication efforts. To document the reproductive behaviors (both mating and oviposition) five males each from the Chicago, IL and Queens, NY strains were mated to three virgin females. When each male was approximately 2, 4, and 6 weeks old he was paired with a female of similar age from the same strain (with one exception). To observe reproductive behaviors, a pair was placed together, for 6 hours or less when natural separation occurred, in a 3.8-liter glass jar with an *Acer saccharum* Marshall bolt (3-7 cm diameter and 20 cm long) as a potential oviposition substrate. After mating females were provided fresh *A. saccharum* twigs and bolts weekly until death to assess fecundity and fertility.

The reproductive behaviors of *A. glabripennis* are typical of diurnally active species of the subfamily Lamiinae. When a male contacted a female with his antennae, generally he would quickly attempt to mount and mate. If the female was receptive (did not fight the mounting and allowed access to her genital chamber), he would mate with her immediately after mounting and initiate a prolonged pair-bond. Nonreceptive females would exhibit one or more of the following behaviors: run away, kick with hind legs, hit with antennae, make quick turns, fall or fly. In this case, the male might abandon his attempt and separate or perform a short antennal wagging courtship behavior. Nonreceptive females would generally become receptive after further contacts. Nineteen of the 30 pair-bonds lasted the entire 6 hours and the earliest natural separation of a pair occurred at ~2 hours. During the entire time the male continuously grasped the female with his front or both front and middle tarsi. The natural separations occurred either when a female escaped the male's grasp after displaying antagonistic behaviors (n = 12) or when the male simply walked off the female's back (n = 2). Individual copulation events lasted an average of 2.8 minutes and one to 10 copulations occurred in a bout followed by a male refractory period averaging 95 and 60 minutes, respectively for the New York and Illinois males. During copulations the female held the genital chamber open while stationary, walking or chewing the host for oviposition (the latter more often during later copulation events). Between copulations the female would most often walk or attempt oviposition in the pit she had chewed. The average total time in copula was 34 minutes and this resulted in an average of 56 percent hatch of eggs females laid over their life time. Oviposition (0-5 eggs per female) lasted an average of 12 and 10 minutes, respectively for the New York and Illinois females on these bolts with bark that was only 1-2 mm thick. After a female chewed a pit, she rotated 180 degrees, extended her ovipositor, and used it to find the pit. She then inserted the ovipositor under the bark, used the sclerites at the tip of her abdomen in conjunction with lifting her body (by extending her front and middle legs) several times to pry the bark up, laid an egg, and wiped excretions across the opening using the tip of her abdomen. Females abandoned some pits at various points in the process.