BIOLOGY AND HOST SPECIFICITY OF *GONIOCTENA TREDECIMMACULATA* (COLEOPTERA: CHRYSOMELIDAE): A POTENTIAL BIOLOGICAL CONTROL AGENT FOR KUDZU

Matthew J. Frye, Judith A. Hough-Goldstein, and Clifford B. Keil

Department of Entomology and Wildlife Ecology, University of Delaware, Newark, DE 19717

ABSTRACT

Gonioctena tredecimmaculata (Jacoby) (Coleoptera: Chrysomelidae) was sent from China to the United States for testing as a potential biological control agent of kudzu (*Pueraria montana* var. *lobata* (Willd.) Maesen & S. Almeida). In quarantine, adult females kept on kudzu produced 2-6 larvae per day by ovoviviparous reproduction. Insect development was rapid, with larval and pupal stages lasting 5.6 ± 0.08 and 9.6 ± 0.13 days at 25 °C, respectively. Larvae consumed a total of 16.3 ± 0.63 cm^2 of kudzu foliage per day, while adult beetles consumed approximately 5 cm^2. Newly emerged adults fed on foliage for approximately 15 days before burrowing in the soil for an apparent obligate diapause. These beetles mated and reproduced the following year. Preliminary host-range tests examined insect feeding on a limited number of native and agriculturally important plants related to kudzu under no-choice conditions. Both adults and larvae of *G. tredecimmaculata* rejected most of the plants that were tested, but fed on soybean (*Glycine max* (L.) Merr.) and American hog-peanut (*Amphicarpaea bracteata* (L.) Fernald) in addition to kudzu. In a supplemental study, insects showed similar responses to field-grown and greenhouse-grown soybean and kudzu foliage despite measurable differences in leaf traits. Field foliage of both plants exhibited greater leaf toughness, higher total carbon content, higher trichome density per mm^2, and reduced water content compared to greenhouse foliage. Further tests are needed in China to determine if feeding on non-target host plants will occur under more realistic, open-field conditions.