STUDIES ON CHION CINCTUS (DRURY) (COLEOPTERA, CERAMBYCIDAE) IN OKLAHOMA*

CHAS. L. HOVEY, St. Paul, Minnesota

The studies herein reported were conducted from October 1938 to June 1939. Since investigations show that the larval stage of *Chion cinctus* (Drury) extends over more time than this period, data covering the complete life cycle are not at hand. In Oklahoma, this cerambycid is a secondary parasite invading trees weakened by disease, drought, or other causes. The larvae are known to infest plum, walnut, apple, oak, pecan, chestnut, ironwood, elm, and particularly hickory trees, hence the common name of "banded hickory borer." However, in Oklahoma, this insect probably injures the pecan more than any other tree owing, no doubt, to the limited distribution of hickory in the state.

The insect-pest surveys conducted by the Department of Entomology of the Oklahoma Agricultural and Mechanical College show that this beetle has been collected in six counties in the state, namely, Ottawa, McCurtain, Pawnee, Payne, Dewey, and Roger Mills. Since these widely separated areas include counties from the eastern to the western boundaries, the records indicate this cerambycid to be present throughout the entire state with the possible exception of the panhandle and the southwestern corner.

Large numbers of larval-infested pecan branches were collected during the autumn, winter, and spring of 1938-1939 and stacked out-of-doors in the entomology hibernation plot where they were exposed to normal weather conditions. An autumn examination of this infested wood showed the larvae to be in varying stages of development deep in the heartwood. In early spring these branches were placed in cages and when the beetles began to emerge they were removed from the cages every day and the number recorded. At Stillwater the first beetles emerged on April 19 and the last was taken from a cage on June 13; however, the majority emerged over a period of 10 days, or from April 19 to April 29. Emergence was greatest on April 24 but since only 43 beetles were taken from the cages this number was felt insufficient to establish a peak emergence date. The museum records of the Department of Entomology of the Oklahoma Agricultural and Mechanical College show that *C. cinctus* has been taken in the field from March 31 to September 19 with each intervening month being represented. These records indicate that the beetles were most common in April while May ranked second.

Cages consisting of screen cylinders four inches in diameter and eight inches high were placed on six-inch flower pots filled with sand to support the cuttings used in the oviposition studies. As the beetles emerged they were placed at once in these oviposition cages. The beetles were not seen feeding in the field nor would they feed in the cages. Hence, all oviposition studies were carried out upon beetles that had not fed.

The preoviposition period varied from three to ten days with an average of 7.75 days.

The female showed a certain selectivity in locating a place to deposit her eggs for the majority of them were discovered in cracks of the bark.

* These studies were undertaken while the writer, now in the Department of Entomology, University of Minnesota, was a graduate student at Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma.

Since the eggs are relatively large and the female has no special adaptation of the ovipositor for inserting them beneath the bark, they were easily seen and counted. In one case an egg was found oviposited on the bare surface where the bark had been removed and in another instance an egg was discovered on the sawed end of the cutting. The eggs were tightly glued to the surface and covered with frass. The total number of eggs deposited by any one female varied from 8 to 33 and a maximum of 5 was laid in one day. The duration of the oviposition period varied from 8 to 16 days with an average of 12.9 days. It was believed that the oviposition records did not represent a true picture of the number of eggs a single female was capable of ovipositing in the field under natural conditions. Hence, ten gravid females were dissected and it was found that the number of fully developed eggs and immature ova contained in the ovaries varied from 88 to 99. An apparent fondness for sun light was observed; frequently both males and females were seen to sit on the ends of the cuttings in the sun's direct rays. This fact was also noted in the field, since it was the poorly foliated and weakened limbs in the trees which were attacked.

The incubation period varied from 7 to 9 days. For as long as two days preceding hatching, the embryo could be seen moving about inside the egg when the protective covering had been removed. The first evidence of egg-hatching was the shell's being filled with frass as the larva bored directly into the wood beneath the egg. Some developing larvae were observed to feed for a time in the sapwood, others to proceed directly into the heartwood where long tunnels running in the direction of the grain were excavated. The full-grown larva about to pupate cut through the wood and bark, creating an opening to the outside, and then packed the hole with wood fibers. The pupal cell, located at the end of the feeding tunnel, was slightly larger in diameter than the tunnel and nearly free from frass. The cast-off pupal skin was located at the bottom of the pupal chamber. The emerging adult forced its way out through the previously-formed fiber-packed opening.

Of those beetles observed, it was found that in all cases but one, the males died before the females. The length of adult life of the male varied from 9 to 19 days with an average of 11.1 days. The longevity of adult females ranged from 14 to 25 days with an average of 19.5 days, thus giving a difference of 8.4 days between the two sexes.