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LIFE HISTORY NOTES ON *CALLIGRAPHA*
MULTIPUNCTATA MULTIPUNCTATA (SAY)
(COLEOPTERA, CHRYSOMELIDAE)¹

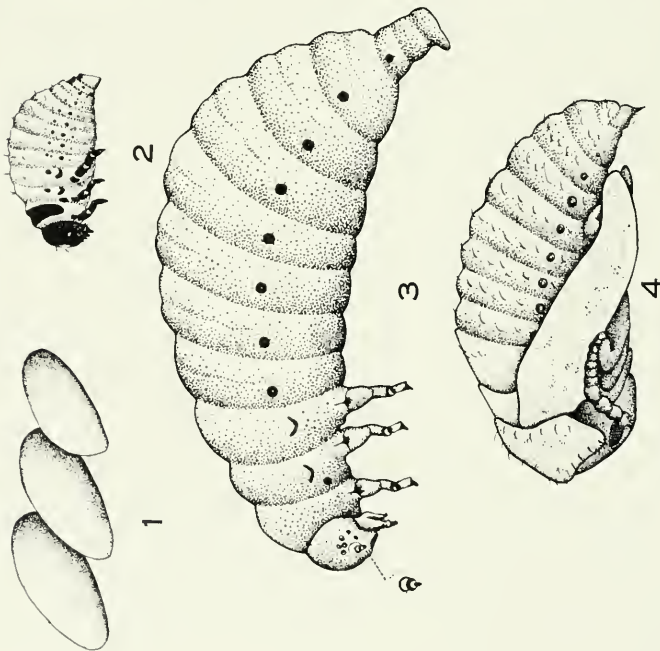
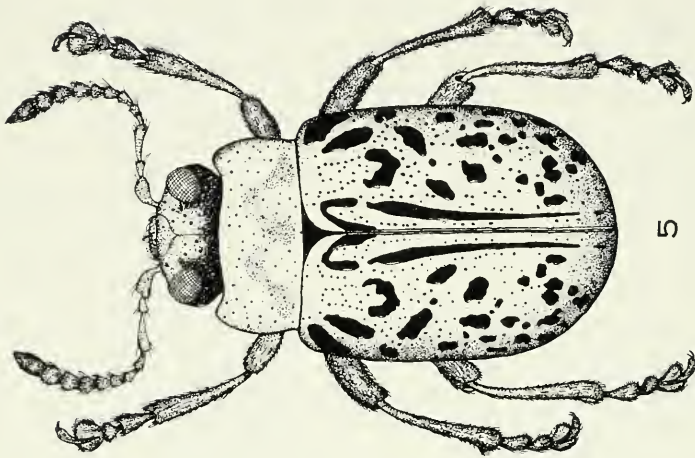
by Vasco M. Tanner

For several years the writer has been gathering information on the immature insects of this area. During the spring and summer of 1958 special attention was paid to the gathering of data on the life history of the Coleoptera. The following observations on the development and behavior of *Calligrapha multipunctata multipunctata* (Say) are recorded for the benefit and aid of students of this family in this area.

This species does not seem to be common in Utah. The writer is not aware of any information on its breeding habits in this area. On May 23, 1958, a small colony of breeding males and females were encountered on willows along the Jordan River two miles West of Lehi, Utah. It was a warm, sunny forenoon when these were first observed. Many pairs were in copula. Only a few clusters of eggs were found, and none of the eggs were observed to have hatched. Thirty pairs were collected and placed in a gallon glass jar along with twigs of the host plant *Salix melanopsis* Nutt. These were brought back to the laboratory and placed in breeding cages in which the bottoms were covered with soil and a small bottle of water containing fresh willows placed in the cages. Fortunately, this particular willow is close at hand since it grows along a stream which passes through the campus and near the laboratory. Five copulating pairs were placed in each of four cages. Only one mating pair was placed in the fifth cage. Before leaving the laboratory at 7:00 p.m. on the day the specimens were collected, May 23, I observed that the single pair in the one cage were in copula. Upon observing this same pair the next morning at 7:00 o'clock, they were still in copula, and the male did not leave the back of the female until 11:00 p.m., May 25. Careful observations were made of this mating pair during the period except at night. There is no evidence, however, that the pair was in continuous coition throughout this period. However, the position of the male as indicated above was not changed throughout the 40-hour period. The first eggs, a cluster of five, were oviposited by this female at 9:00 a.m. the next morning, ten hours after coitus. During the next three days this female laid a total of 31 eggs.

The eggs (Fig. 1) are 1.5 mm in length, .5 mm in diameter, and are a light lemon yellow in color. The eggs began to hatch on the fourth day after being laid. The first instar larvae (Fig. 2) began feeding within a few hours after hatching. No records were kept on the number of instars or the length of the stadia. The larvae (Fig. 3) feed for an average of 23 days before they left the host plant and went into the soil to pupate. The pupal (Fig. 4) period

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lasted for an average of 20 days. The first adult (Fig. 5) emerged on July 16. Thus, from the laying of eggs on May 25-26 to the emergence of an adult beetle was 52 days or about seven weeks. The overwintering adults which were placed in the breeding cages were observed to feed and sporadically copulate and lay eggs for a period of six weeks. Several of the adults which were collected on May 23 were still alive and feeding on August 17 when they were removed from the cages. The new generation adults which began emerging on July 16 began feeding, but there was no evidence of mating. Hibernating specimens were removed from the cages on October 24.

Overwintering and new generation specimens were pinned for cabinet use. Many of these were studied to determine the extent of the variation of the elytral markings. It is surprising to see how constant and what little variation there is in the color markings of this species. The original colony along the Jordan River was observed several times to see if any parasites could be found. None were detected. The development of larvae and the longevity of the adults seem to be similar in the natural conditions as under a laboratory environment.

Two other species of willows were placed in three of the breeding cages to see if they would be used as food by the adults or the larvae. It was very obvious that there was a marked preference for *Salix melanopsis*. The observations on *C. multipunctata* in this preliminary study seems to confirm the findings of W. J. Brown² on several Canadian species of this genus. Additional future observations on this and other Utah species of *Calligrapha* should be made.

I express my thanks to Mr. Hugh B. Leech of the California Academy of Sciences who kindly checked the determination of specimens of this beetle for me and Professors B. R. Harrison and Earl Christensen of the B.Y.U. Botany Department who determined the species of willows.

2. W. J. Brown. 1945. Food-Plants and Distribution of the Species of *Calligrapha* in Canada, with the Descriptions of New Species (Coleoptera, Chrysomelidae). The Canadian Entomologist. Vol. 77, No. 7. pp. 117-133.

Figures 1-5, *Calligrapha multipunctata multipunctata* (Say). 1, eggs; 2, first instar larva; 3, last instar larva; 4, pupa; 5, adult.