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LARVAL HABITS OF *AGATHYMUS MARIAE* (B. & B.)

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ALTHOUGH THE LIFE HISTORY of *Agathymus mariae* (B.&B.) has been known for a number of years many of the details concerning it have remained unpublished. It is an established fact that the larvae have been found only in *Agave lechuguilla* Torr. and there is some apparent reason why this occurs. Several times larvae from *lechuguilla* have been transplanted to other species of *Agave* with rather poor results. During November 1959 larvae were brought home and placed on three species of *Agave* that I had growing for this purpose. One was typical *lechuguilla* from west Texas, one was *Agave scabra* Lam-Dyck from the Big Bend National Park and the last was *Agave neomexicana* Wood & Standley from the Davis Mts., Texas

One larva was placed near the base of a leaf of *lechuguilla*, Nov. 29, 1959 at 11:30 A.M., at 12:30 no apparent effort to enter the leaf had been made even though a small hole had been made in the leaf with a nail near where the larva had been placed. On Nov. 30 the larva made its way into the hole in the leaf and after two days some frass was deposited outside the hole in the leaf. This larva remained throughout the winter in the plant and completed its cycle in October the following year, emerging a male, Oct. 7, 1960.

One larvae was placed near a similar hole made in a leaf of *scabra* on the same day and at approximately the same time. This time the larva moved around the hole and within fifteen minutes had crawled into it. After two days there was no visible signs of frass present. In two weeks the spot where the larva had entered the leaf began turning brown. This continued for three weeks after which the entire leaf, which was much larger than the *lechuguilla* leaf, died. One larva was placed on a leaf of *neomexicana* at the approximate same time as the other two. The leaf had been prepared as in the two preceding plants. The larva entered the hole in the leaf after crawling around for

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about twenty minutes. On Dec. 6, the larva was no longer visible by looking into the hole as it had penetrated about two inches farther basad in the leaf. On this day the hole where the larva entered began turning brown and by Dec. 25 the entire leaf was dead. Apparently the larva was causing sufficient injury to the leaf to produce these results or else it was secreting some material which was toxic to that particular species of plant. This most likely has resulted in the extreme selectivity of the female *mariae* in placing their eggs around or in *lechuguilla* plants.

The manner in which the larvae of *mariae* construct their trap door over their feeding tunnel in the leaf is very interesting. One of the characteristics of *mariae* is to extend its tunnel through two or three leaves but usually not going into the caudex to any extent and then to construct its serecin-like trap door over the opening to the outside two or three weeks prior to pupation. Several plants in which larvae of *mariae* were present were collected August 8, 1960, four to five miles west of Victoria Canyon, Cuthbertson Co., Texas. Some of the larvae had already made their trap doors while others were still in a period of quiescence. On August 10, observations were made concerning the method they used in constructing their doors. At 9:05 A.M. the larva under observation started making a round hole at the spot where it had previously defecated. It worked at this hole for an hour and five minutes. At 10:10 it went down into its tunnel and came up in two minutes and five seconds with white powder all over its head and then it started rubbing this powder all over the hole that it had made. It would do this for from two to five minutes and then go back into its tunnel to reappear again in about two minutes with a fresh supply of white powder. The powder glands are located near the caudal end of the larva. These glands would leave a large supply of powder about two inches down in the tunnel. The larva would back down beneath this area and rub its head back and forth thus collecting a lump of powder on the vertex of its head. At 11:05 it stopped making the trips down into the tunnel and started constructing the door. This was accomplished by the larva making circular movements with its head as it exuded a silken material from its mouth. The material was snow white and as the door was formed, it also was of the same color. The larva was making the door on the upper side of the leaf, which is a characteristic of *mariae*. It made the upper part first so that the door had the appearance of an upside down crescent. The

door was transparent at first but as the material dried and hardened, it became opaque. At 11:25 the door was completed except for an area near the bottom just the size of the larva's head. Then the larva started working on the lower side. At 11:35 the lower part had been completed, leaving only a tiny hole about two-thirds of the way down from the center of the door. The door was completely formed at 11:46, but the larva continued to work on the middle portion until 12:01 when it retreated back into the tunnel to start another period of quiescence prior to its pupation. The entire time involved was two hours and fifty-six minutes. Seven days later the door had changed color to the characteristic tan of this species.

On August 22, 1960 the procedure of pupation employed by *mariae* was recorded. The larva observed was one collected August 8, 1960, four to five miles west of Victoria Canyon, Texas. This specimen was very quiet for approximately twenty-four hours prior to this time. At 9:10 P.M. it started gradual movements from the caudal end cephalically. After ten minutes of this it gave four or five rather violent jerks and the skin began to separate down the anterior, midline of the thoracic region and then gradually down the midline of the head. At 9:20 the pupa began to work itself out of the larval skin by slow and gradual movements beginning at the caudal end, progressing anteriorly. The pupa was of dark green color as it made its appearance. When the pupa was about one half of the way out of the larval skin, it started a lateral movement of the abdomen, speeding up the shedding process. When the skin was two-thirds off and was confined to the last four abdominal segments, the pupa started gradual movements from the caudal end anteriorly, not moving the thoracic region at all. All action took place with the larva and then the pupa on its back. At 10:35 the larval skin was still attached to the last two segments but by rather vigorous lateral movements at 11:03 the larval skin was finally freed from the pupa. The entire process required one hour and fifty-three minutes. Twenty-four hours later the color of the pupa was light brown.

REFERENCES

- BONNIWELL, J. C., 1931. Notes on *Megathymus mariae* Barnes & Benjamin. *Ann. Carnegie Mus.* 20: 264-265.
- COMSTOCK, JOHN A., 1957. Notes on the metamorphosis of an Agave boring butterfly from Baja California, Mexico. *Trans. San Diego Soc. Nat. Hist.* 12:263-276, pl.22.
- FREEMAN, H. A., 1951. Notes on the Agave feeders of the genus *Megathymus*. *Field & Lab.*, 19: 26-32.



Freeman, Hugh Avery. 1964. "Larval habits of *Agathymus mariae*." *The Journal of Research on the Lepidoptera* 3(3), 145–147. <https://doi.org/10.5962/p.333480>.

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