THE OLEANDER CATERPILLAR,
SYNTOMEDIA EPILAI,S, WALKER

HOMER E. BRATLEY

This insect is a pest of one of our important ornamentals, the oleander, *Nerium oleander*; hence its name. The author has not observed the insect feeding on any other plant. At times it is sufficiently numerous to cause great damage by the defoliation of the plants. Its native host plant, according to Grossbeck (4), is *Echites umbellata*. This plant is found in the southern part of Florida, in the West Indies, and possibly in other parts of tropical America. It belongs to the same family as the oleander (*Apocynaceae*). The adult, a purplish moth with greenish wings dotted with white, is known as the Polka-dot wasp moth. (Fig. 22, Plate I.)

**DISTRIBUTION**

Dyar (1) who first described the larvae, obtained them in 1889 from the East Coast of Florida at Lake Worth about four miles south of Palm Beach. Riley (6) mentions what the writer supposes is the adult in a collection made by Mr. Schwarz at Cocoaanut Grove, Florida, sometime prior to March 13th, 1888. By June of 1930 this insect had advanced up the coast of Florida to a point about fifteen miles north of Vero Beach. During the summer of 1930 specimens of its larvae were received at the Florida Experiment Station from several points south of a line from Vero Beach, on the East Coast, to Clearwater on the West Coast of Florida, and in 1931 from Haines City and Davenport. In “Biologia Centrali Americana”, Mexico and several points in northern South America are named as localities where this moth has been collected. From this it appears that this species is native of the tropics.

**LIFE HISTORY**

The egg is light lemon yellow in color and very smooth and even in outline and surface. Seen from above it appears to be
a perfect sphere, but the side next to the attachment with the leaf is much flattened. The equatorial diameter is 1 mm. and the polar diameter 7 mm. The exposed surface, while smooth, gives (under magnification) the appearance of being under-

laid with a hexagonal netting. As the egg approaches to within a few hours of hatching, the color changes to a slate or lead color, due probably to the separation of the larvae from the shell and entrance of air.
The duration of the egg stage depends upon the prevailing temperature, as do also the lengths of the larval instars. (Plate II.) During June, July, August and September, two days were required for the eggs to hatch. This was extended up to a maximum of six days for other months of the year. The moth places from a dozen to seventy-five eggs in a group on the underside of the leaf. (Plate I, Fig. 12.) They are uniformly separated from each other in the group. In some groups they appear in even check rows, while in others no straight rows were noted.

The young larva, in hatching, eats a circular portion of the shell comprising about three-fourths the diameter of the egg. When this operation is completed, the larva rests for about thirty minutes, during which time it passes thru its first molt. In crawling from the shell the larva leaves behind the shed skin of this first molt. After extracting itself from the egg it rests for about an hour, after which it eats the remaining portion of the egg shell and the cast skin. All that remains to indicate where there had been a group of eggs are the small glistening spots on the leaf where each was attached.

The description of the larval stages is well given by Mr. Dyar (1), except for a few variations or corrections and additions here noted.

The first instar is spent in the egg shell as mentioned above. The duration of this instar was about three quarters of an hour. The hairs in this stage are short and very few in number, the more noticeable ones being located on the larger tubercles where, later in life, the more dense tufts occur. The head measures .4 mm. in width. The author wishes to note here with all due respect to Mr. Dyar, for entomologists are indebted to him for a great fund of insect information, that this instar was evidently overlooked by him. Therefore his descriptions apply to instars later by one than the one he designates. His description of the “first larval stage” is of the second and likewise his description of the “second” applies to the third, etc. Thus instead of five larval stages or instars there are six.

The second instar, which has a head breadth of .5 mm., corresponds in other measurements to those given by Mr. Dyar when he describes larval “stage one”. In figures (Plate II) I-III, will be found seta maps of the thoracic segments and in figures 1-10 of the abdominal segments, thus eliminating the necessity of lengthy descriptions. The lettering system used by Fracker
has been followed. These maps resemble most closely Fracker's maps of Syntomis phegea, showing family relationship. Figure 11, Plate I, shows one entire hair of this stage larva.

The duration of the second instar during the first third of March was from three to thirteen days, and during the last part of May, three to four days.

The duration of the third instar in summer, last part of May, was three and four days, and during the first half of March, three to eight days. Figure (13) illustrates the tip of a hair of this stage, and figure 23, Plate I, presents a tubercled area bearing hairs. This and the figures of the hairs are greatly magnified. Figure (14) shows the larva.

The fourth instar occupied from four to ten days during the middle portion of March, and four and five days in early June. Figure (15) illustrates the larva of this instar, and figure (16) shows the larva molting.

From six to twelve days during the last half of March, and from four to six during the first part of June were consumed in the fifth instar (Figure 17).

<table>
<thead>
<tr>
<th>Instar</th>
<th>Spring</th>
<th>Summer</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>½-1 hour</td>
<td>½-1 hour</td>
<td>¾ hour</td>
</tr>
<tr>
<td>2nd</td>
<td>3-13 days</td>
<td>3 and 4 days</td>
<td>4.35 days</td>
</tr>
<tr>
<td>3rd</td>
<td>3-8 days</td>
<td>3 and 4 days</td>
<td>4.33 days</td>
</tr>
<tr>
<td>4th</td>
<td>4-10 days</td>
<td>4 and 5 days</td>
<td>5.60 days</td>
</tr>
<tr>
<td>5th</td>
<td>6-12 days</td>
<td>4, 5, and 6 days</td>
<td>6.37 days</td>
</tr>
<tr>
<td>6th</td>
<td>4-16 days</td>
<td>4-8 days</td>
<td>6.95 days</td>
</tr>
<tr>
<td>Total</td>
<td>20-59 days</td>
<td>18-28 days</td>
<td>27.60 days</td>
</tr>
</tbody>
</table>

The sixth instar required from four to sixteen days during the last of March and early April, and from four to eight days during the middle third of June. The measurements agree with those given by Dyar in his description of the "fifth larval stage". Figure (18) shows a larva and figure (19) illustrates the tip of a hair of this instar (same magnification as other figures of
hairs). In comparing these illustrations of the hairs one would surmise that their length and the character of their side projections could be used as a means of determining the instar.

**RETARDATION DUE TO SOLITARY CONFINEMENT**

During the larval instars it was noted that larvae kept in individual cages remained in the instar longer than those of the same age allowed to remain in the colony. Where three or four larvae were confined together no particular increase of the instar period was noted. When kept together those of the same age passed thru their changes at the same time. Only one exception to this was noted and that for a single molt. When succeeding molts occurred this individual molted along with the rest. Since the work was completed, Mr. W. C. Allee's book "Animal Aggregations", published by the University of Chicago Press, has appeared. This work contains some similar observations along this line.

The prepupal period was marked by the non-feeding of the insect and the evacuation of the alimentary canal. The time required for this period was from three to ten days; from three to seven during the latter third of June, and from four to ten during first half of April. During this time the larva hunts a location for pupation, completes its loosely woven cocoon of hair and silken threads (Plate I, Fig. 20) and sheds its last larval skin. The pupa (Fig. 21) when first formed is a very light brownish yellow in color and requires a day to become a dark brown.

The pupal period, seven to fourteen days during the last of June and first of July and sixteen to twenty during April, lasted on an average thirteen and eighty-three hundredths days.

The adult stage (Fig. 22, female), wasp-like in form, lasts an average of nine days, although it varies from four to twelve days during the last of April and the first of May, and from two to thirteen during mid-July. The adult measures across the expanded wings from 44.6 to 51.4 mm., and from the anterior border of the head to the tip of the abdomen from 16.5 to 18.3 mm. The color according to “Dictionary of Color”, by Maerz and Paul (Plate 46, F' 12), for the body generally, is marine purple navy. The wings' ground color corresponds most nearly to jungle green (L 12 of Plate 32). The antennae for two thirds their length are the same color as the wings, with the apical third
feathered in white. The primary wings are decorated with two large white spots centrally located in the basal and apical halves. Near the middle of the anterior margin is a third white spot; two very small white spots are anterior to the large spot in apical half; and a sixth spot occurs on the costal margin at the junction of wing and body. The secondaries, much smaller than the primaries, have one white spot in each center and one on the anal margin. The legs are of the same color as the wings, with pairs one and two having white tipped joints except those of the tarsi. The third pair are white at conjunction of femur and tibia and the tarsal joints are all white.

The metathoracic segment dorsally displays three white spots, a very small triangular one on the anterior dorsum and one nearly discal spot on each side of the dorsum. Each thoracic segment bears one oval white spot on each lateral area.

The abdomen’s ground color as mentioned above has the last two visible segments “sungod” (Maerz and Paul, Plate 2, H. 12); the lateral surfaces of segments two and three have one rather large white spot and the ventral surfaces of segments one and two have two white spots each, one on each side of the medium venter.

**LIFE CYCLE SUMMARY**

<table>
<thead>
<tr>
<th>Stages</th>
<th>Egg</th>
<th>Larval</th>
<th>Prepupal</th>
<th>Pupal</th>
<th>Adult</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum time</td>
<td>2 days</td>
<td>16 days</td>
<td>3 days</td>
<td>7 days</td>
<td>2 days</td>
<td>30.5 days</td>
</tr>
<tr>
<td>Maximum time</td>
<td>6 days</td>
<td>59 days</td>
<td>10 days</td>
<td>20 days</td>
<td>13 days</td>
<td>108 days</td>
</tr>
<tr>
<td>Average time</td>
<td>4 days</td>
<td>27.6 days</td>
<td>5.06 days</td>
<td>13.83 days</td>
<td>9.05 days</td>
<td>59.54 days</td>
</tr>
</tbody>
</table>

The life periods are graphically shown in the “Life Cycle Chart”. This and the “Temperature During Studies” graph should be studied together, thus comparing the various periods of each stage under different temperatures. The shortest period required to pass a complete life cycle was thirty-three days, which was during June and the first part of July. The maximum or longest period required was a hundred and eight days, during February, March, April and part of May. The general average period for completion was fifty-nine days.

The temperatures prevailing during the growth of this insect may be had from the graph “Temperature During Studies”.
The author wishes to call the reader's attention to the temperatures during March, which were the lowest of any. The development of the larvae was on an average extremely slow. The eggs from which these caterpillars hatched were sent to the Station from Vero Beach. So they were reared away from their nativity as well as being in a colder region. In June the author went to Vero Beach to collect data on them in a more congenial climate. He was able to observe the laying of the eggs, also to collect several groups to bring back and continue the studies. The growth of these last was much more rapid and the temperatures were higher and more constant. The minimum during the latter period continues at about the same temperature level as the maximum in the earlier period. One female, observed laying, spent thirty minutes in the deposition of thirty-five eggs. The depositing of the eggs was not observed to occur
before three P.M., nor after five-thirty P.M. Likewise the adults do not emerge from the pupae during any part of the day except from one-thirty to four-thirty P.M. No emergence of adults nor laying of eggs was observed at any other times of the day.

CONTROL

Natural controls have proven inadequate. During very moist weather some entomogenous fungi and bacterial diseases have a tendency to decrease their numbers, but to such a small extent that it is unnoticed and cannot be depended upon to hold these insects in check. No insect parasites were found.

Liquid sprays, too, have been discarded on account of their inability to spread and stick to the waxy foliage of the oleander. People combating this insect have found best control by dusting. The dust is best applied when the foliage is dry, and a liberal covering is necessary, especially when the larvae are present. Calcium arsenate is a good dust to use. Another dust, composed of one pound of lead arsenate to about four to seven pounds of hydrated lime, also gives good results. The life history studies would indicate that during the summer these dustings should be repeated about every thirty days; during the winter every ninety days should suffice. Paris green has also been used with good results. This should be mixed with hydrated lime in the same proportions and applied under the same conditions as the lead arsenate.

LITERATURE


