BIONOMICS AND CONTROL OF AEOLESTHES HOLOSERICEA F. (CERAMBYCIDÆ: COLEOPTERA)

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Received January 13, 1942
(Communicated by Dr. Hamid Khan Bhatti, F.A.Sc.)

Aeolesthes holosericea F. was collected for the first time by the Director, Imperial Forest School, Dehra Dun, in 1889 from Sal and Terminalia tomentosa. Stebbing (1914) made some observations on the life-history of this pest between 1901-09 and also described the adult. Beeson (1941) recently discussed its life-history, economic importance, food-plants and control. Nevertheless, information as to the duration of its various stages, seasonal history and control (when the attack is in progress) has remained singularly meagre and in the present paper an attempt is made to throw light on these points.

Distribution

Stebbing (1914) collected it from U.P., Oudh, Hyderabad, C.P., D.I. Khan and Ganjam; Gahan from N.W. India, Bombay, Nilgiris, Ceylon, Assam, Andaman, Nicobar, Siam and Malay Peninsula and Lefroy secured it from Bengal. According to Beeson (1914) A. holosericea is distributed throughout the greater part of the forest of India; “it extends up the sub-montane valleys of the Himalayas to considerable elevation, occurs in the Indus plains and in the Sundarban, in moist forests, and in dry, and in Ceylon, Burma, the Andamans and Nicobars”. In the Punjab we have found it between the altitudes of 3,500 to 8,000 ft. above sea-level in Kulu, Bandrol, Raison, Katrain, Naggar and Manali in the Kulu Valley, Kotgrah and Simla in the Simla Hills.

Food-Plants

Stebbing (1914) found it on the following plants: Sal (Shorea robusta), Terminalia tomentosa, Hardwickia binata, Chloroxylon swietenia, Tamarix articulata, Acacia arabica, Guava (Psidium guava), Mango (Mangifera indica). Beeson (1941) mentions the following as its food-plants: Aegle marmelos, Alnus nitida, Anogeissus latifolia, Bauhinia acuminata, Bauhinia retusa,
Bauhinia variegata, Bombax malabaricum, Bridelia retusa, Butea frondosa, Careya arborea, Cedrela toona, Cynometra ramiflora, Duabanga sonneratoides, Eucalyptus robusta, Exacacia agallocha, Ficus bengalensis, Grewia oppositifolia, Kydia calycina, Largerstæmnia parviflora, Laneea grandis, Mallotus philippinensis, Miliusa velutina, Morus alba, Myristica andamanica, Ougeinia dalbergioides, Pentacme suavis, Pinus longifolia, Prunus communis, Pterocarpus marsupium, Pyrus communis, Quercus incana, Sapium sebiferum, Shorea assamica, Soyinda febrifuga, Tectonia grandis, Terminalia balerica, Terminalia myriocarpa. We collected it from Kosh (Alnus nitida), Cherry (Prunus avium), Apple (Pyrus malus), Crab apple (P. baccata), Apricots (Prunus armeniaca), Walnut (Juglans regia), Plum (Prunus domestica), Peach (Prunus persica) and Mulberry (Morus alba).

**Description of Various Stages**

*Egg.*—Egg 2.25 mm. long, 1.0 mm. broad, elliptical, tapering towards either extremity, micropylar end slightly broader with a small petiole.

*Larva.*—Larva yellow with dark brown head. When full-grown it measures 75 mm. in length and 13.5 mm. in breadth. Its body is clothed in fine bristles which are abundant on the thorax and the last abdominal segment. Antenna 4-segmented, 1st segment thick, rest minute with sensoria. Prothorax larger than meso-thorax. Thoracic legs persent. Abdominal segments possess series of tubercles on their dorsal and ventral aspects. Spiracles, pit-like, elliptical, brownish.

*Pupa.*—Pupa yellow, 42 mm. long, 35 mm. broad, Head small, slightly deflected. Thoracic sterna and 2nd and 7th abdominal segments covered with bristles. Last abdominal segment bifurcated, curved dorsally.

*Female.*—Female measures 32 mm. in length, 10 mm. in breadth. It is dark brown in colour with silvery or golden reflections on the elytra. Antenna 11-segmented, basal segment small, rounded, 2nd segment with wrinkled surface, 3rd to 10th segments slender but thickened at their distal ends, 11th segment very thin and tapering. Prothorax wrinkled and furrowed. Elytra with well-developed shoulders inner edge of each of which terminates in a small sharp spine.

*Male.*—Male resembles the female but is smaller with smaller antennæ, the last segment of each of which is flattened dorsally.

**Life-History**

Females lay eggs from May to October. They select injured areas on the bark, more often previously attacked parts of the stem, for egg-laying.
They make minute incisions on the injured edges of the bark into which they push their eggs singly and longitudinally with their ovipositors. 1-5 eggs are laid daily. In confinement a female laid a maximum of 92 eggs in its life-time.

Eggs hatch out in 7-12 days. The young larva bites irregular holes in the egg-shell most of which it usually eats. Larva on hatching feeds upon the inner layers of the bark in shallow and zig-zag galleries, but when it is a few days old it starts feeding on the inner layers of the bark and outer layers of the sapwood making shallow, wide, zig-zag and long galleries. When almost grown up the larva enters the main wood through a self-prepared kidney-shaped entrance hole which later on serves as an emergence hole for the beetle. The larval stage occupies from 2 years 3 months and 5 days to 2 years and 8 months. If the larva is full-grown by October it pupates after a rest of 3 to 25 days only, but when it becomes full-grown in November, the pre-pupal period may be prolonged to 4½-5 months. Such larvae pupate in the middle of April.

The grub constructs a pupal chamber the distal end of which it plugs with a brownish white matter. The pupa lies naked in this chamber. The pupal stage occupies from 1 month 10 days to 3 months 10 days.

If pupation occurs in October the beetle is formed within the chamber in December to February. This beetle remains quiescent in the stem throughout the winter and spring, its resting period varying from 3 months 11 days to 5 months 2 days. But when the larva enters the resting stage in winter and pupates in April, the beetle has a shorter resting period of 1 month 10 days to 1 month 17 days.

### Table I

<table>
<thead>
<tr>
<th>Eggs laid</th>
<th>Eggs hatched</th>
<th>Adults emerged</th>
<th>Duration of stages</th>
<th>Life-cycle completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>26-4-41</td>
<td>Egg days</td>
<td>Larva m. d.</td>
</tr>
<tr>
<td>15-6-38</td>
<td>22-6-38</td>
<td>26-4-41</td>
<td>7</td>
<td>.28</td>
</tr>
<tr>
<td>17-6-38</td>
<td>25-6-38</td>
<td>26-4-41</td>
<td>8</td>
<td>29</td>
</tr>
<tr>
<td>3-6-38</td>
<td>12-7-38</td>
<td>26-4-41</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>13-6-38</td>
<td>22-8-38</td>
<td>25-5-41</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
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<td>24-9-38</td>
<td>25-5-41</td>
<td>9</td>
<td>30</td>
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<td>4-10-38</td>
<td>16-10-38</td>
<td>30-5-41</td>
<td>12</td>
<td>29</td>
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<td>14-10-38</td>
<td>26-10-38</td>
<td>2-6-41</td>
<td>12</td>
<td>29</td>
</tr>
</tbody>
</table>

m. = months; d. = days
From the date of oviposition to the date of emergence of the beetle its life-cycle is completed in 2 years 7½ months to about 3 years.

**Seasonal History**

Beetles begin to appear on the wing towards the end of April and continue to do so upto the middle of July. They live upto the end of October. The annual calendar of activities of the pest is as follows:

<table>
<thead>
<tr>
<th>Months</th>
<th>Stages present</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>One-year old grubs and 2-year old resting grubs present; beetles start emerging</td>
</tr>
<tr>
<td>May-June</td>
<td>Beetles keep on emerging and laying eggs</td>
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<tr>
<td>July</td>
<td>Beetles continue to emerge; and oviposit-grubs present. Pupae sceare</td>
</tr>
<tr>
<td>August-September</td>
<td>Beetles, eggs and grubs present</td>
</tr>
<tr>
<td>October</td>
<td>Beetles, eggs and grubs present; old grubs pupate</td>
</tr>
<tr>
<td>November</td>
<td>Grubs present, old grubs start resting; few pupate</td>
</tr>
<tr>
<td>December-March</td>
<td>Active and resting grubs and immature beetles present</td>
</tr>
</tbody>
</table>

**Damage**

The attacked tree is recognised by the fibrous and faecal matter which falls from the larval tunnel to the ground below. The bark around the attacked area splits up. Attacked sherry trees suffer from gummoses also.

Grubs only do damage. When young they feed upon the inner parts of the bark and the outer parts of the main wood, each grub eating out as much as half a square foot of it. Older grubs bore into the main wood and injure the inside of the stem. The damage done to the bark is more serious and when more than one grub feed in the stem the tree dies; young apple plants, however, are killed by a single grub.

The damage done by the beetle itself is negligible. It feeds upon the damaged area of the stem and interior of the tunnels made by the grubs. The beetle spends the day hiding in the tunnel or beneath the injured bark: it flies at night. It has never been seen feeding upon leaves.

**Control**

1. **Painting solignum on injured areas on the stem.**—The females lay eggs in the edges of the injured bark. Therefore, when such areas were painted with solignum, the beetles refrained from laying eggs. Young apple or cherry trees should be painted every summer because young trees when attacked succumb within a month or two. Such trees are usually attacked on the stem quite adjacent to the soil. This part, therefore, must receive an occasional examination and treatment.
Fig. 1. Adult.  
a, female;  
b, male.

Fig. 2. Egg.

Fig. 3. Larva.  
a, dorsal view;  
b, ventral view.

Fig. 4. Pupa.

Fig. 5. Pupal chamber.  
a, chamber from which adult has emerged;  
b, chamber from which beetle has not emerged.

Fig. 6. Emergence holes.

Fig. 7. Egg slit.

Fig. 8. Hole (h) through which faecal matter (F) is pushed out.
II. Killing grubs in their tunnels

The tunnel is cleaned to some extent with an iron wire or knife and cotton wool soaked in kerosene oil is introduced into it. This is finally plastered with clay mud. The fumes of kerosene oil penetrate into the tunnel, reach the grub or pupa and kill it. Others have suggested potassium cyanide crystal or a mixture of petrol and chloroform and though these chemicals are also successful they are expensive and not so readily available as kerosene oil which is also the cheapest. During 18th June–28th September 1940, 109 trees were treated with kerosene oil and cent. per cent. mortality of the pest was obtained.

LITERATURE

Stebbing, E. P. .. Indian Forest Insects, 1914, 301.
Beeson .. Forest Insects, 1914, 136.