SHORT NOTE

BIOLOGY AND POPULATION OF COCONUT ERIOPHYID MITE, Acetia guerreronis Keifer

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The coconut eriophyid mite, Acetia guerreronis Keifer was first reported as a serious pest in Ernakulam district of Kerala, South India during 1997-98. It has spread to most of the districts in South India. The infestation of the mite to young nuts of coconut (Cocos nucifera L.) results in the reduction of yield of copra and coir (Paul and Mathew, 2002). Many of the fundamental aspects like biology, mite-host interaction and symptomatology are poorly understood (Moore and Howard, 1996). This research gap has to be filled for developing a long term strategy in managing the pest. This was conducted to study the detailed biology of the mite in the laboratory condition and population build up in field condition.

The biology of A. guerreronis was studied under laboratory condition during May - June 2001 in College of Agriculture, Vellayani, Trivandrum, Kerala. Adult mites residing under the perianth of young affected buttons were collected and released in tender and succulent tepal discs (Ramarchitham and Loganathan, 2000). The discs were so placed to keep the upper surfaces in contact with tender coconut water in small containers. Female mites were placed singly on the inner surface of the tepal discs using a camel hair brush. The different stages of mite viz., egg, protonymph, deutonymph and adult on the tepal disc were observed under a microscope. The length and width of egg, protonymph, deutonymph and adult were measured by using a calibrated microscope. All stages of mites were drawn by using camera lucida and measured.

An experiment was conducted to study the development of egg, nymph and adult population in young nuts of critical age under field condition in March, 2001. Nuts with uniform external symptom of triangular marks were labeled from fourth, fifth and sixth bunch by pasting sticker labels. Such nuts with apparently identical population were harvested at weekly intervals for a period of four weeks and the population of adult, nymph and eggs of A. guerreronis was estimated by using the cellotape embedding technique (Girija et al., 2001).

The life stages of coconut eriophyid mite, A. guerreronis include egg, protonymph, deutonymph and adult (Fig. 1).

The eggs were laid singly on the meristematic tissue of young buttons and on the inner surface of the perianth. Eggs are ovoid, glossy, translucent and white coloured. The mean incubation period was 2.8 days. The duration of egg, protonymph, deutonymph and adult were 2-3, 3-4, 3-4 and 3-5 days, respectively. The lengths and widths of different stages of mite are presented in Table 1. Total life cycle of A. guerreronis from egg to adult took 9.8 days.
Fig 1: Life history of *A. guereronis*
Table 1. Measurements and duration of different stages of A. guerreronis.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Length (μm)</th>
<th>Width (μm)</th>
<th>Duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg</td>
<td>39.9</td>
<td>30</td>
<td>2-3</td>
</tr>
<tr>
<td>Protonymph</td>
<td>74.5</td>
<td>32</td>
<td>3-4</td>
</tr>
<tr>
<td>Deutonymph</td>
<td>129.7</td>
<td>33</td>
<td>3-4</td>
</tr>
<tr>
<td>Adult</td>
<td>230.5</td>
<td>47</td>
<td>3-5</td>
</tr>
</tbody>
</table>

The result of population build-up of A. guerreronis in bunches during I, II, III and IV weeks of March 2001 are presented in Fig. 2. A steady increase in population of A. guerreronis in three bunches during the four consecutive weeks could be observed. Adult population increased in the first two weeks, then began to decline in fourth week. Adult population was built up to eight fold in fourth week of March. A similar trend was observed in the case of nymphal population. It increased to a very high population level of up to 22 fold during the fourth week of observation. Egg population increased steadily from first week to third week and then decreased. Study of the biology of mite revealed that a total of 10-12 days was required for completing one generation (egg to adult). Data obtained from population build up under field condition (Fig. 2) revealed that about 3 - 4 generations are completed during the one month period of transition from fourth to fifth bunch stage, which may be considered as the most critical age of the bunch.

However, the extent of control invariably depends on the penetration of the spray droplets into the perianth and the contact effect with the mite colonies in these bunches. Obviously any control, whether chemical or biological, may be targeted to exert a prophylactic effect on the second and third bunches corresponding to the stages of mite entry. The extent of curative effect on the rapidly multiplying populations in the fourth and fifth bunches may be only to a limited scale, depending on the penetration and the contact of spray droplets with the mite colonies.

These observations further indicated that the interval between two consecutive sprays should be fixed with reference to the pattern of bunch production and not on the basis of the life cycle of mite.

REFERENCES


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