First record on the establishment of the parasitoid (Acerophagus papayae Noyes and Schauff) of papaya mealybug (Paracoccus marginatus Williams and Granara de Willink) on cotton

The papaya mealybug, Paracoccus marginatus Williams and Granara de Willink was recorded in a severe form for the first time on cotton around Coimbatore during 2008 (Anon., 2008). It has a wide host range of over 60 species of plants including economically important plants such as Annona squamosa, Carica papaya, Hibiscus rosa-sinensis, Ipomoea spp., Manihot esculenta and Solanum melongena (Meyerdirk and Kauffman, 2001). Severe infestation of mealybug lead to stunted growth and drying of the sympodial branches and subsequent loss of seed cotton yield (Dharajothi et al., 2010).

Density dependent feeding behavior of native predators viz., Spalgis epius (West wood), Cryptolaemus montrouzieri (Mulsant) and Scymnus coccivora (Ayyar) warranted for the other alternative bio control option for the effective management of this serious pest (Meyerdirk et al., 2004). With the initiatives of National Bureau of Agriculturally Important Insects (NBAI - ICAR), Bengaluru three parasitoids viz., Acerophagus papayae (Noyes and Schauff), Anagyrus loecki (Noyes and Menezes) and Pseudoleptomastix mexicana (Noyes and Schauff) have imported and multiplied in collaboration of Tamil Nadu Agriculture University, Coimbatore(TNAU). A nucleus culture of A. papayae was collected from the Bio control laboratory of TNAU and released in the P. marginatus infested field at Central Institute for Cotton Research, Regional Station, Coimbatore. Subsequently establishment of this parasitoid was observed under field conditions. For quantification of parasitoid establishment infested twigs and leaves from the field were collected and numbers of mummified mealy bugs (Plate 1) were recorded per leaf and 10 cm fully infested twigs, respectively. Total ten such observations have been made and data has been presented in figures.

Table 1. Establishment of parasitoid, Acerophagus papayae on papaya mealybug, (Paracoccus marginatus) infesting cotton

<table>
<thead>
<tr>
<th>Sample</th>
<th>Mean no. of bug/sample</th>
<th>Mean no. of mummified mealybug/sample</th>
<th>Adults emerged/sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infested leaf</td>
<td>15.05 ± 17.66</td>
<td>0.98 ± 0.82</td>
<td>2.00 ± 2.05</td>
</tr>
<tr>
<td>Infested twig</td>
<td>5.7 ± 2.83</td>
<td>41.90 ± 28.70</td>
<td>-</td>
</tr>
<tr>
<td>* Shoots with (4-5) leaves</td>
<td>-</td>
<td>-</td>
<td>6.60± 4.12</td>
</tr>
</tbody>
</table>

Number of adults emerged from mealybug infested (grade III) shoot samples, measuring 5.0 cm length with four to five leaves and individual leaf samples as well were recorded. High intensity of parasitization and adult emergence was recorded

Plate 1. Mummified bodies of Paracoccus marginatus by Acerophagus papayae

Plate 2. Acerophagus papayae – Adult
on twigs and twigs kept along with leaves, respectively as compared to leaves alone. Per leaf average populations of live and mummified mealy bugs were 15.05 ± 17.66 and 0.98 ± 0.82 respectively. On twigs 5.70 ± 2.83 and 41.90 ± 28.70 healthy and mummified mealy bugs respectively were recorded (Fig.1). Average adult emergence in shoots with leaves and leaves alone were recorded as 6.60 ± 4.12 and 2.00 ± 2.05, respectively (Table1).

Survey of *P. marginatus* on cotton before the release of the parasitoids showed that there were no local parasitoids that had shifted to attacking this mealybug. A few coccinellid (*C. montrouzieri*) and lycaenid (*Spalgis epius*) were found and feed on it. The populations of polyphagous predators fluctuate irregularly in time and space (Bokonon – Ganta and Neuenschwander, 1995). These, therefore were not apparently capable of suppressing the population of *P. marginatus*.

Establishment of *A. papayae* was confirmed within a month of release. These findings are in line with the observations made by Amarasekare *et al.* (2009) those reported that the maximum parasitization was observed in stem and twigs as compared to other parts of plant.

The adults emerged (plate 2) were found to be highly active with good host searching ability. The present note is a first report of field level establishment of parasitoid *A. papayae* on papaya mealybug infesting on cotton in South India. Off seasonal release of the parasitoids on alternative hosts will help in the establishment and act as reservoirs of parasitoids for further suppression of the pest on cotton.

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