

## Biology of *Eocanthecona furcellata* (Wolff.) on Citrus Leaf Eating Caterpillar, *Papilio demoleus* L.

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The pentatomid bug, *Eocanthecona furcellata* (Wolff.) is a polyphagous predator of lepidopterous larvae (Rao, 1977; Ghorpade, 1975; Chu and Chu, 1975; Singh and Gangrade, 1975; Rai, 1978; Sudheendra Kumar, 1986). An attempt was made to study the biology and feeding behaviour of *E. furcellata* on *Papilio demoleus* L. larvae at the University of Agricultural Sciences, Raichur, under laboratory conditions during 1986-87.

Adult predatory bugs feeding on the larvae of *P. demoleus* in field were collected and released in glass Petri cages (4 x 2") along with the host larvae. Mated bugs laid the eggs and were kept in separate Petri cages to record the incubation period. Observations were recorded on the duration, behaviour and feeding habits of each nymphal instar, preoviposition, oviposition periods and fecundity of each adult.

Barrel shaped eggs were laid by gravid females in groups of 51 to 102. Initially, eggs were reddish, shiny, which changed to pearl white and finally to brown colour as time advanced. Incubation period ranged from 5 to 11 days with a mean of 6 days and each egg measured 0.4 to 1.0 mm with an average of 0.5 mm. Newly hatched nymphs were tiny, active and reddish brown and measured 1.0 to 2.0 mm in length with an average of 1.5 mm and found feeding on young leaf tips or congregating on wet cotton swab, although host larvae were available indicating the nonpredaceous nature which is in agreement with the report made by Wu *et al.* (1983).

The second instar nymphs were very active, black with two red stripes on the dorsal part of the abdomen. They moved slowly towards the posterior side of the larval body after 2 hours of moulting and thrust their stylets to suck the body fluid continuously for 15 to 30

minutes. The average consumption was 0.3 larvae per nymph with a range of 0.2 to 0.4. This nymphal instar lasted for 4 to 7 days with an average of 5 days. The host larvae showed a strong repulsion by shaking its head on either side as the predator started feeding but became dull and paralysed within 5 to 6 minutes.

Initially, the third instar nymphs were active, deep red in colour turned black with the disappearance of stripes. The feeding behaviour was similar to earlier instar, but nymph consumed on an average of 0.5 larvae with a range of 0.4 to 0.6. The time taken for completing third instar ranged from 3 to 9 days with an average of 5.4 days.

Robust, active fourth instar nymphs having a black band in the middle and two red stripes on dorsal surface of the abdomen measured 5.0 to 6.0 mm with an average of 5.4 mm. The duration of this stage varied from 5 to 7 days with a mean of 6 days. Each nymph consumed an average of 1.3 larvae which ranged from 1.1 to 1.6 larvae.

The final instar nymph had similar colouration of the earlier instar but was of longer duration which ranged from 7 to 13 days with a mean of 8 days. These nymphs measured 7.0 to 10.0 mm in length with an average of 9.0 mm. Each nymph had the potentiality of consuming the larvae ranging from 2.0 to 2.2 with an average of 2.1 larvae per nymph. The newly emerged adults were active and searched the host and started feeding on the body fluid of the host larvae and the duration of each feed lasted for 5 to 6 minutes. The adult bug was an aggressive feeder and consumed 8.0 to 14.0 larvae with an average of 9.2 larvae during its stage.

The preoviposition and oviposition periods were 5.0 to 8.0 days and 1.0 to 2.0 days, respectively. The fecundity of the bug ranged

from 100.0 to 120.0 with an average of 83.0 eggs. The adult longevity was 3.0 to 12.0 days with a mean of 10 days. These results are in line with the earlier reports of Pant (1960) and Rao (1977).

**KEY WORDS:** *Eocanthecona furcellata*, biology, *Papilio demoleus*

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## A Simple Method for Mass Rearing of an Exotic Predacious Phytoseiid Mite, *Phytoseiulus persimilis* A.H.

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Among the phytoseiid predators, *Phytoseiulus persimilis* A.H. was extensively and successfully used for suppression of tetranychids both under glasshouse and field conditions (Chant, 1961; Bravenboer and Dosse, 1962; Oatman *et al.*, 1977). Considering the potential and merits, the predator was imported for trials against red spider mites of horticultural crops under All India Coordinated Research Project on Biological Control of Crop Pests and Weeds. Bravenboer (1975) suggested that the most common method for rearing *P. persimilis* was on plants infested with tetranychids. Bakasova (1978) used cut leaves infested with tetranychids. The techniques developed by Scopes (1968) and Theaker and Tonks (1977) were too laborious. Even artificial diets developed by Shehata and Weismann (1972) and Kennett and Hamai (1980) resulted only in immature stages. In this paper, a method has been described for mass rearing both tetranychids and *P. persimilis* with minimal care. The stock culture of

*P. persimilis* was received from the Glasshouse Crops Research Institute, Littlehampton, U.K. in 1984 and was maintained in the laboratory initially on cut leaves held over a wet cotton platform using *Tetranychus urticae* Koch as prey.

### Mass Rearing of *T. urticae*

Potted plants of french beans (*Phaseolus vulgaris* L.) var. Arku Komal were raised once in three weeks as host plants for *T. urticae*. At two tri-foliolate leaf stage, the pots and plants were sprayed thoroughly with fenvalerate 0.01% to keep off indigenous phytoseiids and other predators. Three days after spraying, the plants were inoculated with *T. urticae* @ 20 adults/plant and held under glasshouse conditions. The spider mites multiplied rapidly in the absence of natural enemies and the insecticide residue appeared to be sufficient to keep off especially phytoseiids for more than 3-4 weeks. Spider mite-infested fourth trifoliolate leaf from the bottom was used for mass rearing the predator. Adult spider mites