Note

OVIPOSITION AND PREDATION OF Pentilia egena MULSANT (COLEOPTERA: COCCINELLIDAE) IN RESPONSE TO TEMPERATURE

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ABSTRACT: The species Pentilia egena Mulsant is an important predator of armored scales that occur in citrus orchards in Brazil. To intensify this biological control, knowing bioecological aspects in necessary for the improvement of massal insect rearing. This research investigated the influence of temperature (19°C, 24°C and 29°C) on the number of eggs laid by P. egena and the number of Aspidiotus nerii Bouché scales preyed by this coccinellid. The highest number of eggs laid and of scales preyed, 5.1 ± 0.59 and 11.3 ± 0.19, respectively, occurred at 29°C. However, egg viability (52.86%) was reduced at this temperature, and was lower than those at 19°C and 24°C (78.10% and 74.07%, respectively). Temperature did not affect the ladybeetle oviposition behavior as the eggs were laid under the scale of preyed A. nerii.

Key words: Diaspididae, predator, ladybeetle, natural enemies

INTRODUCTION

The coccinellids play an important role in biological insect control worldwide, as natural enemies of aphids, scales, mealybugs and mites (Hagen, 1962). The introduction of Rodolia cardinalis Mulsant from Australia to a number of countries to control the cottony cushion scale, Icerya purchasi Maskell, an important citrus pest, is a landmark for biological control and mass insect rearing (Caltagirone & Doutt, 1989).

The lady beetles are cosmopolitan insects and it is believed that there are ca. 5,000 known species occurring in ecosystems as diverse as forest, “cerrado”, tundra and agricultural crops. They are well adapted to most environmental conditions, behaving accordingly to the ecological niche they occupy (Olkowski et al., 1990; Iperti, 1999).

Among the Brazilian coccinellid species, Pentilia egena is one of the most important predators of citrus armored scales such as: Selenaspidus articulatus Morgan, Parlatoria pergandii Comstock, Parlatoria cinerea Deane & Hadden, Chrysomphalus aonidum L. and Unaspis citri Comstock (Gravena, 1986; Busoli, 1992). However, little is known about the preying behavior, the oviposition of P. egena, and the influ-
RESULTS AND DISCUSSION

The temperature did influence the preying behavior of *P. egena*. At 19°C, 4.4 ± 0.56 scales were preyed per lady beetle, a value lower than that of 7.6 ± 0.46 scales per lady beetles obtained at 24°C. The females kept at the highest temperature (29°C) consumed 11.3 ± 0.19 scales per lady beetle, quite higher than the results obtained at the other temperatures. These results agree with those reported for the coccinellids *Hippodamia convergens* Guérin-Méneville, *Coccinella septempunctata* L. and *Coleomegilla maculata* DeGeer (Shands & Simpson, 1972; Roach & Thomas, 1991). Extrapolating these results to field conditions, one should presume that preying efficiency would be higher in the seasons with daily temperatures between 25°C and 30°C.

Different temperatures did not affect the oviposition behavior of *P. egena* in relation to eggs laid under the scale of preyed *A. nerii* (Table 1). This is a characteristic behavior of the species to protect the progeny against predation, parasitism and climatic changes (Guerreiro et al., 2001). Total number of laid eggs (inside and outside the armor) was higher at 29°C, but a decrease in egg viability (52.9%) was observed when compared to those obtained at 19°C (78.1%) and 24°C (74.1%). These observation are similar to those of Santos & Bueno (1993), who reported egg viability of *Scymnus (Pullus) argentinicus* Weise being higher at 20°C, although the number of laid eggs had been lower.

The lowest egg viability at the highest temperature (29°C) may be attributed to the egg dehydration, for most of them were wilted. Howe (1981) reported a reduction in the egg viability at high temperatures because of the denaturation of proteins responsible for water absorption.

Within the considered interval (19 to 29°C), temperature did influence, either directly or indirectly, biology and behavior of this coccinellid. The best results regarding oviposition and preying capacity were obtained at 24°C and 29°C. These temperatures are suitable for rearing *P. egena* in laboratory as well as to release this predator in the field.

### Table 1 - *Pentilia egena*: number (mean ± s.e.) of eggs laid inside and outside of armor, and total.

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Outside armor</th>
<th>Inside armor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>0.4 ± 0.13 Ab</td>
<td>2.2 ± 0.17 Ba</td>
<td>2.6 ± 0.23 B</td>
</tr>
<tr>
<td>24</td>
<td>0.5 ± 0.13 Ab</td>
<td>1.7 ± 0.27 Ba</td>
<td>2.2 ± 0.32 B</td>
</tr>
<tr>
<td>29</td>
<td>0.9 ± 0.15 Ab</td>
<td>4.2 ± 0.46 Aa</td>
<td>5.1 ± 0.59 A</td>
</tr>
</tbody>
</table>

Means followed by distinct capital letters in the column and small letters in the line differ by the Tukey test (*P* ≤ 0.05). Minimum significant difference (5%) temperature by oviposition local = 0.8494 and oviposition local by temperature = 0.7098.
REFERENCES


