

FACTORS INFLUENCING THE DISTRIBUTION OF *LEPIDOSAPHES BECKII* (NEWMAN) (HOMOPTERA: DIASPIDIDAE) IN A CITRUS ORCHARD

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INTRODUCTION

Four diaspidines occur on citrus in the Azores: *Aspidiotus nerii* (Bouché), *Chrysomphalus dictyospermi* (Morgan), *Unaspis citri* (Comstock) and *Lepidosaphes beckii* (Newman). Only the latter is considered a key pest due to its economic importance. Several papers have been published with the purpose of improving control methods inserted in the prospect of integrated pest management.

Knowing the distribution of a population is of great importance. Microclimatic factors (temperature, relative humidity, light, etc.), parasitoidism and differential predation may have a strong influence on the distribution of a population. The objective of this study is to investigate the mode of distribution of *L. beckii* in citrus orchards and its dependance on microclimatic factors in order to improve its control.

MATERIAL AND METHODS

The study was carried out in a citrus orchard situated in the west part of São Miguel island. The orchard is found in a relatively deep valley, divided into parcels separated by hedges of *Pittosporum undulatum*, in a way that every quadrant of a tree is protected from the wind. Three trees of *Citrus sinensis* cv Valencia late were selected. During two successive years (1995 and 1996), we collected at two-week intervals five leaves per quadrant thus a total of 20 leaves per tree. With the same periodicity, five 10-cm long branches and 5 fruits were also collected on each tree.

Statistical tests were used: analysis of variance (ANOVA) for the significance of the differences between quadrants and trees; whenever these differences were significant, a Scheffé test for independent values and 95 % confidence level was applied, and finally, a t (Student) test for the differences of the distribution on the two surfaces of the leaves and the parts of the fruits.

RESULTS AND DISCUSSION

Lepidosaphes beckii revealed a preference for the upper surface of the leaves. Active parasitoidism and relative mortality showed no significant difference between the two surfaces. Similarly, about 83 % of the individuals were found in the upper part of the fruits. The preference of the population for the upper surface of leaves and fruits is probably due to positive light phototropism of the crawlers. The homogeneous male distribution indicates a difference in behaviour of male and female crawlers.

Distribution, active parasitoidism and relative mortality were homogeneous as well in the four quadrants. The characteristics of the studied orchard, namely the light exposure to wind and the uniformity of insolation, may explain the homogeneous distribution by quadrant. Almost half of the population was found on tree 1, followed by trees 2 and 3. Only the distribution of larvae followed that of the total population decreasing from the first to the third tree. The differences recorded between the trees seem to indicate the influence of microclimatic factors. The higher isolation of the third tree may create conditions similar to an open habitat, with light canopy making abundance severely controlled by adverse climatic cues. Together with higher percentage of parasitoidism, these conditions explain the smaller percentage of population on this tree.

The relative percentage of males and females was [1:2] in trees 1 and 2 and [1:0.7] in tree 3. The proportion of females in the branches was always more than 50 %.

The average density was the highest on leaves (12 scales per leaf). The contamination of fruits is done by the crawling larvae of the first annual generation. As a result, the number of generations developed on the fruits is the same as on leaves. The contamination was maximal at the end of maturation. The smaller contaminated fruits with 1.8-cm diameter was observed on the second half of May 1995 and on the second half of August 1996 when the fruits are 4-cm diameter. About 69 % of the contaminated fruits had at least one scale.

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