

**ECOLOGICAL, BIOLOGICAL, AND SEX
PHEROMONE STUDIES WITH THE OLIVE
LEAFHOPPER, *Docotettix cornutus*; THE OLIVE
WHITEFLY, *Aleurolobus olivinus*; AND THE OLIVE
LEAF Moth, *Palpita unionalis***

By

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THESIS

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**Department of Plant Protection
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Abstract

This work is concerned, mainly, with the ecological, biological and sex pheromone studies of the olive white fly, *Aleurolobus olivinus* (Silvestri) (Homoptera : Aleyrodidae), the olive leafhopper, *Docotettix cornutus* (Ribaut) (Homoptera : Cicadellidae) and the olive leaf moth, *Plapita unionalis* (Hubn.) (Lepidoptera : pyralidae).

Ecological studies :

Survey of olive insect pests : 18 species belonging to 13 families and 4 orders were recorded. Hymenopterans were the most dominant.

Population fluctuation of *A. olivinus* : The pest had 4 and 6 peaks in the 1st and 2nd years, respectively. Also, two species of its associated predators were recorded.

Population fluctuation of the predators, *Acletoxenus formosus* (Loew) (Diptera : Drosophilidae) and *Semidalis aleyrodiformis* (Stephens) (Neuroptera :

Coniopterygidae) : Data indicated that the population of *A. formosus* recorded 3 peaks in the 1st year and 4 in the 2nd year, while *S. aleyrodiformis* had 3 and 4 peaks for the 1st and 2nd years, respectively.

Biological studies :

A. olivinus : The egg incubation period ranged from 13.98 to 8.43 days, at 23 and 28 °C, respectively. The insect has 3 nymphal instars, and the life span of females was longer than that of males.

D. cornutus : The egg incubation period averaged 23.66 days at 31.9°C and 62.9 % RH, and 33.72 days at 28°C and 61.1 % RH. The nymphal stage has 5 instars, the 1st instar has the shortest stadium. The duration of the nymphal stage ranged from 45.10 to 113.93 days.

S. aleyrodiformis : The egg incubation period averaged 9.7 and 3.91 days at 18 and 28°C, respectively. The larval stage has 4 instars, and the life span of females and males were 29.9 and 16.80 days, respectively.

Predation efficiency of *S. aleyrodiformis* : In the laboratory, the number of eggs consumed by the larval stage reached 662.5 and 481.85 eggs at 18 and 28°C. In the field, the predation rate averaged 70.4 and 83.1% of sampled eggs, when 8 pairs per cage were used.

Host preference : Tophahy variety was the preferable variety for the larvae of *P. unionalis* followed by the Agyzy, while the Ballady variety was the least preferable.

Sex pheromone studies :

Identification : GC and GC/MS analysis showed that sex pheromone of *P. unionalis* consists of two main components i.e., E-11-Hexadecenal and E-11-Hexadecenyl acetate; the quantity of pheromone was 6.57 ng

/ female, in addition to a third component, i.e., Z9, E 11-tetradecadienyl acetate, which present in a smaller quantity.

Laboratory studies : Data indicated that the attractiveness of females was affected by age, density in traps and period of the scotophase.

Field studies : The catch of males was affected by design, height and colour of traps, although differences were not significant. Also, under field cages, it was found that methylene chloride was the best solvent for extraction and stability of extract under field conditions. For concentrations, the highest concentration of the crude extract(i.e., 60 female equivalent (60 FE) gave the greatest male catch specially during the 1st and 2nd day of treatment.

Sex pheromone traps in the open field : The highest number of males caught in traps was obtained when 150 FE pheromone extract was used in two locations of El-Fayoum.

Keywords : Ecology - Biology – Sex pheromone – *Docotettix cornutus* – *Aleurolobus olivinus* – *Palpita unionalis*