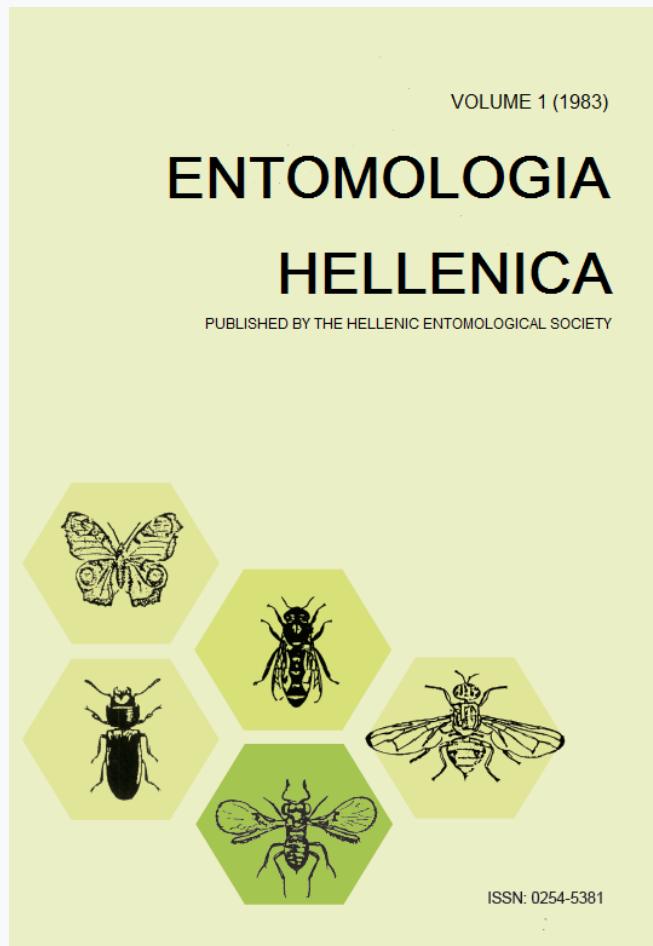


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Catches of Male Olive Moths, *Prays oleae*, in Pheromone Traps in Relation to Numbers of Eggs and Larvae Found in Olive Fruits, in Crete¹

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ABSTRACT

In two groves of the Chania area, male olive moths, *Prays oleae* (Bernard) (Lepidoptera: Hyponomeutidae), caught in pheromone traps and eggs and young larvae in young fruits were counted weekly or daily in May, June and July.

At Mournies, the first rise in the curve of male captures was observed during the last week of May with a maximum on the 18th in 1980 and on the 10th of June in 1981, and the last captures at the end of June-beginning of July. At Chrysopigi, the maximum of captures in 1981 was on the 5th of June.

In all instances the time of maximal moth captures coincided with peaks in oviposition activity, followed after an interval of two weeks by peaks in the number of young larvae found in the fruits.

Introduction

The olive moth, *Prays oleae* (Bernard) (Lepidoptera: Hyponomeutidae), is an important pest of olives in the Mediterranean region. Its attacks during the spring can cause excessive flower drop and during the summer more damage by larval boring in the developing fruits (Pelekassis 1962).

The main pheromone of the olive moth was identified as (Z)-7-tetradecenal (Campion et al. 1978, Campion et al. 1979, Renou et al. 1979) and the use of pheromone trapping may provide the basis for an effective population monitoring destined to time insecticide applications to control the insect. This will only be possible if constant relationships exist between the number of moths caught in pheromone baited traps and the number of eggs and subsequent larvae found in the olive fruits.

In France, Pralavorio and coworkers showed that the numbers of male moths caught in traps baited with virgin female olive moths were related to population density and oviposition activity (Pralavorio et al. 1975, Pralavorio et Arambourg 1977). In Spain, it was also shown that the captures of male moths in the trap were closely related to the flight activity of the female moths (Ramos et al. 1981).

The aim of the present work was to compare the numbers of moths caught in pheromone traps with the numbers of eggs and larvae found in olive fruits, under conditions prevailing in Greece.

Materials and Methods

The experiments were carried out in olive groves of the variety Tsounati, near the villages of Mournies and Chrysopigi in the Chania area of Crete. Ten pheromone traps were installed in each of the two experimental sites which contained about 800 trees. These traps were of the Delta type (Oecos traps)

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having a triangular cross section (8 cm sides) and a length of 18 cm, with the inner basal surface coated with an adhesive. Each trap was baited with a polyethylene vial (32×16×1.5 mm) containing 1 mg of the synthetic sex-pheromone (Z)-7-tetradecenal prepared by the Tropical Products Institute, England. The vials were renewed every four weeks. The traps were hung in the olive trees at a height of about 2 m above ground and 50 m apart.

The experiments in the olive groves near Mournies were conducted during the months of May and June 1980 and 1981. Weekly counts of the male moths captured were made, and on the same day a sample of 200 olive fruits was taken from each of the trees bearing traps. These fruits were examined in the laboratory for the presence of eggs and for young larvae which were found under the calyx or inside the fruits. The experiment in the olive grove near Chrysopigi was conducted only during 1981 and in that site daily counts of traps were made and daily samples of 100 fruits were taken.

Results and Discussion

At Mournies, during the spring of 1980 the first rise in the curve of male captures was observed on the 28th of May with a maximum on the 18th of June. The last few adults were captured on the 2nd of July (Fig. 1). Similarly, in 1981, the first rise in the curve of males captured was observed on the 26th of May with a maximum on the 10th of June and with the last moths caught on the 30th of June (Fig. 2).

This first increase in captured moths could be considered as the beginning of the flight period

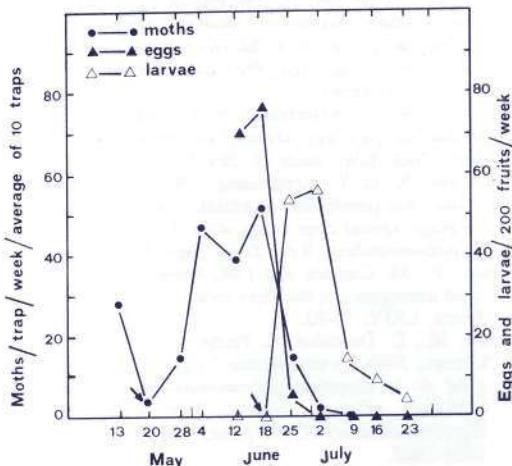


FIG. 1. Weekly catches of male olive moths of the flower-feeding generation in sex pheromone traps and number of eggs and young larvae of the fruit-feeding generation at Mournies in 1980. The arrows show the dates of pheromone evaporator renewal.

of adults of the flower-feeding generation although an overlapping of adults from the leaf and flower-feeding generation was observed in previous experiments in the same general district (Polyrakis unpublished data).

From the weekly samplings of fruits during June 1980 at Mournies, it was observed that the maximum number of eggs was found on the 18th of June, while the maximum number of young larvae was recorded two weeks later (Fig. 1). Similarly in 1981 at Mournies, it was observed that the maximum number of eggs was found on the 10th of June, which coincided with the time of maximum male captures in the pheromone traps. The maximum number of young larvae was again recorded two weeks later (Fig. 2). From the daily counts made at Chrysopigi during June 1981 it was also shown that the maximum number of male captures in the traps coincided with the period of maximum egg-laying, while the majority of young larvae again were recorded two weeks (15 days) later (Fig. 3). Such a time interval between adult captures, eggs and young larvae is in accordance with those reported on an island near Central Greece (Pelekassis 1962).

The appearance of the maximum number of eggs of the olive moth on fruits at approximately the same time with the maximum number of the captured moths in the pheromone traps, confirms the close correlation

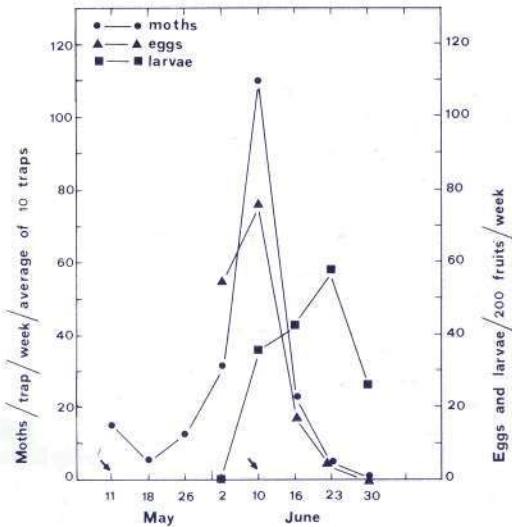


FIG. 2. Weekly catches of male olive moths of the flower-feeding generation in sex pheromone traps and number of eggs and young larvae of the fruit-feeding generation at Mournies in 1981. The arrows show the dates of pheromone evaporator renewal.

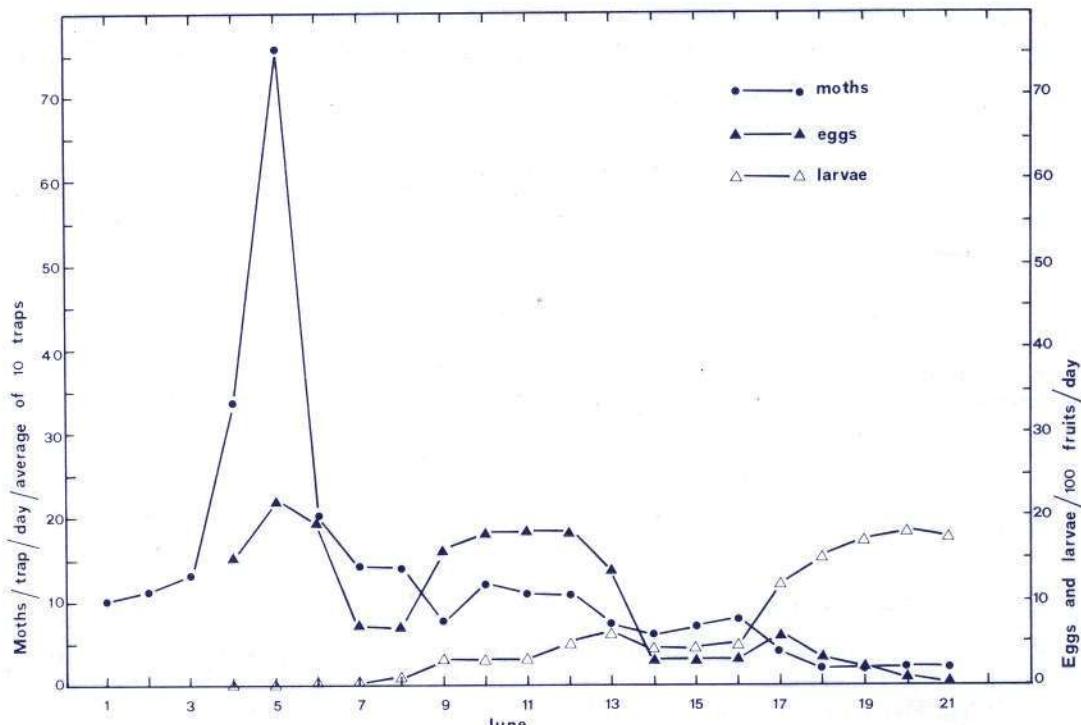


FIG. 3. Daily catches of male olive moths of the flower-feeding generation in sex pheromone traps and number of eggs and young larvae of the fruit-feeding generation at Chrysopigi in 1981.

tion between the emergence of male and female moths reported by Ramos et al. (1981) and the short pre-oviposition time of the females in the field, reported by Pelekassis (1962).

Our data are useful for timing insecticide applications for the control of the olive moth on olives, in Crete.

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KEY WORDS: *Prays oleae*, Olive moth, Pheromone trap, Oviposition period, Olive tree, Olive kernel borer

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Αριθμό Αυγών και Προνυμφών σε Καρπούς Ελιάς, στην Κρήτη**

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ΠΕΡΙΛΗΨΗ

Σε δυό ελαιώνες ποικιλίας «Τσουνάτη» που ευρίσκονται κοντά στα χωριά Μουρνιές και Χρυσοπηγή της λεκάνης των Χανίων στην Κρήτη, μελετήθηκαν οι συλλήψεις αρσενικών του Πυρηνοτρήτη σε παγίδες φερομόνης φύλου το Μάιο, Ιούνιο και Ιούλιο του 1980 και 1981. Παράλληλα με δειγματοληψίες καρπών ελιάς εγένοντο μετρήσεις αυγών και προνυμφών του εντόμου. Οι παρατηρήσεις στις παγίδες και οι δειγματοληψίες στους καρπούς ήσαν εβδομαδιαίες στις Μουρνιές και ημερήσιες στη Χρυσοπηγή. Οι παγίδες ήσαν χάρτινες τριγωνικής διατομής (προσλεύσεως *Oecos* της Αγγλίας) με κόλλα, στη βάση είχαν δε σα δόλωμα την συνθετική φερομόνη φύλου του εντόμου (Z)-7-tetradecenal σε συγκέντρωση 1 mg σε πλαστικό κυλινδρίσκο.

Η πρώτη άνοδος στην καμπύλη των συλλήψεων των αρσενικών στις Μουρνιές παρατηρήθηκε την τελευταία εβδομάδα του Μαΐου, το μέγιστο στις 18 και 10 Ιουνίου του 1980 και 1981, αντίστοιχα, τα δε τελευταία έντομα συνελήφθησαν τέλη Ιουνίου με αρχές Ιουλίου. Το μέγιστο των συλλήψεων στην Χρυσοπηγή το 1981 σημειώθηκε στις 5 Ιουνίου.

Σε όλες τις περιπτώσεις ο χρόνος του μέγιστου των συλλήψεων στις παγίδες φερομόνης συνέπιπτε με το μέγιστο της ωοτοκίας και μετά από χρονικό διάστημα δυό εβδομάδων εμφανίζετο το μέγιστο των νεαρών προνυμφών που ευρίσκοντο στους καρπούς της ελιάς.