

ON THE ECOLOGY OF THE PEACH TWIG BORER,
ANARSIA LINEATELLA (ZELLER) ON APRICOT
TREES AT KALUBIA GOVERNORATE, EGYPT
(LEPIDOPTERA : GELECHIIDAE)

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Abstract

The peach twig borer, *Anarsia lineatella* (Zeller) (Lepidoptera : Gelechiidae) is an economic pest on stone fruits in Egypt. The population fluctuation and rate of larval infestation on twigs and fruits of apricot trees were studied for two successive years starting from September, 1992 to October, 1994 at Kalubia Governorate. Sticky delta traps baited with pheromone was used in this study. Data of pheromone catches indicated that males existed all the year round but frequently fluctuated according to the season of moth activity. During the first season, two remarkable peaks of moth flight were recorded during late September and late May. However, four peaks (during late October, early January, late March and mid June) were noticed during the second season. Two and three main periods of moth activity were approximated in the 1st and 2nd seasons, respectively. Rates of larval infestation were recorded on twigs and on fruits for the 1st and 2nd seasons. From late August to late February, 1st and 2nd instar larvae pass the dormancy period in hibernaculae. It was noticed that almost 50% of larval hibernaculae were empty.

INTRODUCTION

In Egypt, the peach twig borer, *Anarsia lineatella* (Zeller) (Lepidoptera : Gelechiidae) is an important pest on stone fruit trees like peach, apricot, plum, almond and nectarine. Under field conditions, the insect has two overlapping generations

Whenever pre-mature and mature fruits were available, 1000 fruits from each orchard were weekly examined and percentages of larval infestation on fruits were estimated.

Larval dormancy period

During the larval dormancy period (late August to early March of the next year), 50 random branches (about 20 cm long) were collected every two weeks from each of the five orchards. Branches were carefully examined under stereoscopic microscope to determine larval hibernacula, either those contained larvae or empty ones. The mean number of hibernaculae per 100 branches were calculated.

In order to smooth down the frequency distribution curves to an almost normal form, data were cumulated each two successive weeks and 3-reading running means were worked out.

RESULTS AND DISCUSSION

Population Fluctuation of Moths

Figure1 shows mean number of male catches of *A.lineatella* per trap per day (CTD) in apricot orchards at Kalubia Governorate during two successive seasons of moth activity (September 1992 to August 1993 and September 1993 to August 1994).

The data indicated that moths existed in apricot orchards all the season round from early September until late August of the next year. Population density was high for almost nine months (September - mid December (CTD = 1.9 - 6.7 moths) and mid March- mid August (CTD = 2.3 - 6.7 moths). During the remaining three months (mid December to mid March), the population density was markedly reduced (CTD = 0.5 - 1.0 moth).

During the second season, the population density was moderate all over the season round (CTD : 0.9 - 6.2 moths).

Only two peaks of moth activity were noticed during late September (CTD = 6.7 moths) and late May (CTD = 6.7 moths) of the first season. On the other hand, the second season showed four peaks of moth activity; during late October (CTD = 2.8 moths), early January (CTD = 4.1 moths), late March (CTD = 6.2 moths) and mid-June (CTD = 3.1 moths).

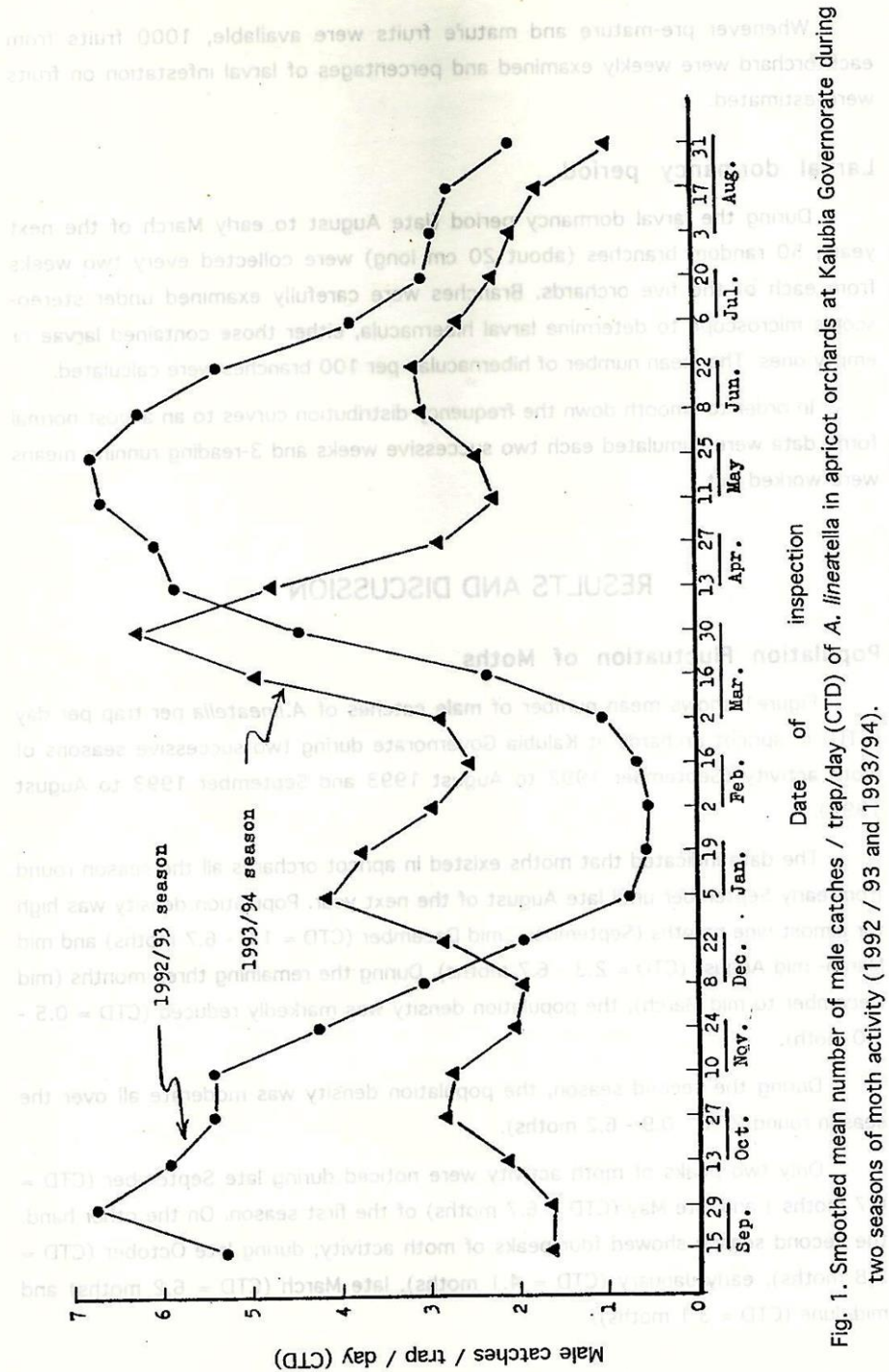


Fig. 1. Smoothed mean number of male catches / trap/day (CTD) of *A. lineatella* in apricot orchards at Kalubia Governorate during two seasons of moth activity (1992 / 93 and 1993/94).

Two apparent periods of moth activity were noticed during the first season; from late July to early January, and from late February to early August. On the other hand, three periods of moth activity were noticed during the second season of moth activity; from early September to late December, from early February to late May and from early April to late August. Moths of the second peak were feeble, smaller in size with scant scales.

These results are in agreement with those mentioned by Roger and Martin (1985) in California and Ahmed and Khadhum (1986) in Iraq who monitored *A.lineatella* moths by sex pheromone in almond and in plum and apricot orchards, respectively. In Egypt, Saafan et al. (1994) mentioned that in North Sinai Governorate, *A.lineatella* moths were recorded in peach orchards most of the year with two peaks of moth activity but disappeared during winter months.

Rate of Larval Infestation on Twigs and Fruits

Larval activity period

The rate of larval infestation with *A.lineatella* on twigs and fruits in apricot orchards was estimated during two seasons of larval activity (March to August for both years). (Fig.2). The earliest larval infestation was noticed on apricot twigs from the 1st week of March, 1993.

On twigs, larval infestation reached its maximum during the 3rd week of April, 1993 (5.2%) and the 4th week of April, 1994 (4.5 %). Infestation declined afterwards reaching its minimum (2.0 %) during the 3rd week of June, 1993 and (1.7%) during the 4th week of June, 1994. Rapid increase of larval infestation was detected from the first week of July, 1993 (12.4%) and the 2nd week of July, 1994 (7.0 %), reaching its maximum during the 3rd week of July, 1993 (23.9%) and the 4th week of July, 1994 (19.4%). Larval attack on twigs had ceased early in August, 1993 and in mid August, 1994.

On fruits, larval infestation was noticed during the fruit pre-mature period from the 2nd week of April, 1994 (2.0 %) and the 3rd week of April, 1993 (3.4%). Infestation increased to reach its maximum on May 11, 1993 (7.7%). Gradual decrease in larval infestation was noticed afterwards as the fruits reached ripening late May to late June (harvesting period). As there were no more fruits during late June, July and mid August, larval infestation was concentrated on apricot seedlings aging one to two years old interplanted with old apricot trees.

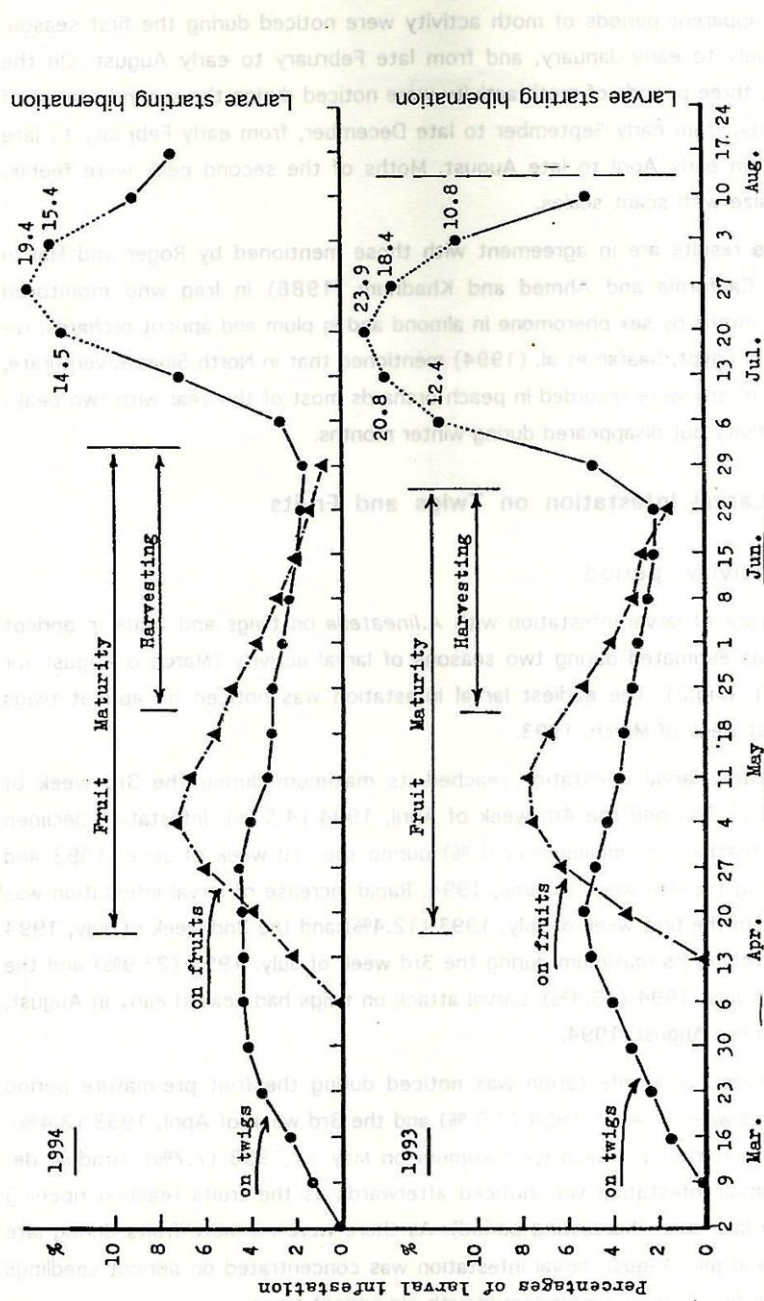


Fig. 2. Percentage of larval infestation with *A. lineatella* on twigs and fruits in apricot orchards at Kalubia Governorate during 1993 and 1994 seasons of larval activity.

At Fayoum Governorate, Saafan (1977) mentioned that larval infestation on apricot trees ranged between 2 and 22% on twigs and between 1 and 12% on fruits.

Larval dormancy period

From late August, larvae of *A.lineatella* enclosed themselves in silken-lined hibernating tube (Hibernacula) and remained in the dormancy stage for about six months (late August to late February). Hibernaculæ were constructed in lateral limbs and base of buds. During the dormancy period, the external parts of hibernaculæ became weathered and difficult to be seen.

Data in Table 1 indicated that during the first season (1992/1993) and the second season (1993/1994), the number of hibernaculæ which contained larvae ranged from 0.8 to 8.8 and from 0.8 to 8.0 hibernaculæ per 100 branches, respectively. The respective number of empty hibernaculæ ranged from 0.8 to 10.4 and from 0.4 to 9.2 hibernaculæ per 100 branches. Those empty hibernaculæ during the period from September to January of the next year may be due to parasitism, predation (Bailey, 1948), unfavourable weather conditions and/ or insecticidal applications. During February empty hibernaculæ may be due to migration of larvae along the limbs and twigs seeking for new vegetative growth of twigs. Based on the total number of larvae that failed to emerge after the dormancy period, about 50% of the larvae had vanished.

This phenomenon can be considered in integrated control programmes of *A.lineatlla* on apricot.

Bagadavadze (1974) found that larvae of *A.lineatlla* hibernate in Georgia, USA from early September to mid March in small silk-lined cells hidden just beneath the bark of small twigs. In North Sinai Governorate, Saafan et al. (1994) mentioned that larvae of *A.lineatella* hibernate from early August to mid February of the next year in hibernaculæ at the base of buds of peach branches.

Table 1. Mean number of hibernaculae of *A.lineatella* larvae on apricot branches at Kalubia Governorate during the two dormancy periods of the two successive seasons (1992 - 1993 and 1993 - 1994).

Date of inspection	Mean no. of hibernaculae / 100 branches					
	1st season			2nd season		
	with larvae	Empty	Total	with larvae	Empty	Total
Aug. 31	0.8	0.0	0.8	0.8	0.0	0.8
Sep.15	1.2	0.0	1.2	0.8	0.4	1.2
29	1.6	0.8	2.4	1.2	0.4	1.6
Oct.13	1.6	1.2	2.8	1.2	0.4	1.6
27	2.0	1.6	3.6	1.2	0.8	2.0
Nov.10	4.0	2.8	6.8	3.2	2.0	5.2
24	6.4	4.8	11.2	5.2	3.2	8.4
Dec. 8	8.8	10.4	19.2	6.8	6.4	13.2
22	7.6	9.2	16.8	8.0	9.2	17.2
Jan. 5	7.2	6.8	14.0	7.6	8.0	15.6
19	6.0	5.2	11.0	5.6	4.4	10.0
Feb. 2	4.4	4.0	8.4	4.0	3.2	7.2
19	1.6	2.8	4.4	2.0	2.8	4.8
Mar.2	0.9	2.8	3.7	0.7	2.6	3.3
Total	54.1	52.4	106.5	48.3	43.8	92.1
Percentages	50.8	49.2	100.0	52.4	47.6	100.0

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دراسات إيكولوجية على ثاقبة براعم الخوخ "الأنارسيا" على أشجار المشمش في محافظة القليوبية - مصر

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تعتبر ثاقبة براعم الخوخ (أنارسيا لينياتيلا) التابعة لرتبة حرشفية الأجنحة - عائلة جليشيدي من الآفات الخطيرة التي تصيب أشجار الفاكهة ذات النواة الحجرية في مصر. أجريت دراسة على تذبذب تعداد الفراشات ونشاطها الموسمي باستخدام المصائد اللاصقة المحتوية على الفرمون الخاص بالحشرة كما قدرت معدلات الإصابة باليرقات على لباليب وثمار أشجار المشمش بمحافظة القليوبية خلال عامين متتاليين من سبتمبر ١٩٩٢ حتى أغسطس ١٩٩٤.

أظهرت قراءات المصائد الفرمونية أن الفراشات تتواجد طوال العام ولكن بأعداد متباينة. أمكن تسجيل قمتان مميزتان لنشاط الفراشات خلال الموسم الأول في أواخر سبتمبر وأواخر مايو إلا أنه خلال الموسم الثاني أمكن تسجيل أربعة قمم لنشاط الفراشات في أواخر أكتوبر ، وأوائل يناير ، وأواخر مارس ، ومنتصف يونيو ولكن بتعداد أقل منه في الموسم الأول. خلال الموسم الأول إتضح أن هناك فترتان أساسيتان لنشاط الفراشات في حين كان هناك ثلاث فترات أساسية في الموسم الثاني . أجرى تقدير معدل الإصابة باليرقات علي لباليب أشجار المشمش حيث تراوحت ١,٣ - ٢٣,٩ % وعلى الثمار ٠,٨ - ٧,٧ % ، ٠,٦ - ٧,٢ % في كل من الموسم الأول والثاني على التوالي . لوحظ أن الحشرة تمضى فترة بيان شتوى على هيئة يرقات في العمر الأول أو الثاني داخل غرف تشتيه من أواخر أغسطس حتى أواخر فبراير من العام التالي ، كما لوحظ أن حوالي ٥٠% من هذه الغرف كانت خالية من اليرقات .