

Activity of Insect Fauna during the Night in the Palm Orchards of Central Iraq

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Abstract: The study was carried out at three palm orchards, each of 2.5 hectare in Al-Madain palm orchards (30 km, South Baghdad) contains the palm varieties (Prem, Osta omran, Zahdi, Berhee, Khadrawi, Khastawi, Oueedi and Tebarzel) in 2010 season aiming to determine the population density of palm borers and to know other insect occurring in date palm orchards. Three light traps with solar energy (Magna Traps with lamps of 320-420 nm wavelength are produced by Russell IPM) were used as one trap in each orchard. The number of fruit stalk borer, *Oryctes elegans* and frond borer, *Phonapate frontalis* adults were calculated per week in each trap aiming to determine the population density of adults in the three orchards under this study. Results of using light traps (Magna Traps) indicated that the number of *O. elegans* adults catch per trap during the period from April to December 2010 were 254, 217 and 240 adult/trap in orchards No. 1, 2 and 3, respectively, the higher population density of frond borer, *Phonapate frontalis* and 81 adult/trap per month, respectively reported in July. Also, the study indicated that the population density of frond borer, *Phonapate frontalis* catch per trap during the period from April to December 2010 were 34, 58 and 54 adult/trap for orchards No. 1, 2 and 3, respectively, the higher population densities were 10, 21 and 15 adult/trap per month, respectively reported in June. Many insect groups were caught in light traps, the insect fauna composed of nineteen insect groups, 12 are coleoptera, 1 hemiptera, 1 hymenoptera, 1 homoptera, 2 dermaptera, and 2 orthoptera, the numbers of this insect were recorded per month a year round in palm orchards.

Key words: Insect, population density, palm, borers, light trap.

1. Introduction

The palm-tree, *Phoenix dactylifera* is the tree most adapted to climatic conditions of mad and south of Iraq, these trees and their fruits subjected to attack by many serious pests causing the considerable loss [1-7]. The fruit (bunches) stalk borer *Oryctes elegans*, palm frond borer *Phonapate frontales* and trunk (stem) borer *Jebusaea hammerschmidti* are from important pests infesting date palm trees in many places of the world and a damaging levels could be found in Iraq and surrounding countries [1, 6, 8-14]. *Oryctes elegans* caused many damages to the bases of fronds and bunches making a long tunnel in the tissue, which is acting as a weakening and breaking factors for these parts. The opened tunnels may be attacked by other insect pests and plant pathogens leading to the complication of the problem [2, 8, 9, 11, 15, 16], that the larvae and adults are feed on heart of palm causing weakness and small size of the palm fruits [13, 17, 18] have been found differences between date palm varieties in degree of sensitivity to infest with *O. elegans*.

Palm frond borer *Phonapate frontales* is one of the important pest infesting date palms in Libya [7, 14]. Three important insects infest affected date palm trees in Qatar, according to their economic importance were red pam weevil *Rhynchphorus ferruginens*, fruit stalk borer *Oryctes elegans* and long horned stem borer *Pseudophilus testaceus* [9]. The most important pests affecting date palm in Kingdom Saudi Arabia and United Arab Emirates have been identified as the red

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palm Weevil *Rhynchphorus ferruginens*, trunk-borer *O. elegans*, stem borer *Jebusaea hammerschmidti* and rhinoceros beetles *Oryctes Agamemnon* [12, 15]. Biological control plays an importance role as a solution responding the economic, sanitary and environmental requirements. The IPM can conserve the biodiversity by natural balance and minimizing and rationalizing to pesticide use [19].

A. Al-Bahi, M. J. Steibaner, et al. [20-23] have pointed to possibility of using light traps in management strategy of insect and date palm pests. This study aims to determine the insect fauna and biodiversity conservation in date palm orchards in Central Iraq.

2. Materials and Methods

The study was carried out at three palm orchards, each of 2.5 hectare in Al-Madain (30 Km South Baghdad) palm orchards contains the palm varieties (Prem, Osta omran, Zahdi, Berhee, Khadrawi, Khastawi, Oueedi and Tebarzel). Three light traps with solar energy (Magna fruit stalks with lamps of 320-420 nm wavelength are produced by Russell IPM) (Fig. 1) were used as one trap in each orchard. The number of economic important pests fruit stalk borer



Fig. 1 Solar insect light traps (Magna Trap, Russell IPM) used to determine the population density of insect in date palm orchards.

Oryctes elegans, frond borer *Phonapate frontales* and others were calculated per week in each trap a year round aiming to determine the population density of this insect in the three orchards under this study.

3. Result and Disccussion

3.1 Population Density of Fruit Stalk Borer Oryctes Elegans

The results presented in Table 1 indicated that the number of O. elegans adults catch per trap during the period from April to December 2010 were 254, 217 and 240 adult/trap, the higher population densities were 87, 79 and 81 adult/trap per month in orchard No. 1, 2 and 3 respectively reported in July. The data showed that the flight activity of the adults started from the beginning of April until October, While the W. A. Kaaka, A. Harib, et al. [18, 24, 25] pointed that adults showed in March till November. Notably a large body of this insect may help on transfer many pathogens among palm trees. The studies in Iraq indicated to isolate many pathogens from Oryctes elegans larvae [26]. This pest was controlled by using chemical pesticide [27, 28], pathogenic nematode [28] and virus [13]. The highest period of adult activity during period of May, June and July, therefore, possibility of application

Table 1The number of oryctes elegans adults caught in lighttraps (Magna Traps) in date palm orchards of south Baghdadduring season 2010.

Maath	Number of Oryctes elegans adults									
Month	Orchard No. 1	Orchards No. 2	No. 2 Orchard No. 3							
January	0	0	0							
February	0	0	0							
March	0	0	0							
April	27	21	23							
May	45	39	38							
June	56	41	56							
July	87	79	81							
August	24	27	31							
September	14	10	11							
October	1	0	0							
November	0	0	0							
December	0	0	0							
Total	254	217	240							

control programs to adults in this period. High efficient of light traps in catch of adults to possibility will be used in IPM programs to this pest.

3.2 Population Density of Frond Borer, Phonapate Frontalis Fahr

The numbers of frond borer, *Phonapate frontalis* Fahr were calculated in weekly and monthly bases during the season 2010. The highest population densities were 10, 21 and 15 adult/trap/month for the orchards No. 1, 2 and 3 respectively with an average of 15 adult per trap/month during in June 2010 as shown in Table 2. The data showed that the highest flight activity of the *P. frontales* in period of May, June and July. Light traps have proven highly efficient in catch of *P. frontales*, therefore, it can be used in IPM programs to this pest for purposes of monitoring and control.

3.3 Palm Stem Borer, Jebusaea Hammerschmidti Reiche

The palm stem borer, *Jebusaea hammerschmidti* Reiche was not recorded in south Baghdad palm orchards with a middle-age tree, but was presented in old trees in palm orchards in North Baghdad and Diwaniyah Region trees.

3.4 Identification of Some Insect Types Caught by Light Traps (Magna Traps) in Date Palm Orchards

The insect caught by light traps were screened and identified by the Iraqi Natural History Museum/University of Baghdad specialist, Dr. Mohammed Saleh Abdul Rassoul. The insect were recorded weekly and monthly (Table 3), and the insect fauna composed of nineteen insect group, 12 are coleoptera, 1 hemiptera, 1 hymenoptera, 2 dermaptera and others as shown in Fig. 2, some of these insects were pests, non pests, natural enemies unknown, this subject needs more studies and contacts with specialized persons or centers. Data showed that it has been found differences between insect groups in the activity period of these insects during the year (Table 3).

The coleopterous insect are important in various-agro-ecosystem, some play in active role as predators or saprophagous insect and others serve as a biological indicators in the place where exist [29].

Table 2Number of *Phonapate frontalis* adults caught in lighttraps (Magna traps) in date palm orchards of South Baghdadduring season 2010.

Month	Number of Phonapate frontalis adults									
Monui	Orchard No. 1	Orchards No. 2	Orchard No. 3							
January	0	0	0							
February	0	0	0							
March	0	0	0							
April	3	4	7							
May	6	5	8							
June	10	21	15							
July	9	19	13							
August	4	7	2							
September	2	2	0							
October	0	0	0							
November	0	0	0							
December	0	0	0							
Total	34	58	45							

Table 3 Some Insect fauna of activity night in date palm orchards of South Baghdad during season 2010.

Insect	Number of insect caught in Light Traps (Magna Traps) per month											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Coleoptera,Scarabaeidae, Oryctes elegans	0	0	0	27	45	56	87	24	14	1	0	0
Coleoptera, Dynastidae Pentodon bispinosas	0	0	0	105	247	509	137	147	69	73	11	0
Coleoptera, Copridae Onitis alexis	0	0	0	19	42	30	6	32	10	6	0	0
Coleoptera, Copridae <i>Onthothagus</i> sp.	0	0	0	1,706	3,737	4,605	2,554	1,296	224	24	0	0

(Table 3	continued)
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T /	Number of insect caught in Light Traps (Magna Traps) per month											
Insect	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Coleoptera, Tenbrionidae Opatroides punctatus	0	0	0	304	607	123	23	39	24	0	0	0
Coleoptera,Bostrychidae Phonopate frontalis	0	0	0	3	36	16	5	4	2	0	0	0
Coleoptera,Rutelidae Anisoplia leacaspis	0	0	0	1	1	131	170	0	0	0	0	0
Coleoptera, Melolonthidae <i>Cyphonoxia praestabilis</i>	0	0	0	1	3	195	170	0	0	0	0	0
Coleoptera,Cicindelidae <i>Cicindela melancholica</i>	0	0	0	0	601	1,179	2,953	291	35	0	0	0
Coleoptera,Carabidae Distichus planus	0	0	0	0	0	81	256	139	5	0	0	0
Coleoptera,Carabidae Chlaenius spoliatus	0	0	0	16	108	276	176	59	17	0	0	0
Hemiptera, Cydnidae <i>Geotomus</i> sp.	0	0	0	0	0	0	0	7,840	9,633	3,722	1,104	0
Hymenoptera,Formicidae Dorylus fulvus	0	0	0	9	56	87	27	3	7	2	5	0
Homoptera,Cicadidae Cicadatra alhageos	0	0	0	0	0	9	4	0	0	0	0	0
Lepidoptera	0	0	0	84	3,988	603	706	46	81	21	44	12
Dermaptera,Forficulidae	0	0	0	16	58	28	8	4	1	0	0	0
Orthoptera,Acrididae, Lacustidea	0	0	0	12	77	77	105	13	2	3	1	0
Orthoptera,Gryllidae, Blattidae	0	0	0	23	75	233	265	285	83	57	13	0
Coleoptera, Cerambycidae		Foundin	north D			:1:4-		h		1-4-1(-1-	1 1 4)

Jebusaea hammerschmidti

Found in north Baghdad and Diwaniyah site orchards but did not calculated (old palm trees)



Fig. 2 Some insect fauna in date palm orchards in central lraq.

4. Conclusion

The activity of coleopteran insect in palm orchards is during the night. A part of these insect causes economically damage (pests) in palm trees, other parts do not cause damage (none pests) and others as natural enemies, from these results the application programs to control these pests will be during at night by using light traps and pathogens against.

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