INSECT DIVERSITY AND INFESTATION ASSESSMENT OF HARVESTED DATE IN EL-BAHRIYA OASES, EGYPT

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INTRODUCTION

El-Bahriya oases lie in the Western Desert of Egypt, 360 kn far from Giza. Date palmsis the major field crop, producing about 43945 ton of tamr (dried dates) annually (F.A.O, 1978). Date palms as well as dates are threatened by the invasion of serveral insect species which reducing the yield of dates (Hussain, 1986; Ali and Hussain, 1995). Different insect pests attacking dates at harvesting time affecting the quality of date yield and this effect may extend to dates in stores until marketing (Altkin, 1963; Hammad *et al.*, 1956; Prevett and Patourel, 1992). This paper sheds light on insect pests attaking dates at harvesting time and their infestation rates at different localities of El- Bahriya oases.

MATERIAL AND METHODS

Insect infestation rates of dates at harvesting time were assessed in El-Bawietti, El-Harra, El-Kubala, El-Zabou and Mandisha localities of El-Bahriya oases. From each locality, 10samples of harvested dates (Saidi variety, semi-dry), 100 fruits each, were chosen at random. Fruits were first visually and externally examined to detect symptoms of insect inestation and then were dissected by a small knife to find out the causal insect species. The number of infested fruits was counted and percent infested dates were calculated. Meanwhile, number of insect havae or adult stages that existing inside fruits were counted and identified. This assessment was carried out for 1997 and 1998 fruiting seasons of date palms in El- Bahriya oasses.

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RESULTS AND DISCUSION

Insect diversity and species composition of stored dates:

Survey of insects infesting stored dates during the period of the present research work (February -June 1997) revealed that insect species prevailing in stores markedly belong to different insect orders and families. As shown in Table (1), nine insect species belonging to 4 families and four orders could be recognized. Order Colepotera is represented by three species followed by order Lepidoptera (3 species), Hymenoptera (2 species) and Hemiptera (one species) .Out of9 insect species, 6 (66.7%) are injurious pests, 2 species are parasites (22.2%) and one species is a predator (11.1 %).

From the previous results it could be concluded that 9 species have been surveyed until now throughout the first year of the present work in El-Bahriya Oases. Lepidopterous species were the most abundant as they constitute 33.3% of the total insect population followed by coleopterous species. This is a preliminary survey and more intensive survey should include in the future several storehouses located and distributed in the different localities of El-Bahriya Oases, ;as we expect more insect species prevailing in storehouses of dates.

TABEL (I)

Survey of insect species infesting stored dates in E.-Bahriya oases, 1997

Insect species	Family	Order	Status	Frequency
Coccotrypes datyliperda F.	Scolytidae	Coleoptera	Pest	++
Oryzaephilus surinamensis L.	Silvanidae	Coleoptera	Pest	+++
Tribolium spp.	Tenebrionidae	Coleoptera	Pest	+
Orius spp.		Hemiptera	Predator	++
Bracon brevicornis Wesmael	Braconidae	Hymenoptera	Parasite	+++
Bracon hepetor Say	Braconidae	Hymenoptera	Parasite	++
Ephestia alidella (Guen)	Phycitae	Lepidoptera	Pest	++
Ephestia cautella (walker)	Phycitae	Lepidoptera	Pest	+++
Plodia interpunctella (Hubn)	Phycitae	Lepidoptera	Pest	++

+: Rare (1-5 insects/trap or fruit), ++: Abunant (5-10 insects /trap or fruit)., +++: Highly abundant (10-25 insects/ trap or fruit).

Assessment of insect infestation of dates at harvest:

Rates of date infestation by insects were estimated at harvest time in different localities of El-Bahriya oases during 1997 & 1998 seasons; these localities were El-Bawietti, El-Harra, El-Agouze El-Zabou El-Kubala and Mandisha. Results (Tables 2 and 3) revealed that Arenipses sabella, Ephestia calidella, Copccotrypes dactylipedra and Carpophuus hemlpterus were responslble of date infestatlon at harvest, however, insect infestation rates greatly váried according to different localities at El- Bahriya oases.

In 1997-season, date infestation ranged between 28% and 46%. The highest percent of date infestation occurred in El-Zabou locality and the lowest in El-Bawietti (Table 2) .Concerning species diversity of responsible insect infestation, *A. sabella* was the least prevailing species and was found only in El-Bawietti (4%) and El-Zabou (2%). The most abundant species was *C. dactylipedra* which caused 10 -19 % date infestation.

In the next season 1998 (Table 3), results on insect infestation of harvested dates were precise than the preceding season since more samples were examined in the different localities under investigation. Date infestation ranged between 8 % and 70.1 % and averaged 69.6%, 1708%, 30%, 18% and 12% in El-Bawietti, El-Harra, El-Kubala, El-Agouz, El-Zabou and Mandisha localities, respectively. These results reveal that percent of infested dates was significantly (P>0.05) higher than in the former season. For all localities inspected, the highest infestation was caused by *C. hemipterus* followed by *E. calidella*, the only exception was observed in El-Zabou locality where date infested by *E. calidella* significantly surpassed that of *C. hemipterus*. The greater date moth, A. sabella was found only in El-Harra, however percent of infested dates did not exceed 1.25 %. Similarly, infestation by *C. dactylipedra* was also very low and recorded in El-Harra and El-Zabou localities where date infestation rates averaged 3.12% and 12.5% respectively. Examination of harvested dates, also invalid infested dates by *Deudorix livia* and infestation rates were 5.37 % , 8.33 % and 3.3 % in El- Harra, El-Zabou and El-Bawietti localities while dates from other localities were free of infestation.

Date infestation by the oases date moth, *Ephestia calidella* is of atmost importance and must be given much consideration since this pest could develop and reproduce in dates under field conditions and in stored dates inside stores (Hussain, 1981, 1986; Aliand Hussain, 1995). The other aforementioned insect pests are mainly field pests infesting dates throughout date-growing season and rarely develop in stores. Infestation by *E. calidella* of harvested dates averaged 5-9% in 1997 while this value ranged between 22.4% and 45% in 1998. Results in Tables (2) and (3) demonstrate the significant increase of date infestation by *E. calidella* in harvested dates from 1997 to

1998 in all inspected localities. Infestation rates were 5%, 8 % and 9% in El-Bawietti, El-Harra, El-Zabou and El-Agouze in 1997–season while these rates significantly increased to become 25.2%, 22.5%, 45%, 26.2% and 25.2% respectively in the harvested dates of the same localities during 1998- season. These differences could be attributed to the high population levels of the considered insect pests in the latter season than in the former one on one hand and variation in climatic factors particularly ambient temperature and relative humidity of the different localities under investigation on the other hand.

TABLE (II)

Percent infested dates at harvesting from different localities of El-Bahariya Oases, 1997.

Locality	Total infestation rate	% infested dates by			
		A. sabella	*C. dactyliperda*	*C. hemipterus*	*E. calidella*
El-Agouz	46	0	24	13	9
	20	0	4	7	9
Average	33	0	14	10	9
El-Harrah	44	0	17	23	4
	45	0	19	14	12
Average	45	0	18	19	8
El-Zabou	49	4	30	74	8
	43	1	8	27	7
Average	46	2	19	17	8
El-Bawietti	26	4	4	5	13
	33	2	4	21	7
	28	7	7	9	5
	25	3	6	9	7
	18	2	5	10	1
	11	2	3	5	1
	31	2	15	10	4
	27	4	5	15	3
	35	7	10	12	6
	36	5	8	20	3
Average	28	4	7	12	5

SUMMARY

Inspection of date fruits at harvest time revealed presence of the insect species: *Arenips* sabella, *Coccotrypes dactyliperda, Carpophilus hemipterus, Deudoris livia and Ephestia calidella.* Insect occurrence and rate of date infestation markedly differed according to locality and insect species. Infestation rates of

TABLE (III)

Insect infestation of harvested dates at El-Bahriya Oases Season 1998.

Locality	Replicates	% insect species					
		Infested dates(%)	*Ephestia hemipterus*	*Charpophilus hemipterus*	*Arenpsis sabella*	*Cocotrypes dactyliperda*	*Decuoris livia*
Ein shoran El-Harrah	1	40	0	40	0	0	0
	2	24	33.3	66.7	0	0	0
	3	16	0	50	0	50	0
	4	20	40	40	20	0	0
Average		25	18.33	49.18	5	12.5	0
Ein Youssef El- Harrah	1	16	0	100	0	0	0
	2	12	0	66.7	0	0	33.3
	3	16	33.3	66.7	0	0	0
	4	8	50	50	0	0	0
Average		13	20.83	70.85	0	0	8.33
Ein Gadid El-Harrah	1	20	20	80	0	0	0
	2	4	10	0	0	0	0
	3	12	0	100	0	0	0
	4	8	0	100	0	0	0
Average		11	30	70	0	0	0
Ein El-Wady El-Harrah	1	20	0	60	0	0	40
	2	32	0	87.5	0	0	12.5
	3	24	50	50	0	0	0
	4	12	33.3	66.7	0	0	0
Average		22	20.83	66.05	0	0	0
El- Kubala	1	28	71.4	28.6	0	0	0
	2	40	10	90	0	0	0
	3	24	33.3	66.7	0	0	0
	4	28	57.1	42.9	0	0	0
Average		30	42.95	57.05	0	0	0
El-Agouze	1	8	0	100	0	0	0
	2	28	71.4	28.6	0	0	0
	3	12	33.3	66.7	0	0	0
	4	8	0	100	0	0	0
Average		14	26.18	73.83	0	0	0
El-Zabou	1	20	80	20	0	0	0
	2	12	66.7	33.3	0	0	0
	3	24	33.3	33.3	0	0	0
	4	16	0	50	0	50	0
Average		18	45	34.15	0	12.5	8.33
Mandisha	1	8	0	100	0	0	0
	2	16	25	75	0	0	0
	3	8	50	50	0	0	0
	4	16	25	75	0	0	0
Average		12	25	75	0	0	0
El-Bawietty	1	70.1	26.5	26.6	2.5	8.0	6.5
	2	68.7	23.8	35.1	0	9.8	0
Average		96.4	25.2	30.9	1.3	8.9	3.3

harvested dates averaged 48.8%, 31.4%, 23.5%, 38%, 32% and 22.5% at El-Bawietti, El-Harra , El-Agopuz , El-Kubala , El-Zabou and Mandisha localities, respectively. For all investigated localities, *C. hemipterus* and E. calidella were dominant in harvested dates while infection with *D. livia* and *A. sabella* was very low. Infestation with *C. hemipterus* ranged between 75% (Mandisha) and 30.9% (El- Bawietti). *E. calidella* infested 45% of harvested dates at El-Zabou and was the lowest (18.3%) in El-Harra.

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