

EFFECT OF MALE TYPE ON FRUIT CHEMICAL PROPERTIES  
IN SOME DATE PALM CULTIVARS

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ABSTRACT

The effect of pollen grains of 16 date palm males, was evaluated and selected, in the Central Region of Saudi Arabia, according to some chemical properties of the fruits of 4 date palm cultivars, namely Seleg, Sakhi, Khudari and Nebut Seif, in 1985 and 1986. The chemical properties which were studied included; moisture, sugars, ash, protein and tannins.

The results of these experiments, revealed that fruit chemical properties were affected differently according to the used males. However, the effect was not similar in both years of the study.

INTRODUCTION

It is well known that type of pollen grains, used in pollination of date palm cvs, has a metaxenic effect on various fruit properties including chemical ones (Nixon, 1926; 1934; 1945 and 1956; Osman *et al.* 1974; Ream, 1974; Whittlesey, 1933; Mahdi, 1969 and Mathew *et al.* 1975). In connection with this criteria, information on the effect of 16 date palm males should be evaluated and selected in the Central Region of Saudi Arabia. Accordingly, this study was carried out in 1985 and 1986 to add more light on the effect of pollen grains of 16 males on some chemical properties of the fruits of 4 date palm cvs, namely, Seleg, Sakhi, Khudari and Nebut Seif.

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MATERIAL AND METHODS

This study was carried out at the College of Agriculture, King Saud University during 1985 and 1986 seasons. Four date palm cultivars were used namely Seleg, Sakhi, Khudari and Nebut Seif. Trees of the four cultivars were similar in vigour and they were in a good physical condition. All trees were subjected to the same cultural practices in both years. Eight bunches of nearly similar size were left on each female tree. These bunches were bagged before opening. The flower strands on each bunch were thinned to 60 strands and were divided into 3 groups, 20 strands each. Each group of strands was pollinated using pollen grains from the different 16 males. The pollen grains of each male were extracted from mature spathes of these males. The strands of each spathe were cut off and spread in a thin layer on paper sheets for 3-4 days till they became dry. Then the pollen grains were separated from the flower parts using fine sieves (40 mesh).

After pollination, strand groups were bagged to prevent contamination with foreign pollen grains. Pollination treatments were replicated 3 times on different trees of each of the 4 female cultivars used.

Pollination was done with small dusters (10 gm/capacity) containing 1 gm of pollen grains of each male used, then the pollinated strands were bagged. All precautionary measures were performed to prevent contamination with foreign pollen grains. The strands of each replicate were unbagged 50 days after pollination, a period enough for fruit setting to be completed.

At harvest time, fruit samples from different pollination treatments were collected for determination of chemical properties. These chemical properties were moisture content, sugars, protein, ash and tannins. Moisture, protein and ash were determined according to the A.O.A.C. methods (1980). Sugars extraction was done with 80% ethyl alcohol. The reducing power of reducing and non-reducing sugars, after hydrolysis with HCl, was determined by Somogyi's micromethod (1952). Tannins content were determined using the method of Indigo Carmine Indicator (A.O.A.C., 1980).

## Effect of male type on date properties.

Date obtained in the present study were statistically analyzed according to the methods described by Snedecor and Cochran (1967).

### RESULTS AND DISCUSSION

The results obtained concerning the effect of different males on moisture; sugars, protein, ash and tannin contents of the fruits of the Seleg, Sakhi, Khudari and Nebut Seif cultivars are presented in Tables (1 to 7).

#### 1. Moisture :

The results showed that in 1985, the interaction between males and females was not significant; on the contrary, this interaction was significant in 1986.

In 1985, it was shown that the highest moisture percentage in the fruit of the rutab (tamar) stage, was noticed when the pollen grains of the Khalas male were used in pollination of the three cultivars under investigation. The least moisture percentage was obtained when Kheskkar male was involved in the pollination. The differences were significant in all the pollination treatments. With respect to the other pollination treatments, the differences were not significant (Table 1).

In 1986, although the F X M interaction was significant, but nevertheless, the differences in moisture percentages, as due to the effect of males, were not significant (Table 1).

#### 2. Sugar Contents :

##### a) Reducing Sugars :

The results showed that F X M interaction was significant in both years (1985 and 1986). On the contrary, male effect was not significant in both years.

In 1985, in the Seleg cultivar, Sakhi, Maktumi and Sefri males had no significant effect on reducing sugars content as compared with most other males. Such contents were 66.88, 65.05 and 64.44 percent, respectively, for the above males (Table 2). In Sakhi cultivar, the percent of reducing sugars

Table (1): Effect of Pollen grains of different males on moisture % of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES																Mean
	Barchi	Succari	Serry	Hebut-Zamal	Monelfi	Shakret El-Qassia	Sefri	Maktumi	Khekkor	Khudari	Khalas	Seleg	Khashram	Dekhaini	Sakhi	Hebut Self	
	1985																
Seleg	15.59	15.58	14.89	16.26	16.42	15.34	14.91	15.60	14.86	13.93	18.21	14.56	17.26	14.84	15.52	16.39	15.64
Sakhi	13.53	13.82	13.00	13.81	14.04	12.60	13.47	13.47	8.64	14.31	14.63	13.91	11.85	14.13	14.42	13.91	13.33
Khudari	15.73	14.87	15.29	14.07	15.18	15.06	15.34	14.30	14.22	14.76	16.12	14.74	14.68	15.06	15.36	15.81	14.99
Mean	14.95	14.76	14.39	14.71	15.21	14.33	14.57	14.46	12.57	14.33	16.37	14.40	14.60	14.68	15.10	15.10	
	1986																
Seleg	12.90	12.67	12.22	12.60	12.18	12.42	12.24	15.02	11.72	12.61	10.30	13.03	11.92	11.43	10.84	12.76	12.30
Sakhi	14.66	14.03	16.87	19.79	16.33	12.72	16.24	13.68	14.91	17.33	16.73	16.98	14.13	20.22	12.18	18.24	15.94
Khudari	15.29	15.52	16.36	15.55	15.42	14.96	15.70	16.10	15.59	15.52	16.55	16.47	16.42	15.29	12.98	17.39	15.74
Hebut-Self	14.45	16.28	17.23	14.65	15.20	--	16.58	18.30	17.00	15.04	14.68	16.45	16.08	16.04	17.60	15.65	16.08
Mean	14.33	14.63	15.67	15.65	14.83	13.37	15.19	15.78	15.54	15.13	14.57	15.72	14.76	15.75	13.40	16.01	

L.S.D. (0.05)	1985	1986
Males (M)	0.94	ns
Females (F)	0.41	0.77
Interaction (M x F)	ns	3.08

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Table (2): Effect of Pollen grains of different males on reducing sugars %<sup>a</sup> of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES																Mean
	Barhi	Succari	Serry	Nobut-Zamel	Monelfi	Shakrat Si-Qassin	Se'ri	Maktumi	Khask'ar	Khudari	Khalee	Seleg	Khushram	Dokhelmi	Sakhl	Nobut Sulf	
	1985																
Seleg	60.82	60.94	54.58	54.64	53.84	51.45	64.44	65.05	55.86	58.79	62.16	56.60	63.21	54.94	66.88	59.54	55.75
Sakhl	46.04	48.29	47.85	47.04	46.31	47.78	47.29	47.78	51.45	40.82	44.84	44.47	49.93	41.65	44.84	43.37	43.36
Khudari	63.42	66.22	59.29	59.09	67.18	66.22	62.63	56.62	58.54	57.36	55.86	60.20	60.76	58.35	56.21	64.68	60.85
Mean	56.77	58.48	53.91	53.59	55.78	55.15	58.12	56.48	55.62	52.36	54.29	53.76	57.97	51.65	55.98	55.86	
	1986																
Seleg	50.18	53.54	48.37	51.02	53.93	42.68	58.98	53.54	48.50	52.51	52.25	46.30	48.11	50.70	52.77	56.65	51.25
Sakhl	33.37	42.68	35.31	37.96	37.36	36.47	39.58	41.90	36.09	37.37	38.26	38.22	34.19	41.56	41.90	42.18	37.93
Khudari	46.56	40.61	48.89	44.82	43.46	55.09	49.66	38.02	48.50	47.59	47.85	47.88	50.73	41.65	50.44	42.68	46.53
Nobut-Sulf	50.18	55.10	54.32	56.68	54.32	--	53.54	55.04	51.99	49.15	51.61	55.87	52.25	55.87	57.42	44.62	53.20
Mean	45.07	47.98	46.72	47.62	47.27	44.75	50.44	47.14	46.27	46.76	45.49	47.07	46.32	47.45	50.63	46.53	

L.S.D. (0.05)

1985

1986

<sup>a</sup>(on fresh weight basis)

Male (M)

ns

ns

Female (F)

1.78

2.03

Interaction (M x F)

7.14

8.13

was significantly higher when Kheskkar pollen grain were used in the pollination than Khudari, Dekheini and Nebut-Seif males, whereas in other pollination treatments, no significant effects were noted. In Khudari cultivar, reducing sugars contents were significantly increased when pollen grains of the Meneifi, Succari and Shakret El-Qassim were used in the treatments (Table 2).

In 1986, F X M was also significant as in 1985. In Seleg cultivar, the percent reducing sugars was significantly higher when Sefri pollen grains were used in the pollination treatment and it exceeded most other males. In Sakhi cultivar, fruit reducing sugars were significantly increased when the pollen grains of the Succari and Nebut-Seif males were used than in the other pollination treatments in which pollen grains of the Barhi, Khalas and Khashram males were used. The differences, as due to the rest of the other males, were not significant. In Khudari cultivar, pollen grains of Shakret El-Qassim induced fruits with significantly higher contents of reducing sugars than in the Succari, Maktumi, Dekheini and Nebut-Seif males. No significant differences were noted in other males. In Nebut-Seif cultivar, reducing sugars were significantly increased, only when pollen grains of the Sakhi male were used in pollination, over than in Nebut-Seif and Khudari males (Table 2).

Regarding fruit reducing sugars in the different cultivars, the results showed that such contents, in 1985 in tamar stage, were generally higher in Khudari, followed by Seleg and Sakhi in a descending order (60.85, 55.75 and 43.36%, respectively). Whereas in 1986, reducing sugars were higher in Nebut Seif, then Seleg, Khudari and Sakhi fruits. Such percentages were 53.20, 51.25, 46.53 and 37.93%, respectively (Table 2).

#### b) Non-reducing Sugars :

The present results showed that fruit non reducing sugars were much lower than reducing sugars. This means that reducing sugars are most dominant in the fruits in the tamar stage in the 4 cultivars.

## Effect of male type on date properties.

In 1985, the F X M interaction was not significant, also male effects were not significant. This means that pollen grains type had no significant effect on the non-reducing sugars content in the fruits of the 4 cultivars (Table 3).

In 1986, F X M interaction was significant and male effects were also significant. In Seleg cultivar, the percent non-reducing sugars were significantly increased in Dekheini male than all other males. In Sakhi cultivar, fruit non-reducing sugars were significantly increased, when pollen grains of Maktumi, Nebut-Seif, Succari and Khalas males were used, than other males. In Khudari cultivar, Maktumi pollen grains produced fruits having significantly higher non-reducing sugars over than that of all other males. In Nebut-Seif cultivar, only 3 males (Seleg, Khalas and Nebut-Seif) produced fruits having significantly higher non-reducing sugars contents than all other males (Table 3).

### c) Total Sugars :

The F X M interaction in 1985, was not significant, whereas male effects were significant. Total sugars contents were significantly higher when pollen grains were Succari (65.99%) and Barhi (65.36%) when used, than of Khashram, (66.95%) and most other males in the 3 cultivars (Table 4).

In 1986, F X M interaction was significant and male effects were not significant.

In Seleg cv, total sugars were significantly higher in Sefri and Nebut-Seif than most other males. In Sakhi cv, Nebut-Seif and Succari pollen grains produced fruits having significantly higher total sugars than most of other males. In Khudari cv, the only male that induced fruits with significantly higher total sugars was Shakret El-Qassim than most of other males used in the pollination experiments. In Nebut-Seif, the total sugars contents of the fruits were significantly increased when pollen grains of Seleg, Sakhi and Nebut Zamel males were used in pollination than some other males (Table 4).

When total sugars were compared between cvs, it was shown that in 1985, Khudari cultivar was the highest in its

Table (3): Effect of Pollen grains of different males on non-reducing sugars\* 2 of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES																
	Barhi	Buccari	Serry	Nebut-Zamel	Menoifi	Shakret El-Qessin	So'ri	Naktimi	Khekkar	Khudari	Thalas	Seleg	Khashram	Dokheini	Sakhi	Nebut Self	Mean
	1985																
Seleg	12.20	5.49	10.61	7.00	11.37	8.91	0.00	3.30	4.72	8.03	6.78	8.31	6.92	9.10	0.84	2.74	6.65
Sakhi	5.33	3.94	3.09	6.51	4.32	0.00	4.34	3.25	0.00	6.72	4.98	2.38	2.68	4.57	0.00	6.71	3.68
Khudari	8.25	13.09	7.09	6.74	7.60	10.15	4.41	16.06	21.31	12.41	15.17	4.12	17.34	9.41	7.61	2.73	10.22
Mean	8.59	7.51	6.93	6.75	7.76	6.35	2.92	7.54	8.68	9.05	8.98	4.94	8.98	7.69	2.82	4.06	
	1986																
Seleg	0.00	0.43	0.00	0.68	0.34	0.95	0.00	0.00	1.78	1.35	0.33	0.00	0.43	3.82	0.00	0.14	0.64
Sakhi	2.41	4.56	0.62	3.06	3.35	1.62	2.69	5.05	0.97	1.82	4.26	3.34	1.49	0.79	0.00	4.94	2.56
Khudari	0.32	2.14	0.43	1.02	0.00	0.00	0.00	5.14	1.18	0.00	0.21	0.00	0.00	0.00	0.00	1.18	0.73
Nebut-Self	0.64	0.15	0.00	0.00	0.00	---	0.31	0.00	0.00	1.84	3.14	3.50	0.00	0.00	0.00	3.12	0.85
Mean	0.86	1.82	0.26	1.19	0.92	0.86	0.75	2.55	0.98	1.25	1.99	1.71	0.48	1.15	0.00	2.35	

L.S.D. (0.05)

1985

1986

\*(on fresh weight basis)

Males (M)

ns

1.16

Females (F)

2.05

0.58

Interaction (M X F)

ns

2.34

1  
2  
3



Table (4): Effect of Pollen grains of different males on total sugars<sup>a</sup> % of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES																Mean
	Barhi	Succari	Sorry	Nebut-Zamel	Nonelfi	Shakrot El-Qasim	Sefri	Maktum	Khashkar	Khudari	Khalee	Seleg	Khashram	Dokhaini	Sakhi	Nebut Self	
	1985																
Seleg	73.02	66.43	65.18	61.64	65.21	60.36	64.44	68.35	60.58	66.83	68.94	64.90	70.13	64.04	67.72	62.27	65.63
Sakhi	51.39	52.23	50.69	53.55	50.62	47.78	50.22	51.03	51.45	47.97	47.79	46.85	52.61	46.25	44.84	50.08	49.83
Khudari	71.67	79.31	67.19	65.83	74.78	76.37	67.03	72.68	80.85	69.77	71.03	64.32	78.10	67.75	63.82	67.45	71.06
Mean	65.36	65.99	61.02	60.34	63.54	67.50	60.56	64.02	64.29	61.52	63.25	58.69	66.95	59.35	58.79	59.63	
	1986																
Seleg	50.18	53.98	48.37	51.70	54.27	43.63	58.98	53.54	50.78	53.52	52.58	46.30	48.43	54.51	52.77	56.79	51.86
Sakhi	35.78	47.34	36.71	41.08	40.71	38.09	42.27	46.95	36.56	39.59	34.52	41.57	35.64	42.15	41.90	47.82	40.54
Khudari	46.88	42.75	49.32	45.84	43.46	55.09	49.66	43.16	48.50	47.59	48.06	47.88	50.73	41.65	50.44	43.86	47.18
Nebut-Self	50.87	55.25	54.32	56.68	54.32	--	53.85	55.09	51.99	50.95	54.75	59.38	52.25	55.87	57.42	47.75	54.05
Mean	45.93	49.83	47.18	48.83	48.19	45.60	51.19	49.69	46.83	47.91	47.48	48.78	46.76	48.55	50.63	49.06	

L.S.D. (0.05)

1985

1986

<sup>a</sup>(on fresh weight basis)

Males (M)

4.98

ns

Females (F)

2.16

1.97

Interaction (M X F)

ns

7.89

total sugar contents (71.06 %), then Seleg (65.63 %) and finally Sakhi (49.83 %).

In 1986, fruit total sugars in the 4 cvs, were as follows in a descending order: Nebut-Seif, Seleg, Khudari, and Sakhi (Table 4).

#### Protein Percentage :

Protein percentage of the fruits, as affected with type of males used in the pollination, is shown in Table (5) for both seasons 1985 and 1986 for the different cvs.

In 1985, the F X M interaction was not significant. The protein percentage of the fruits in the tamar stage was higher when the pollen grains of Nebut Zamel (2.73 %) and Shakret El-Qassim (2.71 %) males were used in the pollination than the other males. The differences were only significant between these males and Barhi (2.53 %) and Nebut Seif (2.34%) males (Table 5).

In 1986, the F X M interaction was significant, but the differences between the effect of the males were not significant (Table 5).

Comparing the percentage of protein contents between the different cultivars, the data in 1985, showed that these readings differed from one cultivar to another and they could be arranged in a descending order as follows : Sakhi, Khudari and Seleg. The percentages of the protein contents in the cultivars were 2.81, 2.84 and 2.43 % respectively, in the above cvs, (Table 5).

In 1986, the cvs, could be arranged in a descending order as follows : Sakhi, Nebut Seif, Khudari and Seleg with 2.90, 2.63, 2.21 and 2.11 %, respectively (Table 5).

#### Ash Percentage :

The interaction between males and females was significant in both years (1985 and 1986).

The effects obtained, due to males in 1985, were not significant. In 1986, the effects were significant. In

Table (5): Effect of Pollen grains of different males on protein<sup>a</sup> % of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES																Mean
	Barhi	Succari	Serry	Nebut-Zamei	Noncifi	Shakret El-Qassim	Sofri	Maktumi	Khaskar	Khudari	Khalas	Seleg	Khasbran	Dakheini	Sakhi	Nebut-Saif	
	1985																
Seleg	2.31	2.39	2.46	2.47	2.50	2.40	2.51	2.56	2.39	2.31	2.37	2.42	2.44	2.41	2.29	2.39	2.43
Sakhi	2.66	2.86	2.98	2.91	2.78	3.01	2.79	2.62	2.72	2.81	3.06	2.73	2.99	2.91	2.68	2.40	2.81
Khudari	2.63	2.59	2.52	2.82	2.68	2.51	2.77	2.69	2.75	2.76	2.63	2.63	2.65	2.62	2.80	2.24	2.64
Mean	2.53	2.61	2.65	2.73	2.65	2.71	2.69	2.62	2.62	2.63	2.69	2.59	2.69	2.65	2.59	2.34	
	1986																
Seleg	2.18	2.22	2.40	2.25	2.38	2.31	1.92	2.05	2.25	1.78	2.09	1.78	1.96	2.57	1.26	2.38	2.11
Sakhi	3.19	2.89	3.02	2.71	2.24	2.84	2.84	2.58	3.24	3.02	2.58	2.67	3.25	2.49	2.84	3.04	2.90
Khudari	2.13	1.96	2.18	2.35	2.58	2.31	1.78	2.18	2.18	2.27	2.18	2.25	2.40	2.11	2.58	1.92	2.21
Nebut-Saif	2.35	2.53	2.58	2.48	2.64	--	2.97	2.58	2.84	2.84	2.51	2.71	2.49	2.75	2.71	3.44	2.63
Mean	2.46	2.40	2.55	2.45	2.71	2.49	2.38	2.35	2.63	2.48	2.34	2.35	2.53	2.48	2.35	2.70	

L.S.D. (0.05)

1985

1986

<sup>a</sup>(on dry weight basis)

Males (M)

0.16

ns

Females (F)

0.07

0.13

Interaction (M X F)

ns

0.53

Effect of male type on date properties.

Seleg cultivar, ash percentage was significantly lower with Shakret El-Qassim (1.61 %) and Nebut-Seif (1.68 %) males as compared with the other males. In Sakhi cultivar, ash percentage was lower in pollination treatment with Khalas (1.82%) and Sakhi (1.89 %) males. In Khudari cultivar, ash percentage was lower when pollen grains of Nebut-Seif (1.84) and Khalas (1.88 %) males were used in the pollination. In Nebut-Seif cultivar, all males produced lower ash values except the Nebut-Seif male, which produced ash percentages significantly higher as compared with most other males used in the pollination treatments.

Comparing ash percentages between different females, regardless of the pollination treatment, Khudari cultivar was significantly lower than the other 2 cultivars. Seleg cultivar followed Khudari cultivar in ash percentage, then finally, Sakhi cultivar (which was significantly higher than the other two cultivars). In 1986, Seleg cultivar was lower in ash percentage than the other three cultivars, Nebut-Seif, Khudari and Sakhi, in an ascending order (Table 6).

#### Tannins :

The results concerning tannins showed that the F X M interaction, in addition to the males effect, were significant in 1985. These results hold true in 1986.

In 1985, in Seleg cultivar, pollen grains of Succari, Shakret El-Qassim, Sefri, Maktumi and Sakhi significantly reduced fruit tannins lower than the other males. In Sakhi cultivar, Succari, Barhi and Nebut Seif males decreased significantly fruit tannins over most other males. In Khudari cultivar, fruit tannins were significantly decreased with the pollen grains of Dekheini and Shakret El-Qassim males lower than most other males (Table 7).

In 1986, in Seleg cultivar, fruit tannins were reduced with pollen grains of Maktumi, Shakret El-Qassim, Khashkar and Khudari males. In Sakhi cultivar, Succari, Barhi, Khudari, Seleg and Nebut-Seif males reduced fruit tannins than most other males. In Khudari cultivar, fruit tannins were almost nil with pollen grains of Sakhi male. The differences, as compared with most other males, were statistically

Table (6): Effect of Pollen grains of different males on ash% of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES																
	Barhi	Succari	Ferry	Nebut-Zamel	Menelfi	Shakret El-Qasim	Sofri	Maktumi	Khasakar	Khudari	Khais	Seleg	Khashras	Dokhaini	Sakhi	Nebut Self	Mean
	1985																
Seleg	1.99	1.94	1.94	1.95	1.89	1.92	1.86	1.89	2.01	1.97	1.92	1.99	1.92	1.96	2.09	2.08	1.96
Sakhi	2.06	2.01	1.90	2.00	2.04	2.02	2.26	1.95	1.98	2.00	1.98	1.88	1.96	2.10	2.15	2.12	2.03
Khudari	1.91	1.95	1.95	1.98	1.92	1.88	1.93	1.98	--	2.01	1.61	1.99	1.88	2.00	1.87	1.94	1.92
Mean	1.99	1.97	1.94	1.98	1.95	1.94	2.02	1.94	2.00	1.99	1.84	1.95	1.92	2.02	2.04	2.05	
	1986																
Seleg	1.79	1.80	1.94	1.95	1.94	1.61	1.95	1.70	1.84	1.85	1.81	1.91	1.84	1.87	1.74	1.68	1.83
Sakhi	2.11	2.06	1.94	2.03	1.94	1.97	2.20	1.99	2.22	1.97	1.82	2.08	1.94	1.91	1.89	2.03	2.01
Khudari	2.07	2.06	1.97	1.96	2.12	2.09	1.93	1.82	2.18	1.97	1.88	2.04	2.18	1.90	1.95	1.84	2.00
Nebut-Self	1.85	2.00	2.07	1.90	1.88	--	1.85	2.03	1.90	1.97	1.79	1.92	1.99	1.85	1.96	2.17	1.94
Mean	1.96	1.98	1.98	1.96	1.97	1.89	1.98	1.89	2.04	1.94	1.83	1.99	1.99	1.88	1.89	1.93	

L.S.D. (0.05)

1985

1986

\*(on dry weight basis)

Males (M)

na

0.09

Females (F)

0.04

0.04

Interaction (M X F)

0.04

0.17

Table (7): Effect of Pollen grains of different males on tannin<sup>a</sup> % of the fruits (Tamar stage) of some date palm cultivars in 1985 and 1986.

Cultivar	MALES															Mean	
	Borhi	Succari	Berry	Nebut-2amri	Mansifi	Shatrol El-Qasim	Safri	Maktumi	Khoskar	Khudari	Khalis	Seleg	Khashram	Dakhalni	Sakhi		Nebut Self
	1985																
Seleg	0.84	0.23	0.56	0.47	0.70	0.23	0.28	0.28	0.75	0.91	0.47	0.33	0.47	0.49	0.28	0.77	0.50
Sakhi	0.07	0.00	0.47	0.51	0.38	0.42	0.28	0.30	0.14	0.14	0.23	0.42	0.56	0.49	0.19	0.09	0.31
Khudari	1.05	0.35	0.30	0.61	0.33	0.69	0.14	0.14	0.23	0.28	0.33	0.56	0.37	0.07	0.19	0.37	0.34
Mean	0.65	0.19	0.44	0.53	0.47	0.25	0.22	0.24	0.44	0.44	0.34	0.44	0.47	0.35	0.22	0.41	
	1986																
Seleg	0.42	0.98	0.19	0.70	0.63	0.28	0.56	0.14	0.28	0.28	0.56	0.61	0.98	0.77	0.70	1.12	0.62
Sakhi	0.05	0.00	0.70	0.51	0.28	1.12	0.70	0.56	0.42	0.05	0.35	0.07	0.56	0.51	0.28	0.07	0.39
Khudari	0.33	0.42	0.37	0.56	0.21	0.28	0.14	0.14	0.35	0.21	0.49	0.56	0.51	0.23	0.00	0.56	0.34
Nebut-Self	0.19	0.28	0.70	0.61	0.91	0.14	0.42	0.00	--	0.56	0.42	0.14	0.35	0.61	0.00	--	0.38
Mean	0.25	0.42	0.67	0.60	.51	0.46	0.46	0.21	0.35	0.28	0.46	0.35	0.60	0.53	0.25	0.58	

L.S.D. (0.05)

1985

1986

<sup>a</sup>(on dry weight basis)

Males (M)

0.18

0.18

Females (F)

0.08

0.09

Interaction (M X F)

0.32

0.37

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## Effect of male type on date properties.

significant. In Nebut Seif cultivar, pollen grains of Mak-tumi and Sakhi males reduced fruit tannins lower than most other males (Table 7).

Fruit tannins of the 3 cultivars in 1985, were decreased, progressively in Seleg (0.50 %), Khudari (0.34 %) and Sakhi (0.31 %), whereas in 1986, the order was Seleg (0.62 %), Sakhi (0.39 %), Nebut-Seif (0.38 %) and Khudari (0.34 %), Table (7).

The results of these foregoing experiments showed that fruit chemical properties were found to be affected differently with males and that this effect was not similar in both years of the experiment. These differences could be due to the effect of male type, but this effect was modified with the environmental conditions. The fact that date palms are alternate bearers might add to the inconsistency of results in both years. In this respect, Ream (1976) reported that variation in the effect of pollen on the time of ripening was as great within inbred lines as between different inbred lines.

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تأثير نوع الذكر على الصفات الكيميائية للثمار في بعض  
اصناف نخيل البلح

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درس تأثير حبوب لقاح 16 ذكراً مختلفاً من ذكور نخيل البلح  
التي اجري تقييمها واختابها في المنطقة الوسطى بالمملكة العربية  
السعودية على اساس الصفات الكيميائية للثمار في اربعة اصناف وهي :  
السلج ، الصقعي ، الخضري والنبوت سيف ، وقد اشتملت الصفات الكيميائية  
على الرطوبة ، السكريات ، البروتين ، الرماد ، والتانينات .

وقد اوضحت النتائج المتحصل عليها في هذه التجارب ان الصفات  
الكيميائية للثمار قد تأثرت بنوع الذكر المستخدم الا ان هذا التأثير  
لم يكن متماثلاً خلال سنتي الدراسة .