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**USING OF SOME BIOLOGICAL DISINFECTANTS ON STONE FRUITS  
TO IMPROVE AND MAINTAIN POSTHARVEST FRUIT QUALITY  
BY**

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**ABSTRACT**

This experiment was carried out during the seasons of 2003 and 2004 Meet Ghamr Peach fruits were picked from elected farm at El- Dakahlia Governorate while Canino Apricot fruits were brought from a private farm at Nubaria region.

Fruits were sorted then treated by soaking in some essential oils as biological solutions jasmine oil at a concentration of 0.25% and orange oil at a concentration of 0.2%, and hydrogen peroxide (5%) for 5-7 minutes, beside the control (untreated fruits). Fruits were packed in plastic bags with holes (of P.E low density), 15 fruits in every bag. Bags were placed in carton boxes and kept in cold storage at 0 C and R.H 90-95%.

Fruits samples were investigated weekly and physical and chemical quality criteria were estimated.

The results showed that soaking Peach and Apricot fruits in jasmine oil solution 0.25% led to a decrease in decay rots and maintained quality and firmness. Orange oil gave similar but less pronounced results compared with control.

Results also indicated that the best treatments are fruit dipping in jasmine oil or Orange oil solution 0.25% for 5-7 minutes. Weight loss and decay rates decreased significantly and this was reflected as an increase in the shelf life of treated fruits.

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**Key words:** Stone fruits-soaking in essential oils-cold storage life

**INTRODUCTION**

Stone fruits as Peaches and Apricots are very tasty and appreciated by the consumers for their good flavor and nutritious value

Egypt produced about 302.667 tons of peach and 79000 of apricots in 2003 according to the Ministry of Agriculture Statistics Peaches and Apricots, among other crops, incurred considerable losses after harvest (Lyen *et al.* 1993).

due to several factors (picking at wrong time, rough handling ..... etc). Picking of peaches should be done at the threshold of ripening (Patte 1985), to enhance accumulation of sugars, aroma substances in fruits and to decrease flesh firmness in the same time.

If good handling precautions are not taken to keep fruits in good sanitary state, they will suffer from rotting caused by several decay organisms (see Shewfelt *et al.*, 1987; Johnson *et al.*, 1989).

Stone fruits are prone to serious post harvest fungal decay as blue mold, grey mold rots, *Rhizopus* rot and internal brown rot (*Monilinia Fructicola*). Fungal growth is stimulated when fruits are subjected to bruises, injuries, compressions after exceeding convenient picking maturity phase.

Many methods were used to ameliorate fruit sanitary state and to disinfect its surface, in order to increase its shelf life. Using fungicides is a current practice (Sommer, 1982). Controlled Atmosphere (C.A) storage retarded color changes of apricots and suppressed decay development (Jeffrey *et al.*, 1982). Other (C.A) works were achieved for peach storage. Using of fungicides is not recommended in the actual area of globalization and rigorous inspection of chemical residues on fresh fruits, which is observed every where, in the mean time controlled atmosphere storage is very costly and not effective due to its mixed results and short period of use.

Many promising natural substances are used actually to combat microbial infection, and prolong shelf life.

Essential oils are used, when applied on plants, to resist fungal and bacterial attacks (Wilson *et al.*, 1997) research work done by Bislop *et al.*, 1998 and Wilson *et al.* (1997), prove the validity of this use.

Jasmine oil as one of these essential oils is effective in this respect. It contains two useful components, Methyl Jasmonate and Jasmonic acid which act as fungicide and insect repellent, (Takeuchi *et al.*, 1997, Sabelis 2001 and Zhinong 2002), in addition to other useful effects as promoting vegetative growth (Vick *et al.* 1984), Shiozaki *et al.* (1998) and Condo *et al.* (2001).

This research aims to test the use of some essential oils (orange, Jasmine) and Hydrogen peroxide as fruit surface disinfection agents in order to prolong peach and apricot shelf life, and reduce marketing losses

## MATERIALS AND METHODS

Fruits of peach variety (Meet Ghamr) were picked from an orchard at El Dakahlia governorate at August in both seasons of 2003, 2004. Fruits were at the stage of physiological maturity. Fruits of Apricot, variety (Canino) were picked from an orchard at Nubaria. in July. Fruits were firm and yellow in color After

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delivery to the laboratory they were sorted and samples of both peach and apricots (30 fruits each) were treated by essential oils. All essential oils were purchased from Arco Company. After dipping in each essential oil solution for 30 minutes, fruits were washed by water and left to dry. Then fruits were packed, each 5 – 6 fruits in plastic sachets provided with 10 – 15 holes (2mm diam.) and packed in carton boxes (3kg) then placed in cold storage at 0°C for 4 weeks.

### **Treatments in details:-**

- 1- Control: - Tap water.
- 2- Ordinary jasmine oil solution at a concentration of 0.025% (1.5 cm<sup>3</sup> /4 liters of waters).
- 3- Orange oil solution at a concentration of 0.02%.
- 4- Hydrogen peroxide, a solution of 5 %.
- 5- Activated jasmine oil solution, at PH of 3.2 (called biological treatment).

### **Quality parameters:-**

#### **1- Weight loss:-**

All fruits were weighed after removal from storage and weight loss was recorded.

#### **2-Percentage of decayed fruits:-**

For each treatment and by the end of cold storage, the number of decayed, or diseased fruits by internal browning or external lesions of *Rhizopus* or other fungal signs, were calculated and its percentage was recorded

#### **3(a)-Firmness: -**

Peach or apricot firmness was measured by a hand penetrometer and expressed by LP / in<sup>2</sup>.

#### **3(b)Texture:-**

Fruit texture was estimated by Lfra texture analyzer using a penetrating needle of 1mm of diameter, 5mm in distance, speed 2 mm/sec and the peak of resistance was recorded per gram McGuire 1992, Vass 1992.

#### **4-Color: -**

Peel color was estimated by a hunter colorimeter, Model DP 9000 using both color criteria "a" and "b" measured by the instrument to evaluate and compare fruits color.

#### **5-Total soluble solids (T.S.S):-**

Percentage of T.S.S in fruit pulp was evaluated by using Carl -zeiss hand refractometer

#### **6-Acidity: -**

Percentage of acidity in fruit pulp juice was estimated by titration with 0.1 N solutions of Na OH. according A.O.A.C (1990)

**7-Organoleptic quality: -**

A test of eating quality at the end of storage was carried out and scales of 4 grades were divided: Excellent – good – acceptable – un acceptable. The judgment was taken by a panel of 3 experienced persons.

**Statistical analysis:-**

The statistical analysis of the obtained data were carried out according to Snedecor and Cochran (1990)

**RESULTS AND DISCUSSION****1- Weight loss%:-**

It's shown in Table (1) for Meet Ghamr Peach fruits after 4 weeks in cold storage that control fruits generally had the highest weight loss compared to other treatments in both seasons (6.5% 1<sup>st</sup> season and 6.9% in the second). The range of weight loss of all treatments was relatively narrow, from 4.3% to 6.5% in the first year and from 5.3% to 6.9% at the 2<sup>nd</sup> year. Fruits treated by jasmine oil had the lowest weight loss in both years.

Data in Table (1 A) showed that for Canino Apricot fruits jasmine oil and orange oil showed the least weight loss (4.09, 3%) Compared to control (6.11%). This is in harmony with peach data in the 1st season. The same trend was observed at the 2<sup>nd</sup> season.

**Table (1): Effect of post-harvest treatments on weight loss % of Meet Ghamr Peach fruits under cold storage (0°C) during seasons 2003 & 2004**

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological*	Means
<b>Storage per weeks</b>	<b>First Season</b>					
0	0.00	0.00	0.00	0.00	0.00	0.00
1	2.32	1.62	1.80	2.17	2.27	2.03
2	2.75	1.93	1.96	2.63	2.72	2.40
3	3.57	2.48	2.53	3.17	3.54	3.06
4	6.54	4.28	5.23	6.07	6.22	5.67
<b>Means</b>	<b>3.04</b>	<b>2.06</b>	<b>2.31</b>	<b>2.81</b>	<b>2.95</b>	<b>2.63</b>
<b>L.S.D 5%</b>						
<b>Properties Value</b>	<b>Treatments: 0.3155</b>	<b>Storage period: 0.3155</b>		<b>Interactions: 0.7054</b>		
	<b>Second season</b>					
0	0.00	0.00	0.00	0.00	0.00	0.00
1	2.80	1.73	1.83	1.97	2.43	2.15
2	3.04	2.15	2.47	2.83	2.90	2.68
3	3.95	2.92	3.13	3.60	3.87	3.49
4	6.85	5.28	6.49	6.37	6.32	6.26
<b>Means</b>	<b>3.33</b>	<b>2.42</b>	<b>2.78</b>	<b>2.95</b>	<b>3.10</b>	<b>2.92</b>
<b>L.S.D 5%</b>						
<b>Properties Value</b>	<b>Treatments: 0.4213</b>	<b>Storage period: 0.4213</b>		<b>Interactions: No</b>		

\*Biological treatment: activated Jasmine oil solution .

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**Table (1a): Effect of post harvest treatments on Weight loss (%) of "canino" apricot fruit after cold storage (0°C) during seasons 2003 & 2004.**

Treatments	Control	jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological*	Means
<b>Storage per weeks</b>	<b>First season</b>					
0	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
1	0.31	0.00	1.18	0.14	0.14	<b>0.35</b>
2	2.65	1.90	1.27	1.80	2.63	<b>2.05</b>
3	6.19	2.67	4.02	4.80	4.46	<b>4.43</b>
4	6.11	4.09	3.00	4.77	5.75	<b>4.74</b>
<b>Means</b>	<b>3.05</b>	<b>1.73</b>	<b>1.89</b>	<b>2.30</b>	<b>2.60</b>	<b>2.31</b>
<b>L.S.D. 5%</b>	<b>Factor Value</b>	<b>P.T. (1)</b>	<b>S.P. (b)</b>	<b>A*B</b>		
		0.615	0.615	1.376		
	<b>Second season</b>					
0	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
1	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
2	3.87	2.13	1.43	2.97	2.00	<b>2.48</b>
3	6.40	2.90	4.40	4.43	5.67	<b>4.76</b>
4	8.00	4.17	3.63	5.73	5.23	<b>5.35</b>
<b>Means</b>	<b>3.65</b>	<b>1.84</b>	<b>1.89</b>	<b>2.63</b>	<b>2.58</b>	<b>2.52</b>
<b>L.S.D. 5%</b>	<b>Factor Value</b>	<b>P.T. (1)</b>	<b>S.P. (b)</b>	<b>A*B</b>		
		0.4181	0.4181	0.9349		

\*Biological treatment: activated Jasmine oil solution.

**2- Decay percentage:-**

For the Extent of fungal attack and internal browning, Table (2) show that Meet Ghanr Peach fruits after four weeks in cold storage, control fruits had the highest decayed fruit percentage in both seasons significantly (25.7% and 29.1% at 1<sup>st</sup> and 2<sup>nd</sup> seasons consequently), while jasmine oil treated fruits had the lowest decay percentage (10.7% and 15.5% in these two seasons), followed by orange oil treatment, while fruits of treated with biological treatment had a higher percentage of decay in both seasons 21.4% and 24.9% respectively, but significantly less than control fruits.

These results are in total accordance with the report of Michael *et al.*, (1992) about the positive effect of jasmine oil components (methyl jasmonate and jasmonic acid) in preventing molds growth in many fruits.

This is also supported by the results of El Shahat (1998) and Bishop *et al.*, 2000.

Data of Table (2 A) showed that, for Canino apricot fruits treated with jasmine oil and orange oil had the least decay percentages (0.0%) in the 1<sup>st</sup> season. At the 2<sup>nd</sup> season jasmine oil treatment had also the least decay percentage (0.7%).

Table (2): Effect of post-harvest treatments on Decay (%) of Meert t Ghamr peach fruits under cold storage (0°C) during seasons 2003 &amp; 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00
3	18.07	8.40	16.01	16.24	19.52	15.65
4	25.72	10.71	15.74	18.79	21.35	18.46
Means	8.76	3.82	6.35	7.01	8.17	6.82
L.S.D 5% Properties Value	Treatments: 1.157	Storage period: 1.157	Interactions: 2.588			
Storage per weeks	Second season					
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00
3	26.46	12.27	14.67	16.31	21.88	18.32
4	29.18	15.53	18.21	22.93	24.92	22.16
Means	11.13	5.56	6.58	7.85	9.36	8.09
L.S.D 5% Properties Value	Treatments: 1.985	Storage period: 1.985	Interactions: 4.438			

\*Biological treatment: activated Jasmine oil solution.

Table (2a): Effect of post harvest treatments on Decay (%) of "canino" apricot fruit after cold storage (0°C) during seasons 2003 &amp; 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.33	0.83	0.43
4	2.17	0.00	0.00	0.83	1.67	0.93
Means	0.63	0.00	0.00	0.23	0.50	0.27
L.S.D. 5% Factor Value	P.T. (1) 0.342	S.P. (b) 0.342	A*B 0.3764			
Storage per weeks	Second season					
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.10	0.00	0.00	0.00	0.37	0.09
2	0.70	0.13	0.13	0.27	1.00	0.45
3	1.37	0.17	0.20	0.70	0.83	0.65
4	3.07	0.73	1.50	2.13	2.53	1.99
Means	1.05	0.21	0.37	0.62	0.95	0.64
L.S.D. 5% Factor Value	P.T. (1) 0.3656	S.P. (b) 0.3656	A*B NO.S			

\*Biological treatment: activated Jasmine oil solution.

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### 3(a, b) Firmness, Texture:-

Flesh firmness values of Meet Ghamr peach fruits reported in Table (3) were the highest for jasmine oil treated fruits in both seasons after 4 weeks of cold storage (6.5 lb / in<sup>2</sup> in 1<sup>st</sup> season and 5.6 in second season), followed by orange oil treated fruits. In all cases peach flesh softened quickly as it advances slowly in ripening in cold storage and the control had the softest flesh (4.1 and 3.5 lb / in<sup>2</sup>, at 1<sup>st</sup> and 2<sup>nd</sup> seasons respectively), while biological and H<sub>2</sub>O<sub>2</sub> treatments were not effective as jasmine oil in slowing ripening. These results agree with F. Schroder report (1998) in attributing a delayed maturity effect to the jasmine oil components, when applied on fruits. In the 2<sup>nd</sup> season the same trend was observed.

Data shown in Table (3 A) for Canino Apricot fruits displayed that jasmine oil, and orange oil treated fruits had the highest firmness (33.05 and 29.5) compared to less firm control fruits (31.8, 20.0%) which indicated that ripening are slowed by these treatments.

As for apricot fruits firmness was taken as a texture measurement using internal infra texture analyzer and item form table that

**Table (3): Effect of post- harvest treatments on firmness of Meet Ghamr peach fruits under cold storage (0°C) during seasons 2003 & 2004.**

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
<b>Storage per weeks</b>	<b>First season</b>					
0	9.00	9.00	9.00	9.00	9.00	9.00
1	8.27	8.53	8.30	8.13	8.30	8.31
2	6.67	8.20	7.40	6.63	6.57	7.09
3	4.97	7.00	6.40	5.63	5.00	5.80
4	4.07	6.50	5.30	4.30	4.27	4.89
<b>Means</b>	<b>6.59</b>	<b>7.85</b>	<b>7.28</b>	<b>6.74</b>	<b>6.63</b>	<b>7.02</b>
<b>L.S.D 5% Properties Value</b>	<b>Treatments: 0.3667</b>	<b>Storage period: 0.3667</b>		<b>Interactions: 0.82</b>		
	<b>Second season</b>					
0	7.85	7.85	7.85	7.85	7.85	7.85
1	6.93	7.50	7.10	6.83	6.53	6.98
2	5.27	7.28	6.17	6.07	5.53	6.06
3	4.17	6.23	4.92	4.50	4.27	4.82
4	3.50	5.65	4.04	3.77	3.53	4.10
<b>Means</b>	<b>5.54</b>	<b>6.90</b>	<b>6.02</b>	<b>5.80</b>	<b>5.54</b>	<b>5.96</b>
<b>L.S.D 5% Properties Value</b>	<b>Treatments: 0.336</b>	<b>Storage period: 0.336</b>		<b>Interactions: 0.7515</b>		

\*Biological treatment: activated Jasmine oil solution .

**Table (3a): Effect of post harvest treatments on texture at (5mm) of "canino" apricot fruit after cold storage (0°C) during seasons 2003 & 2004**

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
<b>Storage per weeks</b>	<b>First season</b>					
0	60.22	60.22	60.22	60.22	60.22	60.22
1	46.44	54.78	55.44	55.66	58.08	54.08
2	41.77	45.11	45.27	46.29	43.22	44.33
3	35.41	38.00	39.55	38.22	35.66	37.37
4	31.84	33.05	29.50	25.19	26.92	29.30
<b>Means</b>	<b>43.14</b>	<b>46.23</b>	<b>46.00</b>	<b>45.12</b>	<b>44.82</b>	<b>45.06</b>
<b>L.S.D. 5%</b>	<b>Factor Value</b>	<b>P.T. (1) NO.S</b>	<b>S.P. (b) 3.477</b>	<b>A*B NO.S</b>		
				<b>Second season</b>		
0	61.67	61.67	61.67	61.67	61.67	61.67
1	53.44	52.67	50.33	52.00	48.33	51.36
2	44.00	44.67	44.67	47.00	41.67	44.40
3	36.67	39.67	42.00	38.33	36.33	38.60
4	20.00	32.67	28.00	23.00	32.00	27.13
<b>Means</b>	<b>43.16</b>	<b>46.27</b>	<b>45.33</b>	<b>44.40</b>	<b>44.00</b>	<b>44.63</b>
<b>L.S.D. 5%</b>	<b>Factor Value</b>	<b>P.T. (1) 2.726</b>	<b>S.P. (b) 2.726</b>	<b>A*B 6.094</b>		

\*Biological treatment: activated Jasmine oil solution.

#### 4- Color evolution:-

As shown in Table (4, 5) for Meet Ghamr Peach fruits, increasing "a" values indicate a rapid change towards red color, while "b" increasing values indicates a turn towards more yellowness. It is shown on data of "a" and "b" representing the color criteria, given by Hunter tristimulus colorimeter, that fruits treated by jasmine oil and by biological treatment had the least notes of "a" value in both seasons among all other treatments (13.2 and 12.6 at the 1<sup>st</sup> season compared to 16.9 for control at first season, and 11.2 and 10.8 at the 2<sup>nd</sup> season compared to 14 for control).

It's evident that these above mentioned treatments were effective in delaying ripening as expressed by color values. Table (6 A) after four weeks of storage Canino apricot fruits, indicated that jasmine treated fruits are greenish in color by a\* value (8.3) compared to other treatments and control in the 1st season. In the 2<sup>nd</sup> season and this treatment resulted also in greenish fruits (a = 8.6) compared to less greenish in control fruits.



Table (4): Effect of post- harvest treatments on color a\*value of Meett Ghamr peach under cold storage (0°C) during seasons 2003 & 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	5.84	5.84	5.84	5.84	5.84	5.84
1	11.55	9.73	10.54	7.93	7.83	9.52
2	12.71	11.44	11.78	10.11	10.07	11.22
3	15.86	11.92	12.40	12.05	11.64	12.77
4	16.95	13.21	14.15	13.13	12.61	14.01
Means	12.58	10.43	10.94	9.81	9.60	10.67
L.S.D 5% Properties Value	Treatments: 1.618	Storage period: 1.618	Interactions: No			
Storage per weeks	Second season					
0	4.51	4.51	4.51	4.51	4.51	4.51
1	8.48	8.83	8.51	9.62	6.77	8.44
2	9.10	10.04	9.04	10.33	6.84	9.07
3	13.67	10.62	9.54	9.80	6.91	10.11
4	13.99	11.17	10.12	13.64	10.78	11.94
Means	9.95	9.04	8.34	9.58	7.16	8.81
L.S.D 5% Properties Value	Treatments: No	Storage period: 2.709	Interactions: No			

Table (4a): Effect of post harvest treatments on color a\*value of "canino" apricot fruit after cold storage (0°C) during seasons 2003 & 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	14.10	14.10	14.10	14.10	14.10	14.10
1	11.10	11.13	11.13	8.36	7.41	9.83
2	8.41	9.04	7.41	8.56	6.22	7.93
3	5.74	8.84	6.99	6.52	6.61	6.94
4	7.52	8.27	7.10	7.42	7.73	7.61
Means	9.37	10.28	9.35	8.99	8.42	9.28
L.S.D. 5% Factor Value	P.T. (1) NO.S	S.P. (b) 1.399	A*B NO.S			
Storage per weeks	Second season					
0	13.77	13.77	13.77	13.77	13.77	13.77
1	9.97	10.67	11.37	9.73	8.57	10.06
2	8.43	8.97	9.13	9.10	8.70	8.87
3	6.47	8.80	8.20	8.77	8.67	8.18
4	7.13	8.60	7.43	8.43	8.67	8.05
Means	9.15	10.16	9.98	9.96	9.67	9.79
L.S.D. 5% Factor Value	P.T. (1) NO.S	S.P. (b) 0.8269	A*B NO.S			

\*Biological treatment: activated Jasmine oil solution.

Table (5): Effect of post- harvest treatments on color b\*value of peach fruits under cold storage (0°C) during seasons 2003 &amp; 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	21.62	21.62	21.62	21.62	21.62	21.62
1	22.49	21.94	22.48	23.10	22.47	22.49
2	24.10	23.28	23.40	25.26	23.67	23.94
3	25.46	24.69	25.02	26.67	24.77	25.33
4	29.71	27.97	28.09	29.87	26.98	28.52
Means	24.68	23.90	24.12	25.30	23.90	24.38
L.S.D 5% Properties Value	Treatments: 0.6666	Storage period: 0.6666	Interactions: No			
Storage per weeks	Second season					
0	18.38	18.38	18.38	18.38	18.38	18.38
1	19.32	18.43	20.47	19.73	19.83	19.56
2	19.38	19.02	21.34	21.57	21.04	20.47
3	19.50	21.21	21.64	22.40	22.29	21.41
4	22.48	22.76	22.25	25.68	23.03	23.24
Means	19.81	19.96	20.82	21.55	20.92	20.61
L.S.D 5% Properties Value	Treatments: No	Storage period: 2.497	Interactions: No			

Table (5a): Effect of post harvest treatments on T.S.S. (%) of "canino" apricot fruit after cold storage (0°C) during seasons 2003 &amp; 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	11.67	11.67	11.67	11.67	11.67	11.67
1	13.70	13.80	14.20	12.87	13.73	13.66
2	11.93	8.67	10.07	12.63	10.50	10.76
3	12.83	11.17	11.83	13.23	12.63	12.34
4	12.17	12.33	11.53	11.21	13.23	12.10
Means	12.46	11.53	11.86	12.32	12.35	12.10
L.S.D. 5%	Factor Value	P.T. (1) 0.612	S.P. (b) 0.612	A*B 1.368		
Storage per weeks	Second season					
0	11.67	11.67	11.67	11.67	11.67	11.67
1	13.63	13.50	13.47	14.33	13.30	13.65
2	13.23	8.80	12.87	12.73	13.40	12.21
3	13.37	13.23	13.47	13.17	13.50	13.35
4	13.63	12.97	13.43	13.07	13.13	13.25
Means	13.11	12.03	12.98	12.99	13.00	12.82
L.S.D. 5%	Factor Value	P.T. (1) NO.S	S.P. (b) 0.9788	A*B NO.S		

\*Biological treatment: activated Jasmine oil solution.

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### **5- Total soluble solids (T.S.S):-**

In Table (6) Meet Ghamr Peach fruits contents of soluble solids of jasmine oil treated fruits was the lowest among fruits of all treatments after 4 weeks of cold storage in both seasons, (recording 12.5% 1<sup>st</sup> year compared to 13.2% of control and 13.2% in 2<sup>nd</sup> year compared to 13.8% of control), while fruits resulted from H<sub>2</sub>O<sub>2</sub> treatment had the highest T.S.S. after 4 weeks in cold storage (13.03% 1<sup>st</sup> year and 13.9% 2<sup>nd</sup> year). Other treatments had a relatively lower T.S.S content than H<sub>2</sub>O<sub>2</sub> treated fruits. These results are in accordance with data of firmness and decay, indicating that jasmine oil treatment delayed ripening, and thus a slower increase in sugar formation compared to other treatments; (in agreement with Vick *et al.*, 1984).

It's clear in Table (5 A) for Canino apricot fruits that orange oil treatment had the least T.S.S. percentage (11.5%) among treatments which caused fruits to be over ripened especially with biological treatment (13.2%) in 1<sup>st</sup> season, while in 2<sup>nd</sup> season most T.S.S. values were similar (13%).

### **6- Acidity content:-**

Data of Table (7) showed that Meet Ghamr Peach fruits treated with jasmine oil had the highest acidity percentage in the 2<sup>nd</sup> season, 0.7% after 4 weeks of cold storage compared to all other treatments which reached a percentage range of 0.33% to 0.45%.

In the first year both jasmine oil and biological treated fruits had the highest acidity values (0.77% and 0.83%) after cold storage, compared to control (0.5%) and other treatments. These results support other data of T.S.S% and firmness as jasmine oil caused a noticeable delay in peach ripening.

In Table (6 A) for Canino Apricot fruits jasmine oil treated fruits had the highest values of acidity % compared with all other treatments

### **7- Organoleptic evaluation:-**

It's seen in Table (8) that for healthy fruits (non infected), of the control and orange oil treatments fruits had the highest grade of eating quality (good) because of their relative advance in ripening compared to jasmine oil treated fruits and biological treatment which had an acceptable quality note due to their slow progress in ripening stage and their low contents of sugars and high acidity, which is in conformity with all previous results.

Different trend was observed for apricots treated with jasmine oil and orange oil treated fruits had the best rate (in the range of 7-7.3) compared with H<sub>2</sub>O<sub>2</sub> and biological treatment fruits with lower rates (in the range of 4.3-5.1) due perhaps to randomness of fruits chosen for this test.

Table (6): Effect of post -harvest treatments on T.S.S (%) of Meet Ghamr peach fruits under cold storage (0°C) during seasons 2003 & 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	10.67	10.67	10.67	10.67	10.67	10.67
1	11.17	10.97	11.10	11.20	11.27	11.14
2	12.33	11.47	11.93	12.00	12.17	11.98
3	13.07	12.07	12.63	12.93	12.83	12.71
4	13.17	12.47	12.80	13.27	13.03	12.95
Means	12.08	11.53	11.83	12.01	11.99	11.89
L.S.D 5% Properties Value	Treatments: 0.2377	Storage period: 0.2377	Interactions: No			
Storage per weeks	Second season					
0	10.83	10.83	10.83	10.83	10.83	10.83
1	11.43	11.47	11.73	11.91	8.61	11.03
2	13.00	12.33	12.33	12.67	12.67	12.60
3	13.63	12.83	13.40	13.67	13.97	13.50
4	13.83	13.23	13.57	14.10	13.93	13.73
Means	12.55	12.14	12.37	12.64	12.00	12.34
L.S.D 5% Properties Value	Treatments: No	Storage period: 0.9793	Interactions: No			

Table (6a): Effect of post harvest treatments on acidity (%) of "canino" apricot fruit after cold storage (0°C) during seasons 2003 & 2004.

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	2.90	2.90	2.90	2.90	2.90	2.90
1	2.33	2.67	2.33	2.83	2.40	2.51
2	2.10	2.43	2.10	1.97	2.13	2.14
3	2.10	2.33	2.01	1.70	2.14	2.05
4	1.43	1.7	1.43	1.50	1.30	1.47
Means	1.88	2.4	2.15	2.18	2.17	2.14
L.S.D. 5%	Factor Value	P.T. (1) 0.0956	S.P. (b) 0.0956	A*B 0.214		
Storage per weeks	Second season					
0	2.73	2.73	2.73	2.73	2.73	2.73
1	1.87	2.43	2.40	2.57	2.23	2.30
2	1.73	2.33	2.63	2.37	1.83	2.17
3	1.60	2.30	2.00	2.07	1.77	1.94
4	1.33	1.5	1.20	1.07	1.37	1.29
Means	1.85	2.3	2.19	2.16	1.99	2.09
L.S.D. 5%	Factor Value	P.T. (1) 0.0656	S.P. (b) 0.0656	A*B 0.1467		

\*Biological treatment: activated Jasmine oil solution.

Table (7): Effect of post-harvest treatments on acidity (%) of Meet Ghamr peach fruits under cold storage (0°C) during seasons 2003 & 2004

Treatments	Control	Jasmine	Orange	H <sub>2</sub> O <sub>2</sub>	Biological	Means
Storage per weeks	First season					
0	1.53	1.53	1.53	1.53	1.53	1.53
1	1.27	1.40	1.37	1.40	1.37	1.36
2	1.00	1.20	1.20	1.20	1.20	1.16
3	0.87	0.97	1.00	1.03	0.97	0.97
4	0.50	0.77	0.90	0.80	0.83	0.76
Means	1.03	1.17	1.20	1.19	1.18	1.16
L.S.D 5%						
Properties Value	Treatments: 0.6989	Storage period: 0.6989	Interactions: No			
	Second season					
0	0.95	0.95	0.95	0.95	0.95	0.95
1	0.83	0.90	0.83	0.70	0.65	0.78
2	0.68	0.80	0.72	0.60	0.60	0.68
3	0.57	0.70	0.60	0.55	0.47	0.58
4	0.42	0.60	0.45	0.40	0.33	0.44
Means	0.69	0.79	0.71	0.64	0.60	0.69
L.S.D 5%						
Properties Value	Treatments: 0.032	Storage period: 0.032	Interactions: 0.0733			

\*Biological treatment: activated Jasmine oil solution.

Table (8): Organoleptic results of peach and Apricot fruits at the end of storage.

Treatments	"Meet Ghamr" Peach		"canino" Apricot	
	1 <sup>st</sup> season	2 <sup>nd</sup> season	1 <sup>st</sup> season	2 <sup>nd</sup> season
	Average	Average	Average	Average
Control	Good 7	Good 7	Acceptable (5)	Acceptable (5)
Jasmine	Acceptable (5)	Acceptable (5)	Good 7.1	Good 7.3
Orange	Good 7	Good 7.2	Good 7	Good 7
H <sub>2</sub> O <sub>2</sub>	Acceptable (5.3)	Good 6.5	Acceptable (5)	Acceptable (5.1)
Biological*	Acceptable(4.8)	Acceptable(5)	Acceptable (4.5)	Acceptable (4.3)
L.S.D 5%	0.5	0.7	0.4	0.6

\*Biological treatment: activated Jasmine oil solution.

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استخدام بعض المطهرات من أصل نباتي لإجراء عملية تعقيم ثمار الفواكه ذات النواة الحجرية

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- أجريت هذه التجربة خلال موسمي ٢٠٠٣&٢٠٠٤ بمعهد بحوث البساتين قسم بحوث تداول الفاكهة. على ثمار المشمش صنف كانيو من إحدى المزارع الخاصة بالنوبارية وثمار خوخ صنف ميب غمر من مزرعة بمحافظة الدقهلية.
- في الصباح الباكر تم قطف الثمار في مرحلة اكتمال النمو ونقلت مباشرة إلى المعمل لدراسة قدرتها التخزينية. تم فرز الثمار. عوملت الثمار بمعاملات طبيعية مثل زيت الياسمين بتركيز ٠,٢% وزيت البرتقال ٠,٢% وأول أكسيد الأيدروجين ٥% (مدة الغمس ٥-٧ دقائق) وبدون معاملة وعينت داخل أكياس بلاستيك متقية من البولي إيثيلين منخفض الكثافة ١٥ ثمرة/كيس. وضعت هذه الأكياس داخل كراتين ٣كجم/كرتونه. خزنت الثمار على درجة الصفر المنوي ورطوبة نسبية من ٩٠-٩٥%. تم فحص الثمار أسبوعيا عن طريق تتبع القياسات الطبيعية والكيميائية.
  - تبين من الدراسة أن غمس ثمار المشمش والخوخ في محلول زيت الياسمين بتركيز ٠,٢%. أدى إلى تقليل معدل التلف والاحتفاظ بجودة الثمار وصلابتها كذلك المعاملة بزيت البرتقال بتركيز ٠,٢% بدرجة أقل مقارنة بالكنترول.
  - أيضا أظهرت النتائج أن أفضل المعاملات هي غمس الثمار في محلول زيت الياسمين (٠,٢%) وزيت البرتقال (٠,٢%) لمدة ٥-٧ دقائق، حيث أظهرت هاتين المعاملتين إلى قدرة عالية في تقليل معدل الفقد في الوزن والتلف مما أدى إلى الحفاظ على جودة وحيوية الثمار وزيادة العمر التخزيني للثمار مقارنة بالمعاملات الأخرى.