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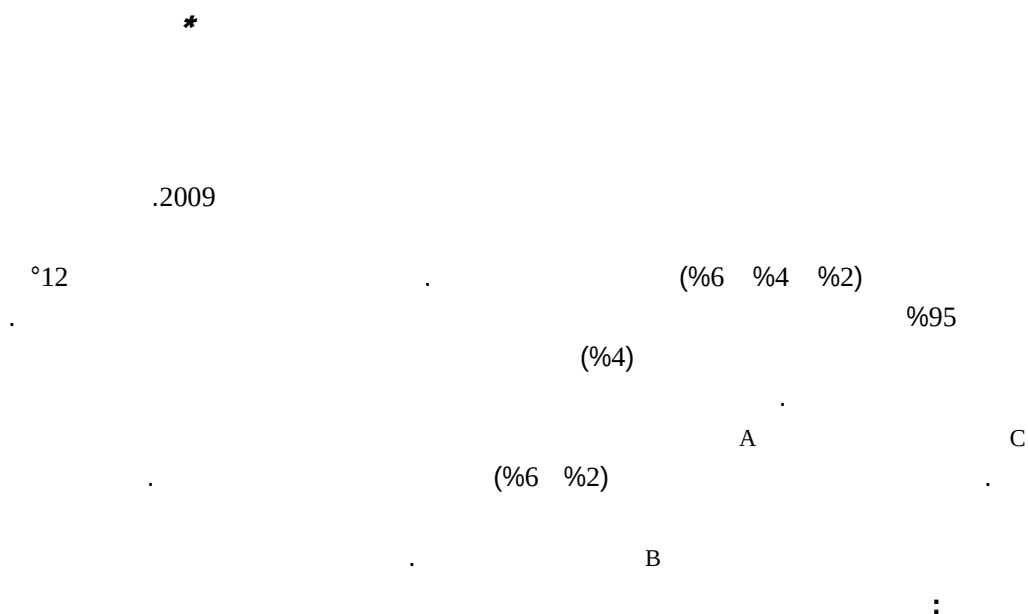
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Mangifera indica L.*Mangifera indica* L.

(Shirokov, 1988, Dementeva and . (Bose,1985; Samson, .1986)
Vegonski, 1988, Kader and kitinoja, 2002)

C B A

301-234 100 .
(1997)

Schumacher *et al.* . (Lizada, 1993)

(1977)
bitter pit

%4

2010/4/6

.2010/9/1

*

100 × ----- = (Conway, 1983;
 .Conway and Sams, 1985)
 (Spalding, 1986)

.2

10
 48 °70

.
 (2002)

:
 —
 100×-----=(%)

Matook and Fumio (2004)
 %100 °20
 %4

.3

20 10

(ALLA and refractometer

.FRANCE)

.4

Lane and Eynon

A.O.A.C.(1990)

.5

50 10
 10

.2009

(0.1) NaoH

.(A.O.A.C., 1990)

%4 %2

4
 .() %0 %6

.6

2
 %95

°12

:
 :
 100 × ----- = (%)

.1

C .7

C

2,6-dichloro phenol

:

C

indophenol

.(Polagaev,1988)

100

$$100 \times \frac{\text{---}}{\text{---}} = (\%)$$

.8

(Pearson, 1970)

.10

(100/)

:

(B)

(A)

Zaehringier

$$100 \times \frac{\text{---}}{\text{---}} =$$

%80

(Goodwin,1976)

.Spectrophotometer

.%7.61

.11

.9

)

:

(2002

:1	:1
:2	:2
:3	:3
:4	:4
:5	:5

Revised LSD

(4×4)

.(1980

) 0.05

CRD

(1)

(%)	(%)	(%)	(%)	(%)	(%)
1.94	4.47	2.65	7.12	15.5	81.66

.1

(Dementeva and

.(2001

Vegonski,1988

(2)

(%5.15)

%3.98

.(2001)

(Kader, 1993)

)

.(2001

4-2

Conway (1982)

Conway and Sams (1985)

%4

(2002)

.(%0.91)

(%3.29)

(2006) . °5

.(%6)

(%2)

(%4)

(2)

	()				
	20	15	10	5	
2.75	4.15	3.77	3.11	0	%2
0.91	2.45	1.22	0	0	%4
2.61	4.18	3.62	2.66	0	%6
3.29	5.15	4.16	3.88	0	
	3.98	3.03	2.16	0	
0.89 : 0.73 : 0.51 : RLSD 0.05					

(%6)

.2

(3)

%72.45

(%6)

(%2)

(%4)

.(%78.03)

(%2)

protopectinase
 polygalactouronase pectin esterase
 (1985)
 (Tomola *et al.* 1998) water stress
 stress ethylene
 .(2001 Shirokov,1998)
 °4-2 6
 .%95-85

(3)

	()				
	20	15	10	5	
75.5	72.11	74.33	76.12	79.45	%2
78.03	75.33	77.65	78.83	80.33	%4
75.73	72.25	74.6	76.22	79.88	%6
74.29	70.11	73.52	75.2	78.33	
	72.45	75.02	76.59	79.49	
2.35 : 2.2 : 1.19 : RLSD 0.05					

(4)

	()				
	20	15	10	5	
17.62	19	18	17	16.5	%2
16.87	18	17	16.5	16	%4
17.62	19	18	17	16.5	%6
18.62	20	19.5	18	17	
	19	18.12	17.12	16.5	
. : 1.64 : 0.92 : RLSD 0.05					

.3

%19

(4)

(3)

(3)

.(Burton,1982)

.(1985)

Climacteric fruits

.(2001)

(6)

.(%18.62)

%4.18

.(1985)

%5.73

.4

(5)

°12

%9.91

.(7)

(5)

	()				
	20	15	10	5	
8.77	9.96	9.05	8.6	7.49	%2
8.27	9.1	8.62	8.15	7.21	%4
8.84	10.06	9.12	8.66	7.55	%6
9.34	10.55	9.86	8.86	8.11	
	9.91	9.16	8.56	7.59	
. : 1.22: . : RLSD 0.05					

(6)

	()				
	20	15	10	5	
3.38	4.09	3.55	3.03	2.88	%2
3.2	3.95	3.17	2.96	2.72	%4
3.41	4.12	3.55	3.11	2.88	%6
3.66	4.56	3.69	3.36	3.03	
	4.18	3.49	3.11	2.87	
. : 0.62: . : RLSD 0.05					

(7)

	()				
	20	15	10	5	
5.38	5.87	5.5	5.57	4.61	%2
5.07	5.15	5.45	5.19	4.49	%4
5.43	5.94	5.57	5.55	4.67	%6
5.68	5.99	6.17	5.5	5.08	
	5.73	5.67	5.45	4.71	
. : 0.21: . : RLSD 0.05					

.5

(8)

. °12

(8)

	()				
	20	15	10	5	
1.86	1.84	1.85	1.87	1.91	%2
1.9	1.88	1.90	1.90	1.92	%4
1.88	1.86	1.87	1.90	1.90	%6
1.87	1.86	1.87	1.87	1.91	
	1.86	1.87	1.88	1.91	
. : . : . : RLSD 0.05					

.6

(%4)

(9)

.(100 / 82.33)
(%2) (%6)

(%)

(%4)

(%4)

(%6)

(%2)

(%2)

(%6)

.(3)

(100/) c

.B
(%4)
(100/ 2.75)
(%6) (%2)
(Meyer *et al.* 1973)

.7

(10)

A
(%4)
(100/ 1.53) A
(%6) (%2)
(1985) Chlorophyllase

(9)

(%)	(%)	C (100/)	(%)	
1.15	0.84	78.32	67.95	(%2)
1.18	0.96	82.33	71.11	(%4)
1.15	0.84	78.45	68.15	(%6)
1.16	0.71	75.12	64.66	
N.S	0.11	3.12	2.86	RLSD 0.05

(10)

(100/)	(100/)	B (100/)	A (100/)	
1.15	2.57	1.11	1.46	(%2)
1.19	2.75	1.17	1.53	(%4)
1.15	2.59	1.13	1.46	(%6)
1.1	2.43	1.06	1.37	
N.S	0.11	N.S	0.05	RLSD 0.05

.8

(%6) (%2) (11)

(%4)

°12

.%95

(11)

3	2	(%2)
2	1	(%4)
3	2	(%6)
4	3	

on decay of Delicious apples. Plant Dis. 66:402-403.

Conway, W.S. and C. E. Sams. 1985. Influence of fruit maturity on the effect of postharvest treatment on decay of Golden Delicious apples, 69: 42-44.

Dementeva, M.E. and M.E. Vegonski. 1988. Diseases of fruits, vegetables and potatoes during storage [in Russian]. Moscow, 231.

Goodwin, T.W. 1976. Chemistry and Biochemistry of Plant Pigments. 2nd Ed. Academic Press, London, New York, San Francisco, 373.

Kader, A.A. 1993. Postharvest Handling. In: Preece, J.E. and Read, P.E., The Biology of Horticulture- An Introductory Textbook. New York: John Wiley and Sons, 353-377.

Kader, A.A. and L. Kitinoja. 2002. Small Scale Postharvest Handling Practices: A Manual for Horticultural Crops (4th edition). Postharvest Horticulture Series No. 8A. University of California, Davis, Postharvest Technology Research and Information Center. USA.

Lizada, C. 1993. Mango. In: Seymour, G.B. Taylor, J.E. and Tucker, G. A. (eds). *Biochemistry of fruit Ripening*. Chapman and Hall, London, 255-271.

Matook, M.S. and H. Fumio. 2004. Effect of heat, calcium chloride and modified atmosphere on the shelf life of banana fruits. *Food Preservation Science*, 30(4).

Meyer, B.S.; D.B. Anderson; R.H. Bohning and D.G. Fratiane. 1973. Introduction to Plant Physiology. D. Van No strand Company. New York, London, 565.

Pearson, D. 1970. Chemical Analysis of Food, Sixth ed. Longman Group Ltd, New York.

Polagaev, B.E. 1988. Methods for Determination of Quality of Fruits and Vegetables [in Russian]. Moscow, 95.

2002

)

(

2002

.909-901 :(3) 70

1997

2001

1980

1985

2006

A.O.A.C .1990. Official Method of Analysis, Association of official Analytical Chemists, Washington, D.C.USA.

Burton, W.G. 1982. *Postharvest Physiology of Food Crops*. Longman, New York, 310.

Bose, T.K. 1985. Fruits of India. Tropical Subtropical, NAYA PROKASH, Calcutta, India.

Conway, W.S. 1982. Effect of postharvest calcium treatment

- and Vegetables. Moscow [in Russian], 94.
- Spalding, D.H. 1986. Evaluation of Various Treatments for Control of Postharvest Decay of Florida Mangos. *Proc. Fla. State Hort. Soc.* 99:97-99.
- Tomola, K.; Montanes, V.J. and Mong, L. 1998. Effect of calcium sprays on storage quality of "Sampion" apples. Proceedings of International Symposium on Mineral Nutrition of Deciduous Fruit Trees. *Acta. Hort.* (448):56-59.
- Samson, J.A. 1986. Tropical Fruits. 2nd ed. Longman Scientific and Technical.
- Schumacher, R.; F. Frankhauser; W. Stadler. 1977. Experiments with calcium chloride, antitranspirants and boric acid to reduce the occurrence of bitter pit, *Hort. Abst.* 047-02306.
- Shirokov, E.P. 1988. Technology of Storage and Processing of Fruits and Vegetables, Moscow [in Russian], 319.
- Shirokov, E.P. 1998. Technology of Biochemistry of Fruits

A Study on the Effect of Postharvest Calcium Chloride Treatments on the Storability of Mango Fruits (*Mangifera indica* L.)

*Dhia Ahmed Taain, Majid Abd-Al-hamed Ibrahim and Eman A. Al-sareh**

ABSTRACT

Mango fruits were collected from commercial orchard in Abu-Alkhasab region south of Basrah during the growing season 2009. Selected fruits were similar in size and appearance. Others which were small and deteriorated were not selected. Fruits treated after harvest with calcium chloride solutions (2%, 4%, 6% w/v) in addition to control (distilled water only) and stored at 12°C and 95% relative humidity for twenty days. Studied properties were determined before storage, during storage and at the end of storage. The results showed that treatment with calcium chloride (4%) was the best in controlling decay which could be noted after fifteen days of storage, retaining water content and increasing the percentage of juice in fruits, vitamin C., pectic substances, chlorophyll A and total chlorophyll. Fruits treated with calcium chloride (4%) had excellent taste and very good appearance at the end of storage, followed by the treatments of calcium chloride (2%, 6%) which differed significantly from control. Statistical analysis showed that there were no significant differences between treatments with calcium chloride and control in their effect on total and reducing sugars, sucrose, fatty acids, chlorophyll B and carotene.

Keywords: Mango Fruits, Calcium Chloride, Storage.

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