GAU Res. J. 1995. 21 (1) : 88-93

Effect of Some Treatments on the Keeping Quality of Sapota [*Manilkara Achras* (Mill.) Forberg.] Fruits Cv. Kalipatti After Transportation

Anil B. Patel*. J. S. Katrodiya and S. C. P. Sachan

Department of Horticulture, N. M. College of Agriculture, Gujarat Agricultural University, Navsari

ABSTRACT

For extending the storage life and stabilizing the market demand, the sapota fruits may be treated with GA 150 ppm + Bavistin 500 ppm which helps in safe transportation of sapota fruits to the distant markert and reduced physiological weight loss, spoilage and also maintained the marketability of the fruits for a longer period.

(Received on 8th Febru., 1995)

INTRODUCTION

Sapota (*Manilkara achras* (Mill.) forberg.) fruits is highly nutritious, delicious when fully ripe and sweet in taste, with a slight flavour of astringency. However, it is highly perishable, ripen fast during summer and becomes unconsumable very soon. The abudant supply of sapota fruits in market from majority of orchard is done in a short span which caused gult in the market thereby reduction in prices. Therefore the lost in total returned incurred to the orchardists. Also fruits can not be stored for a longer period at ambient temperature and hence farmers are bound ro sell their produce. So it become essentials that fruits must be transported to the distant market without spoilage. Therefore, the present study was undertaken to investigate the possibilities of extending the shelf-life by delaying ripening and transporting to the distant market. Such type of information was not available in sapota fruits.

MATERIALS AND METHODS

The study was carriedout in the laboratory of Department of Horticulture, N. M. College of Agriculture, Gujarat Agricultural University, Navsari during summer season of 1992. Sapota fruits were transported from Navsari to Sardar Krushinagar, which is 550 km far away from Navsari. The experiment was laid out in a completely randomized design with six treatments and three times replicated. Mature fruits of uniform size, shape and free from injuries were selected for the study. Sapota fruits were obtained from Fruit Research Station, Gandevi of Navsari Zone. The fruits were washed thoroughly with tap water and surface dried. The fruits were than seperated into different lots of 15 kg fruits for each treatment. The fruits were dipped in the respective chemical solution for 8 to 10 minutes and dried for 60 minutes. Similarly, for waxol treatment the fruits were dipped in it for 2 minutes and shade dried

*Present address : Agricultural Officer, Department of Horticulture, Chimanbhai Patel College of Agriculture, Sardar Krushinagar

for 60 minutes. Treated fruits were packed in wooden boxes having 16 kg capacity with paddy straw as a packing material.

Treatments are as under :

1. MH 2000 ppm + Bavistin 500 ppm
2. Kinetin 10 ppm + Bavistin 500 ppm
3. Waxol-2%
4. GA 150 ppm + Bavistin 500 ppm
5. GA 200 ppm + Bavistin 500 ppm
6. Control

Observation of fruits were recorded at one day interval.

For determination of physiological loss in weight, the initial weight of fruits were recorded prior to packing and subsequently at one day interval. The reduction in weight was expressed on percentage basis. For marketable fruits, the number of visibly sound fruits that can be marked were counted and expressed on percentage over the toal number of fruits at specific interval. Similarly, for spoilage percentage, the number visibly diseased, over ripe fruits were counted and expressed as percentage over the total number of fruits at specific interval. Total soluble solids percentage of the pulp was recorded by using a Eroma hand refractometer. Organoleptic evaluation of the fruits for assessing the taste of the fruits was done by a pannel of five experts who scored on a 9 point Hedonic scale (Amerine *et al.*, 1965). The fruit pressure (firmness) was tested by means of pocket penetrometer in term of pressure required by piecring through the fruit.

RESULTS AND DISCUSSION

The detail studies regarding transportation aspects are rather scanty in sapota fruits.

The results of pooled analysis for different storage period after transportation of fruits

TABLE 1

Effect of post harvest tratements on physiological weight loss (%) of sapota fruits after transportation.

Sr. No.	Treatments	Storage period (days)				Pooled
		3	4	5	6	
1.	MH 2000 ppm + Bavistin 500 ppm	11.15	14.43	19.89	20.08	16.32
2.	Kinetin 10 ppm + Bavistin 500 ppm	10.11	12.5	17.50	17.85	14.49
3.	Waxol - 2%	5.55	7.34	9.40	11.60	8.87
4.	GA 150 ppm + Bavistin 500 ppm	8.60	10.89	13.89	14.54	11.98
5.	GA 200 ppm + Bavistin 500 ppm	8.90	11.00	16.50	16.85	13.31
6.	Control	12.60	14.81	20.00	22.00	17.35
	S. Em. +	00.66	00.74	00.85	00.81	00.41
	C. D. at 5%	1.96	2.192	2.528	2.402	1.165
	C. V. %	13.92	12.47	10.36	9.42	11.19

revealed that there were significant diferences among various ripening retardants for physiological weight loss, spoilage, marketable fruits and total soluble solids.

The results of per cent physiological weight loss of sapota fruits after transportation as a result of post harvest treatments are presented in table 1. Minimum weight loss (8.87%) was recorded in the fruits treated with waxol-2% followed by GA 150 ppm + Bavistin 500 ppm (11.98%) and GA 200 ppm + Bavistin 500 ppm (13.31%). The reduce weight losses with waxol application have been reported in sapota by Ramkrishna and Rao (1989) and Gautam and Chundawat (1990). The treatment with waxol significantly reduced the PLW and delay the ripening of sapota fruits but had an adverse effect on taste and flavour of ripe fruits and increased the incidence of rotting of sapota (Kariyanna, 1990).

TABLE 2

Effect of post harvest treatments on spoilage (%) of sapota fruits after transportation.

Sr. No.	Treatments	Storage period (days)				Pooled
		3	4	5	6	
1.	MH 2000 ppm + Bavistin 500 ppm	12.50	36.25	60.00	90.45	49.65
2.	Kinetin 10 ppm + Bavistin 500 ppm	7.50	35.42	63.34	91.00	49.32
3.	Waxol - 2 %	5.50	39.75	70.00	100.00	53.80
4.	GA 150 ppm + Bavistin 500 ppm	2.38	26.13	50.00	62.47	35.22
5.	GA 200 ppm + Bavistin 500 ppm	5.26	32.24	59.20	70.00	41.67
6.	Control	14.85	47.06	79.27	100.00	60.30
	S. Em., +	2.06	2.22	4.40	1.54	3.00
	C. D. at 5 %	6.12	6.58	13.08	4.57	9.06
	C. V. %	51.51	12.26	13.84	3.59	11.50

The results of per cent spoilage of sapota fruits with the effect of post harvest treatments are presented in table 2. Lowest spoilage (35.22%) was recorded in the fruits treated with GA 150 ppm + Bavistin 500 ppm followed by GA 200 ppm + Bavistin 500 ppm (41.67%). This may be due to treatment effect which retarded ripening and reduced weight loss. Similar observations were also made by Ramakrishna and Rao (1989) and Banik *et al.*, (1988) in sapota fruits.

TABLE 3

Effect of post harvest treatments on marketable fruits (%) of sapota fruits after transportation.

Sr. No.	Treatment	Storage period (days)				Pooled
		3	4	5	6	
1.	MH 2000 ppm + Bavistin 500 ppm	87.50	63.75	40.00	9.65	50.23
2.	Kinetin 10 ppm + Bavistin 500 ppm	92.50	64.58	36.66	9.00	50.69
3.	Waxol - 2%	94.50	60.25	30.00	00.00	46.20
4.	GA 150 ppm + Bavistin 500 ppm	97.75	73.87	50.00	37.63	64.78
5.	GA 200 ppm + Bavistin 500 ppm	95.49	67.76	40.80	30.00	58.51
6.	Control	85.15	52.94	20.73	00.00	3970
	S. Em. +	2.08	2.21	4.40	1.52	3.00
	C. D. at 5 %	6.19	6.58	13.08	4.52	9.04
	C. V. %	4.52	6.94	24.21	21.18	10.76

TABLE 4

Effect of post harvest treatments on organoleptic score of sapota fruits after transportation.

Sr. No.	Treatments	Storage period (days)				Pooled
		3	4	5	6	
1.	MH 2000 ppm + Bavistin 500 ppm	6.00	7.25	6.12	5.15	6.46
2.	Kinetin 10 ppm + Bavistin 500 ppm	6.25	7.00	6.00	4.00	6.48
3.	Waxol - 2%	6.15	6.55	5.15	5.00	5.94
4.	GA 150 ppm + Bavistin 500 ppm	5.50	7.60	7.25	5.20	6.78
5.	GA 200 ppm + Bavistin 500 ppm	5.75	7.40	7.00	5.10	6.70
6.	Control	7.00	6.50	5.00	2.25	6.17
	S. Em. +	0.34	0.29	0.22	0.39	0.42
	C. D. at 5 %	NS	NS	0.66	0.15	NS
	C. V. %	11.10	8.25	7.23	17.45	8.96

The results of per cent marketable fruits with the effect of post harvest treatments are presented in table 3. Highest marketable fruits (64.78%) was observed in the fruits treated with GA 150 ppm + Bavistin 500 ppm followed by GA 200 ppm + Bavistin 500 ppm (58.51%). This may be due to treatment effect which retarded ripening and reduced weight loss through controlled transpiration and respiration rate. Similar findings were reported by Ramakrishna and Rao (1989) and Banik *et al.*, (1988) in sapota fruits.

TABLE 5

Effect of post harvest treatments on T.S.S. (%) of sapota fruits after transportation.

Sr. No.	Treatments	Storage period (days)				Pooled
		3	4	5	6	
1.	MH 2000 ppm + Bavistrin 500 ppm	20.00	21.00	22.55	22.15	21.43
2.	Kinetin 10 ppm + Bavistin 500 ppm	19.66	20.66	23.00	22.70	21.51
3.	Waxol - 2 %	21.15	22.66	24.15	23.65	22.90
4.	GA 150 ppm + Bivistin 500 ppm	21.33	23.33	24.60	24.05	23.33
5.	GA 200 ppm + Bavistin 500 ppm	22.00	23.00	23.85	23.70	23.13
6.	Control	20.00	20.36	22.00	21.87	21.06
	S. Em. +	0.81	0.89	1.04	0.35	0.41
	C. D. at 5 %	NS	NS	NS	1.03	1.15
	C. V. %	7.84	8.15	8.90	3.00	7.33

TABLE 6

Effect of post harvest treatments on pressure test (kg/cm) of sapota fruits after transportation.

Sr. No.	Treatments	Storage period (days)				Pooled
		3	4	5	6	
1.	MH 2000 ppm + Bavistin 500 ppm	4.50	2.00	1.15	0.69	2.09
2.	Kinetin 10 ppm + Bavistin 500 ppm	4.00	1.95	1.00	0.71	1.92
3.	Waxol - 2 %	4.25	1.99	0.95	0.65	1.96
4.	GA 150 ppm + Bavistin 500 ppm	4.75	2.10	1.46	0.87	2.29
5.	GA 200 ppm + Bavistin 500 ppm	4.60	2.00	1.00	0.65	1.82
6.	Control	4.00	1.05	0.80	0.40	1.80
	S. Em. +	0.24	0.13	0.17	0.06	0.13
	C. D. at 5 %	NS	0.39	NS	0.16	NS
	C. V. %	11.00	14.02	32.21	16.51	16.49

The results of T.S.S. of fruits as influenced by various treatments are presented in table 4. From the data it is observed that highest T.S.S. (23.33%) was observed in the fruits treated with GA 150 ppm + Bavistin 500 ppm followed by GA 200 ppm + Bavistin 500 ppm (23.13%). Similar observations were also made by Ramakrishna and Rao (1989) and Banik *et al.*, in sapota fruits.

No significant differences were observed among different treatments for fruit pressure and organoleptic test (Table 4 and 6).

For prolonging the storage life and stabilize the market demand the sapota fruits should be treated with GA 150 ppm + Bavistin 500 ppm for 8 to 10 minutes and then packed in wooded boxes using paddy straw as a packing material.

ACKNOWLEDGEMENT

The first author is greatful to the Indian Council of Agricultural Research, New Delhi for award of Junior Research Fellowship.

REFERENCES

Amerine, M. A.; Pangborn. R. M. and Roessier, E. B. (1965). Principles of sensery evaluation of food. Academic Press, London.

Banik. D.; Dhua, R. S.; Ghos, S. K. and Sen, S. K. (1988). Studies on extension of storage life of sapota, *Indian J. Hort.*,45 (3 & 4) : 241 - 248.

Gautam, S. K. and Chundawat, B. S. (1990). Post harvest changes in sapota Cv. Kalipatti II - Effect of various post harvest treatment on physico - chemical attributes. *Indian J. Hort.*, 47 (3) : 264 - 69.

Kariyanna (1990). Investigation on standardization of maturity indices, post harvest physiology and post harvest technology of kalipatti sapota fruits. *Thesis abstracts, published by HAU, Hissar* 3 (16) : 194 - 95.

Ramakrishna, M. and Rao, M. R. (1989). Post harvest changes in sapota under different storage treatments. *The Andhra Agril J.*, 36 (2 & 3) : 166 - 71.