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Effect of Different Growth Regulators, Chemical and Wax Coating on Ripening of Sapota Fruits Cv.'Kalipatti'

KEYWORDS

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ABSTRACT *Effects of different growth regulators, chemical and wax coating on ripening of sapota at ambient temperature were studied. Sapota fruits were dipped in GA3 @ 100, 200 ppm, NAA @100, 200 ppm and AgNO3 @20, 40 ppm and then coated with wax 3 and 6 % under different treatment combinations. Observation was recorded at 6th, 9th, 12th and 15th days of storage period. Maximum shelf-life (9.17 days) was recorded with GA3 200 ppm and coating of fruits with wax 6 %(7.92 %).*

INTRODUCTION

Sapota[(*Manilkara achras* (Mill.) Fosberg is fifth popular fruit in both production and consumption next to mango, banana, citrus and grapes. In India, it is cultivated under area of 1.56 lakh ha. with a total production of 13.07 lakh M.T. (Annon.,1). The major sapota growing states are Maharashtra, Gujarat, Tamilnadu, Andhra Pradesh, Karnataka, West Bengal, Utter Pradesh, Punjab and Haryana. Being climacteric in nature, the fruit needs ripening treatments after full maturity. Storage and ripening of sapota are beset with a number of problems under tropical conditions. Fruits ripen within 2 or 3 days and become overripe and spoiled within 5 days after harvest.

Post-harvest life of horticultural crops is short due to their perishable nature and physiological break down during handling, transport, storage and these losses are further enhanced by infection of post-harvest disease. Various viable technologies for improving shelf-life and storage of horticultural commodities like use of fungicides, cold storage, controlled atmosphere storage, anti-transparent, wax coating, growth regulators, irradiation and different type of packing materials, etc., were evolved during the past decades. The technology aim to preserve quality, nutritional and economic value and assure food safety and regulated supply of commodities for processing, domestic markets and export.

MATERIALS AND METHODS

The experiment was conducted at Department of Horticulture, B.A.C.A., AAU, Anand during 2007-08 and 2008-09. The handpicked, firm and healthy sapota cv. 'Kalipatti' fruits of uniform size and maturity, free from pest and diseases, injuries, bruises and blemishes were plucked from Horticulture Research cum Demonstration Farm, AAU, Anand. Out of these fruits, two kg. fruits were randomly selected and dipped in two growth regulators solution each at two levels i.e., GA_3 100, 200 ppm, NAA 100, 200 ppm, a chemical at two levels i.e., $AgNO_3$ 20, 40 ppm solution for ten minutes. Treated fruits then surface dried up to sufficient cool and coated with wax (58-60 °C) 3 and 6 % for a minute. The experiment was laid out in Factorial Completely Randomized Block Design comprising thirteen treatment combinations, i.e. GA_3 100 ppm + Wax 3 %(T_1), GA_3 200 ppm + Wax 3 %(T_2), NAA 100 ppm + Wax 3 %(T_3), NAA 200 ppm + Wax 3 %(T_4), $AgNO_3$ 20 ppm + Wax 3 %(T_5), $AgNO_3$ 40 ppm + Wax 3 %(T_6),GA_3 100 ppm + Wax 6 %(T_7), GA_3 200 ppm + Wax 6 %(T_8), NAA 100 ppm + Wax 6 %(T_9), NAA 200 ppm + Wax 6 %(T_{10}), $AgNO_3$ 20 ppm + Wax 6 %(T_{11}), $AgNO_3$ 40 ppm + Wax 6 %(T_{12}) and control(T_{13}). The treated fruits then surface dried up to sufficient cool and then packed in card board cartoon of 30 x 30 x 30 cm size with 6 vents of 3 cm diameter, 3 each on opposite sides and stored in the laboratory at ambient temperature. The mean temperature and relative humidity prevailed during storage at both the season ranges from 25.7 to 31.2 °C, 39-72 % and 28.4 to 32.5 °C, 17-55 %, respectively. Observations on number of days taken to ripening were recorded on 6th , 9th, 12th and 15th days of storage periods. For recording observation, five fruits were randomly selected from a single lot and replicated thrice. The data obtained were statistically analyzed.

RESULTS AND DISCUSSION

Various treatments significantly influenced number of days to reach ripening of sapota fruits (Table 1). Maximum number of days (9.17) for ripening of the fruits were recorded with GA_3 200 ppm followed by $AgNO_3$ 40 ppm(7.83). Wax 6 % treatment showed maximum number of days (7.92) to reach ripening of sapota fruits. This delay in ripening of the fruits was due to the fact that GA_3 slowed down the process of ripening by reducing the respiration rate and ethylene production and through postponement of their climacteric peak a *vis a vis* control. These changes to reduced degradative metabolism in terms of catalase and PME activities and thus are helpful in extending shelf-life of the fruits. The results are in accordance with the findings of Gautam and Chundawat in sapota cv. 'Kalipatti', Attri and Singh in sapota cv.'Cricket Ball', Damodaran *et al*. in sapota cv. 'Cricket Ball' and Sudha *et al*. in sapota cvs. 'PKM-1' and 'CO-2'.

Table 1.: Effects of different growth regulators, chemical and wax coating on number of days taken for ripening of sapota cv.'Kalipatti' fruits during different storage periods

Growth regulators & Chemical(GC)	Number of days taken for ripening		
	Wax 3 %	Wax 6 %	Mean(GC)
Control			4.67
GA_3 100 ppm	7.50	7.83	7.67
GA_3 200 ppm	8.83	9.50	9.17

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NAA 100 ppm	6.83	7.33	7.08
NAA 200 ppm	6.67	7.00	6.83
$AgNO_3$ 20 ppm	7.33	7.67	7.50
$AgNO_3$ 40 ppm	7.50	8.16	7.83
Mean(W)	7.44	7.92	7.68
		F-test	CD at 5 %
Growth Regulators & Chemical(GC)			0.93
Wax (W)			0.54
Interaction (GC x W)			NS

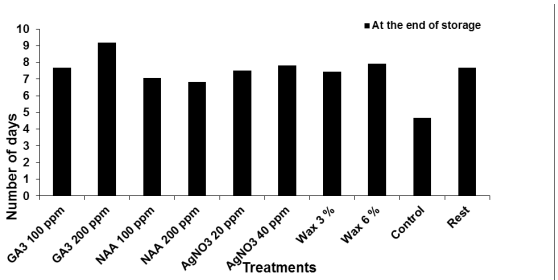

Fig. 1 :Effect of post-harvest treatments on number of day taken to ripening of

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