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A study on biochemical changes of sapota vrieties in cold storage with application of GA_3

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ABSTRACT

Sapota (*Manilkara achras*) fruits of different varieties (Kalipattai, PKM-1, Co-2, Singapore and Kirthibarthi) dipped in GA_3 (150 mg L^{-1}) and then stored at three different cold storage temperatures: 5^0C, 12^0C, 15^0C and ambient condition evaluated for its effect on post storage fruit quality. Sapota fruits stored at 5^0C sustained chilling injury manifested as uneven ripening, pitting and hardened pulp. The rate of change of chemical constituents was found to be slower in fruit stored at 12^0C as compared to fruit stored at 15^0C and control (ambient condition). 'Kalipatti' variety was superior in terms of longer shelf life and required quality attributes. 'PKM-1' noted highest TSS (%), reducing sugars (%) and total sugars (%) although 'Kalipatti' and 'CO-2' variety exhibited good post harvest quality but Singapore and Kirthibarthi varieties had poor fruit quality. Thus, all varieties of sapota fruit can be stored at 12^0C temperature for a long period with edible acceptable quality.

Key words : Sapota, GA_3, Cold storage.

Sapota or sapodilla [*Manilkara achras* (Mill) Fosberg] commonly known as *chiku* is a delicious fruit and valued for its mellow and sweet pulp which mainly used for table purpose in India. South Gujarat and coastal Maharashtra are the principal areas where it is extensively cultivated and marketed to various parts of the country (Parmar, 2002). The fruits are highly perishable and cannot be stored for long as it becomes over ripe and spoiled within 5 days due to rapid degradative metabolism. Extension of post harvest life and quality may be possible by checking the rate of respiration, transpiration and also retard by microbial infection. These can be achieved to some extent by the use of growth regulators and low temperature storage of fruits (Banik *et al.*, 1988). Considering these facts, the present study was carried out.

MATERIALS AND METHODS

The present investigation was carried out for extending the post harvest life and to know the biochemical changes of sapota fruits at Department of Post Harvest Technology, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari in collaboration with Cold Storage Unit, Post Harvest Technology Centre, N.A.U., Navsari during the year 2008. The experiment was laid out in a Completely Randomized Block Design with factorial concept (FCRD) with three repetitions comprised cold storage temperature *viz.* fruits stored at C_1- (5^0C), C_2- (12^0C), C_3- (15^0C) and C_4- control (ambient temperature) and sapota varieties V_1- Kalipatti, V_2- PKM-1, V_3- CO-2, V_4- Singapore and V_5- Kirthibarthi with post harvest dipping of GA_3 (150mgL^{-1}) for 10 minutes. The data were recorded at alternate day. Statistical analysis of data was done by following the Fisher's analysis of variance techniques as given by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been presented under following heads:

Total soluble solids (%):

TSS (%) content was significantly affected by the various cold storage temperatures on all the days of storage period. The TSS (%) content of fruits gradually increased throughout the storage period (Table 1). The combination of post harvest dipping of fruits in GA_3 (150 mg L^{-1}) and cold storage temperature at 5^0C recorded minimum TSS (%) in fruits during all the days of storage. The minimum accumulation of TSS (%) might be due to reduced rate of hydrolysis of starch and delayed ripening in low temperature. In case of variety, PKM-1 obtained highest TSS (%) throughout the storage period due to hydrolysis of starch to sugars and dehydration of juice, minerals and acids. This is in line with findings of Rana (2006), Banik *et al*. (1988) and Balakrishnan (2003) in sapota.

Vitamin-C (mg/100 g of pulp):

A significant decrease in ascorbic acid at later