

## Influence of wrapping material on physico-chemical characters during storage of custard apple

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### ABSTRACT

The uniform size, shape, colour and maturity fruits of custard apple (cv. Local) were stored in 100 gauge *polyethylene* package with 2% vents for five days after harvesting at ambient temperature without any loss in palatability of fruits. Studies conducted on physiological weight loss, external appearance of fruits, fruit softening, TSS, acidity, reducing sugars, non-reducing sugars, total sugars, chlorophyll content and organoleptic score revealed that it is beneficial to wrap the custard apple fruits in the said polyethylene for increasing its shelf-life.

**Key words :** Annonaceae, Polyethylene packaging, Storability, and Physicochemical characters.

### INTRODUCTION

Custard apple is commercially grown mostly in semi-arid region in India. In Maharashtra, the area under this crop is increasing because Government Maharashtra is giving 100% subsidy to the farmers under Employment Guarantee scheme for growing different fruit crops including custard apple. Out of five edible species of *Annona*, only *A. squamosa* L. (Custard apple) is commercially grown. The fruits of custard apple are very delicate and highly perishable in nature. After harvest (maturity) biochemical changes in the fruits occur at the faster rate and fruit become unfit for consumption with short period and in turn limits the transportation to the distant markets.

These biochemical changes occurring during the storage could be lowered down, to some extent, and increase shelf-life without deteriorating the quality of the fruits. One of the methods to achieve this is to lower down the temperature by Wills *et al.* (1984) but fruits of *Annona atemoya* show typical symptoms of chilling injury. Role of polyethylene packaging to increase the shelf-life of the fruits is well documented in many fruits. The present study was conducted to study the effect of polyethylene packaging to prolong the shelf-life of custard apple fruits stored at ambient conditions.

### MATERIALS AND METHODS

The healthy matured fruits of Custard Apple cv. 'Local' were harvested and used in the present experiment. A preliminary study was conducted to standardize the polyethylene gauge and vent percentage required for packaging of fruits of custard apple. In this trial, polyethylene gauge of 5, 100, 200, 250 and vent percentage of 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0 were used.

The selected 20 fruits were washed with water, wiped dry. Ten fruits were wrapped in 100 gauge polyethylene bags with 2% vents and remaining 10 fruits were kept unwrapped under room temperature as adopted by Kumbhar and Desai (1986) and Chaudhary *et al.* (1985).

Thy physiological and chemical observations were recorded immediately after laid down the experiment. The physiological changes in fruits were recorded every day i.e. after 24 hours and chemical changes in fruits were recorded on 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> day of storage. The estimation of chlorophyll content was done by standard method (Arnon, 1949). This fruits were also evaluated organoleptically (Amerine *et al.* 1965).

### RESULTS AND DISCUSSION

It is revealed from Table 1, effective polyethylene packaging on physiological changes in fruits that the storage losses of fruits increased progressively as the storage period advance in both the polyethylene wrapped and unwrapped fruits of custard apple. The fruits packed in 100 gauge/polyethylene bags of 2% vents showed less loss in weight, external appearance and also softening rate at all the storage periods compared to the control (unwrapped fruits) upto 4<sup>th</sup> day of storage. On 5<sup>th</sup> day, packed fruits showed 22.9% weight loss as against 29.8% in unpacked fruits. As far as external appearance (%) is concerned, the unpacked fruits showed only 42.9% external appearance on 4<sup>th</sup> day itself while in packed fruits even on 5<sup>th</sup> day it was 38.4%. Even 100% softening delayed by 1 day in packed fruits (i.e. 100% softening was occurred on 5<sup>th</sup> day). These results are agreement with Chaudhary *et al.* (1985) and Pareek (1993). Further it was observed that wrapping slows down the softening rate and increases the acceptability of external appearance by one more day than the unwrapped fruits. Similar findings were recorded by Chaudhary *et al.* (1985).

It is revealed from Table 2 effect of polyethylene packaging on chemical change in fruits that, initially the T.S.S., sugars and acidity content of fruits was very low and chlorophyll content was high in all the fruits. As fruits started ripening, a significant increase in T.S.S., sugars, acidity and decrease in chlorophyll content of fruits wrapped in polyethylene as well as in unwrapped fruits kept open were noted. On third day of storages, T.S.S., sugars, acidity was more in unwrapped fruits as compared to wrapped fruits. On 5<sup>th</sup> day onward, the T.S.S., sugars, and acidity

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