

## Effect of storage temperature and duration on shelf life and quality of pomegranate fruit

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### ABSTRACT

This investigation was carried out during 2009 and 2010 seasons to study the effect of storage temperature *i.e.* low temperature (4°C) and room temperature (22 ± 1°C) on physiological loss in weight %, fruit decay % and physico-chemical properties of the fruits of three pomegranate cultivars namely; Dholka, Bedana and Kandhari. Results showed that physiological loss in weight % and fruit decay % was gradually increased with time during storage and it was significantly higher in fruits stored at room temperature as compared with those stored at low temperature (4°C) and significant differences were observed between the three cultivars in both seasons. The physical properties of the fruits were significantly affected by the storage treatments among the cultivars in most cases. TSS % was significantly higher in fruits stored at room temperature (22 ± 1°C) as compared to those stored at low temperature (4°C). Acidity and ascorbic acid contents were also significantly affected by storage treatments. During storage, at all temperatures, TSS % was gradually increased with rise in temperature. Acidity and ascorbic acid content was decreased and showed a consistent trend. Fruits of pomegranate cultivars could be safely stored up-to 100 days when stored at low temperature (4°C) with minimum reduction in physiological weight loss %, fruit decay % and physico-chemical properties of fruits.

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**Key words :** Pomegranate, Storage, Temperature, Shelf life, Physico-chemical properties

### INTRODUCTION

Pomegranate (*Punica granatum* L.) is one of the important fruits of tropical and sub tropical regions of the country, which belongs to family puniceae. It is known for its versatile adaptability, hardy nature, less cost in orchard management, high yield potential. Fine table and therapeutical values made this fruit more lucrative and remunerative. Pomegranate is commercially cultivated in Iran, Afghanistan, Russia, Isreal, North and Latin American countries, Africa and India. Whereas in India, it is majorly cultivated in Maharashtra, Karnataka, Gujarat, Rajasthan, Andhra Pradesh and scattered parts of other states including (J&K, H.P. and Uttarakhand). India is world's leading producing country of pomegranate. It is cultivated in area of 109.2 (000 ha) and contribute 807.2 (000MT) production and productivity is 7.4 MT/ha (NHB, 2009). In India it is largely used as dessert fruit and for fresh juice (Pareek *et al.*, 2002). Pomegranate fruit is also used for making delicious juice and health drinks. The edible portion of pomegranate fruit is aril, which is nearly 68% of the total fruit containing 78 per cent moisture, 0.7 per cent mineral matter, 1.6 per cent protein, 0.1 per cent fat, 14.5 per cent carbohydrate and 5.1 per cent fiber. The fruits are rich in vitamins (0.06 mg

thiamine, 0.1 mg riboflavin, 0.3 mg niacin and 16.0 mg vitamin c per 100 g pulp) and minerals (10 mg calcium, 12 mg magnesium, 70 mg phosphorus and 0.3 mg iron per 100 g pulp). The juice of wild pomegranate is used to manufacture of citric acid and sodium citrate which is used for medicinal purpose. Ellagic acid which is particularly plentiful in pomegranate prevents carcinogen oxidation of cellular membranes (Annon, 2004). Recently eight improved high yielding varieties introduced in the region and among them Dholka, Bedana and Kandhari performed better in terms of yield and quality attributes (Mir *et al.*, 2007). Storage temperature is the most important environmental factor affecting senescence of fruits, because it regulates the rate of all associated physiological and biochemical processes. But very less information is available regarding the storage ability of these three commercial pomegranate cultivars under temperate condition. The effect of storage temperature on the keeping quality of some pomegranate cultivars was studied by Heikel *et al.* (1996) in Egypt, Kader *et al.* (1984) in USA and Al-Mughrabi and Bacha (1986) in Saudi Arabia. Keeping the importance of storage of pomegranate fruits in mind the present investigation was carried out to study the effect of different storage temperatures regime and duration on changes in