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Effect of ethylene absorbents on compression injury and quality of Santa Rosa Japanese plum (*Prunus salicina*) during transportation

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Plum is considered as one of the most important stone fruits of temperate origin. The climatic conditions of India favour the cultivation of Japanese plum (*Prunus salicina* Lindl.) because it is hardy in nature and thrives well under adverse edaphic and climatic conditions. In India, Japanese plum varieties like Beauty, Santa Rosa and Mariposa are grown commercially under sub-temperate climatic conditions, but Santa Rosa dominates because of its self-fruitfulness, prolific bearing habit and characteristic flavour (Chattopadhyay 2008).

After ripening, plum has a limited shelf-life of about 3-4 days only. Although under cold storage conditions, it can be stored for about 18-20 days. In India, plums are usually produced in far-flung areas located in different terrains and at high altitudes, and then transported to plains for marketing. Thus, its shelf-life or market life is further reduced drastically due to rough handling and poor storage conditions. Thus, such an important and valuable fruit remains in the market for a very limited period, and there is urgent need to extend its availability in the market through proper postharvest management practices.

Several practices and experiments have been conducted for proper postharvest management of plums. Among different postharvest management strategies, use of ethylene absorbents has been reported to be very useful in some fruits (Thakur *et al.* 2005). Ethylene absorbents counteract the deleterious effects of ethylene on fruit ripening, and softening and thereby enhance the postharvest life and quality drastically, which helps in extending the marketability of fruits (Thakur *et al.* 2005, Glahan 2006, Jang *et al.* 2006). Hence, the studies have been conducted to observe the effect of ethylene absorbents on compression injury and postharvest quality of Santa Rosa plums during transportation.

The studies were conducted in the Division of Post Harvest Technology, IARI, New Delhi in 2010. The plums of Santa Rosa variety were harvested at two stages of maturity, ie, climacteric (ready-to-eat) and pre-climacteric (ready-to-ripe) in the month of June, from a private orchard at Katrain, Kullu (Himachal Pradesh), and then packed in corrugated fibre board boxes (5 kg capacity) by placing different ethylene absorbent ($KMnO_4$ impregnated chalks, $KMnO_4$ impregnated newspaper shreds, ethylene absorbent sachets) at bottom, middle and top of fruits. Plums packed traditionally served as control. After packing, plums were transported to Delhi by road. In the lab, observations on compression injury, weight loss, fruit firmness, total soluble solids, acidity, and ascorbic acid content were recorded. Compression injury was recorded by counting the fruits damaged by pressure during transportation, and represented as percentage (%). The physiological loss in weight was determined by subtracting the final fruit weight from the initial weight and represented as percentage (%). Fruit firmness was determined by using a texture analyzer (model: TA+Di, Stable micro systems, UK) and represented as N (Newton). Total soluble solids were estimated by using Fisher Hand Refractometer (0-50) and expressed as Degree Brix (ºB) at 20°C. Titratable acidity was determined by titrating a known amount of fruit sample against 0.1 N NaOH using a few drops of 1% phenolphthalein solution as indicator, and expressed as percentage (%). Ascorbic acid content were determined as per method of Ranganna (1999), and represented as mg of ascorbic acid/100 g fruit pulp. The experiment was laid out in factorial CRD design with each treatment consisting of 60 fruits with 5 replications. The data obtained from the experiments were analysed as per design and the results were compared from ANOVA by calculating the critical difference (CD) (Panse and Sukhatme 1984).

The compression injury in Santa Rosa plums during transportation was significantly lower in pre-climacteric stage of maturity (5.6%) than climacteric stage of maturity (15.5%) (Fig 1). Further, the compression injury was significantly

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