

1-Methylcyclopropene influences biochemical attributes and fruit softening enzymes of ‘Santa Rosa’ Japanese plum (*Prunus salicina* Lindl.)

Swati Sharma · R. R. Sharma · R. K. Pal · Vijay Paul · Anil Dahuja

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Abstract Postharvest life of plum is only 3–4 days, and to make it available for longer period in the market, studies were conducted with the use of 1-MCP (1-Methylcyclopropene) at two maturity stages (climacteric and pre-climacteric) of ‘Santa Rosa’ plums i.e., plums were treated with 1-MCP (0.0, 0.5, 1.0, 1.5 $\mu\text{L L}^{-1}$ and $\frac{1}{4}$ Celfresh tablet) for 24 h at 20°C. After packaging the treated and untreated plums in CFB boxes, these were transported to Delhi, and stored at super market conditions. During storage observations on biochemical attributes and fruit softening enzymes were recorded at 3 day’s interval. Our results revealed that all parameters of plums were significantly influenced by maturity stage, and 1-MCP treatment. All 1-MCP treatments have maintained significantly higher levels of phenols, AOX (Antioxidants), anthocyanin content, and delayed fruit ripening and softening by interfering with fruit softening enzymes like PG (Polygalacturonase) and PME (Pectin methyl esterase). In general, fruits of climacteric stage have higher levels of phenolic and anthocyanin contents and AOX activity than plums of pre-climacteric stage. The activities of fruit softening enzymes like PG and PME

were significantly influenced by all concentrations of 1-MCP, but the best inhibition was observed in Celfresh treated plums. Thus, Celfresh tablet can be used for extending the marketability of ‘Santa Rosa’ plums for about 6 days.

Keywords 1-MCP · Phenolic content · Antioxidant activity · Polygalacturonase activity · Pectin methyl esterase activity

Abbreviations

1-MCP	1-methylcyclopropene
$\mu\text{L L}^{-1}$	Microlitre per litre
PG	Polygalactouronase
AOX	Antioxidants
PME	Pectin methyl esterase

Plum is an important stone fruit of temperate origin. In India, ‘Santa Rosa’ is the leading cultivar of plum because it is self-fruitful, prolific bearer and has characteristic flavour (Chattopadhyay 2008). For nearby markets, plums are harvested at climacteric stage of maturity and for distant markets, these are harvested at pre-climacteric stage. Plums harvested at climacteric stage usually attain attractive peel colour and have better flavour than pre-climacteric stage. Thus, stage of maturity has significant influence on colour, texture, and postharvest quality attributes of plum. Usually, after ripening, plum has a shelf life of about 3–4 days only because fruit softening is a major factor limiting its shipping, storage and shelf life. Fruit softening is also associated with fruit quality of plums (Chin et al. 1999). Its shelf life is further reduced drastically due to rough handling at farm, transportation or storage. 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 through proper postharvest management practices. Postharvest

S. Sharma · R. R. Sharma (✉) · R. K. Pal
Division of Post Harvest Technology, Indian Agricultural
Research Institute,
New Delhi 110 012, India
e-mail: rrs_fht@rediffmail.com

V. Paul
Division of Plant Physiology, Indian Agricultural
Research Institute,
New Delhi 110 012, India

A. Dahuja
Division of Biochemistry, Indian Agricultural Research Institute,
New Delhi 110 012, India