

**Title** 1-MCP regulates ethylene biosynthesis and fruit softening during ripening of ‘Tegan Blue’ plum

**Author** Ahmad S. Khan and Zora Singh

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#### **Abstract**

To investigate the effects of postharvest application of 1-MCP on ethylene production and fruit softening, activities of ethylene biosynthesis and fruit softening enzymes were measured during postharvest ripening of plum (*Prunus salicina* Lindl. cv. Tegan Blue) fruit after being exposed to 1-MCP (0, 0.5, 1.0 or 2.0  $\mu\text{L L}^{-1}$ ) at  $20 \pm 1$  °C for 24 h. Following the treatments, fruit were allowed to ripen at ambient temperature ( $20 \pm 1$  °C), and ethylene production in fruit, activities of ACS and ACO, ACC content and fruit softening enzymes (PE, EGase, exo-PG and endo-PG) in fruit skin and pulp were recorded at different intervals. Postharvest application of 1-MCP significantly delayed and suppressed the climacteric ethylene production with reduction in the activities of ethylene biosynthesis enzymes (ACS, ACO) and ACC content, and fruit softening enzymes (PE, EGase, exo-PG and endo-PG) in the skin as well as in pulp tissues. The reduction was more pronounced with increased concentrations of 1-MCP. 1-MCP treated fruit showed different rates of fruit softening and activities of ethylene biosynthesis enzymes in the skin and pulp tissues which warrant further investigation on regulation of gene expression related to these enzymes with the inhibitory effect of 1-MCP.