

The application of 1-methylcyclopropene preserves the postharvest quality of cabbage by inhibiting ethylene production, delaying chlorophyll breakdown and increasing antioxidant capacity

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Abstract

Freshly harvested cabbages were treated with air (control group) or $1 \mu\text{L L}^{-1}$ 1-methylcyclopropene (1-MCP) for 12 h, followed by storage for 8 d at $25 \pm 1 \text{ }^\circ\text{C}$. The effects of 1-MCP on postharvest deterioration characteristics, antioxidant capacity, health-promoting compounds and nitrite accumulation in cabbage leaves were investigated. Treatment with 1-MCP significantly extended the shelf life, reduced postharvest deterioration, retarded chlorophyll degradation and inhibited the accumulation of malondialdehyde and nitrite in cabbage. Ethylene production and respiration rate were also inhibited by 1-MCP. Furthermore, 1-MCP treatment delayed the decrease in total glucosinolates, sulforaphane and folic acid during storage. High levels of ascorbic acid, total phenolic content and antioxidant capacity were also maintained in 1-MCP-treated cabbage. This study demonstrates that 1-MCP is a potential postharvest treatment to delay the senescence process, maintain desirable quality properties and reduce the loss of certain health-promoting compounds in cabbage.