Protective effects of 1-methylcyclopropene and salicylic acid on senescence regulation of gladiolus cut spikes

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Abstract:

Reports indicate that senescence in cut flowers is accelerated. Therefore, the effects of 1-methylcyclopropene (1-MCP) or salicylic acid (SA) on the postharvest quality of gladiolus cut flowers and whether these treatments can regulate the flower senescence were investigated. Two concentrations of each 1-MCP (0.2 and 0.4 g m⁻³) or SA (0.5 and 1 mM) were studied. The control spikes were kept in distilled water. 1-MCP or SA treatments significantly prolonged the vase life and minimized the weight loss of gladiolus spikes compared with the control. Both treatments enhanced the relative water content (RWC) of leaves and maintained chlorophyll content compared with the control values, which were decreased. Ethylene production, proline accumulation and malondialdehyde content were increased in florets of untreated spikes. 1-MCP or SA reduced ethylene production, decreased both proline content and malondialdehyde level and hence maintained membrane stability. An increase in floret antioxidant enzyme activities (CAT, SOD and POX) was observed in 1-MCP- or SA-treated spikes compared with the control. The effects of 1-MCP or SA on floret senescence seemed not entirely limited due to their effects on ethylene, but they most likely had a sustainable impact on the above-tested physiological parameters.

Keywords:

Gladiolus; Vase life; Ethylene; 1-MCP; SA; Antioxidant enzyme activity

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