

Title The effects of 1-methylcyclopene on shelf life and quality of three leafy vegetables
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Abstract

Leafy vegetables generally have a very short shelf life due to rapid yellowing caused by chlorophyll degradation and decline in quality during storage at ambient temperature, which often causes significant commercial losses. Since the ethylene binding inhibitor, 1-methylcyclopene (1-MCP), has been shown to substantially prolong shelf life in various ornamentals, fruits and vegetables, the effects of different concentrations of 1-MCP on shelf life and quality of three leafy vegetables (California Burclover, India Horseorchid, and Shepherd's purse) during storage at 20°C were examined. The results indicated that the leaf yellowing of all these vegetables was significantly inhibited by treatments with 0.5µL/L or higher concentrations of 1-MCP, thus prolonged the shelf life. Treatment with 0.5µL/L 1-MCP increased the shelf life of California Burclover, India Horseorchid and Shepherd's purse by 37.5%, 23.8% and 36.8%, respectively, compared to the control. Above 0.5µL/L, increasing 1-MCP concentrations (up to 5µL/L) did not result in further increase in the shelf life of the three vegetables, indicating that the ethylene receptors were nearly saturated by 0.5µL/L 1-MCP. Therefore, the effects of 0.5µL/L 1-MCP on some quality parameters of all three vegetables were further investigated in this paper. The contents of chlorophyll and soluble protein and hue angle value in the leaves declined during storage, except for a slight increase in soluble protein content on the 4th day in the California Burclover, possibly due to the synthesis of some hydrolases. 0.5µL/L 1-MCP treatment significantly delayed the decrease in chlorophyll and soluble protein contents and hue angle value, especially in California Burclover and India Horseorchid. These results suggest 1-MCP may of commercial use to increase shelf life and maintain quality of the three leafy vegetables.