

Abstract:

Broccoli is a highly perishable floral vegetable whose postharvest quality is influenced by temperature and ethylene. Endogenously produced or exogenously applied ethylene promotes sepal yellowing and shortens storage life, whereas low temperature delays color changes and prolongs storage life. We tested the effectiveness of the ethylene action inhibitor, 1-methylcyclopropene (1-MCP), as a complement to refrigerated storage to maintain postharvest quality of broccoli. 'Marathon' broccoli (*Brassica oleracea* var. *italica*) heads were treated with $2 \mu\text{l}\cdot\text{L}^{-1}$ of 1-MCP and stored at 1, 10, and 20 °C. Untreated broccoli heads used as controls were stored at the same temperatures. Potential storage life, as judged by overall appearance, was 2, 12, and 76 days for untreated broccoli stored at 20, 10, and 1 °C, respectively. Treatment with 1-MCP increased storage life by 50% at 20 °C, 67% at 10 °C, and 13% at 1 °C. The color of harvested broccoli evolved in two different stages. During phase I, immediately following harvest, color remained unchanged, whereas during subsequent phase II, the hue angle declined and chroma and lightness increased. Storage temperature affected the duration of phase I and rate of color changes during phase II. In contrast, 1-MCP increased the duration of phase I, but did not affect the rate of color changes during phase II. The results indicate that there is little practical benefit to 1-MCP application at 20 °C and 0 °C. However, at 10 °C, typical of retail temperatures, the use of 1-MCP contributed to the maintenance of postharvest quality of broccoli.