

Title Ozone and 1-methylcyclopropene alter the postharvest quality of broccoli.
Authors Song, J. and Fan, L. H.
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Abstract

Fresh broccoli (*Brassica oleracea* var. *italica*) florets untreated or treated with 1 micro l 1-methylcyclopropene (1-MCP)/litre for 14 h, were stored at 12 deg C with 0, 200, or 700 nl ozone/litre. Senescence parameters were evaluated after 0, 1, 2, 5, 8, or 12 days of storage. Treatment with 1-MCP delayed the yellowing of florets, and at day 5, the hue angle of 1-MCP-treated florets was 116 deg (green) compared to 102 deg (yellow) for the control. Respiration rates of florets were reduced by 1-MCP for the first 5 days. The 1-MCP treatment maintained the highest chlorophyll fluorescence expressed as Fv/Fm at 12 days of storage. Moreover, 1-MCP reduced the dimethyl trisulfide production, which contributes to the off-odour development in broccoli florets. Compared with the controls, florets stored in 200 nl ozone/litre had less mould growth and yellowed more slowly, but no differences were observed in respiration, ethylene production, or Fv/Fm. Florets stored in 700 nl ozone/litre were greener than florets held in air or 200 nl ozone/litre. Interestingly, chlorophyll fluorescence of the florets stored in 700 nl ozone/litre decreased significantly, and at day 12, Fv/Fm was only 30% of its initial value. Ozone at 700 nl/litre stimulated respiration and ethylene production of florets after one day of storage, and caused visible damage in the form of increased weight loss and browning of the floret stem ends. Treatment of broccoli with 1-MCP alone or in combination with 200 nl ozone/litre maintained the quality and extended the shelf life of broccoli florets.