

Title Effects of chlorine dioxide gas on postharvest physiology and storage quality of green bell pepper (*Capsicum frutescens* L. var. Longrum)

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Abstract

The effects of treatment of chlorine dioxide (ClO₂) gas on postharvest physiology and preservation quality of green bell peppers were studied. Green bell peppers were collected in bags and treated with 0, 5, 10, 20, and 50 mg L⁻¹ ClO₂ gas at 10 ± 0.5°C for over 40 d, and the changes in postharvest physiology and preservation quality of the peppers were evaluated during the storage. The inhibition of rot of the peppers was observed for all the tested ClO₂ gas treatments. The rot rates of the treated samples were 50% lesser than those of the control after day 40 of storage. The highest inhibitory effect was obtained after 50 mg L⁻¹ ClO₂ gas treatment, where the peppers did not decay until day 30 and showed only one-fourth of the rot rate of the control at day 40 of storage. The respiratory activity of the peppers was significantly (*P*<0.05) inhibited by 20 and 50 mg L⁻¹ ClO₂ treatments, whereas no significant effects on respiratory activity were observed with 5 and 10 mg L⁻¹ ClO₂ treatments (*P*>0.05). Except for 50 mg L⁻¹ ClO₂, malondialdehyde (MDA) contents in the peppers treated with 5, 10, or 20 mg L⁻¹ ClO₂ were not significantly (*P*>0.05) different from those in the control. Degradation of chlorophyll in the peppers was delayed by 5 mg L⁻¹ ClO₂, but promoted by 10, 20, or 50 mg L⁻¹ ClO₂. The vitamin C content, titratable acidity, and total soluble solids of the peppers treated by all the tested ClO₂ gas did not significantly change during the storage. The results suggested that ClO₂ gas treatment effectively delayed the postharvest physiological transformation of green peppers, inhibited decay and respiration, maintained some nutritional and sensory quality, and retarded MDA accumulation.