Effect of a Ma box combined with high carbon dioxide on preservation qualities of strawberry

B.G. Wang, X.Y. Feng, W.S. Li, J.J. Yang, Y. Yang, L. Shi

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Abstract

Effects of a modified atmosphere box (MAB) combined with high CO_2 on quality of harvested strawberry (*Fragaria × ananassa* Duch. 'Tianxiang') were evaluated in this study. Strawberry fruit were stored in MAB filled with around 10% CO_2 for 20 days at 0±0.5°C, 90-95% RH. Results showed that CO_2 and O_2 concentration in MAB during storage were kept at 9.5-11.2% and 12.2-16.2%, respectively. The fruit stored in MAB maintained higher firmness, vitamin C and total phenolics than those of control fruits during storage. The increase of total anthocyanin levels in fruit were delayed by MAB treatment. No significant differences in soluble solids content was observed between treated and control fruit ($P > 0.05$). Sucrose content in treated fruits was higher than that in control fruit during storage at 0°C. Changes in the concentrations of glucose and fructose were similar in treated and control fruits. After four days of storage, fructose or glucose in strawberry treated with MAB were lower than those in the control. MAB treatment decreased the malic acid level and increased citric acid and succinic acid levels during storage. Decay incidence after 20 days of storage and additional two days at 20°C was reduced significantly by MAB treatment ($P < 0.05$). Activities of antioxidant enzymes including peroxidase and superoxide dismutase of strawberry in MAB were all significantly higher than those of control fruits ($P<0.05$). These results indicated that MAB combined with 10% CO_2 treatment could be used as an effective and convenient method to preserve the postharvest life of strawberry fruit.