

Title Impacts of aqueous 1-methylcyclopropene on edible period and quality of banana fruit
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Abstract

1-methylcyclopropene (1-MCP) is being commercially used to suppress ethylene-mediated ripening and senescence in various fruits and vegetables. Generally, 1-MCP exposure to them is accomplished via treatment with gas in sealed containers. However, the availability of this method could be limited in commercial situations because the treatment requires the use of facilities and a long period. Thus, in this research, effects of immersion in aqueous 1-MCP (Rohm & Haas Japan Co., Ltd.) on the ripening of banana fruit were investigated. Mature green banana fruit were immersed in water (control) or 0.1, 1, 10, 50, 100, or 1,000 $\mu\text{g L}^{-1}$ of aqueous 1-MCP for 10 min 2 days after start of ethylene treatment (DASE) and stored at 20°C in the dark. In fruit treated at 50, 100, and 1,000 $\mu\text{g L}^{-1}$, an increase in the color score was suppressed, and the ratio of the brown-spotted area to the surface area increased slightly and remained low until 12 DASE. To investigate effects of the duration of immersion on ripening, fruit were immersed in 100 $\mu\text{g L}^{-1}$ of aqueous 1-MCP for 0.5, 1, 3, 6, 10, or 15 min or not (control) 2 DASE and stored at 20°C in the dark. In fruit treated for 10 and 15 min, increases in the score and the ratios were suppressed. The internal quality of fruit immersed in aqueous 1-MCP at 100 $\mu\text{g L}^{-1}$ for 10 min, which was effective and efficient to suppress ripening, was similar to that of the control, which shows the treatment has no negative impacts, and the edible period was prolonged more than twice. 1-MCP-treated fruit had higher ethylene production rates and lower respiration rates comparing to the control. These results suggest that treatment of banana fruit with aqueous 1-MCP could be a practical postharvest application because of the availability.