Preharvest 1-methylcyclopropene treatment effects on fruit quality attributes and targeted metabolites in ‘Wonhwang’ pears stored at room temperature after cold storage

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Abstract

Preharvest 1-methylcyclopropene (1-MCP) spray treatment effects on fruit quality attributes and targeted metabolites were investigated in ‘Wonhwang’ Asian pears during the shelf-life period following cold storage. The preharvest 1-MCP treatment was sprayed 1 week before harvest, and then the pears were stored at 1°C for up to 3 months and then transferred to room-temperature conditions for the shelf-life period. The soluble solids content (SSC) was higher in the preharvest 1-MCP-treated fruit than in untreated fruit at harvest and during the second half of the shelf-life period after cold storage. However, preharvest 1-MCP treatment aggravated the incidence and severity of flesh browning. The contents of asparagine, histidine, valine, and isoleucine were higher in the preharvest 1-MCP-treated fruit than in the untreated fruit during the shelf-life period after cold storage. The results of principal component analysis loading plot indicated that preharvest 1-MCP treatment was strongly associated with leucine, tryptophan, histidine, valine, and isoleucine. In addition, the results of Pearson's correlation coefficient networking indicated that preharvest 1-MCP treatment affected the differential responses of fruit quality attributes and targeted metabolites during the shelf-life period after cold storage. Therefore, the results suggested that preharvest 1-MCP treatment could alter SSC levels and certain targeted metabolites along with internal tissue colour variables in ‘Wonhwang’ pears during the shelf-life period after short-term cold storage.