The role of ethylene and 1-MCP in early-season sweet cherry 'Burlat' storage life

Manuel Joaquín Serradilla, Natalia Falagán, Barbara Bohmer, Leon A. Terry and M. Carmen Alamar

Scientia Horticulturae 258: 108787. (2019)

Abstract

Sweet cherries (*Prunus avium* L.) are highly appreciated because of their bioactive compound content and attractive organoleptic characteristics; however, they are very perishable. The aim of this work was to investigate whether ethylene and its antagonist 1-MCP affect the postharvest quality of an early-season sweet cherry cultivar, allowing storage life extension. 'Burlat' sweet cherries were subjected to three treatments at 1 °C for one month: i) control (air); ii) continuous ethylene supplementation (10 μL L^{-1}); and iii) 1-Methylcyclopropene (1-MCP; 1 μL L^{-1} for 24 h) followed by air. The incidence of postharvest physiological disorders, the evolution of physical and functional quality traits, and fruit senescence were evaluated at 0, 7, 14, 21, and 30 days. Results showed that sweet cherries were sensitive to both ethylene and 1-MCP treatments. Continuous ethylene exposure reduced abscisic acid accumulation, resulting in higher weight and firmness loss. Moreover, ethylene application decreased titratable acidity through storage, indicating an effect on sweet cherry senescence. No significant differences among treatments were found for soluble solids content and individual sugars. Conversely, 1-MCP preserved firmness during the first 7 days of storage, while reduced the incidence of physiological disorders at the end of storage life. Furthermore, 1-MCP delayed the accumulation of cyanidin-3-*O*-glucoside for 7 days compared to control and ethylene treated cherries. Taken together these results highlight the potential use of 1-MCP to extend the postharevst life of early season sweet cherry fruit