

**Title** Effect of temperature and exogenous ethylene on the physiological and quality traits of purslane (*Portulaca oleracea* L.) leaves during storage

**Author** Raffaella Rinaldi, Maria Luisa Amodio and Giancarlo Colelli

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### Abstract

The effect of storage conditions on shelf life of purslane leaves (*Portulaca oleracea* L.) was investigated. In a first trial, fresh leaves were harvested and stored under different temperatures (0, 5, and 10 °C) for 17 days. Storage temperature significantly affected color, visual quality, respiration rate, ethylene production, weight loss, vitamin C content, antioxidant activity, total phenolic and total and soluble oxalic acid contents. Leaves stored at 10 °C did not withstand the entire storage period, being judged not marketable after 8 days, while leaves stored at 0 and 5 °C were still marketable after 13 and 10 days, respectively. Samples stored at 10 °C showed a lower hue angle value and a higher chlorophyll loss compared to other samples, while no symptom of chilling injury was observed in leaves stored at 0 and 5 °C. Respiration rate significantly increased with increasing storage temperature; ethylene production was also affected by storage temperature, although values were very low (<1 nL C<sub>2</sub>H<sub>4</sub>/kg/h at 10 °C). Vitamin C was more sensitive to postharvest deterioration during storage and a marked reduction was observed in samples stored at 10 °C. In addition, purslane was found to be high in antioxidants (192 mg TEAC/100 g fw, at harvest) and total phenols (471 mg GAE/100 g fw) and the decline observed during storage was influenced by temperature. A second trial was performed in order to evaluate the effect of exogenous ethylene on leaves during storage at two temperatures. Fresh leaves were harvested and exposed to air (as control), and to 0.1, 1, and 10 µL/L of ethylene for 15 days at 0 and 15 °C. Exposure to C<sub>2</sub>H<sub>4</sub> affected respiration rate, color and overall appearance but only at 15 °C and for high ethylene concentrations (1 and 10 µL/L). Leaves did not withstand the entire storage period and marketable life was about 7 days at 15 °C, except for leaves exposed to 10 µL/L of C<sub>2</sub>H<sub>4</sub>, while for all samples held at 0 °C marketable life exceeded 10 days. Loss of marketability was due to yellowing and discoloration. It is concluded that purslane is not chilling sensitive, can be stored successfully at low temperatures, produces very small amounts of ethylene and is not sensitive to a low concentration of ethylene, especially when exposure occurs at low temperature.