

Title Antioxidant capacity of fresh-cut produce may increase after applying ethylene and methyl jasmonate
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Abstract

Phenolics compounds are important secondary metabolites found in fruits and vegetables, which can act as free radical scavengers and be an important source of natural antioxidants. It is known that ethylene as well as methyl jasmonate can promote the synthesis of phenolic compounds in plant tissues, thus the use of these plant hormones in fresh-cut tissues may have the potential to enhance health promoting antioxidant compounds. The objective of this study was to determine the role of ethylene and methyl jasmonate on the increase of health promoting antioxidant compounds in different fresh-cut produce. Lettuce, cilantro, green beans, asparagus, carrots, potatoes, apples, plums, peaches, table grapes, strawberries, radishes, cabbage, bell peppers, jicama and celery were fresh-cut and stored in dark condition at 23 °C. Ethylene (1000 ppm) and methyl jasmonate (250 ppm) were applied to the fresh-cut and whole tissues (control). Sampling was done after 2 d of storage and total phenolics, antioxidant capacity (AOX) and phenylalanine ammonia-lyase (PAL) activity were evaluated spectrophotometrically. Results showed no significant increase in phenolic content and AOX was observed on treated whole tissues (controls). However, wounding increased the phenolic content (~0.2-fold) and AOX (~0.5-fold) of celery, onion and jicama, and also the phenolic content (~0.5-fold) and AOX (~2.5-fold) of lettuce and carrots. When combining wounding and ethylene there was a higher increase in phenolic content (~1.2-fold) and AOX (4-8 fold) for these same tissues. On the other hand, methyl jasmonate only showed slight increase in antioxidants compared to the wounded tissue. The increase in PAL activity increased with the corresponding increase in total phenolics. This study shows that plant hormones combined with wounding can be used to enhance the health promoting antioxidant content of fresh-cut produce.