

Title Ethylene treatment of 'Hayward' kiwifruits (*Actinidia deliciosa*) during ripening and its influence on ethylene biosynthesis and antioxidant activity

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### Abstract

The aim of this investigation was to assess the influence of ethylene treatment on ethylene biosynthesis and on antioxidant activity in kiwifruits during ripening. Kiwifruits were treated with ethylene of  $100 \mu\text{g ml}^{-1}$  at  $20 \text{ }^{\circ}\text{C}$  for 24 h and then the ripening process at the same temperature was observed for 10 additional days. It was found that in treated fruits: (a) the flesh firmness in the early stage of ripening was significantly decreased in treated samples, (b) the contents of free sugars, soluble solids, ethylene, respiration and sensory value were increased and were significantly higher than in untreated fruits, (c) the ethylene biosynthesis was increased simultaneously with increase in 1-aminocyclopropane-1-carboxylic acid (ACC) content, ACC synthase (ACS) and ACC oxidase (ACO) activities, (d) the polyphenols content and the related antioxidant activity were increased significantly higher than in the untreated fruits and (e) the acidity and pH were not influenced by ethylene treatment.

In conclusion, the ethylene treatment of kiwifruits significantly increases its ethylene biosynthesis, the contents of total polyphenols and the antioxidant activity in comparison with untreated samples. ACS and ACO are the key enzymes, which control the rate of ethylene biosynthesis in kiwifruits.