

**Title** Ethanol vapor vacuum infiltration of tomatoes: morphological analysis and effect on ripening and eating quality.

**Authors** Ratanachinakorn, B., Klieber, A. and Simons, D. H.

**Citation** Journal of the American Society for Horticultural Science. Volume 124, Number 3, May 1999. Pages 283-288.

**Keywords** *Lycopersicon esculentum*; flavor; aroma; acetaldehyde

#### **Abstract**

Tomatoes (*Lycopersicon esculentum* Mill. 'Bermuda') were vacuum infiltrated at the breaker stage with 25 to 55 mL·L<sup>-1</sup> ethanol (EtOH) vapor at a 10 kPa pressure for 5 minutes and then held for a further period before ripening in air at 22 °C. Fruit could tolerate these EtOH vapor concentrations for no longer than 0 to 12 hours after vacuum infiltration, depending on concentration; otherwise skin pitting, uneven ripening and off-flavors resulted. Noninjurious conditions delayed ripening, as judged by color change, by an additional 1 to 5 days compared with 4 days for the control; aroma or flavor were not altered as determined by a trained taste panel, except in extreme conditions where in some cases off-flavors increased. Soluble solids and titratable acidity did not vary, but pH increased by 0.1 units in some treatments. In control fruit EtOH was found only in the gel tissue, and acetaldehyde (AA) was higher in the gel tissue compared with the pericarp and columella, indicating different metabolic behavior of the various tomato tissues. During vacuum exposure, EtOH moved through the stem scar and to a much lesser extent through the epidermis; during subsequent exposure to EtOH more EtOH moved through the epidermis than before, but still less than through the stem scar. AA increased following EtOH uptake, but all increases in EtOH and AA disappeared before fruit ripened.