

Title Postharvest ethylene treatment affects berry dehydration, polyphenol and anthocyanin content by increasing the activity of cell wall enzymes in Aleatico wine grape

Author Rinaldo Botondi, Luigi Lodola and Fabio Mencarelli

Citation European Food Research and Technology, 232, Number 4, 679-685, 2011

Keywords PME; PG; Ethylene; Grape; Polyphenols; Anthocyanins

Abstract

Ethylene is known to induce cell wall degradation by acting on cell wall enzymes. Thus, the objective of this experimental study was to evaluate the effect of ethylene on weight loss in Aleatico wine grape during dehydration and whether this effect was due to cell wall enzyme activation. Moreover, the effect on polyphenol, anthocyanin content, and volatile compounds was studied. Aleatico red grapes (*Vitis vinifera* L, cv Aleatico) were treated with 1,000 $\mu\text{L/L}$ of ethylene in air for 48 h at 20 °C and high relative humidity (RH). Control grapes were untreated. After 48 h, grape clusters were placed at 45% RH, 20 °C, and 1 m/sec air flow (dehydration treatment) to dehydrate until reaching 40% of weight loss (wl). Pectin methylesterase (PME), polygalacturonase (PG), α galactosidase, and β glucosidase were analyzed during dehydration treatment. Weight loss in ethylene-treated berries was about 6% higher than in control grapes, and PME, PG, galactosidase, and glucosidase activities had increased. During dehydration, the concentration of polyphenols and anthocyanins in ethylene-treated grape was higher than in untreated grape. Geraniol and citronellol peak areas rose slightly in ethylene-treated grapes following the pattern of β glucosidase, but the total peak area of terpene alcohols decreased. Ethylene increased the concentration of anthocyanins and polyphenols during dehydration.

<http://www.springerlink.com/content/tu55555q43833x1/fulltext.pdf>