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Effect of low oxygen storage conditions on volatile emissions and anaerobic metabolite concentrations in two plum fruit cultivars

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By harvest time, small amounts of acetaldehyde were accumulated in the flesh of plums, such as 0.31 mg/l for the cv. Stanley and 1.03 mg/l for the cv. Valjevka. This relative difference in concentrations remained constant throughout the whole period of storage in a regular atmosphere. The long-term effects of higher concentrations of CO₂ are the same as for very low oxygen concentrations; and significant amounts of ethanol accumulate in the tissue. Out of a total number of 42 different odour compounds identified in the juice, there were 11 alcohols, 6 aldehydes, 17 esters, 2 terpenes, 3 organic acids, and 1 lactone. Very low oxygen atmospheres slow down the production of esters and aldehydes, but have little effect on the production of lactones and terpenes. It was shown that a very low oxygen concentration, without much CO₂ (Fluctuating anaerobiosis treatment), does not encourage the production of significant amounts of ethanol and acetaldehyde in the fruit flesh, but does significantly slow the biosynthesis of aromatic volatiles.

Keywords:

plum fruit; volatiles; ethanol; acetaldehyde; firmness; headspace gas analysis

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