

**Title** Postharvest response of plum fruits (*Prunus domestica* L.) to low oxygen atmosphere storage  
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**Citation** ISHS Acta Horticulturae 734:431-440. 2007.  
**Keywords** ethanol; acetaldehyde; low oxygen; firmness; quality evaluation; controlled atmosphere

### **Abstract**

Fruits of the plum cultivars 'President' and 'Valjevka' (*Prunus domestica* L.) were kept for 30 days at 3.0 - 3.3°C under ultra-low oxygen storage (ULO = 0.9% O<sub>2</sub> and 1.0% CO<sub>2</sub>), controlled atmosphere (CA = 2.0% O<sub>2</sub> and 12.0% CO<sub>2</sub>), anaerobiosis (AN = 0.2% O<sub>2</sub> and 1.0% CO<sub>2</sub>), PE film (PE = 8% O<sub>2</sub> and 11.0% CO<sub>2</sub>), and regular atmosphere (RA = 21% O<sub>2</sub> and 0.03% CO<sub>2</sub>). Relationships between the effects of the composition of O<sub>2</sub> and CO<sub>2</sub> content during this period and after the removal from storage and the content of ethanol and acetaldehyde, sensorial value and some textural values of the fruits were investigated. Concentrations of ethanol in the flesh are related to levels of oxygen and CO<sub>2</sub> in ambient atmosphere. At anaerobic conditions (0.3% O<sub>2</sub>), the ethanol reached 1099 mg L<sup>-1</sup> for cv. 'Valjevka' and 940 mg L<sup>-1</sup> for cv. 'President', respectively, while it was low in normal atmosphere. Subsequent exposition of the fruit to air but still under cold-storage temperature resulted in linear or exponential decrease of ethanol to half or even one third of its previous value. Low oxygen atmosphere (ULO) is beneficial for storage of plum fruits. The concentration of oxygen at a level of 0.9% does not harm the tissues of plums physiologically. The atmosphere composition (CA - 2% O<sub>2</sub> and 12.0% CO<sub>2</sub>) resulted in increased ethanol level in the tissue before its placement into cold-storage conditions. Cold-storage of plum fruit led to increase in ethanol during the senescence stage. Skin firmness was higher for cultivar 'Valjevka'. At an informal tasting carried out during fruit quality evaluation, no noticeable off-flavour was detected, not even in the fruits from anaerobic conditions.