

Title Physiological responses of potato 'Danshaku' to low oxygen atmospheres
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Abstract

Potato cv. Danshaku was harvested from the experimental farm of Osaka Prefecture University (Japan). These crops were stored under a continuous flow of 0 and 1% O₂ (balance N₂) or air for 7 days at 20 deg C. Acetaldehyde concentration in potato at 0% O₂ increased throughout the storage period. Likewise, ethanol concentration at 0% O₂ also increased and was higher than that of acetaldehyde. During storage in 1% O₂, air ethanol concentrations remained very low. Pyruvate decarboxylase (PDC) activity in potato in 1% O₂, while the activity at 0% O₂ remained at the same low level as the control. The activity of alcohol dehydrogenase (ADH) was about 10 times that of PDC during storage. Changes in ADH isoenzymes correlated well with changes in ADH activity. The concentrations of pyruvate in potatoes kept at 0 and 1% O₂ were higher than at air after day 3. NADH concentration was higher in potatoes exposed to 0% O₂ than those exposed to 1% O₂ or to air by day 3. The homogenate pH of potato exposed to 1% O₂ and air remained constant, while the pH decreased in potato at 0% O₂ during storage. Low O₂ treatment did not induce acetaldehyde and ethanol productions although the activities of PDC and ADH increased.