

Title Storage of horticultural products in closed rooms with TiO<sub>2</sub> photocatalyst: changes in room atmosphere and quality of fruits and cut flowers

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### **Abstract**

Storage of horticultural products in closed rooms often causes deterioration of the quality and shortens the storage period because of changes in the room atmospheres caused by respiration and secondary metabolism during storage. In our study, fruits or cut flowers were stored independently at 13-23°C in a closed chamber, and the effects of photocatalytic oxidation by TiO<sub>2</sub> on quality maintenance of horticultural products and changes in gas environment in the chamber were evaluated. Ethylene and carbon-dioxide concentrations in the chamber of the control sample (without TiO<sub>2</sub> photocatalyst) increased rapidly during storage, while those of treatment (with TiO<sub>2</sub> photocatalyst) increased gradually. Both fruit ripening and senescence of cut flowers stored with TiO<sub>2</sub> photocatalyst were delayed compared to those of control samples. When 'Otome-gokoro' strawberry fruits were stored at 13°C for 8 days, a decrease in sucrose concentrations was observed during storage, irrespective of photocatalytic oxidation. Hexose concentrations in the control did not change during storage, whereas those of treatment slightly increased. As a result, there was no significant decrease in the total sugar (sucrose + hexose) concentrations of treated strawberries. Malic acid concentrations also decreased during storage, irrespective of photocatalytic oxidation, whereas citric acid concentrations did not differ significantly between treated and untreated samples. Our results show that horticultural products can be effectively stored even in closed rooms by using TiO<sub>2</sub> photocatalytic oxidation.