

Title Postharvest Physiology of 'Life' Netted Melon Fruit as Influenced by Storage Temperature and TiO₂ Photocatalyst

Author T. Nishizawa, K. Okafuji and H. Murayama

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Abstract

Ripe fruits of a netted melon cultivar 'Life' (*Cucumis melo* L.) were stored in chambers controlled at 2, 10, or 20°C for 14 days, and then all fruits were kept at 20°C for 2 more days. In the chamber controlled at 10°C, the effect of photocatalytic oxidation by titanium-dioxide (with TiO₂) for the maintenance of fruit quality was also investigated. High flesh firmness was maintained for 14 day when fruit were stored at 2°C, while it decreased rapidly under 20°C and had lost commercial value by day 10. When fruit were stored at 10°C, the flesh firmness was between 2°C and 20°C. Fruit stored at 10°C in the chamber with TiO₂ photocatalyst maintained higher firmness than without TiO₂ photocatalyst but the firmness decreased rapidly during subsequent storage at 20°C and no difference was observed between with and without TiO₂ photocatalyst on day 16. The effects of storage temperature and TiO₂ photocatalyst on changes in the soluble solid content and total soluble sugar concentration were similar to those for flesh firmness. Among sugar components, only sucrose concentration decreased during storage. Cell wall polysaccharides in the water-soluble fractions decreased, while those in the Na₂CO₃-soluble fractions increased during storage, especially when fruit were stored at 20°C. Both surface subsidence of the rind and water-soaked flesh developed, especially at 20°C. When fruit were stored at 2°C for 14 days, no water-soaked flesh developed, even after transferring the fruit at 20°C for 2 more days, but severe surface subsidence occurred during storage at 2°C, resulting in loss of commercial value. On the other hand, only slight surface subsidence occurred during the storage at 10°C for 14 days but water-soaked flesh still developed, especially when the fruit were kept at 20°C for 2 more days. The use of TiO₂ photocatalyst at 10°C, however, could reduce the development of both surface subsidence and water-soaked flesh up to a certain level. In conclusion, therefore, 10°C with TiO₂ photocatalyst is the best storage condition for maintaining the fruit quality of 'Life' netted-melon fruit.