

Abstract

There is general trend of towards a continuous increase in fresh market sales of vegetables. A lot of methods have been investigated to improve quality and shelf life during marketing. In this study, N₂O gas that has been known as one of the potential gases for vegetables was used to extend the shelf life of some perishable vegetables, broccoli and mushroom. The effects of nitrous oxide (N₂O) on weight loss rate, L* a* b* values, respiration rate and ethylene forming enzyme (EFE) activity of broccolis and mushrooms were examined during storage at 20°C and 4°C. In addition, hardness and total soluble sugars were examined. Whole broccolis were treated with different concentrations of N₂O gas (N₂O 60%: O₂ 40% and N₂O 80%: O₂ 20%) for 24 hours and mushrooms were treated for 12 hours with same conditions. The change rates in weight loss of untreated broccoli were higher than the treated samples. Total color difference (ΔE) value increased during storage of all samples and treatment with 80% N₂O was effective at 20°C. Respiration rates of broccoli were reduced by 60% N₂O treatment at 20°C while those at 4°C were not significant differences. EFE activities were inhibited by 80% N₂O treatment. Water losses in the mushrooms were reduced by N₂O treatment and the effect was more remarkable at 4°C than at 20°C. Total color difference (ΔE) value increased during storage of all samples. (ΔE) value increased during storage of all samples. (ΔE values ranged from 0 to higher than 2, indicating noticeable visual changes in color could be perceived at a later stage of storage. Hardness of mushroom sharply decreased throughout storage period. The lowest of hardness values was found in mushrooms placed in controls. Respiratory rates of mushrooms reduced by N₂O treatment and the respiratory rates at 20°C were much higher than those of mushrooms at 4°C. This result was considered due to deterioration of the tissue, development of fungi and drying of mushroom by moisture loss. EFE activities were delayed or inhibited in the treatments of N₂O.