Title Effect of polymeric film and ethylene scrubber on shelf life of leafy vegetable during ambient and cold storage

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Abstract

Kangkong (*Ipomoea aquatica*) and Chinese mustard (*Brassica juncea* var. *rugosa*) are popular leafy vegetables and common market items in Vietnam. Their production and marketing are severely constrained by rapid wilting and yellowing after harvest. Modified atmosphere packaging and storage trials were conducted to identify treatments that could improve shelf life. Freshly harvested, defect-free kangkong shoots 25 cm in length and whole Chinese mustard heads were held in 25 micron-thick low-density polyethylene or polypropylene film with and without ten 5 mm-diameter perforations per kg produce and with or without 0.1-0.4% potassium permanganate in sachet as an ethylene scrubber. Produce in the open served as control. Storage was done at ambient (22-27°C) or in a cold chamber (13°C). As expected, both vegetables deteriorated in quality more rapidly at ambient than at 13°C. All treatments remarkably reduced weight loss regardless of storage condition. Ethylene scrubbing decreased ethylene levels inside the plastic bag and reduced leaf yellowing but were not sufficient to further increase shelf life. The non-perforated low-density polyethylene was the most promising film for kangkong at ambient, reducing weight loss to 2% from 22% in the open after three days of storage. At 13°C, both non-perforated low-density polyethylene and polypropylene were equally effective in reducing weight loss to 1.5% from 35% in the open after nine days of storage. Shelf life was only one day at ambient and 2-3 days at 13°C in the open due mainly to wilting. With modified atmosphere packaging, shelf life increased to three days at ambient and 7-9 days at 13°C. For Chinese mustard, low-density polyethylene was the most promising film both at ambient and 13°C. Film perforation and an ethylene scrubber were not necessary. Low-density polyethylene increased shelf life twofold at ambient and fourfold at 13°C.