

Title Antimicrobial effect of garlic extract and its postharvest use on fresh-cut cabbage, 'Akihime' strawberry, and 'Campbell Early' grape

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Abstract

Garlic (*Allium sativum* L.) was extracted with ethanol (50%, v/v) or juiced by pressure, and diluted 10x, 50x, 100x, and 1000x. The antifungal effect on four fungi (*Penicillium expansum*, *Aspergillus flavus*, *Aspergillus niger* and *Botrytis cinerea*) and the antibacterial effect on three bacteria (*Escherichia coli*, *Bacillus subtilis*, *Salmonella choleraesuis*) were greatest at the 10x dilution using a disk paper method of air treatment. The antimicrobial effect of garlic extracts with ethanol (85%, v/v) and water storage at 0°C was maintained for about 46 days with *E. Coli* and 4 months with *P. expansum* compared to 25 days at room temperature. The effect of garlic extract on postharvest freshness of fresh-cut cabbage (*Brassica oleracea* L. var. *caoutata*), 'Akihime' strawberry (*Fragaria ananassa* Duch.), and 'Campbell Early' grape (*Vitis* spp.) was also examined. Fresh-cut cabbage were sprayed or air-treated with garlic extract. Spraying a 10x dilution of garlic extract with ethanol (50%, v/v) prevented decay and discoloration, and resulted in minimal off-odor compared to control after storage for 9 days at 0°C. For strawberry, spray or air treatment with a 10-fold dilution of garlic extract with ethanol (50%, v/v) reduced decay after storage for 3 days at room temperature; however, no significant difference was observed during storage at 5°C. To increase effectiveness of decay prevention using the garlic extract, the effects of packaging materials were examined. Polypropylene (PP) film with thicknesses of 30mm and 50 mm of packaging material were found suitable for strawberry and grape, respectively.