

614/E2

Shelf life of leafy vegetables treated with natural essential oils

D A Niharepola and B Jayawardena*

Department of Chemistry, University of Kelaniya, Kelaniya, Sri Lanka

Fresh product of vegetables typically contains a complex mix of microorganisms. To prolong the shelf life of vegetables, the growth of microbial population must be controlled and washing and removal of damaged tissues are employed to reduce initial high counts. Clean sanitations are essential because storage life is shorter with high initial microbial loads. Chemical sanitations have a negative impact. Naturally occurring antimicrobial product healthier for environment and humans. Essential oils have antimicrobial properties. We investigated the *in vitro* antimicrobial activity of Cinnamon leaf oils (*Cinnamom zeylanicum*) on the native micro flora of "Gotukola" (*Centella asiatica*). Fresh Gotukola samples were selected with uniformity of color, size and physiological damage were discarded. Leaves were washed 3 times with tap water and allowed to remove surface moisture. Leaves were hand sprayed on both sides with essential oils at minimum inhibitory concentration (MIC) 0.06 ml/100ml v/v that is the concentration that produced a 90% *in vitro* inhibition of the native micro flora of Gotukala. In Control samples leaves were sprayed with tap water. After spraying 50g of the leaves were placed in low- density polyethylene (LDPE, 150 gauge) bags of 20 X 30cm² surface area. The bags were sealed and stored at 5⁰C with 97 % RH. At 3, 5 & 7 days of storage samples were taken for determination of microbiological test include the total plate count (TPC), coliforms, *E. coli* and *Salmonella*, nutritional value (fiber, moisture, ash & ascorbic acid) & sensory properties. For determination of microbiological tests International Standard were used. Moisture, Ash, Fiber & Ascorbic acid content of the leaves were determined according to the standard methods. Leaves were evaluated for their sensory properties color, appearance, taste, and aroma, overall acceptability by providing samples and a questionnaire to six trained panelists. There was no effect due to essential oil treatment on nutritional value of Gotukola samples when compare the treated samples and control samples. Ascorbic acid content of the sample decrease with the storage time. TPC was low in samples treated with essential oils than control samples. Initial TPC of samples before essential oil treatment was 3.67× 10² cfu/g. Seven days after storages at 5⁰C in control sample & treated sample TPC were 2.45×10² & 1.48 × 10² cfu/g respectively. Coliform count was also low in samples treated with essential oils (40 × 10¹ cfu/g) than control samples (110 × 10¹ cfu/g). The *Salmonella* count and *E. coli* count of all samples were nil. On the sensory attributes of the samples the panelists did not find difference among controls & treated samples. Throughout the storage time, no evidence of softening or rot was found on any of the samples. Therefore, we can conclude that cinnamon leaf oil can be used as naturally occurring sanitizing compound in leafy vegetables.

Financial assistance by NSF grant NSF/RG/2006/AG/09 is acknowledged.

*bimali@kln.ac.lk Tel: 011 - 2903269