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SOME AGROCHEMICAL - FREE TREATMENTS TO CONTROL BACTERIAL SOFT ROT OF CARROT

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In Sri Lanka, carrot (*Daucus carota* L.) grows best in Nuwara Eliya and Badulla districts. For exportation, when carrots are transported to Colombo, and stored, high losses are reported before air lifting mainly due to bacterial soft rot (*Erwinia carotovora* s.sp.*carotovora*). Many countries do not accept produce treated with agrochemicals, after harvest.

Several agrochemical-free postharvest treatment techniques are reported in literature, to reduce microbial attacks on vegetables. Hot water dips have been practiced effectively on several vegetables. Hypochlorites are generally used in the 50 to 200 ppm concentration range, to sanitize agricultural produce. Azadirachtin, a compound extracted from the seeds of the neem (*Azadirachta indica*) has also shown varying inhibitory effects on certain bacteria and fungi. The objectives of the present study were to determine the effectiveness of hot water dips, chlorine treatments, combined hot water and chlorine treatments and also azadirachtin treatment in minimizing bacterial soft rot of carrot.

Fresh, healthy carrots were obtained from the Central Market, Kandy, soon after transportation. Six sets, each containing three carrots were used for the experiment. The carrots were first inoculated with 50µl of a suspension of *E. carotovora* (viable cell density, 10^7 CFU ml^{-1}) in 3 locations along the longitudinal axis. Treatments were given after 24 hours of incubation. The five treatments are as follows: hot water dips at 50° C for one minute, chlorine treatment at 50 ppm or 100 ppm sodium hypochlorite dips for 5 minutes. The combined effect of hot water followed by chlorine dips at 50 ppm or 100 ppm was also determined. A commercially available product of Neem was also tried out in the study. The solution used contains 0.05 g l^{-1} azadirachtin and is recommended to control insect attacks on cabbage and mushrooms. The effect of dips in azadirachtin solution (diluted as recommended for mushroom and cabbage) for five minutes was also determined as a separate experiment, as compared to 100 ppm chlorine treatment. In each treatment, disease development was assessed by measuring the diameter of lesions that developed from inoculated sites on carrots.

The experiment with hot water and chlorine was repeated five times. Data were pooled and analyzed using 2x2 factorial experiment set up as a randomized complete block design. The experiment with azadirachtin solution was repeated four times. The data were pooled and analyzed using one-way ANOVA.

Hot water and combined treatments proved ineffective in controlling the development of the disease (P=0.05) and out of the two chlorine treatments 100 ppm chlorine proved the most effective while azadirachtin appeared to control the disease more effectively than 100 ppm chorine.