

Title Efficacy of various plant hydrosols as natural food sanitizers in reducing *Escherichia coli* O157:H7 and *Salmonella* Typhimurium on fresh cut carrots and apples

Author Fatih Tornuk, Hasan Cankurt, Ismet Ozturk, Osman Sagdic, Okan Bayram and Hasan Yetim

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Abstract

In the present study, inhibitory effects of the hydrosols of thyme, black cumin, sage, rosemary and bay leaf were investigated against *Salmonella* Typhimurium and *Escherichia coli* O157:H7 inoculated to apple and carrots (at the ratio of 5.81 and 5.81 log cfu/g for *S. Typhimurium*, and 5.90 and 5.70 log cfu/g for *E. coli* O157:H7 on to apple and carrot, respectively). After the inoculation of *S. Typhimurium* or *E. coli* O157:H7, shredded apple and carrot samples were washed with the hydrosols and sterile tap water (as control) for 0, 20, 40 and 60 min. While the sterile tap water was ineffective in reducing ($P > 0.05$) *S. Typhimurium* and *E. coli* O157:H7, 20 min hydrosol treatment caused a significant ($P < 0.05$) reduction compared to the control group. On the other hand, thyme and rosemary hydrosol treatments for 20 min produced a reduction of 1.42 and 1.33 log cfu/g respectively in the *E. coli* O157:H7 population on apples. Additional reductions were not always observed with increasing treatment time. Moreover, thyme hydrosol showed the highest antibacterial effect on both *S. Typhimurium* and *E. coli* O157:H7 counts. Inhibitory effect of thyme hydrosol on *S. Typhimurium* was higher than that for *E. coli* O157:H7. Bay leaf hydrosol treatments for 60 min reduced significantly ($P < 0.05$) *E. coli* O157:H7 population on apple and carrot samples. In conclusion, it was shown that plant hydrosols, especially thyme hydrosol, could be used as a convenient sanitizing agent during the washing of fresh-cut fruits and vegetables.