

Anti-Bacterial Effects of Mineral Supplement-Hypochlorous Acid Water on Food Products

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Abstract

Hypochlorous acid (HOCl) is a weak acid which is produced when chlorine dissolves in water and is considered as a powerful oxidant that kills microorganisms. It can be generated by the electrolysis of a weak sodium chloride solution and is safer and cheaper compared to bleaching agent such as sodium hypochlorite. Recent days, mineral supplement-treated HOCl (MS-HOCl) water has received great attention on research as a new-concept cleansing agent due to its high sterilizing properties, easy accessibility and safety aspects. In this current study, we investigated the anti-bacterial effects of MS-HOCl water from washing food products such as cabbage, apples and eggs. For this, we divided our experiment into five groups according to different treatment water which includes tap water (TW), distilled water (DW), and low, medium and high concentration mineral water (29, 61 and 117 ppm of available chlorine concentration (ACC) respectively), and confirmed the anti-bacterial effect of MS-HOCl water according to the ACC level as compared to TW and DW. DW was used as a positive control group. To investigate the anti-bacterial effects of these experimental waters, two different strains of aerobic bacteria (*Escherichia coli* and *Staphylococcus aureus*) were used by culturing bacterial strains in agar media and 3 different 3M petrifilm and treatment solutions were prepared by washing cabbage, apple and egg sample with experimental water according to groups. Our results showed that MSHOCl treatment has excellent bactericidal effects against *E. coli* and *S. aureus* bacterial strains compared to TW and DW washing groups in both agar media and petrifilms. Collectively, our results indicate that MS-HOCl water could be used as a new efficient disinfectant alternative due to its cost-effectiveness and easy accessibility in hospital settings, food processing and washing units, agriculture farms and poultry industries. However, further more experiments are needed to clarify its mechanism and application on other bacterial strains.

Biography

Md. Shajedur Rahman is a PhD student in the Faculty of Wellbeing, Education and Language Studies, Open University, UK. His current project aims to understand the nature of teachers' collaboration in a Bangladeshi rural primary school using a qualitative approach.