



Short note on Chemical Food Preservatives on Food Bacteria

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INTRODUCTION

There have been several reports on the efficacy of using chemicals to control the growth of food-borne pathogens. This study investigated the antibacterial activity of six chemical food preservatives namely benzoic acid, acetic acid, sodium nitrite, ascorbic acid, citric acid and sodium chloride against food associated bacteria isolated from tinned tomatoes, banana and cooked rice. The susceptibility test conducted revealed that benzoic acid had the highest zone of inhibition of 8 mm followed by acetic acid, sodium nitrite, ascorbic acid, citric acid and sodium chloride which had the least zone of inhibition. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were 0.5 and 1.0. These findings indicated that benzoic acid could be used to inhibit the growth of food spoilage causing bacteria and food-borne pathogens and can be used to improve the safety of food products by extending their shelf life.

Food is any substance consumed to provide nutritional support for the body. It also serves as an ideal culture media for microbial growth. The bacteria in food cause offensive and sensory changes, food infections and intoxications in the food as it utilizes it as carbon and energy source. The major challenge for the food industry is to eliminate these undesirable changes that occur in foods as a result of the action of these microorganisms and ensuring maximum security in foods. Chemical additives like organic acids which include lactic, acetic and citric acid have been used to combat the actions of these microorganisms. Lactic and citric acid enhance the flavor of fermented foods like pickles and sausage. There are a large number of chemicals that can serve as food preservatives but a small number is allowed in foods due to food and drug administration (FDA) rules which should

be strictly adhered to. Hence, some of these compounds that exhibit antimicrobial effect in vitro do not show that when added to foods. In order to enhance the shelf life of foods, chemical preservatives have been used. There is paucity of information on the spectrum of activity of these chemical food preservatives on the inhibition of the growth of food borne pathogens found in food products. This research work evaluated the antibacterial activity of some chemical food preservatives against some bacteria associated with some foods.

Six food-associated bacteria were isolated from foods like banana, tinned tomatoes and cooked rice. Six chemical food preservatives namely ascorbic acid, benzoic acid, acetic acid, sodium chloride, citric acid and sodium nitrate were evaluated for their antibacterial activity against some selected food-associated bacterial isolates using agar well diffusion method. The in vitro minimum inhibitory concentration (MIC) of benzoic acid, which had been found to be the best chemical food preservative was evaluated against the six food associated bacteria using macro dilution agar plate method. The MIC values of acetic acid ranged between 0.5 and 1.0% (V/V) against the food associated bacteria isolated. Bacteria's were found to be the most sensitive which survived only up to 0.5% concentration of benzoic acid. Thus benzoic acid was found to be the most effective with the lowest MIC of 0.5 against six bacterial isolates. The minimum bactericidal concentration (MBC) equaled the MIC of benzoic acid, which finally was able to inhibit food-associated bacterial growth. In conclusion, the benzoic acid has the highest antimicrobial property than other organic acids tested and hence can be used to improve the safety of food products, preserve and prolong their shelf-life

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