

Title Effect of temperature fluctuation on adherent potential of vegetable related bacteria
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Abstract

The adherent characteristics of bacteria isolated from cabbage and cucumber fruits on the inner surface of a polystyrene test tube were investigated under fluctuating temperature conditions. Fluctuation cycles set at 5°C for 24h and 30°C for 24h were repeated until the fifth day. Two levels of nutrient (trypticase soy broth: fresh broth and 5% of fresh broth) conditions were prepared. Bacterial adhesions were evaluated by the OD₅₀₀ value of bacterial cells stained with 0.1% (w/v) of crystal violet solution. The adhesions of the isolated bacterial group of cucumber fruits gradually increased with incubating days under fluctuating temperature. Approximately two times of OD₅₀₀ value was observed in the 5% of trypticase soy broth condition compared with that in rich nutrition. The rate of bacterial adhesion under poor nutrient condition for 5 days was almost the same as that observed under steady temperature conditions of 15 and 30°C. Remarkable bacterial adhesions were observed under fluctuating temperature conditions for three days. However, the gradual increases in the OD₅₀₀ value were obtained under steady temperature conditions for 5 days incubation in case of isolates from cabbage. The adherent potentials of many kinds of bacteria isolated from fresh produces might be stimulated by the temperature fluctuation during incubation. These results indicated that exposure of produce to high temperature during the distribution chain could influence the bacterial adhesions, and lead to biofilm formations on the surface of fresh produces.