

**Title** Surface adhesion of *Salmonella enterica* and *Staphylococcus aureus* under fluctuating temperatures

**Author** D. Hamanaka, K. Morimatsu, F. Tanaka and T. Uchino

**Citation** ISHS Acta Horticulturae 880:541-546. 2010.

**Keyword** temperature fluctuation; pathogenic bacteria; adhesion

#### **Abstract**

The bacterial adherent characteristics of two pathogens (*Salmonella enterica*, *Staphylococcus aureus*) on the surface of polystyrene were investigated under a fluctuating temperature regime and different nutrient levels (trypticase soy broth). Bacterial adhesions were evaluated by the optical density value of bacterial cells stained with 0.1% (w/v) of crystal violet solution. Under constant temperature conditions at 5 and 30°C, the adherent potentials of both *S. enterica* and *S. aureus* were stable at the end of incubation (5 days). Under a fluctuating temperature regime, the cell adhesion potentials were changed with the period of incubation. The adhesions of both pathogens were considerably increased by rapid temperature elevation from 5 to 30°C, while approximately twice the optical density value of cell adhesion of *S. enterica* was observed on the polystyrene surface compared with constant conditions. Transferring the sample tube to 5°C after fluctuation from 5 to 30°C led to considerable cell detachment of *S. enterica* by the end of incubation. It was probable that *S. enterica* cells used in this study was extremely sensitive to environmental variation, consequently cell adhesion and release could be observed under fluctuating temperature conditions. Meanwhile, stable adhesion of *S. aureus* cells was observed at 5°C after temperature fluctuations from 5 to 30°C.