Multidrug-resistant staphylococcus aureus (MDRSA) properties and their adherence ability on stainless steel surfaces at different temperature and time

ABSTRACT

Staphylococcus aureus is a pathogenic bacterium that capable to adhere on the processing surfaces that could cause a cross-contamination of foods. In Malaysia, S. aureus has been reported from foods and food-handlers hand at food service environment but the multidrug - resistant S. aureus (MDRSA) and their adherence on stainless steel were limited. This study was intended 1) to isolate S. aureus from food contact surfaces and characterize the isolates for MDRSA properties, and 2) to determine the adherence ability of the MDRSA strains. A total of thirty-eight S. aureus isolated from food premises in Sri Serdang were tested for the antibiotic resistance and it was carried out using five classes of antibiotics; Penicillin (I), Cephalosporins (II), Amino-glycosides (III), Quinolones Fluoroquinolone (IV), and Sulphonamide (V) by the standard procedures of Kirby-Bauer disc diffusion method. The adherence assay was performed on stainless steel disc at 25oC and 37oC on 24, 48 and 72 hrs incubation. As a result, twenty-three S. aureus were found as multidrugresistant towards the antibiotics. All the MDRSA can adhere on stainless steel with a minimum 4.00 log CFU/mL. The adherence of MDRSA on stainless steel during 72 hrs were ranging from 4.11 to 6.55 log CFU/mL and 4.25 to 6.86 log CFU/mL at 25oC and 37oC, respectively. The highest adherence was found on 48 hrs at both temperatures. The MDRSA strains revealed high capacity to adhere on stainless steel at 37oC. As a conclusion, the MDRSA strains shows the strong adherence ability at their optimum growth temperature.

Keyword: Staphylococcus aureus; Food contact surfaces; Multidrug-resistant; Stainless steel; Cell adherence