

Influence of biofilm-forming lactic acid bacteria against methicillin-resistant *Staphylococcus aureus* (MRSA S547)

ABSTRACT

Objective: To investigate the antibacterial effect of selected lactic acid bacteria (LAB) biofilms on the planktonic and biofilm population of methicillin-resistant *Staphylococcus aureus* (MRSA) (S547). **Methods:** In this study, biofilm-forming LAB were isolated from tairu and kefir. Isolate Y1 and isolate KF were selected based on their prominent inhibition against test pathogens (using spot-on-agar method and agar-well-diffusion assay) and efficient biofilm production (using tissue culture plate method). They were then identified as *Lactobacillus casei* (L. casei) Y1 and *Lactobacillus plantarum* (L. plantarum) KF, respectively using 16S rDNA gene sequencing. The influence of incubation time, temperature and aeration on the biofilm production of L. casei Y1 and L. plantarum KF was also investigated using tissue culture plate method. The inhibitory activity of both the selected LAB biofilms was evaluated against MRSA (Institute for Medical Research code: S547) using L. plantarum ATCC 8014 as the reference strain. **Results:** L. casei Y1 showed the highest reduction of MRSA biofilms, by 3.53 log at 48 h while L. plantarum KF records the highest reduction of 2.64 log at 36 h. In inhibiting planktonic population of MRSA (S547), both L. casei Y1 and L. plantarum KF biofilms recorded their maximum reduction of 4.13 log and 3.41 log at 24 h, respectively. Despite their inhibitory effects being time-dependent, both LAB biofilms exhibited good potential in controlling the biofilm and planktonic population of MRSA (S547). **Conclusions:** The results from this study could highlight the importance of analysing biofilms of LAB to enhance their antibacterial efficacy. Preferably, these protective biofilms of LAB could also be a better alternative to control the formation of biofilms by pathogens such as MRSA.

Keyword: MRSA; Biofilms; Lactic acid bacteria; Antibacterial