

## **Antimicrobial Activity of Lactic Acid Bacteria Isolated from Fermented Durian Flesh (Tempoyak) Against Pathogenic**

Balqish Nadhirah Sahlan<sup>a</sup>

### **Structured Abstract**

**Background:** One of the biggest problems with bacterial pathogens is their resistance to antibiotics, which raises the risk of disease and death. Options for treatment had become more complicated after the blooming of multidrug resistance in both Gram-positive and Gram-negative bacteria, which often makes traditional antibiotics ineffective or completely unusable. The proposed research aims to explore the antimicrobial activities of lactic acid bacteria that was isolated from the fermented durian flesh (tempoyak) against pathogenic bacteria. This study aims to determine the total number of lactic acid bacteria from a 1-week-old tempoyak and is to study the biochemical characteristics of selected lactic acid bacteria isolated from a 1-week-old tempoyak, lastly is to evaluate the antimicrobial activities of selected lactic acid bacteria against *Staphylococcus aureus* and *Escherichia coli* using the agar disk diffusion.

**Methods:** Tempoyak (10 g) was mixed with 10 ml of 0.85% NaCl, serially diluted to  $10^{-6}$  and 0.1 ml of each dilution was spread on MRS agar. Plates with 30–300 colonies were selected for CFU/ml calculation. Forty-eight colonies were transferred to MRS agar with cycloheximide and tested for five biochemical characteristics: Gram staining, catalase test, carbohydrate fermentation, MRVP test, and SIM test. Finally, an antimicrobial assay (disk diffusion) was performed on selected LAB isolates, including direct and neutralized LAB, to evaluate their antimicrobial activities.

**Results:** This study shows that LAB was successfully isolated from tempoyak and the cfu/ml of the LAB colonies were successfully calculated. All five biochemical tests performed were consistent with the characteristic traits of LAB and successfully determined their biochemical characteristics. Lastly, all of the LAB strains for both direct and neutralized does not show any inhibition zone against *S. aureus* and *E. coli*. Possible factors affecting the results include differences in LAB strains used, culture conditions affecting antimicrobial compound production, and supernatant concentration.

**Conclusion:** LAB was successfully isolated from tempoyak, and its biochemical characteristics were confirmed. However, neither direct nor neutralized LAB exhibited antimicrobial activity against *S. aureus* and *E. coli*. Factors such as strain variation, culture conditions, and supernatant concentration may have influenced the results, highlighting the need for further investigation into LAB's antimicrobial potential.

**Keywords:** Lactic Acid Bacteria (LAB), Tempoyak, Antimicrobial Activities

\*Correspondence: 2022470524@student.uitm.edu.my

<sup>a</sup> School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia