UNIVERSITI TEKNOLOGI MARA

# ANTIMICROBIAL ACTIVITY OF *LACTOBACILLUS PLANTARUM*, ISOLATED FROM LOCAL FERMENTED FOOD (TEMPE)

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# ABSTRACT

*Lactobacillus plantarum* L5 isolated from local fermented food has been shown to produce antimicrobial activity. Agar disk diffusion method was used in antimicrobial activity testing and inhibition zone around disk was measured and recorded. The antimicrobial compound from *L. plantarum* L5 has been found to inhibit *Staphylococcus aureus* and *Escherichia coli*. This study demonstrated the presence of antibacterial compound showing a wider inhibitory spectrum that was produced during culture stationary phase. The growth profile of *L. plantarum* L5 was also studied in shake flasks at temperature 37 $^{0}$C and 100 rpm. Results indicated that mass production of this local isolated probiotic strain, *L. plantarum* L5 had produced maximum cell concentration of 6.14 X $10^{11}$ cfu/mL at hour 20. Thus, *L. plantarum* L5 can be useful as antimicrobial agent for many applications and further study of mass production of *L. plantarum* L5 may assist many functional food industries to improve their yields and reduce their cost.

# CHAPTER 1

# INTRODUCTION

## 1.1 Background of study

The development of probiotics during the past decade has signaled an important advance in the food industry transferring to towards the development of functional foods. Microbes from many different genera are being used as probiotics and the most commonly used strains are members of lactic acid bacteria such as lactobacilli, enterococci and bifidobacteria. In particular lactobacilli are generally used as probiotics. *Lactobacillus plantarum* is one of Gram-positive lactic acid producing bacteria that have been used for centuries for human food preservation. *L. plantarum* are widely used in relief of irritable bowel syndrome (IBS) and reduction of LDL-cholesterol. Recent study by Dr. Richard Fedorak, M.D. has shown that patients with inflammatory bowel disease (IBD) gain the beneficial effect from *L. plantarum*. That is 95% of patient with IBD symptoms noted the improvement with *L. plantarum* treatment compared to 15% of patient with placebo treatment (Niedzielin et al., 2001; Ouwehand et al., 2002).

Therefore, this research has been proposed to study the characteristics of *L. plantarum* as a potential probiotic bacterium in human's body in terms of growth kinetics and antimicrobial activity. The growth kinetics study of *L. plantarum* may use assist in large scale production of this strain by provide time of lag phase, exponential phase, stationary phase and death phase in future studies. While,