



**PROBIOTIC POTENTIAL OF LACTIC ACID BACTERIA (LAB)
ISOLATED FROM *TEMPOYAK* MADE OF MALAYSIAN DURIAN
MUSANG KING, FERMENTED CHILLIES AND *BUDU***

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DECLARATION

I hereby declare that this thesis is my original work and has not been submitted previously and currently for any other degree at UiTM or any other institutions.



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ABSTRACT

Probiotic refer to live microorganism that provides beneficial effect on the host. Lactic acid bacteria (LAB) are probiotic bacteria that play critical role in food production and health maintenance. The research of probiotic bacteria have become increasing interest worldwide nowadays. However, the lacking of the studies have been reported in the isolation LAB from *tempoyak* made from Malaysian Durian *Musang King*, fermented chillies and *budu* on screening its ability to pose stress environment condition that role as probiotic in human health. The objectives of this study are to screen the probiotic potential of LAB isolated from three different Malaysian fermented foods. Seven LABs have been isolated from sample after they were grown on MRS agar that has been supplemented with CaCO_3 . All the LAB was undergo identification with respect on colony morphology, gram staining and biochemical characterization. The screening for probiotic potential of the isolated LAB was represented the survival abilities of isolated LAB in varying stress condition such as in acid environment, high and low temperature and also sodium chloride (NaCl) environment using streaking plate method on MRS agar and also using spectrophotometer to obtain the absorbance value. Lactose utilization test also was done by observing the color changes of the medium. All seven isolated LAB was identified as *Lactobacillus plantarum* 1, *Leuconostoc mesenteroides* ssp *dextracium* 2, *Pediococcus pentosaceus* and *Lactobacillus plantarum* 1 from *tempoyak* sample, *Lactobacillus plantarum* 1 and *Lactobacillus fructivorans* from fermented chillies sample, last is *Weissella cibaria* from *budu* sample. All of the isolated LAB showed the ability in resistant the wide range of stress condition environment that are in pH, NaCl condition and in critical temperature and also proved the acid production on lactose utilization test. Therefore, this study reveals that all isolated LAB has positive impact and high potential for their selection as probiotic bacteria in providing various beneficial effect on human health and can also to be commercialization in the food product.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Lactic acid bacteria (LAB) may define as group of gram-positive organism where it stained blue-purple in color and lack of catalase (Kavitha & Devasena, 2013). LAB is non-sporing cocci and rods with anaerobic habit but aerotolerant which produce lactic acid as the major end-product during fermentation of carbohydrates (Hayek & Ibrahim, 2013). Lactic acid that is produce during the fermentation usually is used to improve the storage quality and nutritive value of perishable foods such as dairy product, meat, fish and some vegetables that has been consumed worldwide (Chang *et al.*, 2010) . They produce various compounds in host such as bacteriocin, reuterin, carbon dioxide, hydrogen peroxide and lactic acid. This compound can inhibit food spoilage and pathogen growth in gastrointestinal tract (GIT) (Shaikh & Shah, 2013). Therefore it has a potential in providing beneficially benefit due to probiotic factor from lactic acid bacteria (Pundir *et al.*, 2013).

Probiotics bacteria refer to live microorganism that provide beneficial effect to the host when consume in adequate among (Ramirez-Chavarin *et al.*, 2013). They is usually related to improve the gut microflora and play an important role in the normal function of GIT (Collado *et al.*, 2007). Probiotic bacteria will prevent and treat the GIT disturbance that usually due to infectious disease from pathogenic bacteria (Tambeka & Bhutada, 2010). Special properties of the probiotic LAB that enhancing beneficial effect including resistance to acid and bile, can adhere to gut epithelial tissue, able to colonies the gastrointestinal tract and production of antimicrobial substances against pathogenic bacteria (Pundir *et al.*, 2013). The health benefit of probiotic bacteria including prevention and treatment of diarrhea disease, prevention of antibiotic associated diarrhea, improve lactose metabolism, stimulate host immune respond, cancer prevention and reduced blood cholesterol (Kechagia *et al.*, 2013).