UNIVERSITI TEKNOLOGI MARA

ISOLATION OF LACTIC ACID BACTERIA AS PROBIOTIC FOR HUMANS

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Dissertation submitted in partial fulfilment of the requirements for the degree of Bachelor of Pharmacy

October 2005

ACKNOWLEDGEMENTS

I am very grateful and thankful to Almighty Allah S.W.T in giving me patience and strength to complete this project. In carrying out the task, I was fortunate to have had the assistance of several people who have contributed greatly to my research project.

Firstly, I would like to take this opportunity to express my gratitude and appreciation to my supervisor, Dr Kalavathy Ramasamy for her continuous guidance, invaluable advises, constructive comments and patience during the course of this project.

I also wish to express my appreciation to my colleagues for their welcomed and needed contributions to the papers. I owe deep gratitude to all of the following :

Norhafizah bt Hassan for graciously taking the time to read and offer the needed contributions for this project.

Ilyana bt Rozali for generously and critically reviewing the thesis.

Farah Nadwa bt Md Yassin for giving constructive opinions and comments regarding this project.

Last but not least, I want to thank to my parents for their support, love, and patience.

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ABSTRACT

In recent years, there has been considerable interest and research on the use of probiotics, for disease treatment or health promotion. However much remains to be done on the selection of strains that actually possess characteristics of true probiotic microorganisms.The present study was carried out to isolate potential probiotic organisms (lactic acid bacteria) that have antagonistic properties against human pathogens and could be used as bacteriotherapeutic agents to combat gastrointestinal disorders in humans. The sandwich overlay method was used to screen for antibacterial activity from four different kinds of fermented food (tapai pulut, rebung pekasam, budu and cincalok). Twenty one lactic acid bacterial (LAB) strains exhibited antibacterial activity in the preliminary screening. Eighteen of the LAB strains were able to inhibit *E. coli* but only four strains (T_1, T_2, T_7 and T_{12}) had the ability to inhibit Staphylococcus aureus. Interestingly, T_{12} was able to inhibit *S. aureus* more effectively than *Lactobacillus casei* strain Shirota (a positive control) from Yakult. The antimicrobial substance produced by T_{12} was characterized, and the results demonstrated that the ability to inhibit *S. aureus* and *E. coli* was probably due to the production of organic acids and not bacteriocins.

CHAPTER 1

INTRODUCTION

Since the discovery in the 1930s, antibiotics have made it possible to cure diseases caused by bacteria - saving the lives of millions of people around the world. It is among the most frequently prescribed medication in modern medicine. However, antibiotic must be used wisely because bacterial resistance to antimicrobial treatment is emerging as one of the major public health threats in the 21st century. In fact, the widespread use and in some cases, overuse of the antimicrobials in all health care settings over the past several decades has been cited as a contributing factor in the development of drug resistance in all bacterial species (Casas, 1997). This has led scientists to seek other alternative methods to antibiotics. In recent years, there has been a growing interest in the role of probiotics bacteria for the prevention and treatment of infectious disease (Elmer *et al.*, 2001; Meurman, 2005). Probiotics are live microorganisms when administered in adequate amounts will confer a beneficial health effect on the host. Numerous studies were undertaken to obtain scientific evidences for the beneficial effects of fermented foods containing probiotic bacteria (Rafter, 2002; Renault, 2002). However, much remains to be done to select new strains that actually fulfil the criteria of the probiotics microorganisms.

Therefore, the main objective of the present study is to isolate potential probiotic organisms (lactic acid bacteria) that have antagonistic properties against human