UNIVERSITI TEKNOLOGI MARA

MICROBIOLOGICAL AND PHYSICOCHEMICAL PROPERTIES OF DOUBLE EMULSIFIED *Lactobacillus plantarum* NBRC 3070 IN SOURSOP JUICE DURING STORAGE

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

The stability of probiotics supplemented in beverages and other food products are often low during processing and has unpredictable shelf life. Manufacturer of probiotics products especially beverages facing significant challenges regarding the survivability of probiotics during processing and storage as well as during their passage through gastrointestinal tract. Application of probiotics entrapment through double emulsification approach significantly improves the survivability of probiotics during food processing, storage, and gastrointestinal transit. Thus, this research was aimed to emulsify *Lactobacillus plantarum* NBRC 3070 and incorporated this emulsified probiotics in soursop juice (*Annona muricata* L.). The viability of emulsified *Lactobacillus plantarum* NBRC 3070 in soursop juice during storage for 4 weeks at 4ºC was determined. The microbial, physicochemical, and sensory evaluations of emulsified *L. plantarum* NBRC 3070 soursop juice were evaluated at weekly intervals for 4 weeks in comparison with control soursop juice without any probiotics. Pasteurized soursop juices were produced from the ripened soursop pulp. Probiotics soursop juice was supplied with emulsified *L. plantarum* NBRC 3070 with 85.03% of emulsification efficiency. The viability of emulsified *L. plantarum* NBRC 3070 in soursop juice showed insignificant reduction within storage period from 7.87×10^7 $\log_{10}$ CFU/mL to 7.01×10^7 $\log_{10}$ CFU/mL. The study of the emulsified *L. plantarum* NBRC 3070 soursop juice showed a significant declined in total soluble solids and viscosity during storage period. Insignificant difference were recorded for pH and titratable acidity (malic acid) of emulsified *L. plantarum* NBRC 3070 soursop juice. Results showed that yeast counts of emulsified *L. plantarum* NBRC 3070 soursop juice significantly increased during storage period. There was no coliform growth observed in emulsified *L. plantarum* NBRC 3070 soursop juice during storage. Sensory evaluation for soursop juice supplemented with double emulsified *L. plantarum* NBRC 3070 showed satisfactory results. This study revealed that the encapsulation of *L. plantarum* NBRC using emulsification approach help in maintaining high cells viability until the end of storage period. The incorporation of double emulsified *L. plantarum* NBRC 3070 in soursop juice affects the microbial and physicochemical properties of the juice product.

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