UNIVERSITI TEKNOLOGI MARA

POPULATION DYNAMICS AND MICROBIAL BIODIVERSITY PROFILING OF SPONTANEOUS FERMENTATION OF *CARICA* PAPAYA LEAVES

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ABSTRACT

In this research, an aenarobic spontaneous fermentation of Carica papaya leaves has been conducted for 100 days. Ten sampling days has been collected in order to identify the microorganism present during the spontaneous fermentation. The maximum no. colonies (in cfu/ml) estimated at each medium; Plate Counting Agar PCA, Man Ragosa Agar MRS, Dichloran Bengal Chloramphenicol (DRBC) agar, Man Rogosa Sharpe (MRS) agar and MacConkey MC. PCA, MRS and MC clarifies bacteria from yeast as yeast is preferable to grow on DRBC media. There are six genera of bacteria present in the ecosystem consist of *Klebsiella, Cronobacteria, Pantoe, Pseudomonas, Bacillus* and *Enterobacter*. A few types of Gram negative bacteria presented which are *Pseudomonas, Salmonella* and *also Escherichia coli*. Four genera of yeast and mould presented in the ecosystem which consist of *Saccharomyces cerevisiae, Candida glabrata, Zygosaccharomyces* and *Aspergillus oryzae*. Based on this research, acidic condition of the fermented juice optimize the growth of both bacteria and yeast. Yet, the growth of pathogens after day 45 should be avoided in order to prevent from harmful effect.

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INTRODUCTION

1.1 Research Background

Originally comes from southern part of Mexico, *Carica* papaya or also known as paw paw, papayer, tinti, pepol, kavunagaci, kepaya etc. Papaya is describes as a fast growing plant, 7 to 8 m tall with copious latex, unbranched tree with about 20 cm diameter of trunk (1). *Carica* papaya plant has been in food and medicine related studies as the species reflect various benefits for the innovation of food and supplementation not only for human but for animals as well (2). Papaya is a perennial plant which grow well in tropics and it has been utilised fully including the fruits, leaves and by-products. The plant does not tolerate with cold weather as the best range temperature is between 21 to 33 °C. The tropical fruit is extensively consumed due to its agreeable flavour along with the beneficial pharmacological properties (3).

In order to utilize the papaya plants or even a part of the plant, research need to done to identify the microbial diversity profiling of respected parts of the plant. Previous research proves that the extraction of papaya dried leaves carried antioxidant properties. The by-products of the papaya such as the enzyme, Papain is said to act as a meat tenderizer meanwhile the latex from the plant is traditionally used to heal wounds. As the aiming of this study is to identify the dominant microorganisms present during the fermentation process of the papaya leaves extraction. Microbial biodiversity profiling consist of the population dynamic and also the identification of microorganism in the fermentation ecosystem. The knowledge of the profile of the microbial diversity presented is important to monitor and control the condition of the fermentation process to ensure the quality and safety of the product.

Fermentation is a promising technology for food processing which increase the shelf life of the food or the product. Based on the market demand, food technology is aiming for long lasting food with a condition of controlling microbiological growth of the food. A sensitive controlled condition helps to reduce toxic compounds of the fermented food such as cyanogen and aflatoxins. In regulation and safety assessment guidance of food fermentation, there is a concept of 'history of safe use' which reflect a significant