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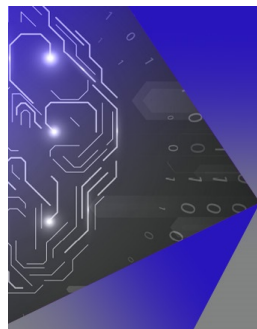
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# Preliminary Screening of Bacterial and Fungal Communities from Spontaneous Fermentation of Durian Pulps (*Tempoyak*) Using High-throughput Amplicon Sequencing

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**Abstract.** Fermentation is a method used to prolong the shelf-life and taste of fruit. *Tempoyak* is a fermented food made from durian pulps. Accumulating works were conducted to isolate and characterize the microbial communities using culture-dependent methods, with little effort in identifying the diversity using culture-independent approaches like next-generation sequencing (NGS) in *tempoyak*. The culture-dependent method showed several limitations such as tedious technique in plating, biasness in morphological identification and incompatibility of media selection for microbial growth. To date, the NGS allowed identification of the unculturable microbes up to species level. The purpose of this study is to screen the microbial communities in *tempoyak* using amplicon sequencing by targeting 16S rRNA and ITS2 for determining the diversity of bacterial and fungal communities respectively. On the other hand, this study also compared the complex microbial structure from the first day, T<sub>0</sub> to day 14, T<sub>14</sub> of the fermentation process. Here, we observed that sample T<sub>14</sub> showed more diverse in both bacterial and fungal populations as compared to sample T<sub>0</sub>. Overall, genus *Lactobacillus* are the most abundant microbes representing the bacterial community. This study highlighted the importance of the NGS in characterizing the complex microbial communities in fermented food, for which could be useful to screen for potential unculturable microbial communities hindered by the limitation of culture-dependent approach.

## INTRODUCTION

In Malaysia, *tempoyak* is a famous dish made from durian pulps that has been fermented in an airtight container to encourage spontaneous fermentation. *Tempoyak* typically has a long shelf life because it is preserved by lactic acid produced by lactic acid bacteria (LAB) and salt added during processing to inhibit growth of food-spoiling bacteria [1]. Earlier analysis showed that LAB are the most predominant microorganisms that present in *tempoyak*. In addition, several organic acids such as acetic, lactic, and propionic acids were also detected [2].

Accumulating studies [2]–[7] showed that the spontaneous fermentation process induces the growth of several autochthonous lactic acid bacteria (LAB) strains which play an important role during the fermentation of fruit pulp. However, research on characterizing the fungal communities in *tempoyak* was still lacking [8]. Moreover, we hypothesized that NGS could be a sensitive approach to detect the unculturable microbes that potentially have functions and benefits in food biotechnology [9].