

UNIVERSITI TEKNOLOGI MARA (UiTM)

**THE EFFECTS OF GELAM AND TUALANG HONEY
ON THE GROWTH AND ACTIVITY OF
*BIFIDOBACTERIUM ADOLESCENTIS***

NURUL AKMAL BINTI SAAD

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ABSTRACT

The intestinal microbiota plays an important role in maintaining host health. Bifidobacteria which inhabit gastrointestinal tracts (GIT) has antimicrobial properties that maintains gut function and contributes to the GIT defense system. Therefore, prebiotic as non-digestible carbohydrate with the ability to stimulate and enhance the growth of bifidobacteria has evoked great interest among researchers. Honey serves as potential sources of prebiotic. This study was carried out to investigate the potential prebiotic effect of Malaysian honey namely Gelam and Tualang to enhance the growth and activity of *Bifidobacterium adolescentis* ATCC 15705, a probiotic in modified De Man Rogosa Sharpe (MRS) media. The growth promoting effects of both honeys were compared with commercial fructooligosaccharide (FOS). Inoculated samples were incubated anaerobically at 37 °C for 48 h. Samples were collected at 0, 24 and 48 h incubation and examined for specific growth rate, viability of bacteria and level of fermentation (acid and lactic acid production) as measured by high pressure liquid chromatography (HPLC). The results showed that, both honey enhanced ($p < 0.05$) the growth and activity of *B.adolescentis*. The production of lactic acid was enhanced ($p < 0.05$) when bifidobacteria was grown in the presence of Gelam and Tualang honey compared with FOS. The results obtained demonstrated that both types of local honey supported the growth and activity of *B.adolescentis* better than FOS. However, Gelam honey 5% (w/v) showed the highest prebiotic effect compared to Tualang honey.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Human gastrointestinal (GI) tract plays an important role in nutritional aspect, health and well-being of the host (Ziemer & Gibson, 1998). Probiotic has natively inhabited our gut and mutually help us in maintaining our GI tract. Therefore, the importance of having good GI tract has gained a significant concern in humankind. Thus, interest in manipulation of gut bacterial populations for improved human health has increased.

Probiotics and prebiotics have significance value in human nutrition. Probiotics are live microorganisms which when administered in adequate amounts conferred a health benefit on the host via improvement of microbiological balance in the intestine (Saad *et al.*, 2013). Probiotics are incorporated inside functional food such as dairy products including milk and yogurt. The most commonly used probiotics are lactic acid bacteria like lactobacilli and bifidobacteria (Ziemer & Gibson, 1998). In contrary, prebiotics are non-digestible food components which have selective fermentation in the colon, allowing specific changes both in the composition and activity in the GI microbiota. Hence, it affects the host by selectively stimulated the growth and activity of