

UNIVERSITI TEKNOLOGI MARA

**ANTIOXIDANT ACTIVITY OF RAW AND
EXTRACTS OF *HETEROTRIGONA ITAMA* HONEY
FROM TWO DIFFERENT REGIONS**

FATIN NABILAH BINTI ABDUL RAHMAN

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ABSTRACT

The growing interest in honey produced by *Heterotrigona itama* is mainly due to the contribution of its composition to many health benefits, such as the antioxidant potential of its phytochemical compound. The total phenolic and flavonoids content in *Heterotrigona itama* honey were studied by using a modified Folin-Ciocalteu method and aluminium chloride colorimetric assay. Different contribution of the entire honey and the phenolic extracted samples on their antioxidant activities were also studied on *Heterotrigona itama* honey from different site and time of collection. The total phenolic and flavonoid content of raw and phenolic extracted samples were statistically different with $P < 0.05$. The differences may be caused by the absence of sugar and insoluble matters that are able to affect the absorbance readings in the phenolic extracted sample. There was also significant difference between the total phenolic and flavonoid content of *Heterotrigona itama* honey collected from Kelantan and Terengganu. This was due to different chemical content in the different batches of *Heterotrigona itama* honey which contributes to different colour intensity.

CHAPTER ONE

INTRODUCTION

Honey is a natural sweetener produced by bees, from nectars of plant flowers and dew (El Sohaimy, Masry, & Shehata, 2015). One commonly consumed honey is honey from *Melipona* sp. bee or commonly known as stingless bee or ‘Kelulut’ locally. Hundreds of bioactive compounds have been identified from several studies conducted on different types of honey especially honey produced by *Melipona* sp. from various countries (Oddo, Heard, Rodrigues-Malayer, Fernandez-Muino, & Sancho, 2008). Generally, honey from *Melipona* sp. consists of glucose and fructose which contribute to the sweetness of honey, and other phytochemical compounds including amino acids, phenolic compounds, vitamins, minerals, lipids, and enzymes (I. A. da Silva et al., 2013). Among other compounds with biological activity present in kelulut honey, phenolic acids and flavonoids are compounds that have been given attention due to their displayed antioxidant activities and ability to prevent diseases associated with oxidative stress. This allows it to serve as a good source of natural antioxidant. The composition of phenolic acids and flavonoids in kelulut honey may vary according to the origin of the raw materials (e.g. nectar or dew), the edaphoclimatic condition, the floral source and the storage condition (Gheldof & Engeseth, 2002). Besides, different bee species will also contribute to the diversity of the phytochemical composition of honeys.

In Malaysia, the most common stingless bee species is *Heterotrigona itama*, in which the honey produced by this species is widely available. The growing interest in