Chapter 6

Comparison of Total Soluble Protein Content and SDS– PAGE Pattern Between Four Different Types of Honey

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ABSTRACT

Generally, there are two types of beekeeping: the Apini tribe and the Meliponini tribe. Both tribes produce honey and have a good demand due to their health benefit properties. Considering the influence of diverse factors on honey composition and the lack of studies, establishing quality standards for stingless bee honey (Meliponini tribe) is still challenging and need to do to protect the consumer. In this sense, this

study aimed to determine the total soluble protein content and compare the SDS-PAGE profile between two species of Apini tribe and two species of Meliponini tribe. Protein concentrations in honey samples were varied and resulted in a micro component in honey. SDS-PAGE profile for Meliponini tribe showed more number of protein bands compared to protein from Apini tribe. The unique protein bands that appeared in the Meliponini tribe may have potential as a biomarker to justify the authenticity and quality of that honey, which is known as Unique Kelulut Factor (UKF).

INTRODUCTION

Honey is a natural sweetener that is consumed worldwide. Malaysia has various types of honey that are already commercial in the global market. There are two types of honey which blossom honey and honeydew honey. The former is produced from the nectar of flowers, while the latter is produced from secretions of the living parts of plants other than flowers or is a product of bees' excretions (Azevedo et al., 2017). Honeybees (Apini tribe) and stingless bees (Meliponini tribe) are two common main honey producers. Honeybees, also known as Apis mellifera bees, are normally bigger and sting, while stingless bees such as Heterotrigona itama are smaller in size and without a sting. As Naila et al. (2018) mentioned, Apis mellifera bee honey is sweet, while stingless bee honey is a mixture of sweet and sour tastes.

Generally, honey is a viscous solution containing various molecules, including fructose and glucose (80-85%); water (15-17%); ash (0.2%); proteins and amino acids (0.1-0.5%) and trace amounts of enzymes, vitamins, and other substances, such as phenolic compounds (Rao et al., 2016). According to Alimentarius (2001), honey is the natural sweet substance produced by honeybees from the nectar of plants, from secretions of living parts of plants, or from excretions of plant-sucking insects. This official definition is restricted to the honey produced by A. mellifera. It may not apply to stingless bee honey, better known as pot honey, which is very popular for its distinct sweetness mixed with an acidic taste, and fluid texture (Ávila et al., 2019). However, the honey composition varies depending on the plants from which the bee consumes nectar. For this reason, the classification and evaluation of honey have always been a challenge for chemical analysis, especially when honey adulteration is increasing (Ramón-Sierra et al., 2015). Among these two types of bees that produce honey, the demand for stingless bees compared to Apis bees is increasing nowadays because of their medicinal value, which can act as an antimicrobial, anti-cancer, anti-inflammatory and wound healing (Queiroz-Junior et al., 2015).

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