

UNIVERSITI TEKNOLOGI MARA

**EFFECT OF HEAT TREATMENT AND STORAGE
PERIOD ON PHYSICO-CHEMICAL PROPERTIES
OF LOCAL HONEY**

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ABSTRACT

EFFECT OF HEAT TREATMENT AND STORAGE PERIOD ON PHYSICO-CHEMICAL PROPERTIES OF LOCAL HONEY

The effect of heat treatment and storage period on physico-chemical properties of two types of local honey namely, "pucuk daun" honey and "gelam" honey (*Melaluca* spp.) honey, had been carried out in the study. The physico-chemical properties including pH, titratable acidity, viscosity, total soluble solid and colour were studied. The honeys were divided into two batches whereby one batch had been heat treated at 63°C for 30 minutes while the other batch been unheated. Both heated and unheated honeys were stored at room temperature ($28 \pm 2.0^\circ\text{C}$) for 4 weeks. The pH of honey was determined by the means of pH meter, titratable acidity was determined by the titration method based on the AOAC Official Method 962.19, total soluble solid was determined by means of refractometer, viscosity was determined by means of Brookfield Viscometer, and colour was determined by means of Chroma Meter. The results of the study have shown that heat treatment had slightly affected the physico-chemical of both honeys. The titratable acidity had decreased; the "gelam" honey decreased from 27 meq/kg to 25.8 meq/kg while the "pucuk daun" honey decreased from 40.7 meq/kg to 38.2 meq/kg. The viscosity of "gelam" honey increased from 1102.9 mPa.s to 1111.5 mPa.s, and "pucuk daun" honey the viscosity also increased from 1297.1 mPa.s to 1301.3 mPa.s. The colour for both honey types; L value increased slightly. For the pH and total soluble solid after the heat treatment, pH of "pucuk daun" honey were 3.59 and 75°B, however "gelam" honey, the total soluble solid had remained unchanged at 73°B whereas the pH had slightly increased from 3.92 to 3.93. At the end of the fourth week, the titratable acidity of unheated "gelam" honey was 40.3 meq/kg while for heated was 35.8 meq/kg and for unheated and heated "pucuk daun" were 49 meq/kg and 43.5 meq/kg respectively. The viscosity for unheated and heated "gelam" honey was 1213.9 mPa.s and 1420.8 mPa.s respectively while for unheated and heated "pucuk daun" honeys were 1602.1 mPa.s and 1642.7 mPa.s respectively. The total soluble solid for unheated and heated "gelam" were 75.5°B and 76°B respectively while for "pucuk daun" honey both unheated and heated samples was 76°B. For pH, unheated and heated "gelam" honey was 3.60 and 3.81 respectively while for unheated and heated "pucuk daun" honeys were 3.38 and 3.47 respectively. For colour of unheated "gelam" honey on the fourth week were L, 40.72, +a, 5.55, +b, 27.97 while colour of heated "gelam" honey were L, 40.45, +a, 5.98, and +b, 27.92. For colour of unheated "pucuk daun" honey on the fourth week were L, 46.89, -a, 0.67, and +b, 17.35 while colour of heated "pucuk daun" honey were L, 46.60, -a, 1.08, and +b, 14.67. From the study, it also can be concluded that the effect of the heat treatment and the storage period are not depended on the types of honey. Although this study has used two different types of honey, the effects of the heat treatment and storage period on both honeys were similar.

CHAPTER 1

INTRODUCTION

According to US Food and Drug Administration (FDA) honey is defined as ‘the nectar and saccharide exudation of plants gathered, modified and stored in the combs of honey bees (*Apis mellifera* and *Apis dorsata*)’ (1997). The definition of honey stipulates a pure product that does not allow for the addition of any other substance. This includes water or other sweeteners with limitation. The composition, colour and flavour of the honey depend mainly on the flowers from which nectar has been gathered. Besides the sensory characteristics, the quality measurement of honey including moisture content, acidity, mineral content (ash), apparent sugar content, diastase activity and hydroxymethylfurfural (HMF) content. The diastase activity and HMF content of honey are strongly influenced by heating and storage duration. In Malaysia, beekeeping is relatively a new agricultural venture. Some farmers usually carried out the beekeeping as the part-time basis to supplement their income. In most of the cases, local honeybees, *Apis cerana* is reared. In the local honey market, there are several types of honey available including coconut, star fruit, and mixed floral types. The local honeys usually command a better market price than the imported honeys and are in demand for use in traditional medicine as a health-giving food.