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Melissopalynology Analysis of Malaysian Gelam Honey

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Structured Abstract

Background: Gelam honey of *Melaleuca* sp. is one of the wild types of honey produced by *Apis dorsata* bees. Nowadays, honey adulteration is rampant as most markets offer adulterated brown sugar-based honey with detrimental effects on blood sugar levels. The difficulty in identifying the floral category causes the floral origin of the honey to be unknown. Melissopalynology is a way to curb adulteration and inaccurate labelling of honey that is happening in the honey production industry. In this study, the pH, moisture content and colour intensity of Malaysian Gelam honey were determined, together with morphology, pollen types and count present in Gelam honey.

Methods: The methods applied in this study include measuring pH values of Gelam honey, determination of honey colour via spectrophotometry, and determination of moisture content using tri-scale honey refractometer. Acetolysis is carried out to identify the morphology and pollen counts of this sample. The resulting pollen was mounted with glycerin jelly and visualised under 400x total magnification using a Leica DM1000 LED automated microscope for image acquisition.

Results: The results showed the following for physical parameters of honey: pH is 3.86 ± 0.06, moisture content is $17.93\% \pm 0.33\%$, and colour intensity is 0.78 ± 0.01, all within the rangeof standard parameter given by the International Honey Commission (IHC). The pollen types identified from the sample comprised of *Melaleuca cajuputi*, *Acacia auriculiformis, Mimosa pudica*, *Moringa pterygosperma*, *Cocos nucifera*, *Melaleuca citrina*, *Elaeis guineensis*, and *Durio zibethinus*. *Melaleuca cajuputi* recorded the highest percentage of abundance, 56.29% and is categorised as the predominant pollen.

Conclusion: The pH, moisture content, and colour intensity of Gelam honey in this study are within the range as outlined by the IHC. The findings obtained also showed that there are eight species of pollen present that have different shapes and sizes, types of apertures, symmetry, and dispersal forms. Malaysian Gelam honey is categorized as unifloral honey because of its predominant pollen frequency for *Melaleuca cajuputi*.

Keywords: Gelam honey; physicochemical properties; pollen analysis; melissopalynology; unifloral honey

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