

Comparative Melissopalynology of Acacia Honey from Yaman and Malaysia

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Structured Abstract

Background: Acacia honey is produced by *Apis Mellifera* and has a significant impact value to the economy due to various health advantages. Therefore, there is an increase in global demand, causing numerous adulterations in commercial Acacia honey. For instance, mislabelling the botanical and geographical origin and mixing or substituting inferior adulterants via direct or indirect methods. By using qualitative and quantitative melissopalynology analysis, the type and total pollen count can be identified for authentication purposes. This study aims to determine the different types of pollen in Acacia honey from Yaman (AHY) and Malaysia (AHM) and their physicochemical properties for authenticity determination.

Methods: The honey sample undergoes an acetolysis to obtain the pollen grains. The pollen grains were then observed under 40x magnification lenses using a Leica automated microscope and compared to the pollen atlas for pollen identification. The colour intensity and pH of the honey sample were measured by spectrophotometer and pH meter while the Baume reading, moisture and sugar contents of the honey were measured using a handheld refractometer.

Results: The results of pollen analysis showed 14 species in AHY and five species in AHM, with Fabaceae being the largest family in both honeys. The AHM contained predominant pollen, which is *Robinia pseudoacacia* and was classified as unifloral honey. The AHY was classified as multifloral honey and contained no predominant pollen species due to the pollen dilution where the bees also visited the other floral source during the foraging. The result of physicochemical properties of both honeys are within the standard range set by the International Honey Commission (IHC) and Codex Alimentarius Commission. Both honeys are considered acidic due to their low pH and have amber colour. The moisture content of both honey is low while the Baume and sugar content are high.

Conclusion: In conclusion, AHY is considered as a multifloral honey meanwhile AHM is considered as unifloral honey. The lower pH and moisture content are important to inhibit the growth of bacteria and reduce the fermentation factor that could affect the shelf life of the honey. According to the result of their physicochemical properties, both honeys are considered high-quality unadulterated honey.

Keywords: Acacia honey, melissopalynology, physicochemical properties, pollen analysis

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