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Classical and novel approaches to the analysis of honey and detection of adulterants

Aishath Naila, Steve H. Flint, A.Z. Sulaiman, Azilah Ajit, Zuben Weeds



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1 Classical and novel approaches to the analysis of honey and detection of adulterants

2 Aishath Naila^a, Steve H. Flint^b, A. Z. Sulaiman^c, Azilah Ajit^{a*}, Zuben Weeds^b

3 ^a Faculty of Chemical and Natural Resources Engineering (FKKSA), Universiti Malaysia Pahang
4 (UMP), Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang, Malaysia.

5 ^b Institute of Food Nutrition and Human Health, Massey University., Private Bag 11-222
6 Palmerston North, NZ.

7 ^c Faculty of Bio-Engineering & Technology, Universiti Malaysia Kelantan Jeli Campus,
8 Malaysia.

9 *Corresponding author: Azilah Ajit, mobile: +60199710201, azilahajit@ump.edu.my

10 Abstract

11 Honey is an extract of floral and secretions from a variety of bees. Some honey manufactures
12 adulterate pure honey with industrial sugar, chemicals, and water either directly or indirectly.
13 Many methods have been developed to detect honey adulterants including physicochemical
14 analysis, microscopy, chromatography, immunoassay, thixotropicity, DNA metabarcoding,
15 sensors, and spectroscopy. However, the most promising methods for the development of a
16 portable test kit for honey adulterant detection are ELISA, electronic tongue, and NIR. The most
17 sensitive and accurate method is NIR. These methods have shown satisfactory results when used
18 individually or combined. Further research is still required to trial different combinations of
19 methods to improve accuracy and the ability to detecting a wide variety of adulterants
20 simultaneously. There is a need to develop a portable honey adulterant detection method, such as
21 NIR spectroscopy using a smartphone.

22 **Keywords:** Honey, stingless bee honey, adulterants, portable honey adulterant kit, NIR
23 spectroscopy, smart phone, electronic tongue

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