OPTIMIZATION OF HEADSPACE SOLID PHASE MICROEXTRACTION (HS-SPME) ON THE ANALYSIS OF VOCS IN STINGLESS BEE HONEY (*Tetrigona apicalis*)

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ABSTRACT

OPTIMIZATION OF HEADSPACE SOLID PHASE MICROEXTRACTION (HS-SPME) ON THE ANALYSIS OF VOCS IN STINGLESS BEE HONEY (*Tetrigona apicalis*)

Isolation of volatile organic compounds (VOCs) from stingless bee honey (*Tetrigona apicalis*) was done by using headspace solid phase microextraction (HS-SPME) separation with gas chromatography-mass spectrometry (GC-MS). Among three different types of SPME fibers examined, the mixed fiber coating, DVB/CAR/PDMS presented the maximum efficiency in extracting VOCs in which 22 compounds were identified and with the total peak area of 1.23×10^8. Prior to the best extraction efficiency using the selected fiber, GC oven temperature programming with the use of hold time recorded a total numbers of 47 VOCs were detected compared to without the use of hold time. SPME significant factors was optimized with the use of multivariate analysis by employing Response Surface Methodology combine with Central Composite Design (RSM-CCD). The experimental design for RSM-CCD method was generated through Design-Expert version 12.0.3.0 (Stat Ease Software). From the result attained through CCD experiments, the value of coefficient of determination (R^2) for the total peak area of all of the compounds analysed was 0.8043. Extraction temperature, extraction time and salt addition at 60°C, 15 minutes and 45 %w/w respectively showed to be the best optimum conditions in extracting VOCs in stingless bee honey with desirability of 0.956.

Keywords: ANOVA, GC-MS, HS-SPME, *Tetrigona apicalis*, RSM-CCD, VOCs