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The roles of acidity, peroxide and non-peroxide compounds in antibacterial properties of Malaysian Kelulut, Tualang and Acacia honey

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Abstract
Aims: In this study, three putative factors that commonly contribute to antibacterial properties in honey were determined, namely acidity (pH level), peroxide compounds and non-peroxide compounds. Methodology and results: Honey samples were prepared based on the known factors of acidity, peroxide compounds, and non-peroxide compounds to identify factors that contribute to the antibacterial properties of the honey based on agar diffusion assay. Liquid chromatography quadropole time-of-flight mass spectrometry was employed to detect and quantify the presence of acidic, peroxide, and non-peroxide compounds in the honey samples. Acidity and non-peroxide compounds were identified as the significant factors contributing to the antibacterial properties of Kelulut, Tualang and Acacia honey. No peroxide compound was detected in this study across all honey samples. In Kelulut, the presence of the additional compounds (reptoside, platycogenic acid and kauranoic acid) may explain its higher antibacterial properties against Escherichia coli and Staphylococcus aureus as compared to Tualang and Acacia honey based on the inhibition zones on the agar plates. Conclusion, significance and impact of study: The presence of multiple antibacterial factors in honey is notably important as it gives an advantage of using honey compared to antibiotics in preventing the growth of a wide range of bacterial species with multiple modes of action.

Author Keywords
Acidity; antibacterial factors; Malaysian honey; non-peroxide; peroxide

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