Loss of key components, methylglyoxal and 2’methoxyacetophenone, in manuka honey by heat

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Objectives

• Mānuka honey contains unique components. Among the components, methylglyoxal (MGO) is expected to have beneficial effects, in particular, antibacterial activity.
• Leptosperin (methyl syringate 4-O-β-D-gentiobioside) is exclusively found in mānuka honey, and the quantification of leptosperin applies to authentication of mānuka honey.
• A set of markers for mānuka honey authentication by the Ministry for Primary Industries (NZ) consists of four chemicals, phenylactic acid (PLA), 4-hydroxphenylactic acid (4HPA), 4-methoxybenzoic acid (MBA), and 2’-methoxyacetophenone (MAP). Of these, MAP is specifically found in the nectar of manuka, *Leptospermum scoparium*.
• Honey is utilized as one ingredient in a candy or a gummy, which is heated for the production. The aim of this study is to know heat fragile chemicals in mānuka honey and also to make clear the mechanism of the loss.

Methods

mānuka honey (UMF10+&15+) or mock honey (fructose, glucose, sucrose + water) → thermal treatment 90°C → 0.1 g/mL or 0.05 g/mL → four chemicals

Map: Certificate mark of manuka honey. The index is MGO, leptosperin, DHA, HMF.

Heat stability of 9 chemicals in honey

Loss of MAP

• Model experiments were done using the simulated mock honey matrix with supplemented MAP.

Loss of MGO

• MGO and L-Proline are rich in the honey. Both MGO and L-Proline were decreased in mānuka honey by heating. 2AP (as 2APQ) was correspondingly increased. 2AP is known to be generated by reaction of L-Proline with MGO.
• Heating of mock honey supplemented with MGO and L-Proline also generated 2AP (data not shown).

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