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R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	G & K Davis Limited	**Lab No:**	1999345 SPv2
Contact:	G & K Davis Limited 106 Lansdowne Road RD 1 Richmond 7081	**Date Received:** **Date Reported:** **Quote No:** **Order No:** **Client Reference:** **Submitted By:**	14-Jun-2018 10-Jul-2018 **(Amended)** G & K Davis Limited

Sample Type: Honey

Sample Name:	PG1811E/1	PG1811E/2	PG1811E/3	PG1811B	PG1811C
Lab Number:	1999345.1	1999345.2	1999345.3	1999345.4	1999345.5
Individual Tests					
NPA (Non Peroxide Activity)* % Phenol Equivalent	4.2	3.5	3.6	7.3	7.7
MPI 5 Attributes Tests					
MPI Manuka Honey Classification	Multifloral Manuka Honey	Multifloral Manuka Honey	Multifloral Manuka Honey	Monofloral Manuka Honey	Monofloral Manuka Honey
Manuka Honey Chemistry Profile					
3-Phenyllactic acid* mg/kg	250	220	210	480	690
2'-Methoxyacetophenone* mg/kg	1.8	1.3	1.2	5.3	5.4
2-Methoxybenzoic Acid* mg/kg	1.6	1.4	1.4	7.7	6.7
4-Hydroxyphenyllactic acid* mg/kg	1.9	1.6	1.7	4.5	5.1
Manuka Honey PCR Profile					
Manuka Cq Cq	24.28 #1	24.36 #1	25.10 #1	21.52 #1	22.17 #1
3-in-1 Honey Analysis					
Dihydroxyacetone mg/kg	153	98	128	820	750
5-hydroxymethylfurfural (HMF) mg/kg	6.9	5.8	6.0	4.0	4.4
Methylglyoxal mg/kg	63	45	47	156	168

Sample Name:	012018/02	012018/03	012018/05	PG1811D	Composite of PG1811E/1, PG1811E/2, PG1811E/3, PG1811B, PG1811C & PG1811D
Lab Number:	1999345.6	1999345.7	1999345.8	1999345.9	1999345.10
Individual Tests					
NPA (Non Peroxide Activity)* % Phenol Equivalent	10.1	10.3	9.4	5.4	-
MPI 5 Attributes Tests					
MPI Manuka Honey Classification	-	-	-	Multifloral Manuka Honey	-
Manuka Honey Chemistry Profile					
3-Phenyllactic acid* mg/kg	-	-	-	330	-
2'-Methoxyacetophenone* mg/kg	-	-	-	4.1	-
2-Methoxybenzoic Acid* mg/kg	-	-	-	2.4	-
4-Hydroxyphenyllactic acid* mg/kg	-	-	-	2.9	-

Sample Type: Honey						
Sample Name:		012018/02	012018/03	012018/05	PG1811D	Composite of PG1811E/1, PG1811E/2, PG1811E/3, PG1811B, PG1811C & PG1811D
Lab Number:		1999345.6	1999345.7	1999345.8	1999345.9	1999345.10
Manuka Honey PCR Profile						
Manuka Cq	Cq	-	-	-	23.18 #1	-
3-in-1 Honey Analysis						
Dihydroxyacetone	mg/kg	820	870	830	240	-
5-hydroxymethylfurfural (HMF)	mg/kg	12.8	12.4	9.7	11.1	-
Methylglyoxal	mg/kg	266	276	235	93	-
Tutin Analysis in Honey (Composited Samples)						
Tutin	mg/kg	-	-	-	-	0.022
Number of composited samples		-	-	-	-	6
MRL as per Tutin in Honey Food Standard 2016	mg/kg	-	-	-	-	0.120
Tutin Result Evaluation	Pass/Fail	-	-	-	-	PASS
Individual Sample Testing Recommended?	Yes/No	-	-	-	-	No

Analyst's Comments

#1 Report Signatory for this analysis is Kevin Wang.

Samples 1-3 Comment:
NPA results less than 5 are estimated from extrapolation of the correlation curve and are indicative only.

Amended Report: This certificate of analysis replaces an earlier certificate issued on 19 Jun 2018 at 3:44 pm
Reason for amendment: Sample names changed for samples 1999345/6,7 and 8 at Clients request.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Honey			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Composite Honey Samples	Individual sample fractions mixed together to form a composite fraction.	-	1-5, 9
NPA (Non Peroxide Activity)*	NPA is calculated from methylglyoxal using a correlation curve based on published data for NPA and the primary active ingredient, methylglyoxal. (1,2). (1) Isolation by HPLC and characterisation of the bioactive fraction of New Zealand manuka (Leptospermum scoparium) honey. C. J. Adams, et al. Carbohydrate Research 343 (2008) 651-659. (2) Corrigendum to "Isolation by HPLC and characterization of the bioactive fraction of New Zealand manuka (Leptospermum scoparium) honey" [Carbohydr. Res. 343 (2008) 651]. C. J. Adams, et al. Carbohydrate Research 344 (2009) 2609.	1.0 % Phenol Equivalent	1-9

Sample Type: Honey			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Tutin Analysis in Honey	Solvent extraction, SPE cleanup. Analysis by LCMSMS. Results are representative of the liquid honey, not the sample as a whole. **RLP Official Test 8.42** *Please note the Pass/Fail criteria is for extracted honey only. For comb honey tutin criteria please refer to the MPI Food Standard: Tutin in Honey.* <u>Tutin Result Evaluation (PASS/FAIL)</u> The PASS/FAIL result is based on comparison of the tutin result with the "Food Standard: Tutin in Honey (2016)". A result that falls at or BELOW the maximum permitted tutin level will give a PASS result. A result that falls ABOVE the maximum permitted tutin level will give a FAIL result. <u>Individual Sample Testing Recommended?</u> Where a tutin result for a composited sample is above the maximum permitted level, it is recommended that the individual samples are retested. Please contact the laboratory to arrange for individual sample retesting.	-	10
3-in-1 Honey Analysis	Aqueous extraction, derivatisation. Analysis by UPLC-UV (dihydroxyacetone, 5-hydroxymethylfurfural, methylglyoxal).	1.0 - 10 mg/kg	1-9
MPI 5 Attributes Tests			
MPI Manuka Honey Classification	Evaluation of results against Ministry of Primary Industries (MPI) criteria for classification of monofloral and multifloral Manuka honey, as per 'General Export Requirements for Bee Products - 29 January 2018.	-	1-5, 9
Manuka Honey Chemistry Profile			
3-Phenyllactic acid*	Aqueous solvent extraction, dilution. LC-MSMS analysis. **RLP Official Test 10.05**.	10 mg/kg	1-5, 9
2'-Methoxyacetophenone*	Aqueous solvent extraction, dilution. LC-MSMS analysis. **RLP Official Test 10.05**.	1.0 mg/kg	1-5, 9
2-Methoxybenzoic Acid*	Aqueous solvent extraction, dilution. LC-MSMS analysis. **RLP Official Test 10.05**.	1.0 mg/kg	1-5, 9
4-Hydroxyphenyllactic acid*	Aqueous solvent extraction, dilution. LC-MSMS analysis. **RLP Official Test 10.05**.	1.0 mg/kg	1-5, 9
Manuka Honey PCR Profile			
Manuka Cq	Quantification of Manuka DNA by real time PCR (Method version 1.05). **RLP Official Test 10.04**.	1.00 Cq	1-5, 9

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Shaun Clay BSc
Senior Technologist - Food and Bioanalytical