Certificate of Analysis

Sample Name:	Melo Melo Instant
Description:	Dehydrated aqueous kava root extract
Batch # & Sample ID:	B1SH
Analysis ID:	240503N96

Mix Date:	17/04/2024
Micro Lab Sampling Date:	22/04/2024
ASE Processing Date:	02/05/2024
UHPLC Injection Date:	03/05/2024
Date of Report:	**30/09/2024**

Plant Morphologist:	Joses Laau
Chromatographer:	John McGowan
Microbiologist:	Ariane Urriza
Sample Preparation Technician:	Eva David Livo
Quality Control Officer:	Anabel Belen
Quality Assurance Manager:	Dianne Manley

Executive Summary

Total extracted major kavalactones: **9.44%** of sample mass (w/w)

Chemotype: **423156** Moisture Content: **3.33%** (w/w)

Contamination: **Pass** Categorisation: **Noble kava**

K and DHK Ratios	
K to DHK: 1.79	DHK to K: 0.56
K to Y: 2.75	DHK to Y: 1.54
K to DMY: 4.21	DHK to DMY: 2.36
K to DHM: 6.66	DHK to DHM: 3.73
K to M: 7.22	DHK to M: 4.04

Chemical Analysis:

Sample Preparation: 1.000 g processed kava powder dispersed with silica sand to fill 10 mL Dionex ASE cell.

Extraction method: Accelerated Solvent Extraction (ASE)

Extraction Process Automation: Thermo Scientific Dionex™ ASE™ 350 Accelerated Solvent Extractor

Conditions – **Solvent**: HPLC grade Acetonitrile (ACN), **Temperature**: 60 °C, **Pressure**: 105 Bar, **Pre-incubation**: 5 min,

Static Hold: 20 min, **Rinse Volume**: 150%, **Dilution to Working Range**: 1 part ASE filtrate + 9 parts solvent (ACN) to give 1/10

Pre-UHPLC Particulate Exclusion: ASE™ filtrate passed through Dionex™ D28 cellulose filter prior to dilution to working concentration, then passed through 0.22 µm hydrophilic PTFE filter prior to injection

Chromatographic Conditions:

System:	Thermo Scientific Vanquish Horizon Ultra-High-Performance Liquid-Chromatography
Instrument Components:	VF-A10-A Split Sampler, VF-P10-A binary pump, VH-C10-A Column Compartment, and VF-D11-A Diode Array Detector
Column:	200 x 2.1 mm Hypersil GOLD, 1.9 µm particle size
Mobile Phase Gradient:	5% isopropanol to 97% isopropanol in water (nonlinear). Total runtime 15.9 minutes
Column Temperature:	60 °C **Injection Volume:** 5.00 µL **Organic Modifier**: None
UV Detection:	362 nm (aflatoxin B_1 and B_2 identification), 341 nm (flavokavain and aflatoxin G_1 and G_2 identification), 246 nm (kavalactone identification), and 218 nm (kavalactone and aflatoxin secondary peaks). Peak identification assisted by elution time and spectrum matching. Relative quantification calculations based on channel 3 (246 nm).
Calibration Standards:	Correlation coefficient for all identified compounds is greater than 99.995% on a 20-point calibration curve derived by serial dilution of one ampoule of Cerilliant (kavalactones and flavokavains) and one ampoule of Ehrenstorfer (aflatoxins) certified analytical reference standards. Analytical balances calibrated with certified class OIML E2 weights with uncertainty +/- 0.000016 g (NATA accredited for compliance with ISO/IEC 17025, by laboratory No.3279).
Instrument Method:	**Software**: Chromeleon 7.2.10 **Program**: 240604 Hypersil iPrOH
Processing Method:	**Software**: Chromeleon 7.3.2 **Program**: 240606 Hypersil iPrOH Pro
Confidence Probability:	Lower = 99.5% Upper = 99.5%

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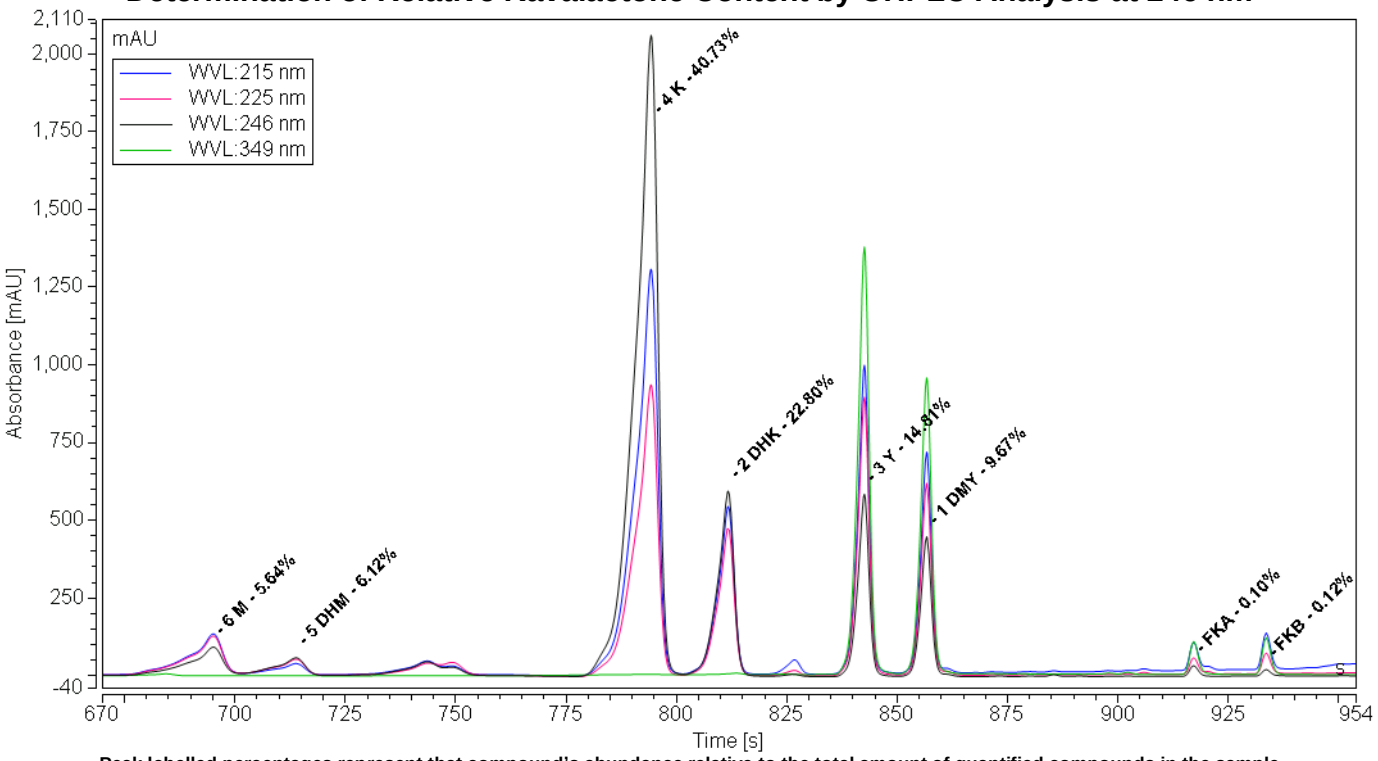
Determination of Relative Kavalactone Content by UHPLC Analysis at 246 nm



Peak labelled percentages represent that compound's abundance relative to the total amount of quantified compounds in the sample

Integration Results

Chem # Name abv	Rel.Amt %	Spectrum Match	Rtn T. min	Rel.Ar %	Rel.Ht %	R^2 %	HV LoD	Cor.Coef %	Cal. Pts.	Lower Limit	Amount (mg/kg)	Upper Limit	Extracted % of mass
4 K	40.73	999.556	13.238	63.11	52.87	99.995	2.8246	99.997	10	38165	38454	38743	3.85
2 DHK	22.80	999.703	13.528	13.38	15.28	99.999	2.2028	100.000	11	21460	21530	21601	2.15
3 Y	14.81	999.809	14.043	9.18	15.04	100.000	1.4260	100.000	11	13939	13979	14020	1.40
1 DMY	9.67	999.893	14.278	6.63	11.48	99.984	9.0105	99.992	11	8878	9134	9390	0.91
5 DHM	6.12	977.361	11.898	2.54	1.52	99.993	5.9188	99.997	11	5603	5777	5951	0.58
6 M	5.64	997.787	11.585	4.51	2.40	99.992	6.3283	99.996	11	5137	5324	5512	0.53
FKB	0.12	999.731	15.558	0.25	0.53	99.994	0.5752	99.997	11	98	116	135	0.01
FKA	0.10	999.545	15.285	0.40	0.89	99.980	0.8939	99.990	11	96	97	98	0.01
Total	100			100	100					93375	**94413**	95450	**9.44**

Peak Results

Peak Name	Peak No.	Purity Match	Ret. T. (s)	Signal to Noise	Peak to Valley	Area mAU*min	Height mAU	Width 50% min	Type	Resltn (EP)	Asym (EP)	Plates (EP)
4 K	3	995	794.252	83.0	348.32	205.049	2062.829	0.087	BM *	2.26	0.68	127625
2 DHK	4	997	811.702	24.0	100.67	43.459	596.193	0.064	MB*	5.54	0.74	245006
3 Y	5	999	842.552	144.9	n.a.	29.822	586.716	0.045	BMb*	3.13	0.83	534822
1 DMY	6	999	856.652	110.6	n.a.	21.553	447.787	0.043	bMB*	15.14	0.89	598160
5 DHM	2	997	713.852	2.4	6.90	8.242	59.347	0.123	M	7.52	n.a.	51879
6 M	1	981	695.102	3.8	10.87	14.656	93.483	0.121	BM	1.51	n.a.	50876
FKB	8	999	933.502	31.4	n.a.	0.820	20.859	0.035	BMB*	n.a.	1.47	1098859
FKA	7	998	917.102	10.8	n.a.	1.309	34.530	0.035	BMB	4.61	1.19	1052934

Disclaimer: The testing protocols employed utilise samples and are representative only of the respective batch, not necessarily other batches or products, even if apparently identical.

These analytical tests have been conducted by suitably qualified personnel on reputable equipment, using high-quality reagents and robust protocols, based upon industry standards. The results are generated in-house, and we believe them to be accurate and precise, however, despite our best efforts, errors may exist; No guarantee is expressed or implied.

These results should not be used as a final determination for use in a finished product; It is recommended that they be verified by the purchaser's quality control department and through the third-party services of an additional certified testing laboratory to ensure the purchased material meets specifications.

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ROOT & PESTLE
PREMIUM KAVA POWDER

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Summary of Microbial Analysis:

Microbial analyses are carried out in accordance with Forney Enterprises' Quality Assurance Programme. Analyses are performed in our modern, well-equipped, built-for-purpose microbiology laboratory, by experienced staff who are skilled in the art, using aseptic technique, calibrated equipment, and high-quality reagents, and incorporate the use of controls. Any given test may be performed using more than one method, substrate, or growth medium, including (but not limited to) 3M Petrifilm, HyServe Compact Dry plates, traditional and chromogenic agars, and culture-specific broths to validate results. We combine the use of industry standard protocols (such as FDA BAM and AOAC) and proprietary methods developed in-house, however, the results reported are from the most sensitive method used (highest test counts). R&P kava is produced in a closely regulated HACCP certified facility, with continuous environmental monitoring and comprehensive testing throughout the production process. The figures below result from testing the finished product as packaged. Kava powder which does not meet the strictest criteria cannot bear the R&P logo.

Indicator Organism	**Test Results (cfu/g)**
Aerobic Plate Count (TPC)	1,150
Coliform	None detected
Escherichia coli	None detected
Yeast	None detected
Mould	None detected
Staphylococcus spp.	None detected
Salmonella spp.	None detected
Listeria spp.	None detected

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