Certificate of Analysis

Sample Name:	Kelai Instant
Description:	Dehydrated aqueous kava root extract
Batch # & Sample ID:	**B1**SJ
Analysis ID:	241004U40

Mix Date:	**02/10/2024**
Micro Lab Sampling Date:	03/10/2024
ASE Processing Date:	04/10/2024
UHPLC Injection Date:	04/10/2024
Date of Report:	22/11/2024

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: **7.69%** of sample mass (w/w)

Chemotype: **423165** Moisture Content: **2.57%** (w/w)

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

K and DHK Ratios

K to DHK: 1.72	DHK to K: 0.58
K to Y: 2.86	DHK to Y: 1.66
K to DMY: 3.95	DHK to DMY: 2.29
K to M: 5.54	DHK to M: 3.22
K to DHM: 6.46	DHK to DHM: 3.75

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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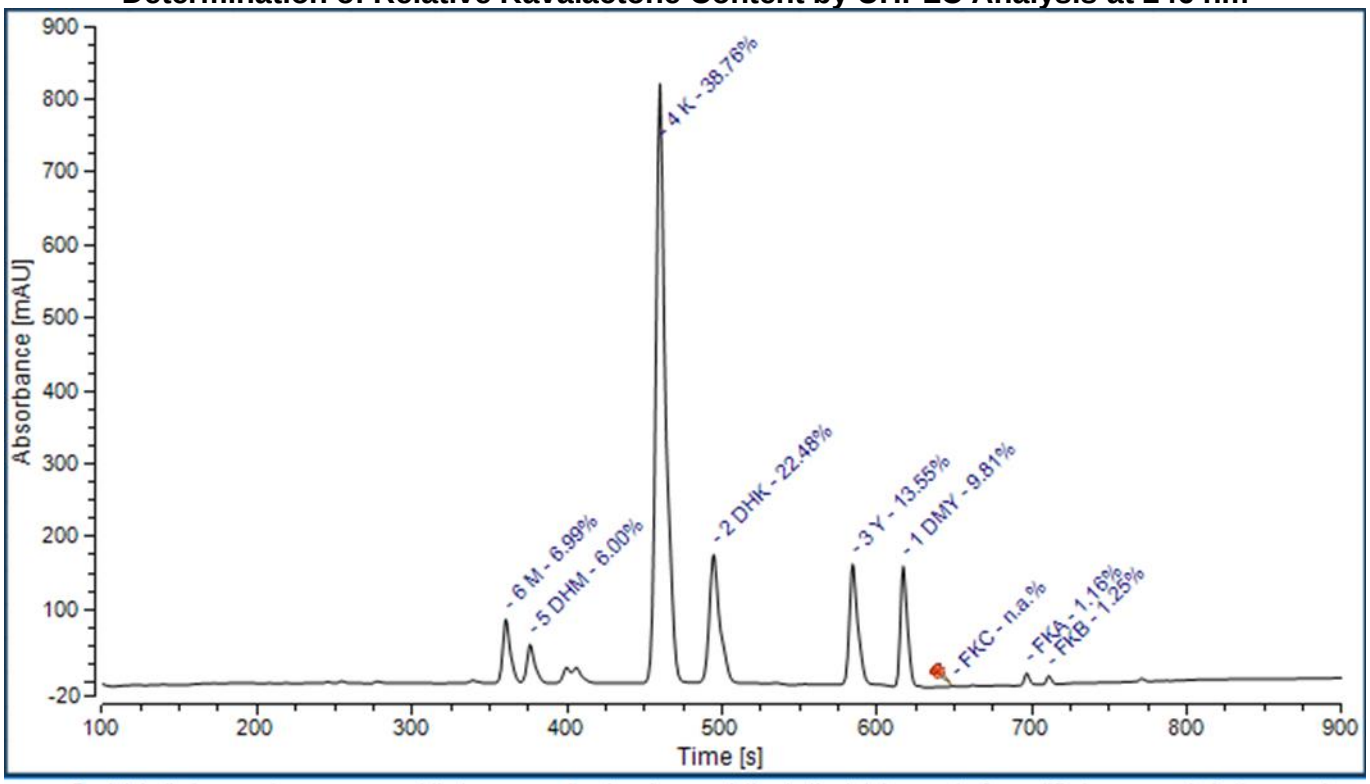
Determination of Relative Kavalactone Content by UHPLC Analysis at 246 nm



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 (mg/kg)	Cor.Coef %	Cal. Pts.	Lower Limit	Amount (mg/kg)	Upper Limit	Extracted % of mass
4 K	38.755	999.871	7.665	58.96	54.82	99.997	2.9065	99.998	20	30421	30521	30621	3.052
2 DHK	22.484	998.711	8.243	13.50	11.75	99.998	2.2489	99.999	20	17663	17707	17750	1.771
3 Y	13.553	999.229	9.739	10.20	11.03	99.999	2.0071	99.999	20	10648	10673	10699	1.067
1 DMY	9.806	999.218	10.282	8.34	11.00	99.998	2.2349	99.999	20	7697	7722	7747	0.772
6 M	6.991	998.645	6.009	4.82	5.84	99.998	2.3968	99.999	20	5480	5505	5531	0.551
5 DHM	6.001	996.348	6.269	3.05	3.53	99.998	2.0995	99.999	20	4703	4726	4748	0.473
FKB	1.253	999.000	11.846	0.43	0.82	99.991	0.4956	99.996	20	981	987	993	0.099
FKA	1.157	993.876	11.608	0.67	1.15	99.994	0.4032	99.997	20	907	911	916	0.091
FKC	n.a.	902.861	10.821	0.03	0.06	99.999	0.1742	99.999	20	n.a.	n.a.	n.a.	n.a.
Totals:	100%			100%	100%	**Major Kavalactones Extracted (% of total mass):**							**7.685**
Flavokavains Extracted (relative %): 2.411						Flavokavains Extracted (% of total mass):							0.19

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	Res (EP)	Asym (EP)	Plates (EP)
4 K	3	999	459.904	66.7	1907.41	99.741	822.427	0.17	BM	3.26	1.34	31783
2 DHK	4	999	494.584	14.3	408.87	22.842	176.294	0.18	MB	8.80	1.34	32204
3 Y	5	1000	584.324	124.9	n.a.	17.251	165.440	0.16	BMB*	3.72	1.37	61591
1 DMY	6	999	616.944	162.5	n.a.	14.116	165.000	0.14	BMB	4.48	1.30	91079
6 M	1	999	360.544	7.1	82.94	8.154	87.616	0.14	BM	1.86	1.31	30480
5 DHM	2	999	376.144	4.3	50.06	5.161	52.880	0.14	MB	8.89	1.34	30783
FKB	9	996	710.764	12.1	110.69	0.721	12.287	0.10	MB	n.a.	1.23	255530
FKA	8	985	696.504	17.0	155.39	1.136	17.248	0.10	BM	2.47	1.43	218002
FKC	7	826	649.244	0.9	n.a.	0.056	0.915	0.11	BMB*^	7.74	1.05	171332

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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)	90
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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