

Confirmatory Non-Invasive and Non-Destructive Differentiation Between Hemp and Cannabis Using A Hand-Held Raman Spectrometer

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Supplementary Information

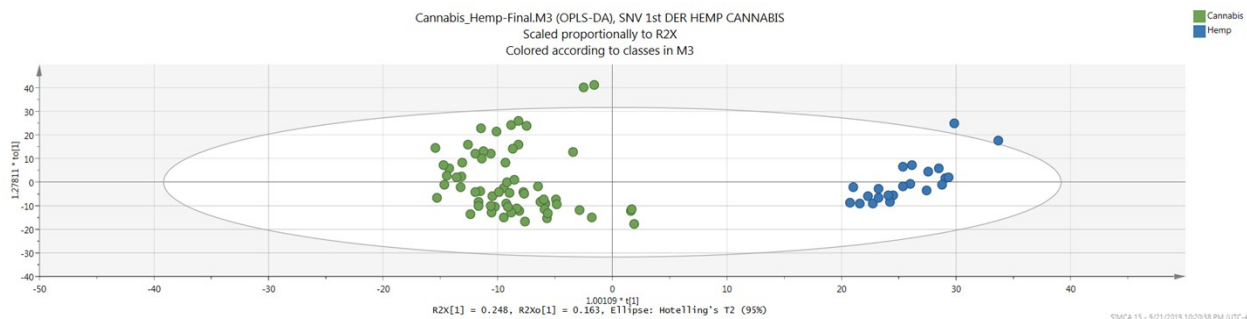


Figure S1. OPLS-DA loadings plot of Raman spectra collected from cannabis (green) and hemp (blue).

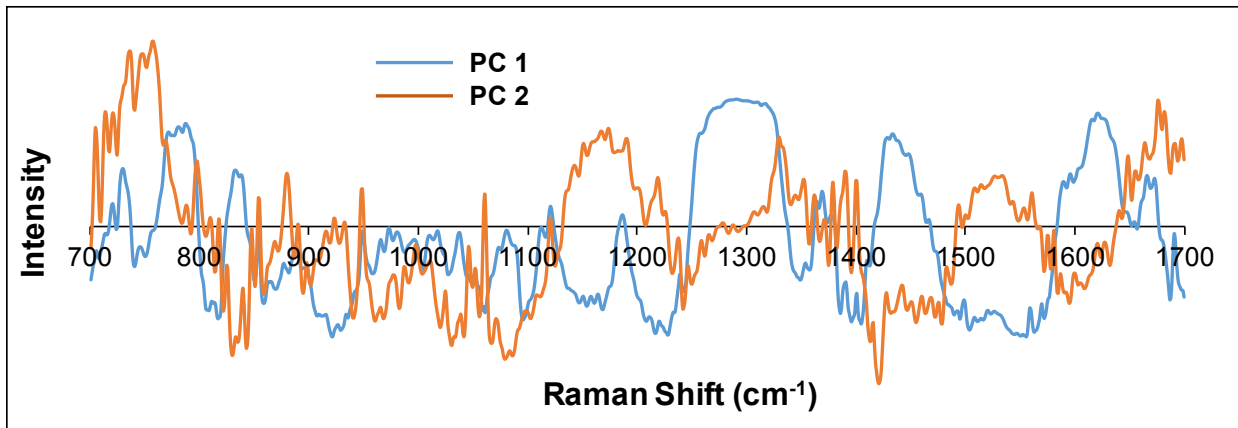
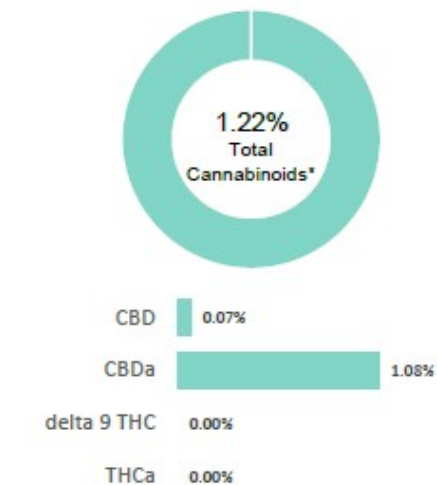


Figure S2. Loading plot of two predictive components in the Raman spectra of three different cannabis varieties.

CANNABINOID PROFILE



Compound	LOQ (%)	Result (%)	Result (mg/g)
Delta 9-Tetrahydrocannabinolic acid (THCA-A)	0.07	0.00	0.0
Delta 9-Tetrahydrocannabinol (Delta 9THC)	0.04	0.00	0.0
Cannabidiolic acid (CBDA)	0.08	1.08	10.8
Cannabidiol (CBD)	0.05	0.07	0.7
Delta 8-Tetrahydrocannabinol (Delta 8THC)	0.04	0.00	0.0
Cannabinolic Acid (CBNA)	0.10	0.00	0.0
Cannabinol (CBN)	0.04	0.00	0.0
Cannabigerolic acid (CBGA)	0.06	0.00	0.0
Cannabigerol (CBG)	0.04	0.00	0.0
Tetrahydrocannabivarinic Acid (THCVA)	0.06	0.00	0.0
Tetrahydrocannabivarin (THCV)	0.03	0.00	0.0
Cannabidivarinic Acid (CBDVA)	0.08	0.00	0.0
Cannabidivarin (CBDV)	0.04	0.00	0.0
Cannabichromenic Acid (CBCA)	0.06	0.07	0.7
Cannabichromene (CBC)	0.07	0.00	0.0
Total Cannabinoids		1.22	12.20
Total Potential THC**		0.00	0.00
Total Potential CBD**		1.02	10.17

NOTES:

N/A

% = % (w/w) = Percent (Weight of Analyte / Weight of Product)

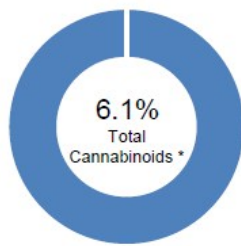
* Total Cannabinoids result reflects the absolute sum of all cannabinoids detected.

** Total Potential THC/CBD is calculated using the following formulae to take into account the loss of a carboxyl group during decarboxylation step.

Total THC = THC + (THCa *(0.877)) and Total CBD = CBD + (CBDA *(0.877))

Results of HPLC analysis of hemp standard

CANNABINOID PROFILE



- Total Potential THC 5.37% **
- Total Potential CBD 0% **

6.12%



0.00%

THC
0 mg/g

0.00%

CBDA
0 mg/g

0.00%

CBD
0 mg/g

0.00%

CBN
0 mg/g

0.00%

CBG
0 mg/g

* Total Cannabinoids result reflects the absolute sum of all cannabinoids detected.

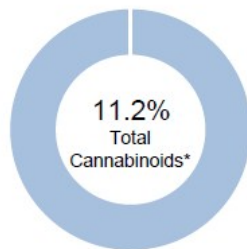
** Total Potential THC/CBD is calculated using the following formulas to take into account the loss of a carboxyl group during decarboxylation step.

Total THC = THC + (THCa *(0.877)) and Total CBD = CBD + (CBDA *(0.877))

% = % (w/w) = Percent (Weight of Analyte / Weight of Product)

Results of HPLC analysis of GC cannabis

CANNABINOID PROFILE



THCa 10.31%

delta 9 THC 0.06%

CBDA 0.00%

CBD 0.00%

Compound	LOQ (%)	Result (%)	Result (mg/g)
Delta 9-Tetrahydrocannabinolic acid (THCA-A)	0.10	10.31	103.1
Delta 9-Tetrahydrocannabinol (Delta 9THC)	0.05	0.06	0.6
Cannabidiolic acid (CBDA)	0.09	0.00	0.0
Cannabidiol (CBD)	0.05	0.00	0.0
Delta 8-Tetrahydrocannabinol (Delta 8THC)	0.05	0.00	0.0
Cannabinolic Acid (CBNA)	0.13	0.00	0.0
Cannabinol (CBN)	0.06	0.00	0.0
Cannabigerolic acid (CBGA)	0.08	0.71	7.1
Cannabigerol (CBG)	0.05	0.00	0.0
Tetrahydrocannabivarinic Acid (THCVA)	0.08	0.00	0.0
Tetrahydrocannabivarin (THCV)	0.08	0.00	0.0
Cannabidivarinic Acid (CBDVA)	0.08	0.00	0.0
Cannabidivarin (CBDV)	0.05	0.00	0.0
Cannabichromenic Acid (CBCA)	0.07	0.12	1.2
Cannabichromene (CBC)	0.09	0.00	0.0
Total Cannabinoids		11.20	112.00
Total Potential THC**		9.10	91.02
Total Potential CBD**		0.00	0.00

NOTES:

Free from visual mold, mildew, and foreign matter.

% = % (w/w) = Percent (Weight of Analyte / Weight of Product)

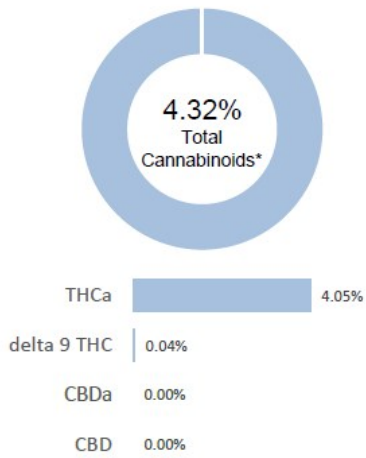
* Total Cannabinoids result reflects the absolute sum of all cannabinoids detected.

** Total Potential THC/CBD is calculated using the following formulas to take into account the loss of a carboxyl group during decarboxylation step.

Total THC = THC + (THCa *(0.877)) and Total CBD = CBD + (CBDA *(0.877))

Results of HPLC analysis of TCC cannabis

CANNABINOID PROFILE



% = % (w/w) = Percent (Weight of Analyte / Weight of Product)

* Total Cannabinoids result reflects the absolute sum of all cannabinoids detected.

** Total Potential THC/CBD is calculated using the following formulas to take into account the loss of a carboxyl group during decarboxylation step.

Total THC = THC + (THCa * (0.877)) and Total CBD = CBD + (CBDa * (0.877))

Compound	LOQ (%)	Result (%)	Result (mg/g)
Delta 9-Tetrahydrocannabinolic acid (THCA-A)	0.08	4.05	40.5
Delta 9-Tetrahydrocannabinol (Delta 9THC)	0.04	0.04	0.4
Cannabidiolic acid (CBDA)	0.08	0.00	0.0
Cannabidiol (CBD)	0.05	0.00	0.0
Delta 8-Tetrahydrocannabinol (Delta 8THC)	0.04	0.00	0.0
Cannabinolic Acid (CBNA)	0.10	0.00	0.0
Cannabinol (CBN)	0.05	0.00	0.0
Cannabigerolic acid (CBGA)	0.07	0.23	2.3
Cannabigerol (CBG)	0.04	0.00	0.0
Tetrahydrocannabivarinic Acid (THCVA)	0.06	0.00	0.0
Tetrahydrocannabivarin (THCV)	0.08	0.00	0.0
Cannabidivarinic Acid (CBDVA)	0.08	0.00	0.0
Cannabidivarin (CBDV)	0.04	0.00	0.0
Cannabichromenic Acid (CBCA)	0.06	0.00	0.0
Cannabichromene (CBC)	0.07	0.00	0.0
Total Cannabinoids		4.32	43.20
Total Potential THC**		3.59	35.92
Total Potential CBD**		0.00	0.00

NOTES:

Free from visual mold, mildew, and foreign matter.

Results of HPLC analysis of TS cannabis