CERTIFICATE OF ANALYSIS

PRODUCT NAME: Tincture - Natural

PRODUCT STRENGTH: 450 mg

LOT NUMBER: 191213B

BEST BY DATE: 06/21

HEMP EXTRACT LOT NUMBER: 111919

Physical Atttributes

Test	Method	Specification	Results
Color	SOP-100	Golden to Amber	PASS
Odor	SOP-100	Characteristic - Olive and hemp	PASS
Appearance	SOP-100	Golden to Amber oil in brown glass bottle with dropper	PASS
Primary Package Eval.	SOP-132	Container clean and free of filth. Container caps tight and shrink bands intact	PASS
Secondary Package Eval.	SOP-132	Labeling Compliance Checked, Cartons sturdy and clean. Sufficient cushion material exists. Box taped and secure.	PASS

Review of Third-Party Analysis

Panel	Method	Specification	Results	Pass/Fail
Potency - Total CBD	SOP-111	427.5-562.2 mg CBD LOQ*: 10 PPM† (0.001%)	479.9 mg	PASS
Potency - D9-THC	SOP-111	None Detected LOQ: 10 PPM (0.001%)	<u>ND</u>	PASS
FL Compliant Pesticide Panel	SOP-111	Florida State Hemp Program Rule 5B-57.014: Action Limits for Pesticides	<u>ND</u>	PASS
Microbial - Stec E.Coli	SOP-111	Complies with USP 61/62	>LOD	PASS
Microbial - Salmonella	SOP-111	Complies with USP 61/62	>LOD	PASS
Microbial - Aspergillus SOP-111		Complies with USP 61/62	>LOD	PASS
CA Compliant Heavy Metal Panel	SOP-111	Arsenic (As): ≤1.5 PPM Cadmium (Cd): ≤0.5 PPM Mercury (Hg): ≤1.0 PPM Lead (Pb): ≤0.5 PPM	>LOQ	PASS

^{*} Level of Quantitation, † Parts Per Million

Quality Certified by: Darcis Moran 1/17/2020

Darcie Moran Date

Director of Quality Assurance



Order #: 44697 Order Name: CTNAT450-

191213B Batch#: 4

Received: 12/20/2019 Completed: 01/24/2020



Sample



N/D D9-THC 1.600% Total CBD

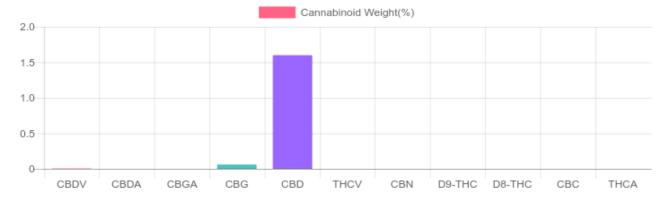
499.1 mg Cannabinoids per bottle 479.9 mg CBD per bottle

1 bottle = 30 ml per bottle x density (1) x Cannabinoid concentration

Cannabinoids Test

SHIMADZU INTEGRATED UPLC-PDA

GSL SOP 400	PREPARED: 12/	23/2019 11:57:57	UPLOADED: 12	/23/2019 18:05:46
Cannabinoids	LOQ	weight(%)	mg/g	mg/bottle
D9-THC	10 PPM	N/D	N/D	N/D
THCA	10 PPM	N/D	N/D	N/D
CBD	10 PPM	1.600%	15.995	479.9
CBDA	20 PPM	N/D	N/D	N/D
CBDV	20 PPM	0.005%	0.052	1.6
CBC	10 PPM	N/D	N/D	N/D
CBN	10 PPM	N/D	N/D	N/D
CBG	10 PPM	0.059%	0.588	17.6
CBGA	20 PPM	N/D	N/D	N/D
D8-THC	10 PPM	N/D	N/D	N/D
THCV	10 PPM	N/D	N/D	N/D
TOTAL D9-THC		N/D	N/D	N/D
TOTAL CBD*		1.600%	15.995	479.9
TOTAL CANNABINOIDS		1.664%	16.635	499.1



Reporting Limit 10 ppm
*Total CBD = CBD + CBDA x 0.877
N/D - Not Detected, B/LOQ - Below Limit of Quantification

Dr. Andrew Hall, Ph.D., Chief Scientific Officer

Bul

Ben Witten, MS, MT., Lab Director

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Order #: 44697 Order Name: CTNAT450-191213B Batch#: 4

Received: 12/20/2019 Completed: 01/24/2020



PESTICIDE ANALYSIS:

GSL SOP 401 PREPARED: 12/23/2019 15:47:09 UPLOADED: 12/26/2019 11:47:55

GCMS-MS - Shimadzu GCMS-TQ8040

Pesticide	Action Level (ppm)	Results (ppm)	LOQ (ppm)	LOD (ppm)
CHLORFENAPYR	0.010	N/D	0.003	0.001
COUMAPHOS	0.010	N/D	0.003	0.001
CYFLUTHRIN	0.010	N/D	0.003	0.001
CYPERMETHRIN	0.500	N/D	0.003	0.001

Pesticide	Action Leve	l Results	LOQ	LOD
	(ppm)	(ppm)	(ppm)	(ppm)
FIPRONIL	0.010	N/D	0.003	0.001
FLUDIOXONIL	0.020	N/D	0.003	0.001
PENTACHLORONITROBENZEN	E 0.030	N/D	0.003	0.001

LCMS-MS - Shimadzu LCMS-8060

Pesticide	Action Level (ppm)	Results (ppm)	LOQ (ppm)	LOD (ppm)	Pesticide Action Lev (ppm)		Results (ppm)	LOQ (ppm)	LOD (ppm)
ABAMECTIN B1A	0.020	N/D	0.005	0.001	METALAXYL	0.010	N/D	0.001	0.001
ACEPHATE	0.020	N/D	0.001	0.001	METHIOCARB	0.010	N/D	0.005	0.001
ACEQUINOCYL	0.020	N/D	0.001	0.001	METHOMYL	0.010	N/D	0.001	0.001
ACETAMIPRID	10.000	N/D	0.005	0.001	MEVINPHOS	0.010	N/D	0.001	0.001
ALDICARB	0.010	N/D	0.005	0.001	MYCLOBUTANIL	0.020	N/D	0.005	0.001
AZOXYSTROBIN	0.100	N/D	0.001	0.001	NALED	0.010	N/D	0.005	0.001
BIFENAZATE	0.010	N/D	0.005	0.001	OXAMYL	0.026	N/D	0.001	0.001
CHLORPYRIFOS	0.020	N/D	0.001	0.001	PACLOBUTRAZOL	0.010	N/D	0.005	0.001
CLOFENTEZINE	0.040	N/D	0.001	0.001	PERMETHRINS	0.020	N/D	0.005	0.001
DAMINOZIDE	0.010	N/D	0.005	0.001	PHOSMET	0.020	N/D	0.005	0.001
DIAZANON	0.010	N/D	0.001	0.001	PIPERONYL	3.000	N/D	0.001	0.001
DICHLORVOS	0.020	N/D	0.005	0.001	BUTOXIDE	3.000	IN/D	0.001	0.001
DIMETHOATE	0.010	N/D	0.001	0.001	PRALLETHRIN	0.020	N/D	0.005	0.005
DIMETHOMORPH	0.010	N/D	0.005	0.001	PROPICONAZOLE	0.020	N/D	0.010	0.005
ETHOPROPHOS	0.010	N/D	0.001	0.001	PROPOXUR	0.020	N/D	0.001	0.001
ETOFENPROX	0.010	N/D	0.001	0.001	PYRETHRINS	0.500	N/D	0.005	0.005
ETOXAZOLE	0.010	N/D	0.010	0.005	(PYRETHRIN I)	0.500	IN/D	0.005	0.005
FENHEXAMID	0.080	N/D	0.005	0.001	PYRIDABEN	0.020	N/D	0.005	0.001
FENOXYCARB	0.010	N/D	0.005	0.001	SPINETORAM	0.040	N/D	0.001	0.001
FENPYROXIMATE	0.100	N/D	0.001	0.001	SPINOSAD	0.020	N/D	0.001	0.001
FLONICAMID	0.100	N/D	0.025	0.010	(SPINOSYN A)	0.020	IN/D	0.001	0.001
HEXYTHIAZOX	0.100	N/D	0.005	0.001	SPINOSAD	0.020	N/D	0.001	0.001
IMAZALIL	0.010	N/D	0.005	0.001	(SPINOSYN D)	0.020	IN/D	0.001	0.001
IMIDACLOPRID	0.020	N/D	0.005	0.001	SPIROMESIFEN	0.030	N/D	0.005	0.001
KRESOXIM-METHYL	0.020	N/D	0.010	0.005	SPIROTETRAMAT	0.020	N/D	0.001	0.001
MALATHION	0.010	N/D	0.005	0.001	SPIROXAMINE	0.010	N/D	0.001	0.001
					TEBUCONAZOLE	0.010	N/D	0.005	0.001
					THIACLOPRID	0.010	N/D	0.001	0.001

 ${\sf N/D} = {\sf Not\ Detected}, \ {\sf A/LOQ} = {\sf Above\ LOQ\ Level}, \ {\sf B/LOQ} = {\sf Below\ LOQ\ Level}, \ {\sf B/LOD} = {\sf Below\ LOD\ Level}$

Dr. Andrew Hall, Ph.D., Chief Scientific Officer

Ben Witten, MS, MT., Lab Director

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0.010

0.020



N/D



0.001

0.001



0.001

0.001

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THIAMETHOXAM

TRIFLOXYSTROBIN



Order #: 44697 Order Name: CTNAT450-191213B Batch#: 4 Received: 12/20/2019

Received: 12/20/2019 Completed: 01/24/2020



Microbial Analysis:

Microbial Analysis GSL SOP 406

Uploaded: 12/26/2019 13:07:18

PCR - Agilent AriaMX Test	nt AriaMX Test Method Used Device Use		LOD	Allowable Criteria	Actual Result	Pass/Fail
STEC E.COLI*	USP 61/62†	ARIAMX PCR	2 COPIES OF DNA	PRESENCE / ABSENT	BELOW	PASS
STEC E.COLI	USF 01/02	ARIAWA PCR	2 COPIES OF DINA	PRESENCE / ABSENT	LOD	FAGG
SALMONELLA*	USP 61/62†	ARIAMX PCR	5 COPIES OF DNA	PRESENCE / ABSENT	BELOW	PASS
SALIVIONELLA	USP 01/02T	ARIAWA PCR	5 COPIES OF DINA	PRESENCE / ABSENT	LOD	FASS
ACDEDOULLIC	USP 61/62†	ARIAMX PCR	ACD 1 OD***	PRESENCE / ABSENT	BELOW	PASS
ASPERGILLUS	USP 01/02T	ARIAWA PCR	ASP_LOD***	PRESENCE / ABSENT	LOD	PASS

[†] USP 61 (enumeration of bacteria TAC, TYM, and ENT/Coliform), USP 62 (identifying specific species E.coli Aspergillus etc)

(Mm) FEL

Dr. Andrew Hall, Ph.D., Chief Scientific Officer

BU

Ben Witten, MS, MT., Lab Director

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^{*} STEC and Salmonella run as Multiplex

^{***} Flavus = 2 Copies of DNA / Fumigatis = 2 Copies of DNA Niger = 20 Copies of DNA / Terrus = 10 copies of DNA



Order #: 44697 Order Name: CTNAT450-191213B Batch#: 4 Received: 12/20/2019

Completed: 01/24/2020



Heavy Metals Analysis:

ICP-MS - Shimadzu ICPMS-2030 GSL SOP 403

Uploaded: 12/23/2019 20:16:47

Metal	Action Level (ppb)	Result (ppb)
ARSENIC (AS)	200	B/LOQ
CADMIUM (CD)	200	B/LOQ
MERCURY (HG)	100	B/LOQ
LEAD (PB)	500	B/LOQ

Lower Limit of Quantitation (LOQ) is 75 ppb

Dr. Andrew Hall, Ph.D., Chief Scientific Officer

Ben Witten, MS, MT., Lab Director

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total cannabinoids

88.5%

84.61% CBD decarb total

> ND A9-THC

This Product Has Been **Tested and Complies with** 7USC1639o(1) **Definition of** Hemp









https://portal.a2la.org/scopepdf/4961-01.pdf

Sample Handling

test ID		sample	e date	12/4/19	2:46	PM
order 607	70 I	abID 9N	1D44	weight	5.4	g
source						

Methods	method	equipment
weights	MSP-7.3.1.3	AUX120.1
potency	MSP-7.5.1.5	LC-2030
terpenes	MSP-7.5.1.7	QP2020/HS20
pesticides	MSP-7.5.1.8	LC-8060
mycotoxins	MSP-7.5.1.8	LC-8060
microbial	MSP-7.5.1.9	Hardy Diag
solvents	MSP-7.5.1.6	QP2020/HS20
metals	MSP-7.5.1.10	ICPMS2030

cannabichromene (CBC)

caryophyllene humulene terpinolene ocimene beta pinene alpha pinene limonene myrcene

linalool



HERBAL

concentrate



Pesticides (other)

acephate

aldicarb

boscalid

carbaryl

carbofuran

chlorpyrifos

clofentezine

cypermethrin

diazinon

dichlorvos

dimethoate

etofenprox

flonicamid

fludioxonil

malathion

metalaxyl

methiocarb

methomyl

permethrins

piperonyl butoxide

oxamyl

phosmet

prallethrin

pyridaben

spiroxamine

thiacloprid

tebuconazole

thiamethoxam

propiconazole

hexythiazox

kresoxym-methyl

fipronil

fenpyroximate

chloantraniliprole

acetamiprid

azoxystrobin

9MD44

0.00 ppm

0.01 ppm

0.00 ppm

0.00 ppm <10ppb

LOQ

<10ppb

Potency	%	estimated error	Terpenes	%	estimated error		%	estimated error		%	estimated error
tetrahydrocannabolic acid (THCa)	ND	± 0.02 %	ß-myrcene	0.004%	± 0.0018%	camphene	0.000%	± 0.0016 %	quaiol	0.000%	± 0.0016 %
Δ^9 -tetrahydrocannabinol (Δ^9 THC)	ND	± 0.02 %	ß-caryophyllene		, -	Δ3-carene			B-bisabolol		± 0.0016 %
Δ^{8} -tetrahydrocannabinol (Δ^{8} THC)	ND	± 0.02 %	alpha-pinene	0.003%	± 0.0017%	a-terpenine	0.000%	± 0.0016 %	eucalyptol		± 0.0016 %
tetrahydrocannabivarin (THCv)	ND	± 0.02 %	B-pinene	0.008%	± 0.0019%	para-cymene	0.000%	± 0.0016 %	,,		
cannabidiolic acid (CBDa)	.14%	± 0.04 %	D-limonene	0.000%	± 0.0016%	g-terpenine	0.000%	± 0.0016 %			
cannabidiol (CBD)	84.48%	± 0.75 %	linalool	0.000%	± 0.0016%	(-)-isopulegol	0.000%	± 0.0016 %		total	
cannabidivarin (CBDv)	.33%	± 0.05 %	ocimene	0.000%	± 0.0033%	geraniol	0.000%	± 0.0016 %		terper	ies
cannabigerolic acid (CBGa)	ND	± 0.02 %	terpinolene	0.000%	± 0.0016%	cis-nerolidol	0.000%	± 0.0016 %		0.0	1 0/
cannabigerol (CBG)	3.54%	± 0.15 %	alpha-humulene	0.000%	± 0.0016%	trans-nerolidol	0.000%	± 0.0016 %		0.0	1 %
cannabinol (CBN)	ND	+ 0.02 %									

Solvents	MT limit 9	MD44 I	LOQ	Pesticides (MT)	MT limit	9MD44	LOQ
propane	5,000 P	ASS <1	0ppm	abamectin	2.50 ppm	PASS	<10ppb
butanes	5,000 P	ASS <1	0ppm	acequinocyl	10.00 ppm	PASS	<10ppb
pentanes	5,000 P	ASS <1	0ppm	bifenazate	1.00 ppm	PASS	<10ppb
hexanes	290 P	ASS <1	0ppm	bifenthrin	1.00 ppm	PASS	<10ppb
cyclohexane	3,880 P	ASS <1	0ppm	chlormeguat cl.	5.00 ppm	PASS	<10ppb
heptanes	5,000 P	ASS <1	0ppm	cyfluthrin	5.00 ppm	PASS	<80ppb
methanol	3,000 P	ASS <1	0ppm	diaminozide	5.00 ppm	PASS	<10ppb
isopropanol	5,000 P	ASS <1	0ppm	etoxazole	1.00 ppm	PASS	<10ppb
acetone	5,000 PA	ASS <1	0ppm	fenoxycarb	1.00 ppm	PASS	<10ppb
ethyl acetate	5,000 PA	ASS <1	0ppm	imazalil	1.00 ppm	PASS	<10ppb
benzene	2 P	ASS <0.	.2ppm	imidacloprid	2.00 ppm	PASS	<10ppb
toluene	890 P	ASS <1	0ppm	myclobutanil	0.60 ppm	PASS	<10ppb
xylenes	2,170 P	ASS <1	0ppm	paclobutrazol	2.00 ppm	PASS	<10ppb
chloroform	2 P/		.2ppm	pyrethrins	5.00 ppm	PASS	<10ppb
dichloromethane	600 P	ASS <1	0ppm	spinosad	1.00 ppm	PASS	<10ppb
				spiromesifen	1.00 ppm	PASS	<10ppb
Toyic Motolo				spirotetramat	1.00 ppm	PASS	<10ppb
Toxic Metals MT III	mit 9MD44	LOQ		trifloxystrobin	1.00 ppm	PASS	<10ppb
arsenic 2 pp	om PASS	<10ppb					
cadmium 4.1 pp		<10ppb		Microbial		014044	
lead 1.2 pp		<10ppb		IVIICIODIAI	MT limit	9MD44	LOQ
mercury 0.4 pp	om PASS	<10ppb		E. coli	10 CFU	PASS	<10 CFU/q
				Salmonella sp.	10 CFU	PASS	<10 CFU/g
				molds	10000 CFU	PASS	<10k CFU/g
				Aflatoxin B1,B2,G1,G2	20 ppb	PASS	<20 ppb
				Ochratoxin A	20 ppb	PASS	<20 ppb

± 0.02 %

· All testing was completed onsite at 6073 US93N, Olney MT · · Potency (cannabinoid concentration) is calcuated from the equation: [cannabioid] = [cannabinoid]_{HPLC} x volume_{dilution}/m_{dry}. Terpene concentration is calcuated from the equation: [terpene] = (terpene mass)_{GCMS} / m_{dry}. ••• Decarboxyted cannabinoid concentration is calculated from the equation XXX_{total} = 0.877 x XXXa + XXX •••• Standards are used to calibrate the resulting data and estimate error using a standard estimate of error method; this is combined with error from weighing and dilution using the propagation of error formula s_q^2 = $\sum (\partial f/\partial i)^2 s_i^2$ where i is the contributor to error. The 95% confidence range is calculated from the equation: (concentration) $\pm t_{CL90} \times s_g$. Sampling error is not

Certified by:



Kyle Larson, MSc (Biology) Deputy Director 6073 US93N, Olney MT 59927 406-881-2019 rdb@stwlabs.co