

SUMMARY OF ANALYSIS (SAMPLE ID: SA2020-23958)

Testing Location: OKC 3680 E. I-240 Service Rd. Oklahoma City, OK 73135	Customer ID: 746 Helix Extracts 9402 E. 55th Pl, Ste C Tulsa, OK 74012 License: PAAA-VYCL-RKVM	Order ID: OR2020-7532 Lot Number: Not Entered Batch Number: Not Entered	Sample Type: Primary Matrix: Concentrate Mass: 3g Date Collected: 03/11/2020 Date Received: 03/11/2020
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Cultivar (Strain) or Sample Description: Humbolt Pineapple live resin **Date Completed:** 03/16/2020

*This page is simply a summary of the analysis performed. For analytical details, please consult the individual Certificate(s) of Analysis for each of the specific test(s) performed.

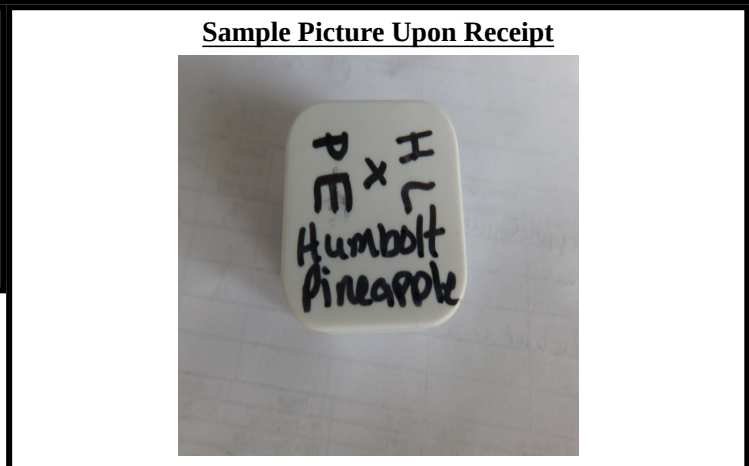
*For Oklahoma, with the new OMMA rules to be effective April 1, 2020, limits on moisture are proposed at 15% and water activity at 0.65aw.

Moisture Content (%) Not Tested	PASS/FAIL N/A	Water Activity (aw) Not Tested	PASS/FAIL N/A
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<u>Cannabinoids (Top 3)</u>	<u>(%)</u>	<u>mg/g</u>
THCa	106	1064
Δ9-THC	4.12	41
CBGa	1.36	14
TOTAL CBD	0.216	2
TOTAL THC	97.4	974
TOTAL CANNABINOIDS	112	1124

<u>Terpenes (Top 5)</u>	<u>(%)</u>	<u>µg/g</u>
β-Myrcene	4.943	49432
β-Caryophyllene	1.988	19881
d-Limonene	1.276	12763
α-Humulene	1.006	10058
β-Ocimene	0.854	8537
TOTAL TERPENES	12	120072

<u>Contaminants</u>	<u>PASS/FAIL</u>
Heavy Metals:	PASS
Microbiology:	PASS
Mycotoxins:	PASS
Pesticides:	PASS
Residual Solvents:	PASS
Visual Inspection:	PASS



Scan the QR code to verify results.

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Kyle W. Felling
Kyle W. Felling, Ph.D.
Laboratory Director



CERTIFICATE OF ANALYSIS (SAMPLE ID: SA2020-23958)

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Cultivar (Strain) or Sample Description: Humbolt Pineapple live resin **Date Completed:** 03/16/2020

CANNABINOID (POTENCY) PROFILE

Analysis Date/Time: 03/12/2020 1013

Method: HPLC/DAD

Moisture Content (%): -

Analyst: WW

Instrument: Agilent 1100

Water Activity (aw): -

Cannabinoid	Result (%)	Result (mg/g)	Reporting Limit (mg/g)	Result (mg/mL)	Per Unit (mg)
CBD	-	-	0.514	-	-
CBDa	0.247	2.47	0.514	-	2
CBDv	0.0565	0.565	0.514	-	0.565
Δ9-THC	4.12	41.2	0.514	-	41
Δ8-THC	0.0545	0.545	0.514	-	0.545
THCa	106	1.06e+03	0.514	-	1064
THCv	-	-	0.514	-	-
CBC	0.0898	0.898	0.514	-	0.898
CBG	0.0712	0.712	0.514	-	0.712
CBGa	1.36	13.6	0.514	-	14
CBN	-	-	0.514	-	-
TOTAL	112	1124	-	-	1124
TOTAL THC	97.4	974	-	-	974
TOTAL CBD	0.216	2	-	-	2

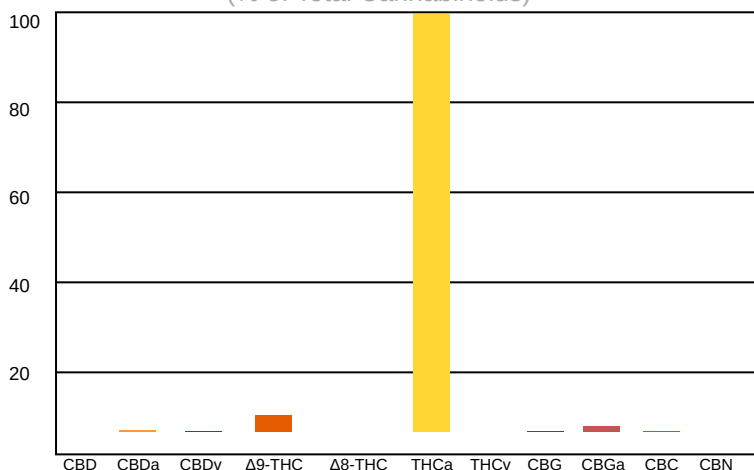


UNIT MASS (g): 1

"-" Not detected above RL.

Cannabinoid Distribution

(% of Total Cannabinoids)



Deviations from standard operating procedure: None

Recoveries for all analyte standards: 90-110%
Replicate Uncertainties: <5% RSD, <20% RPD
Sample/Reagent Blanks: <RL for all analytes

Values for plant matter are adjusted for moisture content.

Total THC = (THCa x 0.877) + Δ9-THC
Total CBD = (CBDa x 0.877) + CBD

Percentage results are reported by mass.
mg/g results are reported as mass component per mass material.

Abbreviations: UV - Ultraviolet, HPLC - High Pressure Liquid Chromatography, RL - Reporting Limit, RPD - Relative Percent Difference, RSD - Relative Standard Deviation

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Cultivar (Strain) or Sample Description: Humbolt Pineapple live resin **Date Completed:** 03/16/2020

TERPENOID PROFILE

Analysis Date/Time: 03/12/2020 1013 **Method:** HS/GC/FID (Internal Method-002) **Deviations from SOP:**
Analyst: DJ **Instrument:** Agilent 6890 None

<u>Terpene</u>	<u>Result (µg/g)</u>	<u>Result (%)</u>	
α-Bisabolol	947	0.0947	
Camphene	428	0.0428	
δ-3-Carene	-	-	
β-Caryophyllene	19881	1.99	■
Caryophyllene oxide	2722	0.272	
p-Cymene	-	-	
Eucalyptol	-	-	
Geraniol	-	-	
Guaiol	436	0.0436	
α-Humulene	10058	1.01	■
Isopulegol	-	-	
d-Limonene	12763	1.28	■
Linalool	813	0.0813	
β-Myrcene	49432	4.94	■
cis-Nerolidol	-	-	
trans-Nerolidol	-	-	
α-Ocimene	654	0.0654	
β-Ocimene	8537	0.854	■
α-Pinene	7389	0.739	■
β-Pinene	5628	0.563	■
α-Terpinene	-	-	
γ-Terpinene	-	-	
Terpinolene	385	0.0385	
TOTAL	120072	12	



Abbreviations: HS - Headspace, GC - Gas Chromatography, MS - Mass Spectrometry, RL - Reporting Limit

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"-" Not detected above RL.

Reporting Limit (µg/g): 20.6

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Cultivar (Strain) or Sample Description: Humbolt Pineapple live resin **Date Completed:** 03/16/2020

RESIDUAL SOLVENT PROFILE

Analysis Date/Time: 03/12/2020 1013

Method: USP <467>

Deviations from SOP:

Analyst: DJ

Instrument: Agilent 6890

None

<u>Solvent</u>	<u>Result (µg/g)</u>	<u>Action Level (µg/g)</u>
Acetone (67-64-1)	-	1000
Benzene (71-43-2)	-	2
n-Butane (106-97-2)	-	1000
2,2-Dimethylbutane (75-83-2)	-	60
2,3-Dimethylbutane (79-29-8)	-	60
Ethyl benzene (100-41-4)	-	430
n-Heptane (142-82-5)	-	1000
n-Hexane (110-54-3)	-	60
Isobutane (75-28-5)	-	1000
Isopropanol (67-63-0)	-	1000
2-Methylbutane (78-78-4)	-	1000
2-Methylpentane (107-83-5)	-	60
3-Methylpentane (96-10-0)	-	60
n-Pentane (109-66-0)	-	1000
n-Propane (74-98-6)	-	1000
Toluene (108-88-3)	-	180
o-Xylene (95-47-6)	-	430
m,p-Xylene (108-38-3 or 106-42-3)	-	430
Xylenes* (1330-20-7)	-	430

Color Key

RESULT < 1/2 AL
1/2 AL < RESULT < AL
RESULT > AL

Reporting Limit (µg/g)
1/2 of AL

"-" not detected above reporting limit

"*" - o,m,p-Xylene and Ethylbenzene



<u>Solvent</u>	<u>Synonym(s)</u>	<u>Solvent</u>	<u>Synonym(s)</u>	<u>Solvent</u>	<u>Synonym(s)</u>
Acetonitrile	Methyl Cyanide, ACN	2-Ethoxyethanol	Cellosolve, Ethyl glycol	Methanol	Methyl alcohol
1-Butanol	n-Butanol, Butyl Alcohol	Ethyl ether	Diethyl ether, Ether	2-Methylbutane	Isopentane
2-Butanol	sec-Butyl alcohol	Ethyl acetate	EtOAc	Methylene chloride	Dichloromethane
2-Butanone	Methyl ethyl ketone, MEK	Ethyl benzene	Phenylethane	2-Methylpentane	Isohexane
1,2-Dimethoxyethane	Monoglyme	Ethylene glycol	1,2-Ethanediol	1-Pentanol	n-Amyl alcohol
2,3-Dimethylbutane	Neohexane	Ethylene oxide	Oxirane	1-Propanol	Propyl alcohol
2,3-Dimethylbutane	Diisopropyl	Isobutane	2-Methylpropane	Tetrahydrofuran	THF
N,N-Dimethylformamide	DMF	Isopropanol	2-Propanol, IPA	Tetramethylene sulfone	Sulfolane
Dimethylsulfoxide	DMSO	Isopropyl Acetate	Acetic acid isopropyl ester	Xylene	Dimethylbenzene

Abbreviations: HS-Headspace, GC-Gas Chromatography, MS-Mass Spectrometry, RL-Reporting Limit, AL-Action Level
CAS-Chemical Abstract Services

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Cultivar (Strain) or Sample Description: Humbolt Pineapple live resin **Date Completed:** 03/16/2020

PESTICIDES PROFILE

Analysis Date/Time: 03/12/2020 1013

Method: LC/MS/MS

Deviations from SOP:

Analyst: DJ

Instrument: Waters Acquity/TQD

None

<u>Pesticide</u>	<u>Result</u> (µg/g)	<u>Action Level</u> (µg/g)
Abamectin (71751-41-2)	-	0.5
Azoxystrobin (131860-33-8)	-	0.5
Bifenazate* (149877-41-8)	-	0.5
Etoazazole (153233-91-1)	-	0.5
Imazalil (35554-44-0)	-	0.5
Imidacloprid (138261-41-3)	-	0.5
Malathion (121-75-5)	-	0.5
Myclobutanil (88671-89-0)	-	0.5
Permethrins* (52645-53-1)	-	0.5
Spinosad A (168316-95-8)	-	0.5
Spinosad D (168316-95-8)	-	0.5
Spiromesifen (283594-90-1)	-	0.5
Spirotetramat (203313-25-1)	-	0.5
Tebuconazole (80443-41-0)	-	0.5

Color Key

RESULT < 1/2 AL
1/2 AL < RESULT < AL
RESULT > AL

Reporting Limit (µg/g)
1/2 of AL

"-" not detected above reporting limit

"*" analyzed by GC/MS (all others analyzed by LC/MS/MS)

Permethrins measured as the cumulative residue of the *cis*- and *trans*-permethrin isomers.



Abbreviations: LC - Liquid Chromatography, GC - Gas Chromatography, MS - Mass Spectrometry, RL - Reporting Limit, AL - Action Level, CAS - Chemical Abstract Services

<u>Pesticide</u>	<u>Synonym(s)</u>	<u>Pesticide</u>	<u>Synonym(s)</u>	<u>Pesticide</u>	<u>Synonym(s)</u>
Cyfluthrin	Baythroid	Myclobutanil	Sythane	Propiconazole	Tilt
DDVP	Dichlorvos	Naled	Dibrom	Propoxur	Baygon
Ethoprophos	Prophos	Phosmet	Imidan		

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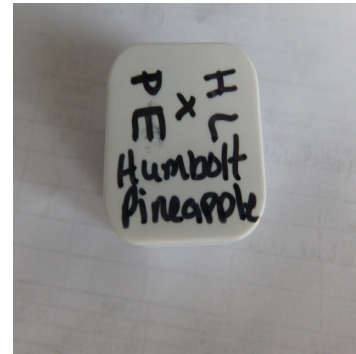
MYCOTOXIN PROFILE

Analysis Date/Time: 03/12/2020 1013
Analyst: DJ

Method: LC/MS/MS
Instrument: Waters Acquity/TQD

Deviations from SOP:
None

<u>Mycotoxin</u>	<u>Result</u> (µg/kg)	<u>Action Level</u> (µg/kg)
Aflatoxin B1	-	20
Aflatoxin B2	-	20
Aflatoxin G1	-	20
Aflatoxin G2	-	20
Ochratoxin A	-	20



Abbreviations: EC - Escherichia Coli, CFU - Colony-Forming Unit,
RL - Reporting Limit, AL - Action Level

Color Key

RESULT < 1/2 AL
1/2 AL < RESULT < AL
RESULT > AL

Reporting Limit (CFU/g)
1

"-" not detected above reporting limit

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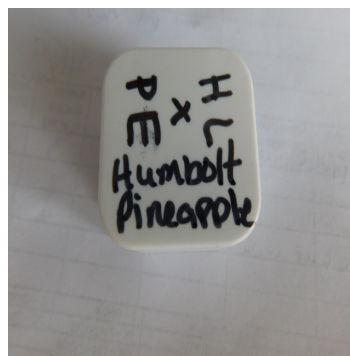
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HEAVY METAL PROFILE

Analysis Date/Time: 03/12/2020 1013 **Method:** ICP/MS **Deviations from SOP:**
Analyst: CC **Instrument:** PerkinElmer Elan 9000 None

<u>Heavy Metal</u>	<u>Result</u> (µg/kg)	<u>Action Level</u> (µg/kg)
Arsenic (As)	-	400
Cadmium (Cd)	-	440
Lead (Pb)	-	1000
Mercury (Hg)	-	200



Abbreviations: ICP - Inductively-Coupled Plasma, OES - Optical Emission Spectroscopy, MS - Mass Spectroscopy, RL - Reporting Limit, AL - Action Level

Color Key

RESULT < 1/2 AL
1/2 AL < RESULT < AL
RESULT > AL

Reporting Limit (µg/kg)
50

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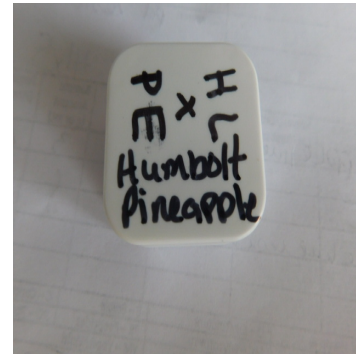
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MICROBIOLOGICAL PROFILE

Analysis Date/Time: 03/12/2020 1013 **Method:** Hardy Diagnostics CompactDry **Deviations from SOP:**
Analyst: KB **Instrument:** Thermo Incubator None

<u>Bacteria/Microbe</u>	<u>Result (CFU/g)</u>	<u>Action Level (CFU/g)</u>
Aerobic Plate Count, Total	90	-
Escherichia Coli (E. Coli)	Absent	1
Mold	Absent	10000
Yeast	Absent	10000
Salmonella spp.	Absent	1



Abbreviations: EC - Escherichia Coli, CFU - Colony-Forming Unit, RL - Reporting Limit, AL - Action Level, NT - Not Tested

Color Key

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RESULT > AL

Reporting Limit (CFU/g)
1

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