

CERTIFICATE OF ANALYSIS

Order Type: Medical Cannabis
Order ID: OR2019-3335

Customer ID: 746
Customer Name: Helix Extracts

Harvest/Extract Lot: None
Harvest/Extract Batch: None

Cultivar (Strain): Kosher Kush
Sample Date: 08/28/2019

Lab ID: SA2019-10540
Date Received: 08/28/2019

Sample Matrix: Concentrate
Date Completed: 09/05/2019

Remarks:

CANNABINOID (POTENCY) PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

Method: HPLC/DAD (Internal Method-001)
Instrument: Agilent 1100

Moisture Content (%): -
Water Activity (aw): -

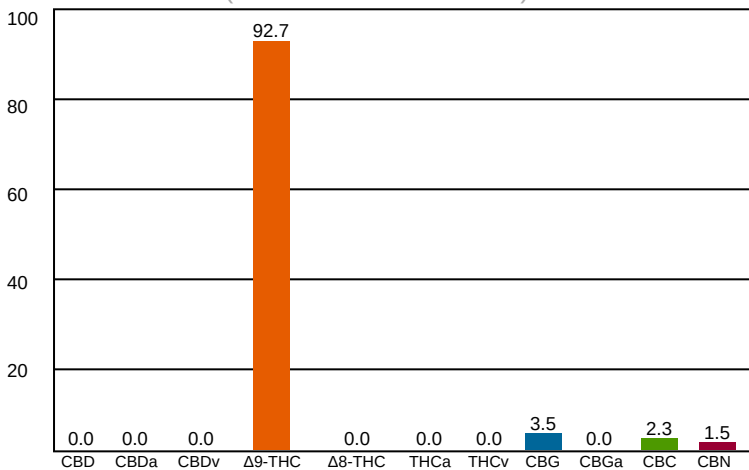
| Cannabinoid | Result (%) | Result (mg/g) | Reporting Limit (mg/g) | Result (mg/mL) | Per Unit (mg) |
|------------------|-------------|---------------|------------------------|----------------|---------------|
| CBD | - | - | 0.495 | - | - |
| CBDa | - | - | 0.495 | - | - |
| CBDv | - | - | 0.495 | - | - |
| Δ9-THC | 75.3 | 753 | 0.495 | - | 753 |
| Δ8-THC | - | - | 0.495 | - | - |
| THCa | - | - | 0.495 | - | - |
| THCv | - | - | 0.495 | - | - |
| CBC | 1.9 | 19 | 0.495 | - | 19 |
| CBG | 2.85 | 28.5 | 0.495 | - | 29 |
| CBGa | - | - | 0.495 | - | - |
| CBN | 1.18 | 11.8 | 0.495 | - | 12 |
| TOTAL | 81.2 | 812 | | | 812 |
| TOTAL THC | 75.3 | 753 | | | 753 |
| TOTAL CBD | - | - | | | - |



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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REPORT OF LABORATORY ANALYSIS

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John K. Irvin
John K. Irvin, M.S.
Laboratory Director (Tulsa)

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Remarks:

TERPENOID PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

Method: HS/GC/FID (Internal Method-002)
Instrument: Agilent 6890

Deviations from SOP:
None

| Terpene | Result (µg/g) | Result (%) |
|---------------------|---------------|--------------|
| α-Bisabolol | 12 | 0.00123 |
| Camphene | 21 | 0.00206 |
| δ-3-Carene | 165 | 0.0165 |
| β-Caryophyllene | 256 | 0.0256 |
| Caryophyllene oxide | - | - |
| p-Cymene | - | - |
| Eucalyptol | - | - |
| Geraniol | - | - |
| Guaiol | - | - |
| α-Humulene | 24 | 0.00243 |
| Isopulegol | - | - |
| d-Limonene | 2180 | 0.218 |
| Linalool | 717 | 0.0717 |
| β-Myrcene | 1538 | 0.154 |
| cis-Nerolidol | 53 | 0.00535 |
| trans-Nerolidol | 41 | 0.00405 |
| α-Ocimene | - | - |
| β-Ocimene | 14 | 0.00144 |
| α-Pinene | 430 | 0.043 |
| β-Pinene | 996 | 0.0996 |
| α-Terpinene | - | - |
| γ-Terpinene | 104 | 0.0104 |
| Terpinolene | - | - |
| TOTAL | 6552 | 0.655 |



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

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"-" Not detected above RL.

Reporting Limit (µg/g): 10

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Remarks:

RESIDUAL SOLVENT PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

Method: USP <467>
Instrument: Agilent 6890

Deviations from SOP:
None

| Solvent | Result (µg/g) | Action Level (µg/g) |
|-----------------------------------|---------------|---------------------|
| 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



| Solvent | Synonym(s) | Solvent | Synonym(s) | Solvent | Synonym(s) |
|-----------------------|--------------------------|-------------------|-----------------------------|------------------------|-----------------|
| 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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Remarks:

PESTICIDES PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

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

Deviations from SOP:
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 |
| Etoxazole (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 | Systhane | Propiconazole | Tilt |
| DDVP | Dichlorvos | Naled | Dibrom | Propoxur | Baygon |
| Ethoprophos | Prophos | Phosmet | Imidan | | |

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Remarks:

MYCOTOXIN PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

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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Remarks:

HEAVY METAL PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

Method: ICP/MS
Instrument: PerkinElmer Elan 9000

Deviations from SOP:
None

| <u>Heavy Metal</u> | <u>Result (µg/kg)</u> | <u>Action Level (µg/kg)</u> |
|--------------------|-----------------------|-----------------------------|
| 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

"-" not detected above reporting limit

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Date Completed: 09/05/2019

Remarks:

MICROBIOLOGICAL PROFILE

Analysis Date/Time: 09/02/2019 1931
Analyst: OL

Method: Hardy Diagnostics CompactDry
Instrument: Thermo Incubator

Deviations from SOP:
None

| <u>Bacteria/Microbe</u> | <u>Result (CFU/g)</u> | <u>Action Level (CFU/g)</u> |
|----------------------------|-----------------------|-----------------------------|
| Aerobic Plate Count, Total | NT | - |
| 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

| |
|----------------------|
| 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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