

CERTIFICATE OF ANALYSIS



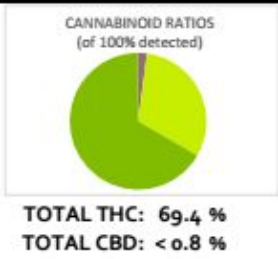
Product Name: **Pineapple Stardog**  
 Lot ID: **none**  
 Sample ID: **A154**  
 Sampling\*: **Representative**  
 Sample Matrix: **CO<sub>2</sub> Cannabis Concentrate**

**Analysis Results Method & Instrument**

**CANNABINOIDS**  
 Test Date: 1/19/2015

CBD	< 0.8 %
CBDA	< 0.8 %
CBG	1.6 %
CBN	< 0.8 %
Δg THC	24.2 %
THCA	51.6 %

Values are reported as percent by weight.



**Method:** Swift et al. (2013), modified.  
**Instrument:** Agilent 1100 HPLC/DAD

Limit of Quantitation (LOQ\*) varies per compound.

**Spike Recovery:** N/A

THCA(0.877)+THC=Total THC  
 CBDA(0.877)+CBD=Total CBD

**WATER ACTIVITY\* Method: QAP 15- a<sub>w</sub> Testing Protocol (not published)**

Test Date: Not Requested

**Instrument:** Decagon AquaLab Water Activity Meter

**TERPENES**  
 Test Date: 1/18/2015

β-Caryophyllene	0.407 %
β-Limonene	0.119 %
Humulene	0.189 %
Myrcene	0.195 %
α-Pinene	<0.1 %
β-Pinene	<0.1 %
Linalool	<0.1 %

Values are reported as percent by weight.



**Method:** Not published.  
**Instrument:** Agilent 6890 Series GC/MS

Limit of Quantitation (LOQ\*) varies per compound.

**MOLD/YEAST Method: USP <2021>; USP <2022>; USP <1223>**

Test Date: 1/15/2015 <1,000 CFU/g PASS

**Instrument:** BioLumix – Rapid Microbiology

**PESTICIDES Method: AOAC 2007.01 + proprietary SPE\* method**

Test Date: 1/19/2015 Oregon State Tolerance = 0.1 ppm

Carbamates	<0.1 ppm	PASS
Organochlorines	<0.1 ppm	PASS
Organophosphates	<0.1 ppm	PASS
Pyrethroids	<0.1 ppm	PASS
Fungicides	<0.1 ppm	N/A
Other	<0.1 ppm	N/A
Other	<0.1 ppm	N/A

**Instruments:** [as follows]

AB Sciex API 3200 LC/MS/MS
Agilent 6890 Series GC/MS
AB Sciex API 3200 LC/MS/MS
Agilent 6890 GC/MS & AB Sciex API 3200 LC/MS/MS
AB Sciex API 3200 LC/MS/MS
AB Sciex API 3200 LC/MS/MS
AB Sciex API 3200 LC/MS/MS

This product has been Quality Control tested for consumer safety by OG Analytical. It meets compliance with OAR 333-008-1190. Values reported relate only to the product tested. This Certificate shall not be reproduced except in full, without the written approval of OG Analytical. See reverse for definitions where \* presents.



*Rodger Voelker*  
 Rodger Voelker, PhD, Lab Director  
 1/13/2015 Date Received  
 1/19/2015 Date Reported

**Source:** Stardog Botanicals  
**Location:** Oregon  
**OMMP#:** 922213  
**Contact:**

**Product Name: Pineapple Stardog**

Lot ID: Sample ID: A154

**Sampling\*: Representative Sample Matrix: CO2 Cannabis Concentrate Average pc wt. 6.27 grams  
Analysis Results Method & Instrument CANNABINOIDS Method: Swift et al. (2013), modified. Test  
Date: Instrument: Agilent 1100 HPLC/DAD**

CBD < 0.8 % Relative Standard Deviation (RSD\*): +/- 3% CBDA < 0.8 % Limit of Quantitation (LOQ\*) varies per compound. CBG 1.6 % CBN < 0.8 % Spike Recovery: Δ9 THC 24.2 % THCA 51.6 % TOTAL THC: 69.4 % THCA(0.877)+THC=Total THC

Values are reported as percent by weight.

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**none**

1/19/2015

N/A

TOTAL CBD: < 0.8 % CBDA(0.877)+CBD=Total CBD

**WATER ACTIVITY\* Method: QAP 15- a**

w

Testing

Protocol (not published) Test Date: Not Requested

Instrument: Decagon AquaLab Water Activity Meter

TERPENES Method: Not published. Test Date: 1/18/2015

Instrument: Agilent 6890 Series GC/MS

β-Caryophyllene 0.407 % Relative Standard Deviation (RSD\*): +/- 3% β-Limonene 0.119 % Limit of Quantitation (LOQ\*) varies per compound. Humulene 0.189 % Myrcene 0.195 % α-Pinene <0.1 % β-Pinene <0.1 % Linalool <0.1 %

Values are reported as percent by weight.

MOLD/YEAST Method: USP <2021>; USP <2022>; USP <1223> Test Date: 1/15/2015

<1,000 CFU/g PASS Instrument: BioLumix – Rapid Microbiology

PESTICIDES Method: AOAC 2007.01 + proprietary SPE\* method Test Date: 1/19/2015 Oregon State Tolerance = 0.1 ppm

**Instruments: [as follows]**

Carbamates <0.1 ppm PASS AB Sciex API 3200 LC/MS/MS Organochlorines <0.1 ppm PASS Agilent 6890 Series GC/MS Organophosphates <0.1 ppm PASS AB Sciex API 3200 LC/MS/MS Pyrethroids <0.1 ppm PASS Agilent 6890 GC/MS & AB Sciex API 3200 LC/MS/MS Fungicides <0.1 ppm N/A AB Sciex API 3200 LC/MS/MS Other <0.1 ppm N/A AB Sciex API 3200 LC/MS/MS Other <0.1 ppm N/A AB Sciex API 3200 LC/MS/MS

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Source: Stardog Botanicals Rodger Voelker, PhD, Lab

Director Location: Oregon

1/13/2015 1/19/2015

OMMP#:

922213 Date Received Date Reported Contact:

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0

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4

0

CANNABINOID RATIOS (of 100% detected)

7

0

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1

1

9

0

TERPENES

0

.

1

8

9

0

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1

9

5

0

.

0

0

0

0



## DEFINITIONS

- \*Sampling: Activity related to obtaining a sample of the object of conformity assessment, according to a procedure. Values can be "Representative", indicating that a trained OG Analytical Sample Technician performed representative sampling of the product batch, or "Submitted", indicating that the customer submitted the sample.
- \* RSD: RSD is relative standard deviation;  $RSD = \frac{(\text{standard deviation})}{(\text{mean})} \times 100\%$ . It is a measurement of precision based on a set of data points, expressed in relative terms (percentage). FDA guidance for approved RSD on active ingredients for dietary supplements is +/- 6.0 percent. (fda.gov)
- \*LOQ: LOQ, or Limit of Quantitation, is the minimum mass or concentration of analyte that can be quantified with acceptable accuracy and precision. Limit of quantitation (or quantification) is variously defined but must be a value greater than the Method Detection Limit and should apply to the complete analytical method. LOQ varies based upon the analyte and the sample matrix. For a complete list of the LOQ for any report, please contact OG Analytical at 541-735-3328.
- \*Spike Recovery: As part of our QA procedure we routinely perform a spike recovery experiment which involves adding a known amount of THC and THCA to a separate portion of the sample being tested. The % recovery is then determined to assess the performance of the procedure. We typically expect >90% recovery for most edibles. Chocolate and high fat samples are more challenging and generally yield recoveries >80%.
- \*SPE: Solid-phase extraction (SPE) is a sample preparation process by which compounds that are dissolved or suspended in a liquid mixture are separated from other compounds in the mixture according to their physical and chemical properties. Analytical laboratories use solid phase extraction to concentrate and purify samples for analysis. SPE is essential for testing pesticides on cannabis due to the complex chemical constituency of the sample matrix. Trace levels of pesticides are difficult to quantify amidst high cannabinoid and or fat content. OG Analytical is currently working with a third party company to validate a procedure for SPE specific to testing pesticides on cannabis.

## SERVICES

- Cannabinoids: Cannabinoid potency content of this product was quantified using HPLC/DAD and various quality control measures to ensure accuracy of data. OG Analytical chose HPLC as our primary instrument for cannabinoid potency because HPLC does not alter the chemical constituency of the cannabinoids during the analytical process. HPLC allows us to measure temperature sensitive acid compounds, such as THCA and CBDA, which cannot be measured by GC.
- Water Activity: Water activity (*aw*) is a measure of microbial susceptibility accepted by the U.S. Department of Agriculture. Water activity is an important consideration for consumables product design and safety. USDA guidelines state that consumables safe from potential hazard should have a water activity value of 0.85 *aw* or less. Higher *aw* substances tend to support more microorganisms. Bacteria usually require at least 0.91 *aw*, and fungi at least 0.7 *aw*.
- Terpenes: Terpenes present aromatic and physiological effects, and are naturally produced by the cannabis plant. The same terpenes found in cannabis can also be found in many other flora, such as Pine trees, pepper, and oranges. Terpenes play a synergistic role with cannabinoids, though to what degree has yet to be scientifically ascertained. Oregon does not require terpene testing, and thus it is an optional service.
- Mold/Yeast: Cannabis is susceptible to a variety of mold species, most notably *Botrytis cinerea* (a.k.a "budrot", or "brown mold") and the many fungal diseases in the *Erysiphale* family, otherwise known as "Powdery Mildew." This product was tested using USP methods for the determination of the presence of mold and yeast on dietary supplements. Concentrates are tested at a threshold of <1,000 CFU/g, while all other cannabis related products are tested at a threshold of <10,000 CFU/g, as required by OAR 333-008-1190.
- Pesticides: There are over 100 different toxic pesticides used on cannabis plants in the State of Oregon. OG Analytical uses AOAC method 2007.01 revision B, the method used by the Department of Agriculture to screen for pesticides on agricultural products meant for human consumption. With this method, we are able to screen for 50+ pesticides at the 0.1 ppm LOQ required by OAR 333-008-1190, as well as several others at 1 ppm.

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