

Hemp Panel

228 Midway Lane, Suite B
Oak Ridge, Tennessee 37830
Toll Free: (866) 547-1727
Local: (865) 813-1700
Fax: (865) 813-1705
Email: info@assuredbio.com
www.assuredbio.com



Inspector:	Bruce Wayne	Date Collected:	12/7/2019
Project Name:	Gotham Haze	Date Received:	12/8/2019
Project Number:	1234	Date Reported:	12/13/2019
Assured Bio Identifier:	BW120819-99	Analyst(s):	C. Kent, P. Parker

Selected References

- 3M™ Petrifilm™ Product Instructions
- Alexopoulos, C.J. and C.W. Mims. 1979. *Introductory Mycology, Third Edition*. John Wiley & Sons, New York, New York.
- Barron, G.L. 1968. *The Genera of Hyphomycetes from Soil*. Robert E. Krieger Pub. Co., Malabar, Florida.
- Ellis, M.B. 1971. *Dematiaceous Hyphomycetes*. CAB International, Wallingford Oxon OX10 8DE, UK.
- Ellis, M.B. 1976. *More Dematiaceous Hyphomycetes*. CAB International, Wallingford Oxon OX10 8DE, UK.
- FDA. Bacteriological Analytical Manual (BAM)
- Hanlin, R.T. 1990. *Illustrated Genera of Ascomycetes*. APS Press, St. Paul, Minnesota.
- Hanlin, R.T. 1998. *Illustrated Genera of Ascomycetes*. II. APS Press, St. Paul, Minnesota.
- Hanlin R.T. and M. Ulloa. 1988. *Atlas of Introductory Mycology, Second Edition*. Hunter Textbooks, Inc., Winston-Salem, North Carolina.
- Kiffer E. and M. Morelet. 2000. *The Deuteromycetes: Mitosporic Fungi: Classification and Generic Keys*. Science Publishers, Inc., Enfield, New Hampshire.
- Macher, J., Ed. 1999. *Bioaerosols: Assessment and Control*. ACGIH, Cincinnati, Ohio.
- Morris, E.F. 1963. *The Synnematos Genera of the Fungi Imperfecti*. Western Illinois University Publication, Macomb, Illinois.
- Nelson, P.E., Toussoun, T.A. and W.F.O. Marasas. 1983. *Fusarium Species: An Illustrated Manual for Identification*. Pennsylvania State University Press, University Park and London.
- Samson R.A., Hoekstra E.S., Frisvad J.C. and O. Filtenborg, Ed. 2002. *Introduction to Food and Airborne Fungi*. Ponsen and Looyen, Wageningen, The Netherlands.
- Wistreich G.A. 1997. *Microbiology Laboratory: Fundamentals and Applications*. Prentice Hall, Upper Saddle River, New Jersey.

Accreditation

Assured Bio Labs, LLC is accredited by the American Industrial Hygiene Association Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC; Lab ID # 183867) in the Environmental Microbiology accreditation program for "Bacterial and Fungal Culture and Identification by PCR" Fields of Testing as documented by the Scope of Accreditation Certificate and associated Scope. AIHA-LAP, LLC accreditation complies with the ISO/IEC Standard 17025:2005 requirements, but this does not imply ISO certification or registration."

Limitations

ASSURED BIO LABS, LLC MAKES NO WARRANTIES AND EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. INSPECTOR ACKNOWLEDGES THAT ASSURED BIO LABS, LLC HAS NOT INSPECTED THE SUBJECT PROPERTY AND THAT THE INSPECTOR IS SOLELY RESPONSIBLE FOR CHOOSING THE LOCATION OF SAMPLE COLLECTION. ASSURED BIO LABS, LLC SHALL NOT BE LIABLE TO INSPECTOR FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL OR PUNITIVE DAMAGES OF ANY KIND OR NATURE, INCLUDING, WITHOUT LIMITATION, ANY DAMAGES TO PROPERTY OR PERSONAL INJURY WHETHER SUCH LIABILITY IS ASSERTED ON THE BASIS OF CONTRACT, TORT, OR OTHERWISE, EVEN IF ASSURED BIO LABS, LLC HAS BEEN WARNED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGE. UNDER NO CIRCUMSTANCES SHALL ASSURED BIO LABS, LLC BE LIABLE FOR DAMAGES UNDER OR ARISING OUT OF THIS REPORT IN AN AMOUNT EXCEEDING THE AMOUNT PAID BY THE INSPECTOR TO ASSURED BIO LABS, LLC FOR THIS ANALYSIS AND REPORT. THIS REPORT IS FOR THE

Methods of Analysis

Assured Bio Labs, LLC uses the following Standard Operating Procedures for the analysis of samples:

CD 122: Sample Processing for Fungal ViaScan(Culture), CD 125: Sample Processing for Bacterial ViaScan (Culture), CD 117: DNA Extraction, CD 118: Polymerase Chain Reaction, CD 119: Agarose Gel Electrophoresis, CD 120: Agarose Gel Imaging, CD 148: PCR Amplicon Cleanup Using the Omega Bio-Tek E.Z.N.A. Cycle Pure Kit (D6492-01), CD 223: Submitting and Analyzing DNA Sequences.

Outline of Analyses and Media

Unless otherwise noted, samples are processed according to the methods of analysis stated above. 3M™ Petrifilm™ Product Instructions and Interpretation Guides are followed according to AOAC guidelines where applicable. Due to the processing of specific panels and sample types, reporting limits may vary between samples and projects. Samples tested for presence/absence in one gram are tested or enriched in a broth unless otherwise noted. The following media and dilutions are used for analysis unless otherwise noted:

Reporting Limits

Method Detection Limit: The American Industrial Hygiene Association defines this term in AIHA-LAP, LLC Policy Document – Module 9 as "The minimum concentration of an analyte that, in a given matrix and with a specific method, has a 99 percent probability of being identified, qualitatively or quantitatively measured, and reported to be greater than zero."

Reporting Limit: The American Industrial Hygiene Association defines this term in AIHA-LAP, LLC Policy Document – Module 9 as "The lowest concentration of analyte in a sample that can be reported with a defined, reproducible level of certainty."

The analytical data included in this report reflect only the conditions of the material sampled and submitted to the laboratory for analysis at the time of collection. The results included in this report may not be used for past or future environmental conditions. Values less than one will be rounded up to one. The reporting limit(s) and result(s) are calculated based on the sampling information (i.e. collection volume, area, mass, etc.) provided by the customer as noted on the Chain of Custody. The results apply to the sample(s) as received.

Additional Comments

Assured Bio Labs, LLC utilizes the standard outlined in *Bioaerosols: Assessment and Control* by J. Macher when making reliable interpretations for standard culture plates. It states, "In general, 25 to 250 bacterial colonies and 10 to 60 fungal colonies are considered optimal for accurate counting and identification of CFU's on standard 100-mm plates." The countable range for 3M™ Petrifilm™ plates varies depending on the analysis and can be found in the product instructions. When multiple dilution plates per sample are counted, that with highest number of colonies in the countable range will be reported. Colony counts outside of the optimal countable ranges should be considered estimates based on the best available plate counted. Colony counts greater than this range may be reported as "Too Numerous to Count" using a greater than ">" sign to indicate the minimum possible concentration. A final colony count per unit reported of less than one will be rounded up to one.

Presumptive presence of *Pseudomonas aeruginosa*, *Salmonella* spp., *Staphylococcus aureus* are confirmed with quantitative Polymerase Chain Reaction analysis.

Additional Comments

Genus Identification is performed using macro- and micro-morphological observation and comparison to relevant literature. In some cases Genus level identification cannot be performed due to indistinct morphological traits typically resulting from a lack of sporulation (e.g. "Sterile Hyphae", "Yeast"). In some cases multiple names may be reported for the same isolate due to taxonomic/nomenclatural uncertainty or the presence of both telomorphic and anamorphic states (e.g. "*Aspergillus* (=Eurotium)").

Assured Bio Labs, LLC strives to fully identify any isolates sequenced to the lowest taxonomic entity available for the organism using specific primers and DNA sequencing methodologies. Unfortunately an isolate cannot always be identified to species based on one or more of the following: PCR inhibition, sequencing inhibition, insufficient genetic resolution, unknown or poorly characterized biodiversity, taxonomic and nomenclatural uncertainty, aberrant and/or atypical strains, etc. A brief description of the identified species is presented as an interpretive guide and is not intended to be exhaustive or diagnostic.

Regions amplified for identification may include, but are not limited to, the following: Internal Transcribed Spacer (ITS), Ribosomal Small Subunit (16S/18S/SSU), Ribosomal Large Subunit (23S/28S/LSU), β -Tubulin, Actin, etc. Additional information (including primers used, thermocycling conditions, identification thresholds, raw sequence data, etc.) available upon request.

Foreign Matter analysis are performed using stereoscope. Foreign matter is synthetic fibers, hair, insects (entire or fragments), mammalian feces, packaging material, non-cannabis plant material, insect damaged plant material, fungal disease damaged plant material, dead plant material and any other particles that are not hemp.

See Methods of Analysis and guidance on permissible contaminant levels on Page 3. These guidelines are compiled from relevant provision, proposed,

Methods of Analysis

Analysis*	Test Media	Dilutions Plated**	Incubation Temperature	Incubation Start Date	Incubation End Date
Aerobic Bacteria Count	3M™ Petrifilm™ Aerobic Count Plates	10 ¹ , 10 ³ , 10 ⁴	35 ± 1 °C	12/8/2019	12/10/2019
Coliform Count	3M™ Petrifilm™ Coliform Count Plates	10 ² , 10 ³	35 ± 1 °C	12/8/2019	12/9/2019
Enterobacteriaceae/BTGNB Count	3M™ Petrifilm™ Enterobacteriaceae Count Plates	10 ² , 10 ⁴	37 ± 1 °C	12/8/2019	12/9/2019
Total Yeast and Mold Count	3M™ Petrifilm™ Yeast Mold Count Plates	10 ² , 10 ³	22.5 ± 2.5 °C	12/8/2019	12/13/2019
Yeast and Mold with <i>Aspergillus</i> Count	Malt Extract Agar with Streptomycin and Tetracycline	Undiluted, 10 ² , 10 ⁴	27 ± 1 °C	12/8/2019	12/13/2019
<i>Salmonella</i> spp. P/A	Rappaport Vassiliades Broth	Undiluted	41.5 ± 1 °C	12/8/2019	12/10/2019
<i>Staphylococcus aureus</i> P/A	Manitol Salt Broth	Undiluted	35 ± 1 °C	12/8/2019	12/9/2019
<i>Pseudomonas aeruginosa</i> P/A	Cetrimide Selective Broth	Undiluted	35 ± 1 °C	12/8/2019	12/9/2019
<i>Escherichia coli</i> P/A	IDEXX Colilert®	Undiluted	35 ± 1 °C	12/8/2019	12/9/2019

*Notes: P/A stands for Presence/Absence; BTGNB - Bile-Tolerant Gram-Negative Bacteria; **Standard Dilutions, subject to change depending on sample.

Table of permissible microbial contaminant limits as of December 2019. NR - Not Required. Note that some limits are currently provisional or proposed.

State	Illinois, Maine, Massachusetts, North Dakota, Ohio, Pennsylvania, Rhode Island ⁷		Colorado (Medical), Connecticut, Utah	Colorado (Recreational)	Washington		California	
	Plant Products	Extracts	All Products	All Products	Plant Products	Processed Products	Inhaled	Non-inhaled
Total Aerobic Count	<100,001	<10,001	USP <1111> ²	NR	NR	NR	NR	NR
Total Yeast and Mold	<10,001	<1,001	USP <1111> ²	<10,000	NR	NR	NR	NR
Total Coliforms	<1,001	<101	NR	NR	NR	NR	NR	NR
Total Enterobacteriaceae/BTGNB	<1,001	<101	USP <1111> ²	NR	<10,001	<1,001	NR	NR
<i>Aspergillus</i>	NR	NR	NR	NR	NR	NR	<1 ⁴	NR
<i>Escherichia coli</i>	<1 ¹	<1 ¹	USP <1111> ²	<1 ³	<1 ¹	<1 ¹	<1 ³	<1 ³
<i>Pseudomonas aeruginosa</i>	NR	NR	USP <1111> ²	NR	NR	NR	NR	NR
<i>Salmonella</i> spp.	<1	<1	NR	<1	<1	<1	<1	<1
<i>Staphylococcus aureus</i>	NR	NR	USP <1111> ²	NR	NR	NR	NR	NR
Miscellaneous	NR	NR	USP <1111> ²	NR	NR	NR	NR	NR
State	Arkansas, Oregon	Alaska, Missouri	Michigan			Montana	New Mexico	Vermont
Type of Product	All Products	All Products	Plant Products	Infused	Extracts	All Products	All Products	All Products
Total Aerobic Count	NR	NR	NR	NR	NR	NR	USP <2023> ⁶	NR
Total Yeast and Mold	NR	NR	<10,001	<10,001	<1,001	<10,000	USP <2023> ⁶	NR
Total Coliforms	NR	NR	<1,001	<101	<101	NR	NR	NR
Total Enterobacteriaceae/BTGNB	NR	NR	NR	NR	NR	NR	USP <2023> ⁶	NR
<i>Aspergillus</i>	NR	<1 ⁵	<1 ⁴	<1 ⁴	<1 ⁴	NR	NR	<200 ⁵
<i>Escherichia coli</i>	<101	<1 ³	<1 ³	<1 ³	<1 ³	<1	USP <2023> ⁶	<200 ³
<i>Pseudomonas aeruginosa</i>	NR	NR	NR	NR	NR	NR	NR	NR
<i>Salmonella</i> spp.	NR	<1	<1	<1	<1	<1	USP <2023> ⁶	<200
<i>Staphylococcus aureus</i>	NR	NR	NR	NR	NR	NR	NR	NR
Miscellaneous	NR	NR	NR	NR	NR	NR	USP <2023> ⁶	NR
State	Nevada				Footnotes:			
Type of Product	Flower and Resin	Extracts	Edibles	Drinks				
Total Aerobic Count	NR	NR	NR	NR	¹ - Pathogenic strains only.			
Total Yeast and Mold	<10,000	<10,000	<10,000	<10,000	² - USP <1111> Requires different types of products be tested for different contaminants with different permissible limits.			
Total Coliforms	NR	NR	NR	NR	³ - Shiga toxin-producing strains only.			
Total Enterobacteriaceae/BTGNB	<1,000	<100	<100	<100	⁴ - Specifically <i>Aspergillus fumigatus</i> , <i>flavus</i> , <i>niger</i> , <i>terreus</i>			
<i>Aspergillus</i>	<1 ⁴	<1 ⁴	NR	NR	⁵ - Sepcifically <i>Aspergillus fumgatus</i> , <i>flavus</i> , <i>niger</i>			
<i>Escherichia coli</i>	<1 ¹	<1 ¹	<1 ¹	<1 ¹	⁶ - USP <1111> Requires different types of products be tested for different contaminants with different permissible limits.			
<i>Pseudomonas aeruginosa</i>	NR	NR	NR	NR	⁷ - These states use the American Herbal Pharmacopoeia - Cannabis Inflorescence Monograph			
<i>Salmonella</i> spp.	<1	<1	<1	<1				
<i>Staphylococcus aureus</i>	NR	NR	NR	NR				
Miscellaneous	NR	NR	<i>Clostridium botulinum</i>	NR				

Assured Bio Identifier: BW120819-99-1
Sample ID: 1A
Sample Description: Second Harvest - Third Bin

Sample Condition: Intact
Sample Type: Flower
Sample Mass: 2.11 g

	<u>Reporting Limit (CFU/g)</u>	<u>CFUs Counted</u>	<u>CFU/g</u>	<u>Dilution Analyzed</u>
Aerobic Bacteria:	962	24	23,100	10 ²
<i>Aspergillus</i> spp.:	0.962	None Detected	Below Detectable Limits	10 ³
Coliforms:	9.62	None Detected	Below Detectable Limits	10 ¹
Enterobacteriaceae:	9.62	4	385	10 ¹
<i>Eschericia coli</i> :	0.962	None Detected	Below Detectable Limits	10 ³
<i>Pseudomonas aeruginosa</i> :	0.962	None Detected	Below Detectable Limits	10 ³
<i>Salmonella</i> spp.:	0.962	None Detected	Below Detectable Limits	10 ³
<i>Staphylococcus aureus</i> :	0.962	None Detected	Below Detectable Limits	10 ³
Yeast and Mold:	96.2	145	13,900	10 ¹

Comments: None.

Date Analyzed:

Mass Analyzed:

	<u>Total Mass of Foreign Matter</u>	<u>Percent Foreign Matter</u>
Foreign Matter:	None Detected	<0.1

Comments: None.
