

Tech Tip 0002 - Botanical Reference Material Product Grades



Botanical Reference Materials (BRMs) are well characterized materials for specific plants and plant parts. ChromaDex offers a product line of Botanical Reference Materials (BRM) to provide users with the tools necessary to better evaluate botanical raw materials. BRMs are typically freeze dried and ground plant material. Their Certificate of Analysis show an HP-TLC test method, profile image, and may also include macro and microscopic images.

ChromaDex offers a wide range of BRMs grades with varying degrees of characterization. The available grades of Botanical Reference Materials are:

Vouchered Botanical Reference Materials (VBRMs)

VBRMs are highly characterized Botanical Reference Materials. The Certificate of Analysis for ChromaDex VBRMs includes macroscopic and microscopic images with HP-TLC fingerprints. In addition, a voucher is collected at the time of harvest and the plant is visually identified. ChromaDex retains access to the full vouchered specimen that can be used for authentication at a later date. Upon request, an image of the voucher and/or at an additional cost full botanical authentication can be supplied.

Botanical Reference Materials (BRMs)

BRMs are well characterized Botanical Reference Materials. The Certificate of Analysis for ChromaDex BRMs includes both macroscopic and microscopic images with HP-TLC fingerprints.

Reagent Grade Botanical Reference Materials (RBRMs)

RBRMs are Botanical Reference Materials characterized only by HP-TLC fingerprint analysis detailed on their Certificates of Analysis.

Extract Botanical Reference Materials (XBRMs)

XBRMs are powdered extracts of Botanical Reference Materials from a specific plant biomass. The Certificate of Analysis for ChromaDex XBRMs includes HP-TLC fingerprints and quantitative HPLC/GC analysis of major chemical markers. As the extraction process cannot be guaranteed, they are not a substitute for actual Botanical Reference Materials. XBRMs should be used along with Reference Standards to provide robust analytical results.

American Herbal Pharmacopoeia (AHP-BRMs)

In partnership with the American Herbal Pharmacopoeia, ChromaDex offers several botanical reference materials as AHP verified. All AHP grade reference materials are VBRM grade reference materials that have been independently verified by the American Herbal Pharmacopoeia and will bear the AHP Verified logo. The certificate of analysis will also bear the AHP verified statement.

A full breakdown of the characterization details for each grade is outlined in the table below:

Grade	Plant Information	HP-TLC Fingerprint Images	Macroscopic Images	Microscopic Images	Botanical Voucher Images	HPLC/GC Analysis
Vouchered Botanical Reference Materials (VBRMs)	✓	✓	✓	✓	✓	
Botanical Reference Materials (BRMs)	✓	✓	✓	✓		
Reagent Grade Botanical Reference Materials (RBRMs)	✓	✓				
Extract Botanical Reference Materials (XBRMs)	✓	✓	✓			✓

The Botanical Reference Material grades ChromaDex offers versatility across a variety of end uses. Listed below is an overview of some typical uses and the appropriate Botanical Reference Materials for each.

Grade	Identity Verification	Raw Material Comparison	Thin Layer Chromatography (TLC)	Microscopy	Basic Research	Early Stage Method Development/validation	HPLC
Vouchered Botanical Reference Materials (VBRMs)	✓	✓	✓	✓	✓	✓	
Botanical Reference Materials (BRMs)	✓	✓	✓	✓	✓	✓	
Reagent Grade Botanical Reference Materials (RBRMs)					✓	✓	
Extract Botanical Reference Materials (XBRMs)			✓*		✓	✓	✓*

*Applicable for TLC/HPLC analysis, but should not be used to establish botanical identity.

Tech Tip 0002 - Botanical Reference Material Product Grades

Example: VBRM Certificate of Analysis

ChromaDex CERTIFICATE OF ANALYSIS		
PRODUCT White pine (Pinus strobus) bark		
PART NUMBER 00031375		
REFERENCE TYPE Botanical Reference Material (BRM)		
LOT NUMBER 00031375-12		
COMMON NAME white pine		
SCIENTIFIC NAME Pinus strobus L. (Pinales)		
PLANT PART Bark		
CEQA NUMBER CDQA-19-016		
REPORT NUMBER CDQA-19004-001		
DATE OF SAMPLE 12 August 2018		
DATE OF REPORT 19 October 2018		
Note: ChromaDex's CEQA and CEQA numbers are not for sale. They are for informational purposes only.		
ANALYTICAL RESULTS		
TEST	METHOD	RESULT
Appearance	Macroscopy	(1) Shredded bark, 1-2 cm in width, brown, with a greenish-brown to light brown interior with green spots and tan veins.
Analytical/chemistry	Macroscopy	(2) Microscopic view showing cellular structure and color.
HP-ILC	CDQA-19-016	CDQA-19004-001
STORAGE CONDITIONS		
20-30 °C. Dry storage; avoid heat, light, and moisture.		
EXPIRATION DATE 08/2019 under the above conditions		

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Example: BRM Certificate of Analysis

ChromaDex CERTIFICATE OF ANALYSIS		
PRODUCT Grape (Vitis vinifera) seed		
PART NUMBER 00031404		
REFERENCE TYPE Botanical Reference Material (BRM)		
LOT NUMBER 00031404-08		
COMMON NAME Grape		
SCIENTIFIC NAME Vitis vinifera L. (Vitaceae)		
PLANT PART Seed		
CEQA NUMBER CDQA-19-019		
REPORT NUMBER CDQA-19004-002		
DATE OF SAMPLE 11/1/2018		
DATE OF REPORT 12/2/2018		
Note: ChromaDex's CEQA and CEQA numbers are not for sale. They are for informational purposes only.		
ANALYTICAL RESULTS		
TEST	METHOD	RESULT
Appearance	Macroscopy	(1) Microscopic view showing cellular structure and color.
Analytical/chemistry	Macroscopy	(2) Microscopic view showing cellular structure and color.
HP-ILC	CDQA-19-019	CDQA-19004-002
STORAGE CONDITIONS		
20-30 °C. Dry storage; avoid heat, light, and moisture.		
EXPIRATION DATE 10/2020 under the above conditions		

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Example: RGBRM Certificate of Analysis

ChromaDex CERTIFICATE OF ANALYSIS		
PRODUCT Yellow cardus (Carduus arvensis) seed		
PART NUMBER 00031407		
REFERENCE TYPE Botanical Reference Material (BRM)		
LOT NUMBER 00031407-01		
COMMON NAME Yellow cardus		
SCIENTIFIC NAME Carduus arvensis L. (Asteraceae)		
PLANT PART Seed		
CEQA NUMBER CDQA-19-020		
REPORT NUMBER CDQA-19004-003		
DATE OF SAMPLE 14 July 2018		
DATE OF REPORT 05 August 2018		
Note: ChromaDex's CEQA and CEQA numbers are not for sale. They are for informational purposes only.		
ANALYTICAL RESULTS		
TEST	METHOD	RESULT
Appearance	Macroscopy	(1) Shredded bark, 1-2 cm in width, brown, with a greenish-brown to light brown interior with green spots and tan veins.
Analytical/chemistry	Macroscopy	(2) Microscopic view showing cellular structure and color.
HP-ILC	CDQA-19-020	CDQA-19004-003
STORAGE CONDITIONS		
20-30 °C. Dry storage; avoid heat, light, and moisture.		
EXPIRATION DATE 07/2020 under the above conditions		

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Tech Tip 0001 - Reference Standards Product Grades

Example: XRM Certificate of Analysis



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CERTIFICATE OF ANALYSIS
For Laboratory Use Only

PRODUCT
PART NUMBER
REFERENCE TYPE
LOT NUMBER
COMMON NAME
LATIN NAME
PLANT PART
CDXA NUMBER
REPORT NUMBER
DATE OF SAMPLE
DATE OF REPORT

lou han guo (Siratka grosvenori) Fruit
00031409
[Extract Reference Material (XRM)]
00031409-101
lou han guo
Siratka grosvenori [Swingle] A.M. & Z.H. Zhang syn. Momordica grosvenori Swingle [Cucurbitaceae]
fruit
CDXA-146943
CDXA-XRM-087-00
05 November 2014
01 October 2015

ANALYTICAL RESULTS

TEST	METHOD	RESULT
Appearance	Microscopy	(1) Extracted, Goldenrod fine powder
HPLC	See below	Conforms
HP-TLC	CDXA-TLCM-184-G	Conforms


STORAGE CONDITIONS
STORAGE
EXPIRATION DATE

20-30 °C; Dry storage area; insect free; Vialite free
11/2019 under the above conditions

MACROSCOPY



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CERTIFICATE OF ANALYSIS
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HP-TLC CONDITIONS

STATIONARY PHASE
SAMPLE PREPARATION
MOBILE PHASE
CHAMBER TEMPERATURE
DETECTION

Silica gel 60, F₂₅₄, 10 x 10 cm HP-TLC plates
0.5 g + 5 ml 80% methanol, sonicated in hot water bath for ~10 minutes.
[Ethyl acetate]/Acetic acid/ Formic acid/ Me₂Q-water
[10/1/1/1/2/4]
Ambient
(1) UV 254 nm
(2) UV 366 nm
(3) Anisaldehyde/H₂SO₄ spray/reagent → visible light


HP-TLC PLATES



YELLOW LINE = SAMPLE ORIGIN
RED LINE = SOLVENT FRONT (9 XMM)

Lane	ID	Lane	ID
1	Butan	5	Siratka grosvenori XRM
2	Siratka grosvenori XRM	6	Siratka grosvenori XRM
3	Siratka grosvenori XRM	7	Siratka grosvenori XRM
4	Siratka grosvenori XRM	8	Butan

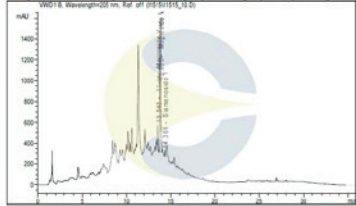
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CERTIFICATE OF ANALYSIS
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Chromatogram Momordica grosvenori swingle (lou han guo) XRM (49.4 mg/mL injection)




REVISION HISTORY

Revision history
00

Date of Revision
01 October 2015

Document Changes
New report

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CERTIFICATE OF ANALYSIS
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HP-LC RESULTS

ANALYTE	METHOD	RESULT
11-oxo-Magnoside V	99-1-LC-D-1.0-0000353	1.75%
Magnoside V		17.5%
Siamenoxide 1		0.518%
Grossmannoside		ND

HP-LC CONDITIONS


INSTRUMENT
COLUMN
MOBILE PHASE
COLUMN TEMP.
FLOW RATE
INJECTION VOL.
SAMPLE INJECTION CONC.
DETECTION

AGILENT 1100-HPLC UV-VIS (VWD) DETECTOR
YMC T-Sphere ODS-H80 250 x 4.6mm, 4µm
A-Me₂Q-H₂O, B-AcOH
Start at 5% B and rise to 10% B over 5 minutes; from 10% B to 50% B over 15 minutes; from 50% B to 90% B over 4 minutes; remain at 90% B for 4 minutes; from 90% B to 5% B over 3 minutes; remain at 5% B for 5 minutes.
60°C
1.75 mL/minute
10 µL
1.01 mg/mL in MeOH, 49.4 mg/mL in MeOH
205 nm

SAMPLE PREPARATION

Sample was prepared at two levels, approximately 500 mg of material was placed in a scintillation vial and approximately 50 mg of material was placed in a 50 mL volumetric flask. 10 mL of MeOH was added to the vial and ~40 mL of MeOH was added to the flask. Samples were sonicated for 15 minutes, then allowed to cool to room temperature. The flask was diluted to volume with MeOH and mixed well. An aliquot of the samples were filtered through a PTFE syringe filter into an HPLC vial for analysis.

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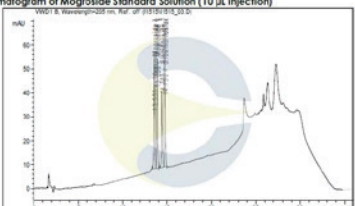


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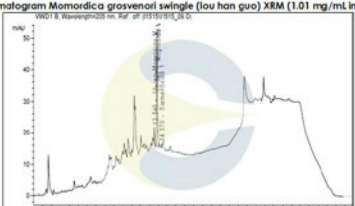
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HP-LC CHROMATOGRAMS

Chromatogram of Magnoside Standard Solution (10 µL Injection)



Chromatogram Momordica grosvenori swingle (lou han guo) XRM (1.01 mg/mL injection)



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