

PRODUCT	Boswellia serrata (Indian Frankincense) Resin
PART NUMBER	00030155
REFERENCE TYPE	Extract Reference Material (XRM)
LOT NUMBER	00030155-018
COMMON NAME	Indian Frankincense
LATIN NAME	<i>Boswellia serrata</i> Roxb. [Burseraceae]
PLANT PART	Resin
SAMPLE NUMBER	CDXA-08-0285
REPORT NUMBER	CDXA-XRMR-020-03
DATE OF SAMPLE	03/04/2008
DATE OF RE-EVALUATION	11/13/2012 (1 st); 02/10/2017 (2 nd); 02/14/2022 (3 rd)
DATE OF REPORT	05/11/2022

ANALYTICAL RESULTS

TEST	METHOD	RESULT
Appearance	Macroscopy	(1) Extracted: Off-white granular powder
HPLC	See HPLC conditions	Conforms
HP-TLC	See HP-TLC conditions	Conforms

STORAGE CONDITIONS

STORAGE 20-30 °C; Dry storage area; Insect free; Volatile free

EXPIRATION DATE 02/2027 under the above conditions

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MACROSCOPY

(1)

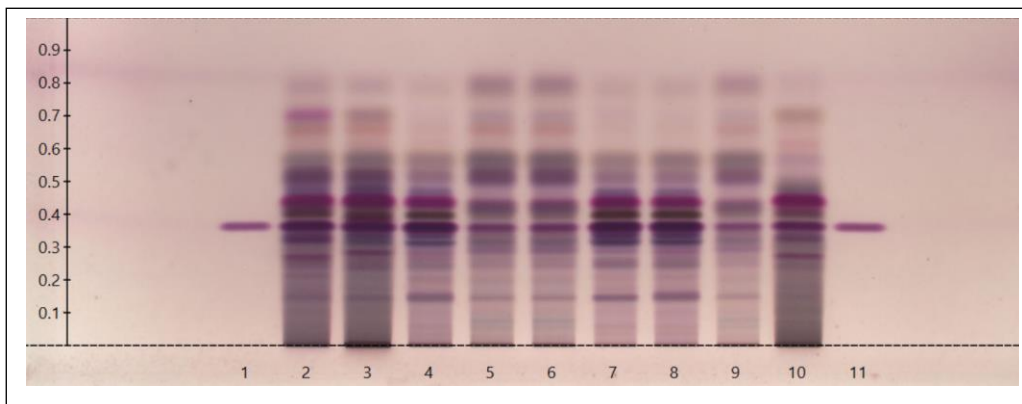


HP-TLC CONDITIONS

STATIONARY PHASE	Silica gel 60, HPTLC plates
SAMPLE PREPARATION	0.3g + 3 mL 100% grain Ethanol, sonicate/heat at 50 °C for 30 min.
MOBILE PHASE	Cyclohexane/Isopropyl alcohol/Acetic acid [6/4/1]
DETECTION	(1) Anisaldehyde/Sulfuric, 100 °C, 2 min, visible (2) Anisaldehyde/Sulfuric, 100 °C, 2 min, 366nm

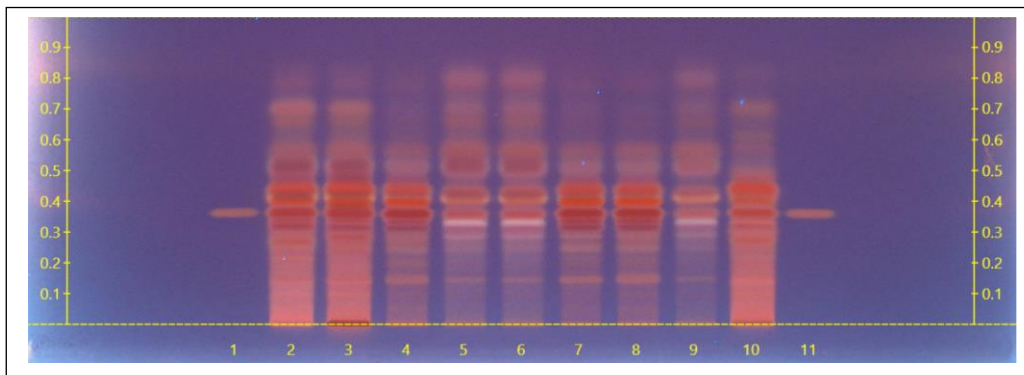
HP-TLC PLATES

HP-TLC (1)



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HP-TLC (2)



HP-TLC LANE APPLICATIONS

Lane	ID	Lane	ID
1	Boswellic Acid (1 µL)	7	N/A
2	<i>Boswellia serrata</i> (gum) (1 µL)	8	N/A
3	<i>Boswellia serrata</i> (resin) (1 µL)	9	N/A
4	<i>Boswellia serrata</i> XRM (00030155-018) (0.5 µL)	10	<i>Boswellia sacra</i> / <i>Boswellia carteri</i> (resin) (1 µL)
5	N/A	11	Boswellic Acid (1 µL)
6	N/A	12	N/A

HPLC RESULTS

ANALYTE	METHOD	RESULT
α-Boswellic acid	0.700.10.2.METH66	5.7%
β-Boswellic acid		17.2%
3-acetyl-α-Boswellic acid		1.8%
3-acetyl-β-Boswellic acid		5.9%
11-keto-β-Boswellic acid		4.3%
3-acetyl-11-keto-β-Boswellic acid		1.7%
Total Boswellic acids		36.6%

ND = Not Detected

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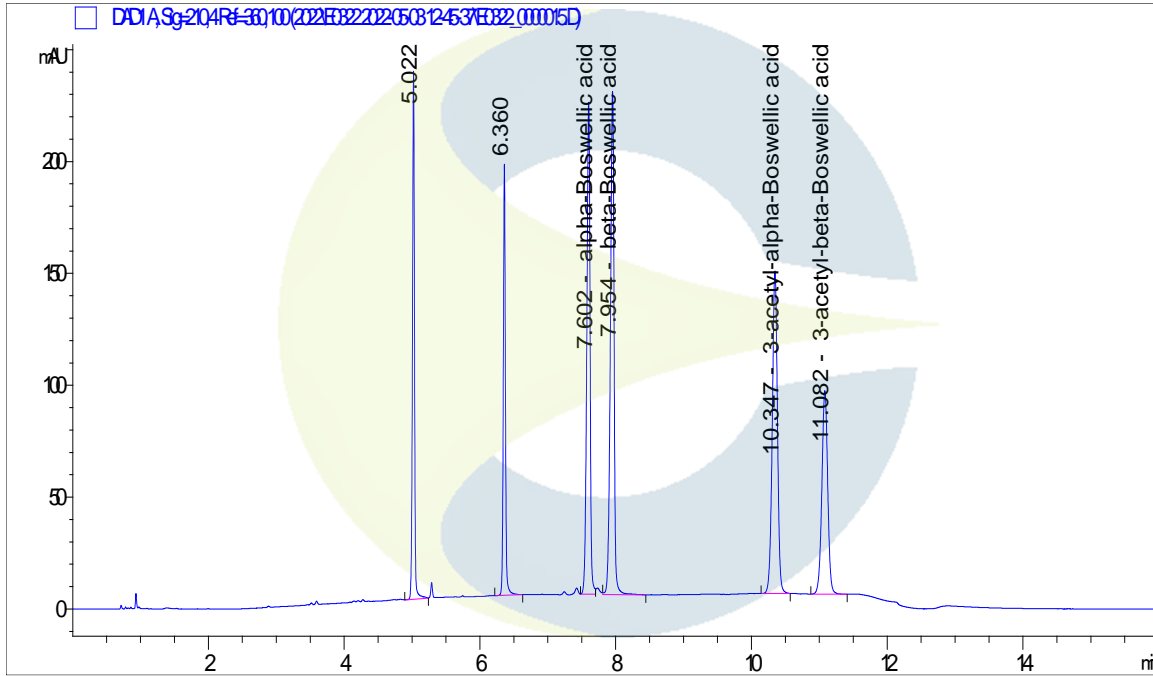
HPLC CONDITIONS

INSTRUMENT	AGILENT 1260 HPLC UV-VIS (DAD) DETECTOR																								
COLUMN	Phenomenex Kinetex C18 150 x 4.6 mm, 2.6 µm particle size;																								
MOBILE PHASE	A – 0.1% Phosphoric acid (aq), B – Acetonitrile;																								
	Gradient -																								
	<table border="0"> <thead> <tr> <th>Time (min)</th> <th>%A</th> <th>%B</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>40</td> <td>60</td> </tr> <tr> <td>1</td> <td>40</td> <td>60</td> </tr> <tr> <td>4</td> <td>10</td> <td>90</td> </tr> <tr> <td>5</td> <td>5</td> <td>95</td> </tr> <tr> <td>10</td> <td>5</td> <td>95</td> </tr> <tr> <td>11</td> <td>40</td> <td>60</td> </tr> <tr> <td>16</td> <td>40</td> <td>60</td> </tr> </tbody> </table>	Time (min)	%A	%B	0	40	60	1	40	60	4	10	90	5	5	95	10	5	95	11	40	60	16	40	60
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1	40	60																							
4	10	90																							
5	5	95																							
10	5	95																							
11	40	60																							
16	40	60																							
COLUMN TEMP.	30 °C																								
FLOW RATE	1.5 mL/minute																								
INJECTION VOL.	3.0 µL																								
SAMPLE INJECTION CONC.	5.0 mg/mL in Acetonitrile																								
DETECTION	210 ± 2 nm, 250 ± 4 nm*																								
	*11-keto-β-Boswellic acid and 3-acetyl-11-keto-β-Boswellic acid are better analyzed at 250 nm																								

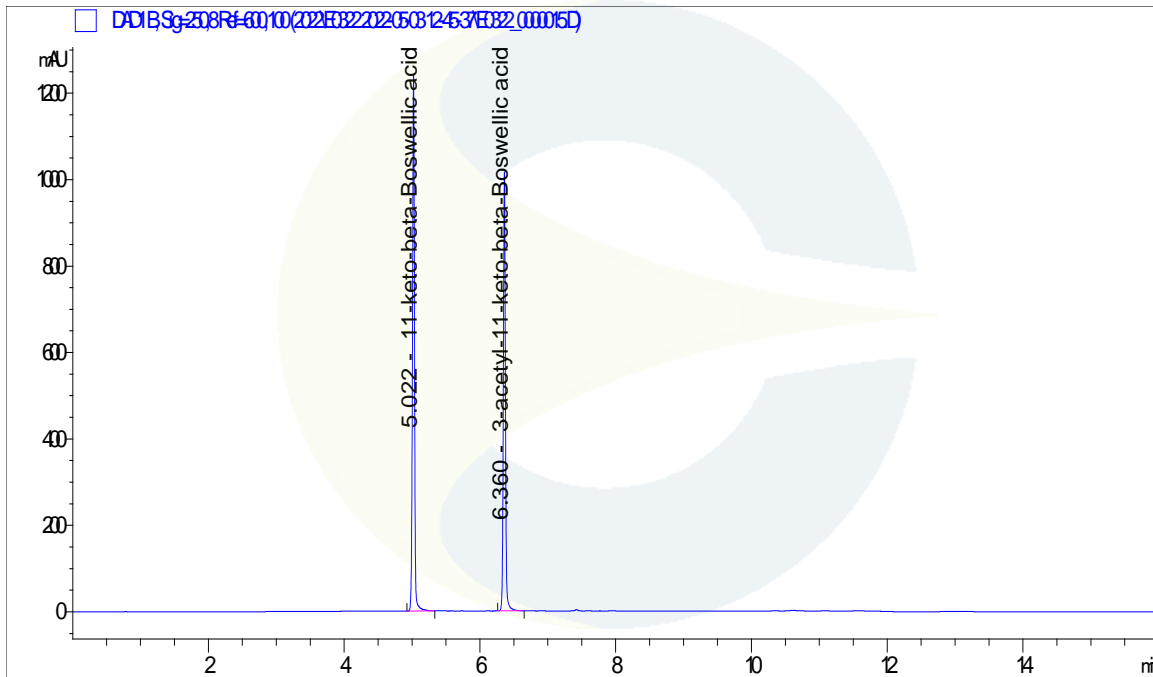
SAMPLE PREPARATION

Approximately 250 mg of material was placed in a 50 mL volumetric flask with around 40 mL of Acetonitrile. The mixture was sonicated for 15 minutes. Once the mixture had cooled to ambient temperature, the flask was filled to volume with Acetonitrile and mixed well. An aliquot of the solution was filtered through a PTFE syringe filter into an HPLC vial for analysis.

CHROMATOGRAM OF STANDARD SOLUTION (210 nm)

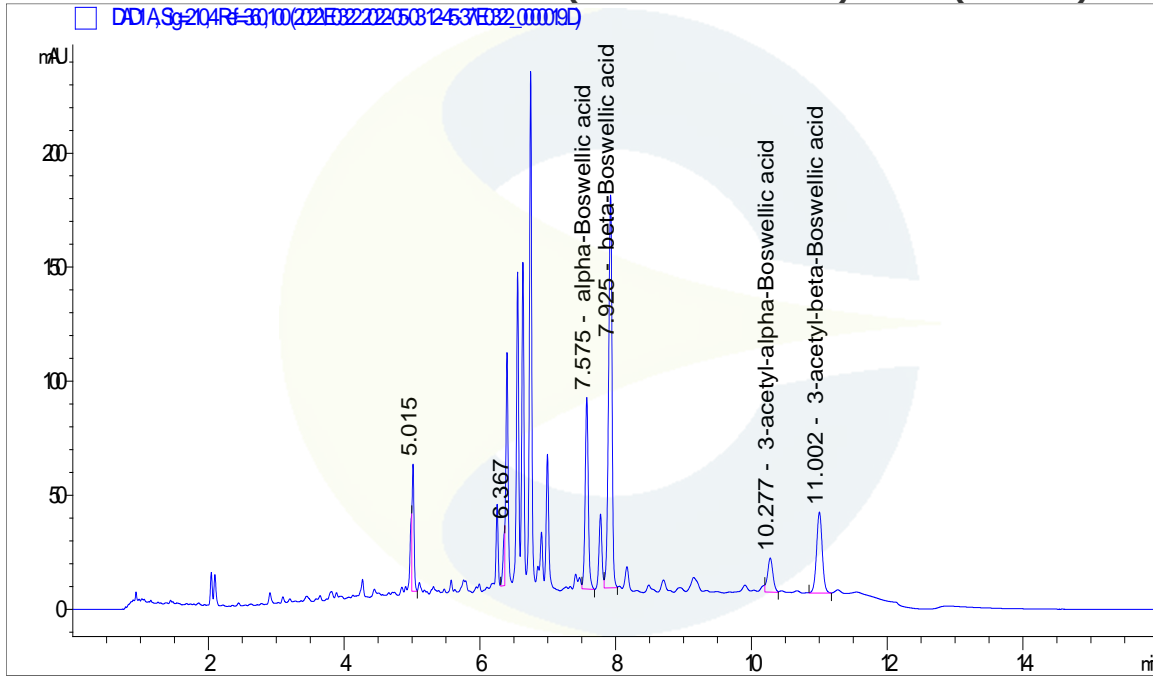


CHROMATOGRAM OF STANDARD SOLUTION (250 nm)

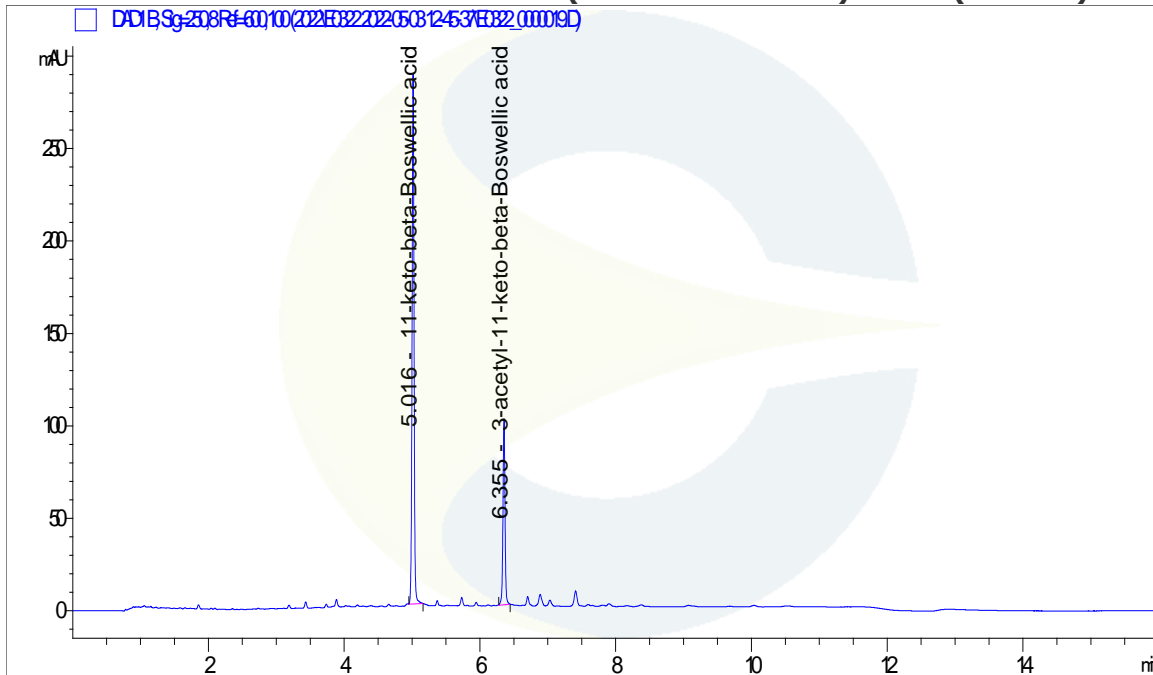


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CHROMATOGRAM OF INDIAN FRANKINCENSE (*Boswellia serrata*) RESIN (210 nm)

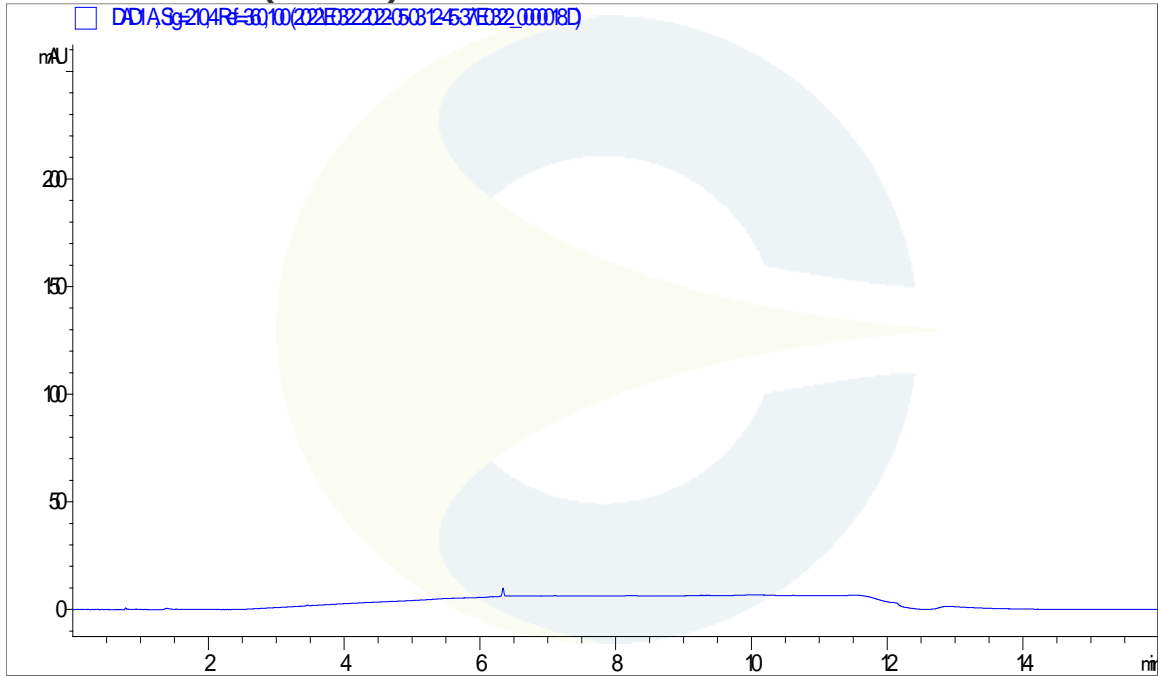


CHROMATOGRAM OF INDIAN FRANKINCENSE (*Boswellia serrata*) RESIN (250 nm)

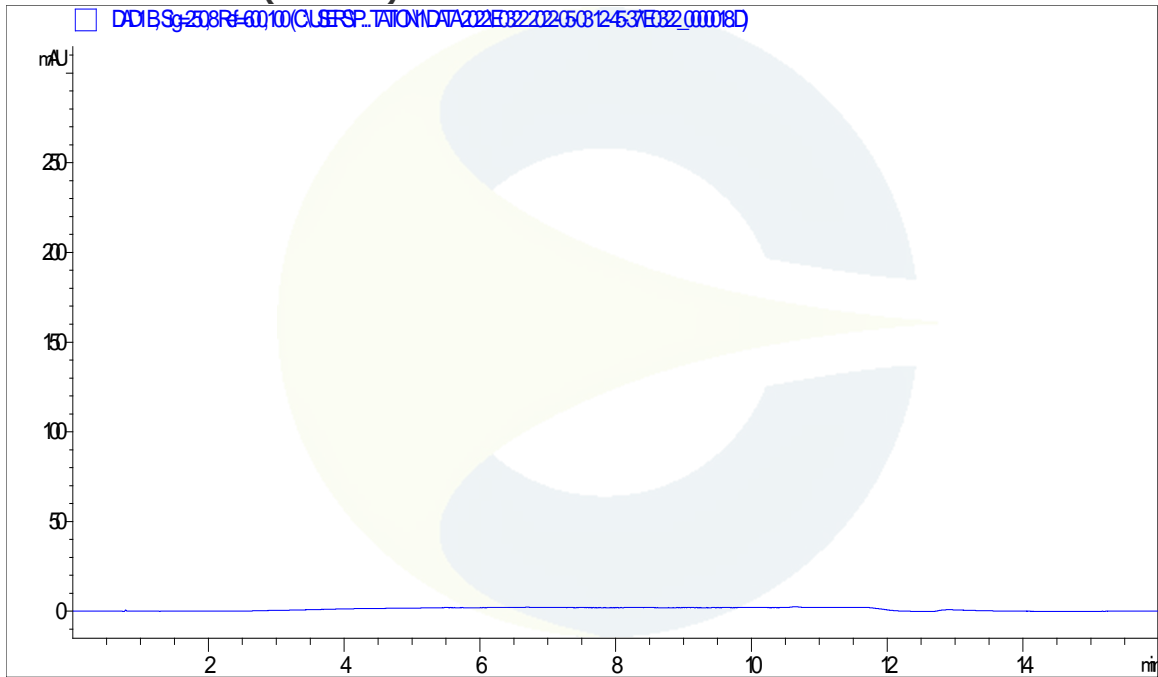


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BLANK CHROMATOGRAM (210 nm)



BLANK CHROMATOGRAM (250 nm)



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REVISION HISTORY

<u>Revision History</u>	<u>Date of Revision</u>	<u>Document/Changes</u>
00	05/05/2008	New report
01	11/13/2012	Passed re-evaluation; updated expiration date
02	02/20/2017	Passed re-evaluation; updated product name, expiration date, TLC conditions, TLC plates, TLC lane applications, HPLC results, HPLC Conditions, HPLC sample preparation, and HPLC chromatograms.
03	05/11/2022	Passed re-evaluation by HP-TLC and HPLC. Updated HPTLC conditions, HPTLC plates, lane assignments, HPLC method conditions, HPLC chromatograms, and expiration date

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