

HPTLC Fingerprint Analysis of Devadarvyadi Choorna Mentioned in Charaka Samhita Kasa Chikitsa Adhyaya

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Abstract

Devadarvyadi Choorna is a classical Ayurvedic formulation mentioned in Charaka Samhita Kasa Chikitsa Adhyaya and is traditionally used in the management of respiratory disorders. The formulation contains Devadaru, Abhaya, Mustha, Pippali, and Shunthi. The present study evaluates the chromatographic fingerprint profile of Devadarvyadi Choorna using High Performance Thin Layer Chromatography (HPTLC). The chromatographic analysis was performed using silica gel 60 F254 plates with Toluene:Chloroform:Methanol (8:3:1) as the mobile phase. Densitometric scanning at 254 nm and fluorescence detection at 366 nm revealed multiple characteristic peaks indicating the presence of diverse phytochemical constituents. The developed fingerprint profile may be useful for identification, standardization, and quality control of the formulation.

Keywords: Devadarvyadi Choorna; HPTLC; Charaka Samhita

I. Introduction

Devadarvyadi Choorna¹ is a classical Ayurvedic polyherbal formulation described in Charaka Samhita Kasa Chikitsa Adhyaya for the

management of kasa and related disorders. The formulation contains Devadaru² (Cedrus deodara)³, Abhaya⁴ (Terminalia chebula)⁵, Mustha⁶ (Cyperus rotundus)⁷, Pippali⁸ (Piper longum)⁹, and Shunthi¹⁰ (Zingiber officinale)¹¹. Standardization of herbal formulations is essential to ensure quality, safety, and efficacy. High Performance Thin Layer Chromatography (HPTLC) is an important analytical tool used for the identification and fingerprint profiling of herbal drugs. The present work evaluates the HPTLC fingerprint characteristics of Devadarvyadi Choorna.

Ingredients of Devadarvyadi Choorna

Ingredient	Botanical Name
Devadaru	Cedrus deodara
Abhaya	Terminalia chebula
Mustha	Cyperus rotundus
Pippali	Piper longum
Shunthi	Zingiber officinale

II. Methodology

HPTLC analysis was performed using silica gel 60 F254 plates. The samples were applied using CAMAG Linomat 5 and developed in Toluene:Chloroform:Methanol (8:3:1). Densitometric scanning was performed at 254 nm and 366 nm.

Chromatographic Profiles and HPTLC Images

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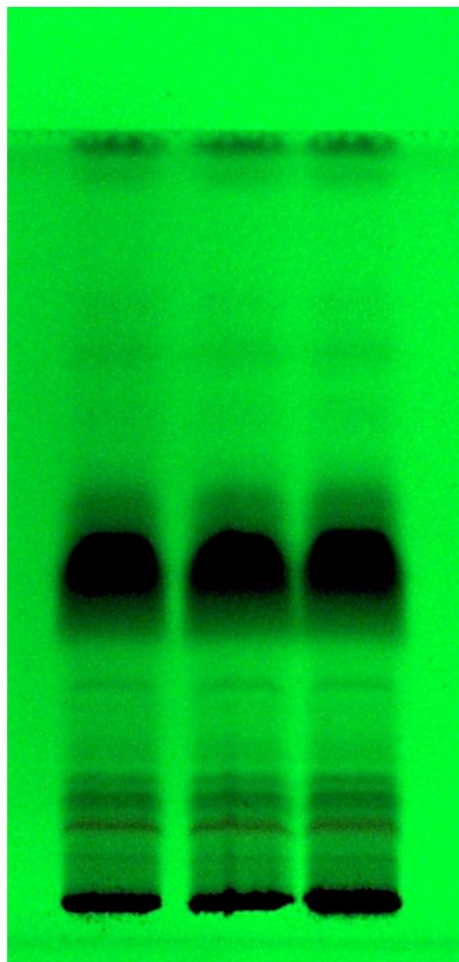


Image information - 366 nm - Image1

Illumination instrument	CAMAG Visualizer : 171217 (Visualizer_171217)
Digital camera type : snr & Lens	DXA252 : 490823510, Computar, 12 mm, f4.0
Created by : on	SARANYA : Saturday, May 11, 2024 3:55:12 PM
Resolution	Full
Plate border size	-2 mm
Automatic capture	Off
Save mode	Lossy (JPG)
Exposure mode	Automatic, digital level: 85 %, Band

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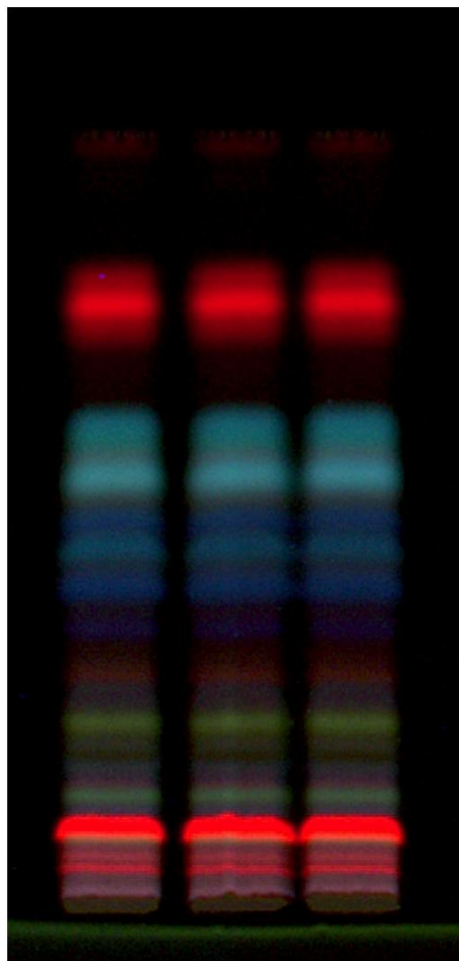
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Capture settings:

Image size: 343 Pxl x 715 Pxl (0.13 mm/Pxl)
Exposure : 965.77 ms gain: 1.00
White balance R: 1.40, G: 1.00, B: 1.20
Illumination type / correction type : 366 nm remission : Default correction

Display settings:

White balance: R: 1.00 G: 1.00 B: 1.00
Contrast enhancement: 1.41 (modified)
Brightness: 0.00
Accentuation: 0.80
Color saturation: 1.30 *
Blank plate compensation : N/A



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Development - Glass tank

Chamber type	Twin Trough Chamber 20x10cm
Executed by	SARANYA Saturday, May 11, 2024 3:54:47 PM
Comment	
Pre-conditioning	30 MINS
Mobile phase	TOLUENE:CHLOROFORM: METHANOL (8:3:1)
Solvent front position	85.0 mm
Volume	10.0 ml
Drying device	Oven
Temperature	60 °C
Time	5 Minutes
Notes	

Detection - CAMAG TLC Scanner

Information	
Application position	10.0 mm
Solvent front position	85.0 mm
Instrument	CAMAG TLC Scanner "Scanner_171019" S/N 171019 (2.01.02)
Executed by	SARANYA Saturday, May 11, 2024 4:19:25 PM
Number of tracks	3
Position of first track X	12.5 mm
Distance between tracks	12.5 mm
Scan start pos. Y	5.0 mm
Scan end pos. Y	85.0 mm
Slit dimensions	4.00 x 0.30 mm, Micro
Optimize optical system	Light
Scanning speed:	20 mm/s
Data resolution:	100 µm/step

Integration

Properties	
Data filtering	Savitsky-Golay 7
Baseline correction	Lowest Slope
Peak threshold min. slope	5
Peak threshold min. height	10 AU
Peak threshold min. area	50
Peak threshold max. height	990 AU
Track start position	5.0 mm
Track end position	75.0 mm
Display scaling	Automatic

Measurement Table

Wavelength	254
Lamp	D2 & W
Measurement Type	Remission
Measurement Mode	Absorption
Optical filter	Second order
Detector mode	Automatic
PM high voltage	189 V

Detector properties

Y-position for 0 adjust	5.0 mm
Track # for 0 adjust	0
Analog Offset	10%
Sensitivity	Automatic (147)

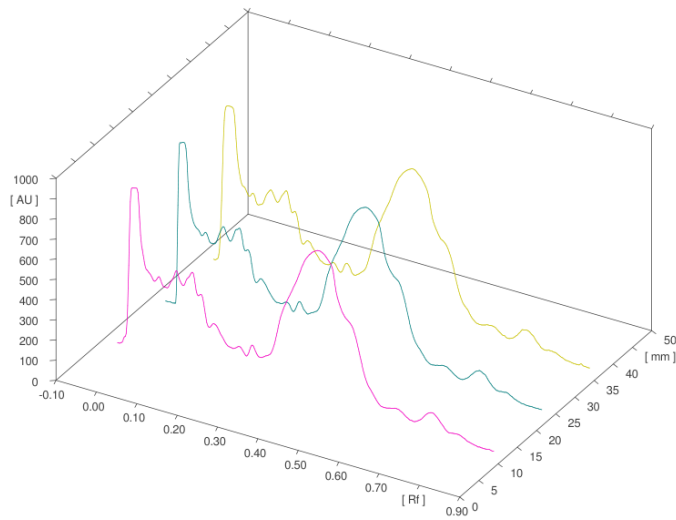
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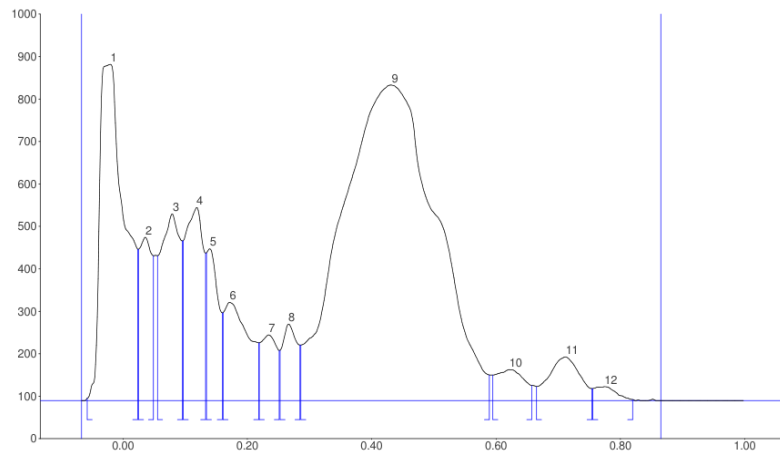
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All tracks at WavelengthSc4



Track 1, ID: DEVADARVYADI YOGA CHOORNA



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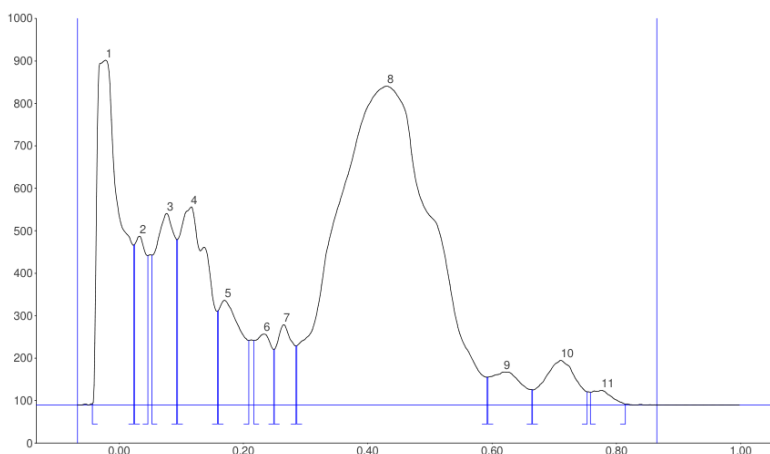
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Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.06	5.9	-0.02	792.1	20.06	0.02	356.7	27875.5	15.06	unknown *
2	0.03	356.7	0.04	385.0	9.75	0.05	341.3	6925.7	3.74	unknown *
3	0.06	341.5	0.08	439.8	11.14	0.10	376.1	12157.6	6.57	unknown *
4	0.10	377.2	0.12	455.1	11.52	0.13	347.6	11467.3	6.20	unknown *
5	0.13	348.5	0.14	357.8	9.06	0.16	206.8	5893.2	3.18	unknown *
6	0.16	207.2	0.17	231.4	5.86	0.22	136.1	8097.1	4.37	unknown *
7	0.22	136.3	0.23	155.0	3.92	0.25	118.1	3530.8	1.91	unknown *
8	0.25	118.7	0.27	180.5	4.57	0.29	131.2	3769.5	2.04	unknown *
9	0.29	131.3	0.43	743.3	18.82	0.59	60.6	96949.7	52.38	unknown *
10	0.60	60.7	0.62	73.1	1.85	0.66	35.6	2907.3	1.57	unknown *
11	0.67	33.3	0.71	103.1	2.61	0.76	28.4	4482.7	2.42	unknown *
12	0.76	28.6	0.78	33.0	0.84	0.82	2.8	1027.3	0.56	unknown *

Track 2, ID: DEVADARVYADI YOGA CHOORNA



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.04	1.6	-0.02	812.1	21.94	0.02	376.7	26930.9	14.30	unknown *
2	0.03	378.4	0.03	398.0	10.75	0.05	352.2	6424.1	3.41	unknown *
3	0.05	353.1	0.08	451.5	12.20	0.09	389.8	12617.3	6.70	unknown *
4	0.09	390.1	0.12	466.9	12.61	0.16	221.2	18407.9	9.77	unknown *
5	0.16	222.8	0.17	246.7	6.67	0.21	152.5	7771.9	4.13	unknown *
6	0.22	152.0	0.23	167.2	4.52	0.25	130.6	3868.7	2.05	unknown *
7	0.25	131.2	0.27	189.2	5.11	0.29	139.1	4330.9	2.30	unknown *
8	0.29	139.8	0.43	751.2	20.30	0.59	65.5	99022.4	52.58	unknown *
9	0.59	65.5	0.62	78.2	2.11	0.67	36.1	3391.5	1.80	unknown *
10	0.67	35.8	0.71	105.1	2.84	0.75	31.2	4608.3	2.45	unknown *
11	0.76	30.0	0.78	35.0	0.95	0.82	2.2	951.8	0.51	unknown *

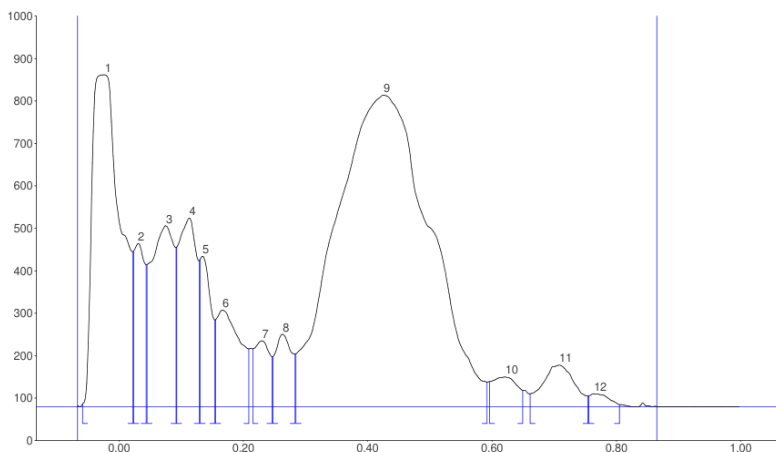
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Track 3, ID: DEVADARVYADI YOGA CHOORNA



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.06	7.0	-0.02	781.8	20.16	0.02	365.1	31117.7	16.72	unknown *
2	0.02	366.8	0.03	384.5	9.91	0.04	334.5	5828.4	3.13	unknown *
3	0.05	335.1	0.08	426.3	10.99	0.09	375.0	13823.9	7.43	unknown *
4	0.09	376.2	0.11	444.3	11.46	0.13	344.4	11272.5	6.06	unknown *
5	0.13	346.9	0.13	354.6	9.14	0.15	204.2	5546.3	2.98	unknown *
6	0.16	205.0	0.17	227.6	5.87	0.21	136.4	7606.6	4.09	unknown *
7	0.22	136.8	0.23	155.3	4.00	0.25	117.6	3390.9	1.82	unknown *
8	0.25	117.8	0.26	171.0	4.41	0.28	124.0	4032.7	2.17	unknown *
9	0.29	124.7	0.43	734.1	18.93	0.59	58.3	95772.9	51.47	unknown *
10	0.60	59.3	0.62	70.0	1.81	0.65	38.6	2486.3	1.34	unknown *
11	0.66	30.8	0.71	98.0	2.53	0.76	25.6	4370.9	2.35	unknown *
12	0.76	25.9	0.77	30.8	0.79	0.81	5.0	825.9	0.44	unknown *

Measurement Table

Wavelength	366
Lamp	Hg
Measurement Type	Remission
Measurement Mode	Fluorescence
Optical filter	K400
Detector mode	Automatic
PM high voltage	189 V

Detector properties

Y-position for 0 adjust	5.0 mm
Track # for 0 adjust	0
Analog Offset	10%
Sensitivity	Automatic (147)

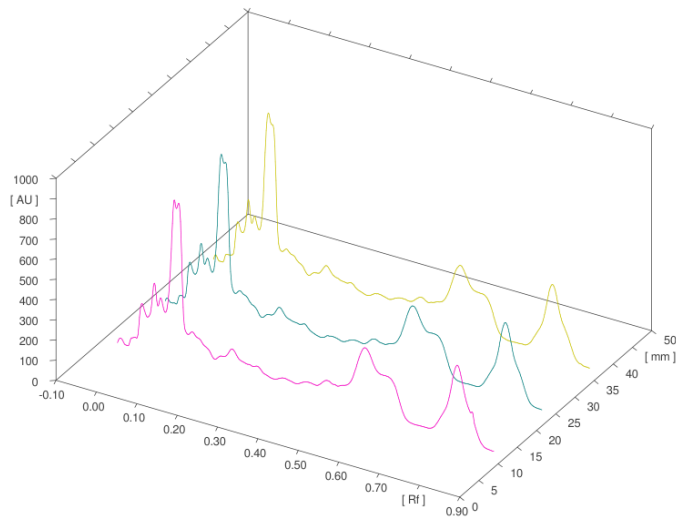
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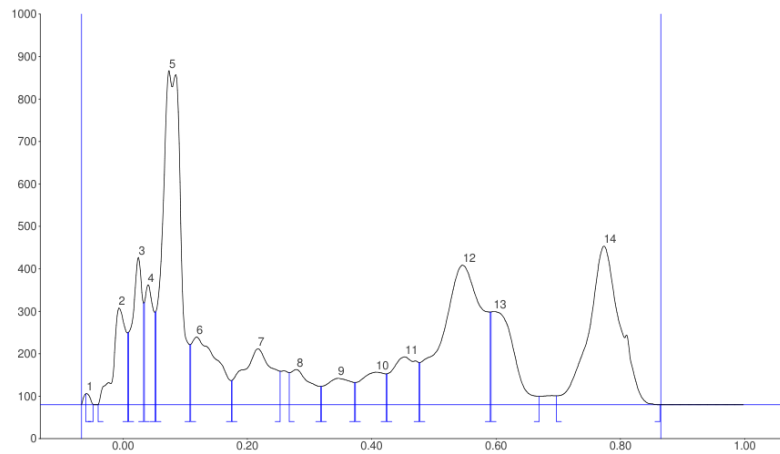
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All tracks at WavelengthSc4



Track 1, ID: DEVADARVYADI YOGA CHOORNA



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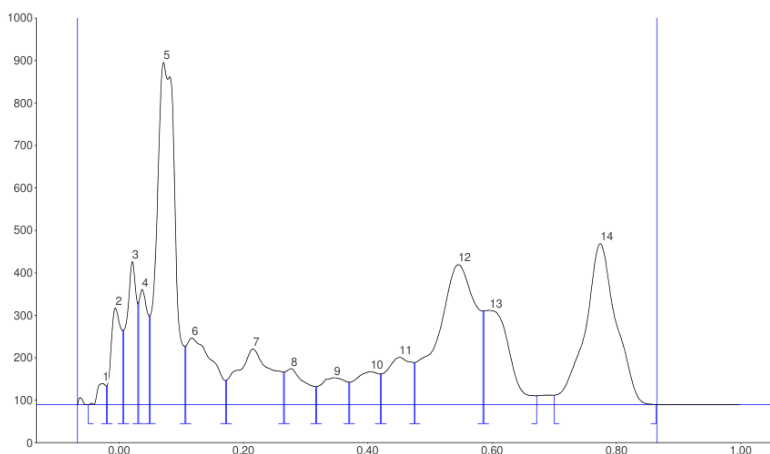
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Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.06	25.9	-0.06	26.7	0.83	-0.05	0.7	167.2	0.17	unknown *
2	-0.04	0.0	-0.01	227.7	7.07	0.01	169.6	4128.1	4.25	unknown *
3	0.01	171.2	0.03	347.2	10.78	0.03	238.9	4869.3	5.01	unknown *
4	0.03	241.6	0.04	282.5	8.77	0.05	217.9	3520.4	3.62	unknown *
5	0.05	220.6	0.07	786.9	24.44	0.11	141.6	19957.5	20.54	unknown *
6	0.11	142.5	0.12	159.6	4.96	0.17	57.1	5882.2	6.05	unknown *
7	0.18	57.9	0.22	132.1	4.10	0.25	78.9	5532.0	5.69	unknown *
8	0.27	75.7	0.28	83.1	2.58	0.32	43.5	2457.8	2.53	unknown *
9	0.32	43.6	0.35	62.4	1.94	0.37	52.5	2269.9	2.34	unknown *
10	0.37	52.6	0.41	77.0	2.39	0.42	72.9	2614.7	2.69	unknown *
11	0.43	73.0	0.45	112.9	3.50	0.48	99.3	3938.0	4.05	unknown *
12	0.48	99.5	0.55	328.8	10.21	0.59	218.6	18441.6	18.98	unknown *
13	0.59	218.8	0.60	219.7	6.82	0.67	20.2	6956.4	7.16	unknown *
14	0.70	21.5	0.77	373.7	11.60	0.87	0.0	16425.3	16.91	unknown *

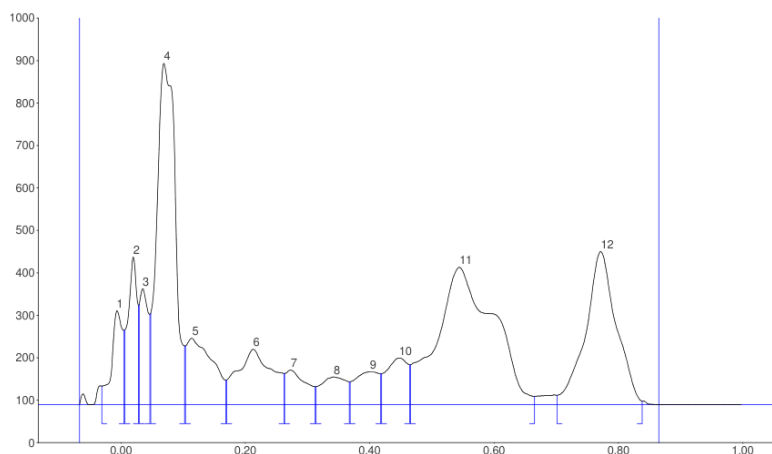
Track 2, ID: DEVADARVYADI YOGA CHOORNA



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Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.05	0.0	-0.03	50.1	1.54	-0.02	43.6	596.3	0.61	unknown *
2	-0.02	45.5	-0.01	227.5	7.00	0.01	174.7	3305.6	3.37	unknown *
3	0.01	175.9	0.02	337.0	10.37	0.03	237.1	4627.2	4.72	unknown *
4	0.03	241.1	0.04	271.8	8.36	0.05	208.5	3401.5	3.47	unknown *
5	0.05	210.4	0.07	806.7	24.82	0.11	137.2	20517.3	20.92	unknown *
6	0.11	138.5	0.12	157.1	4.83	0.17	56.8	5743.9	5.86	unknown *
7	0.17	57.3	0.22	131.2	4.04	0.27	76.5	6368.2	6.49	unknown *
8	0.27	76.8	0.28	84.9	2.61	0.32	42.4	2456.7	2.50	unknown *
9	0.32	42.5	0.35	63.4	1.95	0.37	53.0	2261.5	2.31	unknown *
10	0.37	53.0	0.41	77.3	2.38	0.42	72.3	2626.9	2.68	unknown *
11	0.42	72.4	0.45	111.5	3.43	0.48	99.1	3973.3	4.05	unknown *
12	0.48	99.3	0.55	329.8	10.15	0.59	220.5	17799.4	18.14	unknown *
13	0.59	220.6	0.60	222.2	6.84	0.67	20.7	7839.2	7.99	unknown *
14	0.70	22.1	0.78	379.3	11.67	0.87	0.1	16579.4	16.90	unknown *

Track 3, ID: DEVADARVYADI YOGA CHOORNA



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	-0.03	44.1	-0.01	221.2	7.49	0.01	175.0	3501.1	3.65	unknown *
2	0.01	176.2	0.02	347.6	11.78	0.03	233.6	4413.2	4.60	unknown *
3	0.03	235.6	0.03	272.8	9.24	0.05	212.6	3418.0	3.57	unknown *
4	0.05	215.6	0.07	804.2	27.25	0.10	138.3	20605.3	21.50	unknown *
5	0.10	138.5	0.11	156.5	5.30	0.17	57.5	5815.6	6.07	unknown *
6	0.17	58.3	0.21	130.7	4.43	0.26	73.6	6305.9	6.58	unknown *
7	0.26	73.7	0.27	81.4	2.76	0.31	42.2	2348.2	2.45	unknown *
8	0.31	42.4	0.34	65.5	2.22	0.37	53.9	2340.2	2.44	unknown *
9	0.37	54.0	0.40	77.1	2.61	0.42	73.4	2666.2	2.78	unknown *
10	0.42	73.4	0.45	109.9	3.72	0.47	93.8	3334.6	3.48	unknown *
11	0.47	94.0	0.55	323.7	10.97	0.67	19.9	25559.4	26.67	unknown *
12	0.70	22.1	0.77	360.7	12.22	0.84	8.1	15541.6	16.21	unknown *

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III. Results and Discussion

The chromatographic analysis demonstrated multiple well-resolved peaks indicating the presence of several phytochemical constituents in the formulation. The HPTLC densitograms showed reproducible peak patterns across all tracks, suggesting uniformity and

consistency of the sample. Major peaks were observed at characteristic Rf values indicating dominant phytochemical components. The fluorescence patterns under 366 nm and absorbance bands under 254 nm provided a characteristic fingerprint profile for Devadarvyadi Choorna.

IV. Conclusion

The HPTLC fingerprint profile of Devadarvyadi Choorna established a reproducible chromatographic pattern useful for standardization and quality control. The study confirms the applicability of HPTLC as a reliable analytical tool for evaluation of classical Ayurvedic formulations.

References

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