Indian J. Applied & Pure Bio. Vol. 41(2), 1364-1378 (2026). **ISSN: 0970-2091**

Evaluation of Therapeutic Potential of *Haridradi Ghanavati* in Management of Hypothyroidism Through High-Performance Thin Layer Chromatography (HPTLC) Analysis

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Abstract

Hypothyroidism is characterized by insufficient thyroid hormone synthesis and is linked to inflammation, weight gain, dyslipidemia, and slowed metabolism. *Haridradi Ghanavati* (HGV) is a traditional polyherbal compound detailed in Ashtanga Hrudaya, which may have therapeutic value for hypothyroidism. A proven analytical method for creating phytochemical fingerprints and guaranteeing formulation authenticity, purity, and quality is High-Performance Thin-Layer Chromatography (HPTLC).

Haridradi Ghanavati were made using classical *Ayurvedic* method after raw materials were authenticated. Physicochemical parameters including ash values, loss on drying, tablet hardness, disintegration, and dissolution were assessed. Sample was prepared by weighing 5gm of sample in a beaker and Methanolic extracts was added into it, HPTLC analysis at concentrations of 5–20 µL using silica gel 60 F254 plates. Chromatograms were visualized under 254 nm and 366 nm to identify characteristic phytochemical markers.

Curcumin**,** termerone, zingiberene, berberune, liquiritigenin, isoliquiritigenin, glycurrhizin, tannins,phenolic glycosides, coumarins and tridoids were identified as major phytochemicals. The compounds were known to decrease thyroidal inflammation, antioxidants, improve metabolic rate, control weight gain, hypothalamic-pituitary-thyroid axis regulation.

The obtained fingerprint demonstrates efficient extraction and the presence of signature bioactive markers from each ingredient. The dominance of curcuminoids, berberine, and liquorice flavonoids highlights the therapeutic potential of the formulation, especially in inflammatory and metabolic conditions relevant to hypothyroidism.

Key words : *Ayurveda, Haridradi Ghanavati,* HPTLC, Polyherbal formulation, Pharmaceutical study, Standardization.

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To evaluate the quality of medications, standardization of herbal formulations is essential. Physical, chemical, phytochemical, in-vitro, and in-vivo parameters, as well as the concentration of their active principles, serve as its foundation.[2] Several herbal or herbo-mineral substances are used in Ayurvedic preparations. Each of these ingredients will have a variety of components, and depending on those components, each ingredient will act differently.[12] Ensuring that health searchers receive medication that ensures safety, quality, and efficacy is the regulatory authorities' primary job. These regulatory bodies have set requirements for both raw materials and final goods. Among these is HPTLC, which guarantees the herbs' purity, safety, and authenticity.[4]

One of the most prevalent functional problems is hypothyroidism. Thyroid hormone shortage is a frequent medical disease known as hypothyroidism.[8] Pituitary TSH deficiency or a primary thyroid gland illness (primary hypothyroidism) can both cause hypothyroidism.[10] In affluent nations, 4.6% of people have hypothyroidism. It is 10.95% in India's cities. Hypothyroidism is more common in women (15.86%) than in men (5.02%).[1]

Haridradi Ghanvati is a herbal formulation mentioned for the management of *Sthaulya* and other conditions. *Haridradi Ghanvati* is a herbal formulation mentioned in Astang Hridaya, which includes the following herbs: *Haridra* (Curcuma longa), *Daru Haridra* (Berberis aristata), *Yashtimadhu* (Glycyrrhiza glabra), *Kalasi/Prishniparni* (Uraria picta), and *Indrayava* (Holarrhena antidysenterica). These herbs are particularly effective in addressing conditions such as acute diarrhoea, disorders of *Meda*, and imbalances in *Vat* and *Stanya dosh*, among others.[7]

Aims and objectives :

To conduct phytochemical and pharmacognostical analyses of Haridradi Ghanavati for use in hypothyroidism treatment.

Plant material :

The Vadodara local market provided the ingredients for *Haridradi Ghanavati* (Table-1). At the teaching pharmacy of the Department of Dravyaguna, Parul Institute of Ayurved and Research, Ishwarpura, Gujarat state, India, the gathered medications were recognized and verified.

A pharmaceutical preparation of *Haridradi Ghanavati*

Table-1. Ingredients of *Haridradi Ghanavati*

Sl. No.	*Dravya*	Botanical name	Part used	Quantity
1	*Haridra*	*Curcuma longa* Linn.	Rhizome	1part
2	*Daru Haridra*	*Berberis aristata* DC.	Root	1part
3	*Indrayava*	*Holarrhena antidysenterica* Linn.	Seed	1part
4	*Prishniparni*	*Uraria picta* Desv.	Root	1part
5	*Yashtimadhu*	*Glycyrrhiza glabra* Linn.	Root	1part

Phytochemical standardization :

The analytical study was carried out at the Centre of Research for Development, Parul University.

Prepration :

All the five drugs were taken in equal quantities, cleaned, dried and made into coarse powder (*Yavakuta*), after which sixteen parts of water was added and the mixture was boiled and reduced to one-fourth of its original volume. It was filtered through a muslin cloth and the filtered decoction was further heated until a semi-solid *Ghana* extract was obtained. Fine powder (*Chūrna*) amounting to 50% of the *Ghana* weight was added to the *Ghana* extract and was mixed thoroughly. Finally a suitable binding agent was incorporated before compressing the mass into 500 mg tablets using a tablet-making machine.

Table-2. Physical characteristics of formulation

S.no	Parameters	Value
1	Description	Power
	Colour	Chocolate brown
	Odour	Pleasant
	Taste	Bitter
	Consisteblity	Sticky, Granulated powder
2	Tablet weight	500mg
3	Limit test for metals	Not detected
4	Loss on drying at 110^0 C	1%
5	Total Ash value	14%
6	Acid-insoluble ash	8%
7	Hardness	3
8	Dissolution time	22minutes
9	Disintegration time	36 minutes
10	Test for Phytochemical	Glucosides, saponins and Phenols present

HPTLC :

Haridradi Ghanvati HPTLC fingerprint analysis was performed at concentrations of 5.0 µL, 10.0 µL, 15.0 µL, and 20.0 µL under the following visualizations: 254 nm (UV-absorbing chemicals) and 366 nm (fluorescent compounds). Five grams of the sample were weighed in a beaker and 100 milliliters of methanol were added to create the test solution and sample. For fifteen minutes, the solution was sonicated. After cooling, it was filtered using plain filter paper. The resulting test solution was utilized for HPTLC fingerprinting. 10 x 10 cm thin layer chromatography (TLC) plates coated with 0.2 mm layers of silica gel 60 F254 (Merck) were used for the chromatography. A Linomat 5 sample applicator (CAMAG, Switzerland) was used to apply the samples to the plate as 6 mm broad bands. Toluene was used to develop the plate to a distance of

8.0 cm: In a CAMAG twin-trough chamber saturated with mobile phase vapor, ethyl acetate:formic acid (8:2:0.5 v/v/v) is used as the mobile phase. After five minutes of drying at room temperature, the plate was scanned at 254 and 366 nm using a CAMAG TLC scanner 3 and winCATS 4 software (CAMAG, Switzerland).

Fig. 1. HPTLC Chromatograph of *Haridradi Ghanavati* @254 nm and 05.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

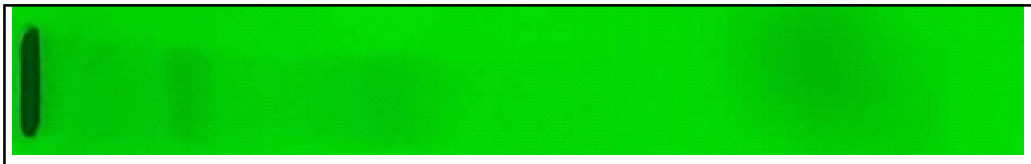

Fig.1[A]

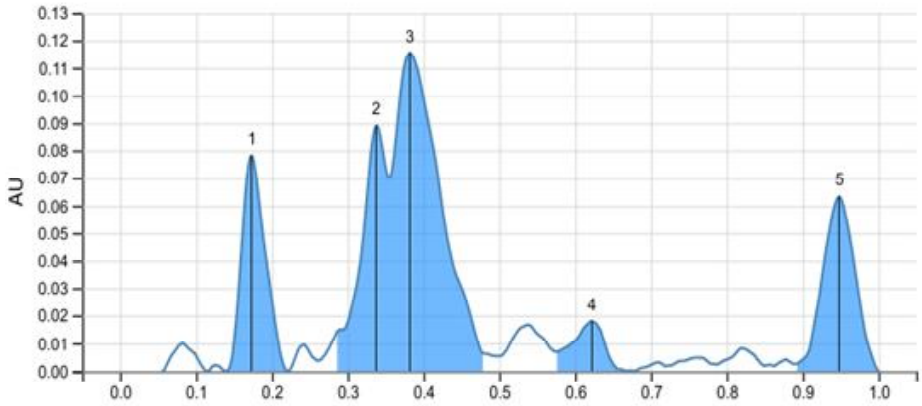

Fig.1[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.140	0.0000	0.174	0.0781	21.48	0.221	0.0000	0.00279	15.21
2	0.286	0.0142	0.338	0.0890	24.46	0.354	0.0700	0.00340	18.52
3	0.354	0.0700	0.382	0.1155	31.75	0.481	0.0061	0.00818	44.51
4	0.575	0.0068	0.622	0.0179	4.93	0.657	0.0006	0.00088	4.78
5	0.890	0.0024	0.949	0.0632	17.38	1.000	0.0000	0.00312	16.99

Fig.1[C]

Figure 2. HPTLC Chromatograph of *Haridradi Ghanavati* @254 nm and 10.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 2 [A]

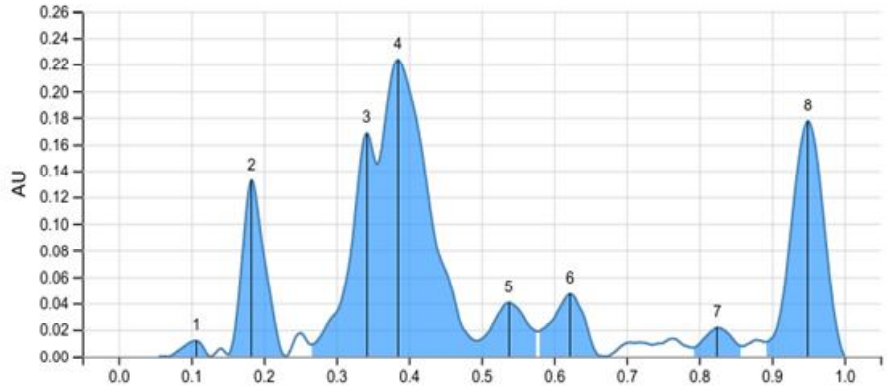

Fig. 2[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.069	0.0000	0.107	0.0117	1.43	0.126	0.0000	0.00036	0.83
2	0.150	0.0015	0.183	0.1324	16.11	0.229	0.0002	0.00468	10.89
3	0.265	0.0087	0.342	0.1683	20.48	0.356	0.1453	0.00671	15.59
4	0.356	0.1453	0.385	0.2234	27.18	0.493	0.0116	0.01657	38.52
5	0.493	0.0116	0.537	0.0404	4.92	0.576	0.0185	0.00226	5.25
6	0.578	0.0185	0.622	0.0469	5.71	0.668	0.0000	0.00240	5.57
7	0.792	0.0063	0.825	0.0216	2.63	0.858	0.0075	0.00098	2.27
8	0.892	0.0106	0.950	0.1771	21.55	1.000	0.0000	0.00907	21.08

Fig. 2[C]

Figure 3. HPTLC Chromatograph of *Haridradi Ghanavati* @254 nm and 15.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 3[A]

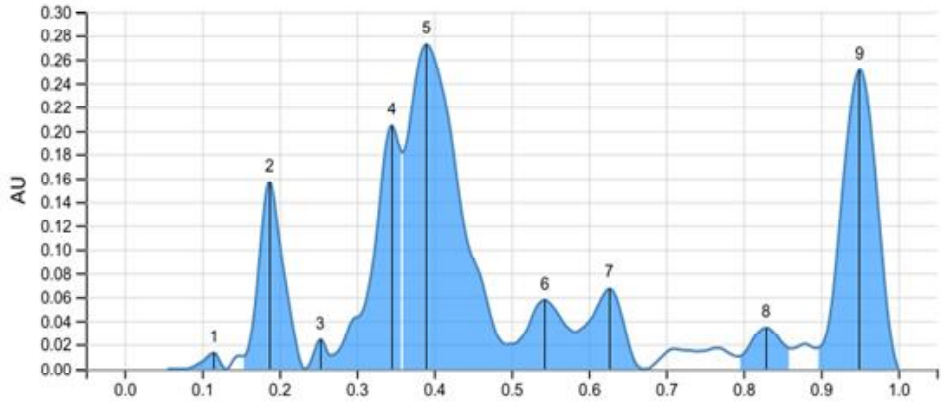

Fig. 3[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.078	0.0000	0.115	0.0128	1.19	0.131	0.0000	0.00030	0.53
2	0.153	0.0103	0.188	0.1564	14.49	0.233	0.0000	0.00568	9.94
3	0.233	0.0000	0.253	0.0238	2.20	0.267	0.0110	0.00046	0.80
4	0.267	0.0110	0.346	0.2041	18.91	0.358	0.1817	0.00837	14.65
5	0.360	0.1815	0.390	0.2726	25.26	0.493	0.0200	0.02085	36.46
6	0.493	0.0200	0.543	0.0575	5.33	0.582	0.0302	0.00343	6.01
7	0.582	0.0302	0.626	0.0670	6.20	0.671	0.0000	0.00341	5.96
8	0.793	0.0100	0.829	0.0342	3.17	0.861	0.0165	0.00161	2.82
9	0.893	0.0168	0.950	0.2509	23.25	1.000	0.0000	0.01306	22.84

Fig.3[C]

Fig. 4. HPTLC Chromatograph of *Haridradi Ghanavati* @254 nm and 20.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 4[A]

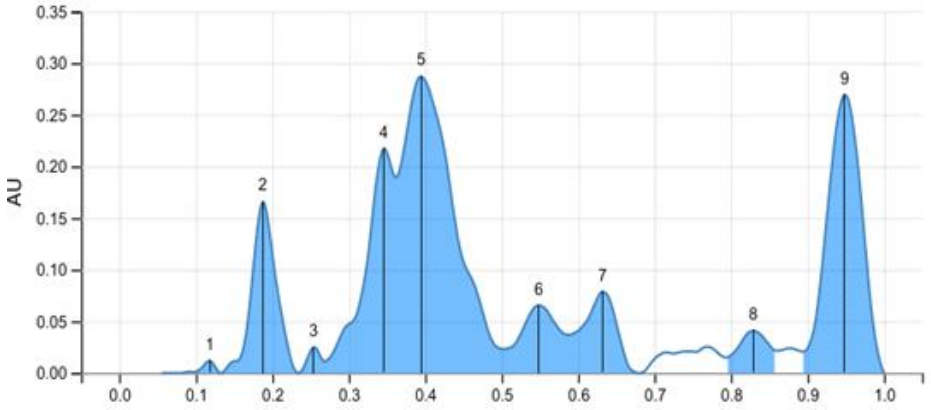

Fig. 4[B]

Peak	Start		Max			End		Area	
#	R_F	H	R_F	H	%	R_F	H	A	%
1	0.097	0.0009	0.118	0.0118	1.02	0.132	0.0000	0.00020	0.32
2	0.133	0.0000	0.188	0.1655	14.26	0.233	0.0000	0.00608	9.64
3	0.233	0.0000	0.254	0.0249	2.14	0.268	0.0113	0.00049	0.78
4	0.268	0.0113	0.346	0.2171	18.71	0.361	0.1895	0.00937	14.87
5	0.361	0.1895	0.394	0.2870	24.74	0.501	0.0231	0.02294	36.40
6	0.503	0.0231	0.549	0.0654	5.64	0.586	0.0369	0.00382	6.06
7	0.588	0.0369	0.632	0.0786	6.77	0.678	0.0000	0.00402	6.38
8	0.793	0.0148	0.829	0.0410	3.53	0.860	0.0215	0.00197	3.13
9	0.894	0.0207	0.949	0.2692	23.20	1.000	0.0000	0.01413	22.42

Fig. 4[C]

Figure 5: HPTLC Chromatograph of *Haridradi Ghanavati* @366nm and 05.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 5[A]

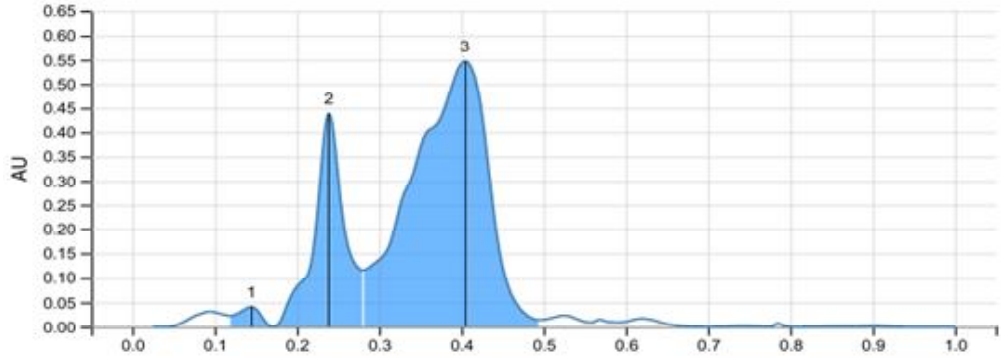

Fig. 5[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.118	0.0228	0.144	0.0408	3.98	0.171	0.0000	0.00135	1.72
2	0.172	0.0000	0.239	0.4375	42.69	0.279	0.1158	0.01838	23.54
3	0.281	0.1156	0.404	0.5465	53.33	0.494	0.0141	0.05834	74.73

Fig. 5[C]

Figure 6. HPTLC Chromatograph of *Haridradi Ghanavati* @366nm and 10.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 6[A]

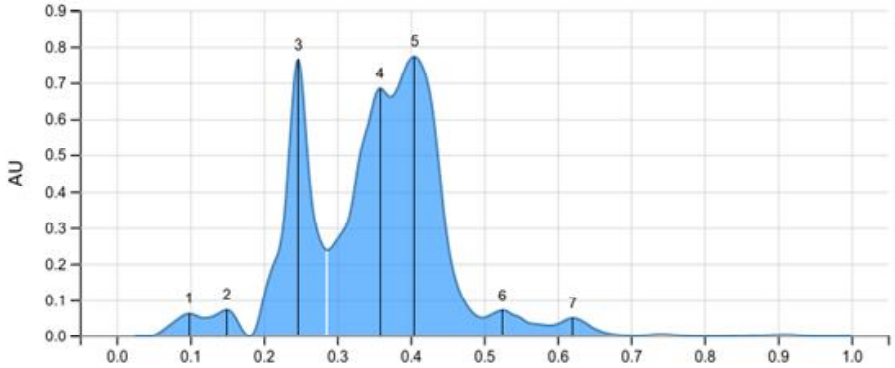

Fig. 6[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.047	0.0000	0.099	0.0620	2.50	0.119	0.0504	0.00277	1.94
2	0.119	0.0504	0.150	0.0724	2.92	0.179	0.0002	0.00296	2.07
3	0.181	0.0000	0.247	0.7637	30.84	0.286	0.2383	0.03406	23.84
4	0.287	0.2382	0.358	0.6838	27.62	0.372	0.6609	0.03973	27.82
5	0.372	0.6609	0.406	0.7727	31.21	0.497	0.0512	0.05597	39.19
6	0.497	0.0512	0.525	0.0713	2.88	0.589	0.0295	0.00462	3.23
7	0.589	0.0295	0.621	0.0502	2.03	0.706	0.0008	0.00272	1.90

Fig. 6[C]

Figure 7. HPTLC Chromatograph of *Haridradi Ghanavati* @366nm and 15.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 7[A]

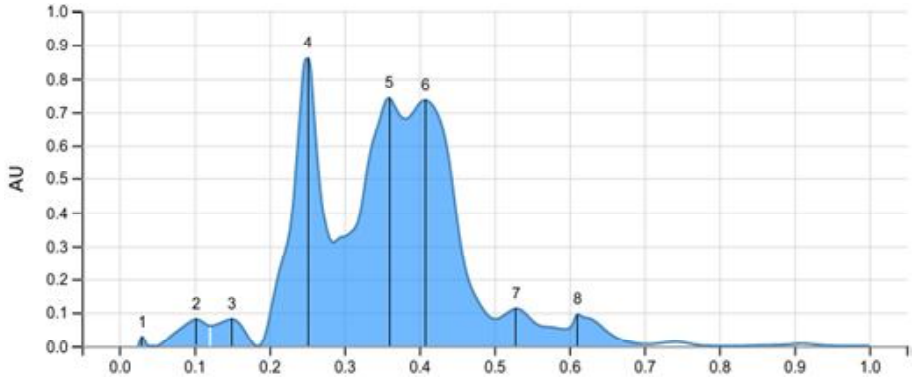

Fig. 7[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.025	0.0000	0.031	0.0273	1.00	0.039	0.0000	0.00020	0.12
2	0.050	0.0000	0.103	0.0799	2.93	0.121	0.0608	0.00350	2.15
3	0.122	0.0607	0.150	0.0800	2.93	0.183	0.0000	0.00342	2.10
4	0.185	0.0000	0.251	0.8593	31.49	0.285	0.3112	0.03923	24.10
5	0.285	0.3112	0.360	0.7417	27.18	0.381	0.6798	0.05057	31.07
6	0.382	0.6797	0.408	0.7356	26.95	0.501	0.0811	0.05359	32.93
7	0.501	0.0811	0.529	0.1113	4.08	0.593	0.0513	0.00725	4.45
8	0.593	0.0513	0.611	0.0940	3.44	0.704	0.0051	0.00500	3.07

Fig. 7[C]

Figure 8: HPTLC Chromatograph of *Haridradi Ghanavati* @366nm and 20.0 µL volume [A=Fingerprint, B= Peak height, C= R_f Value and Area percentage]

Fig. 8[A]

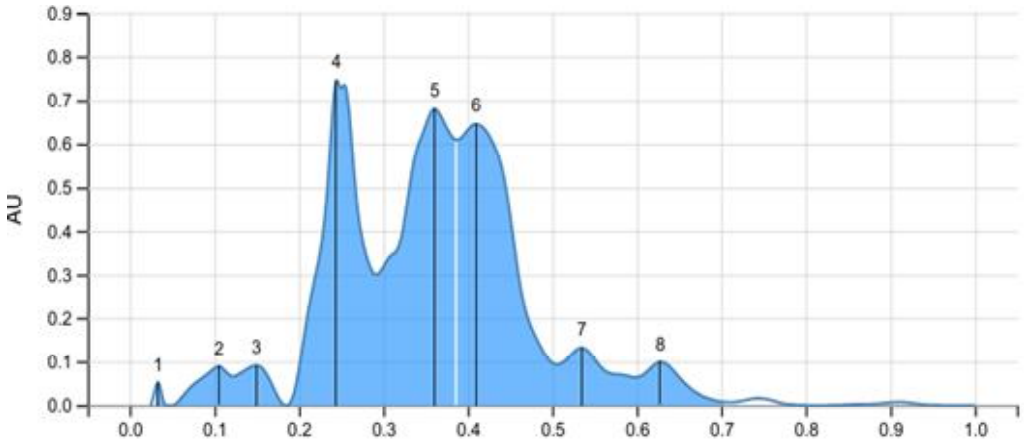

Fig. 8[B]

Peak #	Start		Max			End		Area	
	R_F	H	R_F	H	%	R_F	H	A	%
1	0.025	0.0000	0.033	0.0515	2.04	0.043	0.0000	0.00047	0.29
2	0.050	0.0000	0.106	0.0888	3.51	0.122	0.0658	0.00392	2.44
3	0.122	0.0658	0.150	0.0907	3.58	0.185	0.0000	0.00386	2.41
4	0.186	0.0000	0.244	0.7447	29.43	0.292	0.3000	0.04068	25.35
5	0.292	0.3000	0.361	0.6794	26.85	0.386	0.6089	0.04877	30.40
6	0.388	0.6087	0.410	0.6449	25.49	0.506	0.0932	0.04834	30.13
7	0.506	0.0932	0.535	0.1318	5.21	0.597	0.0637	0.00868	5.41
8	0.599	0.0637	0.628	0.0986	3.90	0.710	0.0070	0.00571	3.56

Fig. 8[C]

Interpretation

Table-3. Interpretation

R_f Value	Visualization	Probable Phytochemical / Class	Possible Source *Dravya*	Remarks
0.22–0.23	254 nm	Tannins, phenolics	*Indrayava, Daruharidra*	Tannins reported in *Holarrhena* and *Berberis* species[11,6]
0.27–0.29	366 nm	Phenolic glycosides, iridoids	*Indrayava, Prishniparni*	Phenolic glycosides of *Uraria picta* & *Holarrhena* fluoresce under long UV [11,6]
0.35	254 nm	Berberine alkaloids	*Daru Haridra*	Berberine shows R_f ~0.35 in TLC/HPTLC studies[3]
0.38–0.40	366 nm	Liquiritigenin, isoliquiritigenin	*Yashtimadhu*	Root flavonoids of *Glycyrrhiza glabra* fluoresce strongly at this R_f[13]
0.48–0.50	254 & 366 nm	Curcuminoids (curcumin, DMC, BDMC)	*Haridra*	Curcumin and derivatives consistently reported at Rf ~0.50 [5,9]
0.58–0.59	366 nm	Coumarins, alkaloids	*Daruharidra, Prishniparni*	Weak fluorescent coumarin bands reported in these herbs [11,6]
0.65–0.67	254 nm	Flavonoid glycosides	*Prishniparni*	*Uraria picta* contains flavonoid glycosides with mid-range Rf[11]
0.70–0.71	366 nm	Minor phenolics	*Prishniparni, Indrayava*	Low-intensity phenolics consistent with earlier studies [11,6]
0.85–0.86	254/366 nm	Coumarins	*Yashtimadhu*	Coumarins of *G. glabra* have Rf 0.80–0.90 [13]
1.00	254/366 nm	Turmeric oils & sesquiterpenes	*Haridra*	Non-polar fractions of turmeric migrate to Rf 1.0 end line [9]

Table-4. Pharmacological Activities Relevant to Hypothyroidism

Phytochemical/ Class	Rf Range	Pharmacological Activities Relevant to Hypothyroidism	Ref
Curcuminoids (curcumin, DMC, BDMC)	0.48–0.50	Potent anti-inflammatory (reduces thyroidal inflammation), antioxidant (protects thyroid cells from oxidative stress), improves metabolic rate, reduces insulin resistance and dyslipidemia associated with hypothyroidism, modulates immune dysfunction seen in autoimmune thyroiditis	[5][9]
Turmeric volatile oils (ar-turmerone, zingiberene)	~1.00	Anti-inflammatory effects supporting thyroid tissue recovery, neuroprotective activity reducing cognitive slowing seen in hypothyroidism, enhances digestive fire (*Agni*), improves sluggish metabolism	[9]
Berberine	~0.35	Improves insulin sensitivity, reduces elevated lipids (common in hypothyroid patients), modulates gut microbiome improving metabolism, reduces systemic inflammation, supports liver function which is essential for peripheral T4 → T3 conversion, controls weight gain and metabolic slowdown	[3]
Liquiritigenin	0.38–0.40	Adaptogenic and anti-stress effects improving hypothalamic–pituitary–thyroid (HPT) axis regulation, reduces inflammation in thyroid tissue, protects gastric mucosa (improving absorption of nutrients essential for thyroid hormones), modulates estrogen which impacts thyroid-binding globulin levels	[13]
Isoliquiritigenin	0.38–0.40	Strong antioxidant protecting thyroid follicles, phytoestrogenic effects that help regulate hormonal imbalance, anti-inflammatory actions supporting autoimmune thyroiditis management, improves microcirculation aiding thyroid perfusion	[13]
Glycyrrhizin	Broad (0.25–0.35)	Adaptogenic and adrenal-supportive (important because low cortisol impairs thyroid hormone action), enhances T4 → T3 conversion, reduces fatigue, improves mucosal protection aiding better absorption of iodine and micronutrients, anti-inflammatory in autoimmune thyroiditis	[13] [11][6]
Tannins	0.22–0.23	Antioxidant and anti-inflammatory actions reducing systemic inflammation associated with hypothyroidism, astringent action supporting gut health and digestion which influences thyroid metabolism	

Phenolic glycosides	0.27–0.29	Immunomodulatory activity reducing autoimmune damage (Hashimoto's), antioxidant support to thyroid tissue, improves cellular metabolic efficiency	[11][6]
Coumarins	0.58–0.86	Anti-inflammatory and antioxidant properties improving peripheral thyroid hormone utilization, vasodilatory effects improving oxygenation and circulation to thyroid and peripheral tissues	[13]
Iridoids	0.27–0.35	Anti-inflammatory and immunomodulatory actions beneficial in autoimmune thyroid disorders, hepatoprotective properties supporting T4-to-T3 conversion, improves digestion and metabolism aiding weight management in hypothyroidism	[6]

Interpretation Under 254 nm

Prominent peaks at Rf 0.48–0.50 with high area % (36–44%) correspond to curcuminoids, which are major constituents of *Curcuma longa* and are known to show strong UV absorption around this zone[5,9] Similarly, a strong peak around Rf 0.35 (18–19%) aligns with berberine and related alkaloids of *Berberis aristata*, consistent with earlier TLC/HPTLC studies.[3]

Peaks at Rf 1.00 represent non-polar fractions such as volatile oils and resins of turmeric.[9] Additional peaks at Rf 0.22–0.27, 0.65 and 0.86 likely represent tannins, phenolics and glycosides contributed by *Indrayava*, *Prishniparni* and *Yashtimadhu*.[6,11]

Interpretation Under 366 nm

Strong fluorescence at Rf 0.38–0.40 (31–39%) corresponds to flavonoids such as liquiritigenin and isoliquiritigenin from *Glycyrrhiza glabra*, which are known to exhibit bright blue/violet fluorescence under long UV.[13]

Very prominent fluorescent peaks at Rf 0.49–0.50 (32–74%) confirm curcuminoids, which show characteristic yellow fluorescence under 366 nm[5,9] Peaks at Rf 0.27–0.29, 0.59–0.71 signify phenolic glycosides, alkaloids and coumarins that are commonly reported in *Indrayava, Daruharidra* and *Prishniparni*.[3,6]

Quality control and Standardization of various classical formulations are necessary to ensure their authenticity, purity, strength and quality. The present study deals with standardization of *Haridradi Ghanavati* by the means of organoleptic, physio-chemical analysis and HTPLC parameters. Analysis of different formulations mentioned in *Ayurvedic* treatises is the need of the todays era.

The organoleptic characteristics of Haridradi Ghanavati pills were examined in this investigation. The final formulation's texture was discovered to be smooth. Due to certain characteristics of the substances utilized, the color was chocolate dark, the flavor was bitter, and the odor was nice and distinctive. The consistency was granulated powder and sticky. The qualitative examination showed that

phenols, saponins, and glucosides were present.

The discussion on physio-chemical analysis is as stated below :

Loss on drying: Drying samples is a sign that they don't contain too much water and don't have any microbiological overgrowth or insect infestation. The Haridradi Ghanavati sample had a 1% drying loss, indicating that it has a long shelf life and won't deteriorate in storage.

Total ash and acid-insoluble ash: They offer details on adulteration, substitution, and contamination. Low amounts of inorganic matter and silica concentration are indicated by low total and acid-insoluble ash. The Haridradi Ghanavati sample had an acid insoluble ash value of 8% and a total ash value of 14%.

Limit test for metals : *Haridradi Ghanavati* is polyherbal drug so metal was not found.

Hardness: Hardness of the tablet should be not less than 3 kg/cm.The sample of *Haridradi Ghanavati* possessed hardness at the level of 3 kg /cm2 and the values were in required range.

Dissolution and disintegration times: It was claimed that this sample took 36 minutes to dissolve. The tablet's disintegration time is a crucial criterion for evaluating its quality since it offers crucial hints on the bioavailability of the ingredients used in its formulation. It becomes crucial to use comparable criteria to evaluate the formulation quality in subsequent studies on the same trial medication.It was reported that this sample took 22 minutes to dissolve.

The presence of several phytoconstituents in different amounts was revealed by HPTLC of the methanolic extract of *Haridradi Ghanavati*.The consistently high area % values at Rf 0.48–0.50 at both 254 nm and 366 nm visualizations show that curcuminoids dominate the phytochemical profile of *Haridradi Ghanavati* HPTLC fingerprint. These peaks, which reach up to 44% at 254 nm and an intense 74% at 366 nm, verify that curcumin and its derivatives are present in high concentration and that *Haridra* is the main ingredient in the formulation.The second significant component is *Daruharidra*, which is represented by the moderate-to-high area% peak at Rf ~0.35 (18–19%), which corresponds to alkaloids of the berberine type and shows successful extraction of its antibacterial properties. Liquiritigenin and isoliquiritigenin are responsible for *Yashtimadhu* high representation by conspicuous fluorescent peaks at Rf 0.38–0.40 (24–39%), showing the presence of substantial flavonoids responsible for *Rasayana,* demulcent, and anti-inflammatory effects. While minor peaks at Rf 0.22–0.23, 0.58–0.59, 0.65, 0.70–0.71, and 0.86 indicate the presence of tannins, coumarins, flavonoid glycosides, and other supporting phytochemicals, moderate peaks at Rf 0.27–0.29 (24–28%) indicate contributions from phenolic glycosides and iridoids of *Indrayava* and *Prishniparn*i. The presence of sesquiterpenes and turmeric volatile oils is further shown by the high area% at Rf 1.00 (16–22%), indicating sufficient *Haridra* oleoresin fraction extraction.The polyherbal preparation's authenticity and quality are confirmed by the area% distribution, which shows a chemically rich and balanced

formulation with *Haridra* as the predominant component. *Daruharidra* and *Yashtimadhu* also make significant contributions, while *Indrayava* and *Prishniparni* provide moderate support.

Thus, the HPTLC fingerprint shows that each component of *Haridradi Ghanavati* has distinctive phytochemical indicators. While berberine-rich bands authenticate *Daruharidra,* the strong curcuminoid peaks verify the purity of *Haridra* extract. *Yashtimadhu* is confirmed by strong flavonoid fluorescence, and *Indrayava* and *Prishniparni* contribute to the modest phenolic/tannin-related bands.

HPTLC provides a reliable tool for the standardisation and quality assurance of *Haridradi Ghanavati*. The comprehensive phytochemical profile confirms formulation authenticity and supports its potential role in managing hypothyroidism.

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