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PHARMACOGNOSTICAL, ANALYTICAL STUDY AND HPTLC EVALUATION OF *SHAMPAKADI KWATHA,* A POLYHERBAL FORMULATION FOR PHARMACEUTICAL STANDARDIZATION

Rajdip Rao*[1], Anup Thakar[2], Harisha CR[3], V.J.Shukla[4]
[1]Ph.D. Scholar, Department of Panchakarma, [2]Director, Dept. of Panchakarma, [3]Head, Department of Pharmacognosy, [4]Head, Department of Pharmaceutics,
IPGT & RA, GAU, Jamnagar

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Address for Correspondence: Rajdip Rao
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ABSTRACT:
Background: *Shampakadi kwatha* is mentioned in Ayurvedic classics as a therapeutic formulation of *Basti* to treat Musculo-skeletal diseases like *Katishool* (Lumbar spondylosis). Back pain is the most common ailment in today's busy life. Majority of us have experienced one or more episodes of back pain in our lives and many of us live with chronic symptoms. Incidences of low back pain affects 60-85% in adults and lumbar Spondylosis is responsible for about 10% of all back pain. *Shampakadi kwatha* contains *Aragvadha (Cassia fistula* Linn.), *Eranda* (*Ricinus communis.*Linn)*, Punarnava (Boerhavi diffusa* Linn) etc. which have *Shoolaghna and Vatahara* property.
Method: *Shampakadi kwatha* powder was evaluated for their pharmacognostic and pharmaceutical analysis.
Results: Microscopic characters were found of all the contents of *Shampakadi kwatha*. Results obtained in pharmaceutical parameters of *Shampakadi kwatha* powder like loss on drying 12.18%, Ash value 9.06%, Alcohol soluble extract 62.15% w/v etc. HPTLC profile of *Shampakadi kwatha* powder showed similarities in number of spots.
Conclusion: From the study, data developed can be espoused for laying down the standards for *Shampakadi kwatha*.
Keywords: HPTLC**,** Pharmacognostical, Pharmaceutical analysis, *Shampakadi Kwatha*

INTRODUCTION

Shampakadi kwatha, comprising of *Aragvadha*, *Eranda, Punarnava*, *Ashwagandha, Shati, Shalparni, Prishniparni, Vrihati, Kantakari, Gokshura, Bala, Rasna, Guduchi, Devdaru and Madanphala* was first explained in Sushruta for curing of Musculo-skeletal diseases like *Katishool (*Lumbar sponylosis)[1]. Maintaining the quality standard of a poly herbal formulation is a challenging task. Available data concerning scientific evaluation of *Shampakadi kwatha* is none. Quality control for safety and efficacy of herbal products is of paramount importance [2, 3]. With the help of identity, purity, content, and other chemical, physical, or biological properties, or by the manufacturing processes quality can be defined as the status of a drug. The analytical techniques have always been cited to understand the quality of the outcome in Ayurveda. It describes different qualitative parameters to critic genuine plant identification, preparations and having scientific evidence, they are not competent to provide quantitative information. By using the modern techniques, qualitative and quantitative analysis of drugs and instruments of the science is of absolute importance in order to rationalize their acceptability in modern system of medicine.

Different chromatographic analysis is routinely used and plays an important role in the quality control of complex herbal medicines. High performance thin layer chromatography (HPTLC) can provide an electronic image of the chromatographic fingerprint and a Densitogram to detect the presence of marker compounds in a plant sample. The advantage of HPTLC in the analytical testing of herbal products is that it provides positive identification as well as visualization of the separated fractions of the sample component and helps in quantitative, qualitative analysis with the same system.

Dried fruit, Fruit pulp, Roots, Stem, seeds and whole plants were used of these herbs have high

medicinal value. *Shampakadi kwatha* is used as drug of choice for Basti in Katishool (Lumbar Spondylosis). So, current study is anticipated to evaluate *Shampakadi kwatha* powder through pharmacognostic, physico-chemical and HPTLC analysis.

AIM:

To authenticate the *Shampakadi kwatha* as per pharmacopeial (Ayurvedic Formulatory of India and Ayurvedic Pharmacopeia of India) method. To evaluate the quality of drug.

MATERIALS AND METHODS:

Collection and preparation of the drug

Fruits of *Madanphala*, Stem of *Guduchi* and *Devdaru,* seeds of *Gokshura, Root of Eranda, Punarnava* and whole plant of *Shalparni, Prishniparni, Vrihati and Kantakari* were collected from the pharmacy of IPGT & RA, Jamnagar. The obtained drugs were shade dried, equally amount had taken and made in to a coarse powder with help of mechanical grinder. Ingredients of *Shampakadi kwatha* are summarized at **[Table 1].**

Table 1: Ingredients of *Shampakadi Kwatha*

No.	Sanskrit Name	Botanical Name	Part used	Dosage
1	*Aragvadha*	*Cassia fistula* Linn.	Fruit pulp	1 Part
2	*Eranda*	*Ricinus communis.*Linn	Root	1 Part
3	*Punarnava*	*Boerhavi diffusa* Linn	Root	1 Part
4	*Ashwagandha*	*Withnia somnifera* D.C	Root	1 Part
5	*Shati*	*Hedychium spicatum*	Root	1 Part
6	*Shalparni*	D*esmodium gangeticum* D.C	Whole plant	1 Part
7	*Prishniparni*	*Uraria picta* Disce.	Whole plant	1 Part
8	*Vrihati*	*Solanum indicum* Linn	Whole plant	1 Part
9	*Kantakari*	*Solanum surratens* Burn	Whole plant	1 Part
10	*Gokshura*	*Tribulus terrestris* Linn	seed	1 Part
11	*Bala*	*Sida cordifolia* Linn.	Whole plant	1 Part
12	*Rasna*	*Pluche lanceolata* C.B Clarke	Root	1 Part
13	*Guduchi*	*Tinospora cordifolia* Willd	Stem	1 Part
14	*Devdaru*	*Cedrus deodara* Roxb	Stem	1 Part
15	*Madanaphala*	*Randia spinosa*	Fruit	1 Part

Organoleptic Evaluation

Various parameters of the material such as colour, odour, touch and taste of the *Kwatha* powder were observed and recorded. [4] **[Table 2].**

Table 2: Organoleptic characters of *Shampakadi Kwatha*

No.	Organoleptic Characters	Results
1	Colour	Brownish muddy
2	Odour	Aromatic
3	Taste	Bitter
4	Touch	Rough
5	Appearance	Powder

Microscopic Evaluation

Microscopic examination of material powder was carried out with and without staining, by powder microscopy to determine the chemical nature and microphotographs were taken using Carl Zeiss binocular microscope [5].

Physico-chemical Analysis

Physico-chemical analyses were carried out by following the parameters. Physico‑chemical analysis like loss on drying at 110°C[6], pH value[7], ash value[8], water soluble extractive[9], methanol soluble extractive[10] were recorded.

Preliminary Phytochemical Investigation

Preliminary phytochemical investigations are carried out by following standard procedure of API [11].

High Performance Thin Layer Chromatography

HPTLC was performed as per the guidelines provided by API [12]. A CAMAG (Switzerland) HPTLC system equipped with a sample applicator Linomat V was used for application of samples. Methanol extract of kwatha powder was used for spotting. Toluene: Ethyl acetate: Acetic acid (7:2:1 v/v) was selected as solvent system. CAMAG TLC Scanner 3, Reprostar and Wincats 1.3.4 were used for scanning the plates. CAMAG twin trough glass chamber was used for developing the plates. The developed plate was visualized under visible day light, short UV (254 nm), long UV (366 nm) and after spraying with vanillin-sulphuric acid reagent and again observed in daylight. The Reference values were recorded.

Instrumental Conditions

Application mode: Camag Linomat V, development chamber: Camag twin trough chamber, plate: Pre coated Silica Gel GF 254 plate, chamber saturation: 30 min, development time: 30 min, development distance: 10 cm, scanner: Camag scanner III**,** detection: Deuterium lamp and mercury lamp, data System: Win CATS software.

OBSERVATIONS AND RESULTS:

Pharmacognostic Study

Microscopic powder characters of contents were found which are depicted in **[Table 3] [Fig 1].**

Table 3: Microscopic characters of *Shampakadi Kwatha*

No.	Drug	Microscopic character found
1	*Aragvadha*	Prismatic crystals
2	*Eranda*	Oil globule
3	*Punarnava*	Raphides of Punarnava
4	*Ashwagandha*	Wax crystals and rosette crystals
5	*Shati*	Multicellular
6	*Shalparni*	Prismatic crystals
7	*Prishniparni*	Prismatic Crystals and Cork cells
8	*Vrihati*	Parenchymetous cells
9	*Kantakari*	Fragment of stellate trichome
10	*Gokshura*	Warty trichome
11	*Bala*	Group of fibre, Lignified fibre
12	*Rasna*	Acicular crystal
13	*Guduchi*	Border pitted vessels
14	*Devdaru*	Lignified fibre
15	*Madanaphala*	Brain shaped epicarp cell , Brown content, Epicarp cell

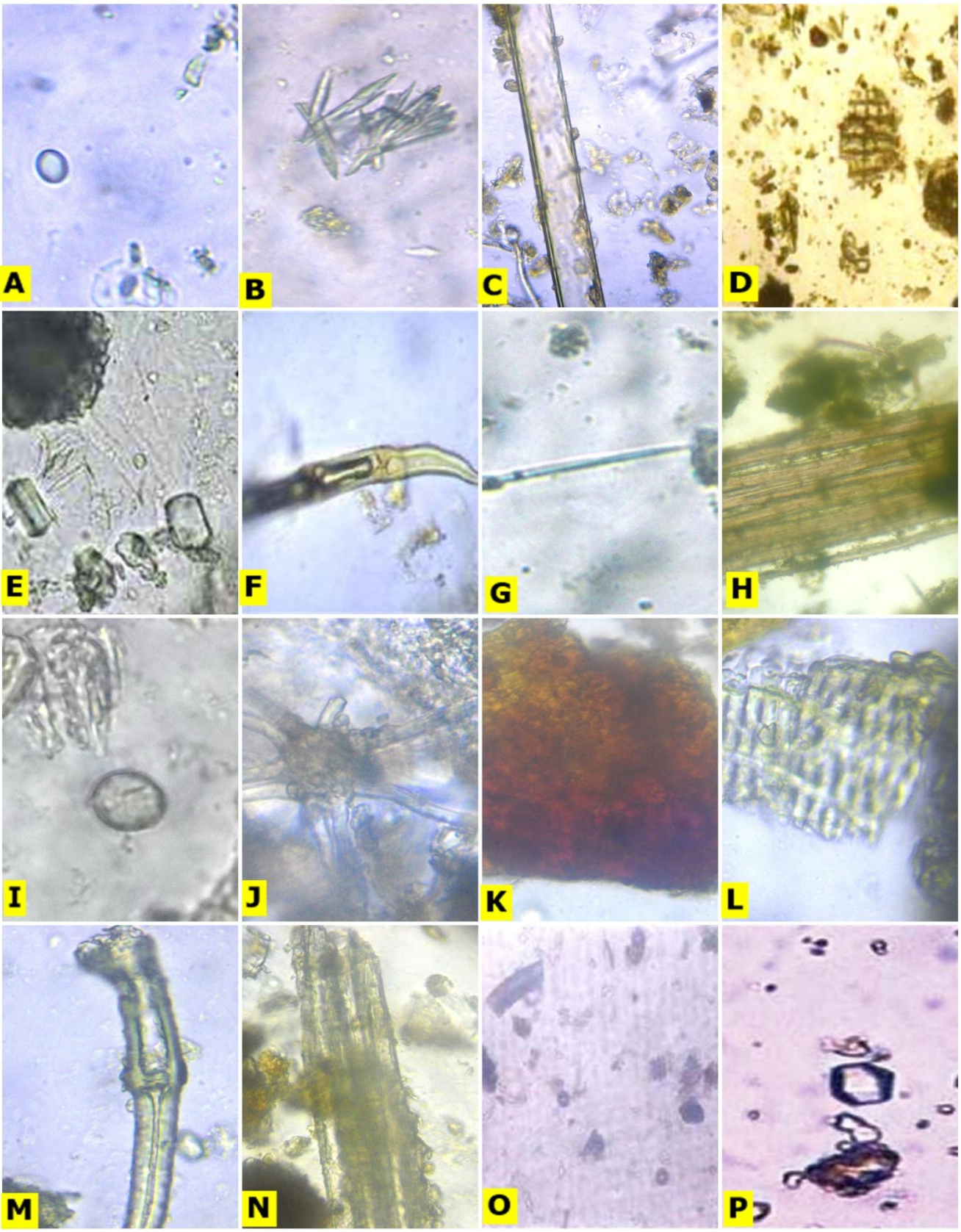


Figure 1: Microscopic characters of *Shampakadi Kwatha*

(A) Oil globule of Eranda, (B) Raphides of Punarnava, (C) Fragment of fibre with broad lumen of Aragvadha, (D) Prismatic Crystals and Cork cell of Prishniparni, (E) wax crystals and rosette crystal of Ashwagandha, (F) Multicellular picture of Shati, (G) Acicular crystal of Rasna, (H) Lignified fibre of Devdaru, (I) Starch grain with hilum of Guduchi, (J) Fragment of stellate trichome of Kantkari and Brihati, (K) Brain shaped epicarp cell of Madanphala, (L) Border pitted vessels of Guduchi, (M) Warty trichome of Gokshura, (N) Group of fibre of Bala, (O) Pitted and annular vessels of Shalparni, (P) Prismatic crystal of Shalparni.

Analytical Study

Results of the analytical study of *Shampakadi Kwatha* powder are as follows.

Physico-chemical Constants

The results are depicted in **[Table 4]**

Table 4: Physico-chemical Constants of *Shampakadi Kwatha*

NO.	Parameters	Result
1	**Loss on drying**	12.18% w/w
2	**Ash Value**	9.06 %
3	**Water Soluble Extract**	46.8% w/w
4	**Alcohol Soluble Extract**	62.15 % w/w
5	**pH**	7

High Performance Thin Layer Chromatography (HPTLC)

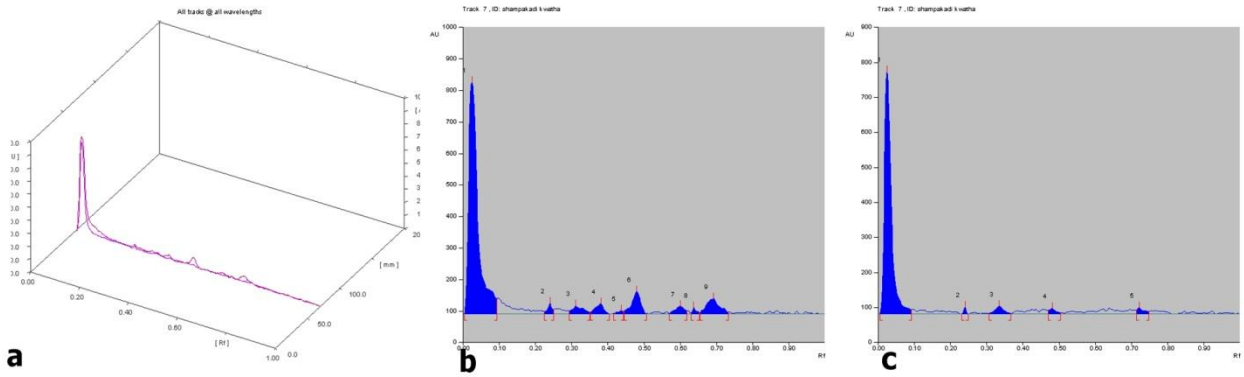
In HPTLC, in short UV-254 nm, maximum 8 spots were observed in *Dhatryadi kwatha*. Similarly in long UV-366nm, maximum 8 spots were observed also **[Table 5] [Fig 2].**

Table 5: Chromatographic results of *Shampakadi Kwatha*

Conditions	Rf values
Short ultra violet (254 nm)	0.00,0.22, 0.29, 0.35, 0.42, 0.44, 0.57, 0.63, 0.65 (9 spots)
Long ultra violet (366 nm)	0.00, 0.23, 0.31, 0.47, 0.71 (5 spots)

Nature of adsorbed components, if with different polarity, formerly total number of components and respective Reference values also differs. In short, nature of different matrix modulates both the studied parameters.

Figure 2: HPTLC evaluation of *Shampakadi Kwatha*



(a) 3D Graph: 254nm & 366nm of *Shampakadi kwatha,* (b) Chromatographic results (Peak display) of *Shampakadi kwatha* at Short ultra violet (254 nm), (c) Chromatographic results (Peak display)of *Shampakadi kwatha* Long ultra violet (366 nm)

DISCUSSION AND CONCLUSION:

Results obtained in physicochemical parameters of *Shampakadi Kwatha* are within limit. HPTLC profile of *Shampakadi kwatha* showed different spots in number. This profile can be used for the identification of the medicinally important formulation of *Shampakadi kwatha*. Present work can be considered as the first step towards identifying the followed methods through HPTLC analysis. This is a preliminary analysis and meticulous nature along with the depiction is to be carried‑out.

REFERENCES:

1. Shastri A, editor, Sushruta, Chikitsasthana, Chapter 38, Verse 41-43, Reprint Edition 2013, Varanasi: Chaukhmbha Sanskrit Sansthana
2. Tripathi YB, Singh VP, Sharma GM, Sinha RK, Singh D. X Ray diffraction and microscopic analysis of Tamra Bhasma: An Ayurvedic metallic preparation. Indian Journal of Traditional Knowledge 2003; 2(2): 107-117.
3. Shailajan S, Menon S, Singh A. Quantitative analysis of piperine from ayurvedic polyherbal formulations using reverse phase high performance liquid chromatography. Int J Pharma Bio sci 2009;1:1-10.
4. A. Siddiqui, M. A. Hakim, Format for the pharmacopoeial analytical standards of compound formulation, wokshop on standardization of unani drugs, (appendix), Central council for research in unani medicine, New Delhi, 1995
5. Dr. P.K.Mukherjee, Quality control of herbal drugs, 2nd Reprint ed., New Delhi: Buisness Horizons; 2007, p-164-165.
6. Anonymous. Indian Pharmacopeia, Vol. II, Appendix 8 (8.6). New Delhi: Govt. of India, Ministry of Health and Family Welfare, The Controller of Publication; 1996. pp. A-89.
7. Anonymous. Indian Pharmacopeia.Vol. II, Appendix 8 (8.11). New Delhi:Govt. of India, Ministry of Health and Family Welfare, The Controller of Publication; 1996. pp. A-95.
8. Anonymous. The Ayurvedic Pharmacopoeia of India., Vol. VI, Part 1,Appendix-2 (2.2.3). 1st ed. New Delhi: Govt. of India, Ministry of Healthand Family Welfare; 2008. pp. 242.
9. Anonymous. The Ayurvedic Pharmacopoeia of India, Vol. VI, Part 1, Appendix-2 (2.2.8). 1st ed. New Delhi: Govt. of India: Ministry of Healthand Family Welfare; 2008. pp. 243.
10. Anonymous. The Ayurvedic Pharmacopoeia of India, Vol. VI, Part 1. Appendix-2 (2.2.7).1st ed. New Delhi: Govt. of India: Ministry of Health and Family Welfare; 2008. pp. 243.
11. Shukla VJ, Bhatt UB. Methods of Qualitative Testing of some Ayurvedic Formulations. Gujarat Ayurvedic University, Jamnagar, June 2001.
12. Anonymous. Ayurvedic Pharmacopoeia of India, Part-2, Vol-2, Appendices. 1st ed. New Delhi: Govt. of India, Ministry of Health of Family Welfare; 2008. p. 165-167.