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PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF KOLAKULATHTHAADI CHOORNA-AN AYURVEDIC FORMULATION

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ABSTRACT

Background: *Kolakulaththaadi Choorna* is mentioned in Ayurvedic classics as a therapeutic formulation to treat *Vata* disorders. It contains 10 ingredients. All the ingredients have *Vata* and *Kapha* pacifying properties. **Materials and Methods:** Powders of all ingredients were evaluated for their pharmacognostical study and finished product which is *Kolakulaththaadi Choorna* was evaluated for pharmaceutical analysis. **Results:** Some typical microscopic characters were found of *Kola, Kulaththa, Yava, Devadaru* etc. Results obtained in pharmaceutical parameters of *Kolakulaththaadi Choorna* like loss on drying 10.11 w/w %, Water solubility 18.2%, Alcohol solubility 17.7%, Acid insoluble Ash 1.95%, Ash value 4.56%, pH 6.5 etc. are within limit mentioned by Ayurvedic Pharmacopoeia of India. High performance thin layer chromatography profile of *Kolakulaththaadi Choorna* showed similarities in number of spots. **Conclusion:** From the study, data developed can be espoused for laying down the standards for *Kolakulaththaadi Choorna.*

KEYWORDS: HPTLC, Kolakulaththaadi Choorna, Pharmacognosy, Pharmaceutics.

INTRODUCTION

In Ayurveda, *Avabahuka* is considered as *Vatavyadhi.*[1] There is restricted movement of shoulder joint, stiffness and muscle wasting in affected shoulder joint. These symptoms are

similar to frozen shoulder. Thus, we can correlate this disease with Frozen shoulder in modern science. By getting localised in the region of the shoulder, *Vata* causes wasting of local musculature, ligaments, constricts the *Siras*(veins) present there and produces *Avabahuka.*[2] *Vagbhatta* has stated similar symptoms along with loss of sensation in arms.[3] Worldwide prevalence of *Avabahuka* is 2 to 5% and it affects at peak age 50s.[4] *Kolakulaththaadi Choorna* is mentioned in *Vatavyadhi* treatment.[5] It removes *Avarana* of local area by rubbing it in the opposite direction of the skin.

Kolakulaththaadi Choorna contains *Kola, Kulaththa, Masha, Atasi, Yava, Devadaru, Vacha, Rasna, Kustha, Taila Phala(Erandbija).* Most of the drugs are having *Vata-Kapha* pacifying property. Till the date pharmacognostical work has not been done. Thus, to maintain the therapeutic activity of the drug standardization is very much necessary for clinical trial. During the last eras, herbal medicines pointed out in *Ayurveda* are getting gratitude globally. In view of severe undesirable side effects of drug, there is growing focus to follow systematic research methodology and to provide scientific basis for the traditional herbal medicines. 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.

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. With this information the present study was done to establish the authenticity of all the ingredients of *Kolakulaththaadi Choorna*. Till date no any standard quality parameters had been tested. In this study, identification of ingredients macroscopically and microscopically, priliminary analysis of physic-chemical parameters including developing the HPTLC(High Performance Thin Layer Chromatography) profile of *Kolakulaththaadi Choorna* was done.

MATERIALS AND METHOD

Collection of Raw Drug

All the raw drugs of *Kolakulaththaadi Choorna* were collected from Pharmacy, Gujarat Ayurveda University (GAU), Jamnagar, India and all these drugs were identified and

authenticated in Pharmacognosy Laboratory, Institute for Postgraduate Teaching and Research in Ayurveda (IPGT & RA), GAU, Jamnagar, India. [Table No. 1].

Preparation of *Kolakulaththaadi Choorna*

Kolakulaththaadi Choorna was prepared in Pharmacy of IPGT & RA, GAU, Jamnagar, India. All identified drugs were washed and dried properly. Then coarse powder was made of each drug and mixed together.

Microscopical evaluation of powdered raw drugs of *Kolakulaththaadi Choorna*

In this study the powder of above mentioned drugs were mixed together and studied with and without staining. The micro pictures were taken under Carl zeis Trinocular microscope attached with camera.[5] [Plate 1].

Organoleptic study of prepared drug

Organoleptic studies of prepared *Kolakulaththaadi Choorna* are endangered for various sensory characteristics like odour, colour etc. were carefully distinguished down. [Table No. 2].

Physico-chemical analysis

Physico-chemical analysis of *Kolakulaththaadi Choorna* was done by using various standard physico-chemical parameters such as Loss on drying[6], Particle consistency[7], Water solubility[8], Alcohol solubility[9], Acid insoluble Ash[10], Ash Value[11], Ph[12] at Pharmaceutical chemistry laboratory, IPGT and RA, Jamnagar, India. Physico-chemical analyses were carried out by following standard procedure mentioned in API. [Table No. 3]

HPTLC (High Performance Thin Layer Chromatography) evaluation[13]

Sample was prepared by diluting 1 gm *Kolakulaththaadi Choorna* with 2 ml Hexane and it was used for spotting. Prepared sample of *Kolakulaththaadi Choorna* was spotted on pre-coated silica gel aluminium plate as 6 mm bands by means of a CAMAG Linomat V sample applicator fitted with a 100 µL Hamilton syringe. Then alcoholic KOH was applied on same spotted area and plate was heated at 110º C on TLC plate heater for 10 minutes. Hexane: Diethyl Ether (7:3) was used for *Kolakulaththaadi Choorna* as a mobile phase. The development time was 30 minutes. After development, Densitometry scanning was performed with a CAMAG TLC scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of Win CATS software (V1.3.4 CAMAG). Then the plate was dipped

in 10% H2So4 followed by heating and then visualized in day light. The Rf values and colour of resolved spots were noted. [Table No. 4, Plate 1].

OBSERVATIONS AND RESULTS

Microscopic Characters

Powder microscopy characters of individual herbal drugs of *Kolakulaththaadi Choorna* were observed under microscope are oil globule of *Kola,* Simple starch grains of *Kulaththa,* Epidermal cells of *Masha,* Lignified epidermal cells of *Atasi,* Unicellular trichomes of *Yava,* Scalriform vessels of *Vacha,* Silica deposition of *Kusta,* Lignified parenchyma cells of *Rasna,* Lignified fibres of *Devdaru,* Lignified scleroids of *Eranda Beeja,* Scalriform vessels of *Shunti,* Starch grains of *Shunti,* Fibresw of *Rasna,* Starch grains of *Masha* and microphotographs are placed at respective plate.[Plate 2].

Table No. 1: Ingredients of *Kolakulaththaadi Choorna.*

Sr No.	Drug name	Botanical Name	Part used	Quantity
1	*Kola*	*Zizyphus sativa* Gaertn.	Friuts	1 part
2	*Kulaththa*	*Dolichous biflorus* Linn.	Seeds	1 part
3	*Masha*	*Phaseolus mungo* Linn.	Seeds	1 part
4	*Atasi*	*Linum usitatissium* Linn.	Seeds	1 part
5	*Yava*	*Hordeum vulgare* Linn.	Seeds	1 part
6	*Devadaru*	*Cedrus deodara* Roxb. Loud	Heartwood	1 part
7	*Vacha*	*Achorus calamus* Linn.	Rhizome	1 part
8	*Rasna*	*Pluchea lanceolata* Oliver& Hiern.	Roots	1 part
9	*Kustha*	*Saussurea lappa*.	Root	1 part
10	*Erandabija*	*Ricinus communis* Linn.	Seeds	1 part

Table No. 2: Organoleptic characters of *Kolakulaththaadi Choorna.*

No.	Organoleptic Characters	Results
1	Color	Light Brown
2	Taste	Bitter
3	Odor	Bitter
4	Touch	Coarse

Table No. 3: Physico-chemical findings of prepared *Kolakulaththaadi Choorna.*

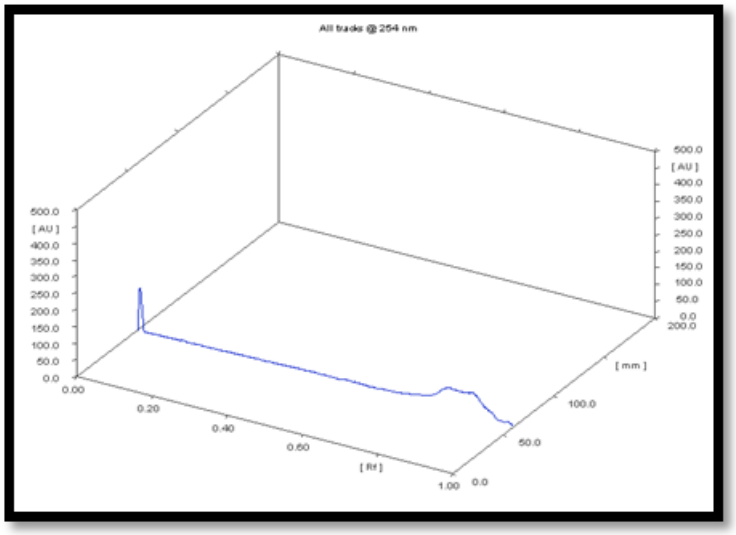
Sr. no.	Analytical Parameter	*Kolakulaththaadi Choorna*
1	Loss on drying	10.11% w/w
2	Ash value	4.56%w/w
3	Water solubility	18.2%w/w
4	Alcohol solubility	17.7%w/w
5	Acid insoluble Ash	1.95%w/w
6	pH	6.5
7	Mesh	5.7

	Sieve No -60	
	Sieve No -85	1.7
	Sieve No – 120	1.5
	Remaining Part	0.5

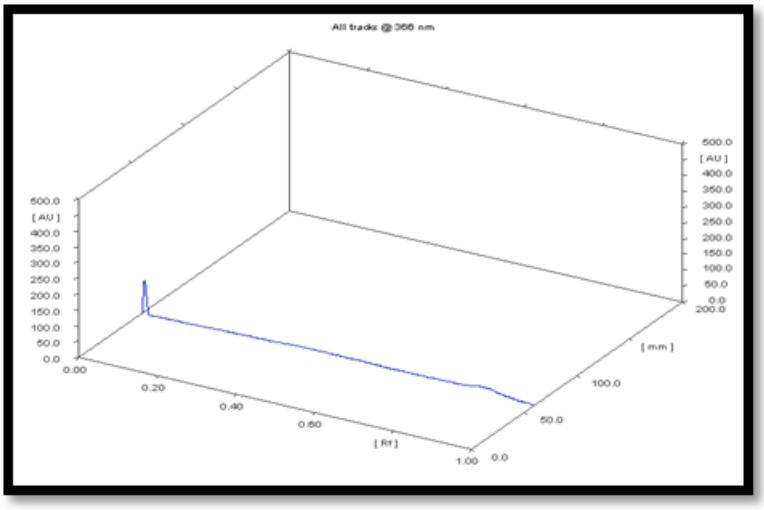
Table No. 4: Results of HPTLC of *Kolakulaththaadi Choorna.*

Visualize under short UV (254 nm)		**Visualize under short UV (366 nm)**
No. of spot separated	3	2
Rf values	0.01,0.83,0.89	0.01,0.86

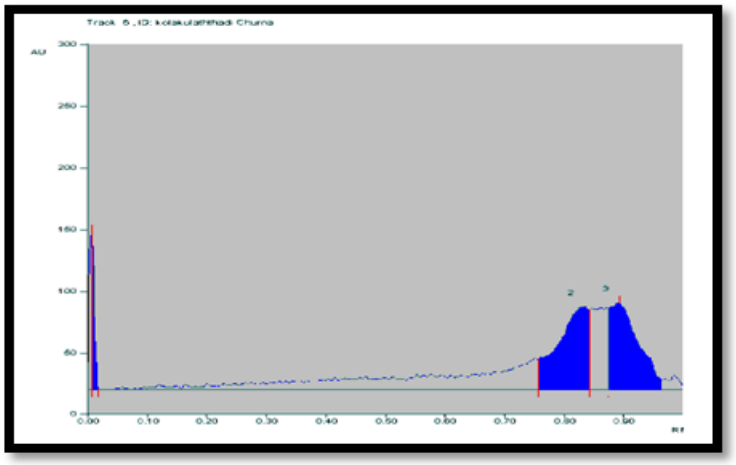
Plate 1: HPTLC evaluation of *Kolakulaththaadi Choorna.*



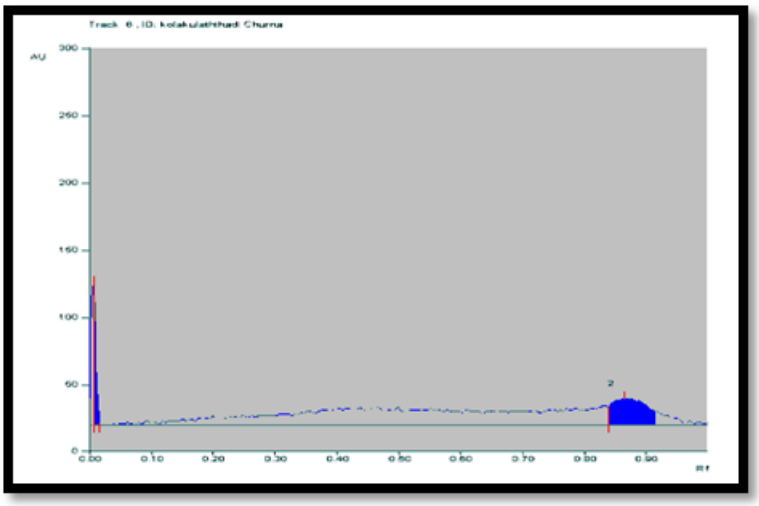
3D Graph: 254nm of *Kolakulaththaadi Choorna.*



3D Graph: 366nm *Kolakulaththaadi Choorna.*

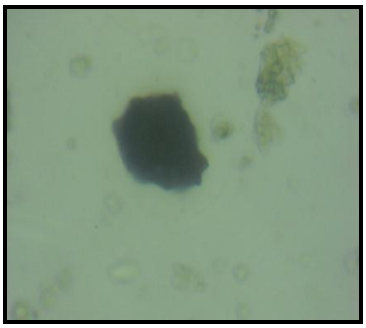
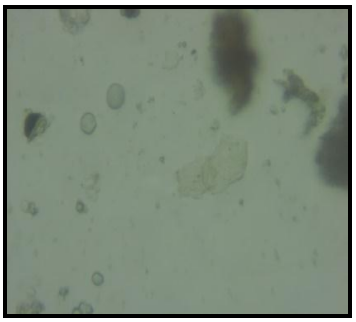


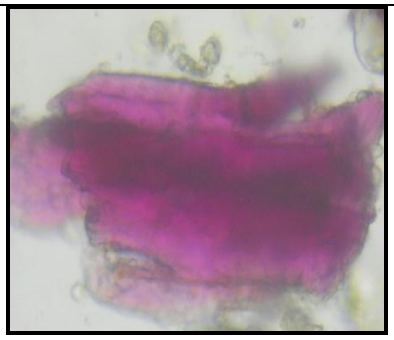
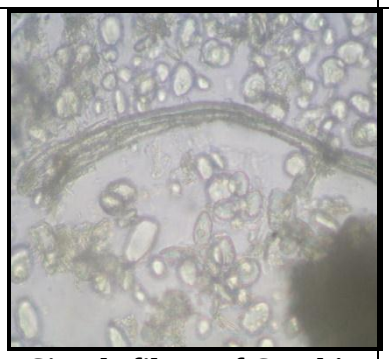
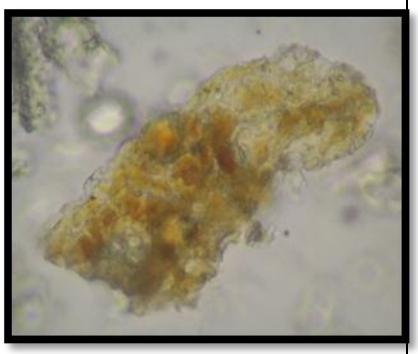
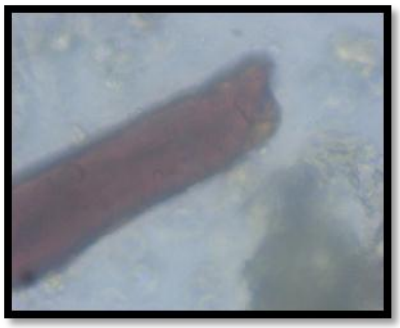
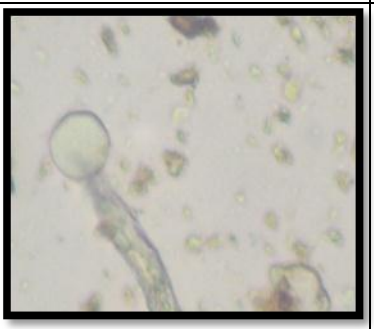
Chromatographic Results (Peak display) of *Kolakulaththaadi Choorna* short ultra violet (254 nm).



Chromatographic Results (Peak display) of *Kolakulaththaadi Choorna* short ultra violet (366nm).

Plate 2: Microscopic characters of *Kolakulaththaadi Choorna* raw drugs.

 **Tannin content of *Kustha***	 **Unicellular trichoms of *Yava***	 **Starch grains of *Vacha***

 **Lignified scleroids of *Erandabeeja***	 **Oil globule of *Kola***	 **Fibers of *Kulaththa***
 **Stone cell of *Rasna***	 **Simple fibers of *Sunthi***	 **Starch grains of *Shunti***
 **Epicarp cells of *Atasi***	 **Lignified fibres of *Devdaru***	 **Fibres of *Rasna***
 **Olioresine of *Vacha***	 **Oil globule of *Eranda beeja***	 **Starch grains of *Masha***

DISCUSSION

Pharmacognosy and pharmaceutical evaluation of *Kolakulaththadi Choorna* was performed. It is effective in rubbing on skin for increase local blood circulation, by this it helps to remove *Avarana* in local area and reduce inflammation. The Pharmacognostical study

showed that the presence of all the ingredients which are used in the preparation of the *Choorna*. In physicochemical analysis, Loss on drying, Particle consistency, Water solubility, Alcohol solubility, pH, Ash value, Acid insoluble were assessed. The quality background work for the standardization is covered in this study, additional analysis and investigations are required for the identification of the test drug to substantiate the clinical efficacy.

CONCLUSION

It is concluded that the formulation meets maximum qualitative standards based on physico-chemical parameters. The separation pattern of VG is documented with help of prechromatographic derivative method in context of R_f & densitogram. Pharmacognostical findings from this study will provide systemic evaluation and also serve as a master document to control the quality of *Kolakulaththaadi Choorna* formulation. The study results may be used as the standard reference in further research undertakings of its kind.

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