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Pharmacognostical and Pharmaceutical Evaluation of Kolakulaththaadichoorna - an Ayurvedic Formulation

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ABSTRACT
Background: KolakulaththaadiChoornais mentioned in Ayurvedic classics as a therapeutic formulation to treat Vatadisorders. It contains 10 ingredients. All the ingredients have Vataand Kaphapacifying properties. **Materials and Methods:** Powders of all ingredients were evaluated for their pharmacognostical study and finished product which is KolakulaththaadiChoornawas evaluated for pharmaceutical analysis. **Results:** Some typical microscopic characters were found of Kola, Kulaththa, Yava, Devadaruetc. Results obtained in pharmaceutical parameters of KolakulaththaadiChoornalike loss on drying 10.12 w/w %, Water solubility 18.3%, Alcohol solubility 17.7%, Acid insoluble Ash 1.94%, Ash value 4.55%, pH 6.4 etc. are within limit mentioned by Ayurvedic Pharmacopoeia of India. High performance thin layer chromatography profile of KolakulaththaadiChoornashowed similarities in number of spots. **Conclusion:** From the study, data developed can be espoused for laying down the standards for KolakulaththaadiChoorna.

KEYWORDS: HPTLC, KolakulaththaadiChoorna, Pharmacognosy, Pharmaceutics.

I. INTRODUCTION

In Ayurveda, JanuSandhigataVatais considered as Vatavyadhi.[1]Sandhigatavata is the commonest form of articular disorder which mainly occurs in Vriddhavastha(old age) due to Dhatukshaya(Depletion of body tissues), which limits everyday activities such as walking, dressing, bathing etc. thus making patient disabled/handicapped. It being a Vatavyadhi, located in Marma, Asthi and Sandhi and its occurrence in old age makes it Kashtasadhya. VataDosha plays important role in the disease. SandhiShula (jointpain) is the cardinal feature of the disease associated with Sandhishotha(jointswelling),AkunchanaPrasaranajanyaVedana(pain during flexion and extension of the joint), Stambha(stiffness), SandhiSphutana(crepitus), Sparshasahyata(tenderness), HantiSandhi(lose of movement) with VatapurnaDritisparshaShoth(sensation of air filled leather bag)[2]. It is ranked one among top few diseases branded by WHO as 'Global disease burden'. 80% of old age people have radiological evidence of O.A.[3], though 25-30% is symptomatic. Knee Osteoarthritis is the leading cause of disability in developed countries. KolakulaththaadiChoornais mentioned in Vatavyadhitreatment.[4]KolakulaththaadiChoorna contains Kola, Kulaththa, Masha, Atasi, Yava, Devadaru, Vacha, Rasna, Kustha, TailaPhala(Erandbija). Most of the drugs are having Vata-Kaphapacifying property. Till the date only one pharmacognostical work has 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

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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 KolakulaththaadiChoorna. 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 KolakulaththaadiChoornawas done.

II. MATERIALS AND METHOD

Collection of Raw Drug

All the raw drugs of KolakulaththaadiChoornawere collected from Pharmacy, Gujarat Ayurveda University (GAU), Jamnagar, India and all these drugs were identified and authenticated in Pharmacognosy Laboratory, Institute for Teaching and Research in Ayurveda (ITRA), Jamnagar, India. [Table No. 1].

Preparation of KolakulaththaadiChoorna

KolakulaththaadiChoornawas 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 KolakulaththaadiChoorna

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 zeisTrinocular microscope attached with camera. [Plate 1].

Organoleptic study of prepared drug

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

Physico-chemical analysis

Physico-chemical analysis of KolakulaththaadiChoornawas done by using various standard physico-chemical parameters such as Loss on drying[5], Particle consistency[6], Water solubility[7], Alcohol solubility[8], Acid insoluble Ash[9], Ash Value[10], Ph[11] 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[12]

Sample was prepared by diluting 1 gmKolakulaththaadiChoornawith 2 ml Hexane and it was used for spotting. Prepared sample of KolakulaththaadiChoornawas 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 KolakulaththaadiChoornaas 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 dippedin 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 KolakulaththaadiChoornawere 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 ErandaBeeja, 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 KolakulaththaadiChoorna

Sr No.	Drug name	Botanical Name	Part used	Quantity
1	Kola	ZizyphussativaGaertn.	Friuts	1 part
2	Kulaththa	DolichousbiflorusLinn.	Seeds	1 part
3	Masha	PhaseolusmungoLinn.	Seeds	1 part
4	Atasi	LinumusitatissiumLinn.	Seeds	1 part

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5	Yava	HordeumvulgareLinn.	Seeds	1 part
6	Devadaru	CedrusdeodaraRoxb. Loud	Heartwood	1 part
7	Vacha	AchoruscalamusLinn.	Rhizome	1 part
8	Rasna	PluchealanceolataOliver&Hiern.	Roots	1 part
9	Kustha	Saussurealappa.	Root	1 part
10	Erandabija	RicinuscommunisLinn.	Seeds	1 part

Table No. 2: Organoleptic characters of KolakulaththaadiChoorna

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

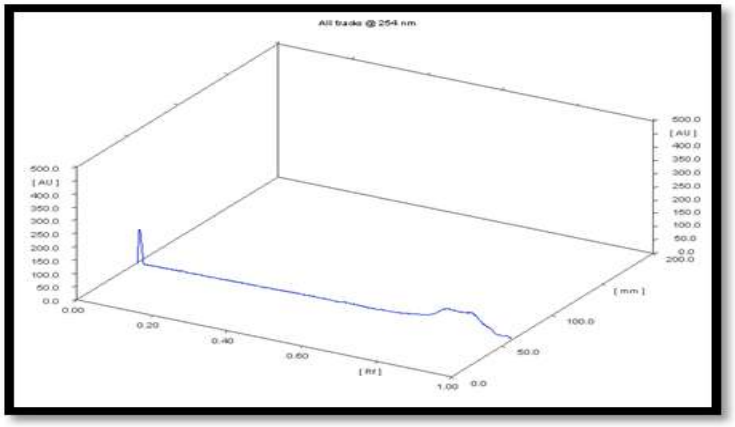
Table No. 3: Physico-chemical findings of prepared KolakulaththaadiChoorna

Sr. no.	Analytical Parameter	KolakulaththaadiChoorna
1	Loss on drying	10.12% w/w
2	Ash value	4.55%w/w
3	Water solubility	18.3%w/w
4	Alcohol solubility	17.7%w/w
5	Acid insoluble Ash	1.94%w/w
6	pH	6.4
7	Mesh	
	Sieve No -60	5.7
	Sieve No -85	1.7
	Sieve No – 120	1.5
	Remaining Part	0.5

Table No. 4: Results of HPTLC of ofKolakulaththaadiChoorna

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

Plate 1: HPTLC evaluation of KolakulaththaadiChoorna



3D Graph: 254nm of KolakulaththaadiChoorna

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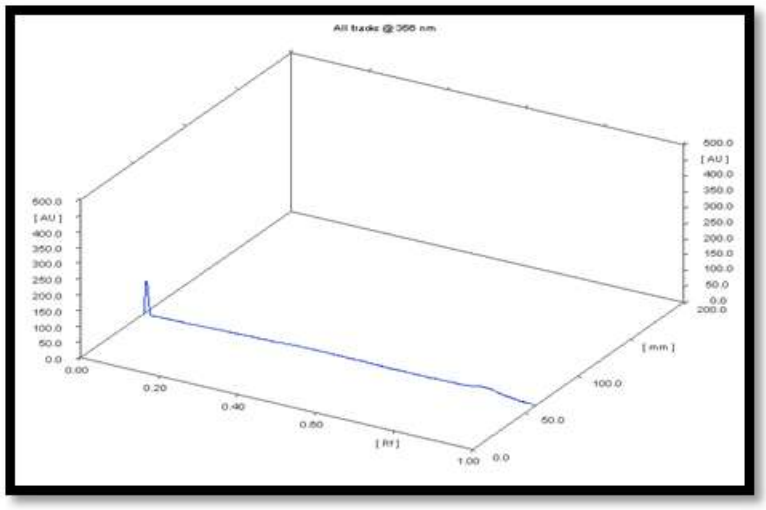
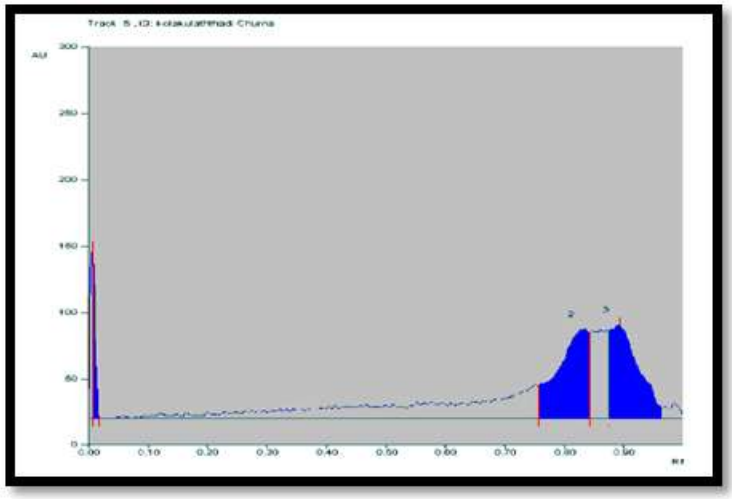


3D Graph: 366nm KolakulaththaadiChoorna



Chromatographic Results (Peak display) of KolakulaththaadiChoornashort ultra violet (254 nm)

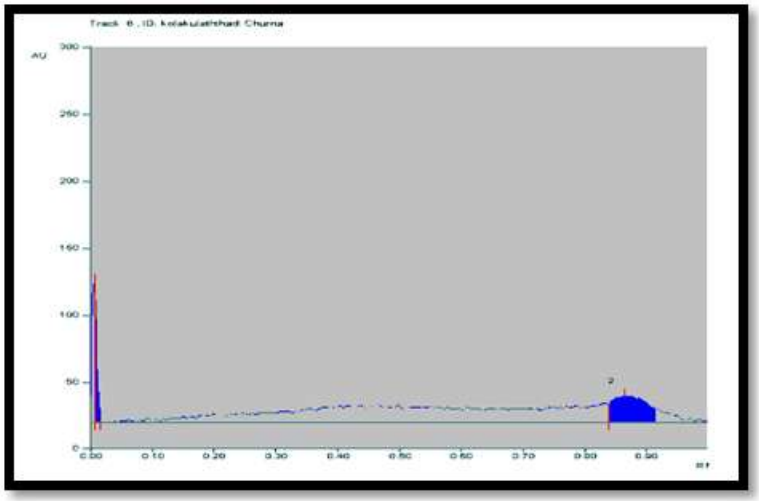


Plate 2: Microscopic characters of KolakulaththaadiChoornaraw drugs

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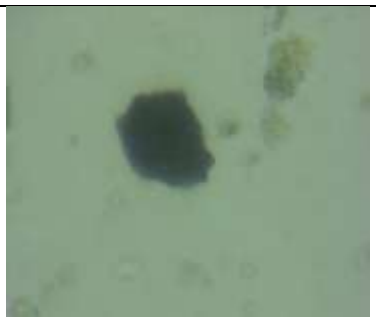
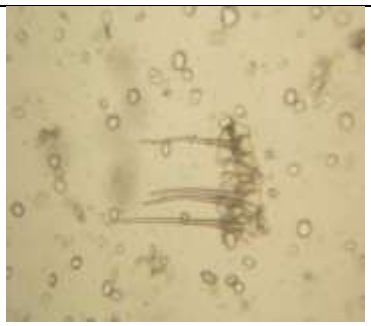
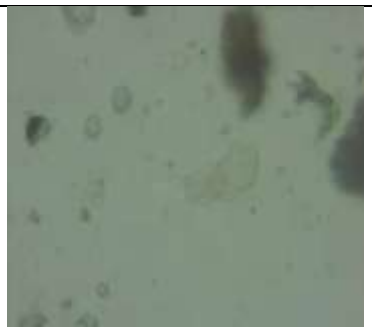
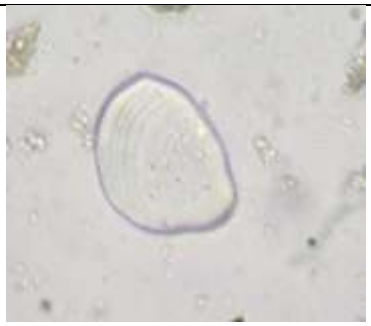
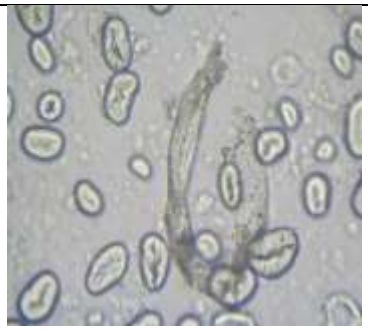
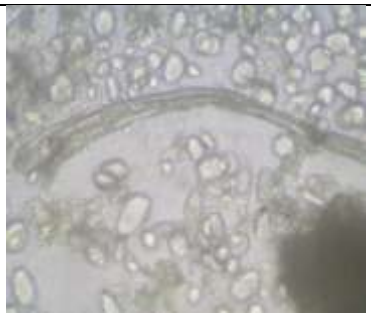
 **Tannin content of Kustha**	 **Unicellular trichoms of Yava**	 **Starch grains of Vacha**
 **Lignified scleroids of Erandabeeja**	 **Oil globule of Kola**	 **Fibers of Kulaththa**
 **Stone cell of Rasna**	 **Simple fibers of Sunthi**	 **Starch grains of Shunthi**
 **Epicarp cells of Atasi**	 **Lignified fibres of Devdaru**	 **Fibres of Rasna**

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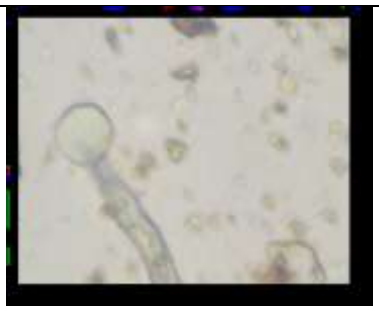
Olioresine of Vacha


Oil globule of Erandabeeja


Starch grains of Masha

III. DISCUSSION

Pharmacognosy and pharmaceutical evaluation of KolakulaththadiChoornawas performed. It is effective in rubbing on skin for increase local blood circulation, by this it helps to remove Avaranain 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.

IV. 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 Rf&densitogram. Pharmacognostical findings from this study will provide systemic evaluation and also serve as a master document to control the quality of KolakulaththaadiChoornaformulation. The study results may be used as the standard reference in further research undertakings of its kind.

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