



Research Article

PHYSICO CHEMICAL ANALYSIS AND HPTLC EVALUATION OF *KOKILAKSHADI KWATHA CHURNA*

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ABSTRACT

*Kokilakshadi Kashaya* mentioned in *Bhaishajya Ratnavali*, *Vataraktadhikara*, it is a therapeutic formulation to treat *Vatarakta*. It is also used by Ayurvedic practitioners for treating hyperuricemia. The symptoms of hyperuricemia and gouty arthritis are similar to *Vatarakta*, a disease explained in classical Ayurvedic textbooks. *Kokilakshadikwatha* contains *Kokilaksha* and *Guduchi* and *Pippalichurna* given as *Anupana* of this formulation. Physico chemical analysis of individual drug and formulation with modern parameters increase their scope and acceptance. The study was based on standard analytical parameters proposed by API. **Method:** *Kokilakshadi Kwatha* powder was evaluated for physico chemical analysis and phyto chemical screening. The analysis was done by using the parameters like Organoleptic features, loss on drying, acid soluble extractive, water soluble extractive. **Results:** Analytical parameters of individual drugs were done. All analytical parameter were within limit. Analytical parameter of *Kokilakshadi Kwatha Churna* like loss on drying 10.4%w/w, acid insoluble ash 0.79%, alcohol soluble extractive 11.2%w/w, water soluble extractive 7.8%w/w, pH 5.78 were obtained. High Performance Thin Layer Chromatography (HPTLC) profile of *Kokilakshadikwatha* powder showed 13 peaks at 254nm and 14 peaks at 366nm. Preliminary phytochemical screening test revealed the presence of steroids, alkaloids, phenols, flavonoids. **Conclusion:** The obtained data can be used for future comparative references.

INTRODUCTION

*Vatarakta* is one of the important diseases described in Ayurvedic literature like *Carakasamhitha*, *Astangahridaya*, *Susrutha samhitha*. It is also called *Vatasonita*, *Vatabalasa*, *Adyavata*, *Khuda*. It is caused by the vitiation of *Vata* and *Rakta*. Pain of *Vatarakta* can be correlate to rat bite in Ayurveda<sup>[1]</sup>. It indicates the severity of pain of the disease. So *Vatarakta* is a painful condition which affects small joints of feet and hands. On the basis of etiology and symptoms, *Vatarakta* can be correlated to hyperuricemia associated with gouty arthritis, as the pain usually starts from the big toe and spreads to the other parts of the body.

*Raktamokshana*, *Vasthi*, *Virechanam*, *Vamana*, *Upanaha* etc are given for the treatment of *Vatarakta* and *Guduchi* is best for curing *Vatarakta*.

Despite the fact that modern science has enhanced procedures for disease detection, diagnosis, and therapy, there is still a lack of solutions for numerous chronic and difficult-to-treat diseases. Gout medications now on the market can relieve pain and reduce inflammation to some extent. As a result, finding alternative therapy options is critical. Plant-based therapy is gaining popularity in the contemporary context for gout prevention and treatment<sup>[2]</sup>.

Available data regarding scientific evaluation of *Kokilakshadi kwatha churna* is none. The status of a medicine can be determined by looking at its identity, purity, content, and other chemical, physical, or biological characteristics, as well as by the manufacturing procedures. The benefit of using HPTLC for analytical testing of herbal goods is that it aids in both quantitative and qualitative analysis using the

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same technology and enables positive identification as well as visualisation of the separated fractions of the sample component. So, current study is anticipated to evaluate *Kokilakshadikwatha* powder through physico-chemical and HPTLC analysis.

**AIM**

To evaluate the *Kokilakshadikwatha churna* as per pharmacopeial (Ayurvedic Formulary of India and Ayurvedic Pharmacopeia of India) method. To evaluate the quality of drug.

**MATERIALS AND METHODS**

**Collection and Preparation of the Drug**

**Table 1: Ingredients of *Kokilakshadi Kwatha* (Fig 1)**

Drug	Latin Name	Part used
<i>Guduchi</i>	<i>Tinospora cordifolia</i>	Stem
<i>Kokilaksha</i>	<i>Astercantha longifolia</i>	Whole plant
<i>Pippali</i>	<i>Piper longum</i>	Fruit

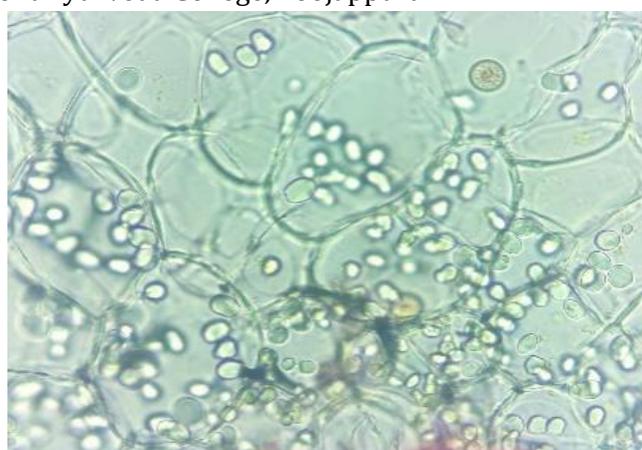
*Kokilaksha* and *Pippali* collected from local market and authenticated from Department of Dravyagunavijnana, Government Ayurveda college, Thiruvananthapuram. *Guduchi* was collected freshly from the dealer who collecting it from nearby sources. Fresh stem of *Guduchi* was microscopically analyzed in the Department of *Dravyagunavijnana* Government Ayurveda College, Thiruvananthapuram. Then powder microscopy of *Guduchi* stem was also done at Pharmacognasy unit Poojappura. Ingredients of *Kokilakshadi Kwatha Churna* are summarized at [Table 1].



**Fig 1: a. *Kokilaksha***

**Pharmacognosy of *Guduchi* (Fig 2)**

Powder microscopy of *Guduchi* was done in order to confirm the identity of given species. It was done in Pharmacognosy Unit, Government Ayurveda College, Poojappura.



**Fig 2: Powder microscopy of *guduchi* stem**

**Preparation of *Kokilakshadi kwatha churna***

Fresh *Guduchi* stem was taken and cleaned well. Peeled of the skin by using knife and scrubber. Then cut into small pieces of about 3cm length. Peeled of *Guduchi* stem were washed well and dried in steel trays. The drug *Kokilaksha* was taken and cut into small pieces by using knife. Then washed thoroughly

and dried well in sunlight in steel trays. Properly dried pieces of *Guduchi* and *Kokilaksha* were crushed in mixer grinder separately and pass through sieve no.22 size (As per API). Then equal quantity of drugs were taken and mixed well and kept in air tight container.

**Assessment of Identity, purity & strength of Raw drugs.**

It includes foreign matter, total ash, acid-insoluble ash, alcohol-soluble extractive, water-soluble extractive.

**Test parameters of Kokilakshadi Kashaya Churna**

Organoleptic evaluation of *Kokilakshadi Kwatha Churna* like colour, odour etc. Physico chemical parameters like pH, loss on drying at 105°C, total ash, acid-insoluble ash, alcohol-soluble extractive, water-

soluble extractive. Phyto chemical parameter like HPTLC and qualitative parameters.

**OBSERVATIONS AND RESULTS****Identity, Purity, Strength of Individual Drugs**

IPS of individual drugs were tested and compared with the values given in API. Foreign matter [3], total ash, acid insoluble ash, alcohol soluble extractive, water soluble extractives were recorded. [Table 2]

**Table 2: Identity, Purity, Strength**

IPS	<i>Kokilaksha</i>	<i>Guduchi</i>	<i>Pippali</i>
Foreign matter	0.367%	1.6%	0.372%
Total Ash	5.6%	5.2%	5.52%
Acid insoluble ash	0.39%	2.6%	2.75%
Alcohol soluble extractive	6.97%	3.4%	5.6%
Water soluble extractive	22.64%	13.4%	16.78%

**Organoleptic evaluation of Kokilakshadi Kwatha Churna****Table 3: Organoleptic features**

No	Features	<i>Kokilakshadi Kwatha Churna</i>
1	Colour	Greenish
2	Odour	Characteristic smell
3	Taste	Bitter
4	Consistency	Powder

**Physico-chemical Analysis**

Physico-chemical analyses were carried out by following the parameters like pH value<sup>[4]</sup> loss on drying at 110°C<sup>[5]</sup>, acid insoluble ash, water soluble extractive<sup>[6]</sup>, alcohol soluble extractive<sup>[7]</sup> were recorded.

**Table 4: Physico-chemical analysis of Kokilakshadi Kwatha Churna**

Physico-chemical analysis	<i>Kokilakshadikwatha Churna</i>
pH	5.78
Loss on drying	10.4%
Acid insoluble ash	0.79%
Alcohol soluble extractive	11.2%
Water soluble extractive	7.8%

**Qualitative Analysis of Kokilakshadi Kwatha**

It is used for identification of different plant constituents in the extractives

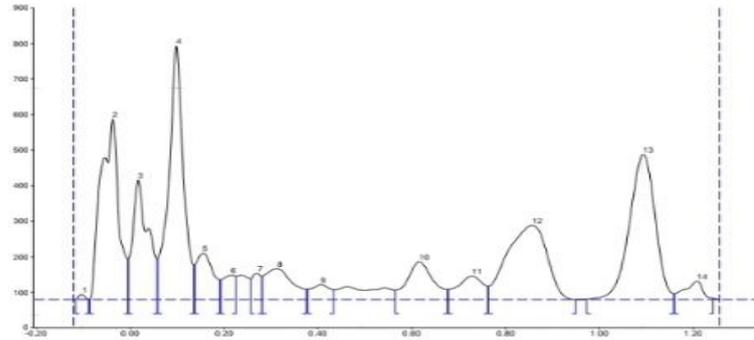
**Table 5: Phytochemical screening of Kokilakshadi Kwatha**

Phytochemical constituents	<i>Kashaya</i>
Steroids	Present
Alkaloids	Present
Phenols	Present
Flavanoids	Present

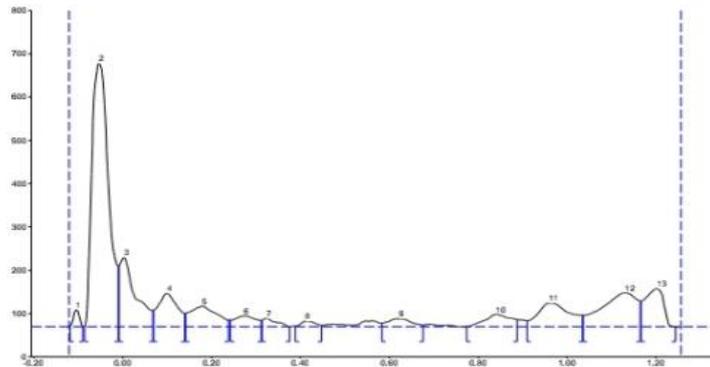
**Phytochemical Analysis****HPTLC of Kokilakshadikwatha churna**

High Performance Thin Layer Chromatography (HPTLC) In HPTLC, in short UV-254nm, maximum 13 spots were observed in *Kokilakshadi Kwatha*; while in long UV-366nm, maximum 14 spots were observed. [Table 6] [Fig 3] [Fig 4].

Fig 3

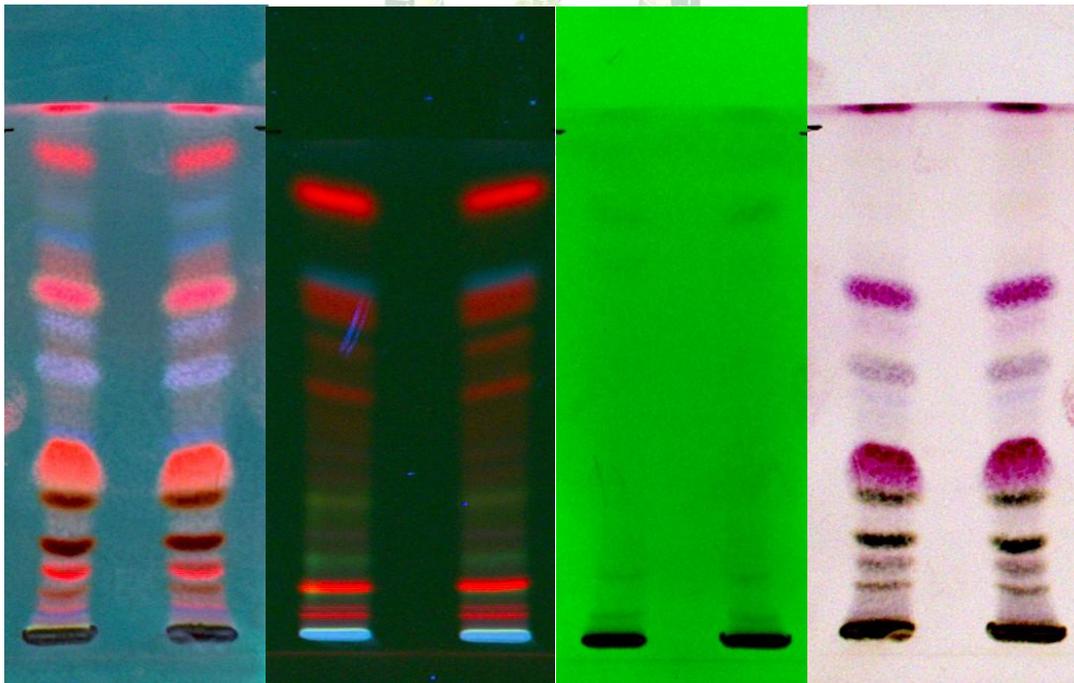


(a) Chromatographic results (Peak display) of *Kokilakshadi Kwatha Churna* at Short ultra violet (254 nm)



(b) Chromatographic results (Peak display) of *Kokilakshadi kwatha churna* at Long ultra violet (366nm)

Fig 4



a) at 366nm b) at 366nm c) at 254 nm d) at visible light

Table 6: Chromatographic results of *Kokilakshadi Kwatha Churna*

Conditions	Rf values
Short ultra violet (254nm)	-0.11, -0.05, 0.00, 0.10, 0.18, 0.27, 0.32, 0.41, 0.62, 0.84, 0.96, 1.13, 1.21
Long ultra violet (366nm)	-0.10, -0.04, 0.02, 0.10, 0.16, 0.22, 0.27, 0.31, 0.41, 0.62, 0.73, 0.86, 1.09, 1.21

## DISCUSSION

Identity, purity, strength of all raw materials were tested and compared with API parameters. All the values like foreign matter, total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractives were tested. All of them were satisfying the API values. It denotes drug were taken for the study, i.e., *Guduchi, Kokilaksha, Pippali* was of genuine sample without any adulteration. The pH of *Kokilakshadi Kashaya* is 5.78, i.e., slightly acidic. So there is less chance of gastric irritation. Loss on drying of *Kokilakshadi Kwatha Churna* was 10.4% which indicate the moisture content of the given sample. It is also important in determining the shelf life of a drug. LOD of *Kokilakshadi Kwatha Churna* was higher than that of other *Kwatha Churna* mentioned in API part II vol 4. This may be due to the moisture absorbing nature of drug. Acid insoluble ash indicates the presence of silica in the sample. Acid insoluble ash obtained for *Kokilakshadi Kwatha Churna* was 0.79%. Alcohol soluble extractive represents the alcohol soluble extractive in the sample. Alcohol soluble extractive for the value for the *Kwatha Churna* was 11.2% Water soluble extractive indicates the percentage of water soluble substances present in the sample. Water soluble extractive of *Kwatha Churna* was 7.6%. HPTLC of *Kokilakshadi Kwatha Churna* using solvent system toluene, chloroform, methanol in the ratio of 8:3:1.13 peaks obtained at 254nm and 14 peaks obtained at 366nm. The Rf values of major bands indicate the presence of compounds in the sample. More compound obtained at 366nm.

## CONCLUSION

Physico chemical parameter and HPTLC profile of *Kokilakshadi Kwatha Churna* was developed.

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