

PRELIMINARY PHARMACOGNOSTICAL AND PHYSICO-CHEMICAL EVALUATION OF *KHADIRASHTAKA KASHAYA* (YAVAKUTA)

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ABSTRACT

Khadirashtaka Kashaya is a compound Ayurvedic formulation prescribed mainly in the management of *Kushtha Vyadhi* (skin diseases), *Visarpa Roga* (erysipelous) and *Masoorika* (type of measles) in *Sangraha Grantha* like, *Yogaratanakara*, *Gadanighraha*, *Bhaishajya Ratnavali*. *Kushtha* and *Visarpa* diseases have common etiological factors mentioned as *Saptaka Dravyasangraha* in *Charak Samhita*. In present era people are adopting some novel dietary habits and lifestyle which are not suitable for health. Consumption of Incompatible food combinations, heavy meals, immediate exposure of cold and hot, travelling and exercise just after meals leads to several metabolic changes which results in unhealthy skin. Continued exposure of such

factors further leads to long lasting dermatological abnormalities having vitiated *Rasa* and *Rakta Dhatu*. *Khadirashtaka Kashaya* helps to break the pathogenesis by its bitter-astringent taste, light and dry properties as well as blood purifying activity. In Present study Pharmacognostical and pharmaceutical analysis of *Khadirashtaka Kashaya*; showing the quality and genuineness of all the constituents of *Khadirashtaka Kashaya* (Decoction) has been done. Organoleptic features of coarse powder made out of the crude drugs were within the standard range. Loss on drying was 5.35 %w/w and pH was 6.5. HPTLC showed 2 spots

at 254 and 2 spots at 366 nm. This shows the presence of certain definite constituents in the *Churna* (Powder) and is helpful for the easy separation of these constituents.

KEYWORDS: *Khadirashtaka Kashaya*, Pharmacognosy, Physico-chemical analysis, *Kushtha*.

INTRODUCTION

Ayurveda is an ancient lifestyle practice which aims to create harmony within the human body, based on holistic approach. In Ayurveda there are everything is described for healthy (*Dincharya & Ritucharya*) as well as diseased person (*Chikitsa*).^[1] Ancient texts of Ayurveda such as *Brihatrayee* have in detail explanation of *Kushtha Roga* and its treatment. Later on, during *Sangrahakala* various Acharya compiled effective and clinically proven formulations for various diseases. *Khadirashtaka Kashaya* is mentioned in *Yogaratnakara*, *Gadanighraha*, *Bhaishajya Ratnavali* with different contexts of indication i.e. *Kushtha*^[2], *Visarpa*^[3] and *Masoorika*^[4] respectively. All three disease have presentations on skin. *Kushtha* and *Visarpa* diseases have common etiological factors mentioned as *Saptak Dravyasangraha* in *Charak Samhita*.^[5] In present era people are adopting some novel dietary habits and lifestyle which are not suitable for health. Consumption of Incompatible food combinations, heavy meals, immediate exposure of cold and hot, travelling and exercise just after meals, etc. leads to several metabolic changes which results in unhealthy skin.^[6] Continued exposure of such factors further leads to long lasting dermatological abnormalities having vitiated Rasa and *Rakta Dhatu*. The study drug *Khadirashtaka Kashaya* contains *Khadira*, *Haritaki*, *Bibhitaki*, *Aamalaki*, *Nimba*, *Patola*, *Guduchi* and *Vasa*. *Khadirashtaka Kashaya* helps to break the pathogenesis by its *Tikta Kashaya Rasa*, *Anushana Virya*, *Madhura Vipaka*, *Ruksha*, *Laghu Guna*, as well as blood purifying activity. *Khadira* is mentioned as best *kushthagha*^[7], *Triphala* is also said for treatment of *Kushtha*.^[8] It has *Anuloman* property which helps to purify body by regular bowel excretion. Regular *Virechana* is mentioned in skin disorders.^[9] *Nimba*^[10] and *Vasa*^[11] also mentioned having *Kushthagha* properties. So, the combination exclusively becomes drug of choice in the treatment of *Kushtha* (skin disorders). Till today no work has been found assessing its organoleptic and physico-chemical parameters. So, the present work was carried out to evaluate aspects of *Khadirashtaka* powder (*Yavkut Churna*) pharmacognostically in addition to analyze the physico-chemical properties of *Khadirashtaka Kashaya* (*Yavkut Churna*).

MATERIALS AND METHODS

Collection of raw materials

Raw drug materials except *Patola* were collected from the pharmacy department, IPGT & RA, Gujarat Ayurveda University and were identified and authenticated at Pharmacognosy laboratory. *Patola* was collected from the forest area of the periphery of Una district, Gujarat and it was identified and authenticated at Pharmacognosy laboratory.

Preparation of *Khadirashtaka Kashaya*:

Khadirashtaka Kashaya was prepared as per classical method. All ingredients were taken in prescribed ratio equal in quantity (Table 1). Powdered and stored in airtight glass jars under hygienic conditions.

Table no. 1: Composition of *Khadirashtaka Kashaya*.

Sr.no	Sanskrit name	Botanical name	Family	Part used
1.	<i>Khadira</i>	<i>Acacia catechu</i> Willd.	Leguminosae	<i>Twak</i> (Bark)
2.	<i>Amla</i>	<i>Phyllanthus emblica</i> Linn.	Euphorbiaceae	<i>Phalamajja</i> (Pericarp)
3.	<i>Bibhitika</i>	<i>Terminalia belerica</i> Roxb.	Combretaceae	<i>Phalamajja</i> (Pericarp)
4.	<i>Haritaki</i>	<i>Terminalia chebula</i> Roxb.	Combretaceae	<i>Phalamajja</i> (Pericarp)
5.	<i>Nimba</i>	<i>Azadirachta indica</i> Linn.	Meliaceae	<i>Twak</i> (Stem-bark)
6.	<i>Patola</i>	<i>Trichosanthes cucumerina</i> Roxb.	Cucurbitaceae	<i>Panchanga</i> (whole Plant)
7.	<i>Vasa</i>	<i>Adhatoda vasica</i> Nees.	Acanthaceae	<i>Patra</i> (leaves)
8.	<i>Guduchi</i>	<i>Tinospora cordifolia</i> Willd.	Menispermaceae	<i>Kand</i> (stem)

Pharmacognostical evaluation: The purpose of the pharmacognostical study was to confirm the authenticity of the drugs used in the preparation of *Khadirashtaka Kashaya*. Raw drugs were identified and authenticated by the Pharmacognosy lab, I.P.G.T & R.A, Gujarat Ayurved University, Jamnagar. The identification was carried out based on the morphological features, organoleptic features and powder microscopy of the individual drugs. Later, Pharmacognostical evaluation of the *Churna* (powder) was carried out. *Churna* was soaked in small quantity of distilled water, filtered through filter paper, filtrate studied under the microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope.^[12]

Pharmaceutical Evaluation

Following parameters were analyzed for different physico-chemical parameters by today's routine methods at the pharmaceutical chemistry lab, IPGT& RA, Jamnagar.

Physico-chemical Parameters^[13]

Physico-chemical parameters i.e. Water-soluble Extract, methanol-soluble Extract, pH (5% solution), ash Value, loss on drying, articles consistency are carried out as per standard methods.

High performance Thin Layer Chromatography study (HPTLC)^[14]

Methanol extract of *Khadirashtaka Kashaya* was spotted on pre coated silica gel GF 254 aluminium plate as 6 mm bands, 10 mm apart and 1 cm from the edge of the plates, by means of a Camag Linomate V sample applicator fitted with a 100 µL Hamilton syringe. Toluene: Ethyl acetate (9: 1 v/v) were used as the mobile phase. After development, Densitometric scanning was performed with a Camag TLC scanner III in reflectance absorbance mode at 254nm and 366 nm under control of win CATS software. The slit dimensions were 6 mm×0.45 mm and the scanning speed was 20 mm per second. All HPTLC plates were scanned with filter fraction Savitsy-goloy 7, minimum slope 5, minimum height 10 AU, minimum area 50 AU, and maximum height 990 AU with absorption unit.

RESULTS AND DISCUSSION

Organoleptic findings: Organoleptic findings of *Khadirashtaka Kashaya* is given in Table 2.

Table no. 2: Organoleptic characters.

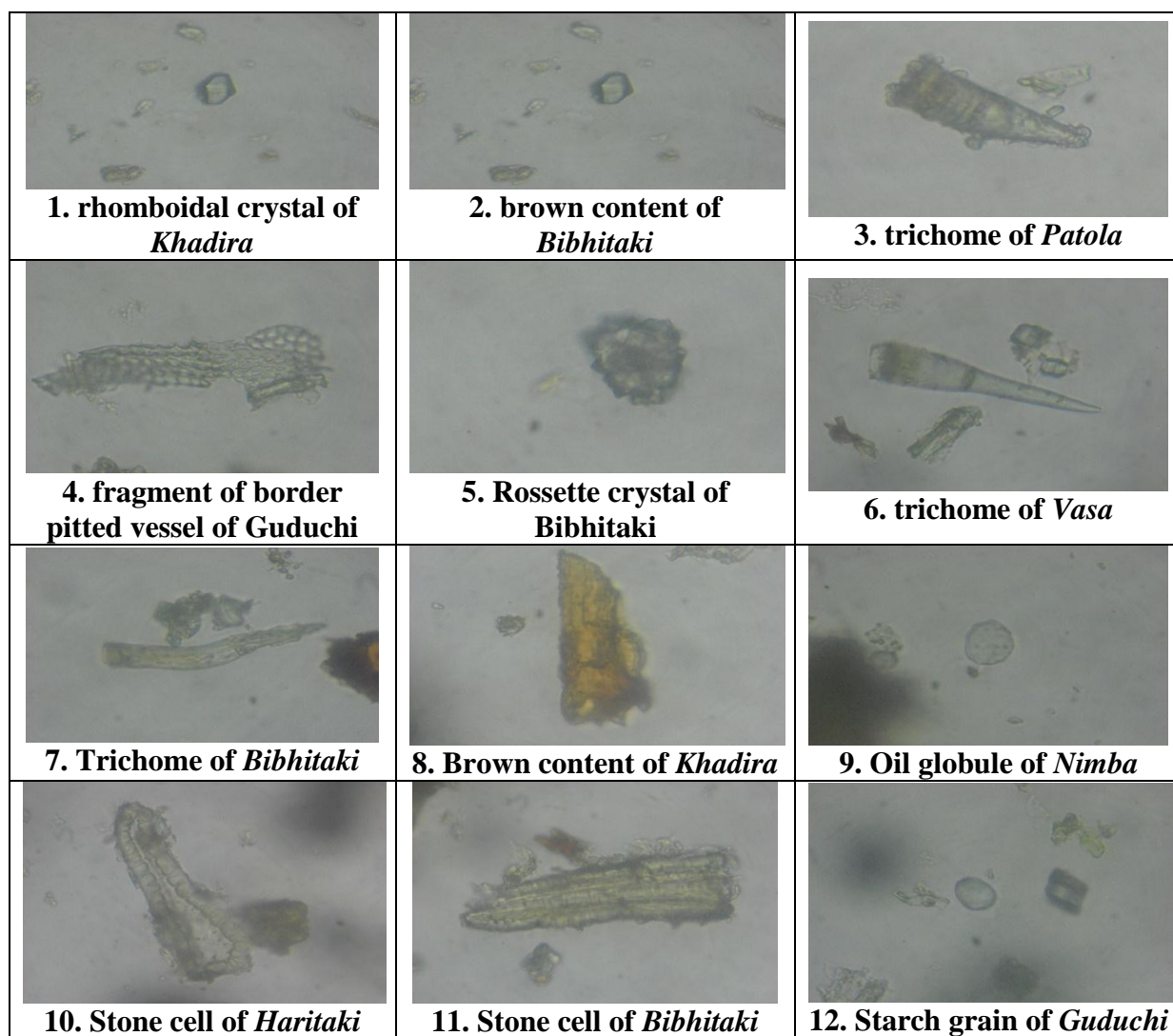
Organoleptic Characters	<i>Khadirashtaka yavkuta Churna</i>	<i>Khadirashtaka Kwatha</i>
Taste	<i>Tikta, Kashaya</i> (bitter-astringent)	<i>Tikta, Kashaya</i> (bitter-astringent)
Colour	Yellowish dark brown	Yellowish Brown
Odour	Kashaya tikta	Tikta kashaya (Bitter-astringent)
Touch	Rough	Liquid
Consistency	coarse Powder	Liquid



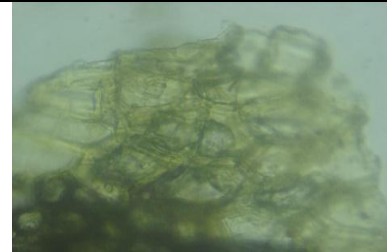
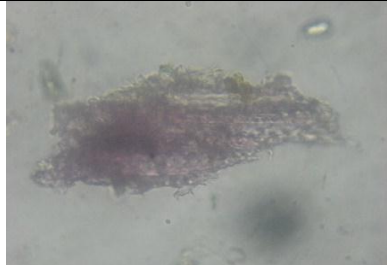
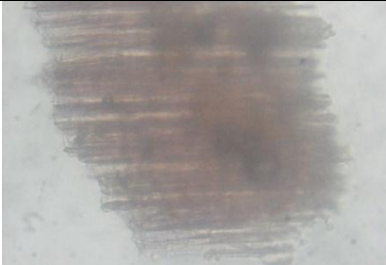




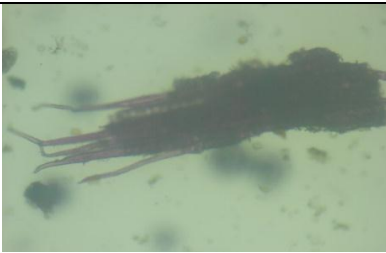
Pharmacognostical study

The initial purpose of the study was to confirm the authenticity of the drug used in the preparation of *Khadirashtaka Kashaya*. For the aim of comparative study, microscopy of powder and decoction was showed following.

In powder microscopy, rhomboidal crystal of *Khadira*, brown content of *Bibhitaki*, Trichome of *Patola*, Fragment of border pitted vessel of *Guduchi*, rosette crystal of *Bibhitaki*, Trichome of *Vasa*, trichome of *Bibhitaki*, brown content of *Khadira*, Oil globules of *Nimba*, Stone cell of *Haritaki*, Stone cell of *Bibhitaki*, starch grain *Guduchi*, simple fiber of *Khadira*, Stone cells *Aamlaki*, crystal fiber of *Nimba* and cork cells of *Guduchi* were found. After staining it showed fragment of border pitted vessel of *Guduchi*, Group of simple fiber of *Khadira*, and collenchyma cell of *Guduchi*, fragment of spiral vessel of *Patola*, scleroid of *Haritaki*, lignified stone cells of *Bibhitaki*, and lignified fibers of *Nimba*. (Microphotographs Plate 1)

Microphotographs Plate 1.



		
13. Simple fiber of Khadira along with tennin	14. Crystal fiber of <i>Nimba</i>	15. Cork cells of <i>Guduchi</i>
After staining:		
		
Lignified border pitted vessel of <i>Guduchi</i>	Group of lignified fibres of <i>Guduchi</i>	Cholenchyma cell of <i>Guduchi</i>
		
Fragment of spiral vessel of <i>Patola</i>	Scleroid of <i>Haritaki</i>	Lignified stone cell of <i>Bibhitaki</i>
		
	Lignified fibers of <i>Nimba</i>	

Pharmaceutical Evaluation: Physico-Chemical parameters of *Khadirashtaka Kashaya yavakuta* like ash value, water soluble extract, pH, loss on drying, particles consistency etc. all were found to be within the normal range. Details are given in Table 3.

Table -3 Results of the drug analysis on Physico-chemical parameters

Sr. No.	Test	Results
1	Loss on Drying	5.35 % w/w
2	Ash Value	8.070 % w/w
3	Water-soluble Extract	11.08 % w/w
4	Methanol-soluble Extract	11.04 % w/w
5	pH (5% solution)	6.5

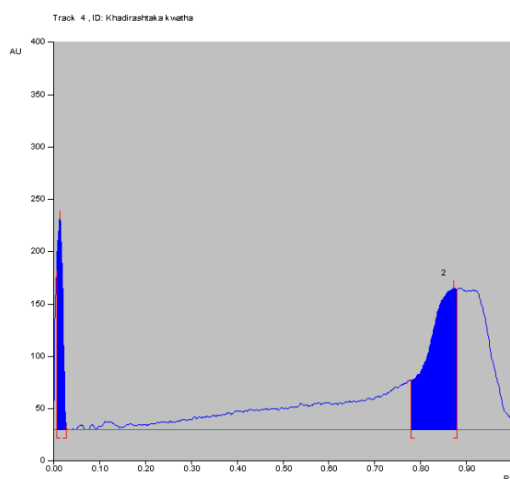
6	Particles Consistency	
	(a) Moderately coarse powder (Above 60 mesh)	79.98 %
	(b) Moderately fine powder (Between 60-85 mesh)	7.47 %
	(c) Fine powder (Between 85-120 mesh)	4.4 %
	(d) Very fine powder (Below 120 mesh)	8.15%

HPTLC study results: On performing HPTLC, visual observation under UV light showed few spots but on analysing under densitometer much more was observed (Plate-2) and at 254nm, the chromatogram showed 2 peaks with Rf values 0.01,0.87 While at 366nm the chromatogram showed 2 peaks with Rf values 0.01,0.89 (Table 4 and Plate-2).

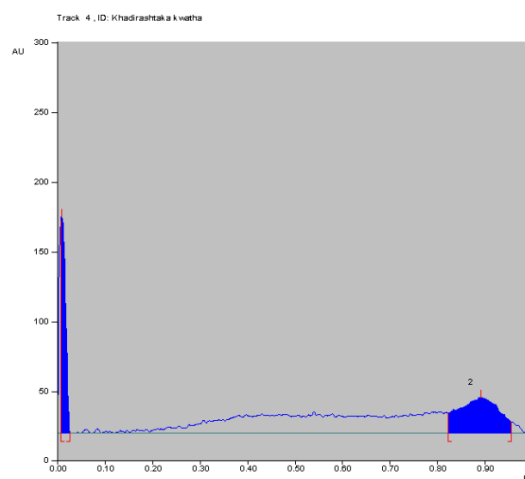
Table 4: Showing consolidated data of HPTLC profile of *Khadirashtaka Kashaya*

Solvent System: toluene: Ethyl acetate (9: 1 v/v)

Condition	No. of spots	Max. Rf
Short UV (254 nm)	2	0.01,0.87
Long UV (366 nm)	2	0.01,0.89



At 254nm



At 366nm

Plate 2: Densitogram of *Khadirashtaka Kashaya*.

DISCUSSION

Medicinal plants have great importance for the *Ayurvedic* treatment as plants are raw materials for drug preparation. The correct identification of those plants are quite necessary. The *Ayurvedic* system of medicine is facing another major problem that is quality control of crude drugs. To get the full therapeutic impact of the drugs it should be remained free from adulterants and thus the quality of the drugs can be lift up to the adequate standard. For this, proper identification of the plant excluding with the adulterant morphologically and microscopically is necessary. The present study was undertaken to standardize *Khadirashtaka Kashaya*, hence the material was subjected to minimum Pharmacognostical and

Pharmaceutical analysis. Pharmacognostical evaluation of *Khadirashtaka Kashaya yavakuta* showed that all the observed characters which are from all eight ingredients used in the compound formulations showed that authenticity and purity of the finished product. Physico-chemical parameters of *Khadirashtaka Kashaya* like Loss on drying, Ash value, pH Value all were found to be within the normal range.

CONCLUSION

Pharmacognostical and physicochemical analysis of *Khadirashtaka Kashaya* showed the specific characters of all ingredients which were used in the preparation. Pharmacognostical findings authenticated the ingredients. Raw drugs were cross verified with API and no major changes were observed. When the finished product was analysed under the microscope, it is concluded that the formulation meets the minimum qualitative standards as reported in the API at a preliminary level. Though the groundwork essentials for the standardization of *Khadirashtaka Kashaya* was covered in the current study, additional important analysis and investigations are required for the identification of all the active chemical constituents. The results of this study may be used as the reference standard in advance research undertakings of its kind.

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