

PHARMACOGNOSTICAL AND PHARMACUETICAL EVALUATION OF SHIGRU PATRA BHAVIT GANDHKADI YOGA.

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ABSTRACT

In *Ayurveda* there are a set of herbo mineral drugs which are used for *Lohashodhana* and *Lohamarana*, also for neutralizing the toxic effects of it. *Gandhakadi Yoga* is a modified form of the drug suggested for *Loha Sevanajanya Vikara Prashamana* (iron overloading) in *Ayurveda Prakasha*.^[1] This can be used as an adjuvant in the management of *Thalassemia Major*. Present study was carried out to pharmacognostically analyze the ingredients and finished product of *Gandhakadi Yoga tablets*. In this combination *Gandhaka* and *Vidanga* are triturated with *shigru patra Swarasa*. The characters i.e. light yellow brown content of *Gandhaka*, fragmented unicellular trychome

of shigru leaf, oil globules and epicarp cells with tannin content of *Vidanga* etc. were the characteristic features of the finished product. In the pharmaceutical study, it was observed that Loss on drying was 9.1 %w/w, pH was 7.00, Alcohol soluble extractive was 12.48%w/w and water soluble extractive was 14 %w/w. Ash value 8.9 %w/w HPTLC study showed 06 peaks at 254 nm and 04 peaks at 366 nm wave lengths.

KEYWORDS: *Gandhakadi Yoga Tablet*, Pharmaceutical analysis, Pharmacognostical analysis.

INTRODUCTION

Ayurvedic Aachaaryas have mentioned various methods to quality control and to standardization those formulations according to the final dosage form. The expected therapeutic effect from an administered drug can be got only if the quality of the finished formulation is in standard level. Quality of the finished drug is entirely depends on the quality and genuine of the raw materials. Therefore proper identification of raw material is a must as there are some controversies, adulteration and substitution regarding raw materials which has been described in *Ayurvedic* authentic literature. Hence the Pharmacognosy is one of the most important sciences in present *Ayurvedic* medical practice. Furthermore it has been developed different techniques to evaluate the quality of medicines with perspectives of safety, efficacy and quality by modern science. Hence there is a need to analyze *Ayurvedic* products and draw out results according to modern scientific pharmaceutical and pharmacognostical parameters for the global acceptance of *Ayurveda*. In the present study pharmacognostical and pharmaceutical analysis were done in order to ensure the quality standards of the *Gandhakadi Yoga Tablet* such as identity, quality and purity of ingredients and finished product along with preliminary physico-chemical and pharmaceutical parameters and pharmacognostical characteristic.^[2]

Gandhakadi Yoga is a modified form of the drug suggested for *Loha Sevanajanya Vikara Prashamana* (iron overloading) in *Ayurveda Prakasha*.^[3] This can be used as iron chelator and help to decrease the iron overload. This drug *Gandhakadi Yoga* tablet has been evaluated for Iron Sorbitol induced iron overload in albino rats by Pramod Yadav et al (2011).^[4] *Gandhakadi Yoga Tablet* is an *Ayurvedic* formulation used as an adjuvant in the management of *Thalassemia Major*.^[5,6] The Pre-clinical studies of *Gandhakadi Yoga* have already been carried out; in which standardization, pharmaceutical, pharmacological studies and also clinical observations on healthy volunteers were done.^[7,8]

MATERIALS AND METHODS

Drug Material

Table no.1: Ingredients of *Gandhakadi Yog* Tablets.

Sr. no.	Drug Name	English / Latin	Part used	Quantity
1	<i>Shuddha gandhak</i>	<i>Sulphur</i>	As whole	1 part
2	<i>Vidanga</i>	<i>Embelia robusta</i>	Dry	1 part
3	<i>Shigru patra</i>	<i>Moringa oleifera</i> Lam.	Green Leaves	Q.S. for <i>Bhavana</i>
4	<i>Bhrinaraaja</i>	<i>Eclipta alba</i> (L.) Hassk. (syn. <i>Eclipta prostrata</i> L.)	Green Leaves	(Q.S. for <i>gandhaka Shodhana</i>)

Collection, identification and authentication of raw drugs

Raw *Gandhaka* (Natural Sulphur), dried fruits of *Vidanga* (*Embelia robusta* Bur m.f.) and *Panchanga* (Whole plant) of fresh green *Bhringaraja* (*Eclipta alba* L.) were supplied by the Pharmacy of Gujarat Ayurved University, Jamnagar and Fresh *Shigru patra* (*Moringa oleifera*. Lam.) Leaves were taken from the garden of Gujarat Ayurved University, Jamnagar. All the drugs were authenticated for quality and purity by the experts of Pharmacognosy Laboratory of the Gujarat Ayurved University.

Preparation of *Gandhakadi Yoga Tablet*

Gandhakadi Yoga Tablets were prepared by following Standard Operating Procedures (S.O.P.) of preparation of *Tablet* as practiced in the department of *Rasashastra* and *Bhaishajya Kalpna* of i.p.g.t. & r.a. and pharmacy, G.A.U., Jamnagar.

Pharmacognostical study of *Gandhakadi Yoga tablet*

Pharmacognostical analysis of the dry powders of ingredients and finished product of *Gandhakadi Yoga Tablets* was carried out in the Pharmacognosy laboratory of I.P.G.T. & R.A., G.A.U., Jamnagar.

Organoleptic Characteristics

Following Organoleptic Characters of *Gandhakadi Yoga Tablet* ie. Color, Touch, Odor, Taste and touch were analyzed with the help of *Darshana*, *Sparshana*, *Aaghrana* and *Rasana Pareeksha* mentioned in *Ayurveda*. (By sensory observations). Results were mentioned in the Table no.2.

Microscopic Characteristics

Tablet of *Gandhakadi Yoga* were crushed and small quantity from this powder was dissolved in distilled water. Few drops of this is spread on a glass slide and covered with a cover slip

and excessive water was removed with filter paper. Microscopic examination was done with the prepared slide first without staining and then stained with Fluroglucinol and concentrated HCl under Carl-zeiss Trinocular microscope. Photomicrographs were taken by using Carl Zeiss Trinocular research microscope attached with camera.^[9]

The *Ayurvedic* Pharmacopoeia of India (A.P.I.)^[10] standards were used for authentication. The microphotographs of the Pharmacognostical characteristics of *Gandhakadi Yoga Tablet* are displayed in Plate 1.

Pharmaceutical study of *Gandhakadi Yoga Tablet*

Physico-chemical analysis of the finished product of *Gandhakadi Yoga Tablet* was carried out in the Pharmaceutical laboratory of I.P.G.T. & R.A., G.A.U., Jamnagar, on following parameters.

A. Physical tests

Following Physical parameters of *Gandhakadi Yoga tablet* were analyzed and results were mentioned in the table no. 3.

Shape^[11]

Hardness^[12]

Uniformity of weight^[13]

Physico-chemical analysis

Following Physico-chemical parameters of *Gandhakadi Yoga Tablet* were analyzed and results were mentioned in the table no. 4.

Loss on drying (LOD)^[14]

Ash value^[15]

Acid insoluble ash value^[16]

pH Value^[17]

Water Soluble Extractive^[18]

Alcohol Soluble Extractive^[19]

High Performance Thin Layer Chromatography (HPTLC)

HPTLC was carried out after making appropriate solvent system with Methanolic extract of *Gandhakadi Yoga Tablet*. On performing HPTLC, visual observation under UV light showed few spots but on analyzing under densitometer at 254nm and 366nm it resulted into 6

and 4 spots respectively. Results of HPTLC are given in Table 5 and densitogram is shown in plate 2.

Pharmacognostical study of Gandhakadi Yoga Tablet

A. Organoleptic characters

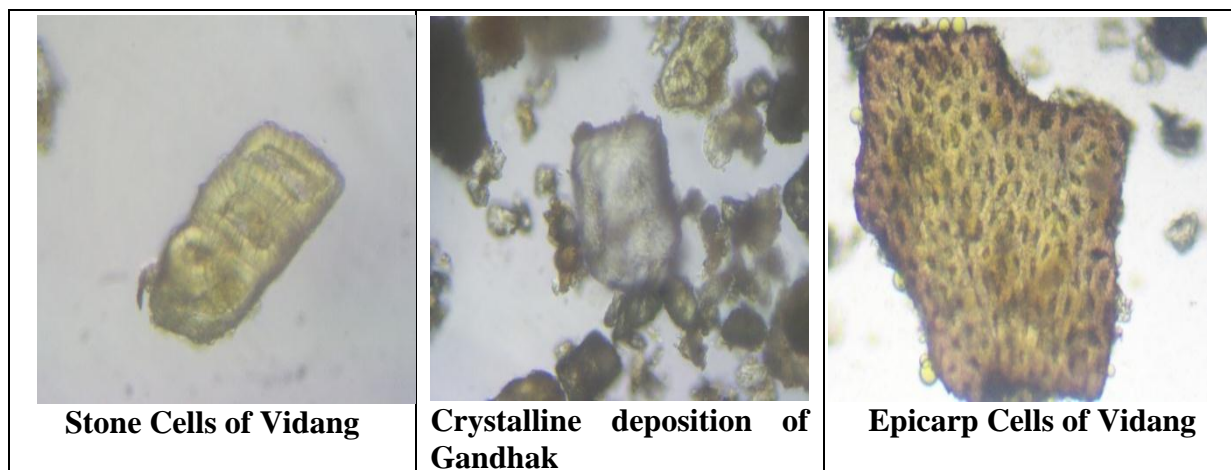
Characters like color, odour, taste and touch of *Gandhakadi Yoga Tablet* are mentioned in the table no.2.

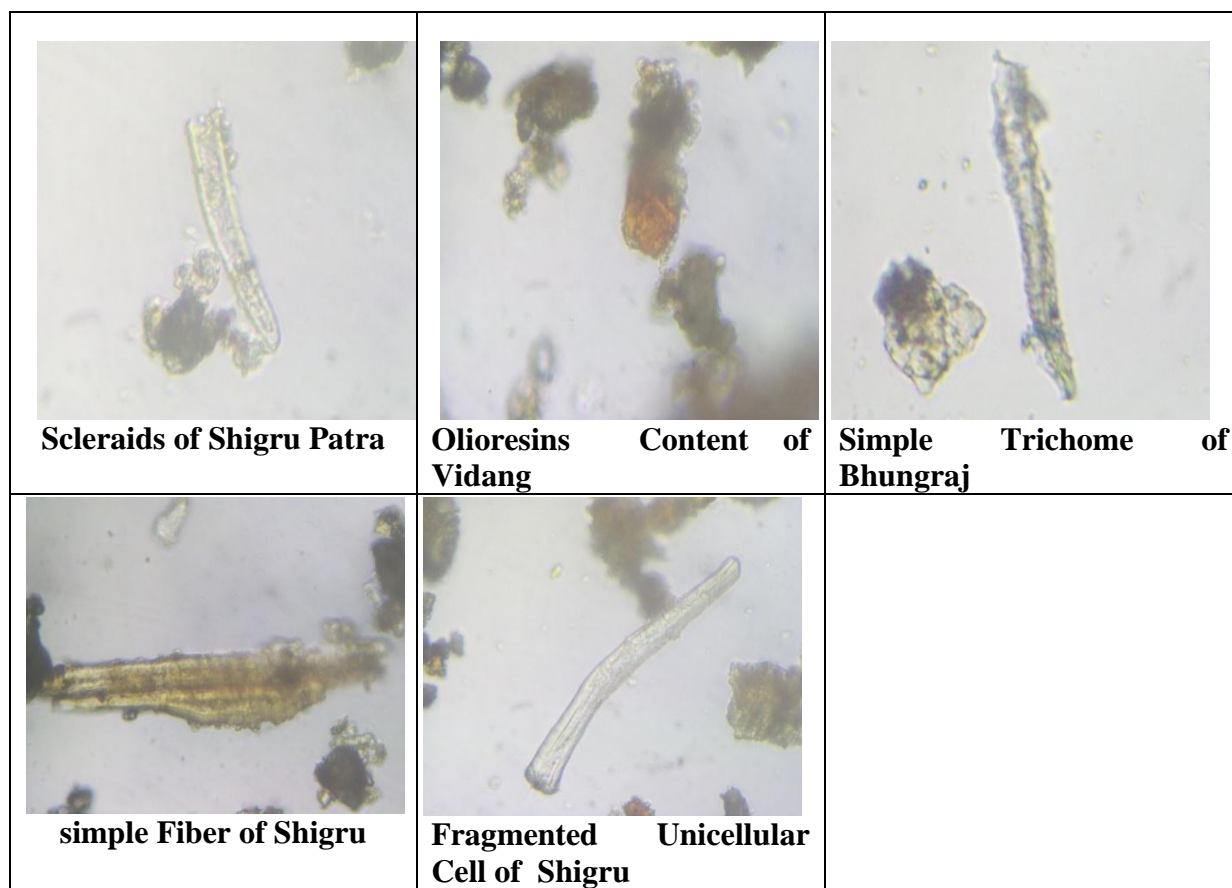
Table 2: Organoleptic characteristics of *Gandhakadi Yoga Tablet*

Sr. No.	Parameters	Observations
1.	Color	Grayish
2.	Touch	Smooth
3.	Odor	Sulphur smell
4.	Taste	Sour, Astringent

B. Microscopic characters

Pharmacognostical characteristics of *Gandhakadi Yoga Tablet* under the microscope showed that Oil globules, stone cell and Epicarp cells of *Vidanga* (*Embelia robusta* Bur m.f.), Fragmented Unicellular Cell of Shigru Simple Fiber of Shigru, Simple Trichome of Bhungraj base of *Bhringaraja* (*E.alba.*) and Crystalline depositions of *Gandhaka* were observed. The microphotographs of the same are displayed in Plate1.



Plate 1: Microphotographs of *Gandhakadi Yoga tablet*Table 3: physical analysis of *Gandhakadi Yoga Tablet*

Sr. No.	Parameters	<i>Gandhakadi Yoga</i>
1.	Shape	Bi-convex
2.	Hardness	0.8 kg/cm ²
3.	Uniformity	Max. (mg) wt.
		Min. (mg) wt.
		Avg. (mg) wt.

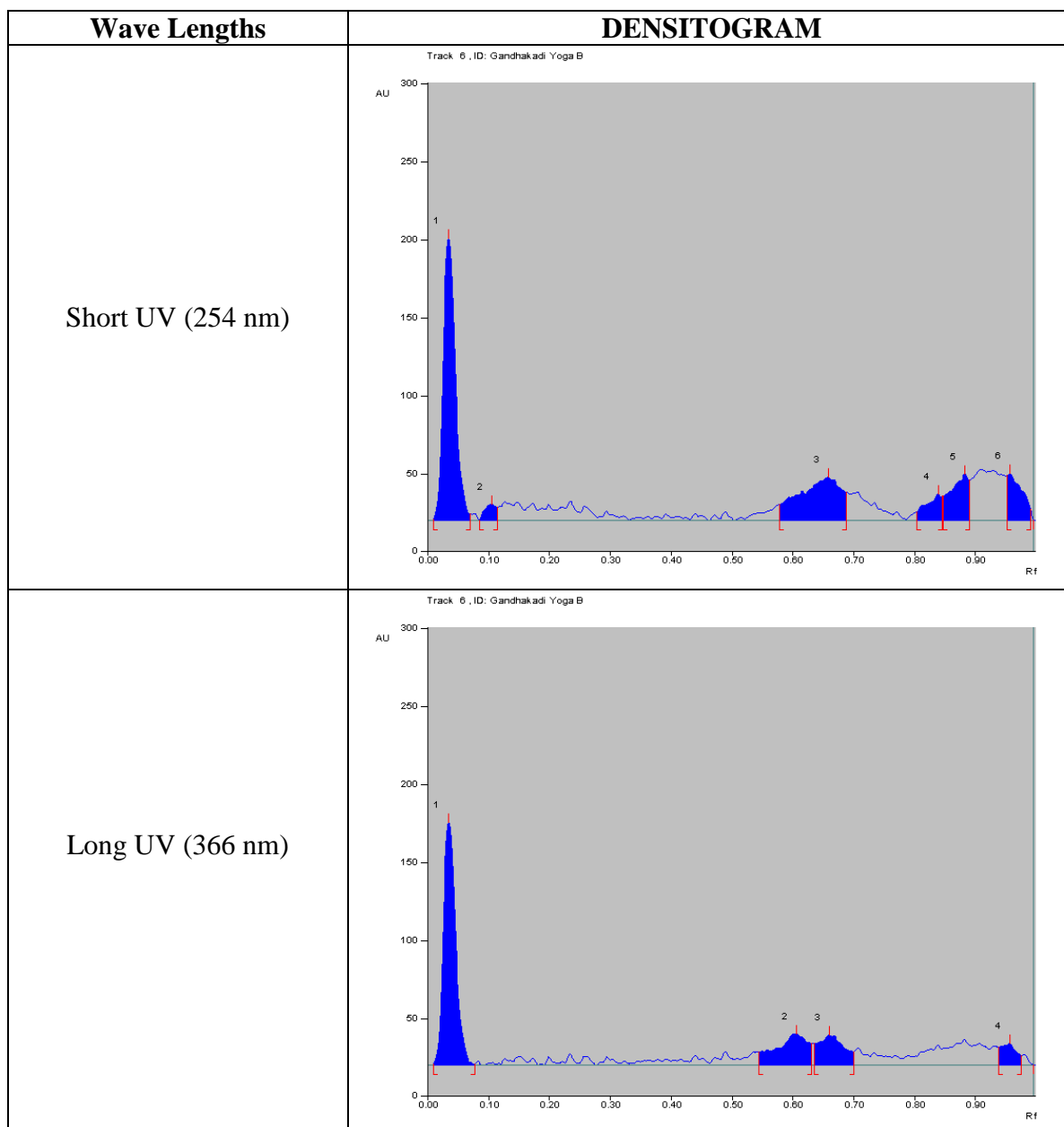
Table: 4: Physico-chemical analysis of *Gandhakadi Yoga Tablet*

Sr. No.	Parameters	<i>Gandhakadi Yoga</i>
1.	pH 10% Aqueous Sol. (% w/w)	7.00
2.	Lose on drying at(110°)	9.1 % w/w
3.	Ash value	8.9 % w/w
4.	Water soluble extractive	14 % w/w
5.	Methanol soluble extractive	12.48% w/w

Table 5: results of HPTLC of *Gandhakadi Yoga tablets*

Solvent system – Toluene: Ethyl acetate: Acetic Acid (7:2:1)

Wave Lengths	Short UV (254 nm)	Long UV (366 nm)
No of Spots	06	04
Max. Rf Value	0.5, 10, 0.58, 0.80, 0.85, 0.95	0.5, 0.55, 0.65, 0.95

Plate 2: Densitogram of HPTLC of *Gandhakadi Yoga Vati* (tablets)**Densitogram****DISCUSSION**

In the present study the formulation consist of three herbal ingredients which were proved to be genuine by assessing the pharmacognostical parameters. The therapeutic effect depends on the quality of the drug administered. To obtain the expected outcome after administration on particular disease, especially a combined drug formula all ingredients should be present in it. Pharmacognostical characteristic of *Gandhakadi Yoga Tablet* under the microscope showed characters of all the ingredients of finished product and there is no major change in the microscopic structure of the raw drugs during the pharmaceutical processes of preparation of

the drug. Evaluation of physico-chemical parameters and qualitative analysis helped to identify the presence of specific ingredients in a formulation and application of chromatographic techniques aid in recognition of number of ingredients and also to assess the purity by comparing with the standard ones.

CONCLUSION

Preliminary organoleptic characteristics and microscopic study of the *Gandhakadi Yoga Tablet* showed that all ingredients used were genuine and all were found in the finished product too. Preliminary physicochemical parameters also are within the standard range. Thus the study proves the quality of the final product.

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