



A Pharmacological Analytical Study of Shatyadi Granules – A Herbal Ayurvedic Antihistamine Drug

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ABSTRACT

According to Ayurveda Acharyas for getting desirable outcome of any medication, it should be precisely analysed. Most of the Ayurveda classical formulations need to be standardized based on newer techniques for their worldwide acceptance. Shatyadi granules is one of the Ayurveda formulations for paediatric disorders of respiratory system. Shatyadi granules is traditionally used in Churna form, in this study Churna was converted into granules form for better palatability and convenience of administration. The present article mainly deals with the preparation and standardization of Shatyadi granules on the basis of organoleptic characteristics, physicochemical parameters and HPTLC fingerprinting.

Keywords: Shatyadi granules; Herbal drug; HPTLC fingerprinting.

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INTRODUCTION

Standardization of herbal medicine is the process of developing and agreeing upon technical standards. Hence, standardization is a tool in the quality control process. While assuring the quality of the drug, consistency of active principles and therapeutic efficacy, standardization of herbal formulations is an essential part. Shatyadi granules is mentioned in the classical formulation used in Kasa, Shwasa. [1]. the ingredients are Shati (*Curcuma zedoaria* Christm. Roscoe), Badara (*Ziziphus jujuba* Mill.), Sugar & Ghrita (Table.1). Palatability being at most concern in paediatric age group, in present study the form of drug has modified from churna to shatyadi granules without altering the quantity of ingredients and subjected to analytical study through organoleptic, physico-chemical and HPTLC fingerprinting methods.

MATERIAL AND METHODS

Collection, Identification and authentication of raw drugs

All the raw material used for this study were procured from local market of Vadodara, Gujarat then identification and authentication of the raw drug were done at Pharmacy of Parul Institute of Ayurved, Vadodara, and Gujarat; GMP certified Ayurveda pharmacy.

Methodology of preparation of Shatyadi granules.

Sr no.	ingredient	Quantity
1.	Shati	1 kg
2.	Badar	1.5 kg
3.	sugar	2 kg
4.	Go ghrita	400 gm
	loss	400gm
	obtain	4.5 kg

Methodology of preparation of Shatyadi granules.

- Collect the all required raw dry drug and remove the impurities.
- Make the fine powder of all drugs.
- Roast all powders in Go-Ghrita.
- Add the sugar in water make the Chasani (Paka 2 thread stage Chasani).
- Add the all powder in Paka and mix it properly.
- Then add the all other powder in the mixture.

- Leave it for cooling for some time and make the granules; through blender and mixer.
- Store and pack Shatyadi granules.

Phytochemical and analytical study

Phytochemical properties are essential for primary evaluation of final product to reveal the presence of the original drug in final finished product, while analytical study is very essential for validation of the exact proportion of the ingredients in the final product. Organoleptic characters, physicochemical parameters, solubility test done at Pharmacy of Parul Institute of Ayurveda and HPTLC study done at Vasu Research Centre, GIDC, Makarpura, Vadodara. (Sample ID- AD/22/145 Dated: 15/06/2022). Shatyadi granules was analysed by employing various analytical parameters. Organoleptic character like colour, odour, and consistency was carried. Physicochemical study to analyse Loss on Drying at 110°C, Total Ash Value, Acid Insoluble Ash, pH, specific gravity, Refractive index, and Total solids content was done.

HPTLC finger printing

10g of sample was weighed accurately in Iodine flask then 20 ml methanol was added and refluxed for 15 minutes. Then after, filtered with help of Whatmann Paper No. 1. The filtrate thus obtained was used for HPTLC fingerprinting.

Preparation of Spray reagent [Anisaldehyde - sulphuric acid reagent]

0.5 mL Anisaldehyde is mixed with 10 mL Glacial acetic acid, followed by 85 mL Methanol and 5 mL Sulphuric acid (98 %).

Chromatographic Conditions:	
Application Mode	CAMAG Linomat 5 - Applicator
Filtering System	Whatman filter paper No. 1
Stationary Phase	MERCK - TLC / HPTLC Silica gel 60 F ₂₅₄ on Aluminum sheets
Application (Y axis) Start Position	10 mm
Development End Position	80 mm from plate base
Sample Application Volume	5 µL
Distance Between Tracks	0.0 mm
Development Mode	CAMAG TLC Twin Trough Chamber
Chamber Saturation Time	30 minutes
Mobile Phase (MP)	Toluene : Ethyl acetate : Acetic acid (7 : 3 : 0.1 v/v)
Visualization	@ 254 nm, @ 366 nm and @ 540 nm (after derivatization)
Spray reagent	Anisaldehyde- Sulphuric acid reagent
Derivatization mode	CAMAG - Dip tank for about 1 minute
Drying Mode, Temp. & Time	TLC Plate Heater Preheated at 100± 5°C for 3 minutes

RESULTS

Organoleptic characters of the shatyadi granules are illustrated in (table-2). colour of shatyadi granules are creamish brown. Physicochemical parameters (Table 3) pH of any liquid provides the quantitative indication of the acidity or alkalinity of a solution which was 7 i.e. alkaline. Loss on drying at 110°C was 4.38(%w/w), Total Ash value 7.57% w/w, Acid insoluble ash 3.43% w/w. water soluble extractive was 66.4(%w/w). alcohol soluble extractive 35.8 (%w/w).bulk density 0.64 (gm/ml). Tap density 10 tap(gm/ml) 0.677, 20 tap 0.699(gm/ml), 50 tap 0.49(gm/ml). angle of repose 0.49, mesh analysis 10-20# mesh(%w/w) 60.08, 20-40 #mesh (%w/w) 37.7, 40-60 #mesh (%w/w) 12.4, 80 #mesh (%w/w) 0.45, 80-120# mesh (%w/w) 0. Chromatographic study (HPTLC) of final product shatyadi granules carried to establish fingerprinting profile. R_f values and colour of the spots in chromatogram developed in Toluene:

Table 1. Composition, parts used of shatyadi granules

DRUG	BOTANICAL NAME	FAMILY NAME	PART USE
Shati	Curcuma zedoaria	Zingiberaceae	Rhizome
Badar	Zizyphus jujuba	Rhamnaceae	Fruit

Table 2. Organoleptic characters of shatyadi granules

PARAMETERS	RESULTS
Color	Creamish brown
Odour	Sweet
Taste	Sweet
Consistency	Granules form

Table 3. Physico-chemical parameters of shatyadi granules

S.NO	PARAMETERS	VALUE
1.	Loss on drying at 110c (%w/w)	4.38
2.	Total ash value (%w/w)	7.57
3.	Acid insoluble ash (%w/w)	3.43
4.	Water soluble extractive (%w/w)	66.4
5.	Alcohol soluble extractive (%w/w)	35.8
6.	PH value (10% aqueous)	7
7.	Bulk density(gm/gm)	0.64
8.	tap density 10 tap (gm/ml)	0.677
	20 tap (gm/ml)	0.691
	50 tap (gm/ml)	0.699
9.	Angle of repose	0.49
10.	Mesh analysis	
	10-20 # mesh(%w/w)	60.08
	20-40# mesh(%w/w)	37.7
	40-60# mesh(%w/w)	12.4
	80# mesh(%w/w)	0.45
	80-120# mesh(%w/w)	0

DISCUSSION

Allergic bronchitis in human is a most common respiratory condition. It is noticed that recurrence rate is very high due to development of resistance towards routine antihistamine drugs. Herbal preparation are best analysed to validate the preparation for assessment of quality and to authenticate the drug for its reproducibility. HPTLC finger printing is commonly used technique in synthetic chemistry for identifying volatiles, compounds, determining their purity and following the progress of a reaction. It also permits the optimization of the solvent system for a given separation problem. In Shatyadi Granules, total 7 spots were seen at 254 nm wavelength. 1st spot was seen at 0.24 R_f value. 2nd spot was seen at 0.32 R_f value. 3rd spot was seen at 0.43 R_f value. 4th spot was seen at 0.65 R_f value. 5th spot was seen at 0.79 R_f value. 6th spot was seen at 0.87 R_f value. 7th spot was seen at 0.90 R_f value. In Shatyadi Granules, only one spot was seen at 366 nm wave length. The spot was seen at 0.32 R_f value. In Shatyadi Granules, total 03 spots were seen at 540 nm wavelength. 1st spot was seen at 0.24 R_f value. 2nd spot was seen at 0.32 R_f value. 3rd spot was seen at 0.66 R_f value. HPTLC finger print profile obtained in the present study for Shatyadi granules will help to develop SMP (standard manufacturing process) of Shatyadi granules which will become a standard for further study and other remedies in future Shatyadi Granules contents are shati Curcuma zedoaria (Christm.) Roscoe, Badar (Ziziphus jujuba Mill.), sugar & Ghrita. Antihistamine action of the betulinic acid (badar) and 1,8 ceniol (shati). Rhizome of Shati was observed in experimental studies. Curcuma zedoaria rhizomes antihistamine action Zizyphus jujube fruit observed antihistamine action. Which is helpful to decrease the symptoms of allergic bronchitis like sneezing, dry coughing. HPTLC finding suggests that the points observed at specific nanometres showed the presence of the active ingredient in recommended proportion in given final finished product of Shatyadi granules.

Table 4. Solubility test of shatyadi granules

Sr.No	Solvent	Result
1.	Flavonoid	Present
2.	Starch	Present
3.	Protein	Present
4.	Essential oil	Present

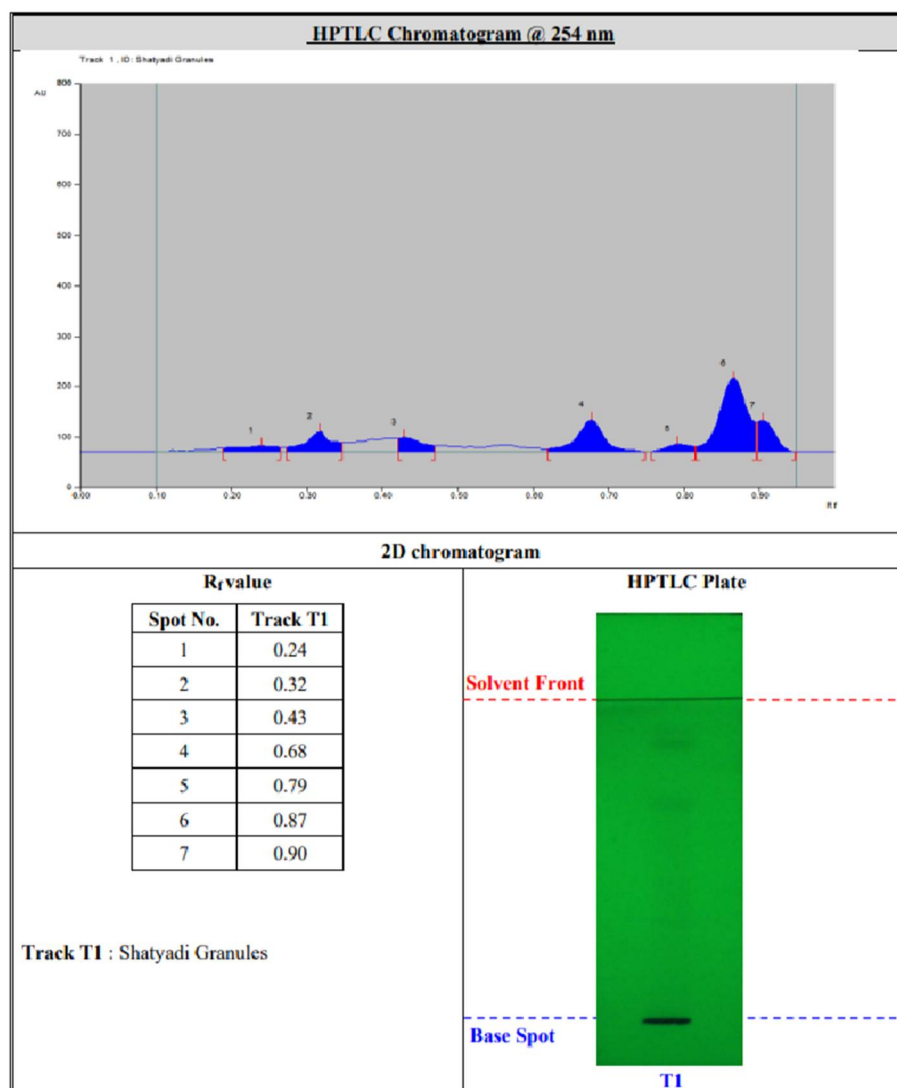


Fig. 1. HPTLC plate showing banding pattern and R_f Values at 254 nm

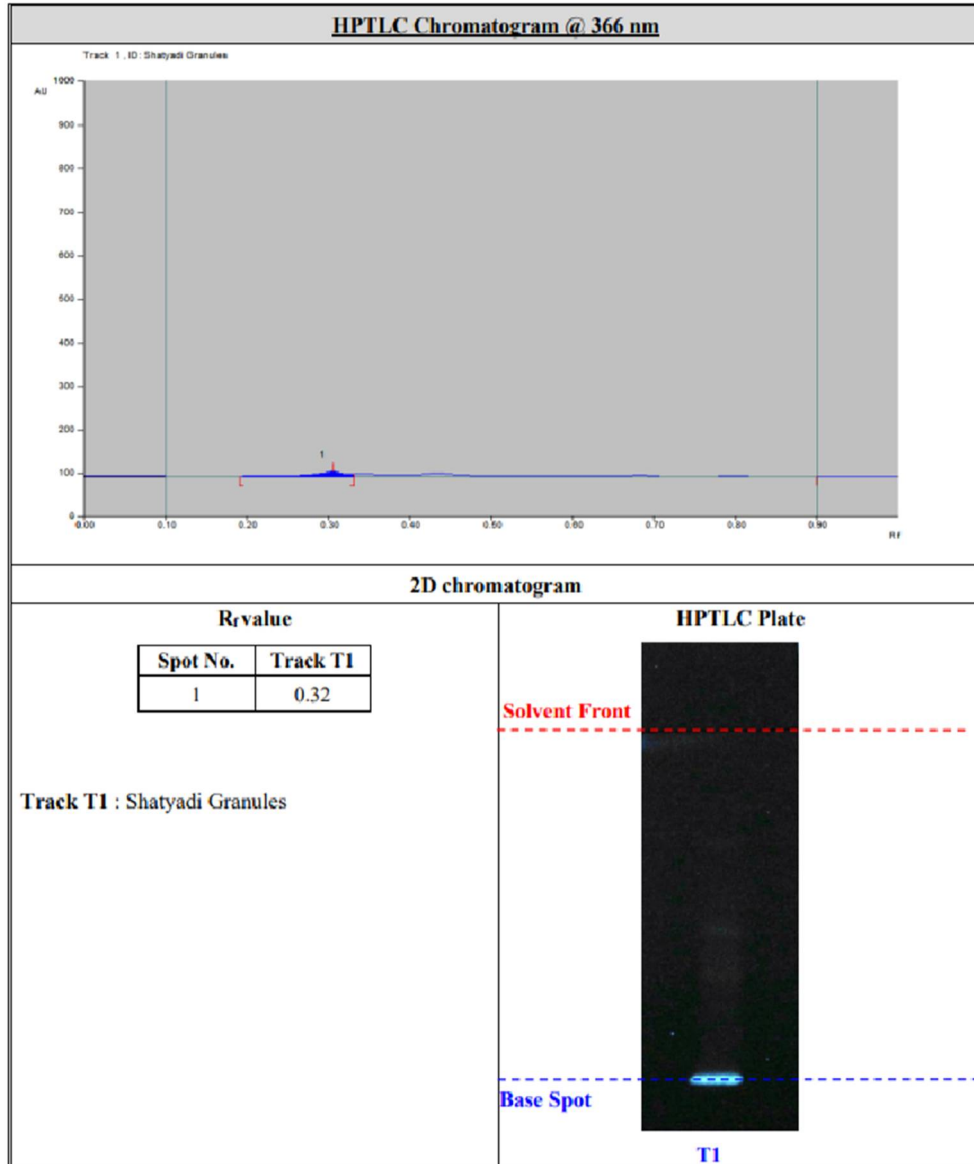


Fig. 2. HPTLC plate showing banding pattern and Rf Values at 366 nm

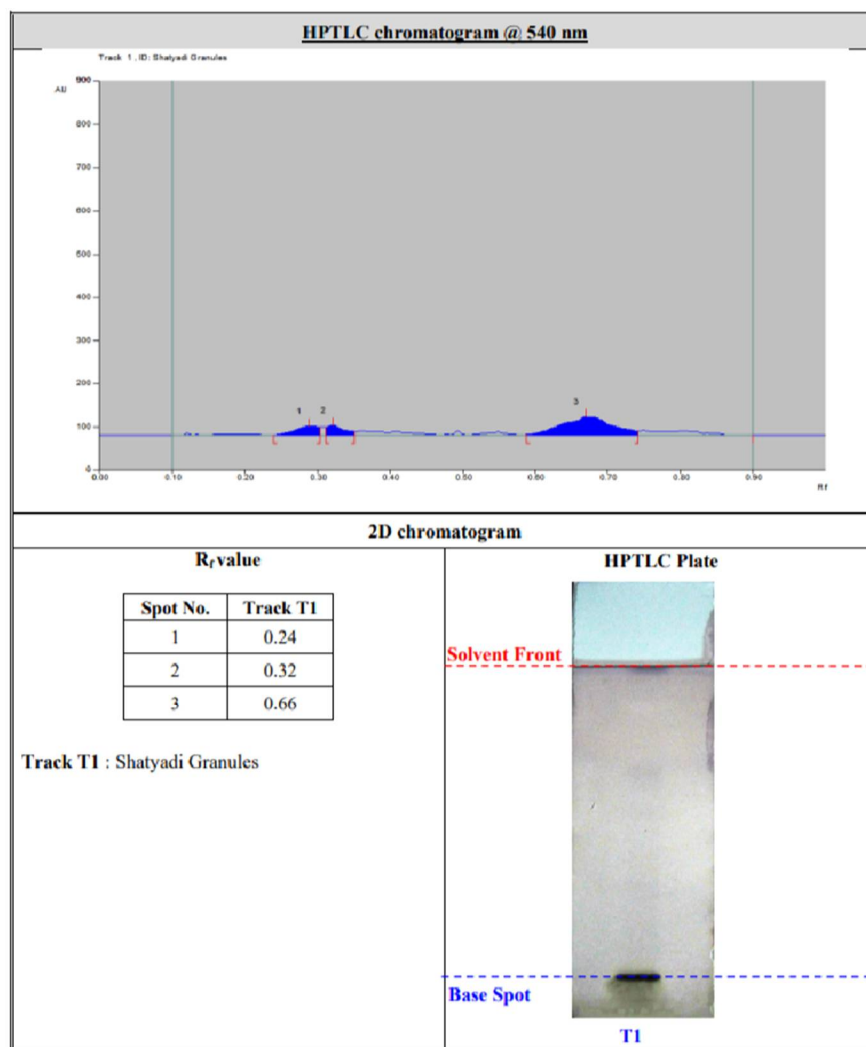


Fig. 3. HPTLC plate showing banding pattern and R_f Values at 540 nm

DISCUSSION

Allergic bronchitis in human is a most common respiratory condition. It is noticed that recurrence rate is very high due to development of resistance towards routine antihistamine drugs. Herbal preparation are best analysed to validate the preparation for assessment of quality and to authenticate the drug for its reproducibility. HPTLC finger printing is commonly used technique in synthetic chemistry for identifying volatiles, compounds, determining their purity and following the progress of a reaction. It also permits the optimization of the solvent system for a given separation problem. In Shatyadi Granules, total 7 spots were seen at 254 nm wavelength. 1st spot was seen at 0.24 R_f value. 2nd spot was seen at 0.32 R_f value. 3rd spot was seen at 0.43 R_f value. 4th spot was seen at 0.65 R_f value. 5th spot was seen at 0.79 R_f value. 6th spot was seen at 0.87 R_f value. 7th spot was seen at 0.90 R_f value. In Shatyadi Granules, only one spot was seen at 366 nm wave length. The spot was seen at 0.32 R_f value. In Shatyadi Granules, total 03 spots were seen at 540 nm wavelength. 1st spot was seen at 0.24 R_f value. 2nd spot was seen at 0.32 R_f value. 3rd spot was seen at 0.66 R_f value. HPTLC finger print profile obtained in the present study for Shatyadi granules will help to develop SMP (standard manufacturing process) of Shatyadi granules which will become a standard for further study and other remedies in future. Shatyadi Granules contents are shati, Curcuma zedoaria (Christm.) Roscoe, Badar (Ziziphus jujuba Mill.), sugar & Ghrita. Antihistamine action of the betulinic acid (badar) and 1,8 ceniol (shati). Rhizome of Shati was observed in experimental studies. Curcuma zedoaria rhizomes antihistamine action Zizyphus jujube fruit observed antihistamine action. Which is helpful to decrease the symptoms of allergic bronchitis like sneezing, dry coughing. HPTLC finding suggests that the points observed at specific nanometres showed the presence of the active ingredient in recommended proportion in given final finished product of Shatyadi granules.

CONCLUSION

All physiochemical parameters as well as analytical study parameters of Shatyadi granules shows that the authenticate drugs was used and finished product was appropriate in regards to its contents.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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