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A PHARMACO ANALYTICAL STUDY OF *VIDANGADI VATI* – A HERBAL AYURVEDIC ANTIFUNGAL DRUG

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ABSTRACT

Context: According to Ayurveda Acharyas for getting desirable outcome of any medication, it should be precisely analysed. For widespread adoption, the majority of the traditional Ayurvedic formulas need to be standardised based on more modern methods. One Ayurvedic preparation for pediatric infectious diseases is Vidangadi vati. Vidangadi vati are often utilised in Churna form; however, in this study, Churna was transformed into vati for easier administration and improved palatability. The manufacture and standardisation of Vidangadi vati based on organoleptic properties, physicochemical parameters, and HPTLC fingerprinting are the major topics of the current article.

KEYWORDS: *Vidangadi vati;* Herbal drug; HPTLC fingerprinting.

1. INTRODUCTION

Ayurveda has given more emphasis on proper knowledge of drug including identification, procurement and collection of raw materials as well as final product. Herbal medicines are derived from natural sources such as plants animals and minerals. They are used for the preparation of medicines that require standards and quality control with proper integration of scientific methods and traditional knowledge. Authentication of Herbal Medicines Certification of original medicine Procurement of high quality raw materials Evaluation of intermediate and final product and detection of harmful and toxic substances. In the era of globalization for global acceptance of Ayurveda medicine, there is need of standardization of Ayurveda medicine to provide good quality drug with higher effectiveness and high potency. In the last two decades herbal medicines have attracted much attention in Western countries due to their high medicinal activity with low toxicity and rare complications.

Vati Kalpana is one of the most useful and convenient dosage form due to easy administration, palatability, better shelf life and convenience in transport. *Vati Kalpana* is *Upakalpana* of *Kalka Kalpana*,[1] one of basic dosage form in Ayurveda pharmaceutics. *Vati Kalpana* is classified in two types according to use of fire i.e. *Sagni Vati Nirmana* and *Niragni Vati Nirmana*.

Skin is the largest organ of human body. there has been increase in incidence of skin problems in tropical and developing countries like India.[2] All the skin disease in Ayurveda are classified in broad heading of *Kustha* which are further classified in *Mahakushtha* and *Kshudra Kushta*. *Dadru*,[3] is one of the *Kshudra Kustha* according to Acharya Charaka. the main symptoms of *Dadru* are *Kandu* (Itching) *Utsanna*(Elevated circular lesion), *Mandala*(Circular Patches) *Raga* (Redness).

From the paediatric point of view, the dose of medicine should be less and appropriate to the disease. children are being more vulnerable and delicate for any disease, so special care should be taken while administering medicine to children. *Vidangadi Churna*,[4] has few difficulties in administration as a powder form due to mom-acceptability by children and bitter taste due to ingredients. For convenience of paediatric patients composition was converted into *Vati* Form.

Present study was carried out to standardize and evaluate the physico-chemical, Phytochemical properties of *Vidangadi Vati.*

2. MATERIALS AND METHODS

2.1 Procurement, Identification and authentication of raw drugs

All the raw material used for *Vidangadi Vati* were procured from local market of Vadodara, Gujarat.

Identification and authentication of the raw drug were done at Pharmacy of Parul Institute of Ayurved, Vadodara, Gujarat; (GMP certified).

2.1.1 Ingredient of *Vidangadi Vati*

Table 1: Formulation Composition of *Vidangadi Vati.*[5]

Sr. No.	Name of Ingredient	Botanical name	Family name	Part used	quantity
1	*Vidanga*	*Embelia ribes* Burm F.	*Myrsinaceae*	Fruit	300 gm
2	*Amalaki*	*Embelia officinale*	*Euphorbiaceae*	Fruit	300 gm
3	*Haritaki*	*Terminalia chebula*	*Combretaceae*	Fruit	300 gm
4	*Bibhitaki*	*Terminalia belerica*	*Combretaceae*	Fruit	300 gm
5	*Pippali*	*Piper longum*	*Piperaceae*	Fruit	300 gm
6	Acacia Gum powder	-	-	-	150 gm
7	Distilled water	-	-	-	12 litre
8	Loss				200 gm
9	Final quantity obtained				1.3 kg

2.2 Methodology of preparation of *Vidangadi Vati*.[6]

- All the raw material were collected and all physical impurities were removed.
- Raw material were authentified in Pharmacognosy laboratory of Pharmacy, Parul Institute of Ayurveda, Vadodara, Gujarat, India.
- Fine powder of all the ingredients were prepared by using 60# mesh.
- Then fine powder was taken to make granules of it.
- Wet granules were made by triturating with distilled water in edge runner.
- Granules were dried in hot air oven.
- Gum acacia powder was added as binding agent and tablet was prepared by using tablet making machine.

2.2.1.Phytochemical and analytical study

Phytochemical properties are essential for primary evaluation of final product to reveal the presence of the original drug in final punished product, while analytical study is very essential for validation of the exact proportion of the ingredients in the final product. Organoleptic character like colour, odour, and consistency was carried. Physicochemical study carried out for Loss on Drying at 110^0 C, Total Ash Value, Acid Insoluble Ash, pH, specific gravity, Refractive index, and Total solids content was done.

Organoleptic characters, physicochemical parameters, solubility test of *Vindagadi Vati* was done at Pharmacy of Parul Institute of Ayurveda,Vadodara ,Gujarat and HPTLC study done at Vasu Research Centre, GIDC, Makarpura, Vadodara. (Sample ID- AD/22/142 Dated: 17/06/2022)[7] HPTLC study was carried out with MERCK - TLC / HPTLC Silica gel 60 F_{254} on Aluminum sheets by means of CAMAG Linomat 5 - Applicator. the mobile phase used was Toluene : Ethyl acetate : Acetic acid (7 : 3 : 0.1 v/v).

3. RESULTS AND DISCUSSION

Table 2: Organoleptic characters of *Vidangadi Vati.*

Sr.No.	Parameters	Results
1	Color	Dark brown
2	Odour	Sour
3	Taste	Sour and Astringent
4	Consistency	Tablet form (solid)
5	Touch	Rough
6	Shape	Round

Table 3: Physico-chemical parameters of *vidangadi vati.*[8]

Sr. No	Parameters	Value
1.	Loss on drying at 110c (%w/w)	12.81
2.	Total ash value (%w/w)	7.15
3.	Acid insoluble ash (%w/w)	4.50
4.	Water soluble extractive (%w/w)	44
5.	Alcohol soluble extractive (%w/w)	38.1
6.	P^H value (10% aqueous)	5.5 (10 % Aqueous)
7.	Tablet hardness	4.3
8.	Tablet weight variation	571 mg
9.	Tablet friability	2.8 gm
10.	Tablet Disintiration test (% W/W)	9 minutes

Table 4: Solubility test of *Vidangadi vati.*

Sr. No.	Solvent	Result
1.	Alkaloid	Present
2.	Tannin	Present
3.	Glycoside	Present
4.	Essential oil	Absent
5.	Carbohydrate	Present

HPTLC finger printing

Weigh 2.5 g of sample in a beaker and to it add 50 mL of Methanol. Reflux for 1 hrs. Cool and filter with filter paper. Use the Test solution thus obtained for HPTLC fingerprinting.

3.2.1. 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 %).[9]

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± 5^0C for 3 minutes

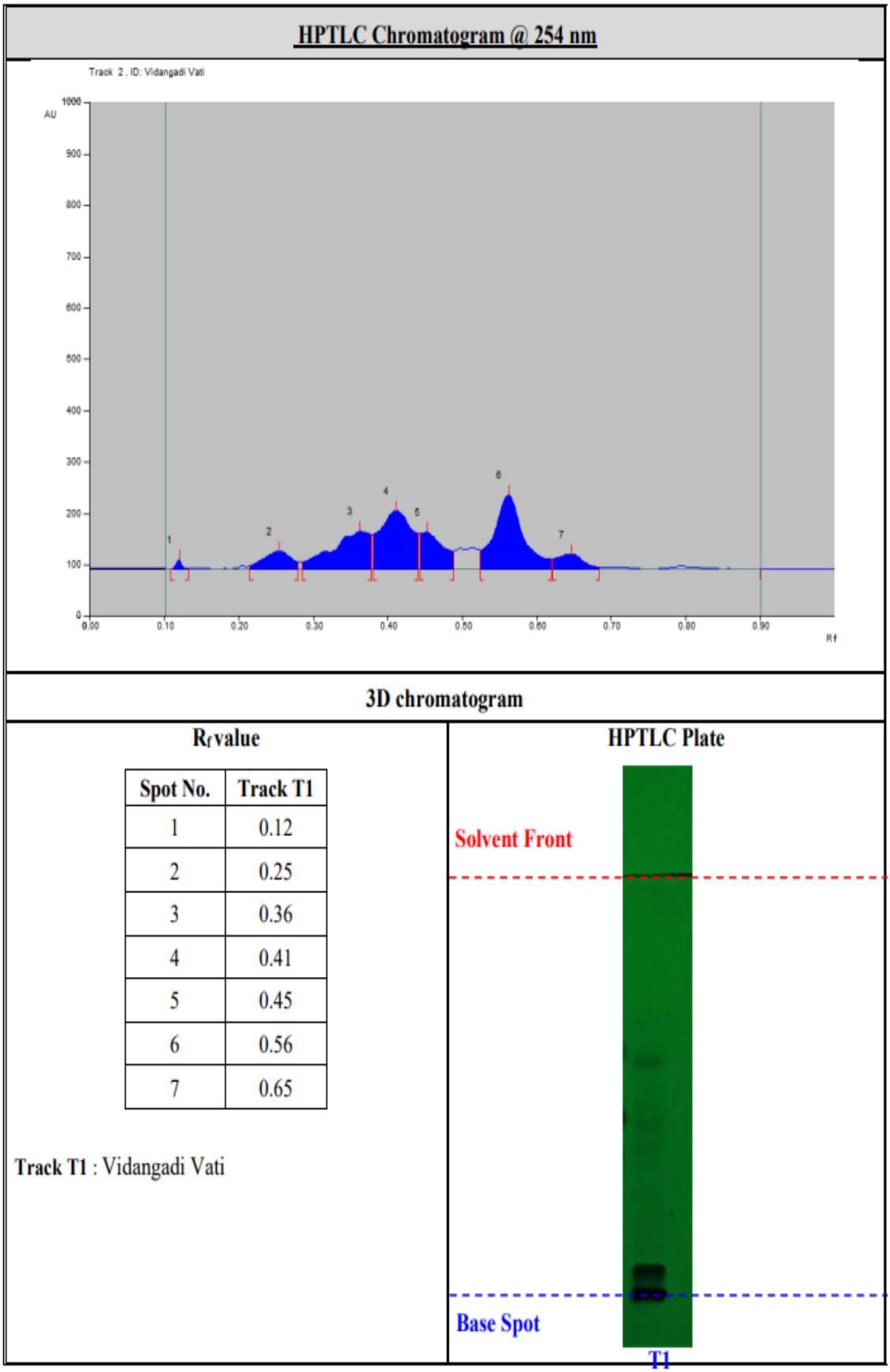
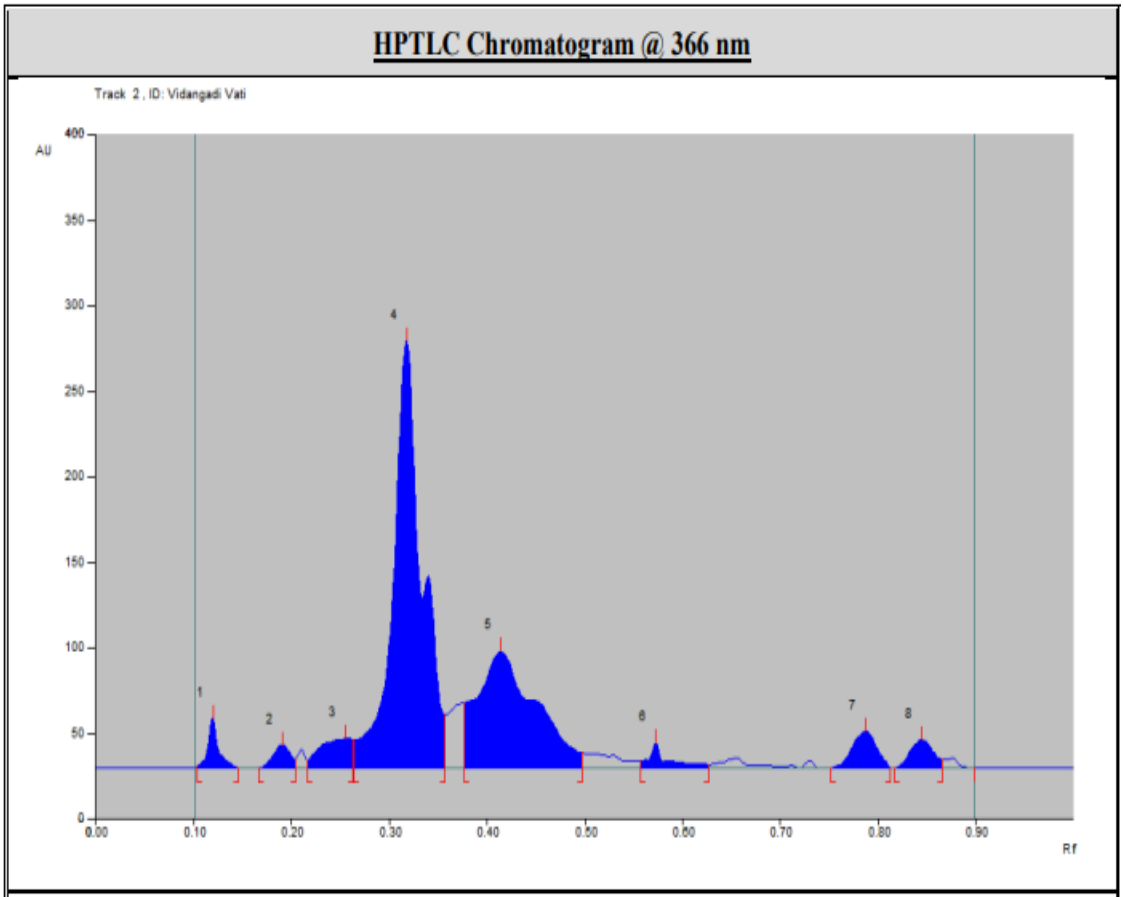


Fig. 1: HPTLC plate showing banding pattern and Rf Values at 254 nm.



R_f value

Spot No.	Track T1
1	0.12
2	0.19
3	0.25
4	0.32
5	0.41
6	0.56
7	0.79
8	0.84

Track T1 : Vidangadi Vati

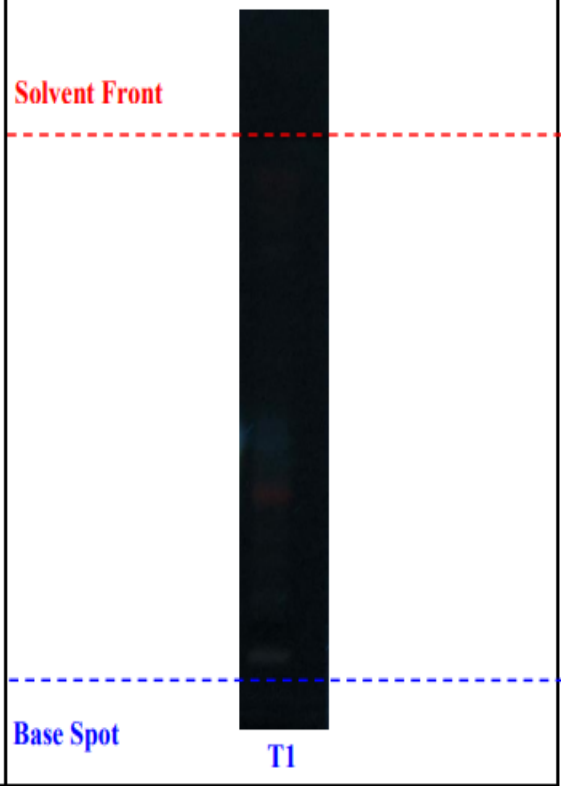


Fig. 2: HPTLC plate showing banding pattern and Rf Values at 366 nm.

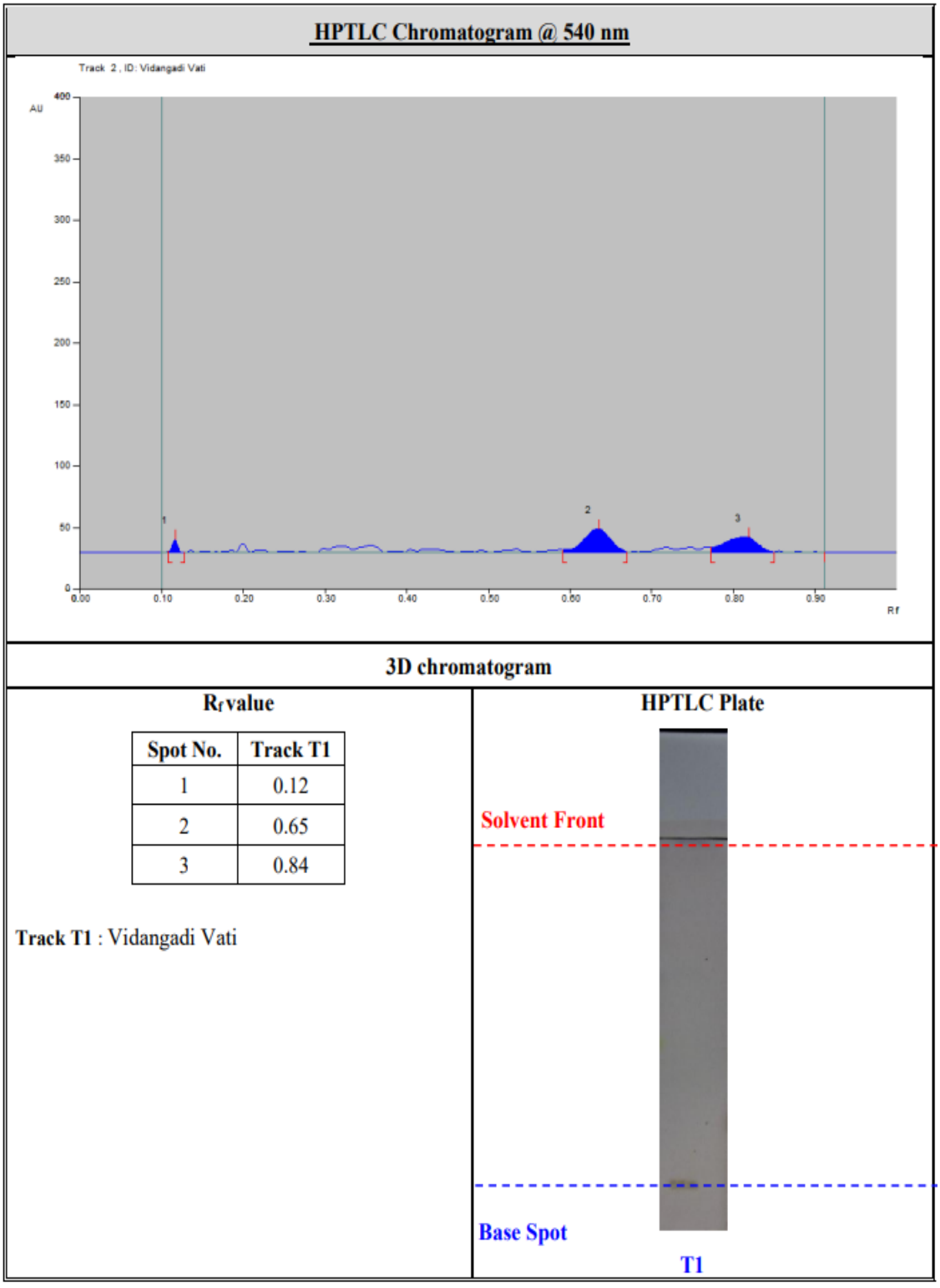


Fig. 3: HPTLC plate showing banding pattern and Rf Values at 540 nm.

Vidangadi Vati was in *Vati* form so organoleptic characters like dark brown in colour, sour and astringent taste with rough in touch and round in shape were observed. (Table-2).[10]

pH,[11] of any liquid provides the quantitative indication of the acidity or alkalinity of a solution which was 5.5 i.e. basic. Loss on drying,[12] at 110° C was 12.81(%w/w).Total Ash,[13] value represent the inorganic residue in product.it confirms the purity and quality of herbal medicine. Total ash value and Acid insoluble ash,[14] were 7.15% w/w, 4.50% w/w respectively. (**Table No.-2).**Water soluble extractive,[15] and alcohol soluble extractive,[16] were 44 % w/w and 38.1 %w/w respectively. (**Table No.-2).**

Physical parameters for *Vati* like Tablet Hardness,[17] Weight Variation and Friabllity were 4.3 kg/cm^2, 571 mg and 2.8 % respectively. Tablet Disintegration,[18] time for *Vidangadi Vati* was 9 minutes. (**Table No.-3)**

Preliminary phyto chemical investigation show presence of Alkaloid, Tannin, Glycoside and Carbohydrate in *Vidangadi Vati.* (**Table No.-4).**Chromatographic study (HPTLC) of final product *Vidangadi Vati* carried to establish fingerprinting profile. Rf values and colour of the spots in chromatogram developed in Toluene .: Ethyl acetate : Acetic acid (7 : 3 : 0.1 v/v)media.**(Fig.-1,2,3)**

4. DISCUSSION

In recent Cosmetic era, skin diseases have gained more importance and attention due to common manifestation and more so frequent. Dermatophytosis, also known as ringworm, is a fungal infection of the skin of various part of body.Tinea corporis is a rash caused by a fungal infection. It's usually an itchy, circular rash with clearer skin in the middle. Tinea corporis is spread by the shedding of fungal spores from infected skin. Transmission is facilitated by a warm, moist environment and the sharing of fomites including bedding, towels, and clothing. Dermatophyte infection elsewhere on the skin, such as tinea pedis, can also be transferred. In Ayurveda skin diseases are mentioned under the name *Kustha*, *Tridoshaja Vyadhi* which involves *Rasa, Rakta, Mamsa* & *Lasika* etc. *Dadru* is one of the most common but miserable variety of *Kushta* affects the population of all the age group & it stands as challenge to different medical systems. *Vidangadi Vati* is combination of anti-inflammatory, antibacterial, antifungal, antimicrobial and antioxidant herbal drug. *vidangadi vati* was evaluated as per WHO guidelines on quality controls and standardization of medicinal plant materials. No foreign matter was found due to careful manual selection of ingredients.

In *Vidangadi Vati*, total 07 spots were seen at 254 nm wavelength. 1st spot was seen at 0.12 R_f value. 2nd spot was seen at 0.25 R_f value . 3rd spot was seen at 0.36 R_f value. 4th spot was seen at 0.41 R_f value. 5th spot was seen at 0.45 R_f value.6th spot was seen at 0.56 R_f value. 7th spot was seen at 0.65 R_f value.

In *Vidangadi Vati*,, total 08 spots were seen at 366 nm wavelength. 1st spot was seen at 0.12 R_f value. 2nd spot was seen at 0.19 R_f value. 3rd spot was seen at 0.25 R_f value. 4th spot was seen at 0.32 R_f value. 5th spot was seen at 0.41 R_f value.6th spot was seen at 0.56 R_f value. 7th spot was seen at 0.79 R_f value. 8th spot was seen at 0.84 R_f value.

In *Vidangadi Vati*,, total 03 spots were seen at 540 nm wavelength. 1st spot was seen at 0.12 R_f value. 2nd spot was seen at 0.65 R_f value . 3rd spot was seen at 0.84 R_f value.

Vidangadi vati 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. Preliminary phyto chemical analysis indicated the presence of alkaloids, glycosides, tannins, carbohydrates and Phenolic compounds.

5. CONCLUSION

In order to determine the quality and purity of *Vidangadi Vati*, the current study has produced some preliminary phytochemical data that will be useful in identifying real *Vidangadi Vati*. Qualitative research has suggested that the medicine contains Alkoloids, Glycosides, Tanins, and Carbohydrates; additional research is needed to determine their exact composition.

Present study shows data about Physico-chemical parameter and HPTLC Study of *Vidangadi Vati.* Since no any data regarding Vidangadi Vati found in API, SO that parameter of this study can be used as standard. Further the HPTLC results can also be compared with standards of individual raw material for obtaining and concluding standards for *Vidangadi Vati.*

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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