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A Pharmaceutical Analysis of *Febrikid Suspension* –A Polyherbal Ayurvedic Antipyretic Drug

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ABSTRACT

According to *Ayurved Acharyas* for getting desirable outcome of any medication, it should be precisely analysed. Most of the *Ayurved* classical formulations need to be standardized based on newer techniques for their Worldwide acceptance. *Guduchyadi kashaya* is traditionally used in *Kashaya* form but in this study, *Kashaya* was converted into Suspension form by adding *Godanti* to increase its effect and efficacy and for better palatability and convenience of administration. The present study mainly deals with the preparation and standardization of *Febrikid Suspension* on the basis of organoleptic characteristics, physicochemical parameters and HPTLC fingerprinting.

Keywords- *Guduchyadi kashaya; Febrikid suspension; poly herbal; HPTLC fingerprinting.*

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INTRODUCTION

Standardization of poly herbal medicine is the process of developing and agreeing upon technical standards. Specific standards are set to carry out the experimentation, which would lead to the development of a set of characteristics exhibited by the particular poly herbal medicine. Hence, standardization is a tool in the quality control process [1]. While assuring the quality of the drug, consistency of active principles and therapeutic efficacy, standardization of herbal formulations is an essential part. *Guduchyadi Kashaya* mentioned in *Sharangdhara Samhita* is used in *Jwara*. In order to increase the efficacy and potential of medicine; *Kashaya* can be converted to Suspension, which is highly effective and potent. With this logic to reduce the dose and to increase the efficacy and palatability *Guduchyadi Kashaya* is converted into suspension and Gypsum is added to prepare “*Febrikid*” suspension [2-6]. The ingredients are *Guduchi*, *Padmaka*, *Nimba*, *Dhanyaka*, *Raktachandana*, *Sitakhanda* (Sugar candy) and Honey (Table 1). In present study the form of drug has been modified from *Kashaya* to suspension 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 Drug

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, Gujarat.

Methodology of Preparation of *Febrikid Suspension*

Preparation of *Kwath* (Decoction) [2]

Required quantity of *Guduchi*, *Padmaka*, *Nimba*, *Dhanyaka*, *Raktachandana* were taken in *Yavakuta* form in a clean stainless steel decoction vessel along with clean water. All drugs were then mixed properly in a vessel and were kept undisturbed for whole night. Next day the mixture was heated on medium flame in stainless steel vessel till the quantity of liquid reduced to one fourth then filtered.

Preparation of syrup

To this filtered *kwath* prescribed quantity of powdered sugar was added and then whole mixture heated and stirred until solution attains thread consistency. After cooling of suspension *Godanti bhasma*, honey

and preservative sodium benzoate were added in required amount and later packed in sterile air tight container.

Phytochemical and analytical study

Organoleptic characters, physicochemical parameters, solubility test was done at Pharmacy of Parul Institute of Ayurved and HPTLC study was done at Vasu Research Centre, GIDC, Makarpura, Vadodara. (Sample ID- AD/21/083 Dated: 27/04/2022). *Febrikid suspension* was analyzed by employing various analytical parameters. Organoleptic character like color, odor, consistency was carried. Physicochemical study to analyze 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 [3,4,5]

1 gram of suspension sample weighed and 10 mL methanol was added to it. Refluxed for 15min and then filtered with the help of Whatman filter paper No.1. The obtained solution was applied on a pre coated MERCK- TLC/PHTLC silica gel 60 F254 on aluminum sheets to a band width of 10mm using CAMAG Linomat 5 – applicator. *Febrikid suspension* plate was developed in Toluene: Ethyl acetate: Formic acid: Methanol in the ratio of 6:3:0.1:1 respectively. After derivatization in CAMAG-dip tank for one minute with Vanillin- sulphuric acid reagent visualized in short and long UV. The plate was scanned at 254 nm, 366 nm, 540 nm and R_f, color spots and densitometric scan were recorded.

RESULTS

Organoleptic characters of the *Febrikid suspension* are illustrated in (Table 2). The suspension is berry red in color. Physicochemical parameters (Table 3) pH of any liquid provides the quantitative indication of the acidity or alkalinity of a solution which was 5.7 i.e., acidic. Specific gravity of *Febrikid suspension* was 1.3560, suggests that the quality of prepared suspension is within normal limits. Refractive index was 1.4542 and Loss on drying at 110°C was 20.10 (%w/w), Total Ash value 1.36% w/w, Acid insoluble ash 0.75% w/w and Total solids were 74.99. Solubility test of *Febrikid suspension* (Table 4) shows that it is soluble in Methanol, Chloroform, 0.5 N HCL and water. Chromatographic study (HPTLC) of final product *Febrikid suspension* carried to establish fingerprinting profile. R_f values and color of the spots in chromatogram developed in Toluene: Ethyl acetate: Formic acid: Methanol in the ratio of 6:3:0.1:1 v/v were recorded. TLC photo documentation revealed presence of many Phyto-constituents with different R_f values and HPTLC densitometric scan of the plates showed numerous bands. Study revealed, at 254 nm got 2 spots, densitometric scan at 254 nm revealed 2 peaks corresponding to 2 different compounds with R_f – 0.69 and 0.73 were found in the suspension (Fig. 1). At 366 nm only 3 spots, densitometric scan at 366 nm revealed 3 peaks corresponding to 3 different compounds with R_f – 0.57, 0.64 and 0.73 were found in the suspension (Fig.2) and at 540 nm only 3 spots, densitometric scan at 540 nm revealed 3 peaks corresponding to 3 different compounds with 3 different R_f – 0.64, 0.73 and 0.78 were found in the suspension (Fig. 3).

Table 1. Composition, parts used and physicochemical parameters of Febrikid Suspension

SR.NO.	Sanskrit Name	Scientific Name	Part Used	Ratio
1	<i>Guduchi</i>	<i>Tinospora Cordifolia Thunb.</i>	<i>Kanda</i>	1 Part
2	<i>Dhanyaka</i>	<i>Coriandrum Sativum Linn</i>	<i>Phala</i>	1 Part
3	<i>Raktachandana</i>	<i>Pterocarpus Santalinus (L.f.) Kuntze</i>	<i>Kanda</i>	1 Part
4	<i>Neemba</i>	<i>Azadirachta Indica A.Juss.</i>	<i>Kanda</i>	1 Part
5	<i>Padmaka</i>	<i>Prunus Cerasoides D.Don</i>	<i>Sara</i>	1 Part
6	<i>Godanti</i>	<i>Gypsum (CaSO₄·2H₂O)</i>	<i>Bhasma</i>	1/10 Part

Table 2. Organoleptic characters of Febrikid Suspension

Parameters	Results
Color	Berry red
Odor	Odorless
Taste	Sweet and bitter
Consistency	Liquid

Table 3. Physico-chemical parameters of Febrikid Suspension

SR.No.	Parameter	Results
1.	Loss on Drying at 110 c (%w/w)	31.65
2.	Total Ash Value (%w/w)	1.36
3.	Acid Insoluble Ash (%w/w)	0.75
4.	pH Value	5.7
5.	Specific gravity (cc)	1.3560
6.	Refractive index	1.4542
7.	Total solid content	67.50

Table 4. Solubility test of Febrikid Suspension

SR.NO	Solvent	Results
1	Methanol	Soluble
2	Chloroform	Soluble
3	Diethyl ether	Insoluble
4	HCL (0.5 N)	Soluble
5	Water	Soluble

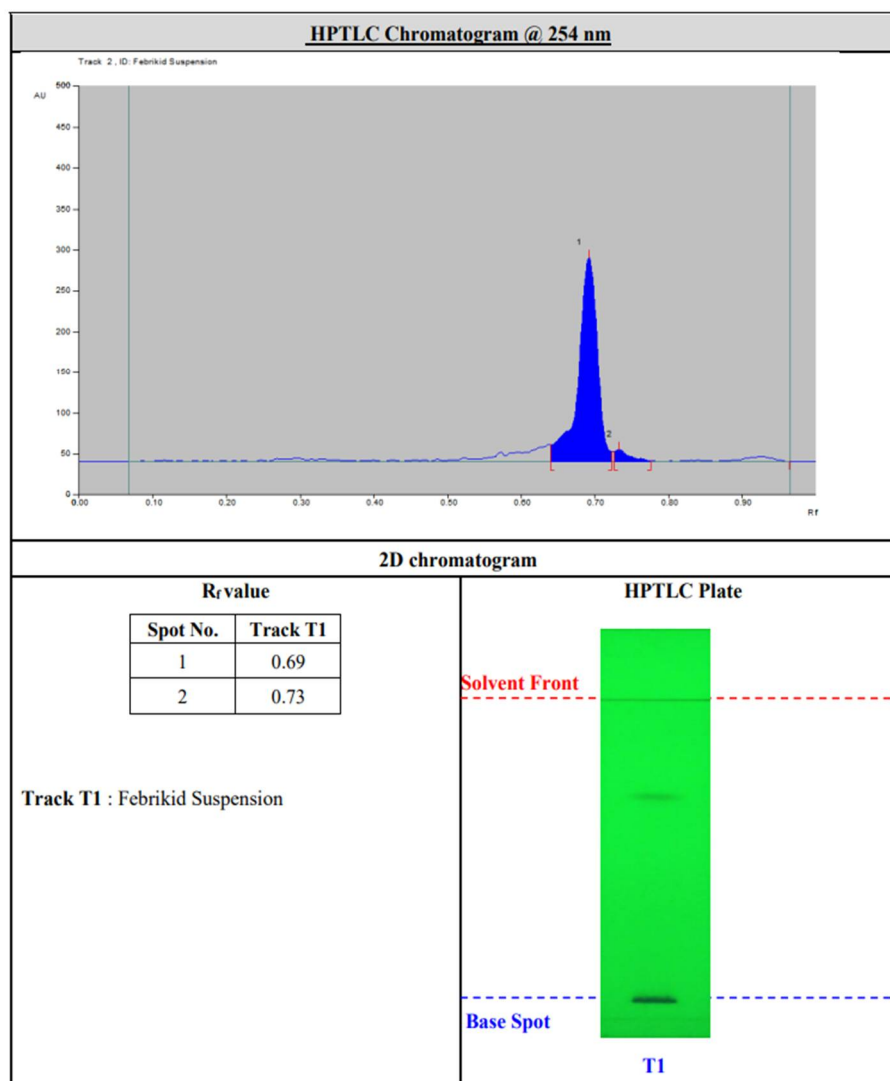


Fig. 1. HPTLC plate showing banding pattern and R_f Values at 254 nm

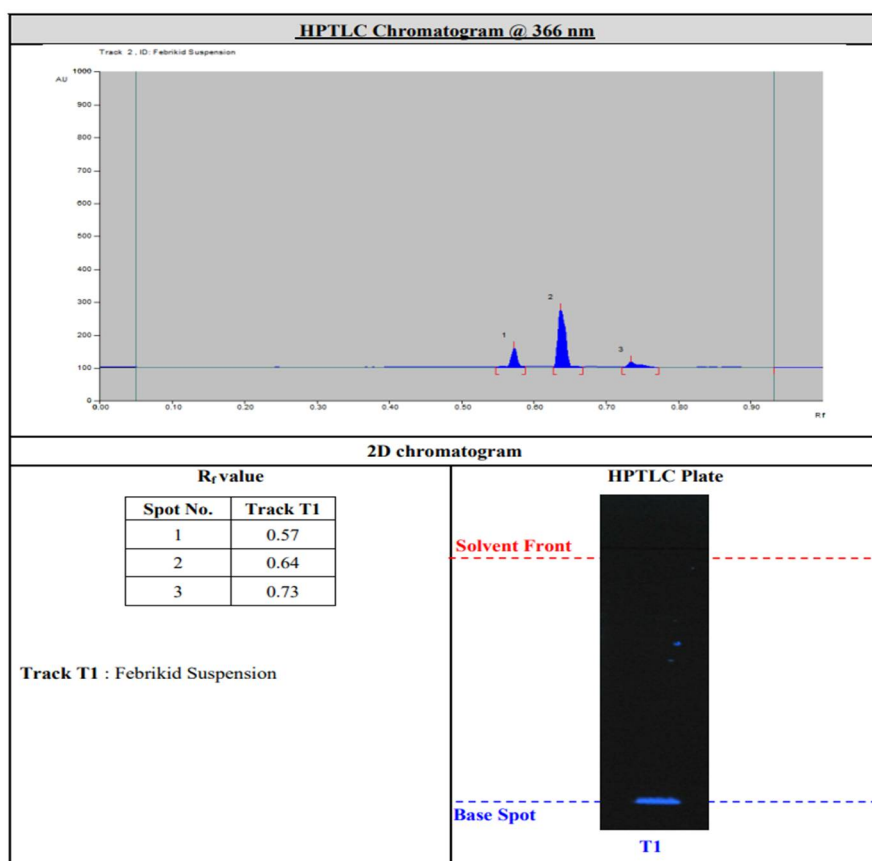


Fig. 2. HPTLC plate showing banding pattern and R_f Values at 366 nm

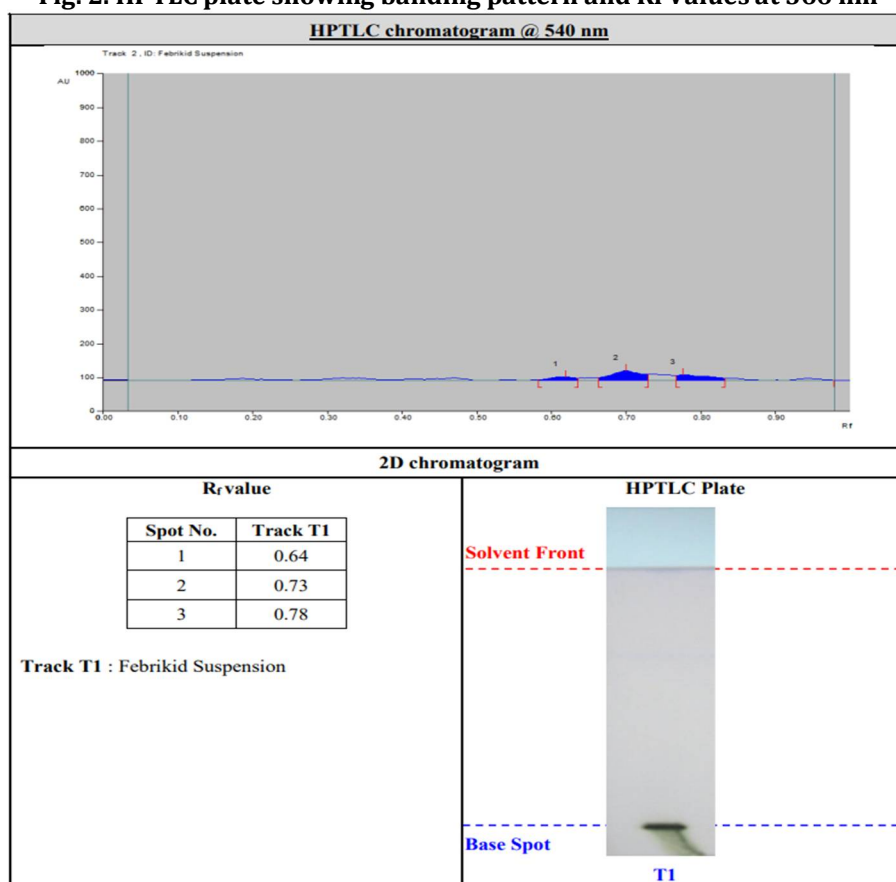


Fig. 3. HPTLC plate showing banding pattern and R_f Values at 540 nm

DISCUSSION

Febrikid suspension contains *Guduchi* (*Tinospora Cordifolia* Thunb.), *Dhanyaka* (*Coriandrum Sativum* Linn), *Raktachandana* (*Pterocarpus Santalinus* (L.f.) Kuntze), *Neemba* (*Azadirachta Indica* A.Juss.), *Padmaka* (*Prunus Cerasoides* D.Don), *Godanti* [*Gypsum* ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)], *Sitakhanda* (Sugar candy) and Honey. In classical texts of Ayurveda, namely, *Charak*, *Sushruta* and *Ashtang Sangraha* and other treatises like *Bhava Prakash* and *Dhanvantari Nighantu*, etc., *T. cordifolia* is claimed to be useful in treating fever. The water-soluble fraction of 95% ethanolic extract of *T. cordifolia* plant has shown significant antipyretic activity [7]. 'Nimbidin' a constituent chemical of *Neemba* have shown antipyretic activity [5,6].

CONCLUSION

Fever is primary clinical feature of most of illnesses and it is very primary sign that led the individual for seeking the medical aid and forcing the physician to investigate the case. Properties of *Febrikid suspension* are not only *Jwarghna* but also have properties that may affect the cause of *Jwara* and have hepatoprotective effect. Poly-herbal preparations are best analyzed to validate the preparation for assessment of quality and to authenticate the drug for its reproducibility. HPTLC finger-printing technique is commonly used 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. The analytical data and HPTLC finger-print profile obtained in the present study for *Febrikid Suspension* will help to develop SMP (Standard manufacturing process) of *Febrikid Suspension* which will become a standard for further study and other remedies in future.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest.

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