International Journal of Pharmacy and Analytical Research (IJPAR)

ISSN: 2320-2831

IJPAR |Vol.12 | Issue 1 | Jan - Mar -2023
www.ijpar.com

Research article ***Analytical research***

Pharmacognostic evaluation of an indigenous polyherbal formulation: *Patoladi* syrup

Dr. Ganga N[1], Dr. Shailaja U[2], Dr. Kannan Sagar[3]

[1]Assistant Professor, Department of Kaumarabhritya, Bapuji Ayurveda Medical College & Hospital, Challakere – 577522, Chitradurga, Karnataka
[2] Vice Principal & Professor; MD (Ayu), PhD (Ayu), Department of Kaumarabhritya, Sri Dharmasthala Manjunatheshwara College of Ayurveda & Hospital, Hassan – 573201, Karnataka
[3]Assistant Professor & Ph D Scholar, Department of Kaumarabhritya, Sri Dharmasthala Manjunatheshwara College of Ayurveda & Hospital, Hassan – 573201, Karnataka

***Corresponding Author: Dr. Ganga N**

ABSTRACT

Patoladi syrup is a poly herbal formulation, which was developed as a remedy for Tundikeri (Chronic Tonsillitis) based on traditional knowledge. The formulation is prepared with herbs which include *Patola (Tricosanthes dioica Roxb.), Shunti (Zingiber officinale Roscoe.), Triphala (Terminalia chebula Retz., Terminalia bellerica Roxb., Emblica officinalis Gaertn.), Vishala (Citrullus colocynthis Scharad.), Brahmi (Bacopa monnieri Linn.), Katuki (Picrorhiza kurroa Royle ex. Benth), Haridra (Curcuma longa Linn.) , Daruharidra (Berberis aristata Dc.) , Guduchi (Tinospora cordifolia Willd. Miers ex. Hook. F & Thoms)* ***Aim:*** To standardize *Patoladi* Syrup.
Materials and methods: The raw materials were collected, authenticated & Physico - chemical studies like refractive index, specific gravity, viscosity, total solids, reducing and non-reducing sugar, and HPTLC were carried out as per the WHO guidelines, Indian Pharmacopoeia and Ayurvedic Pharmacopoeia.
Conclusion: Standardization tests done on *Patoladi* Syrup helped in authenticating and ensuring the quality of the same.

Keywords: Syrup, Polyherbal, Standardization, HPTLC, *Patoladi, Tundikeri*

INTRODUCTION

Man, and his search for drugs in nature dates from time immemorial, of which there is ample evidence from various sources: written documents, preserved monuments and even original plant medicines. As a result of the many years of struggles against illnesses is by which man learned to pursue drugs in barks, seeds, fruits and other parts of the plants. Contemporary science has acknowledged their active action, and it has included in modern pharmacotherapy a range of drugs of plant origin[1]. All medicines, whether synthetic or of plant origin, should fulfil the basic requirements of being safe and effective. Standardization of herbal medicines is the process of prescribing a set of standards or inherent characteristics, constant parameters and definitive qualitative and quantitative values that carry an assurance of quality, efficacy, safety, and reproducibility[2]. As herbal medicines contain more than one active principle and the active compound is frequently unknown, the standardisation of them becomes most of the times challenging. The quality assessment of herbal formulations is important to justify their acceptability and safety[3].

Patoladi syrup contains 11 ingredients[4] which are *Patola (Tricosanthes dioica Roxb.), Shunti (Zingiber officinale Roscoe.), Triphala (Terminalia chebula Retz., Terminalia bellerica Roxb., Emblica officinalis Gaertn.), Vishala (Citrullus colocynthis Scharad.), Brahmi (Bacopa monnieri Linn.), Katuki (Picrorhiza kurroa Royle ex. Benth), Haridra (Curcuma longa Linn.) , Daruharidra (Berberis aristata Dc.) , Guduchi (Tinospora cordifolia Willd. Miers ex. Hook. F & Thoms).* They have a combined action over the vitiated

doshas (body humors – vata, pitta, kapha) & the domination of *Tikta (bitter) katu (pungent) kashaya (astringent) rasa (taste) & Laghu (light) ruksha (dry) guna (property),* makes the drug act as an excellent *Kapha hara (reducing kapha),Shopha hara* (Anti-inflammatory) & having *Lekhana* (Scraping) property[5] which helps in reducing the cardinal features of *Tundikeri* (Tonsillitis). The following table details the properties of the ingredients used in *Patoladi* syrup.

Table 1: Properties of ingredients of *Patoladi* syrup

Drugs[6]& Part Used	*Rasa*	*Guna*	*Veerya*	*Vipaka*	*Doshaghnatha*
Patola (Root)	*Tiktha, Katu*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Kaphapittahara*
Shunti (Rhizome)	*Katu*	*Guru, Ruksha, Tikshna*	*Ushna*	*Madhura*	*Vatakapha Hara*
Harithaki (Fruit)	*Kashayapradhana Lavanavarjitha Pancharasa*	*Laghu, Ruksha*	*Ushna*	*Madhura*	*Tridoshahara*
Vibhithaki (Fruit)	*Kashaya*	*Ruksha, Laghu*	*Ushna*	*Madhura*	*Kaphapittahara*
Amalaki (Fruit)	*Amlapradhana Lavana Varjitha Pancha Rasa*	*Ruksha, Laghu, Sara*	*Sheetha*	*Madhura*	*Tridoshahara*
Vishala (Root)	*Tiktha*	*Laghu, Ruksha, Tikshna*	*Ushna*	*Katu*	*Kaphapittahara*
Brahmi (Whole plant)	*Tiktha, Kashaya*	*Laghu*	*Sheetha*	*Madhura*	*Kaphapittahara*
Katuki (Rhizome)	*Tiktha*	*Ruksha, Laghu*	*Sheetha*	*Katu*	*Kaphapittahara*
Haridra (Rhizome)	*Tiktha, Katu*	*Ruksha, Laghu*	*Ushna*	*Katu*	*Kaphavatahara*
Daruharidra (Stem bark)	*Tiktha, Kashaya*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Kaphapittahara*
Guduchi (Stem)	*Tiktha, Kashaya*	*Guru, Snigdha*	*Ushna*	*Madhura*	*Tridhoshahara*

MATERIALS AND METHODS

Physico - chemical studies like refractive index, specific gravity, viscosity, total solids, reducing and non-reducing sugar, and HPTLC were carried out as per the WHO guidelines, Indian Pharmacopoeia and Ayurvedic Pharmacopoeia.

Plant Material

The constituents of *Patoladi* syrup were collected from the CKKM Pharmacy, Ernakulam, Kerala State, India in the month of March 2018. The collected drug was identified and authenticated by the same pharmacy. (Ayurveda medicine manufacturers license no. EKM/03/240/1992 & Drug license no. 63/25D/2009).

METHODOLOGY

The studies were done at Sri Dharmasthala Manjunatheswara Centre for Research in Ayurveda and Allied Sciences, Kuthpady, Udupi, Karnataka State, India as per standard procedure.

Refractive index

Placed a drop of water on the prism and adjusted the drive knob in such a way that the boundary line intersects the separatrix exactly at the centre. Noted the reading. Distilled water has a refractive index of 1.3325 at 25˚C. The difference between the reading and 1.3325 gives the error of the instrument. If the reading is less than 1.3325, the error is minus (-) then the correction is plus (+) if the reading is more, the error is plus (+) and the correction is minus (-). Refractive index of oil is determined using 1 drop of the sample. The correction if any should be applied to the measured reading to get the accurate refractive index. Refractive index of the test samples was measured at 28˚C

Specific gravity

Cleaned a specific gravity bottle by shaking with acetone and then with ether. Dried the bottle and noted the weight. Cooled the sample solution to room Temperature. Carefully filled the specific gravity bottle with the test liquid, inserted the stopper and removed the surplus liquid. Noted the weight. Repeated the procedure using distilled water in place of sample solution.

Viscosity

The given sample is filled in a U tube viscometer in accordance with the expected viscosity of the liquid so that the fluid level stands within 0.2 mm of the filling mark of the viscometer when the capillary is vertical and the specified temperature is attained by the test liquid. The liquid is sucked or blown to the specified height of the viscometer and the time taken for the sample to pass the two marks is measured. Viscosity is measured using the formula

$$\eta 1 = \frac{\rho 1 t 1}{\rho 2 t 2} \times \eta 2$$

η1 – Viscosity of sample
η2 - Viscosity of water
t1 and t 2- time taken for the sample and water to pass the meniscus
ρ1 and ρ2 – Density of sample and water

X= Specific gravity of sample x 0.9961/specific gravity of water

□= Xx Time for sample x 1.004/specific gravity of water x 70 sec

Total solids

Transfer accurately weighed 50 g of the sample to an evaporating china dish, which have been dried to a constant weight and evaporate to dryness on a water bath, then dry at 105 degree Celsius for 3 hr. After cooling the dish containing the residue in a desiccator for 30 min, weigh it immediately. The weight of residue should comply with the requirements stated under the individual monograph.

Reducing and non-reducing sugar

10 g of sample was taken in a 250 ml volumetric flask and 200 ml of water was added. Slight excess solid basic Lead acetate was added to remove tannins and made up to the mark without disturbing the solution by adding water. Shake and filtered. Slight excess of solid Sodium oxalate was added to remove excess of basic Lead acetate, shake and filtered. This filtrate was used for the estimation of reducing sugar.

Reducing sugar: Take the sugar solution in a 50 ml burette.

Preliminary titration: 10 ml of Fehling's solution was pipette into a 250 ml conical flask, from the burette, 15 ml of the sugar solution was added. The liquid boiled on asbestos-covered gauze and further quantities of the sugar solution was added (One ml at a time) at 10 to 15 second intervals to the boiling liquid until the blue colour is nearly discharged. 3-5 drops of aqueous Methylene blue solution (1%) was added and continued the titration until the indicator is completely decolourised.

Accurate titration: The titration repeated, before heating, almost all of the sugar solution required to effect reduction of copper added. Gently boiled for two minutes. 3-5 drops of methylene blue indicator were added and the titration was completed within a total boiling time of three minutes. At the end point all the blue colour should be discharged and the liquid should be red.

The proportions of the various sugars, equivalent to 10 ml of Fehling's solution are taken from the table.

Total Sugar: 20ml of reducing sugar solution was taken and 10ml of Concentrated Hydrochloric acid added and kept it aside overnight.

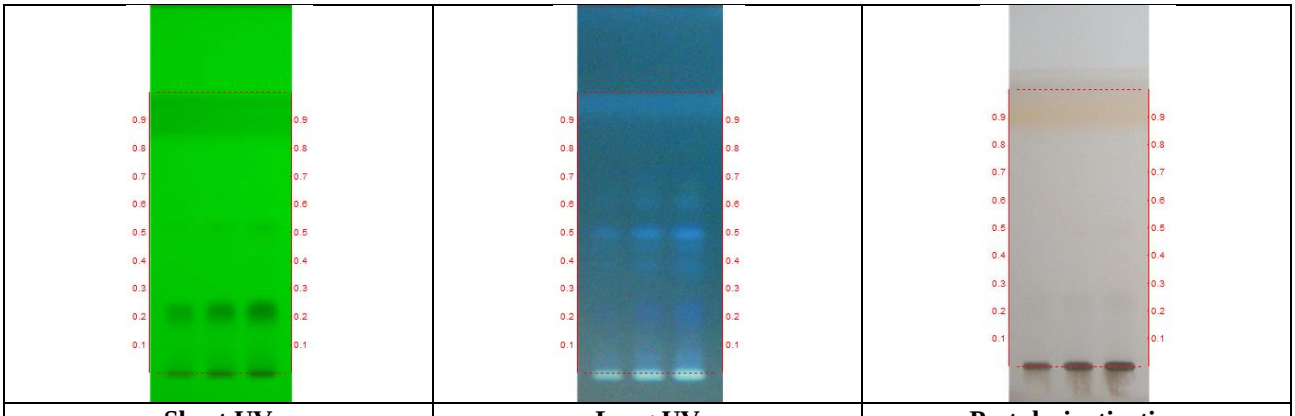
Neutralized with approximately 1M Sodium hydroxide solution or with solid sodium carbonate and made up to 100 ml in a volumetric flask. Determined the total sugar content by the titrimetric method described above. Repeat the experiment twice and take the average value.

HPTLC

10ml of *Patoladi* syrup sample was partitioned with 20 ml butanol in a separating funnel and kept for 24hr. The butanol fraction was collected and filtered. The butanol was then made to evaporate on a water bath and it is dissolved in 10.0ml of methanol. 3, 6 and 9µl of the above sample were applied on a pre-coated silica gel F254 on aluminium plates to a band width of 7 mm using Lino mat 5 TLC applicator. The plate was developed in Toluene: Ethyl Acetate: Acetic acid: Methanol (3.0:3.0:0.8:0.2). The developed plates were visualized under short UV, long UV and after derivatisation with vanillin sulphuric acid spraying reagent, and scanned under UV 254nm, 366nm, and then derivatised plates were observed under white light. Rf, colour of the spots and densitometric scan were recorded.

Table 2: showing results of standardization parameters

Parameter	*Results n = 3 % w/w*
	***Patoladi* syrup**
Specific gravity	1.2556
Refractive index	1.43282
Total solids	32.21
Total sugar	17.65
Reducing sugar	3.0
Non reducing sugar	14.65



Short UV | **Long UV** | **Post derivatization**

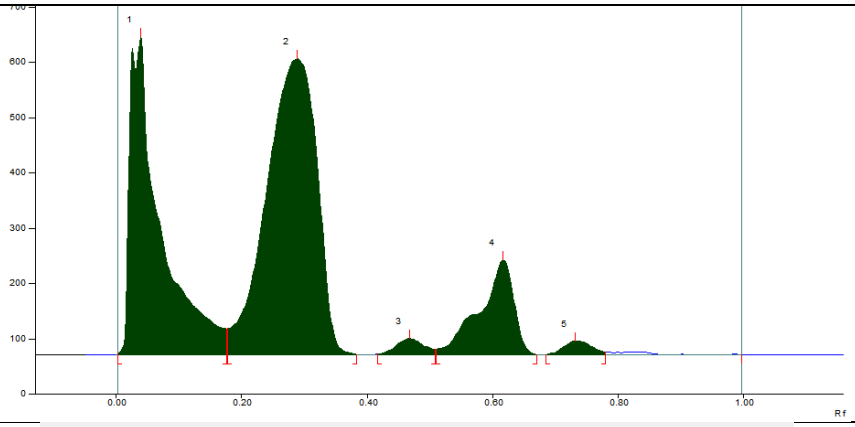
Track 1: Patoladi syrup - 3µl, Track 2: Patoladi syrup - 6µl, Track 3: Patoladi syrup - 9µl
Solvent system: Toluene: Ethyl aetate: Formic acid: Methanol (3:3: 0.8: 0.2)

Fig 1: showing HPTLC Photo documentation of sample of *Patoladi syrup*

Table 3: Rf values of sample of *Patoladi syrup*

Short UV	Long UV	Post derivatization
0.23 (D. green)	0.22 (F. blue)	0.23 (L. purple)
-	0.39 (F. blue)	-
-	0.45 (F. blue)	-
-	-	0.48 (L. purple)
-	0.50 (F. blue)	-
0.53 (L. green)	-	-
-	0.61 (F. blue)	-

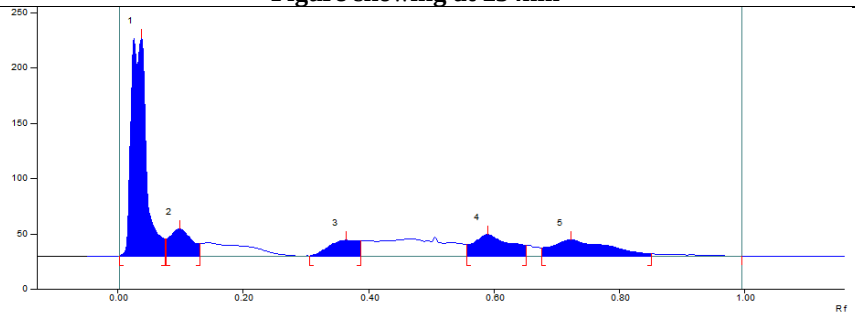
D – dark; L – light; F – fluorescent



Track 7, ID: Patoladi syrup

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	1.7 AU	0.04 Rf	574.9 AU	43.05 %	0.18 Rf	47.1 AU	20161.7 AU	33.80 %
2	0.18 Rf	47.3 AU	0.29 Rf	535.2 AU	40.08 %	0.38 Rf	0.8 AU	31038.1 AU	52.03 %
3	0.42 Rf	1.7 AU	0.47 Rf	29.2 AU	2.19 %	0.51 Rf	9.8 AU	935.5 AU	1.57 %
4	0.51 Rf	10.0 AU	0.62 Rf	171.3 AU	12.83 %	0.67 Rf	0.0 AU	6706.2 AU	11.24 %
5	0.69 Rf	0.0 AU	0.73 Rf	24.7 AU	1.85 %	0.78 Rf	4.8 AU	811.8 AU	1.36 %

Figure showing at 254nm



Track 7, ID: Patoladi syrup

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	0.4 AU	0.04 Rf	197.6 AU	72.80 %	0.08 Rf	15.8 AU	3416.5 AU	53.85 %
2	0.08 Rf	15.9 AU	0.10 Rf	24.6 AU	9.05 %	0.13 Rf	11.6 AU	629.5 AU	9.92 %
3	0.31 Rf	0.4 AU	0.36 Rf	14.6 AU	5.38 %	0.39 Rf	13.9 AU	506.1 AU	7.98 %
4	0.56 Rf	10.9 AU	0.59 Rf	19.6 AU	7.23 %	0.65 Rf	9.6 AU	819.3 AU	12.92 %
5	0.68 Rf	7.7 AU	0.72 Rf	15.0 AU	5.54 %	0.85 Rf	2.1 AU	972.6 AU	15.33 %

Figure showing at 366nm

Fig 2: showing Densitometric scan of the sample of *Patoldi syrup*

RESULTS & DISCUSSION

The standardization parameters of *Patoladi* syrup are detailed in Table 2. The TLC photo documentation of *Patoladi* syrup is shown in Fig. 1. The Rf values of sample of *Patoladi* syrup is detailed in Table 3. The Densitometric Scan of *Patoladi* syrup is shown in Fig. 2. The physicochemical standards would serve as preliminary test for the standardization of the formulation. Tests such as refractive index, specific gravity, viscosity, total solids, reducing and non-reducing sugar, and HPTLC, results of TLC photo documentation, the unique Rf values, densitometric scan and densitogram obtained at

different wavelengths can be used as fingerprint to identify the herbal drug formulation, *Patoladi* syrup.

CONCLUSION

Patoladi syrup has been standardized using diverse scientific quality parameters. The results obtained can be used as reference while setting the pharmacopoeial standards for *Patoladi* syrup for the benefit of the end user without any unwarranted complications.

CONFLICT OF INTEREST

Nil

REFERENCES

1. Petrovska BB. Historical review of medicinal plants' usage. Pharmacogn Rev. 2012;6(11):1-5. doi: 10.4103/0973-7847.95849, PMID 22654398.
2. Sharma K G, Saokar R, Shetty SK, Ravi M. Pharmacognostic evaluation of an indigenous Ayurvedic polyherbal formulation: Sumukti syrup. J Pharm Sci Innov. 2018;7(5):175-82. doi: 10.7897/2277-4572.075104.
3. Sivaraj S, Mallannavar V, Raj GRA, Shailaja U. Standardization of Amritaprasha ghrita: A herbal ghee based medicinal preparation. Int J Pharm Sci Res. 2018;9(11):4842-48. doi: 10.13040/IJPSR.0975-8232.9(11).4842-48.
4. Govind Das Sen K. Bhaishajya rathnavali. Mukha roga adhikara. Varanasi. Chaukhamba surbharati prakashan. Pp 959.
5. Baishajya Rathnavali SAD. Reprinted Varanasi Chaukhambha Sanskrit Sansthan; 2001. p. 677.
6. Sastry JLN, Vijnana D, editors. Varanasi. Chaukhambha orientalia. 2005;2.
7. Prakash HL, Harini A. A textbook of Dravyaguna vijnana. Vol 2. 1st ed. New Delhi. Chaukhambha Publications. 2014.