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Research article

Quantitative analysis of gallic acid present in triphala in a polyherbal formulation

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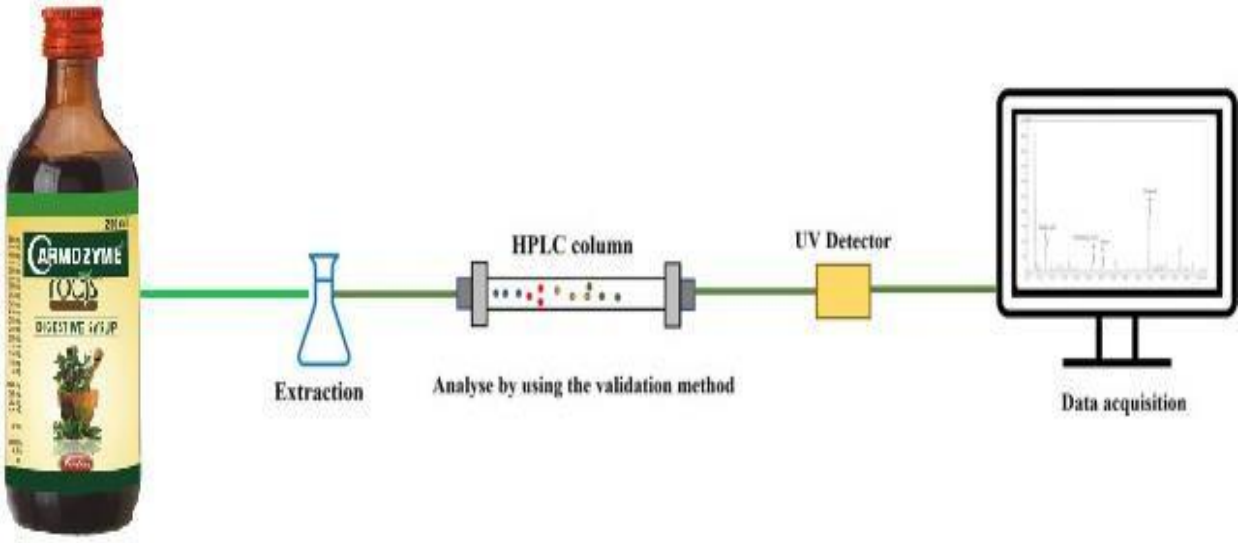
ABSTRACT

Triphala is well known Ayurvedic formulation in official Ayurvedic Formulary of India. It is used for immune system stimulation, improvement of digestion, relief of constipation, gastrointestinal tract cleansing, relief of gas, treatment of diabetes, eye disease, anaemia, jaundice, asthma, fever, chronic ulcers etc. Standardization of herbal formulation is essential in order to assess the quality, purity, safety and efficacy of the drug. In this study an attempt to evaluate the quantification of Gallic acid by High Performance Liquid Chromatography (HPLC) instrument. The percentage of free Gallic acid is prominent in our formulation compared to the standard was found to be under the specified limits.



Keywords: Gallic Acid, Triphala, Immune System, Digestion, Standardization, HPLC, Chromatography.

INTRODUCTION

Triphala is a well-known & widely used drug composition in Ayurveda. It is made up with Amlaki (*Emblica officinale*), Haritaki (*Terminalia chebula*) & Bahera (*Terminalia belerica*) in 1:1:1 ratio [1]. The percentage of Gallic Acid present in Triphala is not less than 2.1 % w/w (Amlaki- not less than 1 % w/w [2], Bahera- not less than 0.3 % w/w [3], Haritaki- not less than 0.8 % w/w [4]. In this current study we tried to establish the percentage of Gallic Acid in Triphala is present in this polyherbal formulation by HPLC Chromatographic technique. The amount of Triphala present in the formulation is 50 mg/10 ml.

MATERIALS AND METHODS

Chemicals & Reagents

Gallic Acid (Molecular Weight- 170.12 g/mol) supplied by Sisco Research Laboratories Pvt. Ltd., Taloja, Maharashtra, India, Potassium Dihydrogen Phosphate (Molecular Weight- 136.086 g/mol), Orthophosphoric Acid (Molecular Weight- 97.994 g/mol), Acetonitrile (Molecular Weight- 41.05 g/mol), De-Mineralised Water.

Plant Extracts

The Triphala Extract strength 4:1 supplied by Amsar Pvt. Ltd., Indore, India.

Marketed Formulation as sample

The Polyherbal Formulation sample is Carmozyme Roots, marketed in India by MENDINE PHARMACEUTICALS Pvt. Ltd., Kolkata, India & Manufactured by BACFO Pharmaceuticals (India) Ltd., Noida, India.

High Performance Liquid Chromatography

HPLC analysis was performed in Mendine Pharmaceuticals Pvt. Ltd., Kolkata, India, using a Shimadzu LC 2010 HPLC system (Kyoto, Japan) (Quaternary Pump, Column Oven, Auto Sampler, Software) equipped with a Shimadzu LC 2010 UV-VIS detector with a thermostatic flow cell and a selectable wavelength of 190–370 nm. The detector signal was recorded on a Shimadzu LC 2010 integrator. The column used was a C18 block heating-type Shim-pack VP–ODS (4.6 mm interior diameter ×250 mm long) with a particle size of 5 µm. Gallic Acid was separated by a mobile phase of Buffer: Acetonitrile 70:30 at a flow rate of 1.0 ml/min. Column temperature 25°C. The injection volume was 20 µl & the detection was carried out at 270 nm. The buffer was made up with 0.15 gm Potassium Dihydrogen Phosphate & 0.5 ml of Orthophosphoric Acid in 1000 ml Di-Mineralised Water.

In addition to the assay study, we also test the sample for pH & Wt./Ml.

Standard Preparation

Took Gallic Acid 100 mg in 100 ml water. Took 1 ml from that preparation & diluted with water, volume make up to 100 ml.

Sample Preparation

Took Carmozyme Roots (Batch No.- MCRS 46) 10 ml in 25 ml water.

Inter Referencing

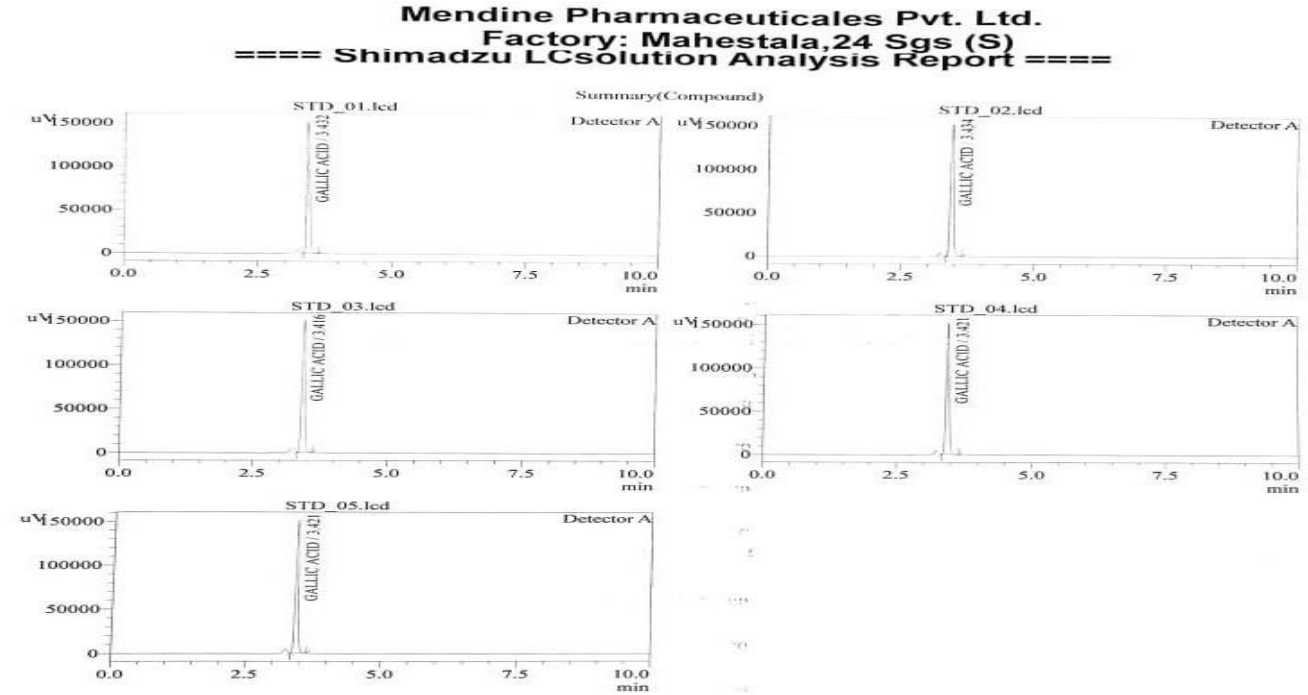
By the quantification of Gallic Acid present in Triphala, we corelated the presence of Triphala in the formulation.

RESULT

The present study was carried out to quantity the percentage of Gallic Acid in Triphala present in us under test polyherbal formulation.

Test	Limits	Result
pH	3.0-5.0	4.85
Wt./Ml.	1.00-1.20	1.0967
Assay	NLT 4.00 %	6.4923 %

Figure 1: Chromatogram of Standard



<< Detector A >>
ID#1 Compound Name: GALLIC ACID

Sample Name	Title	Ret. Time	Area	Height
CARMOZYME ROOTS GALLIC	STD_01.lcd	3.432	573949	151967
CARMOZYME ROOTS GALLIC	STD_02.lcd	3.434	577591	151463
CARMOZYME ROOTS GALLIC	STD_03.lcd	3.416	572263	150599
CARMOZYME ROOTS GALLIC	STD_04.lcd	3.421	566502	151063
CARMOZYME ROOTS GALLIC	STD_05.lcd	3.421	571118	151657
	Average	3.425	572285	151350
	%RSD	0.232	0.708	0.352
	Maximum	3.434	577591	151967
	Minimum	3.416	566502	150599
	Standard Deviation	0.008	4054	532

Figure 2: Chromatogram of Sample

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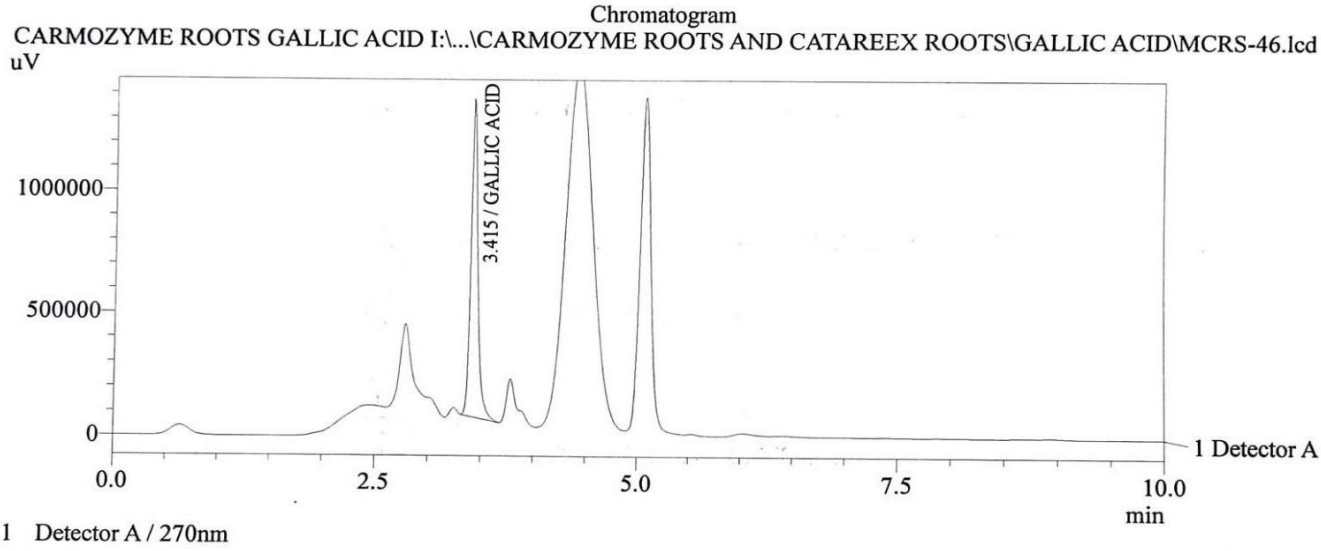
I:\...\Project1\2022 F&D\DECEMBER\CARMOZYME ROOTS AND CATAREEX ROOTS\GALLIC ACID\MCRS-46.lcd
Acquired by : Sagar Maiti
Sample ID :MCRS-46
Sample Name : CARMOZYME ROOTS GALLIC ACID
Tray# : 1
Vail # : 11
Injection Volume : 20 uL
Data File Name : MCRS-46.lcd
Method File Name : GALLIC ACID IN CARMOZYME ROOTS.lcm

<Chromatogram>



PeakTable

Detector A 270nm

Peak#	Name	Ret. Time	Area	Height
1	GALLIC ACID	3.415	5938798	1300477
Total			5938798	1300477

CONCLUSION

The developed method was found to be accurate & simple. So, it can be concluded from this present study that the sample contains considerably amount of Gallic Acid thus Triphala, and thus the samples bear the necessary quality, for therapeutic efficacy. The quantity of Gallic Acid present in the sample is within the specified limits as mentioned in Indian Pharmacopoeia (IP).

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Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this research.

Informed consent statement

This study did not involve any animal or human participants, and therefore, informed consent was not required.

REFERENCES

1. The Ayurvedic Formulary of India. 2003. Part-I, 2nd Revised English Edition. Govt. of India, Ministry of Health & Family Welfare, Dept. of ISM & Homoeopathy. Page 110.

2. 'Indian Pharmacopoeia. 2022. Vol-III. Govt. Of India, Ministry of Health & Family Welfare, The Indian Pharmacopoeia Commission, Ghaziabad. Pages 4146-4165.

3. Indian Pharmacopoeia. 2022. Vol-III. Govt. Of India, Ministry of Health & Family Welfare, The Indian Pharmacopoeia Commission, Ghaziabad. Pages. 4190-4191.

4. V Pawar, P Lahorkar, D B Anantha Narayana, 2009. Development of a RP-HPLC Method for Analysis of Triphala Curna and its Applicability to Test Variations in Triphala Curna Preparations. Indian Journal of Pharmaceutical Sciences. Pages 382-386. Doi: 10.4103/0250-474X.57286.