

Estimation of Ferulic Acid in *Syzygium cumini* Seeds Extract by HPLCRahul M. Shah¹, Aarsh S. Shah¹ and Mamta B. Shah^{2*}¹L. J. Institute of Pharmacy, Sarkhej, Ahmedabad, Gujarat, India.²Department of Pharmacognosy, L. M. College of Pharmacy, Ahmedabad, Gujarat, India.**ABSTRACT**

Ferulic acid is a hydroxycinnamic acid, a type of organic compound. It is an abundant phenolic phytochemical found in plant cell wall components. Ferulic acid is reported to possess an anticancer, antioxidant, and anti-aging potentials. Studies have shown that ferulic acid can decrease blood glucose levels and levels of cholesterol and triglycerides. An HPLC method was developed for the estimation of ferulic acid from ethyl acetate herbal extract of *Syzygium cumini seed powder*. Various extracts of fruit and seeds of *Syzygium cumini* are reported to have antidiabetic, anti-inflammatory, hepatoprotective, antihyperlipidemic, diuretic and antibacterial activities.

Keywords: *Syzygium cumini*, ferulic acid, HPLC.

INTRODUCTION

Syzygium cumini Linn. Skeels (Synonym: *S. jambolana* DC, *Eugenia jambolana* Lam., *E. cumini* (L.) Druce) belonging to family Myrtaceae, is an evergreen tree native to Bangladesh, India, Nepal, Pakistan, Sri-Lanka, and Indonesia. It is commonly known as Jamun, Java plum, Black plum, Jambul and Indian Blackberry. Seeds are recognized in different systems of traditional medicine for the treatment of various conditions. The seeds are sweet, astringent to bowel and valued in the treatment of diabetes and hyperlipidemia.

Ferulic acid is a ubiquitous plant constituent found in plant cell walls, leaves and seeds. It is made from the metabolism of phenylalanine and tyrosine. It occurs primarily in seeds and leaves both in its free form and covalently linked to lignin and other biopolymers. Ferulic acid is reported to have anticancer, antioxidant, and anti-aging potentials and can decrease blood glucose levels. High Performance Layer Chromatography (HPLC) method is the suitable method for estimation of chemical constituents present in plant materials. *Syzygium cumini* contains ferulic acid which

is an important active constituent and is thus estimated by HPLC method.

METHODOLOGY**Instrumentation**

Shimadzu LC 2010 CHT, auto injector, column oven, UV Visible detector. The output signal was monitored and processed using LC Solution software on HP computer.

Solvents and chemicals

Ferulic acid was obtained from Natural Remedies (Bangalore) Chromatographic grade methanol, petroleum ether (AR) and Ethyl acetate (AR), were obtained from Merck (Mumbai, India).

Collection

Seeds of *Syzygium cumini* were collected from the local market of Ahmedabad in the month of June 2011 and were authenticated by comparing the morphological characters given in the literature. Seeds were powdered to 60# and defatted to remove oil using petroleum ether. The powder of the defatted seeds was extracted with ethyl

acetate (AR grade) using Soxhlet apparatus.

Preparation of Standard and Sample Solutions

4.8mg ferulic acid was weighed accurately and dissolved in 10ml methanol and serial dilutions were prepared and 21.4mg extract was dissolved in 10ml methanol to prepare the sample solution.

Chromatography

Flow rate: 1ml/min

Detection: 254nm

Run Time: 42min

Injection volume: 20 μ l

Column: Hiber 150 – 4.6 Purospher star RP – 18 (E) 5 UA (150 mm X 4.6 mm X 5 micron

Mobile Phase: (By gradient method)

A: 50 mM ammonium dihydrogen phosphate, pH 2.6; **B:** 20% of A in acetonitrile

Time (min)	A in %	B in %
0-2	100	0
2-17	75	25
17-27	50	50
27-37	0	100
37-40	0	100
40-40.1	100	0
40.1-45	100	0

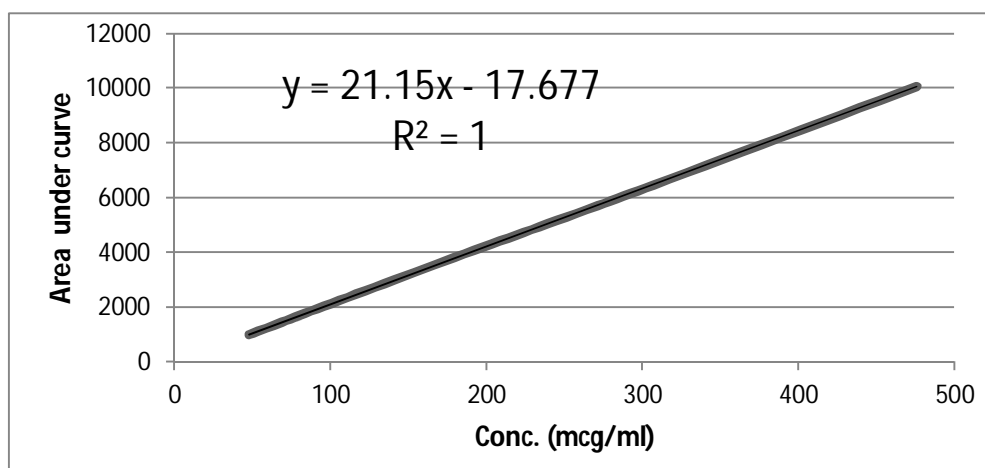
Temperature: 40°C

Standard: ferulic acid

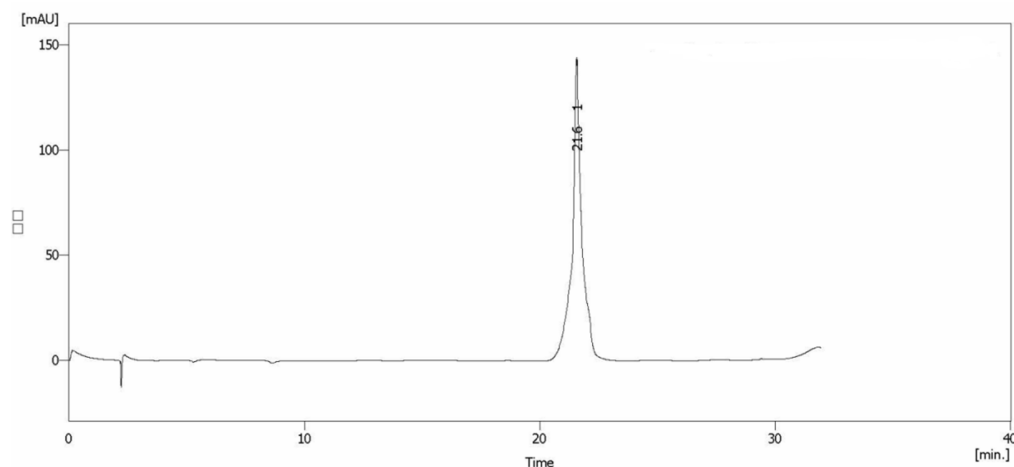
Method Reference: In house

RESULT AND DISCUSSION

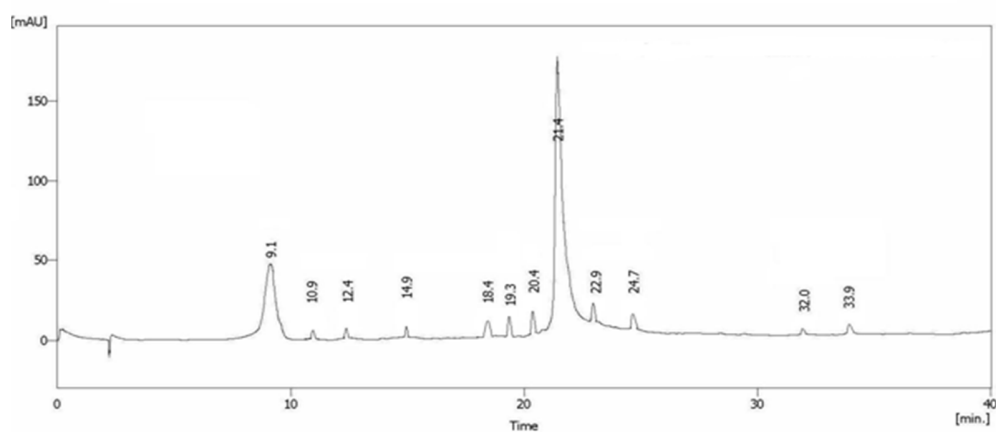
Ferulic acid is reported to possess an anticancer, antioxidant, and anti-aging potentials. *S. cumini* seeds are recognized in different systems of traditional medicine for the treatment of various conditions. Ferulic acid got eluted at 21.6min (Graph 1) and the peak for the same was found to be at 21.4 in *S. cumini* seeds (Graph 2) under the conditions of detection at 254nm and temperature 40°C. The amount of ferulic acid in *Syzygium cumini* seeds was found to be 1.27% w/v.



Calibration curve of Ferulic



Graph 1: HPLC chromatogram of Standard Ferulic

Graph 2: HPLC chromatogram of Ethyl acetate extract of *S.cumini***CONCLUSION**

This method for estimation of ferulic acid in *S. cumini* seeds by HPLC is newly developed and is accurate, precise and reproducible.

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