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PHYTOCHEMICAL EVALUATION AND CHROMATOGRAPHIC FINGERPRINT STUDY OF GUDUCHI PATRA [*TINOSPORA CORDIFOLIA* (WILLD.) HOOK. F. AND THOMS.

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ABSTRACT

Guduchi *[Tinospora cordifolia* (Willd.) Hook. f. and Thoms.] is a large, glabrous, deciduous climbing shrub belonging to the family Menispermaceae. It is distributed throughout the tropical India. In Hindi, the plant is commonly known as 'Giloe'. It is a widely used plant in folk and Ayurvedic systems of medicine. The chemical constituents reported from this plant (patra) belong to different classes, such as Alkaloids, Saponnin, Steroids, Carbohydrates, Flavonoids, Tannins etc. Various properties of *T. cordifolia*, leaf described in ancient texts of Ayurveda are Rasayana, Sangrahi, Balya, Agnideepana, Tridoshshamaka, Dahnashaka, Mehnashaka, Kasa-swasahara, Pandunashaka, Kamala-Kushta-Vataraktanashaka, Jwarhara, Krimihara, Prameha, Arshnashaka etc. Guduchi is an important drug used in Ayurveda in Various diseased conditions and also for maintenance of health. In classical Ayurveda literatures various properties and medicinal uses of *T. cordifolia* have been described, along with phytochemical and Chromatographic fingerprint reports.

KEYWORDS: *Guduchi, Ayurveda, Tinospora cordifolia.*

INTRODUCTION

Guduchi [*Tinospora cordifolia* (Willd.) Hook. f. and Thoms] belonging to the family Menispermaceae.[1,2] Guduchi is an important drug used in Ayurveda in various diseased conditions and also for maintenance of health. Other common names and synonyms of Guduchi are Amrita, Amritavalli, Madhuparni, Guduchika, Chinnobhava, Vatsadani, Tantrika, Kundalini, Gulancha (Bengal), Gurcha (Hindi), Amritaballi (Kannada), Amrita, Gilo (Kashmiri), Chittamrutu (Malayalam), Gulvel (Marathi), GulUchi (Oriya), Gilo (Punjabi), Seen dal, Seendil Kodi (Tamil), Tinospora (English).[3] Guduchi grows throughout India.[4] It is a large glabrous climber with succulent, corky and grooved stems. Branches sending down slender pendulous, fleshy roots, stem is terete, striated, with tubercled, pale bark. Sometimes shining or glaucous bark. Leaves are simple, alternate, membranous, 5 to 10 cm long, roundish or sub-deltoids cordate with a broad sinus and large basal lobes, obtuse or more or less cuspidate, 7 to 9 nerved, reticulate venation with microscopic glistening glands beneath. Petiole is 2.5 cm to 7 cm long.[5] Various karmas of Guduchi patra are Rasayana, Sarve jvarahara, Balya, Sangrahi, Trishanashamaka, Daha, Prameha, Vatarakta, Kamala, Kustha, Pandu, Tridosha shamaka, Pathya, Dipana, Vaya sthapana, Medhya, Agnivardhaka[6], etc. Guduchi, under the name Vatsadani (a synonyms to Guduchi), is mention as one among the Patra Shakas.[7] This indicates that the leaves of Guduchi were used as a vegetable by ancient Indians. At present use of Guduchi patra is limited to certain diseases.

Aim

- To standardize the drug Guduchi patra.

Objective

- Organoleptic evaluation of Guduchi Patra.
- Priliminary phytochemical evaluation of Guduchi Patra.
- Qualitative analysis of Guduchi Patra.
- Chromatographic finger print of Guduchi Patra by HPTLC technique.

Collection and Identification

The test drug Guduchi patra (*Tinospora cordifolia*) was collected from botanical garden of SDM College of

Ayurveda, Kuthpaddy, Udupi. The plant was well identified by Mr. Sunil Kumar Research officer and was distinguished from other one variety of Tinospora found in the habitat. The other common variety found was *Tinospora malabarica*. Only mature leaves of *Tinospora cordifolia* were collected and used for the study purpose.

Drug analysis: The Physical evaluation like Foreign matter, Total Ash value, Acid insoluble ash, Water soluble extractive value, Alcohol soluble extractive value were performed at Department of Dravyaguna, SDMCA&H, Hassan, Karnataka.

Preliminary phytochemical tests (alkaloids, carbohydrates, tannins, steroids, saponins, flavonoids, coumarins, phenol, triterpenoids, carboxylic acid, quinine) and HPTLC finger print of the Guduchi Patra was performed at S.D.M. Centre for Research in Ayurveda and Allied Sciences, Udupi, Karnataka.

Preliminary phytochemical tests: The assessment of alcoholic extract was done as follows - Alkaloids by Dragendroff's test, Wagners's test, Mayer's test, Hager's test; Carbohydrates by Molisch's test, Fehling's test, Benedict's test; Steroids by Libermann-Burchard test, Salkowski test; Saponins by forth formation test; Tannins by ferric chloride test; Flavonoids by Shinoda's test; Phenol by alcoholic ferric chloride test; Coumarins by 2 N sodium hydroxide solution; Triterpenoids by thionyl chloride; Carboxylic acid by sodium bicarbonate; Resin by acetone test; Quinine by 0.5% of sodium hydroxide.[8]

HPTLC: Guduchi patra extract samples were dissolved in 20 ml methanol and kept for cold percolation for 24h and filtered. 3, 6 and 9µl of the above samples were applied on a pre-coated silica gel F254 on Aluminum plates to a band width of 7 mm using Linomat 5 TLC applicator. The plate was developed in Chloroform: Methanol (9.0: 1.0). The developed plates were visualized in UV 254nm, 366 nm and then derivatised with Vanillin sulphuric acid reagent and scanned under UV 254nm, 366 nm and 620nm following derivatisation. Rf, colour of the spots and densitometric scan were recorded.

OBSERVATION AND RESULTS

The findings of physical parameters are shown in table 1

Table 1: Physical parameters of the sample.

Parameter assessed	Standard value[9]	Obtained value
Foreign matter	Not more than 2%	0%
Total a Ash value	Not more than 16%	8%
Acid insoluble ash value	Not more than 3%	1.5%
Water soluble extractive value	Not less than 11%	22.3%
Alcohol soluble extractive value	Not less than 3%	16.43%

The observation of preliminary phytochemical screening showed positive for Saponin Alkaloids, Steroids, Tannins, Flavonoids ,Carbohydrates.

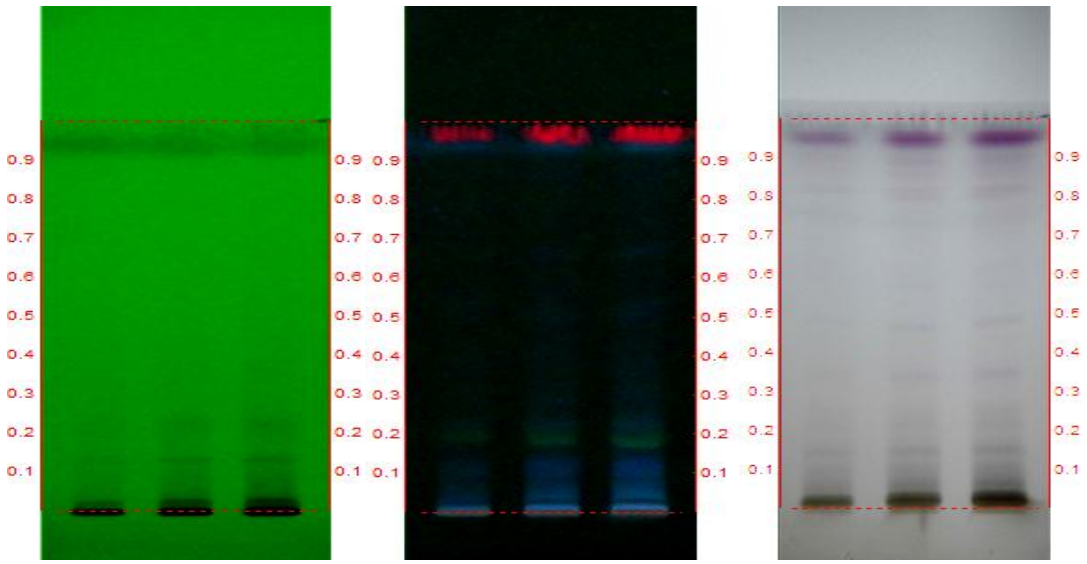
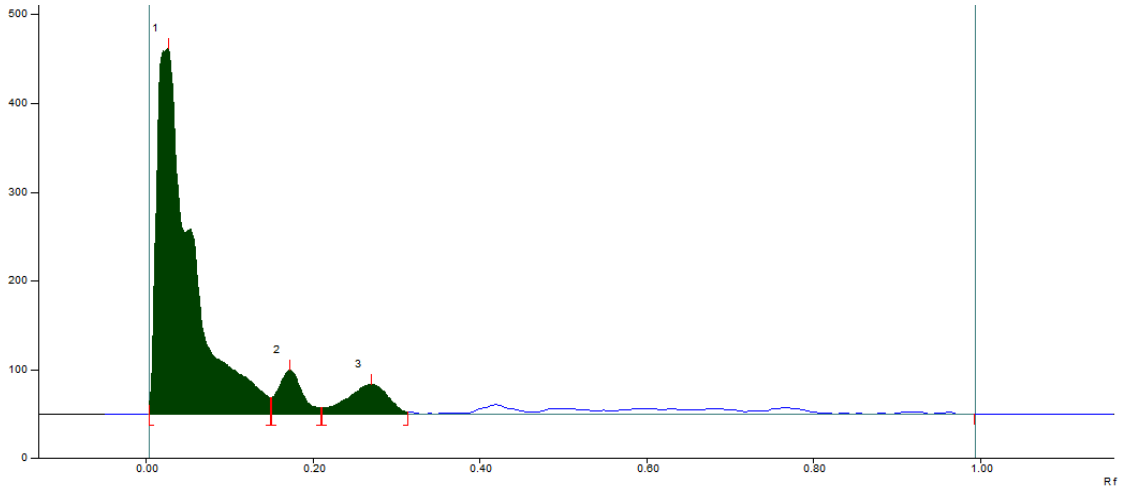


Figure 5: HPTLC photo documentation of methanol extract of leaf of *Tinospora cordifolia.*

Table 2: R_f values of methanolic leaf extract of *Tinospora cordifolia.*

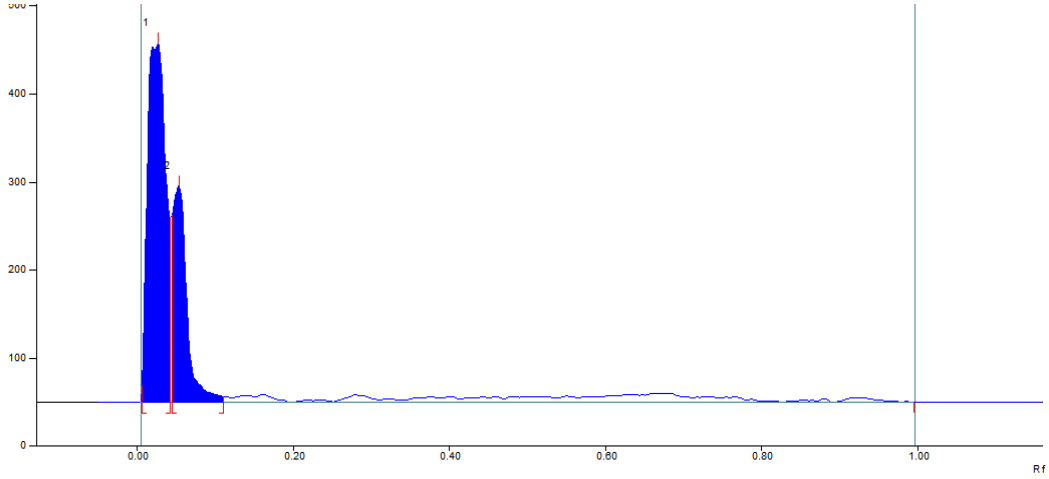
At 254 nm	At 366 nm	Post derivatisation
-	0.05 (FL. blue)	-
-	0.07 (FL. blue)	0.07 (L. purple)
-	0.11 (FL. blue)	0.11 (D. purple)
0.14 (D. green)	0.14 (FL. blue)	0.15 (D. purple)
-	0.19 (FL. green)	-
0.22 (L. green)	0.22 (FD. blue)	0.22 (L. purple)
-	-	0.35 (L. purple)
-	-	0.47 (L. purple)
-	0.51 (FL. blue)	-
-	0.58 (FD. red)	0.58 (L. purple)
-	-	0.63 (L. purple)
-	0.67 (FL. blue)	-
-	-	0.75 (L. purple)
-	-	0.82 (D. purple)
-	-	0.86 (D. purple)
-	-	0.89 (D. purple)
-	0.93 (FD. blue)	-
-	-	0.96 (D. purple

F – Fluorescent, D – dark, L – light



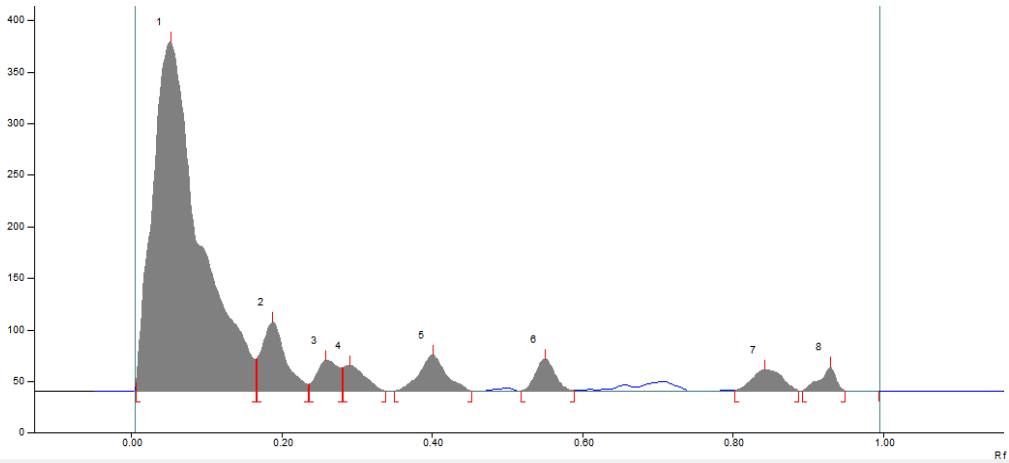
Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	10.4 AU	0.03 Rf	412.1 AU	83.27 %	0.15 Rf	18.7 AU	12269.4 AU	84.86 %
2	0.15 Rf	19.0 AU	0.17 Rf	49.3 AU	9.97 %	0.21 Rf	7.2 AU	999.5 AU	6.91 %
3	0.21 Rf	7.2 AU	0.27 Rf	33.5 AU	6.77 %	0.31 Rf	2.1 AU	1190.2 AU	8.23 %

Fig 6a.254nm



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	19.1 AU	0.03 Rf	407.4 AU	62.36 %	0.04 Rf	09.1 AU	6992.1 AU	67.98 %
2	0.05 Rf	211.7 AU	0.05 Rf	245.9 AU	37.64 %	0.11 Rf	6.7 AU	3293.6 AU	32.02 %

Fig 6b. 366nm



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	7.8 AU	0.05 Rf	339.1 AU	59.24 %	0.17 Rf	31.0 AU	15172.3 AU	75.02 %
2	0.17 Rf	31.7 AU	0.19 Rf	66.8 AU	11.67 %	0.24 Rf	6.6 AU	1503.8 AU	7.44 %
3	0.24 Rf	6.7 AU	0.26 Rf	30.4 AU	5.31 %	0.28 Rf	22.6 AU	616.0 AU	3.05 %
4	0.28 Rf	22.9 AU	0.29 Rf	25.0 AU	4.36 %	0.34 Rf	0.1 AU	504.4 AU	2.49 %
5	0.35 Rf	0.3 AU	0.40 Rf	35.2 AU	6.15 %	0.45 Rf	0.1 AU	883.7 AU	4.37 %
6	0.52 Rf	0.1 AU	0.55 Rf	31.5 AU	5.49 %	0.59 Rf	0.8 AU	578.9 AU	2.86 %
7	0.80 Rf	0.6 AU	0.84 Rf	20.8 AU	3.64 %	0.89 Rf	0.3 AU	604.5 AU	2.99 %
8	0.89 Rf	0.2 AU	0.93 Rf	23.7 AU	4.14 %	0.95 Rf	0.3 AU	361.3 AU	1.79 %

Fig 6c. 620nm (after derivatisation)

DISCUSSION

The physical parameters of the Guduchi patra swarasa is within the standard parameters, hence it gives as an idea that the sample is genuine. The presence of Saponin, Flavonoids, Alkaloid**,** Carbohydrates, Steroid, Tannins in the Guduchi patra swarasa is responsible for its various pharmacological activities like Antipyretic[10],

Antioxidant[11], Antidiabetic[12], Immuno modulator[13] and hepatoprotective[14] The HPTLC finger print showed 8 Rf values in the sample. The finger print of Guduchi patra swarasa helps to identify adulteration and to standardize the drug for future use.

CONCLUSION

The drug Guduchi use for the study is genuine hence it can be used as a medicine as a single drug or as an ingredient. Standardization of drug like Guduchi with evaluation methods like finger printing will be better to have standard formulation and intern to have better and in turn to have accurate therapeutic results.

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