



Research Article

International Journal of Pharmacy and
Natural Medicines

www.pharmaresearchlibrary.com/ijpnm



Phytochemical Investigation of *Tinospora Cordifolia*

Gurvindar Kaur*¹, Amit Kumar Singh¹, Chandra Shekhar Singh¹, Firoj Alam²,
Girendra Kumar Gautam³

¹Shambhunath Institute of Pharmacy, Allahabad, India

²Kunwar Haribansh Singh College of Pharmacy, Jaunpur, India

³Bhagwant Institute of Pharmacy, Muzaffarnagar, India

Received: 23 March 2014, Accepted: 27 May 2014, Published Online: 15 June 2014

Abstract

Medicinal plants have played a key role in the world health and Herbal drugs have been used since ancient times as medicines for the treatment of a range of diseases. *Tinospora cordifolia*. *Tinospora cordifolia* is an annual or perennial Ayurvedic plant which is used in several traditional medicines to cure various diseases. It is commonly known as Giloi, Amrita or Guduchi, an important drug of Indian Systems of Medicine (ISM) and Ayurveda and used in medicines since times immemorial. The drug is used in the treatment of fever, diabetes, jaundice, urinary problems, skin diseases and dysentery. In the present study, an effort has been made to establish the Pharmacognostical as well as Phytochemical Investigation of *Tinospora cordifolia* stem.

Keywords: Pharmacognostical, Phytochemical Investigation, *Tinospora cordifolia*

Contents

1. Introduction	98
2. Materials and Methods.	99
3. Results and Discussion.	99
4. Conclusion	101
5. References	101

*Corresponding author

Gurvindar Kaur

Shambhunath Institute of Pharmacy,
Allahabad, India

E-mail: gk100781@gmail.com

Manuscript ID: IJPNM2043



PAPER-QR CODE

Copyright © 2013, IJPNM All Rights Reserved

1. Introduction

Tinospora cordifolia is an Ayurvedic plant which belongs to family Menispermaceae has important medicinal values. It is widely known as Guduchi, Giloy or Amrita [1]. In India it is known by its various vernacular names, the

most commonly used ones are Amrita, gulbet, gurcha (hindi), Gulvel (Marathi), Amudom, Chindil (Tamil). *Tinospora cordifolia* is a glabrous, succulent, climbing shrub distributed throughout tropical Indian subcontinent [2]. Its bark is grey-brown or creamy white in color, its leaves are membranous and flower is small. It's appears yellow or greenish yellow when plant is leafless. Male flower is clustered and female usually solitary. This plant has been widely used in the Indian System of Medicine (Ayurveda) as Rasayana for the treatment of diabetes, jaundice, rheumatoid arthritis, gout, general weakness, skin diseases and infections [3]. The decoction of leaves is used in treatment of gout, also fresh leaves brushed in milk are used as liniment in erysipelas and with honey used as tonic. The stem of *T. cordifolia* is one of the constituents of several Ayurvedic preparations used in general debility, dyspepsia, fever, and urinary diseases [4].

The plant mainly contains alkaloids, glycosides, steroids, sesquiterpenoid, aliphatic compound, essential oils, mixture of fatty acids and polysaccharides. The stem of the plant was evaluated for its pharmacognostical parameters including morphological and microscopical parameters along with physico-chemical parameters. Ash values, extractive values in different solvents, and phytochemical screening have been carried out in the study. The study will be useful for the identification of stem of *Tinospora cordifolia* and will prevent its adulteration[5].

2. Materials and Methodods

1. Collection and Identification of Plant material

The plant of *Tinospora cordifolia* belong to the family- Menispermaceae, was collected from region of Bhopal, identified and authenticated by Dr. S. N. Dwivedi, Prof. and Head, Department of Botany, Janata PG College, APS, University, Rewa, M.P-India and a voucher specimen TC/13/001/1505.

2. Morphological Characters

Macroscopically Studies:

The dried stems of *Tinospora cordifolia* were taken and observed for the various parameters including shape, size, color, taste, surface characteristic, texture, fracture characteristic and appearance of cut surface.

Microscopically Studies (Section cutting):

Sections of the stem were taken and soaked in water overnight. Free hand section of stem were cut, cleared and stained with safranin and studied.

3. Preparation of Extracts

Stem of *Tinospora cordifolia* was coarsely powdered and extracted with different solvents, viz., petroleum ether, chloroform, acetone, methanol, hydro-alcohol and water.

4. Physico-chemical Parameters

The different extracts were firstly subjected to physico-chemical parameters as per standard methods prescribed in literature [6-7].

5. Phytochemical Screening

The different extracts were then subjected to phytochemical screening as per standard methods prescribed in literature [8-9].

3. Results and Discussion

1. Morphological Parameters

Macroscopically characteristics

Macroscopic characteristics of stem of *Tinospora cordifolia* have been described in Table 1.

Table 1. Macroscopic characteristics of stem of *Tinospora*

S. No.	Parameters	Stem
1	Colour	Light green to brown
2	Odour	Unknown or Odourless
3	Taste	Unknown or Bitter
4	Size	1 to 8 cm in diameter
5	Shape	Long Cylindrical
6	Touch	Silky Smooth
7	Fracture	Fibrous

Microscopically Characteristics

T.S of *Tinospora cordifolia* stem shows cork, cortex and vasculature. The cork comprises of an outer zone of thick-walled brownish compressed cells and an inner zone of thin walled shows colorless, tangentially arranged cells [10]. The cork tissue is broken at some places due to lenticels. Vascular zone is composed of discrete vascular strands with 10 to 12 or more wedge shaped strips of xylem, externally surrounded by semi-circular of phloem, alternating with wide medullary rays; phloem consist of the usual elements. Some of the cells of phloem parenchyma contain calcium oxalate crystals; xylem consists of vessel elements, tracheids, parenchyma and fibers [11]. Microscopic details are shown in fig 1&2.

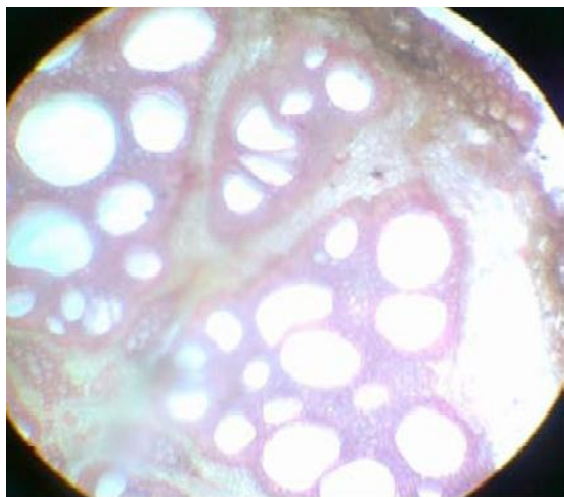


Figure 1. T.S. of stem of *Tinospora cordifolia*

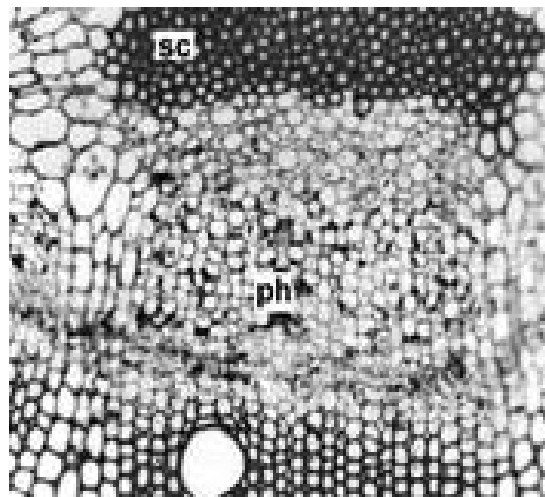


Figure 2. T.S. of stem of *Tinospora cordifolia*

2. Physico-chemical Parameters

Physico-chemical Parameters of stem of *Tinospora cordifolia* have been described in Table 2.

Table 2. Physico-chemical Parameters of *Tinospora cordifolia*

S. No.	Parameters	Values
1.	Foreign matter analysis	1.30% w/w
2.	Loss on drying	4.7% w/w
3.	Total ash	5.9% w/w
6.	Swelling Index	Absent
7.	Foaming Index	Less than 100

3. Extractive Value

Extractive Value of stem of *Tinospora cordifolia* has been described in Table 3.

Table 3. Extractive Value of *Tinospora cordifolia*

S. No.	Extracts	Cold Maceration (w/w)	Hot Extraction (w/w)	Successive Extraction (w/w)
1.	Petroleum ether	1.96%	4.2%	5.33%
2.	Chloroform	3.3%	5.96%	11.13%
3.	Acetone	4.0%	8.16%	12.40%
4.	Methanol	11.93%	11.43%	15.9%
5.	Hydro-alcohol	26.42%	19.33%	23.33%
6.	Aqueous	33.86%	26.73%	29.96%

4. Phytochemical Screening

The plant mainly contains alkaloids, glycosides, steroids, sesquiterpenoid, aliphatic compound essential oils, mixture of fatty acids and polysaccharides. The alkaloids include berberine, bitter gilonin, non-glycoside gilonin, gilsterol. Phytochemical Screening of *Tinospora cordifolia* has been described in Table 4.

Table 4. Observations of Phytochemical Screening of *T.cordifolia*

S. No	Extract constituents	Test	P E	CHCl ₃	Acetone	MeOH	Hydro-alcohol	Aq
1.	Alkaloids	Dragendroff's Test	--	++	++	++	++	++
		Wagner Test	--	++	+-	+-	++	++
		Mayer Test	--	-+	--	--	-+	-+
		Hagers Test	--	-+	++	+-	++	++
2.	Carbohydrates	Molisch Test	--	-+	--	+-	++	++
		Fehlings Test	--	-+	--	+-	++	++
		Benedicts Test	--	-+	--	++	++	++
3.	Glycosides	Keller killiani Test	--	++	--	--	++	++
		Liebermann Test	--	-+	--	-+	-+	-+
		Borntragers Test	--	-+	--	-+	-+	-+
4.	Tannins	5% FeCl ₃	--	-+	--	-+	+++	-+
		Gelatin Test	--	-+	--	-+	-+	-+
5.	Flavonoids	Zinc chloride Test	--	-+	+-	++	++	++
		Lead acetate Test	--	-+	+-	++	++	++
		Ammonia Test	--	-+	+-	++	++	++
6.	Proteins	Biuret Test	--	-+	--	-+	-+	-+
		Xanthoproteic Test	--	-+	--	-+	-+	-+
		Millon's Test	--	-+	--	-+	-+	-+
7.	Steroids	Lieberman Test	--	-+	--	-+	-+	-+
		Salkowaski Test	+-	++	+-	++	-+	-+
		Lieberman Test	--	-+	--	-+	-+	-+

4. Conclusion

This paper research on *Tinospora cordifolia* suggests a huge biological potential of this plant on the basis of that phytocognosical characteristic. It is strongly believed that detailed information as presented in this research paper on the phytochemical Investigation of the extracts might provide detailed evidence for the use of this plant in different medicines. The phytochemical variations and efficacy of the medicinal values of *Tinospora cordifolia* is dependent on geographical locations and seasons. At the same time, the organic and aqueous extract of *Tinospora cordifolia* could be further exploited in the future as a source of useful phytochemical compounds for the pharmacological activity.

6. References

- Gautam Girendra Kumar, Vidhyasagar Gali and Dwivedi S C, "Phytochemical Investigation of *Crotalaria Burhia Hamilt*" *International Journal of Research in Pharmaceutical and Biomedical Sciences*, **2011**, 2.4, 1721-1724
- WHO policy perspective on medicines-traditional medicines growing needs and potential, **2002**: 2, 1-6.
- G. K. Gautam, G. Vidyasagar, S. C. Dwivedi, "Study on Medicinal Plants from Indian Origin" Lambert Academic Publishing (LAP), Germany, **2012**: 70
- Shivani tanwar et al "Standardization and Phytochemical evaluation of *Tinospora cordifolia* (willd.)" *International Journal of Pharmacy and Pharmaceutical Sciences*, **2012**: 4.1
- Devprakash et al "Tinospora Cordifolia: A Review On Its Ethnobotany, Phytochemical & Pharmacological Profile" *Asian Journal of Biochemical and Pharmaceutical Research*, **2011**, 4(1): 291-302
- Girendra Kumar Gautam et al "Uses of Some Traditional Medicinal Indian Plants" *International Journal of Chemistry and Pharmaceutical sciences*, **2014**, 2(1): 576-580
- Singh SS, Pandey SC, Srivastava S, Gupta VS, Patro B, Ghosh AC. "Chemistry and medicinal properties of *Tinospora cordifolia* (Guduchi)" *Indian Journal of Pharmacology*, **2003**, 35: 83-91.
- Nagaraja puranik et al "Anti-diabetic activity of *Tinospora cordifolia* (Willd.) in streptozotocin diabetic rats; does it act like sulfonylureas?" *Turk J Med Sci.*, **2010**, 40(2): 265-270
- V Sivakumar et al "preliminary phytochemical screening and evaluation of *Tinospora cordifolia*" *IJPPS*, 2(4): 786
- D Pradhan et al "Phytochemical Analysis of *Tinospora Cordifolia* (Willd.)" *IJPSR*, 2.1: 208
- Girendra Kumar Gautam et al "Some Disease or Disorder Treated By Indian Medicinal Herbal Plants" *International Journal of Medicine and Pharmaceutical Research*, **2014**, 2.1: 393-397