

# Preliminary Phytochemical Screening of Aqueous extracts of *Tinospora cordifolia* Leaves and Stem

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## Abstract

Guduchi is a medicinal plant which is extensively used in folk and Ayurvedic medicines and it has various health benefits and also used to prevent and treat several diseases. The aim of the present work is to find out the Phytochemicals in the Stem and Leaf of the Guduchi. The physiochemical screening was carried out to know the presence and absence of the different phytochemicals such as Flavonoids, Alkaloid, Steroids, Carbohydrates, saponins, Glycosides, Phenolic compound etc. The aqueous extracts of the Guduchi leaf and stem by maceration process have been compared for the availability of phytochemicals obtained by non application of heat during extraction.

**Key Words:** *Tinospora cordifolia*, Extraction, phytochemicals, Leaf Extract, Stem Extract.

## 1. Introduction

Guduchi is known as *Tinospora cordifolia*, belongs to the family Menispermaceae is well known in Ayurveda as Guduchi. The vernacular names of Guduchi are Assamese: Siddhilata & Amaralata, Bengali: Gulancha, Gujarati: Galac & Garo, Hindi: Giloe & Gurcha, Kannada: Amrutaballi, Kashmiri: Amrita & Gilo, Malayalam: Chittamrutu, Marathi: Gulvel, Oriya: Guluchi, Punjabi: Gilo, Tamil: Seendal & Seendilkodi, Telugu: Thippateega and in Urdu<sup>1</sup>.

Guduchi is a multipurpose plant used to treat several diseases including jaundice, diabetes, fevers, flues, stress, acts as blood purifiers and has rejuvenating properties. *Tinospora cordifolia* has no side effect and toxic. The Stem, Leaves and root have no any toxic effect on human body when orally consumed<sup>2</sup>.

It is extensively used to treat gastrointestinal problems<sup>3</sup>, neuropathies<sup>4</sup>, hyperlipidemia<sup>5</sup>, diabetes and other disorders<sup>6</sup> It is known as ‘rejuvenate herb’, and Ayurveda describes it as Amrita<sup>7</sup> (a drug for immortality).

With keeping in view of the importance of the plant present study was carried out the qualitative analysis of Stem and Leaf Extracts of Guduchi.

## **Materials and Methods:**

### **Plant material:**

Fresh Leaves and Stem of Guduchi (*Tinospora cardifolia*) were collected from the campus of Dairy Science College, Mahagoan, Gulbarga, Karnataka, Distilled water and Whatman's No.1 paper.

### **Authentication of Plant Materials**

The Plant material i.e., leaves and Stem of the plant identified and authenticated by the Herbarium in Botany Department Osmania University, Hyderabad according to the "Illustration on the Flora of the Tamilnadu Carnatic, Vol-II published by K.M.Mathew on 28-12-1982. A specimen voucher No.19 was deposited in the Department.

### **Method of Extraction:**

#### ***Preparation of Aqueous Extract of Guduchi by Maceration Process:***

The aqueous extract prepared according to the procedure adopted by Jyothi *et al*<sup>5</sup>. Collected Plant material washed under running tap water to remove dust and foreign matter and then dried under shade at room temperature for 15 days. The material was crushed well into fine powder, packed into air tight polythene bags and stored at room temperature as base stock material for further use. The aqueous extract is prepared by soaking 50 grams of crushed material of leaves and stem separately in 200ml of water and shaken well. The solutions left at room temperature for 72 hours and then filtered with the help of Whatman No.1 filter paper. Various phytochemicals are heat labile hence the maceration process adopted for the preparation of extracts. The filtrates/ Extracts of the selected plant material were used for further study. The Extracts are coded as G1 and G2.

**GE1-** Extract prepared from Guduchi leaves

**GE2-** Extract prepared from Guduchi Stem.

The Extracts of the selected plant material were taken and used for further studies. The prepared Extracts subjected to the Preliminary phytochemical screening.

### **Preliminary Phytochemical Screening of the Guduchi extracts**

The Preliminary phytochemical analysis gives primary idea about presence of phytochemicals of the extract. The Preliminary phytochemical screening was carried out for both the extract as per standard methods described<sup>9&10</sup>. The results are given in Table 1

### **Detection of Alkaloids**

**Mayer's test:** The extract was added with Dil. HCl and Mayer's reagent, cream colored precipitate formed which indicated the presence of alkaloids. The test results shown positive in both Leaf and Stem Extracts.

**Wagner's test:** Test for alkaloids by this method found positive for both Leaf and Stem extracts. The extract was added with Dil. HCl and Wagner's reagent, reddish brown precipitate indicates presence of alkaloids

**Dragendorff's test:** To the extract add dil. HCl and Dragendorff's reagent, reddish brown precipitate indicates presence of alkaloids.

#### **Detection of Flavonoids:**

**Shinoda test for flavonoids detection:** 5 ml of the extract is taken and added few magnesium burnings and concentrated hydrochloric acid drop wise, pink scarlet, crimson red or occasionally green to blue color appears after few min.

**Alkaline reagent test:** To the extract add few drops of sodium hydroxide solution, intense yellow color is formed which turns to colorless on addition of few drops of dilute acid indicate presence of flavonoids.

**Zinc hydrochloride test:** To the extract add a mixture of zinc dust and conc.Hcl . It gives red color after few minutes.

**Lead acetate test:** Extracts were treated with few drops of lead acetate solution. Formation of yellow colour precipitate indicates that the presence of flavonoids.

#### **Specific chemical tests for tannins**

**Test for Gallotannins:** To the extract add KI solution. Pink color (free gallic acid shows orange).

**Test for Ellagitannins:** To the extract add acetic acid and conc. HNO<sub>3</sub>. Pink at first then turns to purple to blue.

**Gum & Mucilage:** The test found positive for both Leaf and Stem Extracts which indicates presence of Gums and Mucilage in Aqueous extract

**Volatile Oils & fats:** The test showed Negative in both the extracts.

**Test for Carbohydrates:** Fehling's Test for carbohydrates shown positive in both extracts

**Test for Amino acids:** Million's test Ninhydrin's Test for Aminoacids of both the extracts found positive.

#### **Test for Phenolic Compounds**

**Ferric chloride test:** The extract treated with ferric chloride solution if blue color appears that indicates hydrolysable tannins are present and green color appears if condensed tannins are present.

#### **Test for Steroids & Terpenoids:**

**Liebermann-Burchard test:** Treat the extract with few drops of acetic anhydride, boil and cool. The concentrated sulphuric acid added from the side of the test tube, brown ring is formed at the junction in two layers and upper layer turns green which shows presence of steroids and formation of deep red color indicates presence of tri-terpenoids.

**Salkowaski test:** Treat the extract with few drops of concentrated sulphuric acid, red color at lower layer indicates presence of steroids and formation of yellow colored lower layer indicates presence of terpenoids.

#### **Test for Saponins**

**Froth formation test:** Place 2 ml solution of drug in water in a test tube, shake well, stable froth (foam) is formed if the saponins positive test.

**Haemolysis test for detection of tannins:** 0.2 ml of extract taken into a test tube added 0.2 ml of blood in normal saline and mixed well. After mixing the content is subjected to centrifuging and noted observations. The red supernatant compare with control tube containing 0.2 ml of 10 % blood in normal saline diluted with 0.2 ml of normal saline.

#### **Detection of Glycosides**

**Borntrager's test for Glycoside detection:** Boil the extract with 1 ml of sulphuric acid in a test tube for 5 minutes. Filter while hot. Cool the filtrate and shake with equal volume of dichloromethane or pet ether. The lower layer of dichloromethane/ pet ether separated and mixed it with half of its volume of dilute ammonia. A rose pink to red color is produced in the ammoniac layer which indicates the presence of glycosides in extract.

#### **Results & Discussion**

According to the test results shown in Table: 1 the Aqueous Extracts of Guduchi extracts compared and found that some of the phytochemicals are present in Leaf extract and some are shown their availability in stem extract. The Guduchi Leaf Extract G1) shown positive test results which indicates the presence of Alkoloids, Anthraquinone Glycosides, Cardiac gycosides , Gallotannins, Ellagitannins, Gum& Mucilage, Xanthoproteins, Carbohydrates, Amino acids, Phenolic Compounds, Steroids &Terpenoids, Saponins and Flavonoids. The test results for detection of Volotile Oils& fats and Fixed oils & fats shown negative for aqueous Guduchi leaf extract prepared by maceration process which indicate the absence of these phyto chemicals.

The Aqueous stem extract of Guduchi prepared by maceration process containing of Alkoloids, Anthraquinone Glycosides, Cardiac gycosides , Gum& Mucilage Xanthoproteins, Carbohydrates Phenolic Compounds, Saponins and Flavonoids and are shown negative result for Volotile Oils& fats , Fixed oils & fats, Steroids &Terpenoids, Gallotannins, Ellagitannins.

**Table 1. Preliminary Phytochemical Analysis of Guduchi extracts**

S.No.	Name of the Test	GE1 (Guduchi Leaf Extract)	GE2 (Guduchi Stem Extract)
<b>I.</b>	<b>Test for Alkoloids</b>		
	i). Mayer's test:	+	+
	ii). Wagner's test:	+	+
	iii). Dragendorff's test:	+	+
<b>II.</b>	<b>Test for Glycosides</b>		
	i).Borntrager's test for Anthraquinone Glycosides	+	+
	ii). Cardiac glycosides	+	+
<b>III.</b>	<b>Test for specific Tannins</b>		
	i). Test for Gallotannins	+	-
	ii). Test for Ellagitannins	+	-
<b>IV.</b>	<b>Gum&amp; Mucilage</b>	+	+
<b>V.</b>	<b>Volotile Oils&amp; fats</b>	-	-
<b>VI.</b>	<b>Fixed oils &amp; fats</b>	-	-
<b>VII.</b>	<b>Proteins</b>		
	i).Xanthoproteins	+	+
<b>VIII.</b>	<b>Carbohydrates</b>		
	i). Fehling's Test	+	+
<b>IX.</b>	<b>Amino acids</b>		
	i).Milion's test	+	-
	ii). Ninhydrin's Test	+	-
<b>X</b>	<b>Test for Phenolic Compounds</b>		
	i). Ferric chloride test	+	+
<b>XI.</b>	<b>Steroids &amp;Terpenoids</b>	+	-
<b>XII</b>	<b>Sapponins</b>	+	+
<b>XII</b>	<b>Test for Flavonoids</b>	+	+

\*Phytochemical Test: '+' Present, '-' Absent

\*G1-Aqueous Extract of Guduchi Leaves prepared by maceration process.

\*G2-Aqueous Extract of Guduchi Stem prepared by maceration process.

During the study of Phyto chemical Analysis of *Tinospora cordifolia* stem and leaf extracts. The above re-corroborate with the observations found by some of the researchers<sup>11&12</sup>.

### Conclusion

The above study revealed that the aqueous Guduchi leaf extract obtained by the maceration process contains more variants of phytochemicals than stem extract. However further qualitative analysis has to be done to know the quantitative values of phytochemicals of Guduchi Leaf extract and Stem Extract to use for medicinal purpose.

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