

**SRI VENKATESWARA INTERNSHIP PROGRAM
FOR RESEARCH IN ACADEMICS
(SRI-VIPRA)**

Project Report of 2022: SVP-2209

**“Microscopic and chemical evaluation of some herbal crude
drugs”**



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**Sri Venkateswara
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SRIVIPRA-2022**

(Sri Venkateswara College Internship Program in Research and Academics)

This is to certify that this project on **“Microscopic and chemical evaluation of some herbal crude drugs”** was registered under SRIVIPRA and completed under the mentorship of **Dr. Yogendra Kumar Gautam** and **Dr. Shukla Saluja** during the period from 21st June to 7th October 2022.

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SRIVIPRA PROJECT 2022

Title: Microscopic and chemical evaluation of some herbal crude drugs

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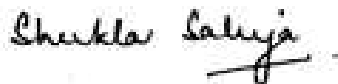
Certificate

This is to certify that the aforementioned students from Sri Venkateswara College have participated in the summer project SVP-2209 titled “**Microscopic and chemical evaluation of some herbal crude drugs**”. The participants have carried out the research project work under my guidance and supervision from 21st June 2022 to 7th October 2022. The work carried out is original and carried out in an online and offline mode.

Signature of Mentor



[Dr. Yogendra Kumar Gautam]



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Microscopic and chemical evaluation of some herbal crude drugs

Abstract

Microscopic and chemical evaluation of *Tinospora cordifolia* (Giloy) were carried out during this project work. Medicinal plants have been used to treat health disorders and prevent diseases since antiquity in all civilizations including the Indian and Chinese. Giloy (*Tinospora cordifolia*) is one of the most important medicinal plants in Indian, folk medicine and is commonly known as the “Heart-leaved Moonseed” or “Guduchi”. Giloy is a perennial shrubby creeper of the family Menispermaceae. It is native to the tropical areas of India, Sri Lanka, Myanmar, Southern Eastern Asia, Africa, and Australia. It attracted attention in the last few decades because its roots, stems, and leaves are used in folk medicine treating several disorders. The main secondary metabolites of Giloy are Alkaloids, Lignans, Steroids, Antioxidants and flavonoids.

Key words: *Tinospora cordifolia* (Giloy), secondary metabolites, alkaloids & flavanoids.

Introduction

Tinospora cordifolia (Giloy) is a medicinal plant which is being used since centuries. Its name is also mentioned in our history as Amrita (Nectar of life). It is also known as Guduchi, heart-leaved moonseed, giloe, amrita and many more. According to the Hindu mythological term, “Giloe” means that keeps eternally young. Whereas in Sanskrit “Guduchi” means to protect the whole body. Its scientific name is *Tinospora cordifolia*. *Tinospora cordifolia* is a climbing shrub native to Southeast Asian regions like India. It is a plant that grows on other trees. Ayurvedic medicine uses its roots, stems, and leaves. The whole plant of giloy is helpful for the body and offers many solutions in the Ayurveda. It is useful for overall body health. The most beneficial properties of Giloy (*Tinospora cordifolia*) is its antioxidant and immune-enhancing power. Likewise, it is also used in many problems related to diabetes, cholesterol, arthritis, stomach, gout, immunity, hepatitis, fever and many more.

The range of benefits of *Tinospora cordifolia* comes from large number of complex secondary metabolite present in the plant from roots to leaves. Some major complexes found in *T. cordifolia* are

Terpenoid

Alkaloids

Lignans

Steroids

Antioxidants

Terpenoids are active compounds mostly found in plants. It is the largest range from the plant that is related to the plants fragrance, taste and colour. Terpenoids are abundant in antimicrobial, antiviral, anti-cancer and antibacterial properties.

Alkaloids are dominant substances from ancient times, it's been used for curing illness and serious diseases. Alkaloids present in the plant are used in herbal medication and ayurveda. It works best for blood pressure, pain reliever, malaria and many more.

Lignans from *T. cordifolia* boost immune responses and prevent the viral, bacterial, fungal and other pathogenic growth. Lignans are majorly found in fibrous plants and trees.

Steroids are highly effective in lowering the cholesterol. In addition, they are also proved to work for skin, wounds healing etc.

Antioxidants found in *T. cordifolia* decrease the oxidative stress and it's required for maintaining health.

Review of literature

The leaf extract of *Tinospora cordifolia* is reported to have antimicrobial activity against gram+ and gram- bacteria, clinically relevant fungal infection and malarial parasites. The antimicrobial properties of *Tinospora cordifolia* extracts is attributed it's phytoconstituents such as furanolactone, tinosporon, jateorine and Columbin [1].

The stem extract was proved to be effective in boosting the immune system of patients. Phytochemicals are also reported be effective inhibitors of H1N1 viral protein [2]. *Tinospora cordifolia* is also used to feed fishes and growth of post larvae of catla catla.[3].

During the surge of Covid -19 virus, when the global pandemic broke the main aim was to ensure the patients be provided with natural immunological boosters since no vaccine or medicine was effective. Many researchers worked on *Tinospora cordifolia* as they have numerous antioxidant, antibacterial, antifungal, anti diabetic hypolipidemic, antimalarial, hepato-protective properties [4].

Many researches aimed on using *Tinospora cordifolia* for diabetic patients as it's effective for curing stomachache, jaundice, urinary problems, skin ailments and prolonged diarrhea and dysentery. The therapeutic properties of Giloy extracts were accredited to its phytochemical constituents which includes alkaloids, steroids, diterpenoid, lactones and glycosides [5].

To study the efficacy of some selected natural compounds reported in *Tinospora cordifolia* extracts were screened using *In - silico* pharmacology against three SARS-Cov-2 targets [7].

Researches done before show the use of all the plant parts in Ayurveda medication. However, the stem is the most beneficial part since it has most curative compounds [8]. The Ayurvedic Pharmacopoeia of India has approved the plants stem for pharmaceutical purposes.

The phytoconstituents of *Tinospora cordifolia* are reported to have antioxidant, antibacterial, antifungal, anti-diabetic, hypolipidemic, antimalarial, hepatoprotective and anticancer activities. Besides this, the plant extract is also shown to have wound healing, and immuno modulating properties [9]. Lignans can kill some types of cancer cells also.

Steroid compounds in plants are benefit for skin health, wound healing and Cardio-vascular health [10]. *Tinospora cordifolia* has cytotoxic activity that has been evaluated in it's crude methanolic extract, petroleum ether, carbon tetrachloride and chloroform extract. It is widely used in the treatment of diabetes, stomachache, jaundice, urinary problems, and prolonged diarrheadiarrhea.

Material and Methods

Tinospora cordifolia

Family: Menispermaceae

English: Gulancha

Hindi: Guruchi

Sanskrit: Guluchi, amrita

The term amrita refers to a heavenly elixir which was reputed to protect the celestial people from senescence and keep them eternally young.

Part used: Leaf and stem are used as explants

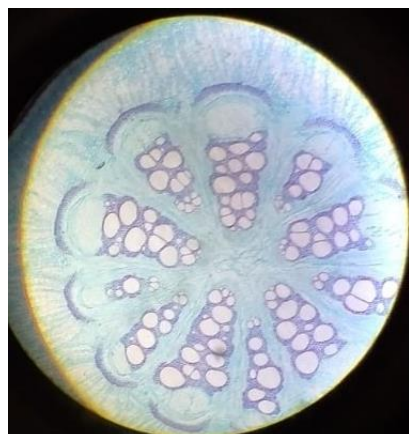
Medicinal use:

tonic, stimulant, immunomodulator, diuretic, hepatoprotective, sedative, asthma, gout, inflammation, jaundice, tumors, liver disorders and malaria.

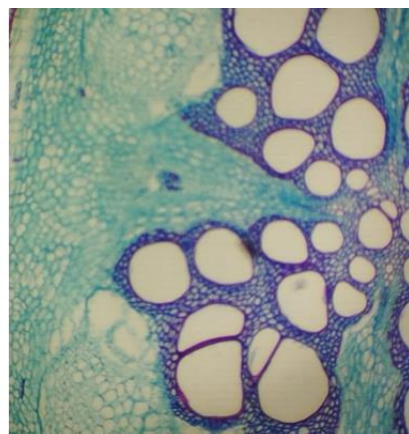


Plant stem and root, plant extract, compound microscope, slides, coverslips, needle, staining dye, chemicals etc.

- 1.) Microscopic analysis – for microscopic study of plant a thin section i.e. T.S .of stem and aerial of *T. cordifolia* was cut , stained and observed under the compound microscope.
- 2.) For phytochemical analysis – A qualitative phytochemical test to detect the presence of alkaloids, tannins, saponins, flavonoids, glycosides and phenols was carried out using the method of Trease and Evans, (1983).



T.S. Stem



T.S. Root

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