

TINOSPORA CORDIFOLIA (Giloy)

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Tinospora cordifolia

ABSTRACT: *Tinospora cordifolia* is one of the medicinal herbaceous vine, which is also known as giloy or guduchi. It is commonly found in India and widely used in traditional ayurvedic medicine. It is one of the Elixir medicine in Ayurveda which means immortality. *Tinospora cordifolia* (wild) Miers has various immune modulator properties as antioxidant, anti-inflammatory, antiallergic, antiviral etc. It has been promoted to the public in India as an immune booster and especially used to prevent novel coronavirus disease -2019, Covid-19 is a transmissible disease initiated and propagated through a new virus strain SARS- Cov-2 (severe Acute Respiratory Syndrome Coronavirus -2). All parts of the plants are used in Ayurvedic medicine but stem has the most beneficial components, extract of the stem reported containing Alkaloids, terpenoid, lignans, steroid, glycoside and some aliphatic compound. Deendayal research institute (DRI) Chitrakoot researches on this drug may provide a new approach as well as insight for prevention, management and development of new therapeutic entity to treat Covid-19. *Tinospora cordifolia* has been used in indigenous systems of medicine, as implied in various transcendent of ayurvedic system of medicine viz Charak, Sushrut and Ashtanghridaya and other ancient treatises.

INTRODUCTION:

Tinospora cordifolia is a deciduous woody climbing shrub distributed throughout the tropical and subtropical parts of Asia, Africa and Australia. *Tinospora cordifolia* is a twinning, succulent-stemmed with tuberous roots rising quickly. Its branches are grey-green turning brown with age, the leaves are heart-shaped, flowers are small green yellow and fruits are appearing bean or ovoid shaped glossy red drupes.

Tinospora cordifolia is also known as "Amrita" means immortality because of its abundant medicinal properties, and it's also called guduchi means something that protect the whole body. Giloy is popular in North and East India, it's native to India.



T. cordifolia



T. sinensis



T. glabra



T. crispa



T. formanti



T. smilacina

Classification
KINGDOM - PLANTAE (UNRANKED-ANGIOSPERM)
ORDER-RANUNCULATES
FAMILY-MENISPERMACEAE
GENUS-TINOSPORA
SPECIES- <i>TINOSPORA CORDIFOLIA</i>

COMMON/ VERNACULAR NAMES OF TINOSPORA
LATIN - <i>TINOSPORA CORDIFOLIA</i>
ENGLISH - GULUNCHA / INDIAN TINOSPORA
HINDI & SANSKRIT - GILOY, GUDUCHI, AMRITA
TAMIL AND MARATHI - SHINDILAKODI
BENGALI - GULANCHA

BENGALI - GULANCHA

Species	Disease /Complaint	Parts of application
<i>Tinospora sinensis</i>	Osteoarthritis	Stem
<i>Tinospora glabra</i>	-	-

Tinospora crispa	Diabetes, injury	Stem, water decoction
Tinospora formanili	-	-
Tinospora smilacina	Wound, injury	Leave, stem
Tinospora cordifolia	Amrita of Ayurveda, has a lot Medicinal properties	The whole plant

PHYTOCHEMICAL SCREENING AND MICROBIAL ANALYSIS:

MATERIAL AND METHODS - Stem of *Tinospora cordifolia* was coarsely powered and extracted with different solvent chloroform, acetone, methanol, hydro-alcohol & water. Stem of *Tinospora cordifolia* were dried under shade for 7-9 days and pulverized using an electric grinder. Terpenoids are one of the largest classes of active compounds found in plants, they have antimicrobial, antiviral, anticancer and antidiabetic properties. Alkaloids are compounds that give some plants their bitter taste, but it's useful and powerful chemical. Steroid compounds in plants may also have potential benefits for skin, wound healing & Cardiovascular health.

Tinospora cordifolia contain diverse phytochemicals including alkaloids, steroids, glycosides, flavonoids, phenols, tannins, protein & amino acid, rich in iron, fiber, carbohydrates, calcium, vitamin C and other essential nutritional elements.

Microbial analysis - *Tinospora cordifolia* have been reported to have potential against microbial infections. The anti-bacterial activity of *Tinospora cordifolia* extracts has been assayed against *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Proteus vulgaris*, *Salmonella typhi*, *Shigella flexneri*, *Salmonella paratyphi*, *Salmonella typhimurium*, *Pseudomonas aeruginosa*, *Enterobacter aerogenes*, and *Serratia marcescens* (Gram-positive bacteria). In mice models, TCE has been reported to function in bacterial clearance and improved phagocytic and intracellular bactericidal capacities of neutrophils.

MEDICINAL PROPERTIES:

During covid- The current Severe Acute Respiratory Syndrome disease caused by Coronavirus-2 (SARS-CoV-2) has been a serious strain on the healthcare infrastructure mainly due to the lack of a reliable treatment option. The practice of Ayurveda has several potent herbal alternatives for chronic cough, inflammation, and respiratory distress which are often seen in the SARS-CoV-2 infection.

Anti-diabetic activity- The stem of *Tinospora cordifolia* is widely used in the therapy of diabetes by regulating the blood glucose in traditional folk medicine of India. It has been reported to mediate its anti-diabetic potential through mitigating oxidative stress (OS), promoting insulin secretion and also by inhibiting gluconeogenesis and glycogenolysis, thereby regulating blood glucose. Alkaloids, tannins, cardiac glycosides, flavonoids, saponins, and steroids as the major phytoconstituents of *Tinosporacordifolia* have been reported to play an anti-diabetic role.

Anti-toxic effects- *Tinospora cordifolia* extracts have been reported to scavenge free radicals generated during aflatoxicosis. (TBARS) levels and enhancing the GSH, ascorbic acid, protein, and the activities of anti-oxidant enzymes viz., SOD, CAT, GPX, Glutathione S-transferase (GST) and glutathione reductase (GR) in kidney. Alkaloids such as a choline, tinosporin, isocolumbin, palmatine, tetrahydropalmatine, and magnoflorine from *Tinospora cordifolia* showed protection against aflatoxin-induced nephrotoxicity.

Anti-arthritic(osteoporotic) effects- Single or synergistic formulations of *Tinospora cordifolia* with *Zingiber officinale* has been used in rheumatoid arthritis treatment in traditional medicine. *Tinospora cordifolia* has been reported to affect the proliferation, differentiation and mineralization of bone like matrix on osteoblast model systems in vitro and hence finds potential application as an anti-osteoporotic agent.

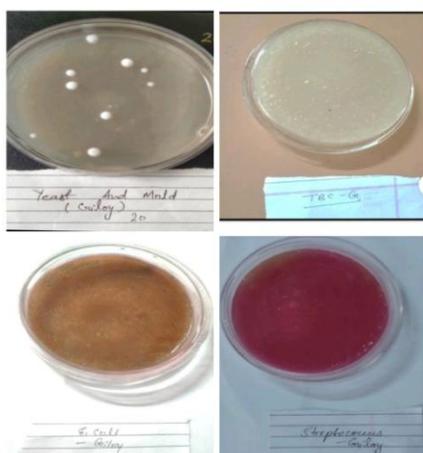
Anti-cancer effects- The anti-cancer effects of *Tinospora cordifolia* are mostly studied in animal models. TCE has been shown to have a radio protective

Anti-microbial activity- The methanol extracts of *Tinospora cordifolia* have been reported to have potential against microbial infections. The anti-bacterial activity of *Tinospora cordifolia* extracts has been assayed against *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Proteus vulgaris*, *Salmonella typhi*, *Shigella flexneri*, *Salmonella Pseudomonas aeruginosa*, *Enterobacter aerogenes*, and *Serratia marcescens* (Gram-positive bacteria). In mice models, TCE has been reported to function in bacterial clearance and improved phagocytic and intracellular bactericidal capacities.

Anti-oxidant activity- The anti-oxidant capacity of *Tinospora cordifolia* stem methanol extracts administered orally increased the erythrocytes membrane lipid peroxide and catalase activity. It also decreased the activities of SOD, GPX in alloxan-induced diabetic rats.

RESULT:

Whole plant of *Tinospora* is a rich source of nutrients & essential macro & micro nutrients & several phytochemicals. The nutraceutical agents present in the plant are responsible for its renowned immunomodulation, antipyretic, antispasmodic, hepato-protection, Anti-inflammatory, memory boosting properties.



SNo.	Parameters	Amount
1	<i>staphylococcus</i>	Absent
2	<i>Salmonella</i>	Absent
3	<i>Pseudomonas</i>	Absent
4	<i>E.coli</i>	Absent
5	TBC	200
6	Yeast&mould	20

s.No	Phytochemicals compound	Active compound with biological activity	Aqueous solution	Methanolic solution
1	Alkaloids Wagner's Mayer's Dragendorff's	Berberine, choline Magnoflorine, palmetine Which is antiviral, anti-cancer, anti-diabetic, immunomodulatory	+ - +	+ - +
2	Carbohydrates Anthrone Fehling	Starch, polyphenol, ascorbic acid Polysaccharides works for anti-inflammatory, antibacterial	+ -	- -
3	Glycosides	Tinocordiside, pamosides, cordifolioside treat with neurological disorder, show anti-cancer activity	+	+
4	Steroids	Ecdysterone, giloisterol works for IgA neuropathy arthritis	+	+
5	Protein/amino acid		+	-
6	Tannin/phenolic	Antihelminthic and antimicrobial activity for enzyme inhibition, metal ion complexation	-	-
8	Flavonoids	antidiarrhoea and antimicrobial which inhibit GI release of acetylcholine	+	-
9	Resins		+	-
10	Terpenoids	Antimicrobial and antidiarrhoeal is prostaglandins	+	+

DISCUSSION:

There are some negative aspects of Guduchi (*Tinospora*) that cause severe liver problems and overdoses can overstimulate the immune system and cause overreaction but the ministry of AYUSH confirmed that Guduchi is safe to use but some similar looking plants like *Tinospora glabra*, *crispa* may be harmful. "*Tinospora cordifolia* is known for its immense therapeutic applications and the practices are regulated in accordance with various application provisions" the ministry said. It observed that different species of *tinospora* are available but only *Tinospora cordifolia* should be used in therapeutic whereas similar looking species may manifest adverse effects.

CONCLUSION:

Tinospora cordifolia is a versatile resource for all forms of life. There are reports as already discussed that the plant extracts have active compounds in the form of alkaloids, glycosides, lactones and steroids. All these active compounds have immunomodulatory and physiological roles of different types, thereby demonstrating the diverse versatility of the plant. *Tinospora cordifolia* has an importance in traditional ayurvedic medicine used for ages in the treatment of fever, jaundice, chronic diarrhea, cancer, dysentery, bone fracture, pain, asthma, skin disease, poisonous insect, snake bite, eye disorders. Various studies that have been conducted on *T. cordifolia* reveals that it is an excellent drug and does not have any adverse or toxic effects till now. The absence of microbes in the result indicates the genuineness of final product.

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