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REVIEW ON BASIC INFORMATION, CULTIVATION AND MEDICINAL USE OF  
*TINOSPORA CORDIFOLIA* IN PHARMACEUTICALS

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**ABSTRACT:**

*Tinospora cordifolia*, commonly known as Giloy or Guduchi is a multipurpose herb used widely in many Ayurvedic preparations. The stem of *Tinospora cordifolia* has a nutrient starch which is extracted and used in medicine. In Ayurveda, it is designated as Rasayana drug recommended to enhance general body resistance, promote longevity and as antistress and adaptogen. The fact that it is called "Amrita" signifies its use for revitalization and its importance in Ayurveda. This significant plant is also mentioned in important Pharmacopoeias. The principal constituents of *Tinospora cordifolia* are tinosporine, tinosporide, tinosporaside, cordifolide, cordifol, heptacosanol and tinosporidine all of these are effective in removing body toxins and improving immune system. The taste of the extract is bitter sweet with no distinct flavour. It is believed to impart youthfulness, vitality and longevity and hence it is also called Amritam in Sanskrit. In Ayurvedic medicine, Giloy is used as a tonic and as a remedy for diabetes. According to Ayurvedic concept, giloy is a rasayana herb, which enhances longevity, promotes intelligence and prevents diseases. The drug is well known Indian bitter and prescribed in fevers, diabetes, dyspepsia, jaundice, urinary problems, skin diseases, chronic diarrhea and dysentery. It has been also indicated useful in the treatment of heart diseases, leprosy, helmenthiasis and rheumatoid arthritis. The starch obtained from the stem known as guduchi-satva is highly nutritive and digestive and used in many diseases.

**Key words.** Ayurveda, Diseases, Herb, Medicinal use, Root, Stem and *Tinospora cordifolia*.

## INTRODUCTION

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*Tinospora cordifolia* is belong to family Menispermaceae. It is a shrub that is native to India. Its root, stems, and leaves are used in Ayurvedic medicine. In Ayurveda, it is designated as Rasayana drug recommended to enhance general body resistance, promote longevity and as



antistress and adaptogen (B. Patwardhan et. al. 2005 and M . Patil et. al. 1997). The fact that it is called “Amrita” signifies its use for revitalization and its importance in Ayurveda. This significant plant is also mentioned in important Pharmacopoeias (BPC 1994, IPC., Govt. Of India 2007 and Dept of AYUSH, Ministry of Health & Family Welfare, Govt. Of India. 1999 ). *Tinospora cordifolia* plant is found mainly

in Malaysia, India and Srilanka. There are about 40 species of Giloy which are found throughout the world, comprising parts of Africa, Southern Eastern Asia, and Australia. Out of 40 species only 4 species have been found in India. The main parts uses of this plant are stem and root. *Tinospora cordifolia* is known as Giloy in hindi and it is also known as Guduchi (Marathi name). Giloy is an evergreen herbaceous perennial climbing shrub. It is found growing throughout in tropical India. Giloy can be seen growing widely on the big trees sometimes thickly covering the entire canopy and hanging from all over the tree. It has a soft stem and heart shaped leaves. It is called Heartleaf Moon seed in English. It is a multipurpose herb used widely in many Ayurvedic preparations. The stem of Giloy has a nutrient starch which is extracted and used in medicine. The taste of the extract is bitter sweet with no distinct flavour. It is believed to impart youthfulness, vitality



and longevity and hence it is also called



“Amritam” in Sanskrit. In Ayurvedic medicine, Giloy is used as a tonic and as a remedy for diabetes. It reduces blood glucose levels and has anti spasmodic, anti viral, anti bacterial, anti inflammatory and anti pyretic properties. It is diuretic. It is an adaptogen. It helps to build up the immune system and increases the resistance of the body against infections. It also stops premature ageing. Fresh juice obtained from the herb aids digestion. It is a blood purifying herb and helps in treating skin diseases. Giloy extract is the main ingredient in the formulations for treating cardiac weakness, anaemia, chronic fever and jaundice. According to ayurvedic concept, giloy is a rasayana herb- A herb that enhances longevity, promotes intelligence and prevents diseases. The demand for medicinal plant by the pharmacies is seen to be moving in correspondence with the rate of growth of consumer demand for the Ayurvedic medicines ten percent per annum from 1993 to 1996 (Suneetha and Chandrakanth, 2002). At home one can harvest the stems in hot season and extract juice and dry it. Once the liquid dries up, white starch is left behind. This is used as medicine. Fresh juice can also be extracted and taken. Capsules of the extracts of giloy of many well known brands are available in the market.

#### COMMON NAMES

Heart leaf moonseed (English), Gulvel (Marathi), Gulancha (Bengali), and Amrutha balli (Kannada). In ancient Indian literature, the plant is termed as Amrit (Sanskrit) and Abb-e-Hyat (Urdu) meaning water of life. In Hindi, the plant is commonly known as Giloya, a mythological term that refers to the heavenly elixir having saved celestial beings from old age and kept them eternally young [Singh et al. 2003]. Other common names and synonyms are *Guduchi*, *Amrita*, *Amritavalli*, *Madhuparni*, *Guduchika*, *Chinnobhava*, *Vatsadani*, *Tantrika*, *Kundalini*, *Chakralakshanika* (Sanskrit), *Gurcha* (Hindi), *Garo*, *Galac* (Gujarati), *Thippateega* (Telugu), *Amrita*, *Gilo* (Kashmiri), *Chittamrutu* (Malayalam), *Guluchi* (Oriya), *Gilo* (Punjabi), *Seendal*, *Seendil Kodi* (Tamil), *Siddhilata*, *Amarlata* (Assamese) [Dept. of Indian system of medicine and homoeopathy New Delhi welfare 2001].

#### CULTIVATION OF GILOY

The plant is very hardy and it can be grown in almost all climates but prefers warm climate. It grows well in almost any type of soils but black soil (Vertisols) or red soil (Alfisols) found in Tamil Nadu is the best for the cultivation of *Tinospora Cordifolia*. *Tinospora* can be propagated by seeds and also vegetative cuttings. The

best way is vegetative way. The cuttings of the small finger thickness with 6 to 8 inch length long stem having two nodes are used. Promotion of rooting of shoot cuttings by exogenous auxins application in several species has been reported (Hartmann *et al.*, 1997). The cuttings are dipped by quick dip method in 2500 ppm of IBA and get greater success of rooting. This may be planted in poly bags of 4 inch ×6 inch size. The poly bags filled with mud, sand and dry cow dung in the ratio 1:1:1. The rooting of the cuttings takes almost 4 to 5 weeks. The cuttings of *Tinospora cordifolia* will be ready for planting into the main field by this time in the month of May-June. The seeds are curved. Flowers appear during the summer and fruits during the winter (Kirtikar and Basu, 1975; Anonymous, 1976). It requires some support preferably Neem and Mango trees, such plants are supposed to possess better medicinal values. Periodical hoeing is done, both in the nursery and field as per requirement. The medicinal plants have to be grown without chemical fertilizers and use of pesticides. Organic manures like, Farm Yard Manure (FYM), Vermi-Compost, Green Manure etc. may be used as per requirement of the species. Yield Approximately 8-10 q./hectare.

#### MEDICINAL USE

1. Diabetes mellitus is a worldwide chronic disease of humans related with the elevated blood sugar level due to insulin deficiency. . Diabetes is broadly classified in to Type-1 and Type-2 Diabetes. *Tinospora cordifolia* has shown signification reduction in blood sugar level in both normal and Allaxon induced Diabetic mice. The extract of plant parts decreases the blood sugar level [RR.Chattopadhyay 1999].
2. *Tinospora cordifolia* extract is a plant derived immunostimulant. It has been observed that it significantly affects the symptoms of HIV as validated by clinical evaluation. *Tinospora cordifolia* can be used as an adjunct to HIV/AIDS management [Kalikar *et. al.* 2008]
3. It is used in the treatment of jaundice because it reduces body heat [Sangeetha *et. al.* 2013].
4. This plant has great potential for developing useful drugs. The leaves extract have shown anti-HIV 1 activity. Thus it can be said that biological extract from this plant will certainly be helpful in protecting and treating various viral diseases in humans [Estari *et. al.* 2012].
5. Plant stem is used in general debility, dyspepsia, fever and urinary diseases [Singla A, 2010].

6. *Tinospora cordifolia* helps in increasing the scavenging and desloughing action of PMN cells and macrophages. These phagocytic cells contributes in pro-healing processes like growth factor activation, angiogenesis and granulation tissue formation which are otherwise inhibited and suppressed in chronic wounds. The exact function of these immunomodulated cells is not proven in this study and the results are only based on the observation of better wound healing in the drug group [H. Purandare and A. Supe 2007].

7. For treatment of cancer, the powder of root and stem is used along with milk [RP. Bhatt and SD.Sabnis 1987].

8. It has been observed that polyherbal formulation of *T.cordifolia* possesses favourable effect in patient with HIV infection [P.Srivastava 2011].

9. Bacterial infection triggers host defence mechanism which is initiated by macrophage activation and differentiation. These activated macrophages have perfect surface morphology. Intensive rough surface or spherical macrophage (abnormal) count is increased to several folds in the presence of carbon tetrachloride. Studies have shown that *Tinospora cordifolia* extract helps in the protection from CCl<sub>4</sub> toxication, probably by the production of monocyte colony stimulating factor or granulocytemonocyte

stimulating factor (M-CSF/GM-CSF) [Sengupta et. al. 2011].

10. Oral administration of the juice of stem with honey can also be used for treatment of asthma [Sinha et. al. 2004].

11. Role of *Tinospora cordifolia* can be seen in tumor suppression also. Studies have shown that the polysaccharide fraction of *T. cordifolia* when injected intraperitoneally in mice resulted in the inhibition of lung metastatic colonies [SS Pingale 2010].

12. Since *T. cordifolia* is a good antioxidant, it is given with L-DOPA during Parkinson's disease. L-DOPA produces free radicals during the formation of dopamine. Thus *T. cordifolia* neutralizes the side effect of drug [P.Srivastava 2011].

13. 9. The stem of *Tinospora cordifolia* is one of the constituents of several ayurvedic preparations used in general debility, dyspepsia, fever and urinary diseases (Singh *et al.*, 2003).

14. Studies have shown that *T.cordifolia* improves the phagocytic function without affecting the humoral & cell mediated immune systems. Active components syringing & cardiol inhibit the invitro immunohaemolysis of antibody coated sheep erythrocytes by guinea pig serum, which is due to inhibition of C3convertase of classical complement pathway. The compounds also give rise to significant

increases in IgG antibodies in serum [Sinha et. al. 2004].

15. Guduchi is also used for soothing inflamed and injured mucous membranes in the digestive tract. It protects the stomach and duodenum by increasing the production of mucin.

16. Modern use of *Tinospora cordifolia* as an immunomodulator has drawn the interest of researchers in the last few decades (Spelman, 2001).

17. Giloy (*Tinospora cordifolia*) is widely used against monkey malaria. Studies have shown that giloy juice which is a mixture of Giloy herb and Tulsi leaves increases body resistance upto 3 times and serves as a powerful counter of Plasmodium virus attacks [Vashist et. al. 2011].

18. Crude extract of *Tinospora cordifolia* contains a polyclonal B cell mitogen which increases immune response in mice. An arabinogalactan polysaccharide, G1-4A from the stem of *T. cordifolia* has been examined to affect induced immunosuppression [M. Alamgir and JU. Shaikh 2010].

#### SOME PRACTICAL USES OF *TINOSPORA CORDIFOLIA*

- The principal and constituents of giloy are tinosporine, tinosporide, tinosporaside, cordifolide, cordifol, heptacosanol and tinosporidine, all of these are

effective in removing body toxins and improving immune system (Singh et al 2003 and Quadir et al 1964).

- Giloy satva is considered to be a good remedy of headaches (along with triphala churna) caused due to dosha imbalance, giloy is a solid powdery substance which is a water soluble extract of the stems of giloy, giloy juice is considered to be clearing some nervous toxins which in turn helps in brain function, that might be helping in management of headaches too.
- Giloy juice taken with neem, haldi and amla is effective in treatment of skin affections, the most annoying types of eczema, lichens planus and other infections can be treated with this (point to be noted is that long standing affections take more time to be cured), the juice is considered a good blood purifier and hence useful in skin affections.
- Giloy juice with buttermilk is beneficial in treatment of piles and fissures, other dietary restrictions should be followed alongside.
- The root and bark juice taken with whey helps in curing asthma and other respiratory ailments.



- Stem decoction is considered good for improving the quality of breast milk in lactating mothers.
- The fresh juice of stem ( a foot long stem crushed and juiced) taken daily first thing in the morning is useful in controlling blood sugar...( dietary restrictions not to be forgotten).
- Excessive menstrual bleeding can be controlled by fresh juice too, to be taken twice a day, till condition improves.
- Warm decoction of stem with pippali ( piper longum) and honey is good for fevers cause by infections in the body.
- for indigestion , the juice of stem with honey or leaf paste mixed with buttermilk and seasoned with black salt and roasted cumin powder are very effective.
- Since the stem decoction is considered anti-inflammatory and diuretic, it helps in urinary tract infections, addition of fennel seeds and palm candy to the decoction is useful.
- For gout and high uric acid conditions, the fresh stem juice first thing in the morning helps; low protein diet will be helpful in a fast relief.

- Since it is a good immunomodulator , it helps in the management of several auto immune diseases.

## **WORK OF TINOSPORA CORDIFOLIA**

*Tinospora cordifolia* contains many different chemicals that might affect the body. Some of these chemicals have antioxidant effects. Others might increase the activity of the body's immune system. Some chemicals might have activity against cancer cells in test animals. Most research has been done in test tubes or in animals. There isn't enough information to know the effects of *Tinospora cordifolia* in the human body.

## **TINOSPORA CORDIFOLIA: SIDE EFFECTS & SAFETY**

*Tinospora cordifolia* seems to be safe when used short-term. The safety of long-term use, more than 8 weeks, is not known.

## **SPECIAL PRECAUTIONS & WARNINGS:**

**Pregnancy and breast-feeding:** Not enough is known about the use of *Tinospora cordifolia* during pregnancy and breast-feeding. Stay on the safe side and avoid use.

**Diabetes:** *Tinospora cordifolia* might lower blood sugar levels. Use it cautiously if you have diabetes, and monitor your blood sugar levels. The doses of your



diabetes medications might need to be adjusted.

“Autoimmune diseases” such as multiple sclerosis (MS), lupus (systemic lupus erythematosus, SLE), rheumatoid arthritis (RA), or other conditions: *Tinospora cordifolia* might cause the immune system to become more active, and this could increase the symptoms of autoimmune diseases. If you have one of these conditions, it’s best to avoid using *Tinospora cordifolia*.

#### DOSE OF *TINOSPORA CORDIFOLIA*

The following doses have been studied in scientific research:

#### BY MOUTH:

For allergic rhinitis (hay fever): 300 mg of a specific *Tinospora cordifolia* aqueous

stem extract (Tinofend, Verdure Sciences) three times daily for 8 weeks.

#### CONCLUSION

*Tinospora cordifolia* plant is rich in many phytoconstituents that are useful in drug designing. Because of the vast immunological properties of Guduchi, it has found medicinal applications from anti-allergic to tumor- suppression and cancer. It is an endangered rasayana herb of India and holds a special position as a potent adaptogen and aphrodisiac in Ayurvedic System of Medicine. Conclusion of this Studies the *Tinospora cordifolia* have been use in therapeutics.

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