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# Ayurvedic Rasayana Guduchi (Tinospora cordifolia): A Review

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## ABSTRACT

Plants derived medicines have played a pivotal role in health care of ancient and modern cultures. Ayurveda, the Indian system of medicine uses plant based as well as rasa-aushadhies/drugs or formulations to treat various ailments. *Tinospora cordifolia*, Sanskrit name *Guduchi*, is a plant from the Menispermaceae family. It has a long history of use in Ayurvedic medicine (the traditional medicine of India). Different therapeutic uses (*karma*) are described as in *meha, kasa, pandu, kamala, vatarakta, krimi* and *jvara* disorders etc. in Ayurvedic texts. The herb also has *balya, agnidipaka, rasayana, sangrahi* properties. The various therapeutic activities (or pharmacological actions) attributed to *Tinospora cordifolia* in Ayurvedic texts have been validated by modern evidence suggesting that this plant has immense potential in modern pharmacotherapeutics.

**KEYWORDS:** *Tinospora cordifolia*, Guduchi, Rasayana etc.

## INTRODUCTION

Medicines derived from plants have played a pivotal role in health care of ancient and modern cultures. Ayurveda, the Indian system of medicine uses plant based as well as rasa-aushadhies/drugs or formulations to treat various ailments. *Tinospora cordifolia*, Sanskrit name *Guduchi*, is a plant from the Menispermaceae family. It has a long history of use in Ayurvedic medicine (the traditional medicine of India). The plant is a glabrous climbing shrub found throughout India, typically growing in deciduous and dry forests. The leaves are heart shaped. The succulent bark is creamy white to grey in colour, with deep clefts spotted with lenticels. Young stems green with smooth surfaces and swelling at nodes, older ones show a light brown surface marked with warty protuberances due to circular lenticels,

transversely smoothened surface shows a radial structure with conspicuous medullary rays traversing porous tissues, taste bitter.

**Synonyms:** Various synonyms in Sanskrit are *Guduchi, Madhuparni, Amrita, Amritwali, China, Vatsadnni, Jivanti, Somawali, Chhakralakshanni, Rasayani, Kundali* etc (Bhava Prakasha Nighantu Guduchhiayadivarga, page-269).[1]

**Properties and Action[1]**

**Rasa:** Tikta, Katu, kashaya

**Guna:** Laghu

**Virya:** Ushna

**Vipaka:** Madhura

It is indicated for different therapeutic uses (*karma*) described as in *meha, kasa, pandu, kamala, vatarakta, krimi* and *jvara* disorders etc in Ayurvedic texts. The herb also has balya, agnideepan, rasayana, sangrahi properties. Acharya Charaka described sangrahak, dipan, sleshman-sonita- and vibandhara (Charaka Samhita Sutrasthana 25/40).[2] There are various formulations of Guduchi in Ayurvedic texts which are used in various diseases such as *Amritaarista, Guduchi churna, Guduchiyadi churna, Amritastaka kwatha, Guduchi Taila, Guduchi Sattva* etc. A number of chemical constituents are reported after various experiments such as terpinoids, alkaloids, steroids etc. which are responsible for different pharmacological actions.

**Therapeutic Uses**

Several plant products have useful medicinal properties for the treatment of various ailments. This herb has been used in Ayurvedic rasayanas since centuries. Following are therapeutic uses of *Tinospora cordifolia*

1. **Effects on Stress, Learning and Memory:** Acharya Charaka described this herb among four rasayana for promoting memory (medhya), increasing strength, digestive fire, longevity and curing various diseases (Charaka Samhita Chikitsasthana 1/3/30-31).[2] In present time, various studies and trails have been performed to evaluate its therapeutic effects on nervous ailments. *Tinospora cordifolia* has been found to enhance verbal learning and memory and logical memory (of immediate and short term type) compared to placebo in healthy volunteers of age 18-30 years (K. Laxminarayan Bairy et al., 2004).[3] Alcoholic and aqueous extracts of the whole plant of *Tinospora cordifolia*

enhances cognition in normal and cyclosporine induced memory deficit rats (Ashutosh Agarwal *et al*., 2002).[4] Petroleum ether extract of *Tinospora cordifolia* showed therapeutic activity for the management of depressive disorders when trialed on depression in mice (D. Dhingra and P. K. Goyal, 2008).[5]

2. **Effect on Immunity Disorders:** In Ayurveda, Guduchi is counted amongst the '*Rasayana'*. Acharya Charaka described rasayana as anti-aging methods, which increase the life span, promote intelligence, improved memory and ultimately ensure freedom from diseases, all of these indicating its immune-stimulant effect. Various experimental/clinical studies continue in present years in treatment of immunodeficiency disorders. So, *Tinospora cordifolia* could be used as an adjunct to HIV/AIDS management for better control (M. V. Kalikar et al., 2008).[6] The alcoholic extracts showed potent immunomodulatory action as evident by enhancement in the bone marrow cellularity as well as α-esterase activity in the rats groups (Vaibhav D. Aher, Arun kumar Wahi, 2010).[7]
3. **Effect on Gastrointestinal disorders:** In Ayurveda, properties of *T. cordifolia* include sangrahi, dipana, agnidipan, javarhar etc. The ethanolic extract of stem of *Tinospora cordifolia* noticed antispasmodic and anti-diarrhoeal activity on isolated rat ileum preparations (Prashant Tiwari *et al.*, 2011).[8] The anthelminthic property of *T. cordifolia* extracts was evaluated using *Pherithema posthuma* as an experimental model and the ethanol extract showed significant results (M. Rajeshwar Reddy *et al*., 2011).[9] Liver diseases are a serious health problem. In the absence of reliable liver protective drugs in allopathic medical practices, herbs play a role in the management of various liver disorders. *Tinospora cordifolia* is well known for hepatoprotective activity and during a study, the extracts of various parts of the plant such as leaf, stem and root were tested orally using Wistar albino rats and results suggests that the biologically active phytoconstituents present in the ethanolic extract of plant *Tinospora cordifolia*, may be responsible for the significant hepatoprotective activity (B. T. Kavitha et al., 2011).[10]
4. **Effect on hematological disorders:** V. Sharma, D. Pandey, (2010)[11] noted protective roles of aqueous extract of stem and leaves of *Tinospora cordifolia* on the toxic effects of lead on the haematological values in male albino mice. Veena Sharma et al., (2011)[12] investigation results reported that ethanolic extract of *Tinospora cordifolia* root significantly diminished the adverse effect of aflatoxin and altered most of the haematological and serological variables.

5. **Antiallergic properties:** *T. cordifolia* may be beneficial in the treatment of allergic disorders as aqueous extract of *Tinospora cordifolia* showed inhibition of reactive oxygen species generation and decreased intracellular calcium levels of activated mast cells (Rishit Zalawadia et al., 2009).[13]
6. **Cardioprotective activity:** Many antioxidative plants were shown to be cardioprotective in experimental models of myocardial ischemia-reperfusion injury. During study, pretreatment with alcoholic extract of *Tinospora cordifolia* was investigated in vivo rat model and results suggests the cardioprotective activity of *T. cordifolia* in limiting ischemia-reperfusion induced myocardial infarction **(**Rao PR et al., 2005).[14]
7. **Anticancer activity**: The anticancer activity of dichloromethane extract of guduchi in the mice transplanted with Ehrlich ascites carcinoma (EAC) was investigated and which exerted cytotoxic effect on tumor cells by reducing the glutathione (GSH) concentration and increase in lipid peroxidation (LPx) simultaneously (Ganesh Chandra Jagetia and Shaival Kamalaksha Rao, 2006).[15] Similarly in other study, Shaival Kamalaksha Rao et al., (2008)[16] which also showed use of Tinospora cordifolia as an alternative treatment strategy for cancer in combination with gamma radiation.
8. **Anti-oxidant activity:** Dried and powdered leaves of *T. cordifolia* were extracted with hexane, chloroform, methanol, ethanol and water and studied for antioxidant activity and results also suggests its antioxidant activity specially ethanol extract (Ramya Premanath and N. Lakshmidevi, 2010).[17]
9. **Antimicrobial activity**: *Tinospora cordifolia* is a promising antimicrobial agent when used in various diseases caused by different types of bacteria. D.R.Verma and Arun Kakkar, (2011)[18] study determines the antibacterial effect of *Tinospora cordifolia* stem methanol extract on Escherichia coli, Staphylococcus aureus and Staphylococcus albus bacteria. Extracts of the roots of *Tinospora cordifolia* also showed antibacterial activity when trialed in a study (M. Fatima Rose et al., 2010).[19] Methanolic crude extract of Tinospora cordifolia showed antifungal activity (Singh S. et al., 2010).[20]
10. **Antiosteoporotic activity:** The extract of *T. cordifolia* has the potential for being used as antiosteoporotic agent as extract showed estrogen like effects in bone (P. Kapur et al., 2008).[21]
11. **Antidiabetic activity***: Tinospora cordifolia* is widely used in Indian Ayurvedic medicine for the treatment of diabetes mellitus. Kinkar Shobha B et al study showed that the extract of Tinospora cordifolia is antidiabetogenic and possess hypoglycemic effects.[22] Varsha

V Sonkamble et al study reported that antidiabetic activity of T. cordifolia is due to presence of compounds inhibiting α-amylase and α glucosidase enzymes.[23]

## CONCLUSION

In Ayurvedic texts, *Guduchi* is placed amongst the rasayana dravyas which improves the body's resistance against infections. Guduchi is a unique source of various types of compounds having diverse chemical structures and functions. The various therapeutic activities (or pharmacological actions) attributed to *Tinospora cordifolia* in Ayurvedic texts have been validated by modern experimental evidence suggesting that this plant has immense potential in modern pharmacotherapeutics. Remarkable research has been done on the biological activity and possible application of these compounds and still broad exploration is needed to take advantage of their therapeutic utility to combat different diseases.

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