



GUDUCHI (TINOSPORA CORDIFOLIA (WILD.) MIERS EX HOOK. F. & THOMS.) A SPECTACULAR CLIMBER & NATURAL ANTIOXIDENT

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ABSTRACT :

All edible things which are used in our food are full of free radicals. So there develop a need to free our body from these free radicals and the things which can help are the natural antioxidants. Guduchi is the best of them which is abundantly available in all over the India. Though almost all of its parts are used in traditional systems of medicines, leaves, stem and roots are the most important parts which are used medicinally. GUDUCHI (*Tinospora cordifolia* (Wild.) Miers ex Hook. F. & Thoms.) is a versatile resource for all forms of life. It belongs to family Menispermaceae. It contains many different chemicals that affect the body. Some of these chemicals have an antioxidant effect. While other might increases the ability of body's immune system and some chemicals have activity against cancer cells also. The 'Rasayana' accords longevity, enhance the memory, improve the health, bestows youth, better complexion, voice, energy and lustre the skin. So it is one of the most effective rasayana and rejuvenative. It works well on all the seven dhatus [tissues]and keeps the system in balance. This review gives a bird's eye view on the therapeutic uses of various parts and extract of *T. cordifolia* to enrich our knowledge about this plant

Key words: *Tinospora cordifolia*, Guduchi, Antioxidant, Antipyretic, Rejuvenator, Rasayana, Dhatu.

INTRODUCTION: Guduchi (*Tinospora cordifolia* (Wild.) Miers ex Hook. F. & Thoms.) is one of the non-controversial and extensively used herbs in Ayurvedic medicine. It belongs to family Menispermaceae. The World Health Organization reported that 80% of the world population relies chiefly on traditional medicines involving the use of plant extracts or their active constituents. It contains Berberine, Giloin and bitter substances. It acts as antiperiodic, alterative and diuretic. Watery extract of the plant is

used as a febrifuge and is called 'Indian quinine'. An infusion prepared from the stem and root is a valuable tonic in debilitating diseases, intermittent fever and dyspepsia^[1]

VERNACULAR NAMES:

Guduchi (*Tinospora cordifolia* (Wild.) Miers ex Hook. F. & Thoms.) is commonly known as "gurcha, giloe, gulanha" in Hindi, "guduchi, amrita, somavalli" in Sanskrit, "gula-vel" in Marathi, "gulanha" in Bengal, "seendal" in tamil, "gilo" in Urdu.^[1]

The plant *Tinospora cordifolia* (Wild.) Miers ex Hook. F. & Thoms. Is known as Guduchi because it protects body from diseases. It is a rope-like (Tantrika) perennial climber (Amrta, Amrtavallari) ascending on host in a circular way (Kundali, mandali). It is generated from stem (Kandodhbhava) and when cut, it regenerates (Chinnaruha). In transverse section of the stem, a circular structure is seen (Cakralaksanika). Its leaves appears like filled with honey (Madhuparni) and are eaten by calves (Vatsadani). The seeds are semilunar (Candrasaha) which is the basis of the name moon-seed.

Guduchi is a potent drug efficacious in fever (Jvarnasini) and well known rasayana (Jivanti, Dhara, Rasayana, Vayastha, Vayasya). It promotes strength and vitality (Soma), counteracts the poisons (Visaghi) and protect from disorders (Guduchi, Vasalya).^[2]

CLASSICAL REFERANCES:

In VEDA Sounakiya Atharvaveda and Panini Upadhi Bhojavrtta Sayana delineated that Guduchi is kept in every house to avoid snakes and scorpions.

CHARAK has catogrized it in Vayahsthapana, Daha prasamana, Trishna nigraha, Triptighna, Stanya-sodhana and also in Agrya dravyas (principal drugs) by attributing Grahi, Vatahara, Dipaniya, Kapha-Rakta hara and Vibandhahara properties. He also identified it as one of the best Medhya Rasayanas (brain tonic).^[3] SUSRUTA has mentioned it in Guducyadi, Patoladi, Valli Panchmula, Kakolyadi, and Aragvadhadi.gana^[4]

Astanga Sangraha has mentioned it into Guducyadi, Patoladi, Aragvadhadi.^[5]

Description of Guduchi is found in almost all nighantus. Dhanvantari nighantu, Bhava prakash nighantu and Raja nighantu

described it under Guducyadi Varga. Sodhala included it into Osadhi Varga

BOTANICAL DISCRPTION:

Guduchi grows throughout India in deciduous as well as dry forests. It is said to be climb over the highest trees. .

It has two varities :

(1) *Tinospora cordifolia* Miers (*Menispermum cordifolium* Willd.)

(2) *T. cinensis*: (*T. malabarica* (Lam.) Miers)

(1) *Tinospora cordifolia* Miers (*Menispermum cordifolium* Willd.)

It is a large climber with succulent, corky, and grooved stems; branches posses slender, pendulous fleshy roots.

Leaves- membranous, glabrous, 5-10 cm long, cordate; petiole 2.5-7 cm long.

Flowers- in racemes of about 5 cm; axillary terminal or from the old wood, pale yellowish white in colour.

Fruits- carpels, dorsally convex, ventrally flat, size of a large pea.

(2) *T. cinensis*: (*T. malabarica* (Lam.) Miers):

It is a large climber with 2 cm. diameter stem, old branches are smooth and shining, more or less warty light coloured papery bark, young parts covered with whitish hairs.

Leaves- membranous, sparingly pubescent above, broadly ovate-cordate, 7.5-23 cm long, petiole 6-12 cm. long, striate.

Flowers- arranged in pseudo racemes arising from the old branches, simple, pedunculate, yellowish green coloured.

Fruits- drupes 1-3, scarlet or orange coloured.^[6]

DISTRIBUTION:

It grows as a climber on small trees and shrubs, both species are distributed almost throughout the India. It is found in lower valleys in Garhwal up to 900m; also reported from Almorha, Kashipur in

Kumaon region. It is fairly common plant of deciduous and dry forests, growing over hedges and small trees.^[7]

SUBSTITUTES AND ADULTERANTS:

T. cordifolia is substituted or adulterated with other species of *Tinospora*, viz. *T. sinensis* (Lour.) Merrill (syn. *T. malabérica* Miers ex Hook. f. and *T. crispa* (Linn.) Miers ex Hook. f. & Thoms.). Although, the microscopical characters of *T. sinensis* resemble that of *T. cordifolia*, there are few characters by which these two species can be differentiated. The distinguishing characters are:

In *T. cordifolia* the sclerenchymatous sheath becomes disintegrated into scattered irregular patches in the cortical regions whereas in *T. sinensis* it is broken into areas capping the vascular bundle and remains persistent even after further secondary growth. Crystals are absent in *T. cordifolia* while in *T. sinensis* a large crystal of calcium oxalate is present within the lumen of each cork cell. Mucilaginous cells are more in *T. cordifolia* as compared to *T. sinensis*. Vascular strands are fewer in *T. cordifolia* while greater in *T. sinensis*. Xylem is well developed in each strip of vascular strand in *T. cordifolia* while it is poorly developed in *T. sinensis*. Pith is very narrow and composed of thin walled cells in *T. cordifolia* while it is wide in *T. sinensis*. Starch content is more in *T. cordifolia* as compared to *T. sinensis*.^[8]

CHEMICAL CONSTITUENTS:

Different constituents that it contains are bitter principles, a glucoside, alkaloids etc. The glycoside - giloin and a non-glucoside - gilenin and gilsterol have been found. The leaves contain alkaloid tinosporin, tinosporic acid and tinosporol. Cordifol, heptacosanol and octacosanol are also

isolated from leaves. From the stem Tinosporodine and B-sitosterol have been isolated and a new furanoid diterpine-tinosporide are also isolated from stems and its structure determined.^[9]

GUDUCHI SATTVA: The process of 'Sattva' (cold water extract) is not traceable in the *Brhat Trayi* text. It is mainly developed during the medieval period. The process involves, crushing of Guduchi stems and extracting in the cold water at room temperature (i.e. without heating). After repeated extractions the cold infusion is dried and the obtained solid powder is called as "Guduchi sattva".^[10]

AYURVEDIC PROPERTIES AND PHARMACOLOGICAL EFFECT:

According to Ayurveda literature Guduchi is *tikta* (bitter), *kasaya* (astringent) in *rasa* (taste), *guru* (heavy) and *snigdha* (unctuous) in *guna* (properties), *ushna* (hot) in *virya* (potency) and *madhura* (sweet) in *vipaka* (metabolism). But *kaiydev nighantu* has mentioned *laghu* (light) *guna* (properties) in Guduchi.^[11]

According to *kaiydev nighantu* and *Bhavprakash*, Guduchi is *katu* (pungent), *tikta* (bitter), *kasaya* (astringent) in *rasa* (taste).^{[12][13]}

Due to these properties, it alleviates all the three doshas and *ama* (indigested food). Pharmacological effects of Guduchi are *rasayana* (tissue vitalizer), *sanghrahini* (absorbent), *balya* (strength giving) and *agnidipani* (appetizer). It cures *trishna* (thirst), *daha* (burning sensation), *meha* (urinary disease including glycosuria), *kasa* (cough), *pandu* (anemia), *kamala* (jaundice), *kustha* (skin diseases), *vata-rakta* (arthritis with skin lesions), *jwara* (fever), *krimi* (worm infestation) and *vami* (vomiting). It also cures *prameha* (twenty types of urinary diseases), *swash* (dysp-

noea), arsh (haemorrhoides), mutrakricha (difficulty in micturition), hridrog (cardiac problems) and vata diseases.^[14]

Guduchi Sattva is claimed to be a potent tonic and rejuvenator. It is useful in fevers, diarrhoea, urinary tract infections, jaundice, skin diseases, irritable bowel syndrome and defects of semen morphology & spermatogenesis.^[15]

MEDICINAL USES:

Parts of Guduchi medicinally used are stem, leaf and aerial roots. Among the Mundas of chota Nagpur the whole plant, well ground, is applied on fractures.

Stem: It is bitter stomachic, stimulate bile secretion, cause constipation, tonic, allays thirst, fever, burning sensation, vomiting, diuretic, enriches the blood, cure jaundice, useful in skin diseases. The juice is useful in diabetes, vaginal and urethral discharges, low fevers, enlarged spleen and act as a powerful diuretic.

Root: The root are considered a powerful emetic and is used for visceral obstruction.

Guduchi sattva: The starch obtained from the roots and stems of the plant is similar to Arrow-root in appearance and effect. It answers not only as a remedial medicinal agent in chronic diarrhea and chronic dysentery, but it is also a valuable nutrient, when there is intestinal irritability and inability to digest any kind of food.

Guduchi should be always used fresh for good result and the twiner which grows on nimba tree is said to have better result.^[16]

THERAPEUTIC USES:

1. The fresh juice of Guduchi (20ml twice daily) used as medhya drug.^[17]

2.(a) Guduchi svarasa (juice) and satavari svaras equal parts (10 ml each) are mixed together and given alongwith guda (jiggery) in vataj jvara.^[18]

(b) decoction prepared with Guduchi, Parpat and Amalaki (500ml-100ml) may be administered in case of pittaj jvara.^[19]

3.Guduchi svarasa with honey given in prameha act as a vitalizer.^[20]

4.Guduchi svarasa along with gingely oil (taila) is given orally in slipada.^[21]

5.Leaves of Guduchi, Nimba and Patola are made into juice and administered along with honey in amlapitta.^[22]

6.Guduchi him kasaya may be given orally along with honey in chardi.^[23]

7.Long administration of Guduchi in either juice or paste or powder or decoction form will definitely cure vatarakta.^[24]

89.Externally, the medicated oil of Guduchi is effectively used to reduce the pain and odema in gout and skin diseases.^[25]

10.Fresh juice with turmeric powder cures all types of hepatitis with in a short period.^[26]

11.In filariasis the paste of Guduchi, kutaki, sunthi, devdaru and vidanga works well when applied externally.^[27]

12.In the diseases due to vata dosa it is given with ghrita, in pitta dosa with sarkara and kapha dosa with madhu.^[28]

13.In tubercular fever, its decoction is given with ativisa.^[29]

14.The juices of guduchi, amalaki and haridra act synergistically in urinary problems.^[30]

15.In hepatitis, the fresh juice of guduchi given with rock candy, hastens the recovery.^[30]

16.The decoction of guduchi and sunthi is a very effective combination for the treatment of gout and rheumatic disorders.^[30]

17.It's medicinal ghee with kantkari is beneficial in cough.^[30]

18.Guduchi juice works well with cow's milk or lodhra in leucorrhoea and with

cumin seeds in burning sensation due to pitta.^[30]

19.It's decoction with nimba and vasa effectively relieves the itching and oozing.^[30]

20.The starch (sattva) of guduchi is used for chronic fever, to alleviate it as well as to reduce the burning sensation and to increase the appetite and energy.^[30]

21.In indigestion it is given with jaggery, in Vata-rakta it is given with castor oil and in Amavata it is given with sunthi.^[31]

RESEARCH:

I. Anti-Cancer activity:

A prospective, randomized, double blind placebo controlled clinical trial was conducted on breast cancer patients. Consenting breast cancer patients, who were receiving adjuvant therapy (CMF regimen), were recruited, and randomized to drug and placebo group. From the results, it appears that the drug *T. cordifolia* provided some protection against the cancer chemotherapy induced leucopenia.^[32]

II. Immunomodulator activity:

In clinical studies, it also showed immunosuppression on obstructive jaundice patients.^{[33][34]}

III. Hepatic disorders:

In clinical studies 20 patients of infective hepatitis were selected on the basis of clinical and biochemical findings. Four tablets (500mg each) thrice in a day, orally with fresh water were given to the patient for 4 weeks. Comparison between before and after treatment of those patients (N=20) were showed that drug *T. cordifolia* (*Guduchi*) played an important role in relieving the symptoms as well as normalization of altered liver function test.^[35]

IV. Post menopausal syndrome:

Clinical evaluation of a non-hormonal drug minofil containing *T. cordifolia* along with other plant drugs was done in women of post-menopausal syndrome. Breast discomfort, nausea and fluid retention was observed in 22% (7 cases) with estriol and almost no side effect was observed with minofil. Minofil with short period of therapy and more sustained effect and without side effects is cost effective and may be an alternative to HRT, which is still in controversy. However, long term follow up is required before universal use in post menopausal syndrome.^[37]

CONCLUSION:In spite of the overwhelming influences and our dependence on modern medicines and tremendous advances in synthetic drugs, a large segment of the world population still likes drugs of plants origin. Of the 2,50,000 higher plant species on earth, more than 80,000 are medicinal. However, only 7000-7500 species are used for their medicinal values by traditional communities. *Tinospora cordifolia* (*guduchi*) is one of the most important medicinal plants used in medicines of ayurveda, siddha, unani and homeopathy because of having a number of pharmacological as well as therapeutic properties. Traditionally, this plant is used to treat a huge variety of health problems. Therefore, there is an urgent need to investigate the biological activity of its phytoconstituents for development of an effective, safe and cheap herbal drug.

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