

## A REVIEW ON GUDUCHI THROUGH AYURVEDIC TEXTS

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### ABSTRACT

*Guduchi* is one of the most highly valued and common herbs in *Ayurvedic* medicine. It has a rich history in the Indian sub-continent where it has been used and written about for thousands of years. It is considered one of the best *Rasayana* and is unusual in its potent versatility. In recent years, significant progress has been attained regarding its biological activity and medicinal applications. Its scientific name is *Tinospora cordifolia* and is in the family Menispermaceae. It is a woody climbing shrub that is deciduous and perennial. This herbaceous vine grows on hedges and trees. It is often seen growing up Mango or Neem trees. Its *Rasa* is *Tikta, Katu, Veerya* is *Ushna*, *Vipaka* is *Madhur* and *Guna* is *Laghu, Snigdha*. *Guduchi* is having *Prabhava* of *Tridosahara*. It is propagated either by stem or by seed. It possess the properties like anthelmenthic, anti-inflammatory, antipyretic, aphrodisiac, hepatoprotective, antidiabetic, brain tonic, blood purifier etc.

**Keywords:** *Rasayana, Tridosahara, Aphrodisiac*

### INTRODUCTION

*Guduchi* or *Giloya* is one of the most highly valued and common herbs in *Ayurvedic* medicine. It has a rich history in the Indian sub-continent where it has been used and written about for thousands of years.<sup>1</sup> It is considered one of the best *Rasayana* and is unusual in its potent versatility. In recent years, significant progress has been attained regarding its biological activity and medicinal applications.<sup>2</sup>

*Guduchi*, as it is most commonly called, has been described as “one which protects the body”. The Sanskrit and Hindi name *Amrita* is derived from ancient Hindu scriptures where *Amrita* was used to bring the dead back to life and keep gods from growing ill and old. It is no wonder that it is also referred to as “nectar of immortality”

and “heavenly elixir”. Its scientific name is *Tinospora cordifolia* and is in the family Menispermaceae.<sup>3</sup>

Common names include:<sup>3</sup>

Marathi	:	<i>Gulvel</i>
Hindi	:	<i>Giloe, Gurcha</i>
Assamese	:	<i>Siddhilata, Amaralata</i>
Bengali	:	<i>Gulanha</i>
Gujarati	:	<i>Galac, Garo</i>
Kannada	:	<i>Amrutaballi</i>
Kashmiri	:	<i>Amrita, Gilo</i>
Malayalam	:	<i>Chittamrutu</i>
Oriya	:	<i>Guluchi</i>
Punjabi	:	<i>Gilo</i>
Tamil	:	<i>Seendal, Seendilkodi</i>
Telugu	:	<i>Thippateega</i>
Urdu	:	<i>Gilo</i>

It is a woody climbing shrub that is deciduous and perennial. This herbaceous

vine grows on hedges and trees. It is often seen growing up Mango or Neem trees. Herbalist Sebastian Pole writes that “those growing up neem trees are said to be the best as the synergy between these two bitter plants enhances *guduchi*’s efficacy.” It is indigenous to areas of India, Myanmar, and Sri Lanka. *Guduchi* typically grows in deciduous and dry forests at elevations up to 1000 ft. Its flowers bloom in summer. The male flower is small, yellow or green in color, and occurs in clusters. Female flowers are usually solitary and are green. The fruits are the size and shape of a large pea and turn from green to red when ripe in winter. The leaves are heart shaped (giving the name *cordifolia* to the plant) and mucilaginous. Its stems, when fresh, have a green succulent bark covered by a thin brown bark and are studded with warty lenticels. When dry, the stem shrinks and the bark separate from the wood. The roots are long narrow aerial roots that arise from the branches. The stems, leaves, and roots are used in medicine. All three parts should be collected in the summer when the bitter qualities are most abundant and, if not used fresh, dried in the shade. *Guduchi* grows well without fertilizer or pesticide making it simple to grow. It is easy to recognize and can be propagated by cuttings.<sup>4,5,6,7</sup>

### Pharmacognosy

#### a) Macroscopic<sup>8</sup>

Drug occurs in pieces of varying thickness ranging from 0.6-5 cm in diameter, 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 smoothed surface shows a radial structure with conspicuous medullary rays traversing porous tissues, taste bitter.

#### b) Microscopic<sup>9</sup>

Transverse section of stem shows outer-most layer of cork, differentiating into outer zone of thick-walled brownish and compressed cells, inner zone of thin walled colorless, tangentially arranged 3-4 rows of cells, cork broken at some places due to opening of lenticels, followed by 5 or more rows of secondary cortex of which the cells of outer rows smaller than the inner one, just within the opening of lenticels, groups of sclereids consisting of 2-10 cells found in secondary cortex region, outer zone of cortex consists of 3--5 rows of irregularly arranged, tangentially elongated chlorenchymatous cells, cortical cells situated towards inner side, polygonal in shape and filled with plenty of starch grains, simple, ovoid, or irregularly ovoid-elliptical, occasionally compound of 2-4 components, several secretory cells, found scattered in the cortex, pericyclic fibers lignified with wide lumen and pointed ends, associated with a large number of crystal fibers containing a single prism in each chamber, vascular zone composed of 10-12 or more wedge-shaped strips of xylem, externally surrounded by semi-circular strips of phloem, alternating, with wide medullary rays, phloem consists of sieve tube, companion cells and phloem parenchyma of polygonal or tangentially elongated cells, some of them contain crystals of calcium oxalate, cambium composed of one to two layers of tangentially elongated cells in each vascular bundle, xylem consists of vessels, tracheids, parenchyma and fibers, in primary xylem, vessels comparatively narrow devoid of tyloses, secondary xylem elements thick-walled, lignified, vessels cylindrical in shape bearing bordered pits on their walls some large vessels possess several tyloses and

often contain transverse septa, medullary rays 15-20 or more cells wide containing rounded, hemispherical, oblong, ovoid, with faintly marked concentric striations and central hilum appearing like a point, starch grains of 5.5-11.20  $\mu$  in diameter and 6-11.28  $\mu$  in length, pith composed of large, thin-walled cells mostly containing starch grains.

#### **Ayurvedic Properties:**

<i>Rasa</i>	:	<i>Tikta, Katu</i>
<i>Guna</i>	:	<i>Laghu, Snigdha</i>
<i>Veerya</i>	:	<i>Ushna</i>
<i>Vipaka</i>	:	<i>Madhura</i>
<i>Prabhava</i>	:	<i>Tridosahara</i>

**Parts used:** Stem, Root, Leaves

#### **Substitutes and Adulterants**<sup>10</sup>

The commonest species of *Tinospora* with which *T. cordifolia* is likely to be substituted or adulterated are *T. sinensis* (Lour.) Merr. and *T. cripisa* (Linn.) Miers ex Hook. f. and Th. The extract of *Guduchi* (*Guduchi Satva*) is adulterated with powder/flour of potato/sweet potato/ arrowroot/banana.

#### **Propagation and Cultivation**

The plant is sometimes cultivated as ornamental and is easily propagated by stem cuttings. It is perfectly suited to and grows well in almost any type of soil and under varying climatic conditions. It is specially trained to grow on Neem tree; thereby it is supposed to possess more medicinal virtue. It can also be grown by sowing seeds in monsoon, but the growth of seedlings is very slow as compared to plants grown by cuttings.

#### **Actions and Indications**

Texts of ayurveda and ayurveda *Acharyas* have lauded medicinal properties of *Guduchi*. This medicinal herb is a climber and known as *Tinospora cordifolia* or *Guduchi* or *Giloy*. In ancient times the whole

plant was used to treat different conditions. Now the extract of *Guduchi* or *Giloy* is encapsulated in capsule form and is being used by *Ayurvedic* practitioners in many health conditions. *Guduchi* or *Giloy* is helpful in several health conditions. Few of them are listed below:

#### **Anthelmenthic (In intestinal parasites):**

*Guduchi* has anthelmenthic properties. Regular use of this herb helps to increase the resistance of intestine to intestinal parasites.

**Anti inflammatory in joint pain:** *Tinospora cordifolia* is very helpful in conditions like arthritis, gout, osteoarthritis etc where joint pain is a common symptom. It helps to reduce pain and swelling of joints. *Giloy* also helps to rejuvenate joints and increases their mobility.

**Anti pyretic:** Use of *Guduchi* is of immense help in uncontrolled fever. This herb helps to bring down the body temperature when used along with other antipyretics. Texts of ayurveda praise the efficiency of *Guduchi* in controlling *Jwara* (fever).

**Chronic cough:** *Giloy* helps to reduce chronic cough. It boosts immunity of lungs and helps in expectoration. Chronic smokers are benefited by this herb. But cessation of smoking is very essential to reap the benefits.

**Aphrodisiac:** *Guduchi* is a very good *Rasayana* (adaptogen) and *Vajikara* (aphrodisiac) herb. Its regular use helps to detoxify male reproductive system and rejuvenate it. Due to its adaptogenic and aphrodisiac properties *Giloy* helps to increase sperm count, sperm motility and erection time.

**Brain Tonic:** *Guduchi* acts as *Medhya Rasayana* or brain tonic by increasing mind powers like comprehension, memory and recollection.

**Blood purification:** *Tinospora cordifolia* helps to remove toxins from blood. It acts as a detoxifying agent. Toxins accumulated due to alcohol and tobacco consumption can be expelled by regular use of this herb.

**Immunity booster:** *Guduchi* is a known immunity booster. It expels toxins from body and rejuvenates it at tissue level by boosting their immunity to diseases. *Guduchi* helps to increase number of white blood cells. Regular use of *Giloy* helps to resist diseases like common cold, cough, fever, leprosy, jaundice, arthritis, etc.

**Anti diabetic:** *Tinospora Cordifolia* is known to reduce glucose level in blood. This wonder herb helps to control uncontrolled blood sugar along with other anti diabetic medications.

**Hepatoprotective: (Rejuvenation and protection of liver):** *Giloy* helps in rejuvenation of liver. It helps to prevent fibrosis and stimulates regeneration of hepatic tissue. Usage of *Giloy* immensely helps in fatty liver. Persons, whose liver is taxed by consumption of alcohol and junk food, can be benefited by regular use of this herb. But withdrawing from alcohol and junk food consumption is absolutely necessary before consuming this herb.

### Identity, Purity and Strength<sup>11</sup>

#### For dried drug

Total ash	: Not more than 2 %
Acid-insoluble ash	: Not more than 16 %
Acid-insoluble ash	: Not more than 3 %
Alcohol-sol. extractive:	Not less than 3 %
Water-sol. extractive:	Not less than 11 %

#### For fresh drug

Foreign matter	: Nil
Moisture content	: 75%

#### Traditional Ayurvedic Preparations

A potent classical herb, *Guduchi* is used as an important ingredient in a number

of Ayurvedic formulations. While the dried stem forms the raw material for many herbal preparations, the roots and leaves are also important. The fresh plant is said to be more effective than the dry one. However, it is traditionally dried and made into a starchy extract called *Guduchi Sattva*. Dr. Gyanendra Pandey writes that *Guduchi Sattva* “is highly valued for many ailments. Fevers, chronic diarrhea, chronic dysentery, burning sensation, secondary syphilis, chronic gonorrhoea, leucorrhoea, jaundice, rheumatism, urinary disorders, and some other ailments”. Dr. K. M. Nadkarni describes how it is made “The watery extract is prepared by powdering the stem and washing out the starch with water and drying the sediment. Pandit Jayakrishna says “that as the deposit settles the sooner it is dried the better. It is similar to arrow-root in appearance.” Another common preparation is a watery extract, often called Indian quinine, which is used in malaria, leprosy, and common fevers due to cold or indigestion. In the ancient text *Charak Samhita* 50 great extract categories are described and *Guduchi* is included in two: Anti-saturative and refrigerant.

#### Contemporary Research

The Ayurvedic Pharmacopoeia of India, along with other therapeutic applications, recommends the dried stems in jaundice, anaemia, polyuria and skin diseases. The stem contains alkaloidal constituents, including berberine; bitter principles, including columbin, chasmanthin, palmarin and tinosporon, tinosporic acid and tinosporol. The drug is reported to possess one fifth of the analgesic effect of sodium salicylate. Its aqueous extract has a high phagocytic index. Alcoholic extract of the stem shows activity against *E. coli*. Active principles were found to inhibit in vitro the growth of

*Mycobacterium tuberculosis*. Oral administration of alcoholic extract of the root resulted in a significant reduction in blood and urine glucose and in lipids in serum and tissues of alloxan diabetic rats.<sup>12</sup>

A significant reduction in levels of SGOT, SGPT, ALP and bilirubin were observed following *T. cordifolia* treatment during CCl<sub>4</sub> intoxication in mature rats. The plant extract showed in vitro inactivating activity in Hepatitis-B surface antigen.

A new hypoglycaemic agent was isolated from the plant; it was found to be 1, 2-substituted pyrrolidin.

The starch from roots and stem, used in chronic diarrhea and dysentery, contains a polysaccharide having 1–4 glucan with occasional branching points.

The usefulness of *Tinospora cordifolia* as a cognitive enhancer has been substantiated by research. For exemplar, healthy volunteers were given an aqueous extract for three weeks in a double blind study. They were found to have a significant increase in test scores for logical memory and verbal memory. A study gave aqueous and alcoholic extracts to normal and cyclosporine induced cognition deficient rats. *Tinospora cordifolia* not only enhanced the cognition in normal rats but also in the rats treated with cyclosporine.

*Guduchi* has been studied for its hypoglycemic actions. Crude ethyl acetate, dichloromethane (CDM), chloroform and hexane stem extracts of *Tinospora cordifolia* was studied for inhibition of the alpha glucosidase enzyme. The enzyme was inhibited by *Tinospora* and the hyperglycemic increase was decreased by 50% in normal animals and 58% in diabetic animals. Another study used an aqueous extract of *Tinospora cordifolia* to test insulin resis-

tance and oxidative stress in rats. *Tinospora cordifolia* treatment prevented the increase in glucose by 21.3%, insulin by 51.5%, triglycerides by 54.12%, and glucose-insulin index by 59.8 of the rats fed fructose without the addition of *Tinospora* extract. Also, *Tinospora cordifolia* treatment was effective in preventing the fructose-induced abnormalities in the liver involving lipid peroxidation, protein carbonyl groups, GSH levels, and enzymatic antioxidants.<sup>13</sup>

*Tinospora* supplies protection against gamma irradiation in mice.<sup>14</sup> Administration of an alcohol stem extract to mice 1 hour before whole body gamma irradiation was shown to increase survival, prevent body weight loss, increase the number of colony forming unit counts in the spleen, restore total lymphocyte counts, increase impaired S-phase cell population and decrease irradiation induced micronuclei. In another study an aqueous extract was used on mice before being exposed to gamma radiation. The results showed various amounts of protection against the radiation through increased survival time and signs and symptoms of radiation sickness. Looking into the immune system's response to tumors one study showed the activation of tumor associated macrophages in Dalton's lymphoma, a spontaneous transplantable T-cell lymphoma, in response to an alcohol extract of *Tinospora cordifolia*. Another study by the same authors again found an increase in the count of tumor associated macrophages. The researchers also found an increase in the number and myeloid differentiation of bone marrow hematopoietic precursor cells in mice bearing Dalton's lymphoma. Further research on its anti-tumor activities used a methanol extract found that it increased the white blood cell

count, maturation of bone marrow stem cells, and increased immune response as seen in macrophage activation, and plaque-forming spleen cells. The reduction in solid tumor growth was significant.<sup>15,16,17,18</sup>

*Guduchi* has been one of the most versatile and important herbs in the Indian sub-continent since ancient times. An enormous amount of knowledge has been accumulated by thousands of years of direct observation and trial and error. In our modern era, impressive research has been done on the biological activity and possible application of *Guduchi* and its chemical constituents. *Guduchi* may have been favorably used for thousands of years but modern herbal pharmacology appears to have just begun to appreciate “the one who protects the body”.<sup>19</sup>

## CONCLUSION

Even-though, there are many herbal plants in the world, *Guduchi* is considered to be having greater medicinal value. It is fore written in the Hindu scriptures about the *Guduchi*. There is scientific reason why our ancestors were insisting us to plant a *Guduchi* sapling in everyone's house. So, it's better to plant a *Guduchi* sapling in house and ensure a long and a healthy life for ourselves.

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Source of support: Nil  
Conflict of interest: None Declared