

THERAPEUTIC VISTAS OF GUDUCHI (*Tinospora cordifolia* (Willd.) Miers): A MEDICO-HISTORICAL MEMOIR

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Abstract : Natural products with medicinal value are gaining importance in clinical research as they provide better alternatives, owing to lesser side-effects and low cost than conventional synthetic drugs. Among the vast library of important medicinal plants, *Guduchi* is immensely valuable in terms of therapeutics and global trade. Scattered information exploring therapeutic potential of *Guduchi* is accessible and there is need to assemble it. Therefore, an effort is made to assemble the scattered information in prehistoric texts, *Brihatrayi*, *Nighantu* and other Ayurvedic treatises along with ethno-botanical and modern evidences highlighting the role of *Guduchi* in therapeutics. Citations relevant to topic were screened.

Keywords: Ayurveda, *Guduchi*, *Tinospora cordifolia*, *Brihatrayi*, *Nighantu*

Introduction

Guduchi, commonly known as *Giloe*, in mythological term refers to the heavenly elixir having saved celestial beings from old age and kept them eternally young (Singh SS, 2003).^[1] This botanical is a large deciduous perennial climber with large succulent stems and papery bark, sending down long, pendulous fleshy roots as it climbs. It is valued for its huge therapeutic potential thousands of years back in Ayurvedic literature, but modern scientific society is just begin to appreciate the immense clinical potential of it. In present times this drug has been subjected to numerous phytochemicals, pharmacological, pre-clinical and clinical investigations, and large amount of compilations are available on the same (Sinha K et al, 2004).^[2] Its therapeutic strength lies in its rejuvenating and strengthening properties while detoxifying and cleansing the whole system, specifically via liver. Since each part of *Guduchi* has some medicinal property, it is very much commercially exploitable. Present review explores (i) Medico-historical aspects of *Guduchi* with its therapeutic

potentials and (ii) the modern scientific information supporting the same.

Historical background

Mythological review

It is narrated that, in a historical war between *Rama* and *Ravana*, several monkey warriors who supported *Rama* were killed. Pleased by the triumph of war and death of *Ravana*, Lord *Indra* sprinkled elixir on the dead bodies of the monkeys and provided rebirth. During the process, where ever the elixir drops have fallen on the earth, *Guduchi* plants originated (Bhavamishra, 2010).^[3]

Vedic kala

Sayan in *Sounakiya Atharvaveda* has mentioned that *Guduchi* is kept in every house to avoid snakes and scorpions. In *Kaushika sutra*, *Guduchi* is mentioned by the name '*Kudruchi*'.

Samhita kala

Charaka Samhita: Total five synonyms, one hundred and eleven (111) references of *Guduchi*

1. Ph.D Scholar 2. Ph.D Scholar 3. Assistant Professor 4. Professor and HOD

are available and included under seven different *Dashemani*. The herb is said to possess best *Sangrahika* and *Vibandhaprashamana* properties. **Sushruta Samhita:** Description of *Guduchi* is found at 41 places and is included in 9 *Gana* or groups, based on its diverse therapeutic uses. Besides, it is also placed in smaller group like *Vallipanchmula*.

Ashtanga Samgraha: *Guduchi* is mentioned alone or in combination with other remedial agents in the treatment of *Jwara*, *Prameha*, *Shlipada* etc.

Nighantu kala

Dhanvantari Nighantu: *Guduchi* was mentioned first in one out of seven *Vargas*. 34 synonyms of it with two varieties like *Guduchi* and *Kanda Guduchi* are described.

Kaiyadeva Nighantu: *Guduchi* is mentioned in *Ausadha Varga* with its 19 synonyms and varieties as *Guduchi* and *Pinda Guduchi*.

Bhavaprakasha Nighantu: *Guduchi* has been described under *Guduchyadi Varga* with its mythological origin, 21 different synonyms with *Rasayana*, *Dipana* and *Balya* properties.

Raja Nighantu: Description of two types of *Guduchi* and *Kanda Guduchi* with its 31

synonyms and therapeutics utilities has been given.

Shaligrama Nighantu: Nine synonyms of *Guduchi* and six for *Kanda Guduchi* have been described in *Guduchyadi Gana*.

Adhunika kala

Dravyaguna Vijnana: The latin name, vernacular names, synonyms, botanical description along with properties and action on different system are described with its therapeutic dose and formulation.

Indian Medicinal Plant: Its botanical description along with different species and medicinal uses are illustrated.

Materia Medica: Detail description of *Guduchi* along with its use in scorpion bite, is documented.

Pharmacognosy of Indigenous Drugs: The description of latin name, family, parts used, both macro and microscopic structure of the plant with its substitute, adulteration, standardization, physical constant value and fluorescence analysis are reported in this text.

Botanical description

Botanical name: *Tinospora cordifolia* (Willd.) Miers ex Hook.f. & Thomas. The genus

Table 1. Synonyms of *Guduchi* and their interpretation

Synonyms	Meaning
<i>Guduchi</i>	Protecting or guarding the body from the diseases.
<i>Amrita</i>	Indicating the undying property of plant i.e. even a piece of stem is sufficient for propagation.
<i>Amritavalli, Amritalata</i>	Pointing the creeping nature of plant with its <i>Sarvadoshahara</i> and <i>Rasayana</i> like properties.
<i>Amritakanda, Kandodbhava, Kandarohini</i>	Illustrating the creeping nature of plant with presence of tubers and properties of <i>Amrita</i> .
<i>Kundali, Kundalini</i>	Showing the rotatory habit of plant.
<i>Chakralakshana, Chakralakshanika, Chakrangi</i>	Means the wheel-like appearance in transverse section of stem.
<i>Chandrasaha</i>	Referring the moon like appearance of transversely cut stem.
<i>Chhinaruha, Chhinodhava</i>	Regular emergence of plant even if it is cut-off several times.
<i>Jwarari, Jwaranashini</i>	Showing its antipyretic activity.
<i>Tantarika</i>	Exposing it as protector of health of all family members.
<i>Tantri</i>	Pointing out its longevity providing properties.
<i>Vishalya</i>	Showing it with unarmed nature.
<i>Devanirmita, Surkrita</i>	Dealing with its origin from god.
<i>Nagakanya, Nagakumarika</i>	Exhibiting it revolving nature around the support like cobra.
<i>Nirjara</i>	Demonstrating its undying nature.
<i>Madhupaparni</i>	Proving the gland dotted nature of leaves which appear like filled with honey.
<i>Vatsadani</i>	Elucidating the taste of calves to this plant which will eat this plant mainly.
<i>Somavalli, Somavallari, Somalatika</i>	Showing it as creeper which pacifies thirst, burning sensation etc.

Tinospora is derived from the *Latin* word *tinnio*” and *Greek* word “*spora*” means subglobose or ellipsoidal seed. The species is ‘*Cordifolia*’ where *folia* means leaves having cordial-heart shape. Family: Menispermaceae which means drug having moon or crescent shaped seed (Anonymous, 2011).^[4] *Guduchi* in its natural habitat with Principal Botanical parts is illustrated in **Figure 1**.

Distribution & Habitat

It is distributed throughout tropical Indian subcontinent and China, ascending to an altitude of 900 m. from Kumaon eastwards as well as Southwards up to Sri Lanka. It is a fairly common wild plant of deciduous nature and dry forests of most districts growing over hedges and small trees (Anonymous, 2002).^[5]

Sanskrit synonyms and their interpretation

Different synonyms of *Guduchi* are described which are related with its mythological origin, morphological characters, propagation, therapeutic efficacy etc (Table 1) (Sharma PV, 2010).^[6]

Vernacular names

Heartleaf Moonseed, *Tinospora* (English), *Gulan* (Bengali), *Gurcha* (Hindi), *Garo*, *Galo* (Gujarati), *Thippateega* (Telugu), *Amrutavalli* (Kannada), *Amrita*, *Gilo* (Kashmiri), *Chittamrutu*



Figure 1: *Guduchi* in its natural habitat with principal botanical parts.

(Malayalam), *Gulvel* (Marathi), *Guluchi* (Oriya), *Gilo* (Punjabi), *Seendal*, *Seendil Kodi* (Tamil), *Siddhilata*, *Amarlata* (Assamese) (Anonymous, 2001).^[7]

Morphological and therapeutic categorization (*Gana* and *Varga*)

Acharya have classified the drugs according to their origin, morphology, property, pharmacodynamics and therapeutic values. Each *Acharya* has adopted different methodology according to his intellectual sense as classified the drugs under different group of drug, named as *Dashemani*, *Gana*, *Varga*, *Skandha*, etc. These groupings are shown in **Table 2**.

Energetics

Ayurvedic pharmacology (*Dravya Guna* and *Karma*) of *Guduchi* is detailed in **Table 3** and is based on biophysical, experiential, inferential and intuitional mechanisms (Sharma PV, 2003).^[19]

Based upon these properties, classical texts of Ayurveda have claimed the wide range of therapeutic attributes of *Guduchi*. With the scrutiny of various verses in different texts, slight difference in views regarding pharmacodynamics properties of *Guduchi* are noted down as in **Table 4**

Karma (action) and *Rogagnata* (therapeutic indications)

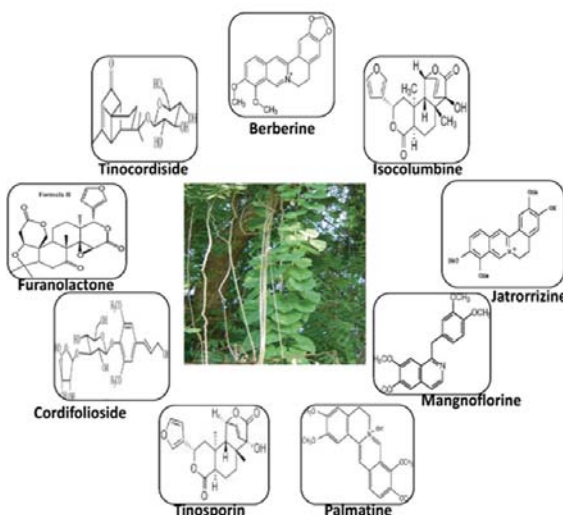


Figure 2: A twig of *Guduchi* and its Chief active phytoconstituents.

Table 2. *Guduchi* in various groups as reported in different texts

In Samhita	Varga/Mahakashaya	Name used in context	Reference
Charaka Samhita ^[8]	<i>Sandhaneeya</i>	<i>Madhuparni</i>	<i>Ch. Su. 4/5</i>
	<i>Triptighna</i>	<i>Guduchi</i>	<i>Ch. Su. 4/11</i>
	<i>Stanyashodhana</i>		<i>Ch. Su. 4/18</i>
	<i>Snehopaga</i>		<i>Ch. Su. 4/21</i>
	<i>Trishnanigrahana</i>		<i>Ch. Su. 4/29</i>
	<i>Dahaprashamana</i>		<i>Ch. Su. 4/41</i>
	<i>Vayasthapana</i>	<i>Amrita</i>	<i>Ch. Su. 4/50</i>
	<i>Madhura Skandha</i>	<i>Guduchi</i>	<i>Ch. Vi. 8/139</i>
	<i>Tikta Skandha</i>		<i>Ch. Vi. 8/143</i>
	<i>Sirovirechana</i>		<i>Ch. Vi. 8/151</i>
Sushruta Samhita ^[9]	<i>Vatasanshaman Gana</i>	<i>Vatsadani</i>	<i>S. Su. 37/7</i>
	<i>Pittasanshaman Gana</i>	<i>Chhinnaruha</i>	<i>S. Su. 37/8</i>
	<i>Shleshmasanshaman Gana</i>	<i>Guduchi</i>	<i>S. Su. 37/9</i>
	<i>Shodhan Varga</i>		<i>S. Su. 37/12</i>
	<i>Ropana Gana</i>	<i>Amrita</i>	<i>S. Su. 37/24</i>
	<i>Aragvadhadi</i>	<i>Guduchi</i>	<i>S. Su. 38/7</i>
	<i>Syamadi</i>		<i>S. Su. 38/29</i>
	<i>Patoladi</i>		<i>S. Su. 38/33</i>
	<i>Kakolyadi</i>	<i>Chhinnaruha</i>	<i>S. Su. 38/35</i>
	<i>Guduchyadi</i>	<i>Guduchi</i>	<i>S. Su. 38/50</i>
<i>Valli Panchmula</i>	<i>S. Su. 38/73</i>		
<i>Shaka Varga</i>	<i>S. Su. 46/270</i>		
Ashtanga Hridaya ^[10]	<i>Shaka Varga</i>	<i>Amrita</i>	<i>A. H. Su. 6/77</i>
	<i>Padmkadi Gana</i>	<i>Guduchi</i>	<i>A. H. Su. 15/12</i>
	<i>Patoladi Gana</i>		<i>A. H. Su. 15/15</i>
	<i>Guduchyadi Gana</i>	<i>Amrita</i>	<i>A. H. Su. 15/16</i>
	<i>Aragvadhadi Gana</i>	<i>Amrita</i>	<i>A. H. Su. 15/18</i>
	<i>Shyamadi Gana</i>	<i>Chhinnaruha</i>	<i>A. H. Su. 15/45</i>
In Lexicons			
<i>Dhanvantari Nighantu</i> ^[11]	<i>Guduchyadi Varga</i>		
<i>Kaiyadeva Nighantu</i> ^[12]	<i>Aushadiya Varga</i>		
<i>Bhavaprakasha Nighantu</i> ^[13]	<i>Guduchyadi Varga</i>		
<i>Raja Nighantu</i> ^[14]			
<i>Shaligrama Nighantu</i> ^[15]			
<i>Priya Nighantu</i> ^[16]	<i>Pippalyadi Varga</i>		
<i>Shodhala Nighantu</i> ^[17]	<i>Guduchyadi Varga</i>		
<i>Nighantu Adarsha</i> ^[18]			

Table 3. Pharmacodynamic properties of *Guduchi*

Rasa (taste)	Tikta (bitter), Kashaya (astringent)
<i>Guna</i> (quality)	<i>Laghu</i> (light), <i>Guru</i> (heavy), <i>Snigdha</i> (unctuous)
<i>Virya</i> (potency)	<i>Ushna</i> (hot potency)
<i>Vipaka</i> (post-digestive effect)	<i>Madhura</i> (neutral)
<i>Prabhava</i> (specific action)	<i>Vishaghna</i> (anti-toxic)
<i>Karma</i> (action)	<i>Agnideepana</i> (increase appetite), <i>Paachana</i> (digestive), <i>Rasayana</i> (rejuvenative), <i>Ayushprada</i> (promotes life) <i>Vayah-Sthapana</i> (anti-ageing), <i>Trishnanigrahan</i> (quenches thirst), <i>Sangrahi</i> (relieve polyuria), <i>Medhya</i> (nerve tonic), <i>Balya</i> (increase strength), <i>Vrishya</i> (aphrodisiac), <i>Chakshusya</i> (eye tonic).
<i>Dosha</i> effect	<i>Tridosahara</i> (pacify all three aggravated doshas)
<i>Dhatu</i> (tissue)	Plasma, blood, muscle, fat, nerve, reproductive
<i>Srotas</i> (channel)	Circulatory, digestive

Karma denotes action of a drug based on its properties. Various texts have highlighted a number of actions and therapeutic indications of *Guduchi*, which are detailed in **Table 5**.

Guduchi in *Brihatrayi*

Brihatrayi (*Charaka Samhita*, *Sushruta Samhita* and *Ashtanga Hridaya*), the prime texts

of Ayurveda, contribute number of references pertaining to clinical application of *Guduchi*.

The herb is mentioned to be used for both external and internal therapeutic purposes under various formulations. Usages of herb in *Panchakarma* and other procedures are also available.

These citations in *Brihatrayi* are listed in **Tables 6, 7, 8** and **9**.

Table 4. Pharmacodynamic properties of *Guduchi* as per different texts

Sr.No.	Classical texts	Rasa	Guna	Vipaka	Veerya
1.	<i>Charaka Samhita</i>	Tikta	Guru	Madhura	Ushna
2.	<i>Sushruta Samhita</i>	Tikta	Guru	Guru	-
3.	<i>Astanga Sangraha</i>	Tikta	-	-	Ushna
4.	<i>Astanga Hridaya</i>	Tikta	-	Katu	Sheeta
5.	<i>Dhanavantari Nighantu</i>	Tikta, Kashaya	Guru	-	Ushna
6.	<i>Madanpala Nighantu</i>	Katu, Tikta, Kashaya	Laghu	Madhura	Ushna
7.	<i>Kaiyadeva Nighantu</i>	Tikta, Kashaya, Katu	Laghu	Madhura	Ushna
8.	<i>Raja Nighantu</i>	Tikta, Kasaya	Guru	-	Ushna
9.	<i>Bhavaprakasha Nighantu</i>	Katu, Tikta, Kashaya	Laghu	Madhura	Ushna
10.	<i>Shaligram Nighantu</i>	Tikta, Kashaya,	Guru, Ushna	Madhura	Ushna
11.	<i>Dravyaguna Vigyanam</i>	Tikta, Kashaya	Guru, Snigdha	Madhura	Ushna

Table 5. Various *Karmas* and *Rogahnata* attributed to *Guduchi*

Sr. No.	Karmas	1	2	3	4	5	6	7	8
1.	<i>Vatahara</i>	+	+	+	-	-	+	-	+
2.	<i>Amahara</i>	-	-	-	-	-	-	-	+
3.	<i>Sangrahi</i>	+	-	-	+	+	-	+	+
4.	<i>Hridya</i>	-	-	-	-	+	-	-	+
5.	<i>Balya</i>	+	+	+	+	+	-	+	+
6.	<i>Vahnikrita</i>	-	-	-	-	+	-	-	-
7.	<i>Vatapittahara</i>	+	+	+	-	-	-	-	-
8.	<i>Ayushya</i>	-	-	-	+	-	-	-	+
9.	<i>Medhya</i>	-	-	-	+	-	-	-	-
10.	<i>Medohara</i>	-	+	+	+	-	-	-	+
11.	<i>Pittahara</i>	+	+	+	+	-	-	-	-
12.	<i>Kataraktahara</i>	-	-	-	+	+	-	+	+
13.	<i>Dipaneeya</i>	+	+	+	-	-	-	+	+
14.	<i>Rasayani</i>	+	+	+	-	+	-	-	+
15.	<i>Tridosahara</i>	-	+	+	+	-	-	+	+
16.	<i>Vayasthapaniya</i>	+	-	-	-	-	-	-	-
17.	<i>Raktadoshahara</i>	-	+	+	-	-	+	-	+
Rogahnata									
1.	<i>Kamalahara</i>	-	-	-	-	+	-	+	+
2.	<i>Pramehaghna</i>	-	+	+	-	+	+	+	+
3.	<i>Kandughana</i>	-	+	+	+	-	-	-	+
4.	<i>Trishnanigrahana</i>	+	-	-	-	+	-	-	+
5.	<i>Visarpaghna</i>	-	-	-	+	-	-	-	+
6.	<i>Kasahara</i>	-	-	-	-	+	-	+	+
7.	<i>Dahaprashamanam</i>	+	+	+	-	-	+	+	+
8.	<i>Kushthahara</i>	-	+	+	+	+	-	+	+
9.	<i>Krimighna</i>	-	-	-	+	+	-	+	+
10.	<i>Raktarshaghna</i>	-	-	-	+	-	-	-	+
11.	<i>Bhramahara</i>	-	-	-	-	-	+	-	+
12.	<i>Chhardighna</i>	-	+	+	-	+	+	+	+
13.	<i>Panduhara</i>	-	-	-	+	+	+	+	+
14.	<i>Jwarahara</i>	+	+	+	+	+	+	+	+

1. *Charaka Samhita*, 2. *Sushruta Samhita*, 3. *Ashtanga Sangraha*, 4. *Dhanavantari Nighantu*, 5. *Kaiyadeva Nighantu*, 6. *Raja Nighantu*, 7. *Bhavaprakasha Nighantu*, 8. *Shaligram Nighantu*

Table 6. Therapeutic usages of *Guduchi* as prime ingredient in different polyherbal formulations

References	Formulations	Therapeutic indications
Ch. Su. 21/22	<i>Guduchyadi Yoga</i>	<i>Krishna Chikitsa</i>
Ch. Chi. 18/161	<i>Guduchyadi Ghrita</i>	<i>Kasa</i>
Ch. Chi. 24/145	<i>Guduchyadi Yoga</i>	<i>Madatyaya</i>
Ch. Chi. 28/157	<i>Amritadi Taila</i>	<i>Vatavyadhihara (Shreshtha)</i>
Ch. Chi. 29/103	<i>Amritadya Taila</i>	<i>Vatahara, Kshatakshina, Akshepa etc</i>
Ch. Chi. 29/121	<i>Guduchyadi Taila*</i>	<i>Vatarakta, Jwara</i>
Ch. Chi. 30/58	<i>Guduchyadi Kwatha</i>	<i>Yoni Parisechana</i>
Ch. Chi. 30/59	<i>Guduchyadi Taila</i>	<i>Vatika Yoni roga</i>
Su. Su. 38/48	<i>Guduchyadi Gana</i>	<i>Deepana, Hrillasa, Arochaka, Pipasa etc</i>
Su. Chi. 5/8	<i>Guduchi Kwatha</i>	<i>Pittanubandha vata</i>
Su. Chi. 9/7	<i>Meshashrungyadi Taila/Ghrita</i>	<i>Vatakushta</i>
Su. Chi. 27/7	<i>Guduchi Kwatha</i>	<i>Ayurvedhana</i>
Su. Chi. 38/47	<i>Guduchyadi Kwatha</i>	<i>Tejovarnabalotsaha Viryagni, Asthapana</i>
Su. U. 39/169	<i>Guduchi Shruta Shitakashaya</i>	<i>Jwara</i>
Su. U. 39/174	<i>Guduchi Swarasa</i>	<i>Anilakrita Jwara</i>
Su. U. 39/178	<i>Guduchyadi Kwatha</i>	<i>Pittajwarapaha</i>
Su. U. 39/213	<i>Guduchi Nimbadhatri Kashaya</i>	<i>Vishamajwara</i>
Su. U. 39/221	<i>Guduchyadi Ghrita</i>	<i>Kshaya, Shwasa, Kasa, Jirnajwara</i>
Su. U. 39/243	<i>Guduchyadi Ghrita</i>	<i>Jirnajwara, Shopha, Pandu</i>
Su. U. 49/24	<i>Guduchi Kashaya</i>	<i>Sannipataja Chhardi</i>
As. H. Su. 15/16	<i>Guduchyadi Yoga</i>	<i>Pittashleshma Jwara, Chhardi, Daha etc</i>
As. H. Chi. 1/94	<i>Guduchyadi Sneha Yoga</i>	<i>Jirna jwara</i>
As. H. Chi. 7/25	<i>Guduchyadyukta Bhojana</i>	<i>Pittaja Madatyaya, Kasa</i>
As. H. Chi. 11/12	<i>Swawadi Taila Pana</i>	<i>Mutraghata</i>
As. H. Chi. 18/6	<i>Duralabhadi Sitakashaya</i>	<i>Trishna, Visarpa</i>
As. H. Chi. 16/53	<i>Guduchi Swarasa</i>	<i>Halimaka</i>
As. H. Chi. 22/7	<i>Guduchi Swarasa Shrita Kshira</i>	<i>Vatashonita</i>
As. H. U. 22/68	<i>Guduchyadi Taila Pana</i>	<i>Galaganda</i>
As. H. U. 39/44	<i>Guduchi Swarasa</i>	<i>Rasayana</i>

* *Guduchi Swarasa* is used

Doses and Adjuvants

Doses of different dosage forms of *Guduchi* are mentioned as follows (Anonymous, 2002) [20]:

Powder	-	1-3 <i>masha</i>	(3-6g)
Decoction	-	4-8 <i>tola</i>	(50-100ml)
Satva	-	5-15 <i>ratti</i>	(1-2g)

The specific adjuvants are mentioned in *Madanpala Nighantu* for different disorders, which are as below (Upadhyaya R, 2004) [21]:

<i>Vata vikara</i>	-	<i>Ghrita</i>
<i>Pitta vikara</i>	-	<i>Sharkara</i>
<i>Kapha vikara</i>	-	<i>Madhu</i>
<i>Vibandha</i>	-	<i>Guda</i>
<i>Vatarakta</i>	-	<i>Erantaila</i>
<i>Amavata</i>	-	<i>Shunthi</i>

Various formulations (Kalpas)

The common and widely practiced formulations of *Guduchi* are as follows (Mishra S, 2001) [22]:

Churna : *Rasayana churna, Sudarsana churna*
Kwatha : *Guduchyadi kwatha, Manjisthadi*

kwatha, Punarnavastaka kwatha

Arista : *Amritarista*

Ghrita : *Guduchi ghrita, Amritadi ghrita, Panchatikta ghrita*

Taila : *Guduchyadi taila*

Vati : *Samsamni vati, Chandraprabha vati*

Lauha : *Guduchyadi lauha*

Rasa-ausadhi : *Gandhaka rasayana, Chandrakala rasa*

Ethnobotanical and Folklore uses

Tribals have their own tradition, beliefs and knowledge about use of natural resources as medicines. Available evidences of folklore and tribal uses are listed in Table 10. (Singh J, 2003). [23]

Major phytoconstituents and their biological roles

A variety of constituents have been isolated from *Guduchi* and their wide range of biological activities is summarized in Table 11. [24-50] Chief active phytoconstituents of *Guduchi* are depicted in Figure 2. Various pharmacologically

Table 7. Therapeutic usages of *Guduchi* as ingredient in different polyherbal formulations

References	Formulations	Therapeutic indications
Ch. Su. 3/3	<i>Aragwadhadi Yoga</i>	<i>Kshudrakushtha, Kilasa, Bhagandara</i> etc
Ch. Su. 4/11	<i>Truptighna Dashemani</i>	<i>Atripiti</i>
Ch. Su. 4/18	<i>Vayasthapana Dashemani</i>	<i>Vayasthapana</i>
Ch. Vi. 8/143	<i>Tiktaskandha</i>	<i>Pittavikara</i>
Ch. Chi. 17/93	<i>Nidigdhikadi Yoga</i>	<i>Shwasa, Hikka</i>
Ch. Chi. 17/102	<i>Dashamuladi Yoga</i>	<i>Kasa, Hridgraha, Shwasa, Hikka</i> etc
Ch. Chi. 18/35	<i>Kantakari Ghrita</i>	<i>Kasa</i>
Ch. Chi. 20/31	<i>Gavedhukamuladi Yoga</i>	<i>Chhardi</i>
Ch. Chi. 21/57	<i>Mustadi Yoga</i>	<i>Visarpa</i>
Ch. Chi. 21/130	<i>Mustabhallatakadi Yoga</i>	<i>Visarpa</i>
Ch. Chi. 26/57	<i>Saptachhadadi Yoga</i>	<i>Mutrakriccha</i>
Ch. Chi. 28/148	<i>Bala Taila</i>	<i>Vatavikara</i>
Ch. Chi. 28/ 170	<i>Vrishamuladi Taila</i>	<i>Vatavyadhi</i>
Ch. Chi. 29/71	<i>Drakshadi Ghrita*</i>	<i>Vatashonita</i>
Ch. Chi. 30/53	<i>Sthiradi Taila</i>	<i>Yonishula, Hridroga, Gulma, Arsha</i>
Ch. Chi. 3/30	<i>Medhya Rasayana</i>	Memory enhancement
Ch. Chi. 3/198	<i>Jwaranashaka Kashaya</i>	<i>Jwara</i>
Ch. Chi. 3/202	<i>Vishamajwaranashaka Kashaya</i>	<i>Chaturthaka Jwara</i>
Ch. Chi. 3/211	<i>Shatyadivarga Kwatha</i>	<i>Sannipatajwara</i>
Ch. Chi. 3/221	<i>Pippalyadya Ghrita</i>	<i>Jirnajwara</i>
Ch. Chi. 3/266	<i>Agurvadi Taila</i>	<i>Shitajwara</i>
Ch. Chi. 3/298	<i>Vishamajwarahara Yoga</i>	<i>Vishamajwarahara</i>
Ch. Chi. 6/28	<i>Kaphapramehanashaka Yoga</i>	<i>Kaphaj Prameha</i>
Ch. Chi. 7/123	<i>Vatakaphaghnakushta Yoga</i>	<i>Vatakaphaghnakushta</i>
Ch. Chi. 7/152	<i>Mahakhadir Ghrita</i>	<i>Sarva Kushtha</i>
Ch. Chi. 12/24	<i>Vatapittajanya Shothartha Yoga</i>	<i>Vatapittajanya Shotha</i>
Ch. Chi. 12/34	<i>Punarnavadyarishta</i>	<i>Hridroga, Shwayathu, Pliha</i> etc
Ch. Chi. 15/190	<i>Panchama Kshara</i>	<i>Grahani</i>
Ch. Chi. 16/62	<i>Pratahakalin Yoga</i>	<i>Kamala</i>
Ch. Chi. 16/133	<i>Siddha Dugdha</i>	<i>Halimaka</i>
Su. Su. 38/5	<i>Vidarigandhadi Gana</i>	<i>Pittamilahara, Shotha, Gulma</i> etc
Su. Su. 38/29	<i>Shyamadi Gana</i>	<i>Gulama, Vishapaha, Anaha, Udara</i> etc
Su. Su. 38/33	<i>Patoladi Gana</i>	<i>Pittakapha, Arochaka, Jwara,</i> etc
Su. Su. 38/73	<i>Vallipanchamula</i>	<i>Raktapittahara, Shukradosha</i> etc
Su. Chi. 5/13	<i>Patoladi Kwatha</i>	<i>Vatarakta</i>
Su. Chi. 6/13	<i>Bharangyadi Takrakapla</i>	<i>Arsha</i>
Su. Chi. 10/4	<i>Mantha Kalpa</i>	<i>Mahakushta</i>
Su. Chi. 15/44	<i>Bala Taila</i>	<i>Mudhagarbha</i>
Su. U. 39/173	<i>Drakshadi Kwatha</i>	<i>Vatakrita Jwara</i>
Su. U. 39/186	<i>Saptachchhadadi Kwatha</i>	<i>Kaphaja Jwara</i>
Su. U. 40/50	<i>Mustadi Yoga</i>	<i>Shulatisara</i>
Su. U. 40/53	<i>Vachadi Yoga</i>	<i>Shulatisara</i>
Su. U. 40/62	<i>Pathadi Kwatha</i>	<i>Paittika Amatisara</i>
Su. U. 44/36	<i>Drakshadi Yoga</i>	<i>Lagharaka</i>
As. H. Su. 10/29	<i>Pathadi Yoga</i>	<i>Tiktaskandha</i>
As. H. Su. 14/22	<i>Kulathadi Yoga</i>	<i>Ati Sthaulya</i>
As. H. Su. 15/15	<i>Patoladi Yoga</i>	<i>Kapha, Pitta, Kushtha, Jwara</i> etc
As. H. Sha. 2/7	<i>Ushiradi Yoga</i>	During Pregnancy

important antioxidants are identified in different parts of *Guduchi* which are cited in **Table 12 (Grover P et al., 2012)**.^[51] *Guduchi* is able to survive assaults from organisms and environmental stress. Interestingly it is recognized as an adaptogenic plant species which contains

Phytoecdysteroids [a class of chemicals that plants synthesize for defence against phytophagous (plant-eating) insects] namely 2-deoxy-20-hydroxyecdysone 3-glucoside and 3-epi-2-deoxy-20-hydroxyecdysone (**Klein R, 2004**).^[52]

Table 7....continued

References	Formulations	Therapeutic indications
As. H. Chi. 1/46	<i>Mustadi Yoga</i>	<i>Jwara</i>
As. H. Chi. 1/51	<i>Pippalyadi Yoga</i>	<i>Vataja Jwara</i>
As. H. Chi. 1/66	<i>Nagaradi Yoga</i>	<i>Vatashleshmottara Jwara</i>
As. H. Chi. 1/154	<i>Triphaladi Yoga</i>	<i>Jwara</i>
As. H. Chi. 3/3	<i>Vrishadi Yoga</i>	<i>Kasa, Jwara, Aruchi</i>
As. H. Chi. 16/13	<i>Vasadi Kwath</i>	<i>Pandu, Pittastra, Kamala</i>
As. H. Chi. 16/43	<i>Triphaladi Yoga</i>	<i>Kamala</i>
As. H. Chi. 18/30	<i>Devadarvyadi Yoga</i>	<i>Visarpa</i>
As. H. Chi. 19/39	<i>Khadiradi Yoga</i>	<i>Kushtha</i>
As. H. Chi. 22/14	<i>Mustadi Kwatha</i>	<i>Kapholbana Vatashonita</i>
As. H. U. 22/97	<i>Khudradi Kashaya</i>	<i>Sarva Mukharoga</i>
As. H. U. 34/28	<i>Kashmaryadi Ghritha</i>	<i>Yonivatavikara</i>
As. H. U. 39/104	<i>Shunthyadi Yoga</i>	<i>Vyadhi, Jara</i>

* *Guduchi Swarasa* is used

Table 8. Therapeutic usage of *Guduchi* in *Panchakarma* and other procedures

References	Compound name	Therapeutic usages	Diseases
Ch. Su. 2/12	<i>Pataladi Yoga</i>	<i>Anuvasana Basti</i>	-
Ch. Chi. 3/246	<i>Guduchyadi</i>	<i>Niruha Basti</i>	<i>Jwara</i>
Ch. Chi. 3/252	<i>Patoladya</i>	<i>Anuvasana Basti</i>	<i>Jwara</i>
Ch. K. 1/25	<i>Badarashadavyadi Yoga</i>	<i>Vamana</i>	-
Su. Su. 25/21	<i>Guduchi</i>	<i>Vellitaka Sivana Karma</i>	-
Su. Su. 44/6	<i>Guduchyadi Yoga</i>	<i>Virechana</i>	<i>Kaphaja Roga</i>
Su. Chi. 37/34	<i>Guduchyadi Taila</i>	<i>Anuvasana & Uttarabasti</i>	-
Su. Chi. 38/43	<i>Shampakadi</i>	<i>Asthapana Basti</i>	<i>Prishita, Grahani etc</i>
Su. U. 39/151	<i>Guduchi</i>	<i>Patra Shaka</i>	<i>Jwara</i>
As. H. Chi. 6/14	<i>Guduchi Swarasa</i>	<i>Virechana</i>	<i>Pittaja Chhardi</i>
As. H. Chi. 12/6	<i>Guduchi Swarasa</i>	<i>Samakshika Bhojana</i>	<i>Prameha</i>
As. H. K. 4/1	<i>Baladi Kalka</i>	<i>Basti</i>	-
As. H. K. 4/55	<i>Guduchyadi Yoga</i>	<i>Anuvasana Basti</i>	<i>Sarva Vatavikara</i>
As. H. U. 9/26	<i>Patoladi Kwath</i>	<i>Vamana and Virechana</i>	<i>Vartma Roga</i>
As. H. U. 22/78	<i>Guduchi -Nimba Kalka yukta Taila</i>	<i>Nasya</i>	<i>Mukharoga</i>

Table 9. Therapeutic usages of *Guduchi* in external application

References	Compound name	Therapeutic usages	Diseases
Ch. Su. 3/21	<i>Rasnadi Ghritha</i>	<i>Pradeha</i>	<i>Vatarakta</i>
Ch. Chi. 8/71	<i>Guduchyadi</i>	<i>Parisheka Sweda</i>	<i>Rajayakshma</i>
Su Su.12/26	<i>Guduchi</i>	<i>Patra Achhadana</i>	<i>Atidagdha</i>
Su. Chi. 1/115	<i>Pathadi Yoga</i>	<i>Patradana</i>	<i>Kaphaja Vrana</i>
Su. Chi. 2/74	<i>Samangadi Taila</i>	<i>Ropana</i>	-
Su. Chi. 20/50	<i>Kulatthikadi</i>	<i>Pralepa</i>	<i>Asadhya Valmiki, Agnirohini</i>
Su. U. 19/13	<i>Guduchyadi Ghritha</i>	<i>Prakshalana, Parisheka, Ashyotana</i>	<i>Nayanabhighata</i>
As. H. Chi. 19/86	<i>Chitrakadi Yoga</i>	<i>Lepa</i>	<i>Kushtha</i>
As. H. U. 22/6	<i>Guduchyadi Ghritha</i>	<i>Abhyanjana</i>	<i>Mukharoga</i>
As. H. U. 22/78	<i>Guduchi -Nimba Kalka yukta Taila</i>	<i>Abhyanga</i>	<i>Mukharoga</i>
As. H. U. 34/33	<i>Guduchyadi Kwatha</i>	<i>Parisechana</i>	<i>Guhyaroga</i>
As. H. U. 38/20	<i>Palindyadi Yoga</i>	<i>Lepana</i>	<i>Shopha in Vishadansha</i>

Reported therapeutic attributes

The plant is useful in wide range of diseases like fevers, diabetes, dyspepsia, skin diseases etc (Chunekar KC, 2006).^[53] The stem is bitter, stomachic, stimulates bile secretion, enriches the blood and useful in jaundice, urinary

disease and upper respiratory tract infections (Vedavathy S, 1991).^[54]

Guduchi: A protective herb

Besides various protective roles such as immunomodulation, hepatoprotection (Bishayi B

Table 10. Folklore and tribal uses of *Guduchi*

Internal usage		
Disease	Mode of application	Tribals and areas
Fever	Pills prepared from paste of <i>Guduchi</i> stem and roots of <i>Bhatkataiya</i> (<i>Solanum surattense</i>)	Baiga, living in interior areas of Naugarh and Chakia blocks of Varanasi, Uttar Pradesh
Jaundice, fever, chronic diarrhea, periodic fever	Whole plant is used	Tribals of Mumbai and adjoining areas, and fishermen along sea coast
Fever	Decoction of stem administered orally	Tribals of Jammu and Bigwada (Rajasthan)
Fever	Warm juice of root orally	Inhabitants of Bhuvneshwar (Orissa)
Fever	Juice or decoction of leaves orally with honey	Local people of Patiala (Punjab)
Cancer, dysentery, diarrhea, periodic fever	Powdered root and stem bark of <i>Guduchi</i> with milk in cancer. Root decoction for diarrhea and dysentery. Stem decoctions for periodic fever	Tribals of Khedbrahma region (North Gujarat)
Burning (<i>Daha</i>)	Paste or juice of leaves and <i>Sarshapa beeja churna</i> (mustard seeds) for <i>Daha</i>	Inhabitants of Banka (Bihar)
General debility	Stem decoction in morning, empty stomach	In Dhanu forest area of Maharashtra, tribes viz. Agaris, Bhils, Dhodias, Dublas, Khakaris, Thakurs, Vandaris, Vagharis and Varlis
Cough	Powders of <i>Guduchi</i> , <i>Haritaki</i> and <i>Ajwain</i> in equal proportion, orally, once daily, in morning with salt	Inhabitants of Dhurla (Haryana)
Otalgia	Two drops of leaves juice are dropped in affected ear	Local people of Patiala (Punjab)
Leukorrhoea	Paste of <i>Guduchi</i> and 5 seeds of <i>Maricha</i> (<i>Piper nigrum</i>), orally, in morning	Local women of Arjunpura (Rajasthan)
Asthma	Stem juice, orally with honey	Local people of Badala (Uttar Pradesh)
Skin disease	Stem decoction, orally	Inhabitants of Dehrabara Kolaras, Sivpuri district of Madhya Pradesh
External usage		
Bone fracture	Whole plant is used as plaster and internally	Muslim Tribals, Gujjars and Backwals of Rajouri Jammu and Kashmir
Fracture	Paste of whole plant as plaster	Mundas of Chhota Nagpur
Emaciation in children	Dyed shirt soaked in <i>Guduchi</i> Juice worn daily	Inhabitants of Banka (Bihar)
Bites of poisonous insects and venomous snakes, eye diseases	Paste of <i>Guduchi</i> is applied to bitten part and administered orally. For eye disorders, juice of root is poured as eye drops	In certain parts of India

et al., 2002),^[55] neuroprotection, gastroprotection (Grover JK *et al.*, 2002),^[56] osteoprotection (Kapur P *et al.*, 2008),^[57] cardioprotection (Rao PR *et al.*, 2005),^[58] free radical scavenging (Rawal AK *et al.*, 2004),^[59] antioxidant (Stanely M *et al.*, 2001),^[60] the plant also provides protection against brain, heart, liver and kidney damage in chronic diseases like diabetes (Prince PS *et al.*, 2004; Prince PS *et al.*, 2005).^{[61],[62]}

Studies have also reported its protective role against toxicities induced by heavy metals such as lead (Sharma V *et al.*, 2010).^[63] The plant extracts have also demonstrated uroprotective role in Cyclophosphamide induced toxicities by modulating GSH and pro-inflammatory cytokine levels (Hamsa TP *et al.*, 2012).^[64] *Guduchi* is also is potent radioprotective agent as it ameliorated radiation

induced testicular injury in experimental studies (Sharma P *et al.*, 2012).^[65] *Guduchi* is well established preventive agent against novel H1N1 flu (Shah A *et al.*, 2013)^[66] and is reported to possess anti-HIV properties (Akhtar S, 2010).^[67]

The constellation of various activities such as antioxidant, immunomodulatory, anti-inflammatory, free radical scavenging, hepatoprotective etc plays a role in its protective effects against antitubercular and cytotoxic drugs, and toxins. An *n*-hexane extract isolated from the plant is proven to exhibit potent antimutagenic activity (Sharma U *et al.*, 2010).^[68]

Apart from biological roles, *Guduchi* is also recommended to be used in drinking water treatment process as its biomass has been proven as suitable and low cost adsorbent to reduce fluoride into standard permissible limit (Pandey

Table 11. Biological activities of major phyto-constituents from different parts of *Guduchi*

Chemical class	Phyto-constituents	Plant Part	Biological Activity (In Human being)	References
Alkaloids	Berberine, Choline, Tembetarine, Magnoflorine, Tinosporin, Palmetine, Isocolumbin, Aporphine alkaloids, Jatrorrhizine, Tetrahydropalmatine	Stem, Root	Anti-viral, Anti-cancer, anti-diabetic, Anti-inflammatory, Neuroprotective, Immunomodulatory, Psychiatric conditions	[24]-[29]
Diterpenoid Lactones	Furanolactone, Clerodane derivatives [(5R,10R)-4R-8R-dihydroxy-2S-R:15,16-diepoxy-cleroda-13 (16), 14-dieno-17,12S:18,1S-dilactone], Tinosporon, Tinosporides, Jateorine, Columbin	Whole Plant	Vaso-relaxant: relaxes norepinephrine induced contractions, inhibits Ca ⁺⁺ influx, anti-inflammatory, anti-microbial, anti-hypertensive, anti-viral, Induce apoptosis in leukemia by activating caspase-3 and bax, inhibits bcl-2	[30]-[34]
Glycosides	18-norclerodane glucoside, Furanoid diterpene glucoside, Tinocordiside, Tinocordifolioside, Cordioside, Cordifolioside, Syringin, Syringin-apiosylglycoside, Pregnane glycoside, Palmatosides, Cordifolioside A, B, C, D and E	Stem	Treat neurological disorders (ALS, Parkinsons, Dementia, motor and cognitive deficits) and neuron loss in spine and hypothalamus, Immunomodulation, Inhibits NF-kB and act as nitric oxide scavenger to show anticancer activities	[35]-[41]
Steroids	β -sitosterol, δ -sitosterol, 20 β -hydroxyecdysone, Ecdysterone, Makisterone A, Giloinsterol	Shoot	IgA neuropathy, glucocorticoid induced osteoporosis in early inflammatory arthritis, induce cell cycle arrest in G2/M phase and apoptosis through c-Myc suppression. Inhibits TNF- α , IL-1 β , IL-6 & COX-2	[42]-[44]
Sesquiterpenoid	Tinocordifolin	Stem	Antiseptic	[45]
Aliphatic compound	Octacosanol, Heptacosanol Nonacosanol-15-one dichloromethane	Whole plant	Anti-nociceptive and anti- against 6-hydroxydopamine induced parkinsonisms in rats. Down regulate VEGF and inhibits TFN- α from binding to the DNA	[46]-[48]
Others	3-(α ,4-Dihydroxy-3-methoxy-benzyl)-4-(4- compounds hydroxy-3-methoxy-benzyl)-tetrahydrofuran, Jatrorrhizine, Tinosporidine, Cordifol, Cordifellone, Giloinin, Giloin, N-trans-feruloyltyramine as diacetate, Tinosporic acid	Root, whole Plant	Protease inhibitors for HIV and drug resistant HIV	[49]-[50]

Table 12. Various antioxidants in different parts of *Guduchi*

Plant Part	Antioxidant (mg/100 g)
Fresh Leaves	Ascorbic acid (360); Lycopene (10.43); Carotene (5.24); Anthocyanin (20.296); Phenol (400).
Dry Leaves	Ascorbic acid (290); Iron (125); Anthocyanin (21.234); Phenol (1240).
Fresh Fruits	Ascorbic acid (40); Lycopene (0.6709); Carotene (6.36); Anthocyanin (19.355); Phenol (560).
Dry Fruits	Ascorbic acid (3660); Iron (37.5); Anthocyanin (19.061); Phenol (2600).

Table 13. Nutritional composition of *Guduchi*

Mineral Analysis*		Proximate Analysis*	
Constituents	Parts per million (ppm)	Parameters	Weight (w/w%)
Calcium	102.233 \pm 0.0385	Moisture	34.390 \pm 4.412
Phosphorous	24.816 \pm 0.1120	Crude Protein	7.740 \pm 0.632
Iron	26.058 \pm 0.0451	Crude fibre ^s	56.420 \pm 2.211
Copper	3.733 \pm 0.0064	Nitrogen free extract	26.970 \pm 1.012
Zinc	7.342 \pm 0.0127	Nutrient detergent fibre ^s	58.310 \pm 2.451
Manganese	12.242 \pm 0.0127	Acid detergent fibre ^s	54.610 \pm 1.861
		Acid detergent lignin	30.590 \pm 0.741
		Hemicellulose	3.700 \pm 0.391
		Cellulose	23.020 \pm 1.183

*Values are expressed as Mean \pm SE; **All values are expressed on dry matter except moisture \$ = fibre and fiber are synonyms

PK et al., 2012).^[69] Thus it also protects against water contamination.

Nutritional values

Along with rich protein and dietary fibre contents appreciable levels of major and minor elements namely Zn, Mn, Cl, K, Ca, Ti, Cr, Fe, Co, Ni, Cu, Br, and Sr are found in this herb, that acts as micronutrients for health restorative purpose (**Nile SH et al., 2009).**^[70] *Guduchi* stem provides sufficient carbohydrate (61.66%), low fat (3.1%) and 292.54 calories per 100 g (**Madhav M et al., 2011).**^[71] Proximate and elemental analysis of its stem revealed rich nutritive composition essential for immunomodulation, body building and health restoration (**Table 13**) (**Mahima et al., 2014).**^[72] An popular dosage form of *Guduchi*- '*Guduchi Satva*' is also reported to possess rich nutrients viz. fat, protein, dietary fibres, energy contents, Ca, Fe as 0.14 g, 0.64 g, 0.16 g, 288.8 cal, 70 mg, and 9.7 mg per 100 g respectively (**Geeta K et al., 2013).**^[73]

Desirable Drug Interactions

Although, extensive works have been conducted on this herb, no negative herb-drug interactions are reported so far. Concurrent administration of TC with metformin showed beneficial pharmacokinetic as well as pharmacodynamic interaction leading to enhanced antihyperglycemic and antihyperlipidemic activity (**Patwardhan B, 2012).**^[74]

The drug interaction study of aqueous extract of TC with gliclazide was conducted in normal and diabetic rats based on pharmacodynamic (blood glucose) response in 12h. The extract improved the

hypoglycaemic activity of gliclazide and shown synergistic action (**Raju MG et al., 2014).**^[75]

Plant alkaloid Berberine is reported to boost the effects of metformin and 2,4-thiazolidinedione (THZ), and can partly replace the commercial drugs, which could lead to reduction in toxicity and side effects of the latter (**Prabhakar PK et al., 2009).**^[76] In Ayurveda, decoction of TC stem is used as a medium of '*Shodhana*' process (relates to combining a substance with another substance to enhance its activity and to help counter some of its unwanted effects) to purify *Guggul* (*Commiphora wightii*), which is an vital component of various Ayurvedic antidiabetic formulations. TC enhanced the activity of *Guggul*. When used alone, the effect of *Guggul* was significantly less. Use of *Guduchi* combinations has a potential basis for clinically desirable drug interactions (**Kamble et al., 2008; Caranasos et al., 1985).**^{[77], [78]}

Toxicity and Safety concerns

Although, extensive works have been conducted on this herb, no conspicuous information on toxicity is available so far. The herb is considered to be safe in dosage mentioned (**Anonymous, 2003).**^[79]

Pharmaceutical products of *Guduchi* and their biological roles

Using various potent chemical compounds from this botanical, various pharmaceutical market products have been produced by the different companies which are enlisted in **Table 14**.

Table 14. Various valuable economic products of *Guduchi*

Name of Market product	Biological role
Shila Pravang	Premature ejaculation, erectile dysfunction, to enhance the sexual stamina
Guduchi Tablets	General infections, immune disease, Hepatitis, Arthritis and anti- cancerous
Madhu Mehari	Cures dryness of mouth, numbness, debility, relieves frequent urination, fatigue, excessive thirst and maintains the blood sugar
Safe Herbs	Cures Anemia, vaginal discharge and sexual disabilities
Mussaffen	Blood purifier and anti-allergic
Rebuild	Anti- stress and anti- oxidant
Septilin	Treats upper respiratory tract infection
Tonplex	Increases immunity and vitality
Joint & Muscle Excellence Tablets	Eliminate the toxins of joints
Natadadrol	Potent muscle-building androgen
Brave Heart Capsule	Hypolipidemic, diuretic
Cirrholiv capsules	Hepatoprotective
Cirrholiv-ds syrup	Hepatoprotective

Threats to this Botanical

Due to immense medicinal utilities and global high demand, this plant has been overexploited by pharmaceutical companies and folk people for traditional remedies that have led to the acute scarcity of this plant. *Guduchi* has been listed amongst 29 highly prioritized medicinal plants of agro climatic zone 8 (Rajasthan, U.P. and M.P.) of India as identified by National Medicinal Plant Board, New Delhi, Government of India. This plant has also been listed in 178 medicinal plant species in high Volume Trade by NMPB, New Delhi, India (**National Medicinal Plant Board**).^[80] More initiatives are needed for large scale planned cultivation of the plant to meet the needs.

Conclusion

Present review spotlights the therapeutic importance of *Guduchi* from Ayurvedic perspective which is now validated by contemporary evidence based studies. Existing literature spotlights the preventive, promotive and curative aspect of *Guduchi*; proving it an ancient elixir with modern cure. However, the mechanistic studies and application in clinical studies are still lacking. *Guduchi* imbibes a tremendous quantifiable potential and deserves a special attention of scientific fraternity to explore its practical clinical applications. As the global scenario is now changing towards the use of non-toxic herbal products having traditional medicinal usage, development of modern drugs from *Guduchi* considering Ayurveda concepts should be encouraged to combat various ailments.

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