



Review Article

GILOYE - ROOT OF IMMORTALITY FOR PAST, PRESENT & FUTURE IN AFFORDABLE PRICE

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ABSTRACT

Aim: An explicit study of *Giloye* (*Tinospora cordifolia* Wild. & Miers.) to find out its safety and solution to the loopholes that are preventing its multidimensional therapeutic efficacy from spreading globally. **Material and method:** Information regarding the *Giloye* (*Amrita*) was collected from various ancient works of literature, Nighantu (lexicons of medicinal plants), recent journals, and information was also gathered from the internet. For various references like Vedic and mythological references, text related to *Dravyaguna* and published articles were referred to. **Result:** From the above study, it was concluded that *Giloye* "The magical herb" is an *Amrita* (elixir) for humankind because of its easy propagation, affordable price, diverse uses, and effective pharmacological action. No significant information is available on *Giloye* regarding toxicity on therapeutic dosage. But we noticed from the above study that we must focus on some important points like Dissemination of identity of herbs to the public, Digitalization of pharmacovigilance program. **Conclusion:** Herbs like *Guduchi* are popular and is being used for various disorders for many years. Various researches was also conducted on *Guduchi* which proves its safety and efficacy. Thus, it is reiterated that "*Guduchi*" ayurvedic herb is safe and cost-effective however it should be used after proper consultation from Ayurvedic medical practitioners. If rules and regulations or proper platforms like mentioned below are not made for use of *Giloye* or any other herb or Ayurvedic formulation, then the day is not due when a tragedy like thalidomide will be in front of us in Ayurveda itself.

INTRODUCTION

From ages for increasing the comfort zone in our lives, we are making various undesirable and unwanted changes in our ecological system. Due to these changes, many new diseases are arising along with known diseases. A sedentary lifestyle, smoking, drinking alcohol, poor sleeping habits, etc so-called modern living habits bonus to make the situation worse. If we draw our deep attention towards Ayurvedic classic literature, the origin of *Vyadhi* (disease) in person depends upon its *Prakriti* (physical

constitution), *Aahar-Vihara* (lifestyle), *Bala* (strength), *Vyadhi Kshamtv* (immunity), *Vaya* (age), etc. With the advancement of science, various lines of treatment are available for the cure of diseases but as we know that science is both a blessing and a curse. The drugs available for the various diseases are always in clinical trial i.e., phase 4 in which effectiveness is confirmed but with uncertain risk in the future. There is a various example of such kind of risk which result in withdrawal of drugs from the market after so many years like the famous Thalidomide tragedy of birth defect (1960),^[1] fatal cardiac arrhythmia by Terfenadine which was approved in 1985, and withdrawal after 13 years.^[2] There are lots of examples like this and today in India 344 medicine of fixed drug combinations are banned by the ministry of health and family welfare due to various risk factors.^[3] In 1991, also the first time an Ayurvedic product "select" had

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been banned by the government of Gujrat, but it is banned due to misleading advertisement.^[4] Along with this, it was claimed in various platforms that metallic preparations lead to toxicity, but this only happens if meticulous guidelines like *Shodhana* (purification), *Marana* (incineration), etc, and proper dosage for the proper time that is laid down in classical literatures are not followed properly. To overcome such kind of risk "Ayurveda" the ancient medical science may act as a blessing if used with holistic principles (*Dashvidha Pareeksha*, *Bheshaj Pareeksha*, *Astvida Pariksha*, etc) that are mentioned in classical texts. In Ayurveda, there are various herbs and formulations (*Aushadha*) for treating diseases and for improving the quality of life of a patient suffering from untreatable diseases (*Asadhya Roga*). But sufficient thought should be given to selecting the *Aushadha* for any disease because *Aushadha* is one of the four factors of "*Chikitsa Chatuspada*" which is responsible for the cure of any kind of disease. Today various Ayurvedic formulations are available in the market, but they are directly or indirectly derived from various origins (plant, animal, mineral, etc). The non-availability, standardization, ambiguity in identification, safety, high cost, adulteration, etc. are some of the problems encountered in the utilization of Ayurvedic formulation. On the other hand, the single drug was proven for their potential in the modern parameter and are cost-effective, safe, and economical. So, when we explore the treasure of Ayurvedic herbs we find out that *Giloye* (the root of immortality) as the single herb has the potential to overcome the problems that are associated with formulations from ancient times to the upcoming future at affordable price. The *Giloye* is botanically known as *Tinospora cordifolia* Wild. & Miers. belongs to the family menispermaceae. It is a climber with deeply heart-shaped leaves which is known by a different name in different languages in India.

MATERIAL AND METHOD

Information regarding the *Giloye* (*Amrita*) was collected from various ancient literature, *Nighantu*

Table 1: *Giloye* in various groups as reported in *Samhita*, *Nighantu*, and *Rasa Grantha*^[7]

Based on number	<i>Chatuspada Varga, Panchdasha Gana</i>
Based on the first drug of the group	<i>Aragvadadi Gana, Guduchiyadi Gana, Kiratadi Gana, Gokshuradi Gana, Padmakaadi Gana, Vidarikandadi Gana, Pipaliadi Varga, Abhyadi Varga, Murvadi Gana, Shatavariadi Gana, Brihatshatyadi Varga, Mustakadi Gana, Kakolyadi Gana, Patoladi Gana, Rasnaadi Gana, Shtyadi gana, Shayamadi Gana, Triplhadi Gana, Madanadi Gana Varga</i>
Based on habit	<i>Valli Panchmool, Latavarga, Lata kand, Vrikshadi Varga, Valli Gana</i>
Based on properties	<i>Katu Skandh Dravya, Madhur Skandh Dravya, Tikat Rasa Gana, Tikat Varga, Tikat Skandh</i>
Based on <i>Dosha</i> Karma	<i>Kapha Shanshamana Varga, Vata Shanshaman Varga, Tridoshghana Dravya, Kapha-Vaat Ghana Varga</i>

(lexicons of medicinal plants), recent journals, and information were also gathered from the internet. Both print and e-version of Ayurvedic texts were covered for a study like online sources of e-Nighantu, etc. For various references like Vedic and mythological references text related to *Dravyaguna* and published articles were referred.

DISCUSSION

Giloye term was referred to as "heavenly elixir" that saved mankind from old age and kept them eternally young. In the present study medico-historical review of *Giloye* along with the modern scientific information supporting the same was discussed.

Ayurvedic point of view

What is *Giloye*?

"*Gudti Rakshiti Itti Guduchi*"^[5] i.e., *Guduchi* is a plant that protects from diseases.

Historical background

Mythological review

In *Bhavprakash Nighantu* it is narrated that, during the war between *Ram* and *Ravana*, several monkeys who supported *Rama* were killed. At that time *Indra* was pleased by the victory of Lord *Rama*, the death of *Ravana*, and sprinkled *Amrita* (elixir) on the dead body of the monkeys to provide rebirth to them. During this process wherever *Amrita* (elixir) drops were fallen on earth, *Giloye* herb originated.^[6]

Vedic Kaal

- *Kudruchi* is the name mentioned to *Giloye* in *Kaushika Sutra*.
- *Giloye* is used to avoid snakes and scorpions in every house was mentioned by *Sayana* in *Sounakiya Atharveda*.

Giloye in various groups in classical texts and modern books

In Ayurveda, *Giloye* is categorized under various groups as per its characteristics. The detail of the classification of *Giloye* has been mentioned in Table 1 & Table 2.

Based on use	<i>Aushadhadi Varga</i>
Based on actions	<i>Jvarahara Mahakshaya, Sndhaniya Mahakshaya, Stanya Shodhan Mahakshaya, Prajasthapan Mahakshaya, Snehopaga Mahakshaya, Triptighana Mahakshaya, Trishna Nigrehan Mahakshaya, Vyasthapan Mahakshaya, Daha Prashamana Mahakshaya, Hikka Prashmana Mahakshaya, Vamana Dravya Kalpa Sangreha.</i>
Based on action given in <i>Rasagranth</i>	<i>Dahaghan, Jvaraghan, Mutra Virechaniya, Sandhaniya, Stnyashodhana, Snehopaga, Triptighana, Trishnaghana, Vyasthapanagana.</i>

Table 2: The Description of Giloye as per modern books

Indian medicinal plant	In this book description of <i>Giloye</i> along with its different species and medicinal uses are illustrated beautifully.
Pharmacognosy of indigenous drugs	The description of Latin name, family, part used both macro and microstructures of the plant with its substitute and adulteration, standardization, physical constant value, and fluorescence analysis are reported in this text.
Materia medica	A detailed description of <i>Amrita</i> along with its use in <i>Vrishchika Visha</i> (Scorpion bite) is documented.
Dravyaguna Vigyaana	The Latin name, vernacular name, synonyms, botanical description, along with properties and action on the different system are described with its therapeutic dosage and formulation.

Synonyms of Giloye**Table 3: Synonyms of *Tinospora cordifolia* Wild. & Miers^[5]**

Based on	Synonyms with their interpretation
Habitat	<ul style="list-style-type: none"> • Kandodbhava- <i>Giloy</i> can be propagated with the stem • Amritvallari- If planted, <i>Giloy</i> never dies • Chinruha- When cut <i>Giloy</i> grows again
Morphology	<ul style="list-style-type: none"> • Kundli- <i>Giloy</i> ascends on the supporting plant circularly • Mandali- <i>Giloy</i> climbs up the supporting plant in a circular manner • Tantrika- The stem of <i>Giloy</i> resembles a row • Chakralakshnika- When cut transversely the stem shows the circular structure • Madhuparni- When crushed, leaves give viscid juice like that of honey • Chandrasasa- The seeds are semilunar in shape
Properties and action	<ul style="list-style-type: none"> • Amrita- <i>Giloy</i> is a very useful drug and possesses the quality like that of nectar • Rasayani- <i>Giloy</i> has rejuvenating quality • Jivanti- <i>Giloy</i> protects life because of its <i>Rasayana</i> (rejuvenating) property • Vyasya- <i>Giloy</i> promotes longevity • Jwarnashani- <i>Giloy</i> is a very efficacious drug in fever • Vishalya- <i>Giloy</i> protects by removing toxins • Vatsadni- Leaves of <i>Giloy</i> are like calves

Regional names of Giloye**Table 4: Regional names of *Tinospora cordifolia* Wild. & Miers**

English	<i>Gulantha tinospora</i>
Hindi	<i>Giloye</i>
Kannada	<i>Amrutavalli</i>
Malayalam	<i>Amrita</i>
Marathi	<i>Gulaveli Chittamrutu</i>

Rasa Panchaka (pharmacodynamics of Giloye as per different classical texts)

In Ayurveda, the action of the drugs depends upon *Rasa, Guna, Virya, Vipaka, Prabhava*. Pharmacodynamics (*Rasa Panchaka*) of *Giloye* is mentioned in Table 3.

Table 5: Ayurvedic pharmacodynamics as per different classical texts^[8]

Samhita/Nighantu	Rasa	Guna	Virya	Vipaka
<i>Charaka Samhita</i>	<i>Tikta</i>	<i>Guru</i>	<i>Ushana</i>	<i>Madhur</i>
<i>Susruta Samhita</i>	<i>Tikta</i>	<i>Guru</i>	-	<i>Guru</i>
<i>Ashtang Samgreha</i>	<i>Tikta</i>	-	<i>Ushana</i>	-
<i>Ashtang Hridaya</i>	<i>Tikta</i>	-	<i>Sheet</i>	<i>Katu</i>
<i>Dhanwantri Nighantu</i>	<i>Tikta, Kashaya</i>	<i>Guru</i>	<i>Ushana</i>	-
<i>Raja Nighantu</i>	<i>Tikta, Kashaya</i>	<i>Guru</i>	<i>Ushana</i>	-
<i>Bhavprakash Nighantu</i>	<i>Katu, Tikta, Kashaya</i>	<i>Laghu</i>	<i>Ushana</i>	<i>Madhur</i>
<i>Shaligram Nighantu</i>	<i>Tikta, Kashaya</i>	<i>Guru, Ushana</i>	<i>Ushana</i>	<i>Madhur</i>
<i>Dravyaguna Vigyana</i>	<i>Tikta, Kashaya</i>	<i>Guru, Snigadha</i>	<i>Ushana</i>	<i>Madhur</i>

Various Karma and Doshghanta attributed to Guduchi

Various *Karma* and *Doshghanta* of *Giloye* were mentioned in different classical literature of Ayurveda. We discussed various uses of *Giloye* as per classical literature and its scientific validation in Table 4.

Table 6: Various Karma (therapeutic action) of Giloye that are scientifically validated^[7]

Karma (Therapeutic efficacy)	Scientific validation
<i>Jvarahara</i>	Anti-pyretic activity
<i>Krimighan</i>	Anti-microbial activity
<i>Medhya karma</i>	Learning and memory enhance activity, anti-depressant activity, anti-stress activity, etc
<i>Kamala Hara</i>	Hepatoprotective activity
<i>Swasa Hara</i>	Anti-asthmatic activity
<i>Atisaar shaman</i>	Anti-diarrheal activity
<i>Vaat Rakt, Shothara, Vedna Sthapan</i>	Anti-inflammatory and analgesic activity
<i>Amalpiittahara, Chardighan</i>	Gastroprotective activity, anti-ulcer effect
<i>Kandu, Kusth, Udard, Visarp Nashak</i>	Anti-allergic activity
<i>Parmeha</i>	Hypoglycemic activity, anti-diabetic activity
<i>Vran Ropana</i>	Wound healing activity
<i>Stholya Nashak, Arbud, Granthi</i>	Anti-dyslipidemic activity, hypolipidemic effect
<i>Rasayana</i>	Immunomodulatory activity, neuroprotective effect, or antioxidant activity

Along with above mentioned *Karma*, if *Giloye* is used with different *Anupana* (vehicle) then it gives different action like when used with *Shunthi* it cures *Aamvaat* (rheumatism), with *Guda* used in *Vivandh* (constipation), with *Erand Taila* used to cure *Vaatrakta* (Gout), with *Ghee* pacify *Vata*, with *Sita* pacify *Pitta* and with *Madhu* pacify *Kapha*.^[9,10]

Variety of Guduchi

In *Dhanwantri* and *Raj Nighantu* another variety of *Giloye* is mentioned i.e., *Kand Guduchi* and it possesses *Jvarghana, Vishbhutghani, and Valit-Palit Nashini* property. ^[9,11,12]

Table 7: Multidimensional use of Giloye

Giloye as Satva	<i>Satva</i> is defined as dried starchy water extract. The <i>Satva</i> obtained from the <i>Giloye</i> stem is known as <i>Giloye Satva</i> and is mentioned in <i>Rasayogsagar</i> ^[13] , <i>Yogratnakar</i> ^[14] , <i>Rastantrasara</i> , and <i>Sidhyogsamgraha</i> . AFI recommends the preparation of <i>Giloye Satva</i> from fresh stems. ^[15] There are various properties of <i>Giloy Satva</i> like <i>Vyasthapanakarma, Dhatukrit, Medhyam, Chakshushya</i> and it exhibits various therapeutic uses like in <i>Aruchi, Daha, Bahumutrata, Swasa, Jwara,</i>
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	<i>Pradra, Kshay, Arsha, Soma roga, etc.</i> [16]
<i>Giloye as Agraya Aushadha</i>	In classical literature, <i>Giloye</i> is considered a lead drug for various clinical conditions. In <i>Charaka Samhita</i> [17] and <i>Astanga Samgraha</i> [18], <i>Giloye</i> is considered as <i>Agraya Aushadha</i> (lead drug) in clinical conditions that are <i>Samgrahika Vatahara, Deepanilyshma shonitvivandh prashamana</i> . Also this drug alone or with other drugs used as an <i>Agraya</i> for <i>Amapachna, Vatarakta</i> [19], <i>Kustha</i> [20], and <i>Jwara chikitsa</i> . <i>Giloye</i> is also considered the best drug for <i>Shamana</i> treatment.[21]
<i>Giloye in Ras Shastra</i>	<i>Giloye</i> is a commonly used herb in <i>Ras Shastra</i> classics. In <i>Sharangdhar Samhita</i> , <i>Giloye</i> is advised to be used in fresh condition [21] which indicates that it is high hygroscopic and on drying there is a change in its phytoconstituents. <i>Giloye</i> is used in various processes like <i>Maran, Jarana, Murchan</i> , etc of <i>Parada</i> . It is used in various <i>Shodhana</i> (purification) like <i>Mukta, Shilajeet, Gandhaka</i> , etc. Various other uses of <i>Giloye</i> are present in <i>Ras Shastra</i> .

Part use: Stem, leaves [22]

Dosage[23]

Powder (*Churna*) – 1-3 *Masha* (3-6 gram)

Decoction (*Kwath*)- 4-8 *Tola* (50-100 ml)

Satva (Starchy extract) – 5-15 *Ratti* (1-2 gram)

Folklore uses of *Giloye*

Each tribe or state had its own beliefs and knowledge about the use of natural resources. Folklore uses of *Giloye* are mentioned in Table 5.

Table 8: Folklore uses *Giloye* in various states

State	Disease & Mode of Use
Punjab	Fever – <i>Swaras</i> (juice), <i>Kwath</i> (decoction) of leaves is used with honey orally Otalgia – Leaves juice is used as ear drops.
Haryana	Cough – In equal proportion powder of <i>Guduchi, Haritaki, and Ajwain</i> with salt is used.
Uttar Pradesh	Asthma – Stem juice with honey.
Madhya Pradesh	Skin disease – Stem decoction is used.
Rajasthan	Leucorrhoea – <i>Kalka</i> (paste) of <i>Giloye</i> with 5 seeds of <i>Marich</i> is used.
Bihar	Daha – <i>Kalka</i> (paste), <i>Swaras</i> (juice) of leaves, and mustard seed powder is used.

Modern Point of View

Taxonomical classification

The word *Tinospora* used for *Giloye* is derived from the Latin word “tinnio” and the Greek word “spora”, which means subglobose or ellipsoidal seed. Botanical name of *Guduchi* is *Tinospora cordifolia* (Willd.) Miers ex Hook. f. & Thomas. The family menispermaceae of *Guduchi* represents that it has the moon and crescent-shaped seed.

Distribution and Habitat

Guduchi grows throughout India to an attitude of 900 meters and is commonly cultivated owing to excessive demand. Its large climbers grow on trees, shrubs, and hedges mostly in tropical regions.[5]

Morphology [24]

Tinospora cordifolia is a large deciduous climber with succulent, corky, grooved stems.

Table 9: Morphology of *Tinospora cordifolia* Wild. & Miers.

Leaves	Leaves membranous, 7-9-nerved, 5-10cm or rarely 12 by 10cm, roundish subdeltoid cordate with a broad sinus and large basal lobes, obtuse or cuspidate, reticulately veined.
Male flowers	Clustered in the axils of small subulate bracts.
Female flowers	Usually solitary, like male, but sepals green, margins not reflexed, staminodes, short, linear.
Stem	The fresh stem has a green succulent bark, covered by a thin brown epidermis, which peels off in flakes, it is studded with warty prominences here and there, given or roots and branches bearing smooth, heart-shaped leaves and bunches of red berries, when dry it shrinks very much and the bark separates from the wood and becomes dull brown, the latter consists of several wedge-shaped bundles, the taste is very bitter, the odor not on any way peculiar.

The macroscopic and microscopic study of *Giloye (Tinospora Cordifolia Wild. & Miers.)* was shown in [Figure 1-5]



Figure 1: Showing leaves of *Tinospora cordifolia* Wild. & Miers.



Figure 2: Showing stems of *Tinospora cordifolia* Wild. & Miers.



Figure 3: Showing stem of *Tinospora cordifolia* Wild. & Miers. in circular way satisfying its Kundli synonym in Ayurveda

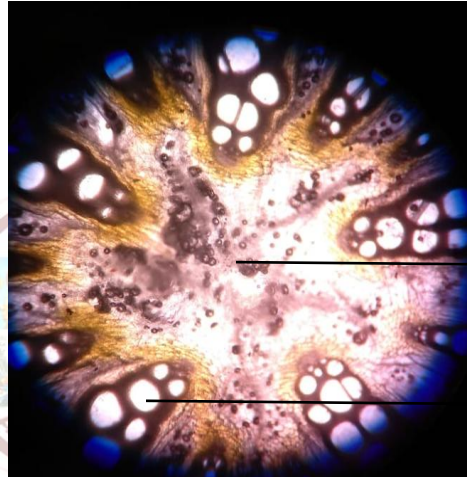
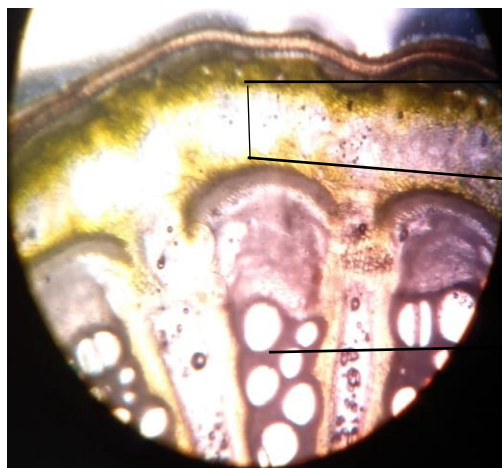


Figure 4: Showing Pith and Xylem in transverse section of *Tinospora cordifolia* Wild. & Miers.



Epidermis

Cortex

Metaxylem

Chemical constituents [7]

Giloye consists of the following active principles: Alkaloids (berberine, choline, tinosporin),

diterpenoide lactones, glycosides, steroids, sesquiterpenoid, phenolics, etc.

Recent studies [8]

Recent research has shown various activities in *Giloye* like anti-viral, anti-cancer, immunomodulatory, anti-inflammatory, neuroprotective, anti-diabetic, anti-microbial, anti-hypertensive, etc.

Safety

There is a misconception among people that the drug of "natural" origin is "safe" and also people believe that long term use of traditional medicines assures both safety and efficacy but in recent periods lots of adverse events are reported related to the use of herbs or formulations i.e., attributed due to the wrong identification, poor quality, and improper use. With the growth of Ayurvedic products in the international market, it is important to ensure the safety, efficacy, and quality control of Ayurvedic products. Ayurpharmacoepidemiology is a new discipline that can be a viable alternative to answer the question about the safety aspects of Ayurvedic drugs. Pharmacovigilance and reverse pharmacology are the part of Ayurpharmacoepidemiology which helps to

monitor the safety concerns and unwanted effects rise in drugs that are already on market. So we will study the safety of *Giloye* with two parameters:

- Reverse pharmacology
- Pharmacovigilance

Reverse pharmacology

This term was first coined in India to develop Ayurvedic medicine pharmaceuticals. This science is used at multiple levels to optimize the safety and efficacy of natural products. In this pharmacology "laboratory to clinics" study is reversed to "clinics to laboratory".^[25] Various therapeutic actions are implied for *Guduchi* like *Tridoshamaka*, *Swas-Kasa Hara*, *Rasayana*, *Krimihara*, *Pandunashaka*, *Vatarakta*, *Dahahara*, etc. These properties require scientific validity and that is done by adopting the reverse pharmacological approach.

So, the scientific researches related to *Giloye* are mentioned below in table 10.

Table 10: Few important recent researches related to *Giloye*

Medhya Rasayana	In Ayurveda, <i>Giloye</i> is known as <i>Medhya Rasayana</i> . Various studies have been done in modern parameters which prove that <i>Tinospora Cordifolia</i> Wild. & Miers. (<i>Guduchi</i>) enhance verbal learning, logical memory and protect the neurodegenerative changes. ^[26,27]
Jvarahara	<i>Giloye</i> is well known for its <i>Jvarahara</i> activity in Ayurvedic classical texts. Various experimental studies proved that <i>Tinospora Cordifolia</i> Wild. & Miers. Shows remarkable antipyretic activity and anti-infective activity. ^[28,29,30]
Swasa and Kasa	In Ayurveda <i>Guduchi</i> are advised for <i>Swasa</i> (asthma) and <i>Kasa</i> (cough). Traditionally its <i>Swarasa</i> (juice) is used for the treatment of chronic cough. On evaluation <i>Tinospora Cordifolia</i> Wild. & Miers. was found to be a good anti-allergic and bronchodilator which help to decrease bronchospasm and reduce the number of disrupted mast cells. ^[31,32]
Vatarakta and Daha	<i>Giloye</i> is mentioned in various Ayurvedic texts for <i>Vatrakta</i> (gout), <i>Daha</i> (burning sensation). In recent research <i>Tinospora Cordifolia</i> Wild. & Miers. shows significant anti-inflammatory effect in both acute, sub-acute inflammation and is found to be more effective than acetylsalicylic acid in acute inflammation. ^[28]
Vyasthapana, Vrishya, Rasayana, Balya, Chakshushya, Ayushprada	In Ayurveda <i>Giloye</i> is believed to have <i>Vyasthapana</i> , <i>Vrishya</i> , <i>Rasayana</i> , <i>Balya</i> , <i>Chakshushya</i> , <i>Ayushprada</i> properties, and in modern parameters <i>Giloye</i> is successfully tested for immunomodulatory and aphrodisiac activity. ^[33]
COVID-19	In the 21 st century three times coronavirus outbreaks occur due to animal reservoirs and covid-19 is a new pandemic disease caused by coronavirus also known as SARS-CoV-2. In Ayurveda, these kinds of communicable diseases are mentioned under <i>Janapadodhwansa</i> and in its general treatment use of <i>Rasayana</i> is mentioned. <i>Giloye</i> can be effective in the treatment of covid-19 along with various other herbs because they are rich in <i>Rasayana</i> activity. The recent study also shows that the active principle of <i>Giloye</i> i.e., <i>Tinocordiside</i> , <i>Ashwagandha</i> i.e., <i>Withanoside-V</i> , <i>Tulsi</i> i.e., <i>Vicenin</i> acts as an inhibitor against SARS-CoV-2 M ^{pro} (main protease). ^[34]

Along with these various other recent studies have proved that *Tinospora cordifolia* Wild. & Miers. exhibit antioxidant, anti-neoplastic, hepatoprotective and anti-

hyperglycemic, diuretic, cardioprotective, anti-infertility activities, etc.

Pharmacovigilance

Pharmacovigilance known as drug safety is the pharmacological science relating to the detection, assessment, collection, monitoring, and prevention of adverse effects. Anything that shows pharmacological action results in toxicity if inappropriately used (Paracelsus). In Ayurvedic classical texts, the same thing is mentioned that if the drug is administered improperly it acts like poison (*Visha*), weapon (*Shastra*), fire (*Agni*), and when properly administered acts like *Amrita* (elixir).^[35]

Today due to the popularity of Ayurveda around the world, multiagency has made Ayurveda a business with low investment and high return. Due to money-making minds and incomplete knowledge companies are compromising the quality of drugs that result in less therapeutic efficacy and more side effects. Along with this, some mischievous elements spread false rumors under jealousy, incomplete knowledge, and for fun. These misleading false rumors spread like fire on social platforms.

Its recent example is related to *Giloye*

Giloye is mentioned by the AYUSH ministry as an immuno-booster against coronavirus,^[36] but a media report based on a study published in "Journal of clinical and experimental hepatology" mentioned that *Giloye* resulted in liver failure in six patients in Mumbai. When this study is analyzed, it was found that the herb is not identified by the author properly and no opinion is taken by a botanist or by an Ayurvedic expert regarding the identification of administered herb. Wrong identification of herb leads to wrong results many times. A similarly-looking herb *Tinospora crispa* is used in those patients. This incomplete information opens the door for defaming and misinformation related to *Giloye*.^[37]

Toxicity study of *Giloye*

Before administration of any drug, it is very important to know about its toxicity study i.e., whether the drug will result in any kind of toxic result in a particular dose and period. *Giloye* is the most commonly prescribed herb in Ayurveda and has proper pharmacopeia standards. In the public domain "*Guduchi* and safety" as keywords show approximately 169 studies. Even no adverse event is noted in clinical practice by pharmacovigilance related to *Giloye* till now.^[37]

Toxicity study^[38]

Acute and chronic toxicity of *Tinospora cordifolia* Wild. & Miers. showed that if the drug is used at the dosage of 500mg/kg body weight for therapeutic purposes then *Giloye* does not elicit any toxic symptom but shows some gross effect at the dosage of 1000mg/kg body weight like initial excitement, mild

depression, dullness, decrease respiration and reduced spontaneous motor activity (SMA). Therefore, the median lethal dosage of *Tinospora cordifolia* Wild. & Miers. has been more than 100mg/kg body weight.

***Guduchi* is an "early antidote" for avoiding *Ras Sindoor* toxicity^[39]**

As per classical literature guidelines, *Ras Sindoor* i.e., mercuric sulphide preparation should be administered with *Guduchi Ghan* (solid aqueous extract of *Tinospora cordifolia* Wild. & Miers.). Here *Guduchi Ghan* is used as *Anupana* (as a medium of administration called vehicle) for improving the palatability, helps in absorption of the main drug, and acts as an early antidote. From the recent research, it is found that *Guduchi* when used with mercuric preparation as *Anupana* exhibits hepatoprotective activity has potential against heavy metal toxicity and aflatoxins. *Ras Sindoor* is proved to be non-toxic up to 2000mg/kg in acute administration in rats but chronic administration for 90 days produces mild to moderate adverse changes in kidney, liver, etc. Results show *Ras Sindoor* is when used with appropriate *Anupana* (i.e., *Giloye*) safe to consume at the therapeutic level.

RESULT

From the above study, it was concluded that *Giloye* "The magical herb" is an *Amrita* (elixir) for humankind because of its easy propagation, affordable price, diverse uses, and effective pharmacological action. No significant information is available on *Giloye* regarding toxicity on therapeutic dosage. But we noticed from the above study that we must focus on the below-given points so that the Ayurvedic system emerges in the world and the use of herbs like *Giloye* and various other Ayurvedic formulations does not remain limited only in India but spread throughout the world for humankind.

Here are mentioned few points that should be taken into consideration

1. Dissemination of identity of herbs to the public

As we all know that each plant species has various varieties and their morphology, therapeutic efficacy, toxicity vary from each other due to different active principles present in them. So, when we promote any herb to the public to use on their own because of their easy access, the administration can't track the variety used by everyone. At such a time if any side effect occurs to an individual or if any adverse or side effect is tracked in any study then who was the culprit?

Solution

The administration has to provide complete and correct information regarding the promoted drug. For this various types of platforms can be used in

such a way that they can be easily understood by the public like:

- Advertisement in the new paper
- Awareness programs
- Digital awareness through blogs, news media, official channels on Youtube, official pages on Facebook, etc.
- Health magazines

In the above platforms, the key identification, particular dosage, time of administration, vehicle (*Anupana*), etc of a variety of species (*Giloye – Tinospora cordifolia* Wild. & Miers.) that is promoted for a particular use is mentioned. Along with this if any variety of particular species is found to have any side effect then its key identification should also be mentioned to the public so that by mistake they don't use that particular variety.

2. Digitalization of pharmacovigilance program

If any herb shows a particular side effect, then every time patients don't come to report due to hesitation or any other reason. Along with this various slick people spread rumors about a promoted thing (herb, formulation) to come in fame.

Solution

So, such an App (application designed for mobile devices) is made in which not only Ayurvedic medical practitioners but also the public should register themselves to report any side effect, rumors regarding Ayurveda quacks from home, and for validation of reports given by the public or by practitioner separate system in the app should be generated.

CONCLUSION

The ancient system of science i.e., Ayurveda is popular in India, and in recent times has become accepted in other countries throughout the world. Herb like *Guduchi* is popular and is being used for various disorders for many years. Various researches were also conducted on *Guduchi* which proves its safety and efficacy. Thus, it is retrated that "*Guduchi*" Ayurvedic herb is safe and cost-effective however it should be used after proper consultation from Ayurvedic medical practitioners. If rules and regulations or proper platforms like mentioned above are not made for use of *Giloye* or any other herb or Ayurvedic formulation, then the day is not due when a tragedy like thalidomide will be in front of us in Ayurveda itself.

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