IJBPAS, November, 2025, 14(11): 5824-5834

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

A POTENTIAL REVIEW OF MEDICINAL PLANT GILOY ON UROLITHIASIS

SYAN J*[1] AND MD. QAUMURRIDIN[2]

1: Assistant Professor, College of Pharmacy, Shivalik, Shimla bypass Road Shiniwala, Sherpur, Dehradun 248197, Uttrakhand, India

2: Research Scholar, College of Pharmacy, Shivalik Campus Shimla bypass Road Shiniwala, Sherpur, Dehradun 248197, Uttarakhand, India

***Corresponding Author: Ms. Jasmeen Syan: E Mail: jasminsyan@gmail.com**

Received 15th July 2024; Revised 20th Sept. 2024; Accepted 18th Oct. 2024; Available online 1st Nov. 2025

https://doi.org/10.31032/IJBPAS/2025/14.11.9506

ABSTRACT

Urolithiasis or kidney stones is defined as the urinary stone originating anywhere in the urinary tract. Urolithiasis plays a significant economic burden in the healthcare system, especially in developing countries owing to changes in food habits and lifestyle due to which there has been significantly increase in the disease over the last few decades. Medicinal plants are established as renewable sources with anti urolithiatic activity. There are many Marketed formulations which are having Anti urolithiatic activity as well as many traditional medicinal plants which is primarily used to dissolve urinary stones in the kidney or urinary bladder. The words "urolithiasis" and "lithos" (stone) come from the Greek word "ouron."That is thought to be the third most common urinary tract illness.

According to Ayurveda, giloy has several therapeutic applications and is believed to be an immunomodulator, antioxidant, and anti-inflammatory. It might also be helpful in the treatment of fevers and respiratory ailments. The plant is used in numerous forms (fresh stems, powder, and extracts) and often included in Ayurvedic formulae due to its purported health advantages. Giloy should only be taken under the guidance of medical professionals, as with any herbal therapy, since every person responds differently to herbal medicines and there may be drug interactions to

consider. Of them, *Tinospora cordifolia* has shown to be a significant therapeutic plant with a variety of bioactive components, although it has not attracted much scientific attention

Keywords: Kidney stones, Urolithiasis, Syrup, Extraction, Medicinal plants

INTRODUCTION

A Kidney stone (KS) is a solid piece of material that forms in the kidney from substances in the urine. Kidney stone are a common medical condition, and they vary in size. Small stones may pass through the urinary tract on their own, causing little or no symptoms, while larger stones can be quite painful and require medical intervention. The global issue of the most incurable diseases, including kidney ailments. Known as stones that can form anywhere in the urinary system, urolithiasis is a frequent illness caused by a multifactorial combination of epidemiological, biochemical, and genetic risk factors **[1]**.

The Greek word "ouron" is the source of the term "urolithiasis." as well as "lithos" (stone). That regarded as the third most prevalent urinary tract ailment **[2]**.

Urolithiasis is the accumulation or development of stones in any area of the urinary system, including the kidney, ureters, or bladder. Urine becomes supersaturated with excess of the components that make stones, which causes precipitation and eventually the growth of stones **[3]**.

Up to 80% of the stones examined are calcium oxalate stones **[4]**. In of these, 15–25% are calcium phosphate, and the remaining 10–15% are mixed stones. The remainder are 15%–30% cystine and struvite. 2–10% have uric acid stones, while 6–10% do **[5]**. Osteoporosis of calcium are mostly classified into two kinds: calcium oxalate monohydrate (whewellite) and dihydrate calcium oxalate (weddellite). As the frequency of whewellite occurrence is 78%, whereas the 43% are married **[6]**.

A multi-step biochemical process with a high recurrence rate is urolithiasis. If urolithiasis treatment is not received, there is a 50% probability that stones will form within 7 years. Consequently, preventive care is crucial and advised, particularly for such individual's topics **[7]**.

Reduced urine volume or increased excretion of substances that might form stones, such as calcium, cystine, oxalate, phosphate, urate, and xanthine, are associated with Calcium oxalate and stone formation. Nephrolithiasis is most commonly manifested as stones **[8]**. These indisputable compositions play crucial roles in the health system, particularly in the

treatment of cancer and many other diseases, such as urolithiasis.

Numerous elements have gotten more the frequency of urolithiasis: Insufficient vegetable intake, fruits, liquids, and a diet heavy in animal proteins, Sweetened beverages and salt play a major role in urolithiasis prevalence (2018) **[9]**. The most modern methods for treating urolithiasis now involve surgery, such as ureteroscopy (URS), excoriporectomy, and percutaneous either by using artificial medications, such as nephrolithotomy (PNL). But those processes have drawbacks. And highly expensive. Kidney stones have long been treated traditionally with medicinal plants, even before creating all of those contemporary therapies, as they have been shown to be safe and effective natural cures **[10]** While information regarding the formation of human stones has been gathered, the mechanisms underlying the growth and formation of kidney stones remain unclear **[11]**. The current analysis offers summary of the mechanisms underlying kidney stone development, In order to give urologists a better understanding of kidney stones, nephrologists and providers of primary care **[12]**. Voiding About 12% of people experience stone formation. Having a repeat incidence of 47–60% for females and 70–80% for men. It can also permanently injure the kidneys if they are not well cared for **[13]**, Thus, we looked at the connection between vinegar consumption and urine chemistry in our study's human participants. We also examine the effects of vinegar consumption in an experimental model of hypercaluria in rats, and we discover that the effectiveness of the treatment depends on the control of miRNAs that carry the components of kidney stones. Using vinegar to lessen the development of CaOx crystals **[14]**. Nevertheless, these actions are not without limitations Because of this, these individuals are more likely to experience decreased kidney function due to the high probability of stone recurrence and the surgical burden. Long-term renal damage **[15]**. Up to 65% of kidney stone formers, according to recent studies, are thought to have a family history of kidney stones 7-9, as well as twin10 and genealogy. Kidney stone illness has a high heritability, according to research. Studies on candidate gene associations have tried to evaluate the function of multiple genes related to calcium homeostasis stone arrangement **[16]**.

There are a lot of tiny, smooth, oval, yellow-looking calyceal stones in cystinuria stone formers that appear to have formed in free solution. Each of these four stone production processes has a scientific foundation that is

examined in order to identify new areas for investigation **[17]**.

Types of Kidney Stones

- There are several types of kidney stones, each with different causes and compositions

1. **Calcium Oxalate Stone**

   These are the most common type of kidney stones, formed when calcium in the urine combines with oxalate, a naturally occurring substance found in some foods and produced by the liver. Foods high in oxalate include beets, chocolate, nuts, tea, and certain vegetable **[18]**.

2. **Calcium Phosphate Stones**

   Formed when calcium in the urine combines with phosphate, another mineral.

   Often associated with metabolic conditions, such as renal tubular acidosis **[19]**.

3. **Uric Acid Stone**

   Appear when the urine has an excessively acidic pH, causing uric acid crystals to develop.

   Conditions with low urine volume and high acidity make it more likely to occur. Often seen in gout sufferers or individuals who eat a diet heavy in purines, which are found in organ meats and some fish **[20]**.

4. **Struvite Stones**

   Also known as infection stones.

   Formed in response to an infection, usually a urinary tract infection (UTI), leading to the production of ammonia

   Can grow quickly and become quite large **[21]**.

5. **Cystine Stone**

   Formed due to genetic disorder that causes the kidneys to excrete excessive amounts of certain amino acids, including cysteine **[22]**.

6. **Mixed Stones**

   Some kidney stones may have a combination of minerals **[23]**.

Risk of Factors in Kidney stone

- **Dehydration:** Urine that is concentrated due to low fluid intake raises the possibility of stones forming.
- **Diet:** Stone formation can be attributed to a high consumption of specific foods, such as foods high in oxalate (beets, spinach, nuts), purines (red meat, organ meats), and salt.
- **Family History:** Kidney stones can raise your risk if kidney stones run in your family.
- **Obesity:** An elevated risk is linked to a higher body mass index (BMI).
- **Medical Conditions:** The risk can be increased by diseases including gout,

hyperparathyroidism, and urinary tract infections **[24]**.

- **Medications:** Kidney stones may become more common as a result of certain drugs.
- **Digestive Diseases:** Stone formation can result from conditions that alter the way your body processes waste or absorbs calcium **[25]**.
- **Age and Gender:** Kidney stones are more common in men, and the risk rises with advancing age.
- **Geographic Lection:** Because of dietary and climate-related factors, kidney stone prevalence can differ by region.
- **Previous Kidney Stone:** Your chances of getting a kidney stone again are increased if you've already had one.

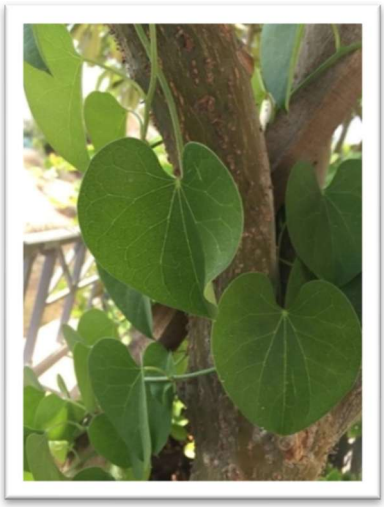

Figure 1: Leaves of Giloy

Tinospora cordifolia (Willd.) Miers ex Hook. & Thoms is a huge, deciduous, climbing shrub that grows throughout India, Sri Lanka, Bangladesh, and China. It is a member of the Menispermaceae family. It goes by the names Moonseed, Guduchi in Sanskrit, and Giloy in Hindi. Plant (word for word). Flavonoids, glycosides, saponins, and a little quantity of plant steroids. Antioxidant properties are caused by these active ingredients, either separately or in combination. Actions. Giloy leaves have a high protein content and a moderately high Ca and P content. In the present study an attempt was made to investigate the effect of medicinal plants on the immune response in mice commonly called amrita, gurcha or jetwatika, is a large glabrous deciduous climbing shrub (Chadha, 1948) **[26]**. WHO estimates indicate that 80% of people rely on traditional treatments, like medicinal herbs, to prevent or cure illnesses. Because they generate a wide variety of bioactive compounds, plants are an abundant supply of various kinds' of medications **[27]**. *Tinospora cordifolia* has been shown to have anti-periodic, anti-inflammatory, anti-arthritic, antioxidant, anti-allergic, hepatoprotective, immunomodulatory, and anti-neoplasticism actions, which has piqued the interest of researchers worldwide (Soham and Shyamasree) **[28]**.

The semi-evergreen deciduous climbing shrub *Tinospora cordifolia* is frequently seen on the trunks of huge trees, such as neem and mango.

Oblong, juicy, sharp, membranous young leaves with a circular petiole, 5 to 14 cm in diameter **[29]**.

The chemical components of *Tinospora cordifolia* are numerous and have the potential to impact the human body. Certain chemical substances exhibit antioxidant properties, whilst others may stimulate the immune system within the body. Certain chemicals may exhibit anti-cancer effects on test animals' cells. The majority of research has been conducted on animals or in test tubes. This review focuses on the medical use of the giloy plant **[30]**.

Giloy is thought to have a number of medicinal uses in Ayurveda, such as being an immunomodulator, antioxidant, and anti-inflammatory. It may also be useful in treating respiratory conditions and fevers. Because of its alleged health benefits, the plant is utilized in several forms—fresh stems, powder, and extracts—and is frequently incorporated into Ayurveda formulas. As with any herbal therapy, Giloy should only be used under the supervision of medical specialists because each person's response to herbal remedies is unique and there may be drug interactions to take into account. Because of the numerous documented health benefits of *Tinospora cordifolia*, including its anti-inflammatory, anti-arthritic, anti-allergic, hepatoprotective, immunomodulatory, and anti-neoplasticism activities, researchers from all over the world are very interested in this plant. Several potent substances sourced from plants, include Different sections of plants have been used to separate alkaloids, steroids, diterpenoid lactones, and glycosides. Including the stem, root, and entire plant, comprise the plant body. Here, we report one of the first cases of liver damage caused by *Tinospora cordifolia* in the United States **[31]**.

Tinospora cordifolia has long been used in traditional Ayurvedic medicine to treat a variety of conditions, including fever, jaundice, dysentery, cancer, and chronic diarrhea. Bone break, discomfort, asthma, skin condition, and toxic snakebite, bug, and eye conditions **[32]**.

Among these, *Tinospora cordifolia* has a variety of bioactive principles and has proven to be a significant therapeutic plant; yet, it has not garnered a great deal of scientific interest. According to Sofowora et al. sizable fraction of Plants are utilized in medicine as preventative or for preventative measures **[33]**.

1. **Botanical Description:** Giloy is a climbing shrub with heart-shaped leaves. The stems are succulent and have a characteristic cinnamon-brown color.

The plant is known for its ability to climb and spread over large areas **[34]**.

2. **Antioxidant:** Giloy is also recognized for its antioxidant and anti-inflammatory properties. These properties may contribute to its potential in managing inflammatory conditions and protecting the body from oxidative stress **[35]**.
3. **Immunomodulatory Properties:** One of the most well-known aspects of giloy is its immunomodulatory properties. It is believed to help regulate the immune system, making it potentially beneficial in preventing and managing various infections **[36]**.
4. **Anti-inflammatory and wound healing activity:** Significant anti-inflammatory benefits were observed in acute and sub-acute models of inflammation using the dried stem of *T. cordifolia*. In case of acute inflammation, it has been discovered that *T. cardifolia* is less harmful than phenylbutazone but more efficacious than acetylsalicylic acid **[37]**.

Table 1: ***Tinospora cordifolia*** **as an Ayurveda medicine for various diseases [38]**

Diseases	Application	Properties
Periodic fever	Giloy stem juice	anti-pyretic, increases platelet count
Diarrhea	Giloy stem juice	enhances the activity of macrophages
Jaundice	Giloy stem juice	Antioxidant
Emaciation	Wearing clothes soaked in giloy juice	hypolipidemic immunomodulatory
Leukorrhea	Paste of giloy with seeds of piper nigrum	anti-inflammatory
Asthma	Chewing on giloy root or drinking giloy juice	anti-allergic
Skin infections	Giloy leaves paste and drinking juice	anti-aging, anti-bacterial
Insects bite	Giloy leaves paste and drinking juice	anti-inflammatory
Diabetes	Giloy Juice	hypoglycemic agent
Improves digestion	Giloy stem powder	rejuvenating and appetizing properties
Arthritis	Giloy stem powder	anti-inflammatory, anti-arthritic
Cancer	Giloy stem juice	anti-proliferative
Wounds	Paste of giloy leaves	astringent and healing properties

CONCLUSION:

Given the several amazing qualities of *Tinospora cordifolia* (Giloy) that were previously discussed in the study, it can be concluded that *Tinospora cordifolia* (Giloy) can be useful in interrupting the viral chain that causes illness. For centuries, people have believed that Ayurveda possesses the ability to naturally alleviate fatal illnesses. These herbs do help the body fight off viruses and increase immunity. They also greatly aid in viral diseases. This plant is a treasure trove of different phytochemicals that strengthen immunity, cleanse the blood, and remove

toxins from the physique. Consuming it can provide anti-inflammatory and antibacterial effects that can treat fever and respiratory issues. The herb's components have the ability to prevent the new virus from proliferating and may also act as a strong tonic during the course of treatment.

REFERENCE:

[1] Kaleeswaran, B., Ramadevi, S., Murugesan, R., Srigopalram, S., Suman, T., & Balasubramanian, T. (2019). Evaluation of anti-urolithiatic potential of ethyl acetate extract of Pedalium murex L. on struvite crystal (kidney stone). *Journal of traditional and complementary medicine*, *9*(1), 24-37.

[2] Studies on phytochemical, mineral content, in vitro anti-urolithiatic and anti-diabetic activities of horse gram flour extracts and its biosynthesized Ag nanoparticles.

[3] Ram, J., Moteriya, P., & Chanda, S. (2015). An overview of some promising medicinal plants with in vitro anti-urolithiatic activity. *IOSR J. Pharm*, *5*, 23-28.

[4] Dwivedi, P., Dwivedi, J., Patel, D., Desai, S., & Meshram, D. (2016). Phytochemical analysis and assessment of in vitro urolithiatic activity of colocasia leaves. *Journal of Medicinal Plants*, *4*(6), 43-47.

[5] Kaleeswaran, B., Ramadevi, S., Murugesan, R., Srigopalram, S., Suman, T., & Balasubramanian, T. (2019). Evaluation of anti-urolithiatic potential of ethyl acetate extract of Pedalium murex L. on struvite crystal (kidney stone). *Journal of traditional and complementary medicine*, *9*(1), 24-37.

[6] Suvarna, Y., & Rahaman, S. A. (2020). In Vitro–In Vivo evaluation of antiurolithiatic activity of piperine from Piper nigrum. *Research Journal of Pharmacy and Technology*, *13*(1), 63-68.

[7] Ahmed, S., Hasan, M. M., & Mahmood, Z. A. (2016). In vitro urolithiasis models: An evaluation of prophylactic management against kidney stones. *Journal of Pharmacognosy and Phytochemistry*, *5*(3), 28-35.

[8] Nagarajan, Y., Boopathi, R., Yahoob, S. A. M., & Venkatraman, A. (2019). In vitro evaluation of anti urolithiatic activity of Bryophyllum pinnatum Lam. *In Vitro*, *5*(8), 97-102.

[9] Ammar, R. B., Khalifa, A., Alamer, S. A., Hussain, S. G., Hafez, A. M., &

Rajendran, P. (2022). Investigation of the potential anti-urolithiatic activity of Alhagi maurorum (Boiss.) grown wild in Al-Ahsa (Eastern Province), Saudi Arabia. *Brazilian Journal of Biology*, *84*, e259100.

[10] C. T, S., C. K, J., K. M, P., & Balachandran, I. (2022). Phytochemical characterization and evaluation of Antiurolithiatic activity of selected source plants of Pashanabheda. *Clinical Phytoscience*, *8*(1), 12.

[11] Rahim, N. F. A., Muhammad, N., & Abdullah, N. (2021, April). Investigation on antiurolithiatic activity of aqueous extract of Ananas fruit (in-vitro). In *IOP Conference Series: Earth and Environmental Science* (Vol. 736, No. 1, p. 012057). IOP Publishing.

[12] Wang, Z., Zhang, Y., Zhang, J., Deng, Q., & Liang, H. (2021). Recent advances on the mechanisms of kidney stone formation. *International journal of molecular medicine*, *48*(2), 1-10.

[13] Nirumand, M. C., Hajialyani, M., Rahimi, R., Farzaei, M. H., Zingue, S., Nabavi, S. M., & Bishayee, A. (2018). Dietary plants for the prevention and management of kidney stones: preclinical and clinical evidence and molecular mechanisms. *International journal of molecular sciences*, *19*(3), 765.

[14] Prochaska, M., & Worcester, E. (2020). Risk factors for kidney stone formation following bariatric surgery. *Kidney360*, *1*(12), 1456-1461.

[15] Zhu, W., Liu, Y.,Lan, Y., Li, X., Luo, L., Duan, X., & Zeng, G. (2019). Dietary vinegar prevents kidney stone recurrence via epigenetic regulations. *EBioMedicine*, *45*, 231-250.

[16] Oddsson, A., Sulem, P., Helgason, H., Edvardsson, V. O., Thorleifsson, G., Sveinbjörnsson, G., & Stefansson, K. (2015). Common and rare variants associated with kidney stones and biochemical traits. *Nature communications*, *6*(1), 7975.

[17] Evan, A. P., Worcester, E. M., Coe, F. L., Williams, J., & Lingeman, J. E. (2015). Mechanisms of human kidney stone formation. *Urolithiasis*, *43*, 19-32.

[18] Khan, S. R., Pearle, M. S., Robertson, W. G., Gambaro, G., Canales, B. K., Doizi, S., ... &

Tiselius, H. G. (2016). Kidney stones. *Nature reviews Disease primers*, *2*(1), 1-23.

[19] Crivelli, J. J., Maalouf, N. M., Paiste, H. J., Wood, K. D., Hughes, A. E., Oates, G. R., & Assimos, D. G. (2021). Disparities in kidney stone disease: a scoping review. *The Journal of urology*, *206*(3), 517-525.

[20] Siener, R. (2021). Nutrition and kidney stone disease. *Nutrients*, *13*(6), 1917.

[21] C. T, S., C. K, J., K. M, P., & Balachandran, I. (2022). Phytochemical characterization and evaluation of Antiurolithiatic activity of selected source plants of Pashanabheda. *Clinical Phytoscience*, *8*(1), 12.

[22] Shukla, A. K., Shukla, S., Garg, A., Garg, S., & Sukhadia, M. (2017). A review on anti-urolithiatic activity of herbal folk plants. *Asian Journal of Biomaterial Research*, *3*(2), 1-11.

[23] Anand, D., Chandrasekar, R., & Sivagami, B. (2021). A critical review on antiurolithiatic activity of bioactive phytoconstituents. *Research Journal of Pharmacognosy and Phytochemistry*, *13*(2), 95-100.

[24] Shelke, T., Wayal, S., Gunjegaokar, S., Gaikwad, S., Shirsath, A., & Hadke, S. (2014). An overview on Indian medicinal plants with antiurolithiatic activity. *J. Pharm. Res. Clin. Pract*, *4*, 33-40.

[25] Mikawlrawng, K., Kumar, S., & Vandana, R. (2014). Current scenario of urolithiasis and the use of medicinal plants as antiurolithiatic agents in Manipur (North East India): a review. *International Journal of herbal medicine*, *2*(1), 1-12.

[26] Kapil, A., & Sharma, S. (1997). Immunopotentiating compounds from *Tinospora cordifolia*. *Journal of ethnopharmacology*, *58*(2), 89-95.

[27] Singh, S., & Devi, P. (2017). Pharmacological potential of *Tinospora cordifolia* (Willd.) Miers ex hook. & Thoms.(Giloy): A review. *Journal of Pharmacognosy and Phytochemistry*, *6*(6), 1644-1647.

[28] Sajith, K. S., & Farhan, H. (2022). Pharmacological effects of *Tinospora cordifolia*:(Giloy) in human body. *The Pharma Innovation Journal*, *11*(7), 07-10.

[29] Jain, H., & Dhupper, R. (2021). A review on healing properties of

Tinospora cordifolia (Indian Giloy). *International Journal for Research in Applied Science & Engineering Technology*, *9*(5), 1114-1118.

[30] Saxena, C., & Rawat, G. (2019). *Tinospora cordifolia* (Giloy)-Therapeutic uses and importance: A review. *Current Research in Pharmaceutical Sciences*. Saxena, C., & Rawat, G. (2019). *Tinospora cordifolia* (Giloy)-Therapeutic uses and importance: A review. *Current Research in Pharmaceutical Sciences*.

[31] Nnamani, I., Tolu-Akinnawo, O., Dufera, R. R., Akintunde, A., & Maliakkal, B. (2023). *Tinospora cordifolia* (Guduchi/Giloy)-Induced Liver Injury: A Case Review. *Cureus*, *15*(5).

[32] Srivastava, A. K., & Singh, V. K. (2021). *Tinospora cordifolia* (GILOY): A magical shrub. *Asian Journal of Advances in Medical Science*, 93-101.

[33] Singh, A., & Sagar, A. (2021). Medicinal Uses of Giloy: A Review. *European Journal of Molecular & Clinical Medicine*, *8*(04), 2021.

[34] Meshram, A., Bhagyawant, S. S., Gautam, S., & Shrivastava, N. (2013). Potential role of *Tinospora cordifolia* in pharmaceuticals. *World J. Pharm. Sci*, *2*(6), 4615-4625.

[35] Satruhan, D. K. (2022). A Review on *Tinospora cordifolia*: Biological And Medicinal Properties. *Journal of Pharmaceutical Negative Results*, 3929-3940.

[36] Payyappallimana, U., Ravikumar, K., & Venkatasubramanian, P. (2022). Can Guduchi (*Tinospora cordifolia*), a well-known ayurvedic hepato-protectant cause liver damage?. *Journal of Ayurveda and Integrative Medicine*, 100658.

[37] Srivastava, P. (2020). Study of medicinal properties of herb *Tinospora cordifolia* (Giloy) in preventing various diseases/abnormalities by increasing immunity naturally in human bodies. *Int. J. Eng. Res. and Gen. Sci*, *8*(4), 10-14.

[38] Singh, A., Singh, A., & Kumar, K. (2019). A Pharmacological Review on *Tinospora cordifolia*-A Medicinal Herb. *Phytochemistry*, *24*(3), 49-60.