



Phyllanthus niruri: Nature's Healing Herb

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Abstract

Phyllanthus niruri, sometimes referred to as the "stonebreaker" plant, is highly valued in traditional medical systems in many different cultures for its therapeutic qualities. *Phyllanthus niruri*'s botanical, phytochemical, pharmacological, and medicinal features are all intended to be thoroughly covered in this review article. The taxonomy, morphology, and distribution of the plant are introduced at the outset of the text. After that, it explores the wide range of phytochemical components present in *Phyllanthus niruri*, such as tannins, lignans, alkaloids, and flavonoids. Additionally, the review delves into the wide range of pharmacological action demonstrated by chemicals and extracts from *Phyllanthus niruri*, including anti-inflammatory, antioxidant, hepatoprotective, antibacterial, antiviral, and anticancer qualities. The plant's well-known capacity to promote kidney health, dissolve kidney stones, and lessen urinary tract infection symptoms is highlighted in particular.

Its function in supporting liver health and preventing liver diseases is also covered in great detail. Furthermore, by highlighting putative mechanisms of action behind the pharmacological effects that have been seen, this research clarifies the molecular processes involved. The study concludes by highlighting the enormous therapeutic potential of *Phyllanthus niruri* and urging more investigation to clarify its modes of action, enhance its preparations, and investigate its clinical uses in contemporary medicine.

Keywords: *Phyllanthus niruri*; Anti-Inflammatory; Antioxidant; Hepatoprotective; Antibacterial; Antiviral; Anticancer Qualities

Abbreviation: WHV: Woodchuck Hepatitis Virus.

Introduction

History

Phyllanthus niruri is native to India, where it is typically found as a winter weed in the warmer regions. More than 600 species of shrubs, trees, and annual or biennial herbs of the *Phyllanthus* genus are found in tropical and subtropical regions. *Phyllanthus niruri* is a 60-cm-tall plant belonging to the Euphorbiaceae family. Because the fruit and flower appear to merge into one, the name *Phyllanthus* means

"leaf and flower." A prevalent kharif (rainy season) weed in both cultivated fields and wastelands is *Phyllanthus Niruri* [1]. The Indian Ayurvedic medical system most frequently uses *Bhumyaamalaki* (*Phyllanthus niruri* Schum. & Thonn., Euphorbiaceae), which is widely distributed throughout tropical and subtropical countries of the world, including India, to treat issues with the stomach, genitourinary system, liver, kidney, and spleen. *Phyllanthus niruri* is known by the Sanskrit names *Bhoomyaamalakee*, *Taamalakee*, and *Bhoodhatree* in Ayurveda. It was said to possess the qualities of *Veerya*, *Rasa*, *Guna*, and *Vipaaka*. Its uses as an antitussive, an antispasmodic, an antidyspnoic, a *Raktapittahara*

(haemorrhage disease reliever), an antianemic, a Kaamalaahara (jaundice cure), a Kushthaghna (indicated in leprosy), a Daahaghna (refrigerant, relieves burning sensation), a Kshatakshayaghna (indicated in trauma), and Mootrarogahara (which cures urinary disorders) are just a few of the uses documented in Ayurvedic literature. This plant is used as a tonic and appetizer and is considered restorative. You may also use it as colic. The plant is used to treat diabetes and is said to be a diuretic when the leaves are cooked. Although *phyllanthus* originated in India, it is now produced around the world in tropical regions like the Bahamas, China, and Malaysia, as well as in the Amazon's jungles [2].

Biological source

Phyllanthus niruri, sometimes referred to as "Chanca Piedra" or "Stonebreaker," is a tropical plant that grows in the Amazon rainforest and other tropical areas of the world. It is a member of the family Phyllanthaceae. This plant has a long history of usage in traditional medicine, especially in South American Ayurvedic and traditional medicine, where it is used to cure kidney stones, liver problems, and other diseases [3].

Different Parts of a Selected Plant that has Medicinal Values

The plant samples, with the leaves having the highest concentration of lignans and the roots having the lowest concentration. This indicates that the leaves are crucial for further research on this plant to identify the chemicals causing its antimalarial properties [4]. Oral administration of the whole plant's hot water extract is used as a laxative and to lower fevers. Oral decoction of dried leaves and roots is given for fever and general well-being. For the treatment of jaundice, the dried whole plant is taken orally and mashed with buttermilk. Cuts and bruises are treated externally with fresh leaf juice. The juice is used topically to the eye after being combined with castor oil for eye problems. Oral infusion of dried leaves is used to treat diarrhoea and dysentery. An oral infusion of green root is used to treat heavy menstrual cycles.. After boiling the plant, tea is extracted. Oral administration of the leaf and root water extract is used as a diuretic and to treat diabetes [1].



Figure 1: *Phyllanthus niruri* leaves.

Geographic Distribution, Collection & Cultivation

Phyllanthus niruri is a perennial tropical shrub, which has been used for a wide range of diseases in South and south-east Asian traditional medicine [5]. It's a kind of field weed that spreads widely throughout tropical and subtropical areas in China, America, and Asia. There are 600–700 species in the genus *Phyllanthus* (L) Murr. with just a few minor characteristics separating them. *Phyllanthus niruri* is an annual plant that grows naturally in Jharkhand, Bihar, Chhattisgarh, and other Indian states following the first monsoon rainfall. It has also reportedly been observed to grow often in coastal regions. In the Indian states, it typically begins to grow in the second week of June and bears fruit by the middle of July or early August. Until the conclusion of the rainy season, it stays in the wild. It can, however, develop and last until the middle of winter under safe circumstance.

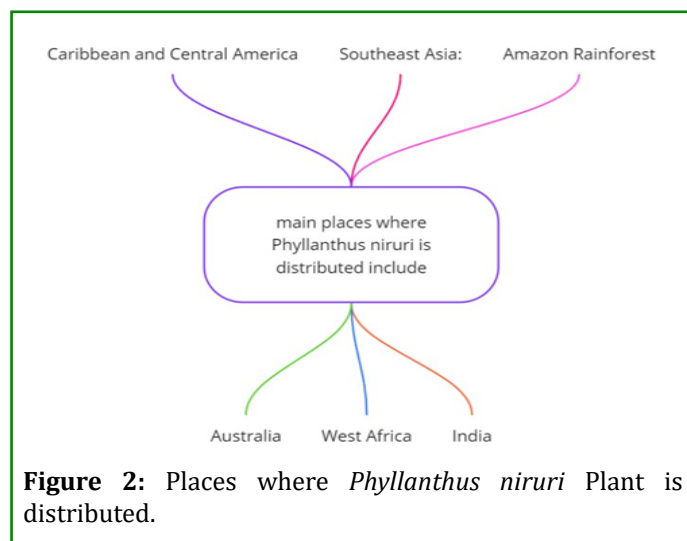


Figure 2: Places where *Phyllanthus niruri* Plant is distributed.



Figure 3: *Phyllanthus niruri*.

Phytoconstituents

Phytoconstituent	Antimicrobial Activity
Rutin	Anti-oxidants
Quercetin	Anti-aggregant, Anticancer, Anti-fungal
Astragalgin	Reduced inflammation
Catechin	Pro-oxidative activity and Bactericidal effects
Ellagic acid	Anti-carcinogenic and Anti-viral properties
Kaempferol	Antibacterial, antifungal
β -sitosterol	Antibacterial, antifungal

Table 1: Different Phytoconstituents & its activity found in *Phyllanthus niruri*.

Uses

Phyllanthus niruri L. (Euphorbiaceae) is a tiny herb that grows in most tropical and subtropical environments. It is known locally as “dukong anak” [6]. For more than 2000 years, *P. niruri* has been used in Ayurvedic medicine to treat a variety of conditions, including diabetes, kidney stones, bacterial and viral infections, jaundice, gonorrhoea, and many more. It is also utilised as an herbal cure for hepatoprotective effect. Traditional medical practices have employed this plant to treat a variety of ailments, including hepatitis B virus, hypoglycaemia condition, cancer, and lipid-lowering activity [7]. *Phyllanthus* has several traditional applications and has been utilised in the Indian Ayurvedic medical system for over 2,000 years. An essential component of the plant, seeds is used to treat issues with the stomach, genitourinary system, liver, kidney, and spleen. It has antibacterial, stomachic, diuretic, bitter, and astringent properties. For gonorrhoea, menorrhagia, and other genital illnesses, the whole plant is utilised. It helps with scabies, ulcers, wounds, ophthalmopathy, diarrhoea, dysentery, gastropathy, and intermittent fevers. *Phyllanthus niruri* L. has been shown in recent research to be an immunomodulator and to have antiviral action against a number of RNA viruses, including hepatitis B and by preventing viral entrance and replication, the hepatitis C virus [8].

Antimicrobial

The effectiveness of *Phyllanthus niruri* Linn.'s methanolic extract as an antibacterial agent was studied against pathogenic bacteria that cause common cutaneous, urinary, and gastrointestinal tract illnesses. All studied Gram- positive and Gram-negative bacteria were susceptible to the extract's antibacterial properties [9]. *Phyllanthus niruri* extract effectively combats *Escherichia coli* infection both in vitro and in vivo. It has no negative effects on the kidneys, liver, or

blood circulation system. The extract's bioactive ingredient has been shown to provide health advantages and is safe to take as a supplement [10].

Antiviral Activity

Aqueous extracts of *P. niruri* have been shown to possess significant antiviral potential and appear promising especially with regard to hepatitis B carriers. Overall, studies conducted on sera obtained from chronic hepatitis B patients and woodchuck hepatitis (WHV)-infected woodchucks, which were treated with *P. niruri* extracts, showed decreased viral antigen levels. This is perhaps the most notable of *P. niruri*'s potential therapeutic effects [11].

Antidiabetic

One generally acknowledged contributing factor to the development of diabetes and its consequences is elevated oxidative stress brought on by persistent hyperglycemia. Studies on animals using *P. niruri* extracts have shown dose-dependent improvements in glucose tolerance, fasting blood sugar, and pancreatic tissue architecture restoration. These effects may be attributed to the inhibition of intestinal carbohydrate digestion and glucose storage enzyme pathways [5].

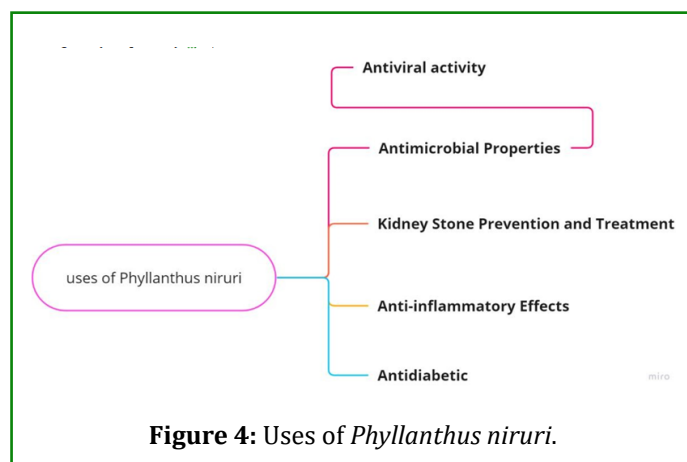


Figure 4: Uses of *Phyllanthus niruri*.

Adverse Effects

Phyllanthus niruri has the potential to reduce blood pressure. As such, vigilance should be used by those on blood pressure medicine. Alcohol and some drugs can make people drowsy; *Phyllanthus niruri* may make this worse. Use care when operating machinery or when driving a vehicle. When consumed correctly, Bhumi Amla usually has no negative effects; but, if taken in large quantities, it may elevate the body's Vata Dosha. High dosages may occasionally result in dysentery and diarrhea. Moreover, giving Bhumi Amla juice to expectant or nursing mothers is not advised. Overall, studies on this herb have demonstrated a considerable restoration of the decreased GSH levels and numerous antioxidant

enzymes, as well as a reduction in lipid peroxidation. *P. niruri*, however, may have negative effects on the kidneys and testes, according to a research [12]. Bleeding risk may be increased by *Phyllanthus niruri*. Patients with bleeding problems or those taking medications that raise the risk of bleeding should use caution. It could be essential to modify the

dosage. Additionally, *Phyllanthus niruri* can cause anorexia, chills, diarrhoea, disturbed sleep, dizziness, enlarged lymph nodes, fatigue, fever, headaches, hives, increased sodium, potassium, and chloride in the urine, increased urine volume, joint pain, lung disease, malaise (discomfort), muscle pain, nausea, rash, skin prickling, and sore mouth [13].

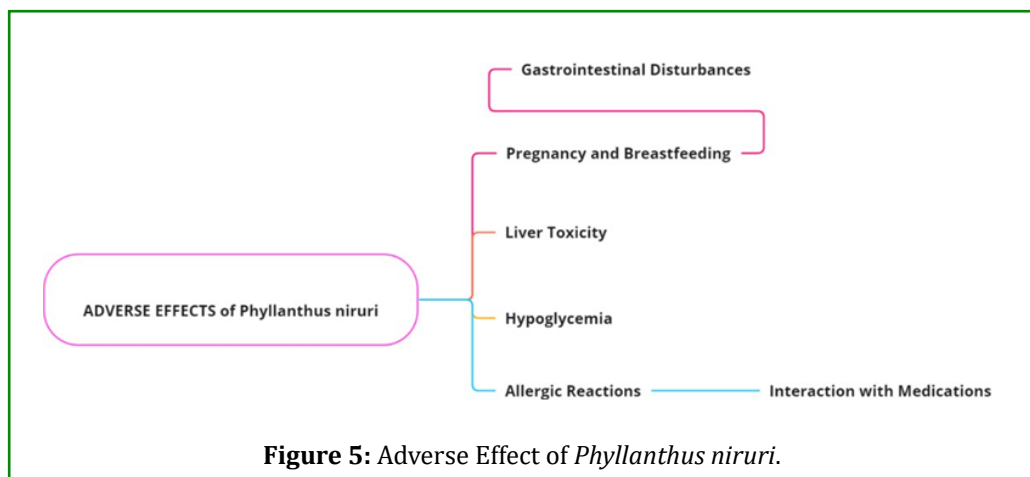


Figure 5: Adverse Effect of *Phyllanthus niruri*.

Marketed Formulation

Types	Brand Name	Company Name	Dose	Price
Tabls	Sabal serrulata 1xMTTabls	Dr. Willmar Schwabe India Pvt. Ltd	2-4 tablets, 2-3 times a day	₹ 175
Powder	VAAIMAI Keelanelli Powder	SIXER SQUARE, SALEM	1 spoon	₹ 209
Powder	Sidhara Betta Herbals <i>Phyllanthus Niruri</i> Whole Plant Powder	Sidhara Betta Organics Private Limited	1 spoon	₹ 236
Powder	Keelanelli Neruri powder	Gtee Scinagro Processing Private Limited	half ateaspoon	₹ 130
Capsules	Morpheme Remedies <i>Phyllanthus Niruri</i> Bhumyamlaki	Morpheme Remedies	2-4 tablets, 2-3 times a day	₹ 249
Capsule	Lama Bhumi Amla Capsule	Lama Pharmaceuticals	Take 1-2 capsules twice a day	₹ 187

Table 2: Marketed Formulation.

Home Made Remedies

Herbal Tea: Boil *Phyllanthus niruri* leaves in water to make a tea. Before straining, let it soak for a few minutes. Regular use of this tea can aid in the treatment of kidney stones and urinary tract infections.

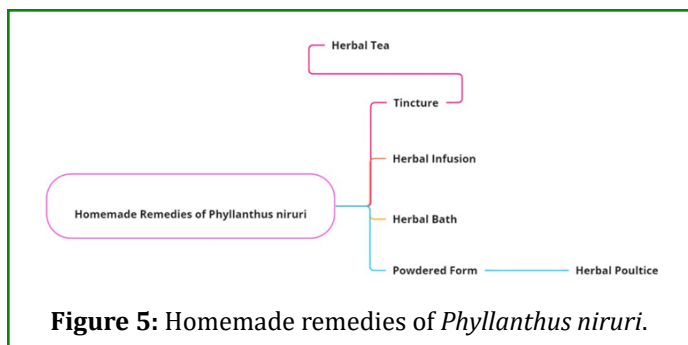
Juice: Press the fresh leaves of *Phyllanthus niruri* to release their juice. You may frequently drink this juice by mixing it with water or other fruit juices. Consuming this juice, according to some, may help avoid kidney stones from forming [14].

Decoction: To create a powerful infusion, boil *Phyllanthus niruri* leaves or whole plant parts in water. This can be used

as a daily tonic for liver health in tiny doses.

Tincture: To make a tincture, soak leaves or other components of the *Phyllanthus niruri* plant in alcohol for a few weeks. Then, you may take modest quantities of this tincture for a number of health advantages, including liver support.

Capsules or Tablets: Many health food stores carry *Phyllanthus niruri* supplements in the form of capsules or tablets. These supplements can be taken in accordance with the manufacturer's directions and are usually plant extracts that have been standardised [9,10].



Conclusion

This review concludes by highlighting the diverse qualities of *Phyllanthus niruri*, a medicinal plant that is widely found in a variety of geographical areas. Its relevance in both traditional medicine and current healthcare practices is highlighted by its vigorous growth, rich phytoconstituents, and multiple medicinal benefits. *P. niruri* has enormous pharmacological potential, ranging from its ability to cure liver diseases and urinary tract infections to its anti-inflammatory and antioxidant qualities. Its addition to homemade medicines increases its usefulness and accessibility for treating common illnesses. Overall, this thorough analysis emphasises how crucial it is to carry out further study in order to fully realise *Phyllanthus niruri*'s medicinal potential and enhance global health outcomes.

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