



A LITERARY STUDY ON BHUMYAMLAKI MEDICINAL PLANT – AN IMPORTANT MEDICINAL PLANT IN AYURVEDA

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Abstract

The Ayurvedic medical system is currently quite popular, and as a result, there is a developing demand for diverse medicinal plants used in the production of Ayurvedic medications. Because these plants are grown in different geographical regions, there is a lot of adulteration or substitution in the commercial markets. Studies on plant drugs' histology are critical for understanding adulterants as well as for precise identification. The herb has astringent, diuretic, bitter, invigorating, antiseptic, and fungal properties. Indigenous medical systems including Ayurveda, Siddha, Unani, and homoeopathy employ it for its hepatoprotective, anticancer, antidiabetic, antihypertensive, analgesic, anti-inflammatory, and antibacterial qualities. The plant can treat a variety of conditions, including dropsy, jaundice, diarrhoea, dysentery, intermittent fevers, urino-genital system infections, scabies, ulcers, burns, and the common cold. The hepatitis B virus is resistant to its powerful antiviral activities. In addition to having anti-inflammatory and anti-nociceptive actions, it also contains anti-diabetic and antilipidemic qualities.

Keywords: *Bhumyamlaki, Phyllanthus, Ayurvedic Medicinal Plant etc.*

Introduction

The herb has antiseptic, diuretic, bitter, astringent, cooling, gastric, and febrifuge properties. It is frequently utilised for its hepatoprotective, anticancer, antidiabetic, antihypertensive, analgesic, anti-inflammatory, and antibacterial qualities in indigenous medicines including Ayurveda, Siddha, Unani, and homoeopathy.¹ The plant is also used to treat colds, scabies, ulcers, wounds, diarrhoea, dysentery, intermittent fever, dropsy,

jaundice, and intermittent diarrhoea. To treat skin problems, bhuyamlaki leaf paste is applied to the skin. In the event of a fracture, the area causing the agony is covered with rock salt and *Phyllanthus niruri* plant paste.² When administered as a paste, the plant's root is converted into a paste by being rubbed with lime juice or rice gruel. About 30% of diabetes individuals get the relatively early and frequent condition known as diabetic neuropathy. Although the development of insulin and hypoglycemia has greatly benefited diabetics, these individuals might not have access to the most effective treatments for their neuropathic consequences.³ Despite having some negative effects, the most common drugs are used primarily to relieve symptoms. It's also critical to look at other therapy options that can be safer and more effective. A plant known as *Phyllanthus niruri* (*Phyllanthus niruri*) has been classified as a Pitta and Kapha lowering plant, meaning it can aid in balancing these two. Ayurvedic texts classify Suptata (numbness) and Daha (burning feeling) in bodily parts, particularly the hands and feet, as Purvarupa of Prameha. Additionally, Prameha's Upadravas mentions Daha (complications). The symptoms of diabetic neuropathy include those listed above.⁴

Habit and Habitat

The leaves are elliptical in shape and oblong in shape, with dimensions of 3.0-11.0x1.5-6.0 mm. The elliptical-oblong leaves range in height from 10 to 60 cm. Their stem is upright and treaded, and their leaf is 3.0-11.0 x 1.5-6.0 mm. The first 2-3 axils of axillary flowers are home to unisexual 1-3 male flowers, while the following axils are home to bisexual flowers. Male flowers: pedicel 1 mm long; calyx 5, oblong-elliptic, apex acute; hyaline with unbranched midrib; disc segments 5, rounded; stamens 3; filaments connate; filaments connate (Bagchi et al., 1992).⁵

Method and Materials

Bhumyamalaki resources, authentic websites (PubMed, medicinal plants, etc.), authentic magazines, literature, manuscripts, a Sanskrit dictionary, the Shabdakosha, and other works have been assembled from a variety of periodicals and journals, as well as from Ayurvedic and contemporary writings.

Bhumyamalaki

Schum and Thonn's novel vegetal materials from *Phyllanthus amarus*. *Phyllanthus* Web. Linn *Phyllanthus maderaspatensis*. *Phyllanthus simplex*, Linn *Urinary*, and *Phyllanthus simplex*. The samples of vouchers were gathered from the foothills of the Western Ghats in India and placed at the Department of Pharmaceutical Sciences at Guru Jambheshwar University in Hisar and Haryana. Both samples had the shadow dried. To analyse the epidermal structural tests for the dried leaves, the epidermis of the leaves must first be prepared. A home adhesive (Quick fix) was consistently applied to the top and lower epidermis of the dried leaves. It is then allowed to dry at ambient temperature. A clean, dry glass slide is then put with the imprint surface facing up and the dried clear "Quick repair" film is delicately pulled away from the leaf's surface.⁶ It is covered with a cover slip, which is then softly tapped to flatten the film. Then it is examined under a compound microscope. Line drawings were produced using a lucida camera with a mirror-like design. In resolutions, the World Health

Assembly emphasised the significance of utilising current monitoring techniques and employing suitable standards to guarantee the safety of medicinal plant products.⁷ Traditional pharmacognostical studies are often suited for quality control of herbal medications. To create criteria for individual medications and compound formulations in order to verify the authenticity of unprocessed drugs with sources from plants, minerals, and animals, In order to develop standards for both single pharmaceuticals and compound preparations, pharmacognostical standardisation of herbal drugs encompasses macroscopic, microscopic, physio-chemical constants, and fluorescence investigation of studied sections. According to WHO (1998), the macroscopic and microscopic examination of a medicinal plant is the first stage in identifying its categorization and purity and should be carried out before any studies are carried out. The plant medicinal "Bhumyamalaki," which is one of the promising herbal treatments used in the Indian system of medicine for various liver problems, is produced by *Phyllanthus niruri* Lin, a member of the Euphorbiaceae family.⁹ Only the West Indies include *P. niruri*; India is not home to this species. *Phyllanthus* species known as "Bhumyamalaki" include *P. amarus* Schum and Thonn, *P. fraternus* Web, *P. maderaspatensis* Linn, *P. simplex* Retz, and *P. urinaria* Linn. Additionally, it has been used to treat various ailments as well as skin ulcers, sores, and itching. *Phyllanthus* emphasises its capacity to inhibit viruses, particularly the hepatitis B virus. Studies show that *Phyllanthus* can lessen the quantity of hepatitis B virus in the circulation and impede the growth and replication of the virus. Although its effectiveness in eradicating viruses has not been shown, it has been demonstrated to be efficient in easing symptoms and combating the hepatitis B virus. *Phyllanthus* can also support the overall health of the liver. An examination of the literature revealed that few scientists have studied the specifics of *P. fraternus*'s structure. Saha and Krishna Murthy examined the *P. fraternus* Web's structural features (1959). Yelene et al. later completed the study on leaf structure. There has not yet been research published that analyses the microscopic diagnostic features of all distinct *Phyllanthus* species that are known to have hepatoprotective qualities. Khatoon et al. looked at three different *Phyllanthus* species. Studies on plant drugs' histology are critical for understanding adulterants as well as for precise identification.¹⁰

Pharmacological Activities

Antioxidant activity:

Phyllanthus amarus fresh and dried samples were used to calculate the Total Phenolic Content (TPC) and antioxidant activity using the Folin-Ciocalteu method, 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging activity, and Ferric Reducing Antioxidant Strength (FRAP) tests. The antioxidant capabilities of *P. amarus* Methanolic extracts were significantly reduced by various drying techniques, with microwave drying producing the highest drop in TPC and antioxidant activity.

Anti-hepatotoxic activity:

When ethanol is administered, the levels of triglycerides, cholesterol, and phospholipids in the liver, brain, kidney, and heart are decreased (Tripathi et al., 1992). Whole plant powder at dosages of 35 and 70 mg kg⁻¹ for cattle. (1995; Sane et al.).

Antiviral activity:

Elisa antigen screening was done after *P. amarus* alcoholic, hexane, chloroform, butanol, and water extracts were tested in vitro on HbsAg, HBeAg, and HBV-DNA in blood samples positive for the HBV antigen. The butanol extract was the most efficient against HBV antigen (Mehrotra et al., 1991). a single injection of cells obtained from human hepatocellular carcinoma with an aqueous extract at a dosage of 1 mg mL⁻¹. HBsAg secretion was stopped for a total of 48 hours (Jayaram and Thyagarajan, 1996; Yeh et al., 1993). *Phyllanthus amarus* might be employed as an antiviral drug since it interfered with the Hepatitis B virus's reproduction, transcription of its mRNA, and polymerase activity. *Phyllanthus amarus* might be employed as an antiviral drug since it interfered with the Hepatitis B virus's reproduction, transcription of its mRNA, and polymerase activity (Lee et al., 1996; Ott et al., 1997).

Anti-bacterial Activity

Using the Bauer disc diffusion technique, the antibacterial effectiveness of root and leaf extracts was evaluated against ESBL-producing *Escherichia coli* isolated from stool samples of HIV-positive individuals. All strains of HIV-positive individuals' cells were sensitive to various dosages of the extracts (5, 10, 20, 40 and 80 mg mL⁻¹). This demonstrates the extract's ability to combat germs (Akinjogunla et al., 2010).

Hepatoprotective Activity

Total cholesterol, AST, ALT, urea, uric acid, total protein, prostatic, alkaline, and acid phosphatases all statistically significantly decreased following a methanol extract of *Phyllanthus amarus* leaves (p0.05 student's t-test) (50-800 mg kg⁻¹). Uric acid showed the largest decrease impact at 400 mg kg⁻¹ *P. amarus* extract, but total cholesterol showed the least reduction effect. The quantity and duration of this impact were likewise significant. This demonstrates the leaves of *P. amarus* have hepatoprotective, nephroprotective, and cardioprotective characteristics (Obianime and Uche, 2008).

Discussion

The plant is also used to treat scabies, ulcers, burns, jaundice, diarrhoea, dysentery, intermittent fevers, urino-genital system infections, and intermittent fevers. The hepatitis B virus is resistant to its powerful antiviral activities. In addition to having anti-inflammatory and anti-nociceptive actions, it also contains anti-diabetic and antilipidemic qualities. In order to incorporate a thorough evaluation of the literature on its pharmacological, traditional, and phytochemical qualities, the current study tries to do just that. Microscopic examination of the *Phyllanthus* species revealed that *P. fraternus* and *P. maderaspatensis* exclusively exhibit anisocytic stomata, but *P. amarus* possesses both anisocytic and paracytic stomata. While *P. maderaspatensis* has smooth epidermal cell walls, *P. amarus* and *P. fraternus* have wavy epidermal cell walls. The *Phyllanthus* species mentioned above are all referred to as "Bhumyamalaki" in India and are used to treat a variety of liver conditions. However, not all *Phyllanthus* species have the active ingredients necessary for treating liver illnesses.¹¹

P. amarus Schum and Thonn, *P. fraternus* Web, *P. maderaspatensis* Linn., *P. simplex* Retz., and *P. urinaria* Linn. are all separate species that make up *Phyllanthus niruri* Linn. *P. amarus* Schum and Thonn, *P. fraternus* *P. niruri*, listed in the flora of British India, and "Bhumyamalaki," referenced in the classical literature, have lately been equated with *P. amarus* based on clinical effectiveness. *Phyllanthus niruri* Linn. is a combination of five separate species. However, because all five kinds of *Phyllanthus* share morphological characteristics, they can occasionally be confused and marketed in herbal medicine marketplaces all over the world under the same common name. This investigation, which was carried out utilising a highly particular realistic technique, generated diagnostic features for all five *Phyllanthus* species investigated.¹²

Conclusion

Using straightforward methods, the current study's microscopic diagnostic characteristics will aid in the identification of genuine *Phyllanthus* samples utilised in liver illnesses. This is the first study of its sort on "Bhumyamalaki's" comparative microscopic diagnostic traits. In India, the whole plant is utilised to treat a number of illnesses. There are many *in vitro* tests that may be used to determine the extracts' antioxidant capacity. The efficacy of root and leaf extracts as antibacterial agents was evaluated using extensive spectrum lactamase. *P. amarus*, antitumor and anticancer action can be shown by the suppression of cell cycle regulators as well as the metabolic regulation of carcinogens.

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