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Hepatoprotective, anticancer & antiviral effects of Bhui amla in Unani Medicine: an overview

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Abstract
Bhui amla is commonly known as "bhumi amla" which belongs to Euphorbiaceae family. In Unani literature it is described in the name of "*BHUTI"* which means *Bhum Amlak* (Amla of land).There are many chemical constituents reported in bhui amla, but major chemical constituents are mainly alkaloids, in the form of lignins, like phyllanthin and hypophyllanthin. Globally it is used as a home remedies to treat different disorders *viz*; Hepatitis-B, Jaundice, Cirrhosis of liver, intestinal infection, diabetes, chronic fever, loss of appetite etc. Owing to its hepatoprotective property, it is in great demand in the market. There are many formulations available in the market for the cure of different ailments.

Keywords: *Bhui Amla*, *Bhuti*, *Bhum Amlak*, Hepatoprotective, Unani Medicine.

1. Introduction
Bhui amla is an annual herb mainly growing in rainy season. The plant is found to grow sufficiently in many parts of country like Bihar, Uttar Pradesh, Tamil Nadu, Maharashtra, Punjab and Sikkim as a weed. It can be survives under tropical and high rainfall conditions and tolerates temporary water logging [1].
Bhui amla is an important hepatoprotective remedy being used since time immemorial. The hepatoprotective activity has been reported from phyllanthin and hypophyllanthin present in *P. amarus*. Although it is highly valuable as hepatoprotective agent, it suffers from the dilemma of short supply due to its low herbage, availability in limited period and stringent requirement of climatic situation [2, 3].

2. Plant Catalog
Family: Euphorbiaceae
English name: Country gooseberry
Indian name
Bhuti, Bhum Amlak (Unani), Bhuamlaki, Bahupatri (Sanskrit), Jangliamli, Hazardana, Jaramala (Hindi), Keela nelli (Tamil), Nela usirika (Telugu), Nela Nelli, Kiranelli (Kannada), Bhonya amli, Anmali (Gujarathi), Bhuivali (Marathi), Bhuiamla (Bengali), Kizaneli (Malayalam).

Species
Phyllanthus amarus Schum & Thonn (Phyllantus niruri auct. Non L.), Phyllanthus fraternus Webster [1, 4].

3. Images of Bhui Amla



4. Plant Parts Used
Leaves, steams, seeds, fruits, and whole plants [5, 6].

5. Chemical Constituents
P. amarus is reported to contain variety of phytoconstituents like lignans namely phyllanthin, hypophyllanthin, nirphyllin and phyllnirurin; flavanone glycosides like niranthin, nirtetralin, phyltetralin and lintetralin; a steroidal hormone estradiol; flavanoids like quercetin, quercitrin, and astragalin; triterpenes like phyllanthenol, phyllanthenone and phyllantheol [6, 7, 8, 9, 10, 11].

6. Action (Af'al)
Dafe Yarqan, Dafe Humma, Dafe Hiddate Safra, Dafe Istehaza, Dafe Suzak, Dafe Sartan, Dafe Istisqa, Dafe Ziabetus Shakri, Dafe Baul Uddam, Dafe Shauzashe Baul, Dafe Qillate Baul, Dafe Suddah, Dafe Zaheer, Dafe Silan Uddam, Dafe Silane Mani, Dafe Kharish, Dafe Sual, Dafe Kasrate Haiz, Dafe Iltehab, Dafe Qula [4, 12].

7. Pharmacological Activity
7.1 Hepatoprotective activity
It is reported that aqueous extract of *P. amarus* shows hepatoprotective effect on ethanol-induced rat hepatic injury **[13]**. Another study revealed that aqueous extract of bhui amla at the dose of 50 or 100 mg/kg body weight for duration of 7 days against nime sulide induced hepatic damage showed hepatoprotective effect [14]. The methanolic and aqueous extracts of bhui amla seeds at the dose of 250 mg/kg body weight showed protective effect, in-vitro and in-vivo models of against CCl_4 mediated liver injury **[15]**. One another study reported that *P. amarus* aqueous extract against ethanol induced hepatotoxicity in rats both in *in vitro* and *in vivo* exhibit hepatoprotective activity, possible mechanism may involve their antioxidant activity [16].

7.2 Anticancer activity
One study revealed that aqueous extract of of *Phyllanthus amarus* treatment exhibited potent anticarcinogenic activity against 20-methylcholanthrene induced sarcoma development and increased the survival of tumour harboring mice, antitumour and anticancer activity may be related with the inhibition of metabolic activation of carcinogen as well as the inhibition of cell cycle regulators and DNA repair [17]. It is reported that a mixture (1:1) of phyllanthin and hypophyllanthin isolated from *P. amarus* exhibited antitumor activities against Ehrlich Ascites Carcinoma in Swiss albino mice at a dose of 25 mg/kg, 50 mg/kg, and 100 mg/kg body weight **[18]**. It is documented that *P. amarus* protects the liver from hepatocarcinogenesis and the root extract of *P. acuminatus* exerts growth inhibition in murine P-388 lymphocytic leukemia and B-16 melanoma cell lines [19]. Another study declared that methanolic and aqueous extracts of *Phyllanthus* showed anti-metastatic effects on human lung (A549) and breast (MCF-7) cancer cell lines [20]. One another study revealed that flavonoids isolated from *Aloe vera*, *Mimosa pudica* and *Phyllanthus niruri* showed cytotoxicity activity against human breast carcinoma cell line (MCF-7) and the inhibitory concentration at 50% growth (IC50) was found to be, Mimosa pudica (IC50= 35.52±0.50 µg/ml), *Aloe vera* (IC50= 54.97±0.36 µg/ml) and Phyllanthus niruri (IC50= 84.88±0.87 µg/ml) [21].

7.3 Antiviral effect
It is reported that an aqueous extract of the plant bhui amla inhibits endogenous DNA polymerase of hepatitis B virus and binds to the surface antigen of hepatitis B virus *In vitro* [22]. Another study regarding bhui amla exhibit antiviral activity against HIV [23]. It is documented that aqueous and methanolic extracts of bhui amla showed antiviral effect against dengue virus [24]. Bhui amla reveal the powerful antiviral activity against Herpes Simplex Virus type-1 and Herpes Simplex Virus type-2 which is anticipated to its action in the early stage of infection and replication [25].

8. Conclusion
Bhui Amla is an excellent medicinal herb which is broadly used in tropical countries including India. They have various pharmacological activities such as hepatoprotective, anticancer, antiviral, antidiabetic, nephroprotective, anti-inflammatory, antimicrobial etc. This effective diverse herb particularly hepatoprotective, used therapeutically by the Unani Attiba, since time immemorial in various disorders has been duly supported and validated by above mentioned *in vitro* and *in vivo* studies support the claims made by Unani scholars. However conservation and optimum utilization of such medicinal herbs is also a challenge and requisite to the stakeholders for the betterment of humanity.

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