



A Comprehensive Review on a Unani Dynamic Drug: Amla (*Emblica officinalis*)

Arshi Anjum¹ and Huda Nafees^{2*}

¹Department of Ilmul Qabalat wa Amraze Niswan, State Unani Medical College, Prayagraj, India.

²Department of Saidla, Ajmal Khan Tibbiya College, Aligarh Muslim University, Aligarh, India.

Authors' contributions

This work was carried out in collaboration between both authors. Author AA helped in literature searches. Author HN designed the study, wrote the protocol and wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Traditional system of medicine have been in vogue since ages. *Amla* is one of the herbal plant used in Unani medicine having very versatile actions. The word "*Amla*" is derived from an Arabic word '*ambalji*' and in Persian it is called '*amlah*'. In English is commonly known by the name of Indian gooseberry. It is used as medicinally since centuries. Each and every part of the *Amla* tree is used medicinally but more commonly its fruit is used. It is mostly found in tropical and sub-tropical parts of the world. All the information on the plant available in Urdu, Persian, Arabic language in classical Unani literature available in different libraries of India from recent to past were searched, for phytochemical and pharmacological activities and computerized databases such as Medline, Pubmed, Ovid SP, Google Scholar and Science-direct were searched. In unani classical texts, the temperament of *Amlais* mentioned as *Barid 1° Yabis 2°* and its actions are *Qabiz, Muqawwie Meda, Muqawwie Shaar*. The chemical constituents like amino acids alanine, aspartic acid, glutamic acid, lysine and proline are present in major quantity. Several pharmacological studies have been carried out on it like anti-ulcer, immune modulatory, anti-inflammatory, antitussive and gastroprotective etc. It is used both as single as well as in compound formulations as a main ingredient like Jawarish *Amla*, Jawarishshahi, Anushdaru and Itrifalat. Through this review an attempt has made to reveal the Unani aspect of *Amla* and describe Unani pharmacological activities in the light of recent experimental studies.

*Corresponding author: E-mail: dr.hudanafees@gmail.com;

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1. INTRODUCTION

Amla (*Phyllanthus emblica*) is a dynamic drug, having distinct position in Indian systems of Medicine. It belongs to family Euphorbiaceae. The word '*Phyllanthus*' is derived from Greek words '*Phyllon*' means leaf and '*anthos*' means flower. The species is native to India and also grows in tropical and subtropical regions including Pakistan, Uzbekistan, Srilanka, South East Asia, China and Malaysia. *Amla* is one of the richest sources of vitamin-C and low molecular weight hydrolysable tannins which make *Amla* a good antioxidant [1]. It is used in anaemia, biliousness and as diuretic [2]. The fruits of *Amla* are widely used in Unani system of Medicine. Therapeutically used in cancer, diabetes, liver treatment, heart trouble, ulcer, anemia and various other diseases. Due to presence of high Vitamin C content, it is useful in memory enhancing, ophthalmic disorders and to lower the cholesterol level. It helps in skin protection and promotes hair growth. Other properties are antifungal, antimicrobial, radio protective, chondroprotective, antioxidative [3,4].

Classification: [5]

Kingdom: Plantae

Genus: *Phyllanthus*

Species: *P.emblica*

Family: *Euphorbiaceae*

Scientific name: *Emblica officianalis* / *Phyllanthus emblica*

Vernacular Names: [5,6,7,8,9]

Arabic: *Amlaj*

Persian: *Aonla, Amla, Amuleh, Amial*

English: *Emblimyrobela, Indian Gooseberry*

Hindi: *Amla, Aonla, Amlika*

Kannada: *Nallika, Nelli, Amalaka, Nellikkai*

Kashmiri: *Ambali, Amliaonla*

Malayalam: *Nellikka, Nellikai, Nelli*

Marathi: *Anvala, Avolkathi, Avala, Arda, Bhuiawali, Aonli*

Sanskrit: *Dharti-phala, Amraphalam, Amalku, Adiphala*

Tamil: *Nellikai, Nelli, Topi Amalagam*

Telegu: *Usirikayi, Nelli, Amalekamu, Usiri, Triphalam Usirikai*

Urdu: *Aamla, Amlaj*

2. UNANI DESCRIPTION

Mahiyat: It is a fruit of a big tree having thin branches with short and thin leaves; resembles

Aalu Bukhara in structure and size, yellowish green in colour [7,10]. The pericarp of dried fruits is used mostly as drug. It tastes sour with a little bitterness. Seed is round in shape, when broken it breaks into three parts [11,12].

Hissa Mustamela (Parts used): Plant, Stem bark, Leaf, Root, Flower, Fruit and Seed [13].

Mizaj (Temperament): *Barid 1° Yabis 2° ; Barid 2° Yabis 3°* [7,10,14,15].

Afa'al (Actions according to Unani medicine): *Qabiz, Muqawwie Meda, Muqawwie Shaar Muqawwie Qalb, Muqawwie Hafiza, Muqawwie Basar* [7,10].

Traditional Uses: [6,7,10,11,14,16,17]

- It strengthens heart, Gastro intestinal tract and protects humours.
- It quenches thirst, helps to relieve nausea and vomiting.
- Due to its *qabiz* action, it strengthens hair roots.
- It gives strength to heart, eyes and hair. It helps in preserving black colour of hair.
- Its application along with *Mehndi* as dye is used to colour hair black and improve hair fall.

Muzirat (Adverse effects): Harmful to Spleen and produces colitis [7,11,17].

Musleh (Corrective): *Shehad, Sunbulut teeb* and *Roghan Badam shireen* [6,17].

Badal(Substitute): *Halela Kabuli* [6,17].

Miqdare Khurak (Dose): 10 to 17 gm [16]; 3-5 gm [7].

Murakkabat(Important compounds): *Anoshdaru, Murabba-e-Amla, Majoone-e-Maqawwi-e-Rahem, Majoone-e-Mundi, Majoone-e-Lana, Dawa-ul-Misk Motadil Sada, Itrifal Zamani, Itrifal-e-Sagheer, Itrifal-e-UstuKhuddus, Sufoofe-Aamla. Majoone-e-Kundur, QurseMulaiyin, Jawarish Aamla Sada, Sufoofe-Hazim Kalan* [10,16,18].

3. ETHENOBOTANICAL DESCRIPTION

Habitat and distribution: Almost in every part of India especially in deciduous forests and slopes

and also cultivated in many parts [5]. It is mostly distributed in tropical and sub-tropical parts of world like Peninsula, Indonesia, China [19].

Pharmacognostical descripton: *Amla* is an evergreen medium-sized and deciduous tree. Bark is of grey colour and wood is reddish. It grows in variable agro-climatic and soil conditions. Height of tree is about 60 ft (18 m). The leaves are pinnate like, small and fine, linear-oblong with a rounded base. The flowers are small, greenish-yellow and borne in compact clusters in the axils of the lower leaves. Male flowers are found on slender pedicels, and female flowers are few and sub-sessile. *Amla* fruits are round or oval with smooth textured skin and yellowish green in colour. There are 6 to 8 pale visible lines on fruit, appearing as grooves. Unripe fruits are light green turning yellow to red at maturity. Edible part of fruit is mesocarp and endocarp forms the hard stone enclosing seeds, approximately 6 in number [1,19]. Flowers bloom during October [20].

Chemical Constituents: The chemical constituents present in *Amla* in major quantity are amino acids are alanine, aspartic acid, glutamic acid, lysine and proline. Its Fresh fruit pulp having protein, carbohydrate, fibre, minerals, iron, niacin, vitamin C, copper and chromium. Other Phytochemicals like calcium, phosphorus, and potassium, crude proteins are also present [21]. The fruits, leaves and bark are rich in tannins. The root contains ellagic acid and lupeol and bark contains leucodelphinidin. The seeds yield a fixed oil (16%) which is brownish-yellow in colour. It has the following fatty acids: linolenic (8.8%), linoleic (44.0%), oleic (28.4%), stearic (2.15%), palmitic (3.0%) and myristic (1.0%) [22]. The fruit is rich in quercetin, phyllaemblic compounds, gallic acid, tannins, flavonoids, pectin, and vitamin C and also contains various polyphenolic compounds. "Phyllembin" is the active ingredient that has significant pharmacological action in *Amla*. The phytochemicals of this plant include hydrolysable tannins (Emblicanin A, Emblicanin B, punigluconin, pedunculagin) [23]. A good source of vitamin C; carotene, nicotinic acid, riboflavin, D-glucose, D-fructose, myoinositol and a pectin with D-galacturonic acid, D-arabinosyl, D-xylosyl, L-rhamnosyl, D-glucosyl, D-mannosyl and D-galactosyl residues; embical, mucic and phyllemblic acids, phyllembin and fatty acids (seed oil); leucodelphinidin, procyanidin, 3-O-gallated prodelphinidin and tannin [24].

4. PHARMACOLOGICAL ACTIONS

Antibacterial, Adrenergic, Alexeteric, Anabolic, Antiaggregant, Antibilious, Antibradykinin, Anticancer, Anticholinergic, Anticlastogenic, Anticonvulsant, Antidote, Antihistaminic, Antiinflammatory, Antileukotrien, Antipyretic, Antioxidant, Antiperoxidant, Antiserotonin, Antiviral, Aperient, Aphrodisiac, Astringent, Cardiotonic, Carminative, Cerebrotonic, CNS-Depressant, Diuretic, Expectorant, Hepatotonic, Laxative, Lipogenic, Propecic, Stomachic, Tonic, Vulnerary, Astringent [25,26]. Antianaemic, Anabolic, Antiemetic, Astringent, Antihæmorrhagic Diuretic, Antidiarrhoeal, Antidiabetic, Carminative, Antioxidant [27].

5. THERAPEUTIC EFFECTS

The different parts of *Emblca officinalis* used in various diseases, as follows:

Root bark: Jaundice, ulcerative stomatitis, gonorrhoea, diarrhoea and myalgia.

Leaves: conjunctivitis, inflammation, dyspepsia, diarrhoea.

Fruits: Skin diseases, bronchitis, diabetes, cough, peptic ulcer, hæmatemesis, anaemia and greyness of hair [5,28]. It is also used in premature greying of hair and falling of hair [29]. *Amla* juice is said to be effective treatment for gonorrhoea [21]. It helps in absorption of calcium, which is necessary for healthier hair. It also helps in promoting hair growth and maintaining them [30]. It is used in hair dyes and shampoos because of its detergency property.

Seeds of *Amla* fruit contain a fixed oil which is used for manufacturing soaps [31].

Pharmacological studies:

- 1. Antimicrobial action:** The alcoholic extracts of *Amla* were studied for antimicrobial activity against some microbial pathogens in a study conducted by Rahman et al. The results showed significant antimicrobial action [32].
- 2. Healing effect:** Chatterjee A. et al. carried out a work to study the biphasic effect of *Amla* extract on NSAID-induced ulcer in Swiss albino mice. The results indicated that ethanolic *Amla* extract has distinct healing effect on NSAID-induced gastric ulcer [33].

3. **Proliferative action:** A study showed strong proliferative effect of *Amla* extract on cultured human dermal Papilla cells, which may prolong the anagen phase of hair cycle [34].
4. **Antioxidant effect:** The antioxidant activity of tannoid active principles of *Amla* were evaluated emblicanin A (37%), emblicanin B (33%), punigluconin(12%), pedunculagin(14%) in a rat model [35].
5. **Anticancer effect:** The powerful antioxidant Ellagic acid, present in *Amla*, can inhibit mutations in genes and repairs the chromosomal abnormalities. It inhibits the growth and spread of various cancers like breast, uterus, pancreas, stomach and liver cancers [35].
6. **Protection against oxygen radical:** The tannins of *Amla*, emblicanin-A (37%), emblicanin-B (33%), punigluconin and pedunculagin are reported to provide protection against oxygen radical included haemolysis of peripheral blood erythrocytes in rats [23].
7. **Hypolipidemic effect:** The hypolipidemic effect of *Amla* has been proved in a study conducted to evaluate the effects of *Amla* on serum lipids and atherogenesis in Albino rats fed with high fat diet. The ethanolic extract of *Amla* showed significant reduction of lipid levels but in comparison with simvastatin which was taken as standard drug, the effects of *Amla* were not so pronounced [36].
8. **As antivenom:** *Amla* and *Vitex negundo* were explored for the first time for antisnake venom activity. Najakaouthia and *Vipera russellii* venom was antagonized by the plant extracts significantly both *in vivo* and *in vitro* studies. *V. russellii* venom-induced coagulant, haemorrhage defibrinogenating and inflammatory activities were significantly neutralized by both plant extracts. No precipitating bands were formed between the snake venom and plant extract which confirmed that the plant extracts possess potent snake venom neutralizing capacity and need further investigation [37].

6. CONCLUSIONS

Plant-derived drugs have an important place in both traditional and modern medicine and about 80% of the world's population depends on

traditional plant-derived drugs for their primary health care. Amla (Emblica officinalis) is a versatile plant due to its various medicinal properties. Since ancient times it has been used as a remedy of almost every ailment. For mankind it is a single shot for various targets in context of its wide therapeutic effects. Although many pharmacological activities both in vivo and in vitro and also clinical trials have been done on it but still more research is required, particularly examining the effects of chronic consumption patterns. With increasing interest in alternatives to non-steroidal anti-inflammatory agents in the management of chronic inflammation, research is emerging on the use of food extracts such as E. officinalis.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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