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REVIEW ON *Emblica officinalis* PLANT: ITS PHYTOCHEMISTRY, MORPHOLOGY AND USES

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ABSTRACT

Emblica officinalis, commonly known as Amla or Indian Gooseberry, is a highly valued plant in traditional medicine systems like Ayurveda and Siddha. Known for its numerous therapeutic benefits, Amla is rich in vitamin C, alkaloids, flavonoids, carbohydrates, tannins, phenolic compounds and antioxidants, which contribute to its health-promoting properties. It is widely used for its antibacterial, antifungal, antiviral, and anti-inflammatory effects, addressing a range of conditions such as digestive disorders, skin ailments, fevers, and joint pain. Amla is also known for its energy-boosting and rejuvenating properties. Grown extensively in India and other parts of Asia, Amla is commonly consumed fresh, dried, or in various herbal formulations. The plant's diverse chemical composition, including compounds like Emblicannin, gallic acid, and quercetin, further supports its medicinal value. With its minimal side effects and growing demand, Amla is increasingly sought after as an alternative to synthetic drugs, especially in the developing world.

KEYWORDS: Emblicannin, *Emblica officinalis*, phytoconstituents, quercetin.

INTRODUCTION

In this century, unparalleled medicinal inventions have been achieved to resolve incalculable diseases, including cancer and AIDS. Yet most of the investigation studies have been conducted in all over the world against newly discovered diseases. Thus, we have forgotten our ancient medicines such as Siddha, Ayurveda and Unani systems.[1]

In spite of synthetic medicines like antibiotics, steroids and advanced surgical practices gives faster action and bring quick relief, it cause some life threatening side effects including death. Furthermore, regular ingestion of antibiotics and some pain killer tablets may produce toxic substance in liver. Ancient people had been live long when compared to nowadays. Because of their life style, which is completely depends on nature. Traditionally life threatening diseases have been deals with herbal medicines which are taken as food not as medicine or drug. Phytochemicals present in fruits and vegetables could reduce various risks of diseases owing to prevent the oxidative damage produced by free radicals.[1]

The number of patients seeking alternate and herbal therapy is growing exponentially. Herbal medicines are now in great demand of developing world for primary health care not because they are inexpensive but also for culture acceptability, better compatibility with the human body and minimal side effects.[2]

According to WHO, nearly 75-80% of world population still depends on herbal medicines. Indigenous or herbal medicines confer considerable economic benefits to most rural and poor people. WHO noted that about 25% of modern medicines are descended from plant sources used.[2]

Emblica officinalis is a well-known plant in India for its therapeutics. It is also used in the fields of Ayurveda and siddha.[3] In this article the nature of amla and its medicinal properties have been briefly discussed. According to believe in ancient Indian mythology, it is the first tree to be created in the universe.[1]

PLANT PROFILE

Botanical name of the plant: *Emblica officinalis* belonging to family Euphorbiaceae.[1]

Scientific name: *Phyllantus emblica.*[1]

Table 1: Vernacular names.[1]

English	Indian Gooseberry
Kannada	Nellikayi
Sanskrit	Aamalaki
Hindi	Amla
Nepalese	Amba
Chinese	An Mole
Malaysian	Popok Melka
Bengali	Amloki
Assamese	Amlokhi

Parts recommended for use as medicine[1]

The dried fruit, the nut or seed, leaves, root, bark and flowers are frequently employed. The ripe fruits are generally used fresh, but dried fruit are also used.

Distribution

The Amla tree is native to tropical southeastern Asia, particularly in central and southern China and Mascarene Islands. It is commonly cultivated in home gardens throughout India and grown commercially in Uttar Pradesh. In India and to a lesser extent in Malaya, the Amla is important and esteemed, raw as well as preserved and it is prominent in folk medicine.[4]

The Amla is indeed grown extensively across India in various agro-climatic conditions, ranging from arid climates to regions with high pH and poor soil fertility. It thrives in diverse environments, including mixed deciduous dry forests, hills ranging from sea level up to 1300m, and even higher in certain regions like the Himalayas. India is the leading producer of Indian gooseberry globally, with significant cultivation in states like Uttar Pradesh, Madhya Pradesh and Tamil Nadu. Additionally, naturally growing gooseberry trees are found in various countries including Sri Lanka, Thailand, Vietnam, USA, Iran, Iraq, Pakistan, Malaysia, Bhutan, Trinidad, Panama and Japan.[5]

In last two decades, there has been tremendous increase in the area under Amla cultivation across the country, utilizing the wasteland. This has resulted in efficient utilization of resources leading to better income to farmers, nutritional security coupled with enhanced employment and rehabilitation of wastelands.[6]

Plant Description

Medicinal plants are large source of traditional medicinal system of drug among them Amla is a well known plant since Vedic Kala.[7] *Emblica officinalis* (Amla) is a small to medium sized tree with greenish-gray or red bark, growing to a height of about 8-18m.[8] The tree is common in the mixed deciduous forest of India of India ascending TO 4500 ft on the hills. It is often cultivated in Gardens and Homeyards. A type bearing comparatively larger fruit than the wild plant is known in cultivation.[7]

Fig 2: Emblica officinalis plant.

Stem bark

Emblica officinalis stem bark displays smooth texture with slight ridges and longitudinal fissures, ranging in color from grayish- brown to brown. Its outer bark is soft and easily removable, revealinga hard, fibrous inner bark. Small, scattered lenticels and brown to black streaks run longitudinally on the bark, complemented by arhythimode composed of corky tissue layers.[9]

Flowers

Small, inconspicuous, greenish-yellow flowers are borne in compact clusters in the axils of the lower leaves. Male flowers are unisexual and numerous on short, slender pedicels, females few, subsessile, ovary three celled.[8]

Fruit

Pale yellow, depressed, fleshy, globose, about 2 cm in diameter with 6 obscure vertical furrowsenclosing 6 trigonous seeds in 2 seeded 3 crustaceous cocci.[8]

Leaves

They are 3 mm wide and 1.25-2 cm long, alternate, bifarious, pinnate, leaflets numerous, alternate, linear-obtuse, entire, petioles are striated, round.[8]

Seeds

Obovate-triangular, 3 celled, seeds 2 in each cell.[8]

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Taxonomical classification[8]

Table 2: Taxonomical classification.

Kingdom	Plantae (Plants)
Subkingdom	*Tracheobionta* (Vascular plants)
Super division	*Spermatophyta* (Seed plants)
Division	Angiospermae (Flowering plants)
Class	Dicotyledonae (Dicotyledons)
Subclass	Rosidae
Order	Geraniales
Family	Euphorbiaceae
Genus	*Emblica*
Species	*Officinalis*

Chemical constituents[1]

- *Emblica officinalis* mainly contain tannins, alkaloids, phenolic compounds, amino acids and carbohydrates.
- Its fruit juice contains the highest vitamin C (478.56 mg/100 mL). The fruit when blended with other fruits, boosted their nutritional quality in terms of vitamin C content.
- The other principle components are Emblicannin A, Emblicannin B, Punigluconin and Pedunculagin.
- Compounds isolated from EO were gallic acid, ellagic acid, 1-O-galloyl-betaD-glucose, 3,6-di-O- galloyl-Dglucose, chebulinic acid, quercetin, chebulagic acid, corilagin, 1,6-di-O -galloyl beta D glucose, 3 Ethylgallic acid (3 ethoxy 4,5 dihydroxy benzoic acid) and isostrictiniin.
- *Phyllanthus emblica* also contains flavonoids, kaempferol 3 O alpha L (6" methyl) rhamnopyranoside and kaempferol 3 O alpha L (6"ethyl) rhamnopyranoside.
- A new acylated apigenin glucoside (apigenin 7 O (6" butyryl beta glucopyranoside) was

isolated from the methanolic extract of the leaves of *Phyllanthus emblica* together with the known compounds; gallic acid, methyl gallate, 1,2,3,4,6-penta-O-galloylglucose and luteolin-4'- Oneohesperiodoside were also reported.

- The number of chemical constituents was listed in table 3.

Table 3: Chemical Constituents.[1]

Sl. No.	Chemical Constituent	Sl. No.	Chemical Constituent
1.	Carbohydrates	11.	Alkaloids
2.	Phenolic compounds	12.	Tanins
3.	Amino acids	13.	Flavanoid
4.	Vitamin C	14.	Pectin
5.	Ellagic acid	15.	Punigluconin
6.	Quercetin	16.	Chebulagic acid
7.	Emblicanin-A	17.	Gallic acid
8.	Emblicanin-B	18.	Pedunculagin
9.	Citric acid	19.	Ellagotannin
10.	Trigallayl glucose	20.	Quercetin

Nutritional Value[1]

Amla is well known for its nutritional qualities. It is rich in polyphenols, minerals and is regarded as one ofthe richest source of vitamin C (200-900 mg per 100 g of edible portion).

Pharmacological Uses[1]

1) **As an energy refiller:** One teaspoon of amla powder over with honey after taking milk in the morning helps to improve freshness and strength to the body.
2) **Aperient:** The green fruits are made into pickles and preserves to stimulate the appetite.
3) **Antibacterial, antifungal, antiviral:** Medical studies conducted on Amla fruit suggest that it has antiviral properties and also functions as an antibacterial and anti-fungal agent.
4) **Boils and spots:** The pericarp of the fruit is often used in decoctions along with other ingredients and alsoapplied externally on boils with cow ghee to promote suppuration.
5) **Antipyretic:** The seeds are given internally as a cooling remedy in bilious affections and nausea, and in infusion make a good drink in fevers. The flowers are employed for their supposed refrigerant and aperient qualities. Often after a fever there is a loss of taste and a decoction of the emblic seed, dried grapes and sugaris used for gargling.
6) **In Gonorrhoea:** The juice of the bark combined with honey and turmeric is a remedy for gonorrhea.
7) **Analgesic:** A paste of the fruit is a useful application to the forehead in cases of cephalalgia (headache).The name "Itrifal" of Unani medicine is the same as "Triphala" in the

Ayurvedic system and represents a group of preparations used for the care of all manner of cranial conditions. Amla is mixed with buttermilk for anointing and "cooling" the head.

8) **For Skin Fareness:** Skin lightening agents have been widely used to either lighten or depigment the skin in the Asia, Far East and Middle East countries, whereas in the European market products tend to be employed for age spots and freckles. The effectiveness of a standardized antioxidant fraction of *Phyllanthusemblica* fruits as a skin lightener and also as an antioxidant was proven.
9) **To stop burning in the vagina:** A mixture of the fruit juice and sugar is prescribed as a remedy for burningin the vagina. Juice of the bark combined with honey and turmeric is a remedy for gonorrhea.
10) **To stop nausea and vomiting:** A powder of the amla seed and red sandalwood is given with honey, to stop emesis.
11) **To Treat Indigestion:** Fruit is carminative and stomachic. The tender shoots given in butter-milk cure indigestion combined with and it are known that green fresh leaves curds have similar effect.
12) **To Stop bleeding of the nose:** Seed fried in ghee and ground in conjee is applied as Lep to the forehead to stop bleeding from the nose.
13) **Antitumour activity:** Aqueous extract of *Emblica officinalis* (E.O) was found to be cytotoxic to L 929 cells in culture in dose dependent manner.
14) **Heals Arthritis Condition:** Amla has anti-inflammatory properties which help in reducing the swelling and pain of the joints of knees caused due to arthritis.
15) **Cures Sleep Disorders:** Amla cures sleep disorders like the insomnia.

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